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MIX

PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

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- Skywalker Sound's Gloria Borders
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For some people, only one console is good enough.

Dolly Parton with producer Steve Buckingham (right) and engineer Gary Paczosa (left) pictured at Sound Stage, Nashville.

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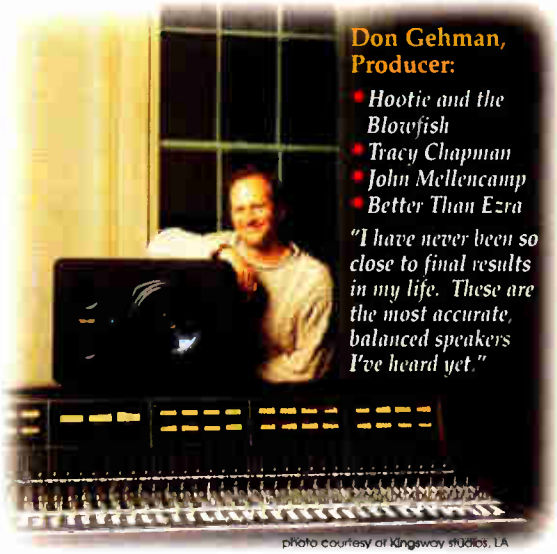

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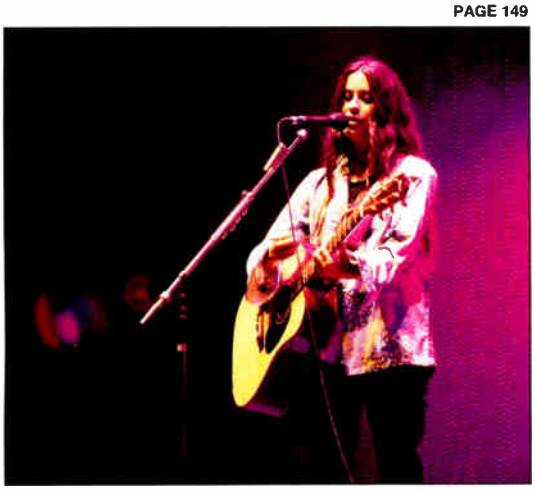

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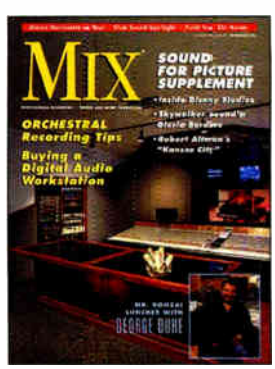
Cover: Music I of Chicago Trax Recording opened in April with an 80-input SSL 4072 (G computer and Total Recall), Studer A-800 24-track, Genelec 1031A monitors and a wide selection of vintage mics and outboard processors. Acoustical design was by Doug Jones of Electrical Acoustic Systems, with audio design by Jeffrey Schroeder. **Photo:** Fred Leavitt. **Inset Photo:** Edward Colver.



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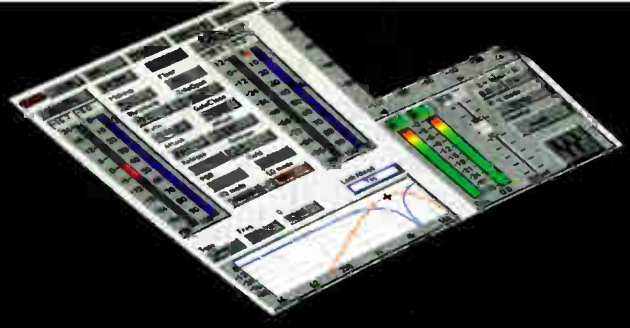

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FROM THE EDITOR

ENTER THE MDSTUDIO...

Perhaps this column should have been called, "Have you driven a MiniDisc lately?" I just returned from Summer NAMM, where everybody was talking MiniDiscs. Yamaha used the occasion to begin U.S. deliveries of its $1,199 MD4 4-track MiniDisc recorder/editor/mixer units (Waylon Jennings got the first one), and competing products—Sony's MDM-X4 ($1,250) and Tascam's Digital Studio 564 ($1,499)—should be arriving in the near future, or at least in time for Santa to stock up for holiday sales.

All of these MD ministudios—or should we say "MDstudios"—share common features, such as 37 minutes of 4-track recording on a "Data" format MiniDisc, a built-in analog mixer, MIDI sync, cut-and-paste editing and a unique write-after-read mode that allows users to bounce four tracks onto two of its own tracks. To fit four tracks onto a 140MB disc, all the MDstudios use the same ATRAC data compression scheme developed for Sony's consumer MiniDisc systems. Since debuting the first consumer MD decks a couple of years ago, Sony has vastly improved its ATRAC encoding, and the new systems are quite impressive, especially considering the formidable task of 5:1 compression.

MDs exist in three forms: prerecorded MD is a nonrecordable optical format (similar to the CD process); recordable MD-Audio disks are for stereo applications only; and the MD-Data format (which the MDstudios use) was designed for computer storage applications. Audio MD blanks are about $15, but are unusable in the MDstudios; MD-Data disks are about $30, and because these never caught on in the computer industry, they're gonna be tough to find at 3 a.m.

Questions that remain to be answered include disk interchangeability between the three MDstudios. All use proprietary methods of placing pointers and marking edit points, so edit data from one system is unreadable by another manufacturer's deck. An impromptu test on the NAMM show floor indicated playback compatibility, and a Sony rep I spoke to said all the systems had to comply with the MD standard, so record compatibility would be assured.

Designed as a replacement for the analog cassette, MD is especially well-suited for home recording, and MDstudios offer quality and versatility light years ahead of 4-track cassette studios. A number of pro applications also come to mind, such as 4-track production of radio spots (with narration, SFX track and stereo music bed), or as a random-access, instant playback system for 4-channel sound effects in theatrical or special venue installations.

The birth of any new format has never been a bed of roses, and the MDstudio is no exception. But whenever affordable, great-sounding technology gets into the hands of creative people, good things are bound to happen. The only question now is who'll be the first to chart a hit on an MD wonderbox?

We'll be listening...

George Petersen

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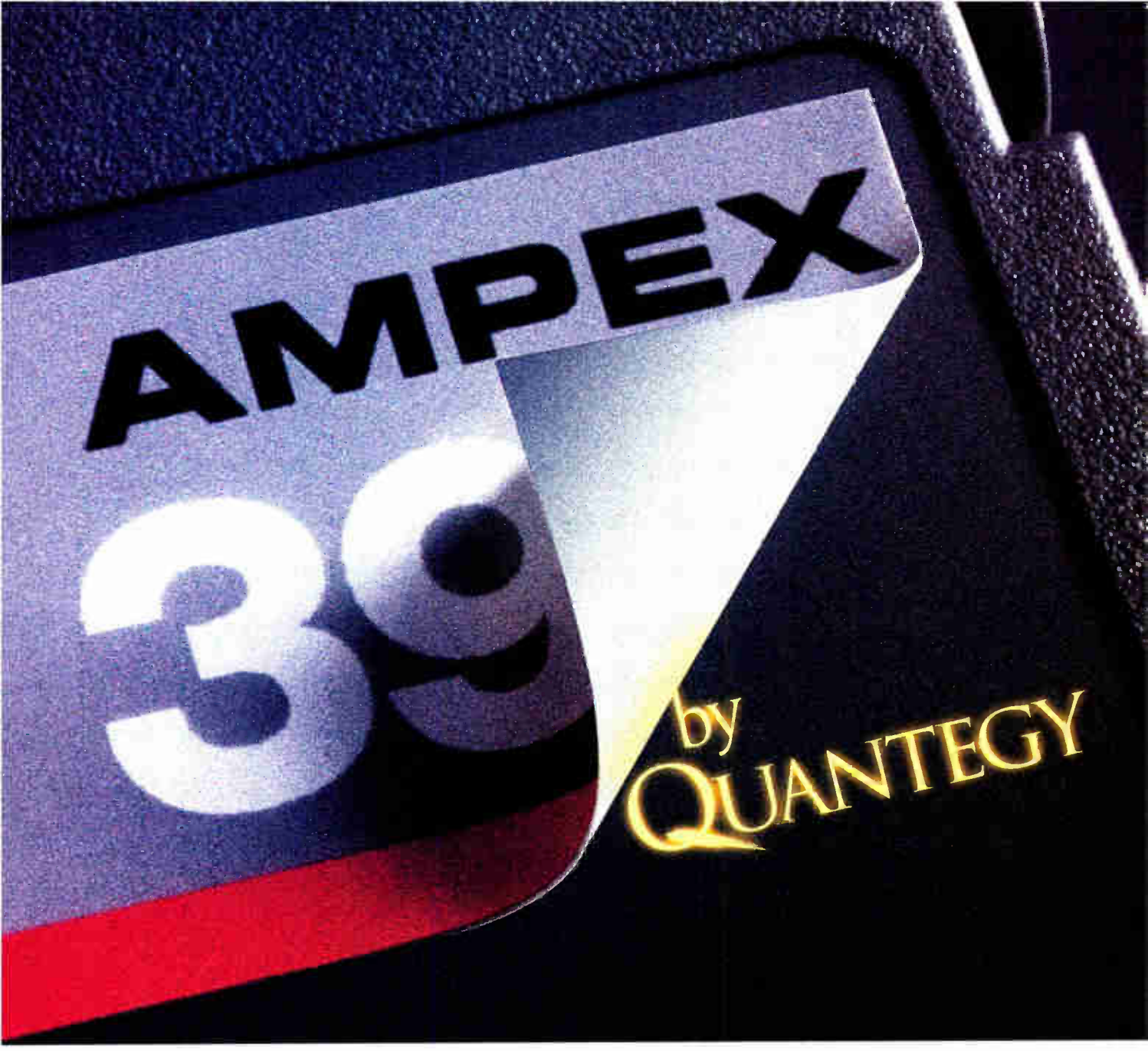

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A limited number of sponsorships and tickets are still available. If you would like more information, call 510/939-6149.

WINTER NAMM MOVES TO L.A.

The NAMM Board of Directors announced that the Winter NAMM International Music Market will move to the Los Angeles Convention Center in 1998 and 1999. The decision to move from the Anaheim Convention Center was motivated by a combination of current space limitations and expansion construction issues, says NAMM representative Warner Page. "The Anaheim Convention Center will not be large enough to accommodate our show and, with the planned construction, will not be in acceptable condition during these years," he says. The convention will return to an expanded Anaheim Convention Center in 2000.

NEW SOUNDTRACS DISTRIBUTORS

As of August 15, 1996, Korg USA became the exclusive U.S. distributor for audio products from UK console manufacturer Soundtracs. As part of the agreement, Korg USA will also handle marketing, servicing and support for all Soundtracs consoles, from the new line of entry-level Topaz mixers to the large-format Jade and Solitaire production consoles and the new Virtua digital board. The announcement reflects Korg USA's current growth and recent expansion to new 5.5-acre facilities at 316 South Service Road, Melville, NY 11747. Phone 516/333-9100; fax 516/333-9108.

Canadian distribution of Soundtracs' higher-end consoles—such as Solitaire, Jade and Virtua—is now handled by Sascom Marketing, of Oakville, Ontario.

SPATIALIZER ACQUIRES MULTIDISC TECHNOLOGIES

Spatializer Audio Laboratories Inc. (Woodland Hills, Calif.) acquired the assets of Home Theater Products International's MultiDisc Technologies division, which includes an array of development-stage compact disc server technologies. The acquisition strengthens Spatializer's manufacturing and OEM licensing relationships and broadens the company's technology portfolio. Irwin Zucker, former senior vice president of engineering and product development for Harman International, is president of Spatializer's new MultiDisc Technologies Inc. subsidiary.

ANALOG DEVICES FORMS JOINT VENTURE WITH TSMC

Norwood, Mass.-based Analog Devices Inc. (ADI) recently announced that it has entered into a joint venture with Taiwan Semiconductor Manufacturing Company (TSMC) of Hsinchu, Taiwan, and other equity partners to build a wafer fabrication facility in Camas, Wash. The new venture, WaferTech, is the latest in a series of ADI systems IC business infrastructure expansion announcements that include the opening of four new DSP design centers, new customer support centers around the world and the growth of its submicron manufacturing capacity.

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

CALIFORNIA CD PLANT SUED BY MAJOR RECORD COMPANIES

The Recording Industry Association of America (RIAA) announced that 20 of its member companies have filed a copyright infringement suit against ASR Recording Services of California, a compact disc facility in Canoga Park, Calif. According to Steven D'Onofrio, RIAA executive vice president and director of anti-piracy, "The plaintiffs are seeking injunctive relief and monetary damages allegedly caused by the manufacture and distribution of hundreds of thousands of unauthorized CD top-hit compilation albums." The lawsuit alleges that the defendants infringed the plaintiffs' exclusive rights in copyright to sound recordings involving major artists such as Michael Jackson, Elton John and Madonna. The 20 plaintiffs include A&M Records, BMG Music, Capitol Records, Sony Music Entertainment and Warner Bros. Records Inc.

FAREWELL, OLD FRIEND

Charles R. Fischer passed away on July 29, 1996, at age 38, due to complications from diabetes. An expert in analog synthesis, Chuck was a longtime contributor to *Mix*'s sister publication, *Electronic Musician*, and occasionally served as a technical advisor to the *Mix* editorial staff. Over the years, Chuck had worked as a tech for such companies as dbx, Orban, AKG and ADA. He will be missed by all.

HEADSPACE INC. PARTNERS WITH WEBTV

Headspace Inc., a company co-founded by composer/musician Thomas Dolby Robertson to develop music and sound

—CONTINUED ON PAGE 12

World Radio History

MM-8

Time-Align®

An honest system
beyond audible response

ELF

While DC to LIGHT response is sometimes joked about in audio circles, it is very desirable to extend a system's bandwidth beyond the audible range because it provides a real sonic improvement.

Unlike any other monitor system, our Studio-A system responds flat from above 20 kHz down to 8 Hz and meets the Time-Align® specification from E.M. Long, even in the bass range.

The MM-8 is a precision 8" coaxial studio monitor with a calibrated flat frequency response and a licensed Time-Aligned™ crossover. Precisely manufactured and tested, the MM-8 system offers you an honest listen to your mix.

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INDUSTRY NOTES

Shure Brothers Inc. of Evanston, IL, named **Santo (Sandy) LaMantia** as president. LaMantia replaces **Jim Kogen**, who retired after 34 years with the company...The **Walters-Storyk Design Group** and **Berkow/SIA** opened a joint office in New York City. The address is 31 Union Square West, New York, NY, 10003. Phone 212/675-1166; fax 212/691-4690...**Mackie Designs** (Woodinville, WA) founder/CEO **Greg Mackie** was presented with the 1996 High Technology Entrepreneur of the Year Award from investment firm Ernst & Young. In other Mackie news, the company announced its new analog team, headed by **Carl Perkins**. Mackie also named **Richard Rosenzweig** as new vice president of operations and **Tami Pereira** as vice president of international sales and marketing...Bicoastal wonder **Wayne Freeman** joins the teams of **Audio Toys Inc.** (Columbia, MD) and **Otari Corp.** (Foster City, CA), offering his marketing skills to both companies. Otari also announced that Otari Singapore and OtariTec Japan were granted exclusive sales and service distribution rights for **Arrakis Systems** (Ft. Collins, CO) products throughout most of Southeast Asia...**HHB Communications** in Portland, ME, is now the exclusive U.S. distributor for the **ATC Loudspeaker Technology Ltd.** product line. For information, call 207/773-2424...German microphone manufacturer **B.P.M. Studio Tecknik** announced the formation of B.P.M. USA (Miami, FL), headed by **Larry Misrahi**. Phone 305/588-7008 for more information...**Vari-Lite International Inc.**, headquartered in Dallas, appointed **Clay Powers** as vice president of operations for Vari-Lite and **Richard Bratcher** to Show-Co's board of directors...**Carl Amend** joined NVision in Grass Valley, CA, as eastern regional manager...**Telex Communications Inc.** (Minneapolis, MN) named **Gary Bosiacki** as national dealer sales manager for sound reinforcement products; **Tom Hansen** as national dealer sales manager for broadcast products; **Lisa Hankins** as western regional sales manager; and **John King** as eastern regional sales manager...In **Korg Inc.** news, **Sadao Fukushima** was appointed as president...**Event Electronics** of Santa Barbara, CA, brought onboard **Barbara Brown** to handle operations and export sales and **Richard Dean & Associates** and **Michael Belitz** as sales representatives...SAE, the **School of Audio Engineering**, recently celebrated its 20th anniversary and announced the opening of a training center in Milan, Italy...QMI (Holliston, MA) was appointed exclusive U.S. distributor of the **Chevin Research** brand of power amplifiers. Phone 508/429-6881 for details...**Conrad Sundholm**, co-founder of Sunn Musical Equipment Co. and Biamp Systems Inc., announced the formation of **Sundholm Acoustics Inc.**, a speaker design firm. The address is 16630 SE Round Oaks Ct., Milwaukie, OR 97267. Call 503/794-2661...**Keith Clark** was named public relations manager at **Eastern Acoustic Works** (EAW) in Whitinsville, MA...**Applied Research Technology**, of Rochester, NY, promoted **Mark Fiammi** to director of manufacturing, **Brian Peet** to director of materials engineering and **Jeff Cary** to marketing development manager...**Harry Limauro** was named to the post of director of marketing and **Ed Mims** was promoted to director of sales at **Cerwin-Vega** in Simi Valley, CA...Norwalk, CA-based **Fostex Corp.** appointed **Griffin Public Relations & Marketing** (New York City) as its U.S. public relations agency...**Audio-Technica** in Stow, OH, named both **Bruce Wismer Sales** (Atlanta) and **CM Sales** (Redford, MI) as its sales reps of the year...**Dr. Randall Eyles** was appointed executive director of the **Percussive Arts Society**, based in Lawton, OK. ■

—FROM PAGE 10, CURRENT

technology for the Internet and interactive entertainment, announced a plan to provide music and audio effects technology for the interactive WebTV network. The agreement is centered around the licensing of Headspace's proprietary RMF (Rich Music Format) technology, which is a platform-independent open standard created to provide intelligent musical interactions in the multimedia entertainment and online arenas. RMF, also available to authoring and content developers, allows the streaming of MIDI data integrated with digital audio.

WEB ANNOUNCEMENTS

Baudway Communications introduces Music Interactive, a Web site where individual visitors describe their musical interests and receive customized information. Also offered are a product database, career resources and online instruction/advice for professional musicians. Visit http://musicinteractive.com.

Crest Audio recently debuted online at www.crestaudio.com. Features include company information, technical data and photos of products and information about recent installations and tours featuring Crest products.

The JeepJazz Music page on the World Wide Web is an online resource for professional musicians. Included are a free online recording handbook, a RealAudio demo service for unsigned bands and access to the Jeep Jazz Company Store. At www.jeepjazz.com.

Sabine's Web site provides product information and reviews, user lists, rep maps and operating guides. The address is www.sabineinc.com.

Studiomaster has opened a Web site at www.studiomaster.com. There, find product photos and information and specifications.

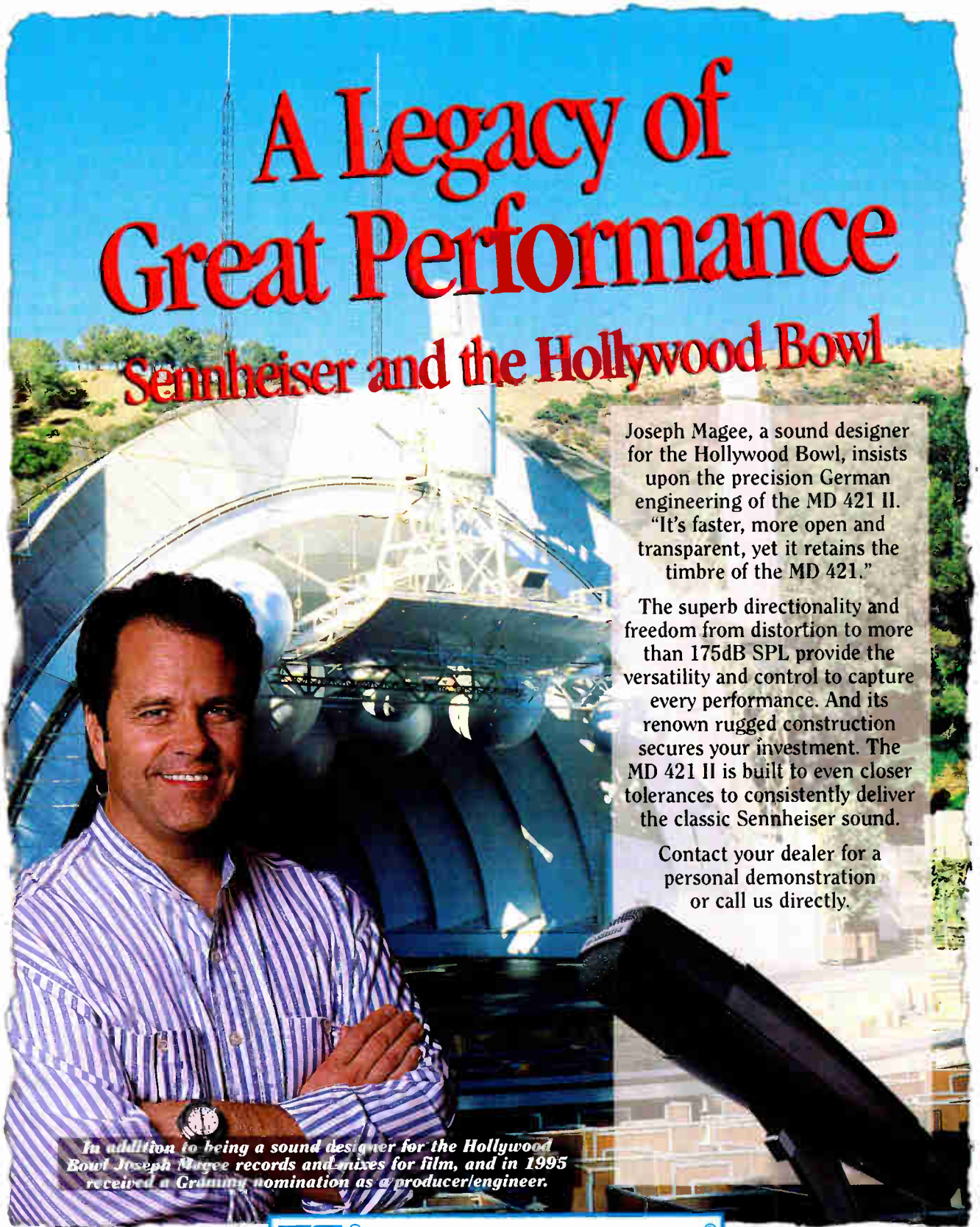
CORRECTION

The NAB Convention report in the July *Mix* erroneously implied that two of the disk-based video recorders unveiled at the show had similar pricing. The Doremi V1 is $5,995; the Drastic Technologies VVCR starts at $17,000. We regret any confusion this may have caused. In addition, the August feature on business software misidentified E Ware's product. The correct name of the software is Sound Business Music Production Manager. E Ware's telephone number is 615/386-3605. ■

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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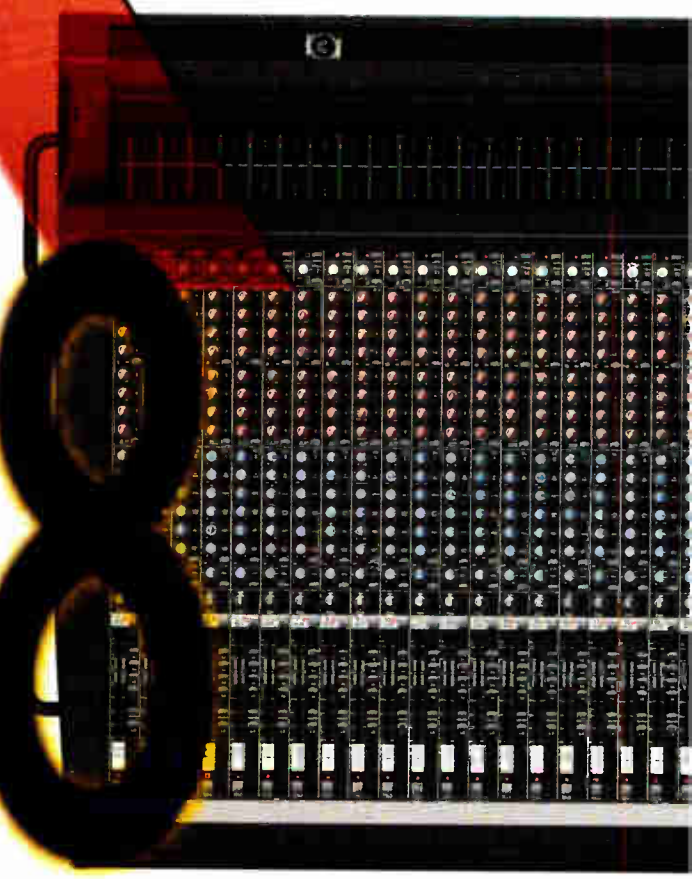
SR 40x8

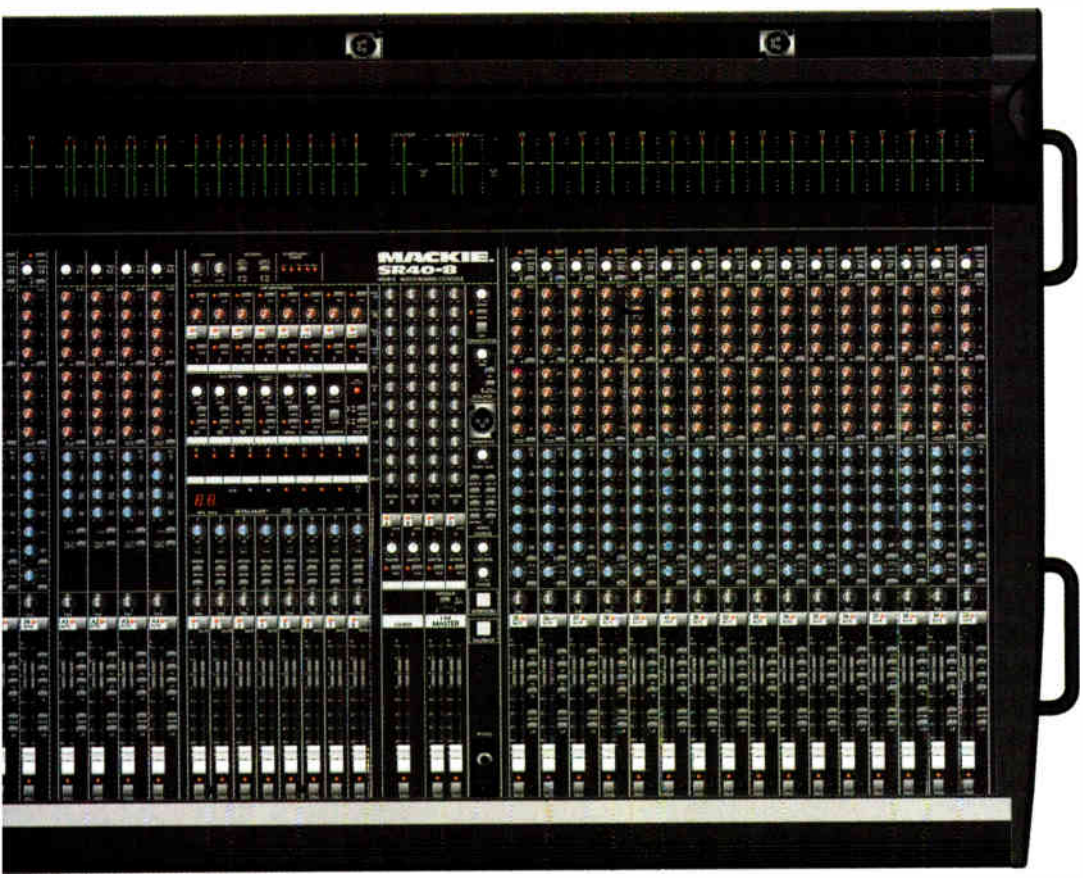
40x8x3 If you're you'll be



- **Center-mounted Master section** with 4 full-length "aux strips" including 4-band EQ, pan & trim controls
- **Independent L/R/center bus assignment**
- **On-board snapshot group muting** with external computer control capabilities
- **12x4 matrix** w/Center, L & R input controls, matrix mute button + LED, matrix master level control, and matrix solo + LED
- **All inputs & outputs fully balanced** (except RCA tape inputs & outputs)
- **Master section** includes fader link L/R switch, center master fader, center solo + LED, L&R/L-R master level faders, L&R solo switches + LED indicators
- **8 Submix section bus strips** each feature 100mm log-taper faders, "Air" EQ controls, center & L-R assign switches, pan controls, mute & solo switches with LEDs
- **Stereo Aux/Tape Return section** includes level control, mute switch, solo switch + LED, monitor line out level control, monitor mute switch, global PFL/AFL solo switch & Mackie's famous Rude Solo Light LED
- **40* mono channel strips** with Mackie's renowned high-headroom/low noise discrete mic preamps, polarity switches & sweepable 30-800Hz Low Cut (high pass) filters at 12dB/octave
- **Mono channel strips include:** 60 dB range gain trim, individual phantom power switch and status LED, 8 individual aux sends, Aux 1-4 & 5-8 pre/post switches, 4-band equalization with 12kHz Hi shelving EQ, sweepable (500Hz-15kHz) Hi Mid EQ, sweepable (45Hz-3kHz) Lo Mid EQ, 80Hz Lo shelving EQ, EQ In switch, 30-800Hz sweepable Low Cut (high pass) filter at 12 dB/octave and In/Out switch, constant power pan control, mute switch + LED, Submix 1-8 assign switches, L/R /Center assign switches, 100mm log-taper fader, solo switch + LED indicators
- **4 extra stereo line channel strips** for aux returns, which include: 4-band equalization with 12kHz Hi shelving EQ, 3.5kHz Hi Mid EQ, 800Hz Lo Mid EQ and 80Hz Lo shelving EQ, plus 150Hz fixed Low Cut (high pass) filter at 18dB/octave, Low Cut In/Out switch, other features same as mono channels
- **Flip switch** for stage monitor applications: Exchanges the master control of any selected aux send with the corresponding subgroup fader, routing the aux send to the sub insert jacks, slide master fader, air EQ, and balanced output connectors

World Radio History

large-format SR console. impressed with its features, downright amazed at its price.



Never before has so much been so affordable. Using the automated manufacturing processes and design expertise that established our 8•Bus and SR Series, we've created a no-compromise, 40x8x3* LARGE-format live sound console.

With features like built-in digital muting automation, Left/Right/Center outputs, 12x4 matrix, 4-band EQ with swept Hi & Lo Mids and built-in meter bridge.

NEW!

• **UltraMute section** has 99 mute groups and 99 snapshot capablility, mute select switch + LED indicators, Store/Preview/Snapshot/Clear/Go switches + LEDs, 10-unit snapshot indicator, group indicator, Mode/Up/Down switches

• **Talkback section** includes talkback mic input (phantom powered), assign switches for Matrices A-B-C-D/Aux 1-4/Aux 5-8/Ext./L-R, talkback level control, solo level control, program level control, talk button, recessed phones jack (there's one on the rear panel too) 400 Hz/pink noise source with separate level control (uses talkback routing switches)

• **The non-optional meter bridge** includes individual 12-segment bargraph displays for each channel, dual bargraphs for the stereo channels, eight additional bargraphs for subgroups, and three more for Left/Right/Center outputs. Input & output meters may be globally switched to read pre-fader or post-fader, and meters are dimmable.

• **Rear panel** includes RS232 data port & MIDI In and Out jacks, L&R outputs, L&R monitor outputs (engineer's wedge), L/R/Center XLR outputs, talkback output, XLR Matrix A-B-C-D & sub outputs, Aux Return B inputs (4 stereo pairs), Tape A & B inputs & outputs, main L & R inserts, Center insert, subgroup inserts, Clear-Com input, & main power supply input

• **Each channel** has rear panel XLR mic & TRS line in jacks, insert with separate send & return (balanced), & direct out

• **Built-in Clear-Com™ compatible interface:** ties the SR40•8 into any Clear-Com party-line intercom system, with ground isolation, ignore switch, call button + LED, and a trick or two that even Clear-Com doesn't have

• **External 400-watt power supply** with redundant power capability

• **4-pin XLR lamp sockets and dimmer**

• **$8995 U.S. suggested retail price!**

**What's this I hear about a 56 channel SR56•8? Is this true?*

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World Radio History

EAT YOUR SQUASH

OR GO TO YOUR ROOM, ALONE

ILLUSTRATION: NATHAN OTA

Nintendo says "Play it loud." Yeah. Louder is better. "Louder" radio stations get the listeners. Saturate. Compress. Overmodulate. Clip a little. Squeeze it. Squash it...Wait! That's it! Squash it. That's what this column is about.

Those of you who regularly read this column may remember that I have on occasion expressed my confusion and distress concerning the trend of decreasing audio quality in this time of decidedly increasing technical ability and potential. Whether it be mediocre audio from DSP hardware (created in the interest of offering a longer list of simultaneous effects for a shorter stack of bucks a year before the technology can really do it properly), or the lush, artifact-rich sound of audio compressed by today's infant compression algorithms (made for getting more music on less disk space or more data down the line), this saddening trend is as unfortunate for all of us as this sentence is long.

To me, this is technology lost, technical evolution which has taken a wrong turn. Dirty, clouded little audio from a world that can just now, for the first time, produce clean, clear, big, almost real audio. Very bad. Very sad.

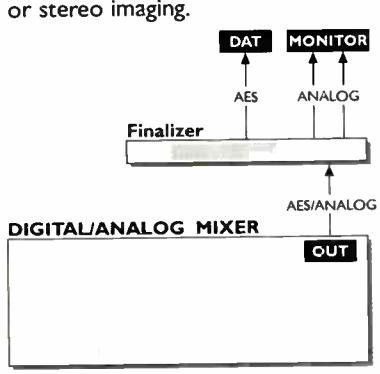
BY STEPHEN ST.CROIX

And now another wrong turn, another disturbing trend is upon us, and in force. This one is not perpetrated in the interest of more data in less space, nor for more effects from the same wimpy processor. No, this one is strange. This one is squash.

We have all worked so hard for dynamic range. Decades of design and redesign in tape recorders and mixing desk electronics, endless evolution in mics and mic preamps. Remember all those mods to get your plate a few dB quieter? Or that month you spent replacing every op amp in your desk with those new, faster, quieter ones that just came out? Allisons? Valleys?

World Radio History

Want your mixes to deliver the punch and clarity of the industry heavyweights? Now you can... thanks to the Finalizer™, TC's new concept in dynamics signal processing. Inserted between the stereo output of your mixer and your master recording media, the Finalizer dramatically increases the volume without sacrificing fidelity or stereo imaging.



The Finalizer creates that extra energy boost that you otherwise only can get from a professional mastering house. With its powerful multiband processing it will make *your* mixes sound **punchier**, ***louder***, **crisper, warmer,** spectrally balanced, more "in your face"... it's your choice!

The Finalizer's 'Wizard' function easily finds the optimum setting for your mix: Simply enter the type of music you are mixing and to what extent you want it processed... and you are done! The more experienced user may "tweak" the signal path extensively, with over 75 parameters to choose from. You will also find additional signal analysis tools including a Phase Correlation Meter, Peak-Hold Meter, Level Flow Meters, and a Digital Format Analyzer.

We've even thrown in a Calibration Tone Generator. All of the Finalizer's functions are easily monitored on the graphic LCD and on the seven precision LED meters.

Now even your demos will sound like a CD. You can simultaneously:

Convert It:	20 Bit precision A/D and D/A Convertors
Shape It:	Five band 24 Bit Parametric Equalizer
Enhance It:	Choose between De-Essing, Stereo Adjust or the Digital Radiance Generator™
Normalize It:	Real-time Gain Maximizer
Expand It:	Variable Slope Multiband Expander
Squeeze It:	Multi-band Compressor
Trim It:	Variable Ceiling Limiter prevents overloads
Fade It:	Manual or Auto Fade Tool
Dither It:	To maintain the highest resolutions on the digital AES/EBU and S/PDIF outputs

Naturally, the Finalizer fully lives up to TC's twenty year reputation for sound quality, specifications and construction.

Try it - you'll be knocked out by what the Finalizer will do for your mix. Call 1-800-798-4546 for the location of a TC dealer near you.

Wizard | Finalizer

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How about all those different grounding schemes we tried, or the trick cables? And Ray Dolby's contributions? SR, dbx, single-ended systems like the Symetrix—all of these? Then converters; that painful, slow climb out of the grit and dirt...

And what do we have to show for it? Well, actually, we *have* achieved it; 90+ dB whenever we want it. Kind of amazing when you stop to think about it. But nowhere near as amazing as what we are doing with it!

In the last couple of years squash has become a real problem. When you buy a rock or new blues CD today, you stand a real chance of getting one with "NO DYNAMIC RANGE" stamped across the front (albeit in invisible ink).

Sing along with me: "96 decibels on the disk, 96 decibels. Take one away, and next time you play, 95 decibels on the disk. 95 decibels on the disk, 95 decibels. Take one away, and next time you play, 94 decibels on the disk..." Now keep singing until you have about 20 or 30 left, and you have 1996 CD technology.

Let me introduce you to a couple of people who you should know about. First, Glenn Meadows. This is the mastering engineer who actually improves the stuff I send him, even though it's perfect when I send it. And then there is Bob Ludwig, who...wait—you know who he is. They, along with others, are mounting a campaign to attempt to bring dynamics back to music. Since I too believe in the importance of this, this month's column is going to the cause.

Basically, here is what *they* have to say (more or less, sorta, kind of rewritten by me).

"When the music starts out loud and stays loud for 45 minutes, you are simply assaulted, not gently pulled in. If the average level of a CD is 4 dB away from the loudest possible, when the listener sets his listening level at the start of the CD, there is only 4 dB left for it to get any louder. But, if the average level is 12 dB down when he initially sets his volume control, then that 12 dB is available for peaks, for accents and, well, drama and excitement. People buy music because they react to it emotionally. But without dynamic expression, the CD is basically emotionless, it grows tiring—it wears you out." They said a lot more, but I squashed it.

When you buy a rock or new blues CD today, you stand a real chance of getting one with "NO DYNAMIC RANGE" stamped across the front (albeit in invisible ink).

I say there are probably circumstances where you may well want insanely limited dynamic range, but these are specific, bizarre situations. I offer three such examples, with proposed approaches for the first two, and a reminder of how the third is already handled.

1) You are going to bed, not alone, and not to sleep. You want "going to bed, not alone, and not to sleep" music at exactly the right volume to hear but not interfere. You live in an apartment, so you don't want to bother the neighbors, because the last thing

—CONTINUED ON PAGE 196

USE READER SERVICE CARD FOR MORE INFO

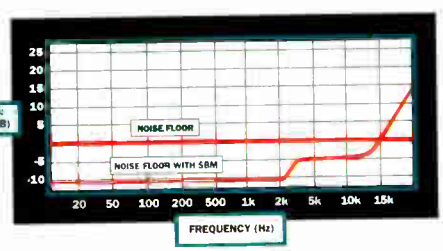
World Radio History

BUILT LIKE A BATTLESHIP.

WITH A SOUND THAT WILL BLOW YOU AWAY.

The Sony PCM-2600 and PCM-2800 DAT recorders are durable enough for the daily battles of the audio professional, sophisticated enough to provide day in and day out great sound.

Four direct-drive motors (on the head drum, capstan, supply and take up reels) and our servo-controlled mechanism mean better tracking, lower error rate, longer motor and tape life, and faster, smoother high speed cueing and shuttling.



SBM is a sophisticated noise shaping technique that significantly reduces audible noise by shifting it to a higher, less audible frequency range, maximizing your 20-bit performance.

And only Sony offers Super Bit Mapping™ (SBM), a patented technology used in major mastering facilities and now available on our pro DAT recorders for improved sonic performance.

SBM maintains much of the sonic quality of the 20-bit signal created in the recorder's advanced A/D converter and stores the data in the 16-bit DAT format. The result is superior sound resolution with added clarity and greater imaging.

And the PCM-2800 adds Read-After-Write (RAW) confidence monitoring for those critical recording situations.

But don't just take our word for it all. Call 1-800-635-SONY, ext. SBM for more information. And prepare to be blown away.

SONY

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World Radio History

FEATURES:

- 8 tk. simultaneous disk recording
- Non-destructive editing
- Multiple TAKE function
- Expand to 128 tracks
- Link up to 8 machines

You Could Always Hear What AKAI Did For Your Music . . .

In 1992 we introduced low cost disk recording with our 4-track DR4d. Thousands of DR4d's have found their way into broadcast facilities, recording studios, post production houses, and project studios. Combining our experience with input from thousands of end users, we created the DR8 and DR16. Whether you're just starting out with your first 8-track, upgrading your current tape-based MDM, or even if you're planning on a double-whammy, 128-track, multi-interfaced, graphically-based, post production facility, the new DR Series from Akai will serve your needs and grow with you in the future. It's an important fact to consider when someone tries to sell you a "budget" digital recorder that never really meets your needs. Check out these features and you'll "see" what we're talking about.

Record/Edit The new DR Series utilize our latest 24-bit internal processing technology enabling simultaneous 8-track recording with the transparent digital audio quality that has become an Akai trademark

Three dedicated LSI's (Large Scale Integrated circuit) for recording, mixing, and optional EQ provide real-time performance and stability of operation that computer based units simply cannot provide.

Real-time random-access editing features like copy, insert,copy + insert, move, move + insert, erase, delete, slip, and sliptrack inspire creative efforts that are simply unthinkable with tape based recorders. The TAKE function allows you to record up to five separate takes of a critical solo, or enables you to compare separate effects treatments of a singular passage. The jog and shuttle wheels make finding precise edit points a breeze, while the familiar tape-machine style transport controls and autolocator make operating the DR Series recorders like working with an old friend.

DR8 - $3495.00 Sugg. Retail Price
8 Track Disk Recorder

MORE FEATURES:

- 18 bit ADC • 64X oversampling
- 20 bit DAC • 8X oversampling
- 24 bit internal processing
- 16 channel digital mixer
- Dynamic MIDI mix automation
- Built-in mic preamps
- 2AUX sends
- 199 point autolocator
- AES/EBU and S/PDIF digital I/O
- 50 pin SCSI port

DR16 - $4995.00 Sugg. Retail Price
16 Track Disk Recorder

EVEN MORE FEATURES:

- Balanced 1/4" TRS in/out
- Switchable +4/-10dB line levels
- 8 in 8 out + stereo master (DR8)
- 8 in 16 out + stereo master (DR16)

Media The DR8 can be equipped with an optional internal 1 GB SCSI drive, while the DR16 is available with an optional 2 GB internal SCSI drive. The DR Series recorders are both equipped with a standard 50 pin SCSI port alowing a combination of up to seven SCSI drives with disk overflow recording capability. Lists of compatible drives are available from Akai product information.

Data backup is achieved through standard audio DAT or Exabyte.

At the time of this writing, the Iomega Company is preparing to go into production with their new 1 GB "JAZ" drive, a removable media SCSI drive which will greatly enhance the capabilities of our new DR Series recorders. Stay tuned for more info in our upcoming ads. Better yet, test drive a new DR Series recorder today at your local Akai dealer.

World Radio History

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THE RIGHTS STUFF

HOW OLD LAWS CREATE NEW OPPORTUNITIES

BY PAUL D. LEHRMAN

Everywhere you go, everyone's screaming about copyright. Fair use, repurposing, electronic rights, digital signatures, offshore counterfeiting, electronic watermarks, works-for-hire—all of a sudden, these terms are part of everybody's everyday vocabulary. As the digital revolution worms its way into all realms of our existence, from records to magazine articles to dirty pictures, and nothing is safe from the threat of infinite, perfect replication, the protection of "intellectual property" that copyright law provides has become increasingly important. The debates about that protection—what it means and how to extend it—are flying fast and furious. What are the rights and limitations of the copyright holder, or of the user of a copyrighted work? How do consumers know that they're getting a genuine article? How do owners of intellectual property protect themselves and their livelihoods? How does anything retain value when everything is available for free?

Some of these issues need to be resolved quickly, or whole industries will fall. On the other hand, some of them are going to take awhile—witness the suit by the Music Publishers Association against CompuServe about dissemination of MIDI files without compensation to the original composers. It's three years old, a "settlement" was announced at the beginning of the year, but CompuServe still isn't accepting any MIDI file uploads, even if the uploader swears they're his or her own compositions.

There are folks who think copyright is outmoded in the digital age, and that all information wants to be free. Among these are the anarcho-libertarians—most of whom, it seems, get regular royalty checks or have obscure but comfortable academic sinecures (not that I'd turn down either...), or else are just mad at how much they spend each month at Tower Records. Allow me to say that I don't have much truck with them because, frankly, I'd rather be doing this than flipping burgers, thank you very much. I'm afraid that this society does run on

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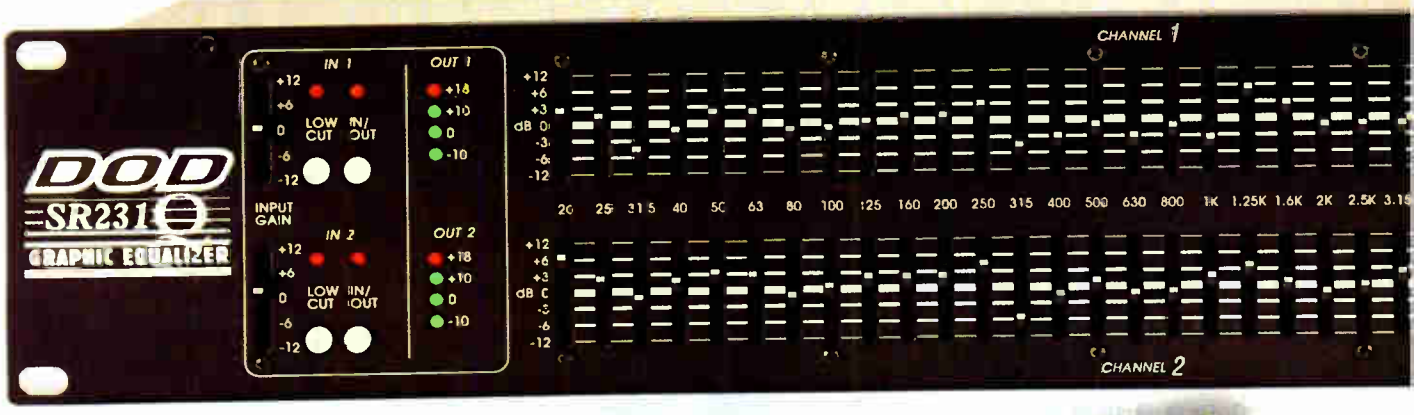

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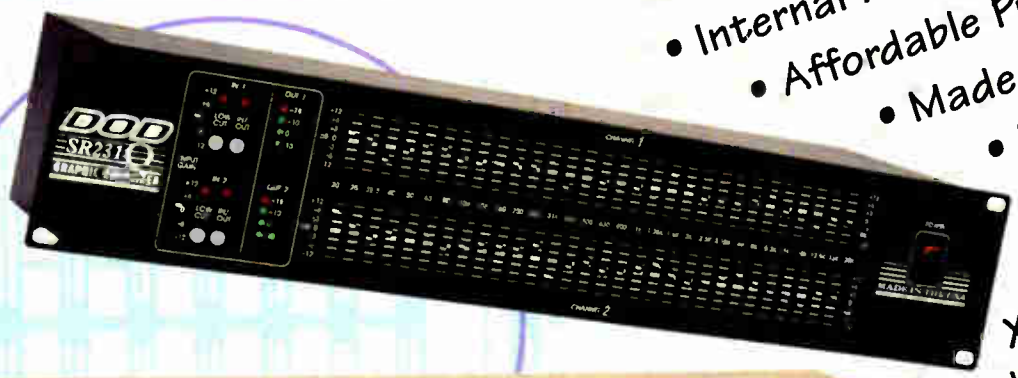

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Sometimes the music was original and was contracted as a work-for-hire, so there was no problem. But in many other cases, a series would assemble a soundtrack out of pieces of classical music on records, often editing the picture to fit the music. Since the programs were originally broadcast over licensed stations, all of whom pay annual fees to ASCAP and BMI for the privilege of playing any commercially available recording they want, this was never an issue. But a license to *broadcast* music is quite different from a license to *sell* recordings of that music. And although the music itself might be in the public domain (Beethoven's been dead a long, long time), the recording isn't.

The record companies, being no fools (at least about money), are not about to sell cheap master licenses to TV networks and studios just for the latter's convenience. Hollywood producers will pay very big bucks for the rights to use a current or "classic" Top 40 record in a film, an effect that has trickled down throughout the industry, so that even the most modest of such licenses these days tend to be very expensive. So in most cases, going back to Sony, BMG or EMI (who all operated under very different names in those days) for permission to use the originals is not usually an option. But since the film was cut to the music, how are you going to get a new soundtrack that fits the picture? Do you record the music all over again? You may not have to pay the composer, but you do have to hire a whole orchestra to make a new recording, and that would probably be way more expensive than getting the master rights!

There are folks who think copyright is outmoded in the digital age, and that all information wants to be free.

There are a couple of solutions, and both of them happen to be good for the type of folks who read this magazine. One is to find other recordings of the same music and use them. There probably aren't any that are old enough to be out of copyright entirely (and if there were, the sound quality would be such that nobody would want to listen to them), but there might well be a good recording from a small label eager for exposure, recorded in the high-culture, low-budget, non-union salons and concert halls of the former Eastern Bloc, which the label would be delighted to lend in exchange for a reasonable fee and a credit at the end. Then, through the magic of hard disk editing, you can change the tempos, add or delete passages and pauses, and otherwise customize the recordings so that their timings match the originals closely enough to work with the picture. Fly the new track back in with the original narration and sync sound, and you're done. (If the network doesn't have the original narration and sound on separate reels, then you get the chance to re-record the track and do some creative sound design.) It's still going to cost them less than paying BMG, and if the contracts are set up right, when the

—CONTINUED ON PAGE 198

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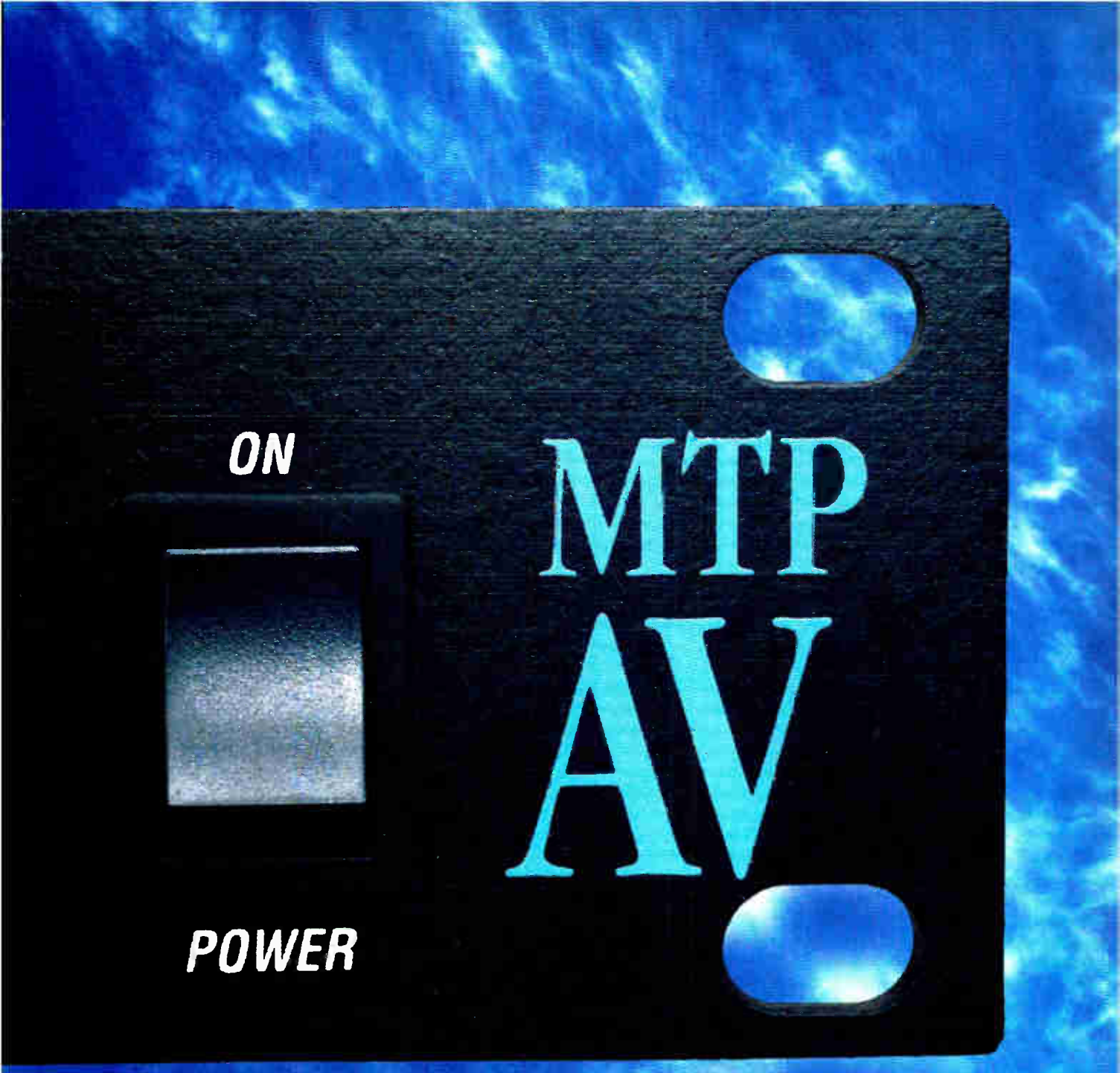

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AES and APRS

A Tale of Two Conventions

BY GEORGE PETERSEN

Sony's PCM-3348HR multitrack digital audio recording system

THE 100TH AES COMES TO COPENHAGEN

Founded in 1948, the Audio Engineering Society held its first "Audio Fair" at the Hotel New Yorker in Manhattan in October of 1949. Now, 99 conventions later, AES has grown into a truly international event, drawing thousands of attendees from nearly every part of the globe.

So, it was somehow fitting that Copenhagen, honored as the "1996 Cultural Capital of Europe," was selected as the site of the 100th AES convention. Incidentally, this show also marked the 25th anniversary of the first European AES, held in Cologne in 1971. As a means of commemorating the 100th AES, Danish audio companies organized a huge banquet for hundreds of attendees, held at the 150-year-old Tivoli amusement park in the center of Copenhagen, complete with a midnight fireworks display to salute the event. Adding further cause for celebration, this year's winter convention date was moved to mid-May, which generally boasts more temperate weather conditions than the traditional February show date.

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AMS Neve Libra digital console

Penny & Giles Digital One-Stop

As it turned out, Copenhagen had snow flurries the day before the show and the weather didn't warm up until later in the week. However, the mild chill didn't seem to dampen the spirits of the attendees who, after a tough day of schmoozing at the show, could be found exploring the shopping and gastronomic delights along the Strøget "walking street" or Nyhavn canal district. Best of all, after exploring the city on foot, you could hop on any one of the city-owned bicycles (provided free throughout Copenhagen) and ride back to your hotel.

Free bikes were just one of the many delights of Europe's favorite city; even more surprises could be found within the Bella Convention Centre. I've never been to an AES show with so many digital consoles. The main topic of conversation centered around AMS' new Libra digital mixer. Previewed in the July '96 *Mix*, Libra represents a mid-point somewhere between the successful AMS Logic series and its flagship Capricorn console. An in-line console available in 24- and 48-channel frames, Libra is designed for music recording and incorporates aspects of both Logic and Capricorn. AMS also unveiled software upgrades for its Logic 1, including file time-stamping, insert point automation and enhanced dynamics control.

Sony announced that the first of its OXF-R3 digital consoles had been sold to Studio Guillaume Tell, located outside Paris. [*The first U.S.A. OXF-R3 order has since been announced; Allen Sides' new Nashville studio is the destination*—Ed.] The Guillaume Tell installation also included two of Sony's new 24-bit PCM-3348HR 48-track recorders, which offer full compatibility with existing 24/48-track DASH tapes. In other news, Sony provided continuous demonstrations of its Direct Stream Digital process (see the May '96

Brian Eno

NEW DIRECTIONS FOR APRS/AUDIO 96

From June 19-21, 1996, several thousand audio professionals dropped by London's Olympia Convention Center for Audio 96, the 29th annual exhibition staged by the Association of Professional Recording Services (APRS).

Over the past few years, the show's overall attendance has dropped somewhat, although its ability to attract the UK's top recording elite makes it viable. In fact, the exhibitors I spoke to reported excellent business from this year's show, especially the console manufacturers. The keynote speaker at Audio 96 was artist/producer Brian Eno, who made a passionate plea for the music industry to support War Child, an aid agency founded in 1993 to provide food,

—CONTINUED ON PAGE 30

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Soundtracs Virtua

Mix for more details) for showgoers, who generally seemed quite impressed with DSD's audio reproduction.

On a slightly more affordable level with expected pricing in the mid-$30k range is the Virtua from Soundtracs (distributed in the U.S. by Korg), a fully digital 64-channel mixer with eight aux sends, 4-band parametric EQ, compressors and gates on every channel. Intended for the music and post-production markets, Virtua features full dynamic automation with snapshot recall and LCRS panning. Interfaces include analog XLRs, and ADAT optical, AES/EBU and S/PDIF digital ports. New at AES were optional "wings" that expand Virtua's work surface, providing more physical faders and control buttons for easier access to the system's 64 channels.

Not to be outdone, Studer unveiled

—CONTINUED ON PAGE 200

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—FROM PAGE 29, NEW DIRECTIONS

and social and medical assistance to young people in the former Yugoslavian republic. One of War Child's recent efforts is to create The Mostar Children's Music Center, Bosnia-Hercegovina, which will use music performance and instruction as a form of therapy for children traumatized by the war. [*More information about War Child can be found at www.fma.com/help/warchild.html*—Ed.]

Many of the products shown at Audio 96 such as the AMS Libra had appeared a few weeks earlier at AES Copenhagen, yet the UK show still provided some interesting debuts, which you can see at the fall AES in Los Angeles. Interestingly, while AES focused heavily on digital technologies, Audio 96 offered plenty of new analog developments.

Soundtracs has taken its top-of-the-line in-line console over the top with the new Jade S, an upgraded version, now enhanced with LCRS panning-assignable dynamics on each channel and moving fader automation. It's available in frames with 24 to 48 modules.

Former Trident founder Malcolm Toft of Malcolm Toft Associates showed his Intermix system, a series of rackmount modules that can be used alone or linked to form custom consoles. In addition to a master section, the series includes units each with 16 channels of mic/line amps, 4-band equalizers, 8 aux sends, meters, fader/router/panners or tape monitor/tape returns. For those who need a high-quality, specialized console (for example, a 16-channel line mixer with 16 aux sends), Intermix offers the affordable, flexible solution.

Joe Meek Limited, which wowed last year's AES with its line of high-end (and very bright green!) analog processors, demo'd its VC2 Tube Channel. The VC2 combines a mic preamp, photoelectric compressor, HF enhancer, VU meter and tube make-up stage, all in a two-rackspace box.

Amek unveiled its 9098 com-

—CONTINUED ON PAGE 200

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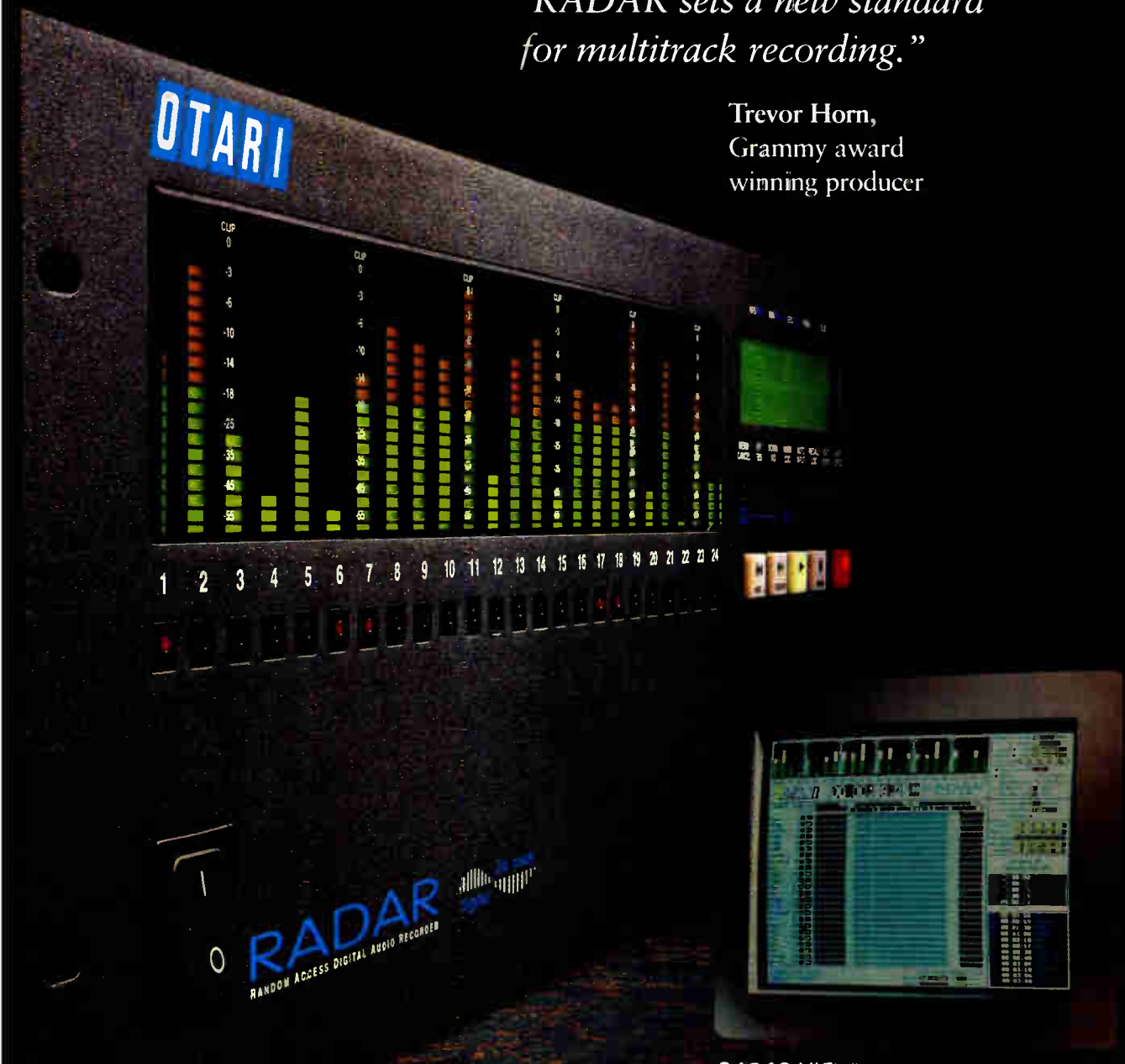

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Recording the Symphony

BY JOHN LA GROU

What is it that motivates top orchestral recording engineers? It is an unquenchable desire to capture—artistically and technically—the live concert experience in a convincing manner. Granted, most orchestral recordists confess an enormous chasm between the live concert experience and even the best-recorded facsimile. But the desire to secure for posterity a vivid impression of the live orchestra can border on obsession.

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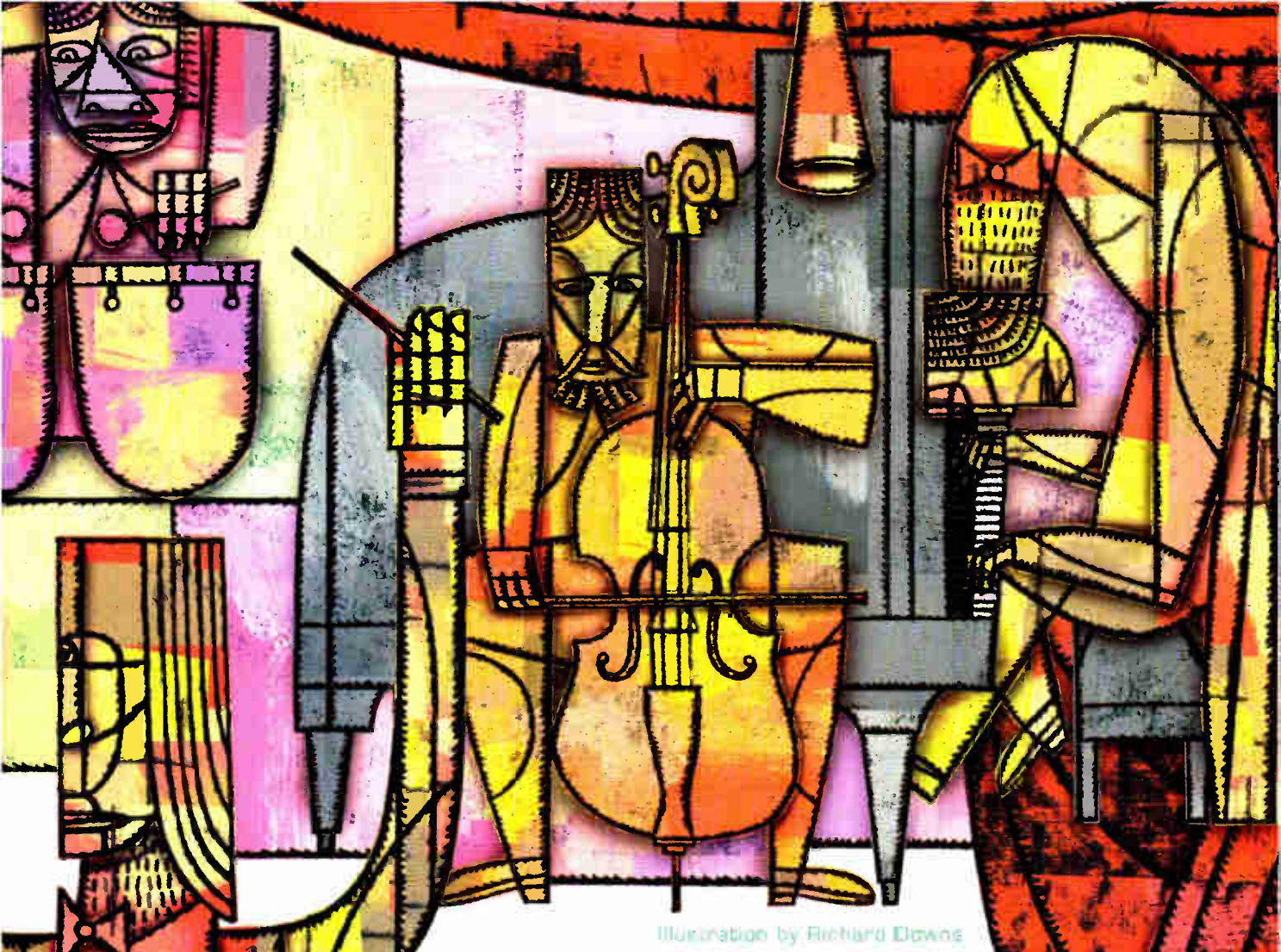

Illustration by Richard Downs

Orchestra

This, no doubt, explains why, when a new recording technique or device promises greater musical reality, whether it be microphone, recording format, etc., the large-ensemble recordist is first in line to experiment with the latest promise of accurate audio. For example, it is believed that the emerging high-density CD format will drive the envelope of technology and reinvent the craft of orchestral engineering.

This month, *Mix* spoke with some of the U.S.'s leading orchestral engineers about the driving forces behind their work, and about the ways they use technology. But before presenting their insights, allow me to describe the techniques I've found useful in recording orchestras such as the Sacramento Symphony, Camellia Symphony, California Wind Symphony and others.

Of primary importance in any orchestral recording is the acoustic quality of the venue. For this reason, serious orchestral recordings demand a thorough assessment of the acoustics. It is common to employ union laborers to prepare a hall in advance of recording sessions—building hard surfaces over seats, blocking potential traps with ply-

World Radio History

wood sheets, installing fabric or diffusion on overly reflective surfaces, laying carpet, extending a stage, etc.

Once the necessary acoustic corrections are made, mics are selected and layout schemes are developed. Unless a producer requests otherwise, I aim to capture the live concert experience of sitting in a center seat just a few rows back from the stage.

For recordings with the Sacramento Symphony in a 2,500-seat concert hall, I found that a single pair of main mics, usually B&K 4003s with silver grid, provides a realistic image. Depending on the size and layout of the orchestra, I tend to fly these mics between 9 and 10 feet above the stage, spread anywhere from 3 to 6 feet apart, generally over the conductor's head or somewhat back.

If more string focus is required, a pair of outrigger mics are hung. These omnis, usually Schoeps M221B or CMC6 bodies with MK2 capsules, are placed in front of the string sections, each mic spread around 12 feet beyond the main pair at a height of around 9 feet. I've also flown an additional pair of subcardioid mics, with good results, directly over the center of each string section.

If still more sectional focus is required, various spot mics are placed within the orchestra. These can include a near-coincident stereo pair of AKG C12-VRs on woodwinds, a single B&K 4012 on timpani, one or two near-coincident pairs of Sennheiser MKH-40s or 4012s on percussion section, and occasionally an AKG C-24 close to the principal bass, all mixed sparingly. (With the probable development of multichannel audio standards, experimentation with ambience mic techniques will become part of the process, too.)

All microphones are fed into nearby stage-based microphone preamplifiers via MIT and Mogami cables. Most microphones do better with a shorter run of cable, relying on the preamps' line drivers for long hauls. All mic preamp outputs are fed to a modular line mixer, which sums to stereo buses. Alternatively, when using a simple stereo pair of mics, I avoid the mixer and feed an A/D converter directly. Or, if using three or four mics, I often sum passively, relying on relative mic preamp gain settings for left, right and overall balance.

In mixing a symphony orchestra, the mission continues to preserve a stereo image with the least amount of timbral or spatial coloration. For this reason, the mixer I work with employs extremely pure, carefully matched discrete summing amps and a minimum of mixing path functions, retaining essentials such as panning and sweepable rumble filters. We use no other EQ or dynamics, relying instead on the "personality" (or lack thereof) of each task-selected microphone. In fact, if the mic is intended hard center, left or right, we engage a Bypass function that requires only two active stages of electronics before summing.

Following the mixed stereo output, our 20-bit A/D handles the conversion. Then, depending on format requirements, we'll send 20 bits directly to a recorder or use the Apogee UV-22 process for 16-bit output to DAT machines, often in redundant pairs for safety backup. Remote monitors include Paradigm Minis and Totem Model 1s driven by a pair of Pass Labs ALEPH 2 amplifiers.

Now, here's what some other engineers had to say.

DAVID SMITH

As chief engineer for Sony Classical, David Smith oversees all of Sony's

For Musicians Who Bought The Other Digital Multitrack SORRY!

World Radio History

major symphonic recordings. Sony Classical primarily records for CD but is often involved in sound for television, film, discrete HQAD surround and more. Recent Sony Classical projects include dates with the symphony orchestras of Los Angeles, Boston, Chicago and Pittsburgh.

"The individuals who engineer orchestra at Sony," says Smith, "do so exclusively. These engineers also post-produce what they record, spending about 30 percent of their time recording and 60 percent of their time editing and mixing. They may also prepare projects for television and film, yet the recording skills are not interchangeable—that is, Sony will not permit pop mixers to do classical work, or vice versa. Orchestral and general classical work generally require specialization of skills and practice."

I asked Smith to comment on some of the philosophical objectives of a Sony orchestral project. "Our objectives center around capturing a faithful sense of the musical event," he says, "as opposed to just recording the music. There are two principal schools of thought here. One school is based on the Tonmeister decree, which tries to analyze the event by accurately capturing the individual pieces using a multiple-microphone array and synthesizing the event electronically after the fact.

"The other school, which is primarily English but evolved from the early days of electronic reproduction—such as Decca Tree, ORTF, XY, MS and Blumlein—tries to take a picture of the event as a whole but requires far more attention to detail and is far more difficult to teach, learn and execute competently. The central point here is that the English school relies on capturing the overall orchestral pickup with the objective of avoiding the spot mics at all costs.

"Philosophically," Smith continues, "Sony Classical goes for the latter school by using some form of single point or single area pickup. However, you will see spot mics placed as insurance due to the fact that some of these sessions can cost up to five dollars per second to record. Moreover, an artist or producer may sometimes request a perspective change like moving a listener from the audience to the podium. A post-production change such as this would require a tighter pickup pattern available in our multitrack recording."

Considering the hundreds of personnel sometimes involved in an orchestral recording project, and given the enormous size of the Sony organization, I asked Smith to talk about symphony-recording logistics. "Our sessions are booked by the label," he says. "We have a separate department which does nothing but planning and scheduling. The recording venues are restricted by the recording engineer's committee. Some of our favorite halls are Symphony Hall in Boston and Chicago, Royce Hall in L.A., and Mechanics and Jordan Halls in Massachusetts.

"Liaison is established with the venue for the often elaborate remote setup requirements, while [Sony] corporate deals with the label artists; a third-party contractor handles the local union of orchestra players. Common variables occur within the actual layout and setup, traffic noise minimization, union representatives and their strict timetables, equipment and power details, room treatments, performance schedules, lodging for the crew and artists, and so forth."

I asked Smith to comment on Sony's equipment choices and specific layout plan for a typical orchestral session. "Each session requires a different setup,

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of course, but the main pickup is usually built around first selecting the proper match of microphone, preamp and A/D converter," he says. "The microphone is determined by the venue, and the preamp is usually determined by the microphone. Our primary orchestral microphones are B&K 4000 Series, Neumann M50s, or Schoeps MK-2, 2S and 2H. We sometimes work with B&K measurement microphones with line-level outputs, as well. Preamps are selected for their coloration or neutrality. We have a collection of Jensen, Millennia Media, Creation and Sonosax mic preamps. Converters are chosen from those designed by George Massenburg, Daniel Weiss and Dan Lavry.

"This front-end trio of mic, preamp and converter," says Smith, "usually feeds a tape machine directly. We monitor the output of the tape machine in analog via Studer mixers and listen through Levinson-powered B&W 801 Series 3 speakers. Sony Classical is unique in that it is the only label that has recorded 24-bit multitrack since 1991. For this reason, we have special 24-channel banks of high-bit converters based around Ultra-Analog components.

"A maximal session will record on a 48-track DASH machine, configured for dual-track 24-bit operation, using several microphones and the Studer mixers for monitor. A minimal session will actually use some form of mixer, either analog or digital, to form the stereo mix with outboard converters and preamps, mixing live to 24-bit 2-, 4- or 6-track machines."

Smith declined to comment about Sony's long-term, proprietary plans. However, he did share that, "Clearly, the future of orchestral recording will involve more bandwidth and greater dynamic range to accommodate future consumer digital playback formats. New varieties of surround sound, depending on their commercial viability, might also be a force in future orchestral formats."

JOSEPH MAGEE

For more than 15 years, Joseph Magee has been recording symphony orchestras from his base in Southern California. Beginning his career as a second engineer with the Los Angeles Philharmonic Orchestra, Magee was soon promoted to first engineer, and finally to audio producer. Magee says he still reflects back on those early days as "the perfect learning experience for acoustical recording; world-class soloists with one of our country's great orchestras, five days a week. Most of this work was live, straight to 2-track."

Today, Magee finds himself alternating between record projects, live sound design, and feature films such as *Twister, The Preacher's Wife* (a Christmas release starring Whitney Houston and Denzel Washington), *Sister Act* and dozens of others. Magee's efforts have recently been rewarded with a Grammy nomination for his production and engineering work on a Manhattan Transfer children's record.

"When recording symphony," says Magee, "I still get a thrill every time I hear a live full orchestra of great players start their day. My recording techniques are based in the years of experience pioneered by many of the great engineers before my time. In general, whether I'm doing film or record work, I stick to one philosophy of engineering: maintaining a realistic, spacious soundstage, front to back, left to right.

"My foundation for recording orchestra is almost always a trio of microphones in the 'Decca' configuration—that is, a fairly tightly packed

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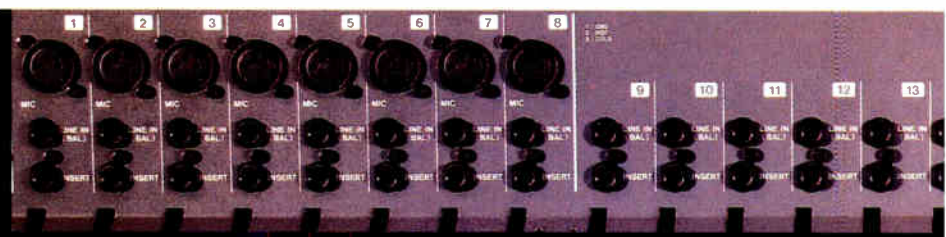

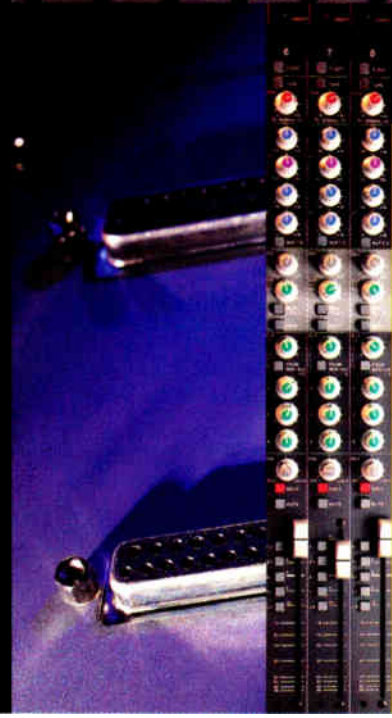

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World Radio History

COMPUTER EDITING FOR CLASSICAL MUSIC

by Lolly Lewis

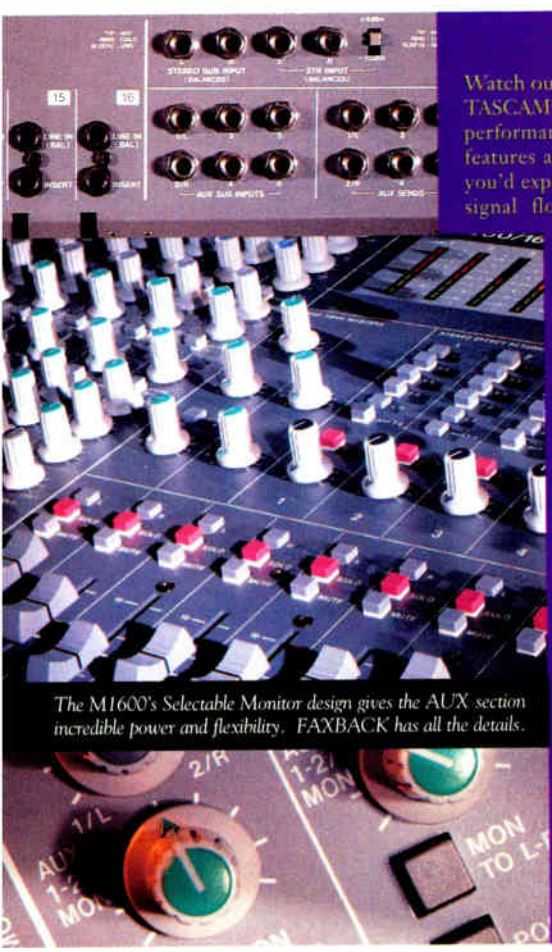
Classical recordings have been composed of carefully assembled multiple takes for as long as media could be cut and spliced. Unlike most pop music, classical music recording is done in real time, and several takes of the same material (maintaining constant tempo, loudness and musical intention) are often edited into one performance which contains the fewest mistakes and the greatest emotional impact and artistic integrity. With the advent of hard disk recording and computers, editing has become a realm of almost unlimited possibility.

The most obvious limitation of razor blade editing (other than the constant need for a handy supply of Band-Aids) is that the editing process destroys your master. Working on an irreparable master makes an editor less likely to take risks. After a few attempts at a difficult edit, serious degradation of the sound quality can and often does occur. Even if the editor makes a backup copy for edit tests, mistakes can be very time-consuming. In computer-based editing, however, the master remains intact, and the editing is done on a copy on the computer drive. The computerized sound files themselves are not altered in the editing process, edits are never "permanent," and the editor can take more chances, attempting edits which would never have been possible with tape. Also, identifying the edit spot is much easier. With tape, individual sounds can be isolated if they're separated in the musical texture. By rocking the reels across the heads the editor can make a relatively accurate assessment of a possible splice location. But if the notes are played smoothly, such as in a legato violin passage, this process can become very approximate indeed. The computer, on the other hand, displays the audio as its analogous waveform, so the user can easily see the location of the desired edit spot as it is played.

Also, the computer can easily keep track of takes, a real improvement over analog methods. When working with tape on complicated edits, it is common to find that more and more pieces of the master get separated onto individual reels, or, if the fixes are small, on tiny tape snippets. They all look exactly the same, and you can't even tell if they're heads-out. Editors have created elaborate systems for keeping track of segments, including writing on the back of the tape, hanging small segments from the wall, and of course, the ubiquitous Post-it notes. In the computer, on the other hand, each take is named upon load-in, and is stored just like any other data file.

Computer-based recording systems rely on hard drive technology to store and retrieve digitized audio. The higher the quality of the system, the better the capability of this process. The high-end classical editing market is

—CONTINUED ON PAGE 44



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triangle with mics at left, center and right, adding a pair of widely spaced outriggers and a number of inner-orchestra spot mics for increased presence, when necessary."

Specifically, Magee prefers his trio of vintage Neumann M50 tube microphones for the Decca arrangement, while employing a host of other fine mics in the secondary positions. "Each session is different and presents a new challenge," says Magee. "While my main array usually stays fairly constant, the spot miking will vary significantly depending on any number of session variables, including orchestra size, production goals and venue acoustics.

"Some of my most used spot mics include the Schoeps CMC-6 series, B&K 4000 Series, Neumann M49, U47 and KM Series, Coles 4038, Sony C-48 and Sennheiser MKH series. Most of the mics are sent to destinations which vary depending on session requirements. Often, for film work, we'll record on a digital multitrack and monitor through the house console. The 'palace' at Todd-AO film scoring in Studio City is tops for this—it may be the world's finest scoring stage. I prefer to do most of my film work there.

"Usually," continues Magee," when recording for feature film, I'll fully outfit the orchestra with spot mics. The sections or players that get mics include percussion, timpani, brass, tuba, French horns, woodwinds, both violin sections, viola, cello, bass and a left/right pair of flanking microphones at the front of the ensemble. However, before any of the spots are monitored, I always start with all spot faders down to assure that the main tree and flanking mics are giving us good information. All mics get their own discrete digital track. This allows us to develop an appropriate mix at a later date depending on the final edit of the film."

I asked Magee to comment on what might be a good course of study for anyone trying to break into the lofty world of orchestral recording. He says, "The most important skill to master is the physical placement of the ensemble and microphones—and this can only be learned by doing. Working in a good hall is just as important. For pure concert recording, one of the best halls around is Royce, on the UCLA campus. Thank goodness its earthquake renovation is almost complete."

TOM LAZARUS

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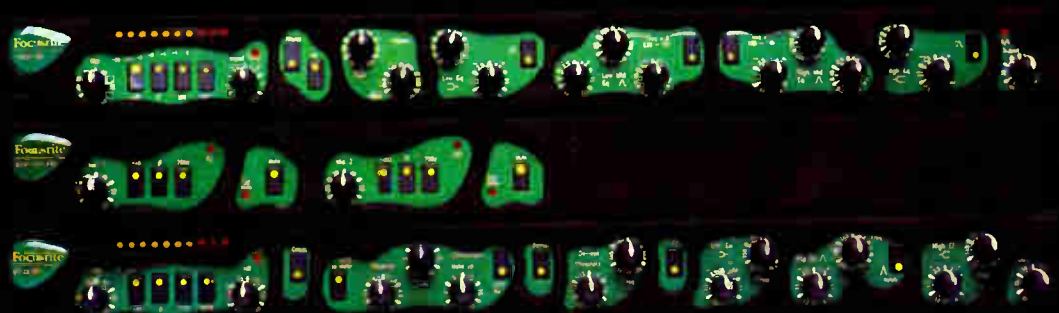

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is one of the industry's busiest classical music-recording engineers. With a discography spanning more than 60 labels (including EMI, BMG, CBS, Deutsche Gramophone, Denon, MCA, Philips and Sony) and dozens of film score recordings, Lazarus clearly knows orchestral engineering. Ironically, one of the first things he will tell you about orchestral recording is that he's "never been perfectly satisfied with the sound of my orchestral work. There are simply too many variables and trade-offs.

"On a good day," says Lazarus, "an extraordinary orchestra, an exceptional hall, performing an excellent piece, makes for an ideal recording experience. On a bad day, the players can't hear each other, they can't see unless the lighting system hums, the English horn player wants his own mic, video is complaining because they can still see a microphone, and then the producer decides to use the rehearsal tapes.

"Even on the few orchestral recordings I'm especially proud of, they are far from perfect. But, you know, it's that quest for perfection that keeps me going in this business. Every session, no matter how straightforward it may seem, always provides an opportunity to improve on capturing that elusive sense of reality with new equipment and ever-improving techniques."

I asked Lazarus to comment a little about those techniques that he's found most appropriate for capturing that evasive sense of musical reality. He says, "Before a decision can be made on technique, the engineer must combine a number of sometimes opposing forces into the equation. The producer may have ideas which prevent an ideal technique, or the soloists may have strong opinions which preclude optimal sonics. And whether it's a new mic, mic preamp, mic placement, mic array, converter, player position or hall, approach and experimentation must be done with a healthy respect for everyone's feelings.

"That said," continues Lazarus, "I'll first try to find a usable listening room at the venue and create a reasonably well-behaved playback environment. And as the aural memory is about as reliable as an engineer's schedule, all my comparisons are controlled using reference CDs that I'm intimately familiar with.

"A placement technique I often use first is 'isolated mono.' I'll place half a dozen mics in one central location, down stage center, 11 to 15 feet up and a few feet behind the conductor. From this single location, with at least one of the mics a known standard and each re-

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turning to individual faders, I can compare such qualities as timbre, reach, direct vs. reflected ratios and clarity. Of course, it's always possible to extend the test to compare mics, preamps, converters and producers' patience.

"After a winning combination is found, it's much easier to start working on stereo placement. I'll usually continue to compare stereo pairs—the winner and its runner-up—while fine-tuning the placement. Various stereo arrays are then reviewed, such as spaced omnis, Blumlein, coincident, Decca tree, spheres, heads and sinks—usually in multiple combinations with spot mics. I'll listen and listen and listen, while realizing the limitations of hall, orchestra, performer, equipment and format.

"We use those devices which help us achieve the objectives I've just discussed," Lazarus continues. "Microphones vary widely in terms of sonic character. Our mic closet contains many of the mainstays in critical acoustic recording, including Sennheiser, B&K and Gefell. The mics are then mated to preamps feeding Neotek and GML consoles, terminated to various digital recording media via Prism and Wadia 20-bit A/D converters.

"For each situation, there is no single ideal place for the main microphones. For better or worse, that decision depends on inspiration as much as anything else, though there are a few more concepts I should mention. First, try to get as good a sound as possible with the main array, using the spot mics only as crutches. Second, strive for a uniform, homogeneous string sound across the left-center-right image. Basically, the lower and more in front of the orchestra [downstage], the richer and darker the sound with less reach over the orchestra rear. The higher and more over the orchestra [upstage], the better reach can be achieved. Third, create realistic depth while maintaining enough clarity as the image progresses up stage. And remember the inevitable—as soon as that 'ideal' orchestral recording technique is discovered, and subsequently counted on, it will let you down."

TONY FAULKNER

One of the most well-known and prolific engineers of classical music is Britain's Tony Faulkner. With a typical schedule of more than 80 recordings each year, Faulkner brings to our story a wealth of tips and techniques on recording a large classical ensemble.

"With classical orchestral recording," says Faulkner, "the engineer should never ignore the fact that most people who buy the eventual CD will have a familiarity of what a live orchestra sounds like in concert. The whole recording process interferes a great deal with the sound of a live orchestra anyway, and if you attempt to maintain total control of the music with a large quantity of close directional mics, it will sound the least natural from an audiophile point of view.

"For instance," continues Faulkner, "take 30 bass-shy cardioid microphones, put them through a nice, bright modern op-amp mixer, take that through a typically hard analog-to-digital converter and send the master to some uncaring factory. Next, play the CD in your typically bright home CD player, through a thin solid-state power amp and a pair of nice, bright speakers. What you get at the end sounds like breaking glass!

"What I usually prefer on technique," Faulkner continues, "is to start with a great hall, such as Watford Town Hall or David's Hall Cardiff in the UK, or Boston Symphony Hall in the U.S.A. The goal is to find a hall where the

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sound is both clear and warm and where the musicians can hear each other well enough to create their own balance, rather than expect me to do it for them. If we're looking for an especially reverberant carpet of sound, I love some of the churches we work in, like St. Jude's Hampstead and All Hallows' Gospel Oak. But if the music gets too loud or brassy in these venues, the musicians have a hard time hearing what everyone else is playing.

"Once the ensemble is set, I like to fly a main pair and outrigger pair of old Neumann tube microphones feeding tube mic preamps. If necessary, a few spot mics get placed on the woodwinds, and perhaps the horns and timps if we are in a wet acoustic. If in doubt, we put out extra microphones even if we do not use them. Orchestral time is expensive, so we can ill afford to waste it running out extra stands and cables for an inaudible glockenspiel.

"From there, I often mix through a custom tube mixer and convert to digital via a variety of converters. We'll normally record to DA-88 in 24 bits via the Prism bit-packing system, though sometimes we simply run direct to recordable CD via noise shaping. My monitor system includes Quad electrostatics and B&W 801s."

But sometimes, technical issues are the least of Faulkner's concerns. Often, he says, the most difficult situations are personal. "Sometimes I wish I had a psychology degree. I try to avoid dilemmas involving interpersonal pressures, and that is why a good producer is essential. Much of my work has been with freelancers such as James Mallinson and Andrew Keener. The right team combination makes it much easier to cope with a crisis."

Some of Faulkner's inspiration is found in the early RCA stereo recordings by Lewis Layton and Robert Auger, and more recently from the work of Kenneth Wilkinson, Robert Gooch and Christopher Parker. "These engineers all have qualities to which I aspire," says Faulkner. "That is, they all have an exciting, natural sound with inexcessive manipulation. Basically, these guys have more interest in being part of the musical team than attempting ruthless, razor-sharp audiophile precision."

I also asked Tony to share his most challenging and most forgettable orchestral experiences. He says, "The most challenging session was the Alexander Nevsky movie soundtrack recorded in St. Petersburg. Straight to stereo, locked to video pictures. The trip to and working in Russia were challenges enough, not to mention the last-minute schedule foul-ups, meaning we had to set the hall throughout the night immediately before the recording.

"My worst experience recording orchestra? That's easy. There is this low-budget German label who scheduled a major symphonic and choir recording in London. Should have been given a 12-hour budget but received only six. No concert before the sessions. No rehearsals before the sessions. A sea of whining musicians who were getting paid below union scale. No producer. No time even to set a balance. And then, no editor was budgeted for post-production—the conductor did it himself, with a pocket knife and gaffer tape by the sound of it. My advice? Know what you're getting into—avoid ultra-low-budget projects, for your reputation will only suffer." ■

John La Grou is a musician and inventor who lives with his family in the viticultural region of the Sierra Nevada foothills.

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SX-1

"The first choice in picking a mixing console should be sonic quality," says Sound Image President Dave Shadoan. That's Dave on the right, by the way, and his partner Ross Ritto on the left. The SX-1 sound quality led Sound Image to pick the Panasonic/RAMSA WR-SX-1 console. Five of them actually.

Before they bought, Sound Image did a blind test on high-end, industry-standard touring consoles, and the SX-1 was, by far, the #1 pick. Now, Sound Image has these consoles out on the road with tours like Jimmy Buffett; Crosby, Stills and Nash; Melissa Etheridge; and The Mavericks.

Shadoan and Ritto also rave about the console's ergonomics. "Well laid out, comfortable to use", says Shadoan. With on-board and external MIDI controllable automated mixing, Mute Group and VCA subgroup facilities, parametric EQ, and stereo input module choice, the SX-1 defines high performance.

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—FROM PAGE 37, COMPUTER EDITING
dominated by Sonic Solutions and SADiE digital audio workstations (DAWs); some editors use the more affordable Pro Tools. Foremost on the wish list of a classical editor is accurate sound and ease of use. Twenty- and 24-bit recording is available, and soon removable drives will greatly facilitate direct hard disk recording. The computer system is really just the "host" for the sound drive: it acts as the interface between the user and the stored sounds. Most digital editing software is designed for use on Macintosh systems, as the Mac's superior graphics are well-suited for rapid updates of the waveform display. By manipulating these screen graphics, the editor creates the set of instructions which comprise an "edit schedule," the sequence by which the computer plays the recorded sound files. The sounds reside on the drive, unchanged, while the computer "plays" or retrieves the encoded information in a specified order. Once the takes for a project are installed on the drive, they can be edited numerous times, saving each separate version as a file on the host computer.

The entire project, with all its attendant sounds, can be archived to a digital backup medium, usually Exabyte or DAT, and reloaded into the computer at a later time for revision and correction in collaboration with the artist. The editor can restore and manipulate the different versions of the assembled takes based on the performers' comments. The final result, to the listener, is a seamless performance. In fact, however, it is an elaborate series of discontinuous events as the computer accesses various locations on the sound drive. The ear can't hear them, but a typical classical CD will have hundreds of edits.

Editing protocols are available as in other software: the Undo and Redo functions are invaluable, and cutting and pasting allow a wide range of sound manipulation, including such features as Loop and Fill which might allow the editor to create, for instance, a longer break between movements than was played in the session without having to search the tape for a long and silent pause. Each edit is composed of a crossfade from one segment to another, and the character and length of the fades is variable. In highly articulated music, such as percussion or piano, a very short fade, much like a razor blade splice, is ideal, although in most cases a somewhat longer crossfade sounds more natural. The loudness of one take can be adjusted to match another. But even with the computer there are limitations. It's crucial to keep the tempo consistent among all the takes of a particular section, as the listener will hear incredibly subtle differences in rhythm. And although you can adjust loudness, the computer can't change the character or tone of the instrument, and thus two takes of the same passage played with different intensity or styles of attack might not match. Although the computer programs do provide powerful and flexible equalizers which might allow for adjustments of timbre, this is usually not the best way to go with classical music, where the particular and idiomatic sound of each instrument carries important contextual and interpretive information about the music. In fact, EQ is usually a "last resort" when there is a problem which can't be solved any other way. Therefore it's important for the artist to have clear ideas about interpretation and solutions for the various technical issues presented by the repertoire before the sessions begin, as changing these in the middle of a session can result in some interesting editing problems.

However, the sessions benefit in another way from the flexibility of computer editing: the repertoire may contain passages several minutes long without any significant pause for a clear edit spot. For the purposes of editing with tape, the artist would have to play many long takes, which can be exhausting and result in a lower overall quality in the recorded performance. With digital editing, the editor can combine minuscule items from various takes, and the artist can correct small details without having to waste a lot of energy.

Digital editing has dramatically changed the context of classical recording by changing the parameters of what is now possible. And it's changing the context for audiences just as dramatically, raising important questions about the ethics of editing and its ramifications for live performance. People who learn to listen to music from recordings, rather than by going to concerts, learn to expect an unrealistic level of perfection in what they hear. No real performance is flawless, and imperfections are often a part of what gives a live performance its vitality. On commercial recordings, however, mistakes are usually expunged through elaborate and painstaking editing.

This aversion to technical errors permeates the entire fabric of music making, extending even to aspiring young musicians whose careers have yet to begin, as high school- and college-aged musicians can now submit artificially perfect audition tapes for competitions and education programs. A mediocre player can be made to sound quite extraordinary, and this defeats the audition tape's purpose, which is to identify nascent talent, not to applaud professional-level virtuosity. Youngsters who only know the perfection they hear on recordings are sure they will be judged by that same standard, regardless of the context of the recording.

This way of thinking diminishes us all: Instead of learning that music is about expressiveness and the courage to try new ideas as well as just precision, we learn that rewards come from technical achievement only. It takes a truly mature artist to maintain that golden underlying thread of musicality through the grueling and often disjointed recording process. And listeners must understand that music is performed, not assembled. The recording process itself adds a veil between the musical experience and the listener, and diminishes its impact. Live performance is meaningful and compelling as a result of spontaneity and communication among the performers, and in no small degree because the acoustic qualities of the instruments cannot be translated to an electronic medium. Recordings are like a fond memory—although we come up with ever more sophisticated tools to attempt it, and although there are many extraordinary performances on record, they can only evoke the moment, they cannot ever really duplicate it. ■

Lolly Lewis is a classical producer and editor. Recent projects include a San Diego Symphony Berlioz series, a premier recording by the contemporary music group earplay, and a Boccherini series with the early music Artaria Quartet.

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GEORGE DUKE

BROTHER OF INVENTION

PHOTO EDWARD COLVER

Keyboard ace, fusion groove-digger, composer and tasteful producer George Duke was born in 1946 in San Rafael, California. A graduate of Tamalpais High School, he studied music under Robert Greenwood, whom he calls "the best teacher on the planet."

In his teens Duke was writing and performing professionally, as well as backing such jazz greats as Dizzy Gillespie in the Bay Area. By 1970, he was working with Frank Zappa through some of the Mothers of Invention's most productive incarnations, gigging with Cannonball Adderley, and over the ensuing decade exploring fusion with Stanley Clarke, Billy Cobham and Jean-Luc Ponty. The acclaimed Clarke-Duke Project was launched in 1981, and throughout the years Duke has produced a wide variety of artists and released a successful assortment of solo albums showcasing his love of blues, Brazil and electronics.

On his 1996 album *Muir Woods Suite*, Duke is doing what he loves most: playing a big piano. Recorded live in Montreux with L'Orchestre National de Lille, he's joined by Stanley Clarke on bass, Chester Thompson on drums and Paulinho Da Costa on percussion.

In the mid-'70s Duke built a project recording studio, one which continues to evolve today as a pro-but-personal workspace. As a producer, Duke had his first Number One hit in 1980 with A Taste of Honey's "Sukiyaki." This year, he's producing tracks for Natalie Cole and Al Jarreau, and planning an orchestral tour of his own. Join us now in the private labyrinth of George Duke Enterprises...

Bonzai: What are you up to today?
Duke: I'm working with Natalie Cole this afternoon. We've been working on vocals lately, and we had an incredible string date yesterday down at Ocean Way. Claire Fischer did the string arrangements for a couple of tunes, and I arranged some others. Claire is a genius—he really is. The way he hears internal string parts is just incredible. I've also been working with Al Jarreau. We start up again next week.

Bonzai: Your studio here has been around for 18 years. I guess it's gone through a few changes?
Duke: [Laughs] Quite a few. Actually, it just started out as a listening room. I had a couch with a couple of speakers, and I was even going to do a "Quad" thing with speakers in the back. I just wanted to be able to listen to mixes that I'd bring in from other studios.

It evolved from there because I decided I wanted to create a situation where I could actually make a record. There weren't a lot of home studios back then, and I was one of the first in L.A. to have one. I thought it was a cost-effective thing to do and something I needed, but I wanted it to be on a level that was competitive quality-wise with anything I would do anywhere else. That's what I strived to do with the limited budget that I had. Of course, I had some good engineers, and that makes a difference.

Bonzai: What was the original layout? What kind of equipment?
Duke: We had a Soundcraft Series 3B, which was a great-sounding console. It only cost about $30,000, and I put another $5,000 into it expanding the patchbays. We took the EQ and made it a little wider,

BY MR. BONZAI

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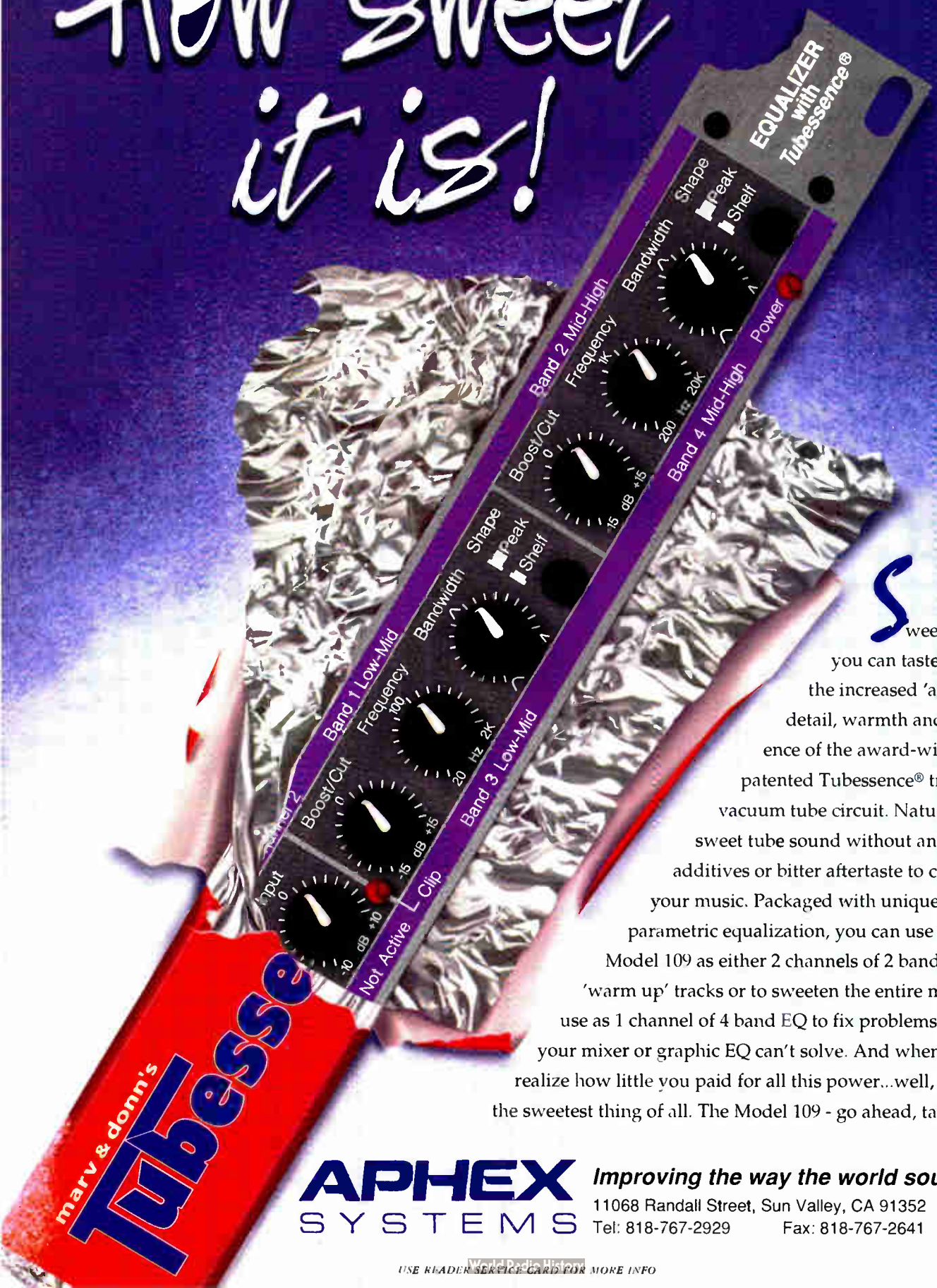

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so there was a little more low and high end, making it a little richer and expanded. Mick Guzauski did that for us. I put in some big Westlake three-way crossover monitors, and some NS-10Ms. That was it.

It was crazy at first, because we used to record in the control room. I was working on a Sea Wind record, and we just put on the headphones and set up the drums over in a corner. A lot of those early records I did with Jeffrey Osborne like "All on the Wings of Love" and Deneice Williams were all recorded in my office. I would turn the phone off, put foam in the window, turn the refrigerator off, and occasionally you could hear dogs barking, cats meowing, planes. "Stop the take. Okay, we can go now!" That's the way the studio started out. Eventually, I built an isolation room in the garage.

Bonzai: The studio today seems to meander all around the lower part of your home.

Duke: It was the only way I could do it without tearing the house down, which has been here since 1915. When I bought the place, I knew it had the potential for what I am doing now, but it couldn't be quite like a normal studio setting where you can look through the control room glass and see the person recording. We took care of that with video cameras wired into the studio. I have to admit, the way it's laid out is kind of strange. I have my office right next to the control room, and then down the hallway is the shop where Wayne [Holmes] works, and then you go down into the studio.

Bonzai: What are the essential pieces of gear today?

Duke: The Euphonix is the main board, and it's working out great because I can have all of my keyboards plugged in—and I've got an arsenal of keyboards. The main one used to be my Synclavier, but I have since retired it. It's now in my garage, and I pull sounds off it. Basically, I'm using an E-mu E-4 now, one that's fully loaded. I'm on the way to getting another. Recordingwise, we have an Otari DAT machine that we do mixes to. You can do timecode mixes for film or whatever. I also have an Ampex 2-track, the old analog machine. We're running a Mitsubishi X-850 multitrack with Apogee filters that we still love.

Bonzai: They're not too common these days, are they?

Duke: Well, I have two. One for here and one for when I work outside of my studio. There are still a few around. They use 'em a lot in Nashville. I like the way it sounds—and besides, it's paid for.

We also use the Radar unit, which I like a lot. We wanted a hard disk-based system to be able to manipulate data. I was there at the inception, when Otari took it over from that Canadian company, or whatever the arrangement was. I love the way it sounds and works. So, I've got the X-850 multitrack, the Radar as a 24-track machine, and also 32 tracks of Pro Tools. So, we're multitracked out.

Bonzai: Can we talk about the evolution of synthesizers from your perspective?

Duke: Well, in the beginning, I rebelled. I didn't want to play any electronic gear, because it was like going back to school. I started with the Fender Rhodes, the one with that gray top. It "plunked," but it had this vibrato that was interesting. I got into electronic music that way.

I learned quite a bit from Frank Zappa. He knew stuff about the studio that I never realized musicians even cared about.

Eventually, Frank Zappa told me, "You should play synthesizers." I said, "What's that? That thing with all those knobs? No, no, I'm not interested." So, he and Ian Underwood, who was in the Mothers of Invention at the time, had an Arp 2600. I said, "Look, I don't even know how to turn it on—not interested." So Frank says, "I'll buy you one. We'll put it on your Fender Rhodes. If you like it, fine." Okay, I couldn't stop him from buying one.

I told him I just couldn't get it. I messed around and said forget it. Then I was down in Brazil, relaxing on the beach, and I heard a record by the Mahavishnu Orchestra. I said to myself, "My God! What is that?" Something sounded like a guitar, but it wasn't a guitar. It was Jan Hammer playing a Minimoog. I said to myself, I've got to do this. This was 1971, and that was when I got turned on.

I came back to the States and went down to the music store and asked, "Where are the synthesizers." They had two—a Minimoog and an Arp Odyssey. Well, Jan was playing Minimoog so I didn't want that. I told the clerk to give me the other one.

I took that Arp, learned how to play and rejoined Frank in 1973. I just loved the fact that you could bend notes. I had never been able to play piano and bend a note, and that was interesting to me. Jan Hammer was playing technically, with a lot of soul, a lot of notes. But I wanted to play the blues on that synthesizer. I found that I could play it like a guitar, like a blues guitar—or even like a flute. Yusef Lateef, who was a saxophonist with Cannonball Adderley, had a way of playing flute where he would bend a note. Incredible. With a synthesizer I could do that. That's how it all started.

Bonzai: So by this time around you fit into the Zappa camp nicely with your new synthesizer?

Duke: Oh yeah, and Frank loved it. But the hardest thing about working with Frank was that we had no presets. When he would assign you different timbres and things, between me and Ian it was very tough to make those patch changes during the space of time he allowed you to do it. And he would know if it was wrong.

Bonzai: I saw him composing and teaching parts to the band once. It was a very long day.

Duke: He was a strict disciplinarian. If it was wrong, even in performance, he would make you do it again. I had it happen once. He stopped the band and said, "Stop. George made a mistake." I went, "Oh, Frank..." He said, "Do it again." It was embarrassing, and the crowd all laughed, but Frank was serious. I screwed up once, and he let everybody know it. I said to myself I would never let that happen to me again.

Bonzai: So you suffered, but you have to suffer to be beautiful, don't you?

Duke: [Laughs] Yeah, I guess so...

Bonzai: Could you point out a few things that you learned from Frank?

Duke: I learned quite a bit from Frank. He was an incredible arranger, composer, and he knew stuff about the studio that I never realized musicians even cared about. I would see him walk into a studio and tell the engineer he needed something, and I wouldn't know

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what he was talking about. At the time, he was using technical terms that I was unaware of, but since then I've learned a lot about that side of studio.

And I learned a lot from the way he rehearsed a band and what he required of his musicians. There was a world of Frank that was very intuitive and genius-like. Musically, he was so broad—he was the one that really broadened my musical horizons, and that's why I'm so crazy now.

The reason I do so many different things musically is because of him. He was into rock, and he was into jazz. He would say he wasn't into jazz, but he lied. We played a lot of jazz; he just didn't call it that. And then there was the contemporary orchestral music. We used to do all that kind of stuff. He challenged the musicians.

Bonzai: Of your work with Frank, do you have a favorite album?

Duke: *Roxy and Elsewhere*, a double album that we did at the Roxy. It's a great record—really what that band was all about, live and unbelievable. And I do like "Sofa" from the album *One Size Fits All*. It's hard to pick a favorite.

Bonzai: Is there anyone else who had a big influence on your life?

Duke: I learned a lot from Cannonball Adderley and Miles Davis. Along with Frank, those are my mentors.

Bonzai: What did you learn from Cannonball?

Duke: First of all, he was a humanitarian, and I learned about history. I also learned how to swing. My personality today is probably more like Cannon's than anybody, and I probably look like him now, too. [Laughs] I loved him; he was like a father figure to me. I learned about the history of jazz from him. It was like being with a history book on jazz. And he knew everybody. When I was working with him, all my idols would come by—Sarah Vaughan, Carmen Macrae, Bill Cosby. I got a chance to talk to these people. Joe Williams, Nancy Wilson, Quincy Jones—my God. It was like a family of musicians.

Bonzai: What year was this?

Duke: '71, '72, but I continued working with [Adderley] until a week before he died.

Bonzai: What about Miles?

Duke: Miles was probably my biggest influence overall. Frank and Cannonball were big influences, in a hands-on sense, but I didn't work with Miles for a long time. I wasn't in the band. Miles

—CONTINUED ON PAGE 197

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Scott Page of the Apogee team, after shanking one on the 14th hole

Record Plant's Bernice Moreno and Amy Burr welcome the players

The EFX/Record Plant team of Mike Morongell, Walter Hyjek, Colin Rogers and Robert Owen

Tournament Director Terry Lowe, Mix Editor-in-Chief/Publisher Hillel Resner, and Alesis' Jim Mack and Allen Wald

The Audio-Technica team of Jerry Hogerson, Steve Rosefield, Mike Margolis, Buzz Goodwin and Andy Heyneman

Terry Lowe, left, Hillel Resner, right, surround the first-place Group One team of Chris Fichera, Mike McCormick, Rob Grubb and Bobby Szymanski.

Mix L.A. Open

It was a perfect, balmy Southern California summer afternoon as more than 65 participants gathered at the Knollwood Country Club for the first annual Mix L.A. Open Golf Tournament, held on Monday, June 17.

For some time now, there has been speculation that golf is *the* music business game—and a full complement of the L.A. recording community took the afternoon off to prove it. Tournament sponsors Apogee Electronics/Mix This, Audio-Technica, Alesis and Record Plant/EFX were out in full force, mingling with record producers, engineers, manufacturers, and studio and rental company folks enjoying the chance to meet and greet in the great outdoors.

Spirits were high, and golfers, with talents ranging from the very skilled and dead-serious, to the moderately skilled I-just-play-for-the-fun-of-it, to the, ahem (yes, really, there was one!) first-time-out, teed off as the foursomes headed out bravely onto the links. All returned that evening to tell of fun in the sun and adventures in putting and driving with scores ranging from the winning 60 (Group One team Chris Fichera, Mike McCormick, Rob Grubb and Bobby Szymanski) to the high score of 79, made by a foursome whose request to remain nameless will be honored.

Awards were handed out to the top three teams, as well as to perpetrators of "The Longest Drive" and "Closest to the Pin," with trophies going to foursomes sponsored by Group One for first place, House Ear Institute for second and a mixed foursome from Alesis, with Seymour Duncan and a *Mix* player, for third. Prize clubs were awarded to Bobby Szymanski with Group One for "Longest Drive" and Ken Dahlinger on the Otari team for "Closest to the Pin."

Proceeds from the L.A. Open will go to Hearing Is Priceless, the outreach program at Los Angeles' House Ear Institute that is co-sponsored by the Mix Foundation for Excellence in Audio.

Terry Lowe, Tournament Director and *Mix* Southern California/Southwest ad manager, summed up the day: "There were good shots all around. Everyone had a wonderful afternoon, and it was a great way to relax in a relationship-building environment that supports a good cause."

To those who were there, thanks for being present and supporting the debut event. To everyone else, start practicing your swings—see you next year! ■

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The second-place House Ear Institute team of Chris Camozzi, Ricky Phillips, Charlie Lahaie, Mags Cain and Gary Lee

Chris Fichera of the Group One team putts for the lead

Design FX owner Gary Ladinsky with Mort Fujii of Metro Magnetics

Hillel Resner, Closest to the Pin Champion Ken Dahlinger and Terry Lowe

Producer/engineer Greg Ladanyi takes a much-needed respite from the heat

Terry Lowe, Longest-Drive Champion Bobby Szymanski, Hillel Resner and A-T's Buzz Goodwin

Business never stops for producers' manager Terry Lippman

Mix promotion manager Christen Pocock stands guard over the trophies

Pete Kalmen of QSC and Russ Kunkel

From Rumbo Recorders, studio manager Vicky Camblin and Guns N' Roses producer Mike Clink

Drummer/producer Russ Kunkel, producer/engineer Ed Cherney and Erika Lopez of Apogee

Ted Keffalo and Barbara Brown playing for Event Electronics

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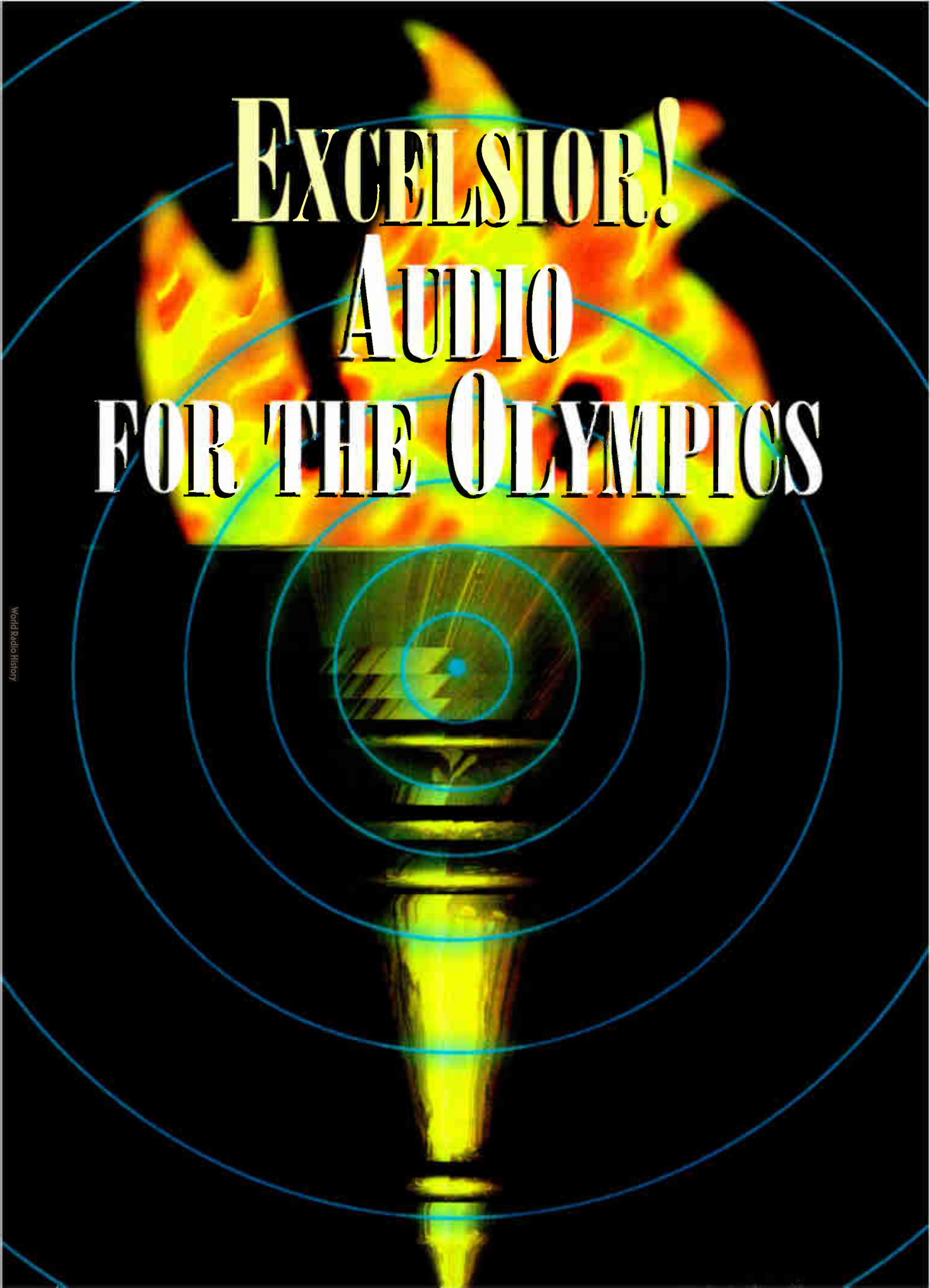


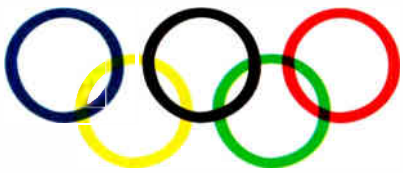
World Radio History

From Venue to You, The Sound of the Games Gets Better

[Editor's Note: The following story on the Centennial Olympic Games was put together a month prior to Opening Ceremonies, when venue plans were still being finalized. Mix will follow up its Olympics coverage in November with a report from Atlanta.]

More than a decade after the often-dramatic Olympics were played out in Los Angeles, the international games will return to the United States in July, this time to Atlanta. In the four years since Barcelona, audio production for the events has evolved considerably, and the changes should be readily apparent to the estimated 2 billion viewers worldwide.

One major difference for the 1996 Olympics broadcasts is that the entire audio portion issued from the International Broadcast Center (IBC) and from the various venues will be in stereo. The 1992 Olympics from Barcelona were a mono affair, with only the Opening and Closing Ceremonies broadcast in stereo. This time, the same ceremonies will be broadcast in surround sound, a format that chief mixer Dennis Baxter wants all future broadcast of sports events to use. The future of television sound lies in surround, he says.



To give the stereo image of all the other programming a somewhat fuller, more encompassing feel, Baxter uses the Spatializer system to simulate surround audio, applying it to ambient sounds like crowd noise and then panning the single-source signals to provide the illusion of movement as sound follows picture. In total, 22 Spatializer PRO systems will be used on the broadcast, which will be fed to 197 broadcasters worldwide.

The move to all-stereo was evolutionary, says Frank Grillo, head of broadcast operations at the International Broadcast Center, the technical hub of the sprawling complex of venues in Atlanta. "There was no real demand from any single broadcaster or group of broadcasters," he explains. "Really, where it came from was our anticipation of broadcaster demand, and following the trend that's been going on in television for some time now toward all-stereo broadcasts."

Both Grillo and Jim DeFlippis, head of broadcast engineering, have been working on the Olympics since 1993. But the task of providing basic feeds to scores of international broadcasters sounds deceptively simple; in reality, as many as 23 events from 38 individual venues will be taking place simultaneously over the course of 17 consecutive days. Each event site has its own control rooms; the main venue, Olympic Stadium, has five separate control rooms. As many as 60 multiple-signal stereo audio feeds may be sent via fiber-optic lines from the various venues to the IBC, where internal audio routing is done in an all-analog domain. From the venues to the IBC, the multiplexed audio signals are carried through a fully redundant, high-capacity, self-healing fiber-optic land-line transmission network. Named the digital SONET network by supplier BellSouth, the system carries full-bandwidth (up to 20kHz) audio.

What the IBC will be capturing and sending to international broadcasters is what both DeFlippis and Grillo refer to as "natural sound," the sound generated by the events themselves and the crowds watching them. All spoken commentary and audio effects (and music for the opening and closing) will be added by individual broadcasters for their respective foreign markets. "The key is to make that natural sound as realistic as possible, as comprehensive as possible and as intelligible as possible," states DeFlippis.

Panasonic is the official primary equipment supplier for the events' audio and video; thus, Panasonic/Ramsa consoles abound throughout the complex, including multiple Ramsa S840 40-input, 8-bus consoles and several larger 48-input Ramsa SX-1 consoles fitted with microprocessor-controlled VCAs to automate the feed mixes. The SX-1 was designed as a live sound board but was modified by Ramsa with input from the IBC staff to include broadcast amenities, such as added balanced outputs and redundant power supplies, which are critical for live broadcast events. Other equipment to be used on the broadcasts at the IBC include Tannoy PBM-8 and PBM-6.5 monitors, Ramsa WRA-200 and WA-80 monitors, and Spatializer signal processing. The entire proceedings will be recorded—audio and video—to the D-3 digital videotape format, which provides four channels of digital audio.

Ultimately, the signals coming from the IBC will be routed, again via fiber-optic lines, to the main satellite uplinks using a full-rate digital transmission protocol, another difference from the previous Olympics, at which both analog and compressed 45MB audio data were transmitted. Listeners to the 1996 Olympiad will get the benefit of full-bandwidth, CD-quality 16-bit audio.

LIVE SOUND

Those lucky enough to attend the games will get an aural glimpse of what future Olympics broadcasts will be like. The main venue will issue its own version of live surround sound. Mixer Patrick Baltzell has designed a specially configured multichannel system with 380 surround speakers (EAW two- and three-way boxes) and 20 EAW field clusters using 57 KF860 and KF861 cabinets aimed up at the stands.

The drama of the Opening Ceremonies will be heightened with prerecorded audio material played back from a Tascam DA-88 with discrete tracks of vocals and music. (A second DA-88 is to be used as a backup, both running in sync off a time-code generator.)

"In all, there are four channels of discrete surround audio being fed to the live sound system," explains Baltzell, who was hired as the system designer and mixer by Don Mischer, whose production company will produce the ceremonies and for whom Baltzell has

ILLUSTRATION: TIM GLEASON

BY DAN DALEY

World Radio History

mixed Emmy Award and Kennedy Center broadcasts. "All the feeds are split, with me getting them for live sound and Ed Greene getting the same feed to his truck for the broadcasts. The live sound is every bit as complex and elaborate as the broadcast sound. I really think it's going to sound amazing sitting in the stands for these games."

Baltzell will mix through the first production edition of Cadac's new F-1 console, this one with 32 inputs, and a Cadac J Series sidecar desk with another 28 inputs. The L.A.-based freelancer was looking forward to the Closing Ceremonies: "There'll be over 100 drummers playing simultaneously, in time with a prerecorded track," he says. "We've got Comtek monitors in the ears of the lead drummers playing them a click track. It's going to be something to watch."

MICROPHONE PLACEMENT

The various venues this year will have substantially more cameras, and the Olympics audio crew wanted the dimensionality of the sound to match the new visual angles. "What has changed dramatically is the number and placement of cameras this time around, and we wanted to enhance the audio to match the pictures," says DeFlippis. For instance, the pummel horse in gymnastics will have cameras and microphones built into the events' hardware, with a mic and camera on the springboard and landing pad, ready to record the grunts, grimaces and groans of the competition. DeFlippis says this year's event will have a broader array of microphones—and some hydrophones for the first time, to record underwater sounds in swimming races and on resonant surfaces like approach tracks—to get more realistic sound. "It's the enhanced sense of realism that we're trying to increase this year, taking sports audio to the next level, so to speak," he says. "The stereo sound helps that, as does using specialized transducers for the audio."

CONTROL ROOMS AND MIC PLACEMENT

Dennis Baxter, sound specialist on the Olympics audio team, is a veteran of both the recording studio and live sports broadcasts, and he believes both skill sets are being tested at the Olympics. "Microphone choice and placement are critical in this situation, both because of technical requirements and because of what the [Olympic rules] Federation says we can and can't do," he explains. For instance, Baxter notes, he had applied more than two years ago to have wireless microphones placed inside the bases for the baseball competition, only to be turned down. However, the rules committee did agree to let him place them on the softball field. Sennheiser 250s will be inside first and third base, cleverly installed in a protective housing. "What we're looking to achieve there is the sound of the infield, which is rarely heard," he explains. "The sound of the coaches talking to runners and general infield chatter, as well as the sound of feet hitting the bases." Baxter will also be placing Audio-Technica PCC boundary microphones along the outfield wall, an area he said is virtually never heard in play. The PCC mics will capture the sound of outfielders hitting the wall as they go after long drives.

Aquatic sports will be making maximum use of hydrophones developed by the same company that used to make them for the Navy's Trident nuclear submarines, ITC (Santa Barbara, Calif.). For the first time, according to Baxter, viewers will be able to hear the coordinators of synchronized swimming competitions talking to their teams underwater. "You'd never even know they do that unless you listened with a hydrophone," he says. Aquatic environments also called for close-miking techniques. "The problem with sports broadcasts is that most are typically done in acoustically poor environments," Baxter notes. "They're like a reverb chamber, especially for water events. The response is to place mics close in and as many as possible. I've got them on the diving board handrails, underneath the springboard and on the lip of diving platforms—anywhere the rules federation will allow me to put them. And the other problem is having to keep them dry. The main thing, though, is to keep the crowd sounds isolated from the foreground sounds. Crowds are most intense at college sports and Olympic events; they can literally deafen any sounds you hear there. That's why doing pro ball sports is easier—there the crowds are only half-drunk. At college games, they're totally drunk and you can't hear a thing on the field. That's why I won't do University of Tennessee games at Knoxville anymore—98,000 seats filled with screaming, drunk fans."

Televised boxing competitions normally have fishpole microphones hanging above the fighters' respective corners to capture sound, but the rules committee vetoed that approach for the Olympics. Instead, Baxter is placing A-T lavaliers atop the corner posts facing out over the boxers' heads, and he's putting highly directional A-T supercardioid mics on top of the ring's ropes. A-T hydrophones are being used on the velodrome bicycle racing track. "The point there is to capture the resonance of the wooden track as the racers pass by, not the actual acoustical sound of it," he says. "It acts in the same way as a piezo guitar pickup does, and the result is quite effective. We're also using it in the gymnastics competitions."

Baxter and other engineers were responsible for as many as 12 pairs of microphones per event, ranging from the highly specific foreground mics to the overhanging crowd mics. These were then fed into the Ramsa mixers in the nine local control rooms at the main events venues. At each of these venues, broadcasters could request specific mixes. In some cases, broadcast consortia—the EBU or the Asian group, for instance—might request a pooled custom feed (Japan and Germany were, incidentally, broadcasting in high-definition television, and shipped over trucks with that capability to the U.S for the Olympics); NBC, holder of the U.S. broadcast rights, had its own custom audio feed requirements, which were posted in script form to each of the venues for each of the events. "NBC was my single biggest client," says Baxter.

But even hundreds of microphones and nine built-from-scratch control rooms pales compared to the 43 mobile units that Baxter has to send feeds to. The trucks are reminiscent of fighter planes lining up behind an airborne tanker for refueling, and each one's sponsor has provided scripts for customized audio feeds for specific events, which Baxter and other engineers execute, sending the audio out to what's known as the "demarc" point for each venue where the trucks are waiting. Once the customized feed is created (for instance, the ambient sound on cables one and two; site-specific foreground sounds labeled cables three through 12), they hook into the waiting connectors, and a ready submix is mixed in the truck with that respective broadcaster's talking heads. "In a sense, the trucks have me doing premixes for them" says Baxter.

From within the trucks or the IBC, this year's version of the quadrennial games promises to have as much excitement behind the scenes as it does on-camera. The planning has been meticulous, but in live broadcasts, anything can happen, and often does. In any event, though, this year's Olympics audio is shooting for the Gold. ■

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Mariann Mayberry as Jane and John Malkovich as John Wilmot in the Steppenwolf Theatre's production of The Libertine by Stephen Jeffreys

Chicago's Regional Theaters

SOUND DESIGN AT THE GOODMAN AND STEPPENWOLF

The Goodman Theatre's production of Tom Stoppard's Arcadia

Mix has covered quite a few facets of Chicago's audio industry over the years. There have been stories about blues recording, club sound reinforcement, the local studio business and an early rundown of the system installed at the United Center (before all the basketball and decibel records got broken this year). But there's still some unexplored territory that has been too-long neglected. This month we take a look at the sound designers at two of Chicago's vital and exceptional regional theaters: the Goodman Theatre and the Steppenwolf Theatre. Both of these Tony Award-winning houses have gained nationwide reputations for excellence and consistency. They've sent plays to other regional theaters and to Broadway, and certainly—though no Tony category yet exists for it—the sound design that's being done in these theaters has made a substantial contribution to their success.

by Barbara Schultz

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PHOTO: MICHAEL BROSILOW

Steppenwolf Theatre's production of A Clockwork Orange

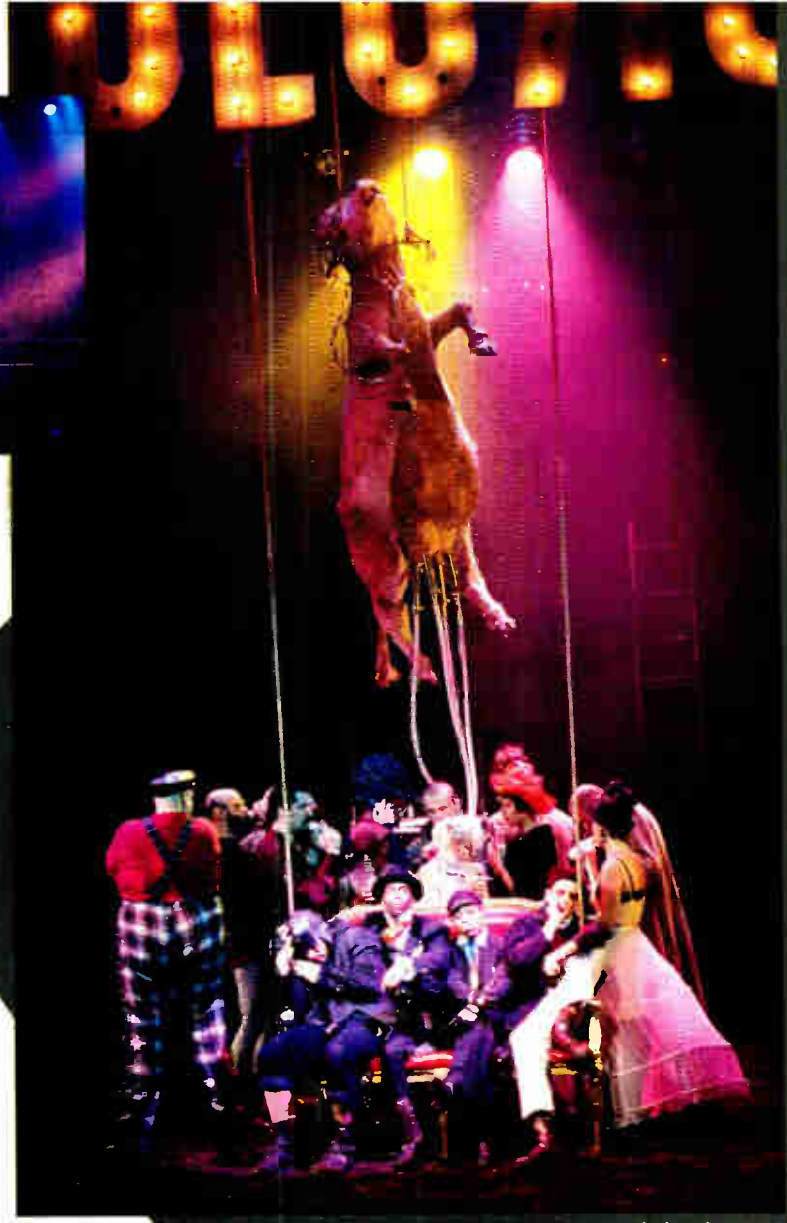

PHOTO: MICHAEL BROSILOW

A Clockwork Orange

Most of the sound design at the Goodman and Steppenwolf is created by three designer/composers, all of whom came up on Chicago stages. They are Richard Woodbury, Michael Bodeen and Rob Milburn, the latter two often working as a duo.

MICHAEL BODEEN

Michael Bodeen began his audio career the same way so many people do—playing guitar in high school and college party bands. He and Rob Milburn were classmates at New Trier East High School, and they had been playing in various groups together for years when they fell into theater. "It's sort of complicated, but our bass player's cousin was in a theater company called Remains. We used to go to their plays and they used to come see us perform, and one day they asked us to write the music and play onstage for a play called *Tooth of Crime* by Sam Shepard. That was in 1982." Bodeen took a five-year hiatus from '85 to '90, during which, he says, he "tried to become an adult, which didn't work at all. I missed music. So I quit the regular job, got rid of the tie, came back and started to work with Rob again."

Bodeen says that work on most of the projects he designs begins about four to six months before a play opens. He and the other designers (set, costumes, lighting) meet with the director and production manager to review the script and discuss the director's vision for the production, as well as the designers' general suggestions. "I try to get the director to walk through the script and identify all of the moments that require music and sound," Bodeen says. "Rehearsals are usually three to

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Arcadia

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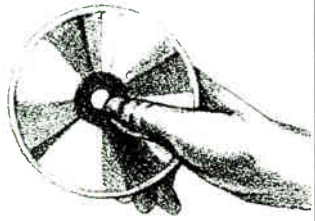

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Rob Milburn (left) and Michael Bodeen in Bodeen's home studio

four weeks, and because sound is sort of a reactive element, you've got to know what's happening before you can address it in the piece.

"Hard work in the studio, building a show, begins about two weeks before what we call technical rehearsals," he continues. "Once you get into technical rehearsals, you have a very tight schedule. Usually, the first three days are 12-hour days in the theater. This is when all the technical elements: sets, lights, costumes and sound converge. But not everything you bring in works the first time, so I can count on being back in my studio that night or the next morning to make the changes. Then you have an audience by the fourth day, and the pace eases up a bit, and instead of working 18 hours a day I'm now working 14."

Bodeen uses the Goodman Theatre's studio setup, but he also has a home studio with much of the same gear: a Pro Tools system running Opcode Studio Vision Pro, an Akai S1000 sampler with 32 megs of RAM and a SampleCell card with 8 megs of RAM. Bodeen also likes the sound of Lexicon processing live. "The LXP-1 or an LXP-5 is a perfectly great unit. It sounds great, it's inexpensive, easy to operate."

For effects, he prefers the Hollywood Edge Sound Effects library. "They're very clean," he says. "Also, creative. Not the typical field recording, which really helps. But I don't normally just pull them off a CD and dump it onto tape either. I'll manipulate it so it's not the same sound effect you heard on a Clorox commercial." Bodeen also takes whatever opportunities he can to contribute original music to a production. It's very satisfying," he says. "I try to write something original so that it fits. You've got a set that's created specifically for the production—costumes, lights—why not sound and music?"

A play that enabled Bodeen to flex his design muscles quite a bit was the Steppenwolf Theatre's 1994 production of *A Clockwork Orange*, which he designed in collaboration with Milburn (though Milburn's involvement was curtailed by his participation in the *Angels in America* tour). The design team for *A Clockwork Orange* also included a musical director, Willy Schwarz. "The music of Beethoven is a huge part of the play, the book and, as I'm sure you'll recall, the movie," says Bodeen. "We needed to find a way to incorporate this into a theatrical setting. We decided that it would be great to have a string quartet onstage. We also thought that because there are dark, brutal beatings involved that it would be great to have something to contrast with the string quartet, so Willy Schwarz hired a guy named Bill Wallace to design and build these weird drums: 55-gallon drums with skins stretched over them, and then Willie hired another guy named Jeff Bek (not that one) to help develop the sounds and play onstage with him.

"We also had a big sawtooth gong and some other weird kind of junkyard drums, and we sampled all that with an EPS 16+ sampler and then triggered it by an Octapad that Jeff played. Then it came time to say, 'Well, where are we going to put them?' That became a little

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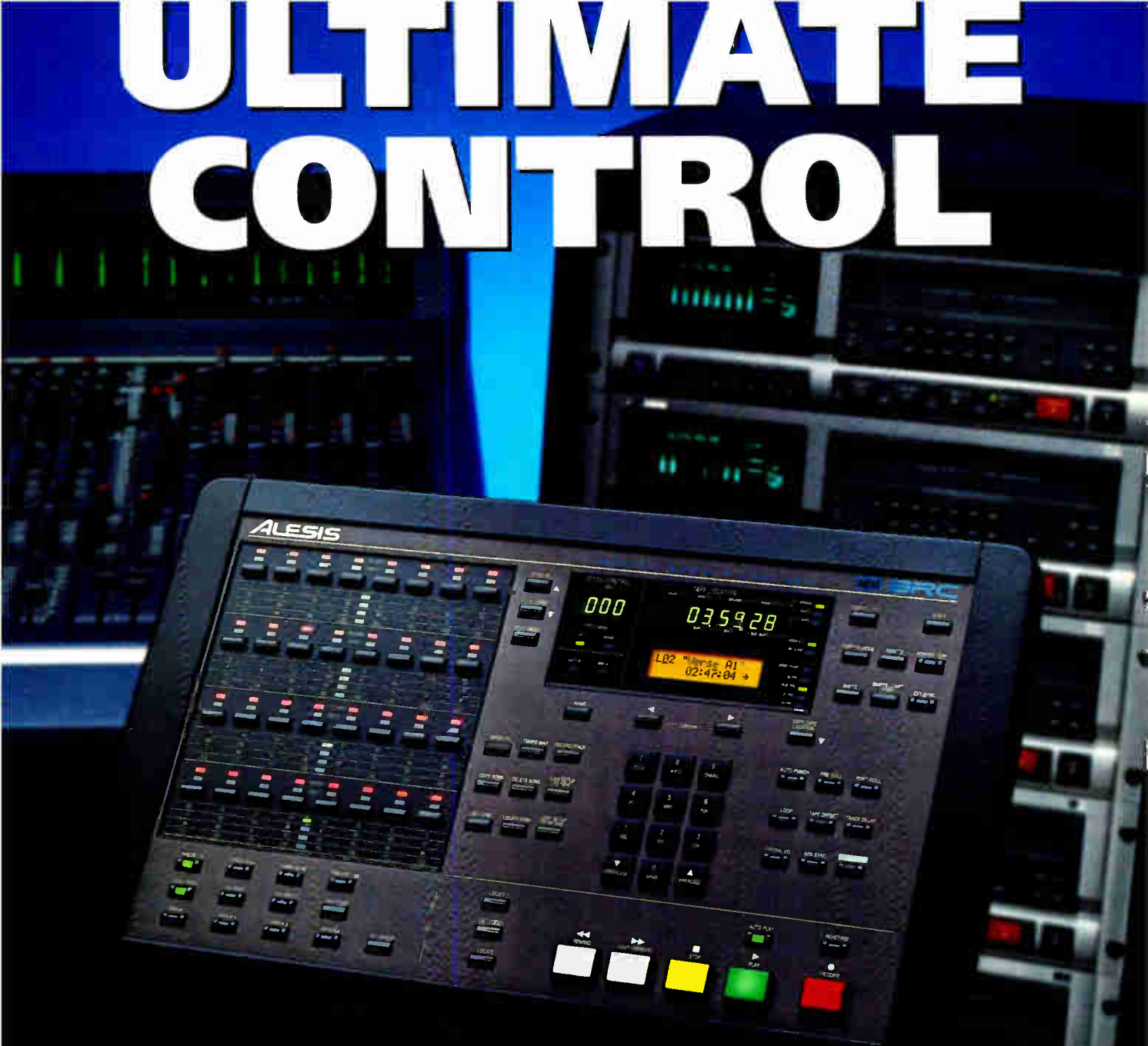

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PHOTO MICHAEL BROSILOW

Francis Guinan as Charles II and John Malkovich in another scene from The Libertine.

bit of a challenge for the set designer. We ended up putting the quartet in a little room that was cut into the back wall of the set, and we hung SM81s from the ceiling. We were able to hide them in a chandelier. And then we put the percussionists at the top of the set—probably 30 feet in the air. Pretty scary. We used SM58s and 57s to mike them."

Bodeen also had to create sounds that would effect some fairly intricate emotional transitions. "One of the things that happens in the play is that Alex, once he's 'cured' of his violence, any time he encounters violence, he becomes very sick. So we needed to enhance his sensation of sickness," he explains. "In other words, what can we do to help the actor get motivated to double over and vomit and involve the audience in the experience? So we had a Korg Wavestation EX onstage and, using a pitch wheel, we created this very low, weird, subsonic, descending rumble. And when Alex goes to the hospital, we used a sampled pipe organ with the pitch on the sampler so far down that, as it played, you actually started to feel queasy.

"You have to make it hyper-real at times," Bodeen says, "to energize the emotions, because sound is such an emotional thing. Music and sound can be incredibly effective tools for this. It's a primal thing."

ROB MILBURN

Rob Milburn, Bodeen's frequent collaborator, began pursuing theater sound as a career soon after the two worked for the Remains company. "After that gig," he recalls, "they asked me to do another, but my boss at my day job said, 'Well, that was really interesting and we're very proud of you, but don't ever do that again.' So I had to make a choice, and I went for theater, which was terrifying at the time, but it was also wonderful. A real change in life."

Since then, he's been working steadily in Chicago's regional theaters and on the road for such impressive productions as the national tour of *Angels in America*, *Nomathemba*'s trip to the Kennedy Center, Sam Shephard's *Buried Child* on Broadway and the American Conservatory Theater (San Francisco) production of Eric Overmeyer's *Dark Rapture*—a heavily stylized play that takes its cold, self-interested characters to a variety of American cities. Milburn says that his goal for this design was to "musically create something that had the kind of seedy spirit that the text did. Another important function of the music was, because there were so many scene changes, to help propel the story along." Some of the musical choices were obvious: grunge rock in a Seattle cafe, hot Latin jazz to indicate the presence of one of the Cuban characters, marimbas in Key West and a New Orleans funeral band in New Orleans.

Another scene showed a murder in a used car lot, where part of the conflict was a racial one, between Armenian and Turkish people. Milburn began underscoring this scene with a Turkish military march. "And over that, or actually under that, being trampled by it, were different voices from Armenian folk songs. It's something that probably nobody in the audience ever got, but nevertheless, the effect of that cacophony

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"music hit me early on,..."

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when I was five I was stretching rubber bands across brooms and making sounds. My father was my first real inspiration. I watched him create wonderful music on piano and came to understand that you could just compose your own songs.

That composing is just another form of improv. And vice versa. It could be used as a way to reach into your soul to get the music out. I give myself some goals... it's important to define where I am trying to go. For me, writing is my alter ego. I'll sit here with Logic Audio at the center of this very sophisticated system, work for a week or two, get one or two songs down, and then the really good stuff starts to pour out. It's very intuitive. It follows my stream of consciousness."

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created the right mood for that scene."

The scene transitions in *Dark Rapture* also required some manual typewriter sounds (to establish the presence of the play's screenwriter character), which Milburn used as a base for some of the original music. "I took the typewriter as a rhythmic base," he explains, "adding a lot of percussive samples that I've collected over the years, creating a very vigorous and physical sound, and then out of respect for the history of film noir music, added muted trumpet and saxophone. It mixed a modern, percussive feel with more traditional film noir jazz sound." Milburn recorded most of the score for *Dark Rapture* in the Goodman's recording studio with the help of David Naunton (see sidebar below).

Another production Milburn enjoyed working on was the Goodman's '94 production of *Dancing at Lughnasa* by Irish playwright Brian Friel. *Dancing at*

THE GOODMAN THEATRE'S 70-YEAR TRADITION

The Goodman Theatre was established in 1925 by the Art Institute of Chicago, which still owns the 70-year-old building that houses the theater. It's the city's oldest and largest regional theater, and its long history includes the American premieres of David Mamet's Pulitzer Prize-winning *Glengarry Glen Ross* and August Wilson's *Seven Guitars*, as well as works by Edward Albee, Samuel Beckett, Tennessee Williams and many others. The Goodman won a Tony for Best Regional Theater in 1992.

Audio at the Goodman is ably handled by David Naunton, who's been in regional theater reinforcement for nearly 20 years and at the Goodman for ten. He's in charge of a crew of FOH engineers who work the theater's 14-year-old Richmond 816 routing console. "It's sort of based on the design of an old lighting system, where you have scene presets, and there are eight inputs and 16 outputs," he says. "It's basically the precursor to automated systems." Also at Naunton's disposal are a Mackie 32x8 and a Soundcraft Delta 24x4 mixer, as well as two 16x4 Soundcraft 200Bs.

Speakers at the Goodman are mostly Electro-Voice 200Bs and Bag End 12 Juniors. Naunton also uses a Bag End ELF subwoofer system and Crest amps. He has amassed a collection of Shure SM81s, Sennheiser 441s and 421s and PCC160 floor mics and is in the process of acquiring a Telex FM450 wireless system. Not a lot of actor reinforcement is necessary for most productions in this 650-seat house, but Naunton uses quite a few mics for the theater's musicals (at press time, he was going into production for *The House of Martin Guerre*, which would require an orchestra and 23 wireless mics onstage) and a couple of floor mics for dialog support to fill dead spots in the grand old room.

"It's an old building, and it's almost square with wood walls," Naunton explains. "As people have learned over the years, parallel walls aren't really good for sound distribution, so we do have problems with hearing in some areas, which is why we have to support most of the actors with floor mics."

The Goodman Theatre also includes a smaller theater space called The Goodman Studio, which shows smaller-scale productions by local playwrights and actors to audiences of 100 to 135. Naunton uses reel-to-reel equipment, MiniDisc players and samplers for playback in both theaters.

Probably the most unique feature of the Goodman from an audio standpoint is the theater's recording studio. "We're one of the few regional theaters with our own studio," says Naunton. "We have a disk-based Pro Tools system, Akai samplers, BPS samplers and lots of MIDI equipment. Also, we have three DAT machines, CD players, and MiniDisc recorders that we use for playback on the stages. We also have three or four CD effects libraries."

There are plans in the works for the Goodman to build a new theater in the next few years. "The proposed theater would be built in the Loop on a site where there used to be four theaters: the Gerrick, the Woods, the Selwyn and the Harris," says Naunton. "We're hoping we'll have that new building soon." ■

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Lughnasa is a memory play about five sisters, in which the transitions are more mental and emotional than physical.

In one scene, a particularly vivid memory causes the sisters to break into an Irish Caile dance. Millburn first looked at production music for this scene, but he didn't find anything that he thought could become as intense as he wanted. So, with the help of Irish-American musician John Williams, he put together a Chicago Caile band, which he recorded in Chicago's Seagrape Recording. In the Goodman's studio, he also laid some tracks with a bodhran player and added those sounds to the band. "What's called for in the stage directions is that the beat and the rhythm of this traditional Caile band becomes more and more intense, and the dance turns into a frenzy," says Millburn. "So, the music begins by coming out of the sisters' radio, which they call 'Marconi.' As the dance became more frenzied, I started adding it into speakers that filled the stage, and also bringing in slowly the bodhran through the stage speakers and through the subwoofer. As the dance built and grew, it took over from coming from the small source on the stage and grew

ROCK 'N' ROLL THEATER AT THE STEPPENWOLF

The Steppenwolf Theatre is a young upstart compared to the Goodman, but its 20 years of productions have been quite impressive as well, being the jumping-off point for actors such as John Malkovich and Laurie Metcalf, and having debuted plays by the likes of Sam Shepard and Anne Tyler. The company is particularly proud of ensemble member Frank Galati's adaptation of Steinbeck's *The Grapes of Wrath*. The production won Tony Awards for the Steppenwolf and Galati for Best Play and Best Director when it went to Broadway in 1991.

Also in 1991, The Steppenwolf moved into a new building just north of the Loop on Halsted Avenue and hired a dedicated front-of-house engineer, Martha Domine. Domine moved to The Steppenwolf from a position as David Naunton's assistant engineer at the Goodman. She and Naunton maintain a friendly professional relationship, sharing gear and advice whenever necessary. Domine is very happy in the theater's new-ish digs and can't say enough about what the thoughtful design job means in her work. "Probably the nicest thing about the building, soundwise, is the building," she says. "They did such a good job designing it acoustically. Some people wouldn't consider it an attractive building; it's cinder block inside. But it's a really warm, close feeling. I think the farthest seat is 40 feet from the stage, which is perfect for the style of shows they do here. They tend to be dysfunctional, in-your-face drama, the rock 'n' roll theater that Steppenwolf is so famous for.

"And there are speaker outlets, mic outlets, video outlets, headset outlets everywhere in the building," she continues. "There are outlets all around the backstage area and in the pit and

—CONTINUED ON PAGE 68

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to the entire stage and filled the entire house. Then it was all interrupted by a burst of static to bring the characters back to their stage reality. I started with a mono signal of the Caile band, EQ'd to sound like an old radio, and then brought in the full-range stereo.

"The thing about theater is that honesty becomes a greater goal than reality," he continues. "For example, when a thunder clap happens in theater, it's usually very dramatic. And lightning would be triggered at exactly the same time as the sound, which, as we all know, in reality rarely happens. But nevertheless, there's a different reality here. It's about the impact of the moment."

RICHARD WOODBURY

Richard Woodbury's background is in dance as well as music. In addition to designing sound, he serves as music director in the dance program at Chicago's Columbia College.

Woodbury's first theater sound project was composing the musical score for a play at the Wisdom Bridge Theater; Rob Milburn was the play's sound designer. "We wove the design of sound effects into a lot of the musical cues," Woodbury says. "The show opened with a slide show depicting a pogrom in Russia, so there was creepy music and the sounds of horses. The slides follow an immigrant as he moves from Russia in the 1800s to the U.S., so we'd have the sound of water and the boat horn and the arrival in America all woven into a musical score. It was very filmic in that sense."

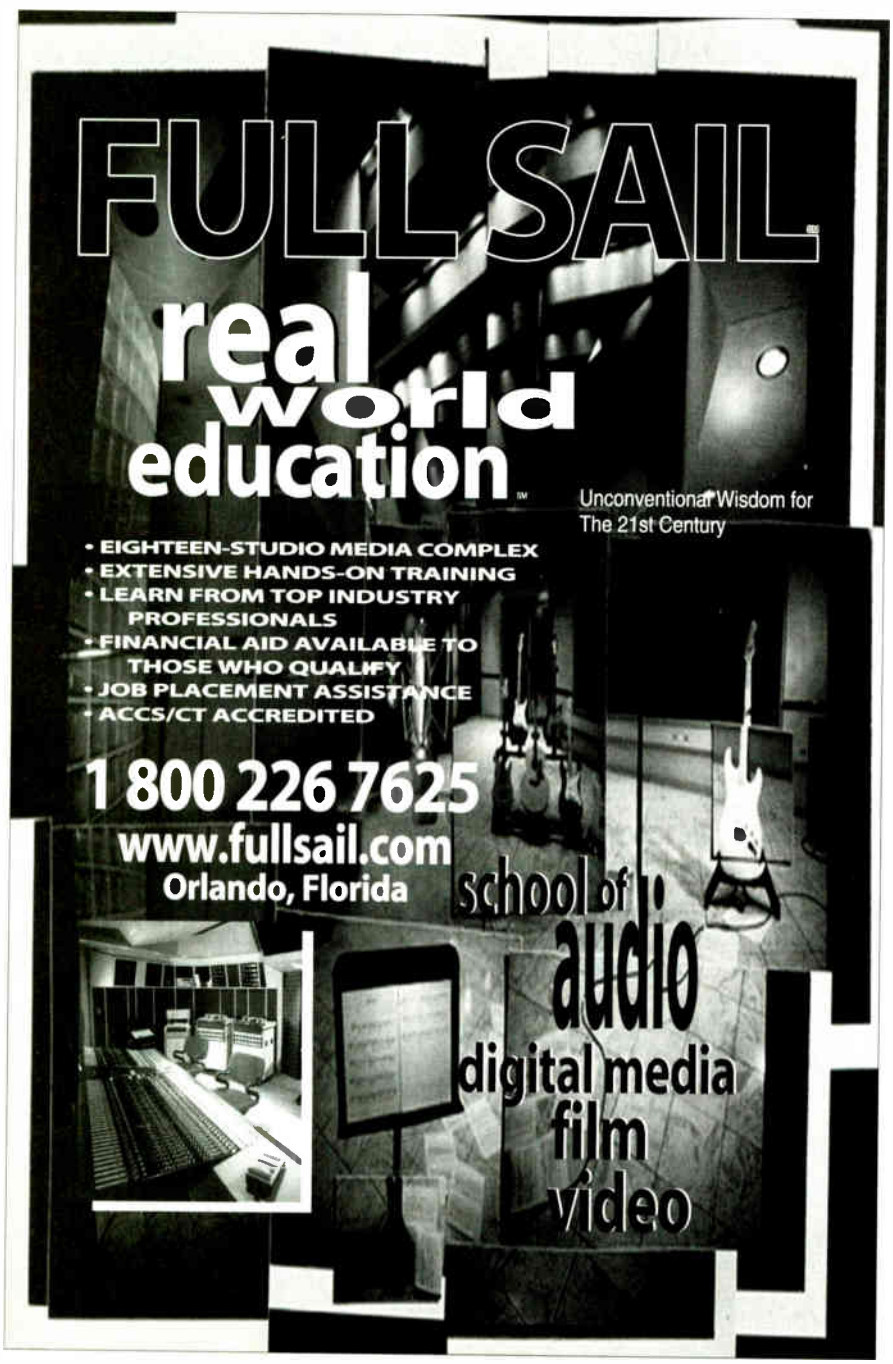
After that, Woodbury began getting work in other theaters, including the Steppenwolf and Goodman. His recent projects include the Goodman's production of Tom Stoppard's *Arcadia*, a densely cerebral play about humanity's natural passion for knowledge and the inseparability of past and present discoveries. The director, Michael Maggio, had hired a composer, Jeff London, to create most of the transition and underscore music for the play, so Woodbury didn't get to sink his teeth into the

—FROM PAGE 66, ROCK 'N ROLL THEATER

the catwalks and the booth, upstairs, pretty much anywhere you could imagine you might want to put a mic and speakers."

The 550-seat Steppenwolf is equipped with a DDA Q Series board. Most of the playback is done with Revox reel-to-reel machines. The speaker system was installed by Modular Sound, the company that designed the space. "They're also the makers of Bag End speakers, so obviously we have Bag End speakers," says Domine. "I like them a lot. Amplification is with Crowns. Everything is patched so each amp has an EQ to the patchbay, but I find that we can generally keep the EQs in bypass, because there's no reason to use them. The house sound itself is pretty slick."

Because the house sound is so good, Domine doesn't have to keep too many mics on hand, though the theater's recent production of *Nomathemba*, a South African musical featuring Ladysmith Black Mambazo, required a Telex UHF wireless system. "But we don't really do musicals here," she explains. You don't see us doing *Hello Dolly*. Our next big show soundwise is *Slaughterhouse Five*. That's a little more our style. We've never had a pit orchestra here, although we have a pit...There's been a pool in it, there's been plenty of set pieces going up and down in it, but there's never actually been an orchestra in it." ■



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work as much as he might have liked. "But I did get one poetic moment at the end of the first act," he says. "There's a gunshot and reference in the script to birds flying off into the distance. We had our gunshot presented somewhat in the foreground abstractly, and—we played with this for quite a bit—a flight of crows takes off and then flies across the proscenium and then over the back of the house. A little bit of spatial play there. That's what the script called for."

Like Bodeen, Woodbury says his approach to any sound design project begins with a careful look at the script. "You and the director use the script to figure out what the vision of the show is," he says, "and the job of the sound designer is to add to the realization of that vision. Rob [Milburn] has said, and I kind of agree, that the best sound design is one that nobody notices. You don't want it to call attention to itself. There are the rare productions where sound actually gets to come to the front, and those are great, but most of the time it's more subtle. Or if it's blatant, it's because the thing, not the design, is blatant. If it's a thunderstorm, people should be going, 'It's a thunderstorm,' not 'Ooh, what a great sound cue.'"

And like Bodeen and Milburn, Woodbury uses Pro Tools running Studio Vision Pro and Sound Designer II. "Praise God for hard disk-based editing systems," he says. "This used to all be done on multitrack tape. If you found out during tech that something needed to be ten seconds shorter, you had to re-record every element, line them all up, and now we get in there and just grab the little hand, move it, fade out a little earlier."

Woodbury also makes use of the Goodman's Hollywood Edge and Sound Ideas effects libraries. "My favorite thing about Sound Ideas is if you want it, it's there. Some of their bird stuff has been the best I've come up with for individual species. I did a thing for the Field Museum's Traveling the Pacific exhibit, where I had to go to the Cornell library to get recordings of some of the specific birds, but some of the more common ones I was able to find from Sound Ideas. I had to find sounds for extinct birds. That's a tough one. And they won't let you put a robin in when it's supposed to be something else."

This past spring, Woodbury designed the sound for the Steppenwolf's *The Libertine*, directed by Terry Johnson and starring John Malkovich. The play, by Stephen Jeffreys, tells the story of an

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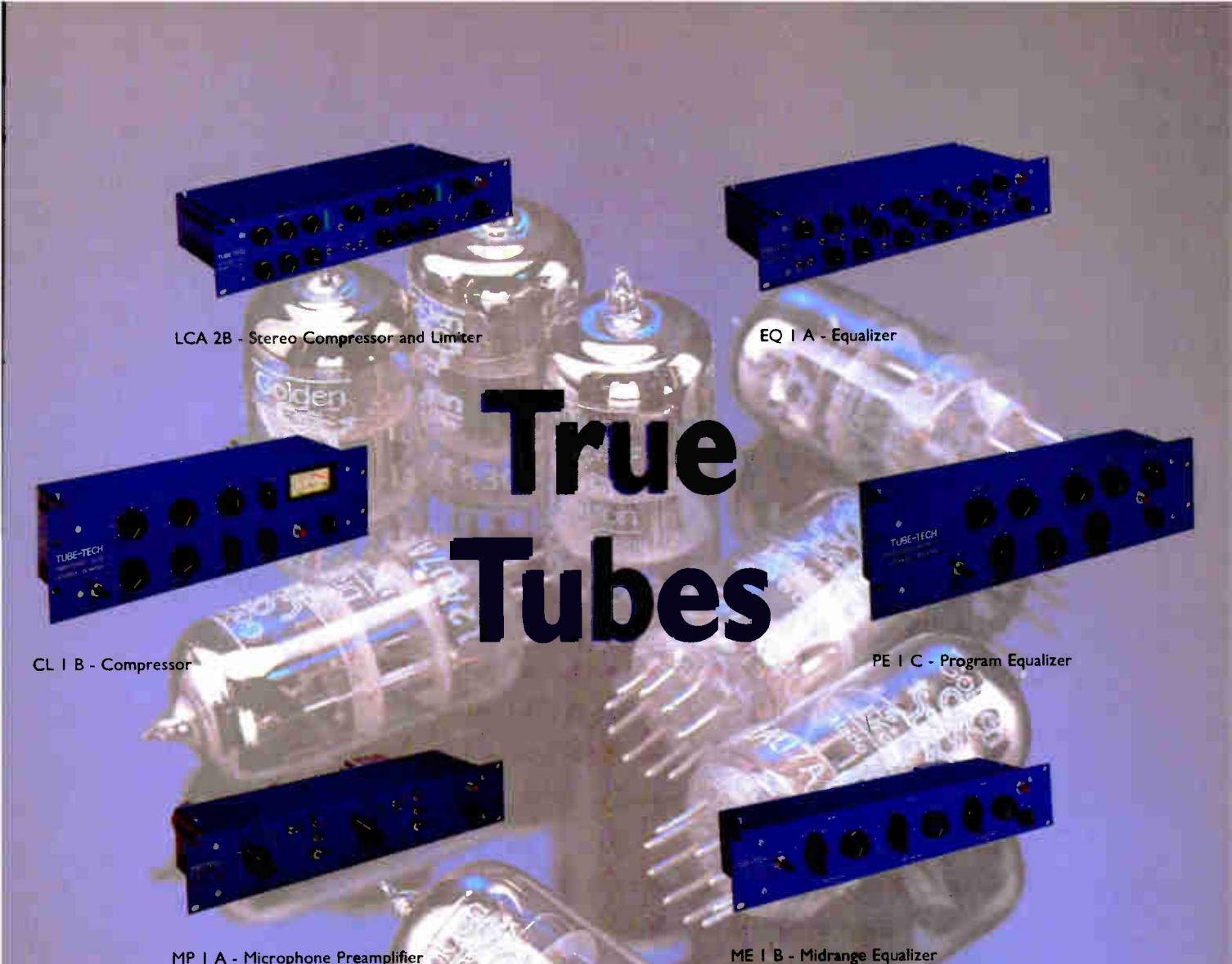

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amoral character confronting moral issues. "Perfect casting for Malkovich," observes Woodbury. "The show was very much of the [Restoration] period in terms of costumes but very abstract in terms of the set. After initial discussions with the director, we decided to do the whole show with harpsichord music. I did lots of research into music of the period, but when I came back with a first take on what the music might be, he and I concurred that it wasn't rich enough.

"So we listened to orchestral music of the period and found some absolutely stunningly gorgeous music. This meant a lot of underscoring, which I always like. You don't get enough chances to do that with theater, because it gets tricky with actor timing, but it makes scenes dramatic. There were also a good deal of sound effects in the show. There was a stage onstage, and at certain points of the play, there was a play going on offstage onstage. And so the stage would be a backstage set. We presented, in sound, the actual play, the stage play, in the wings. People onstage would react to lines and applause and laughter that were coming offstage. Coordinating all that with the live action was somewhat of an undertaking."

Woodbury says he accomplished this task by using multiple decks and feathering cues, one into the next. "We'd run something until a time-dependent point and then cue in the thing that was time-dependent. So things overlapped. I also do things where I'll record on a 4-track deck, each of four sources on a separate track, and fade them in and out as I need them. At one point in the play, they're at a racetrack, and we would quadrophonically pan the horses around the back of the theater, so that the actors' heads would move as the horses appeared to run around the track.

"But I've seen really brilliant sound designs done with two cassette decks and a home stereo," he continues, "and I always try to remind myself that my bells and whistles and knobs and dials don't mean a thing if there's not a good idea behind it. And one of the things that's great about Chicago theater is the sense of experimentation and risk-taking. Commitment to theatrical ideas as opposed to commercial ideas or for-profit ideas is really strong here, and that's a wonderful arena in which to work." ■

Barbara Schultz is a Mix *associate editor.*

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MAXIM ENTERTAINMENT GROUP

COMPOSER'S COMMERCIAL FACILITY

Though he has only owned Maxim Entertainment Group for a couple of years, 26-year-old composer/producer Joe Dilillo has a long history of involvement with the Hoffman Estates, Ill., studio. At age 16, he took a recording class at the facility (which was known at the time as Solid Sound) and then ended up working there as an assistant for a couple of years.

Bitten by the bug, Dilillo decided to pursue a career in the music business and moved to L.A., looking mainly for a songwriting deal. He made a few helpful contacts and connections (he gives particular credit to Sandy Roberton of management company World's End), got some work and gained valuable experience. But when a publishing deal wasn't forthcoming, he cast about for a way to make ends meet while continuing to work in the field he loved. He was considering opening a project studio when he heard that the old Solid Sound was for sale, so he got together some financing and bought it.

Dilillo's idea was to earn a living catering to the studio's well-established music clientele while also using the place to pursue his own work writing and producing and developing artists. At first, though, the balance was a little skewed, as he had to put his own work on the back burner. "The place was pretty much on its last legs when I came in," he says. "It had an old Sound Workshop console that was not long for this world. It got to the point where there was one channel on the entire console that worked. We would be pounding on the console during sessions, which didn't look really good to the clients."

To revitalize the studio, Dilillo and staff engineers Phil Bonnet, John Towner and Chris Steinmetz rewired the whole place, bought new gear and constructed a B room. Now the 2,400-square-foot facility includes a 25x25-foot tracking room, which contains a grand piano, a Hammond M3/Leslie, and lots of guitars and amps. A pre/post-production room offers MIDI and digital editing gear, and the control room features a Mackie 32x8. "We dug out the old Sound Workshop and put the Mackie inside its frame," Dilillo says, "and we're really pleased with it. It's a clean board, and we ended up getting a bunch of API and Focusrite mic pre's and EQs. Everything goes straight to tape through the mic pre's, and we mainly just use the Mackie for monitoring. It's nice not to have big console payments looming over our heads."

Joe Dilillo at Maxim

Other gear includes an Otari MX-80 24-track and a large array of mics. Dilillo also acquired a "gorgeous pair of matched Pultec EQH-2s, the silver-faced ones, which are in great condition," Tube Tech units, and a Vac Rac tube mic pre that he says makes the U87 sound like a 47.

All of the hard work refurbishing has paid off, as the studio continues to attract a steady stream of mostly music-recording clients, including the New Duncan Imperials (Pravda), Carlos Villa Lobos (Trinity/Warner-Chappell) and Chicago success story the Smoking Popes (Capitol). But Dilillo is quick to point out that the gear isn't the secret. "People don't come here because we have a Neve or an SSL, they come because they want to work with Phil or Chris or John or myself. We're the type of mid-sized studio that everyone said was going to get squeezed out due to the influx of ADATs and stuff like that, but I just haven't seen that here. Maybe it's the case elsewhere, but our business has been increasing steadily since I took over in 1994. The fact that we have such a versatile, flexible staff is what's sustained us."

And what about Dilillo's own work? Now that the studio is hitting its stride commercially, he finally has more time to use his facility for his own projects. A CD he made with Chicago artist Jeffrey Miles Harris was just released, he's been doing some TV dates and work for local festivals, and he recently collaborated on the title song for a feature film. Still, he admits, "Sometimes it can get tough to sit down, get inspired and write a song when you have mountains of bills to pay and the bathrooms need to be cleaned. But you just do what needs to be done." ■

BY ADAM BEYDA

Adam Beyda is a Mix *assistant editor.*

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The mindset in the audio community five or ten years ago was to wait until after the "shakeout," which would leave only a few companies in the market. However, this shakeout never occurred. Although a few companies—such as New England Digital—disappeared, others soon took their place, leaving today's workstation buyer with more choices than ever before. Such a wide-ranging menu isn't necessarily bad, but as the diner trying to choose one item from a huge dessert tray can confirm, any increase in the number of available selections inevitably complicates the decision-making process.

The good news is that the audio community benefits directly from changes in the computer industry. RAM and hard disk prices have dropped to record lows. This week's CompUSA flyer lists 1GB (IDE) drives for $149! And an investment in an extra 32, 64 or 128 MB of RAM no longer represents a major portion of a workstation investment. At the same time, prices and the available variety of all forms of removable media (for both production and back-up chores) have never been better. Meanwhile, CPUs (both Mac- and PC-based) are inexpensive, stable and fast, with 100+MHz machines within anyone's price range. Five years ago, the once-venerable Mac IIci (operating at a now snail-paced 25 MHz) was considered state of the art, and it was priced at $7,200, including an 80MB hard disk and 4 MB of RAM.

BY GEORGE PETERSEN

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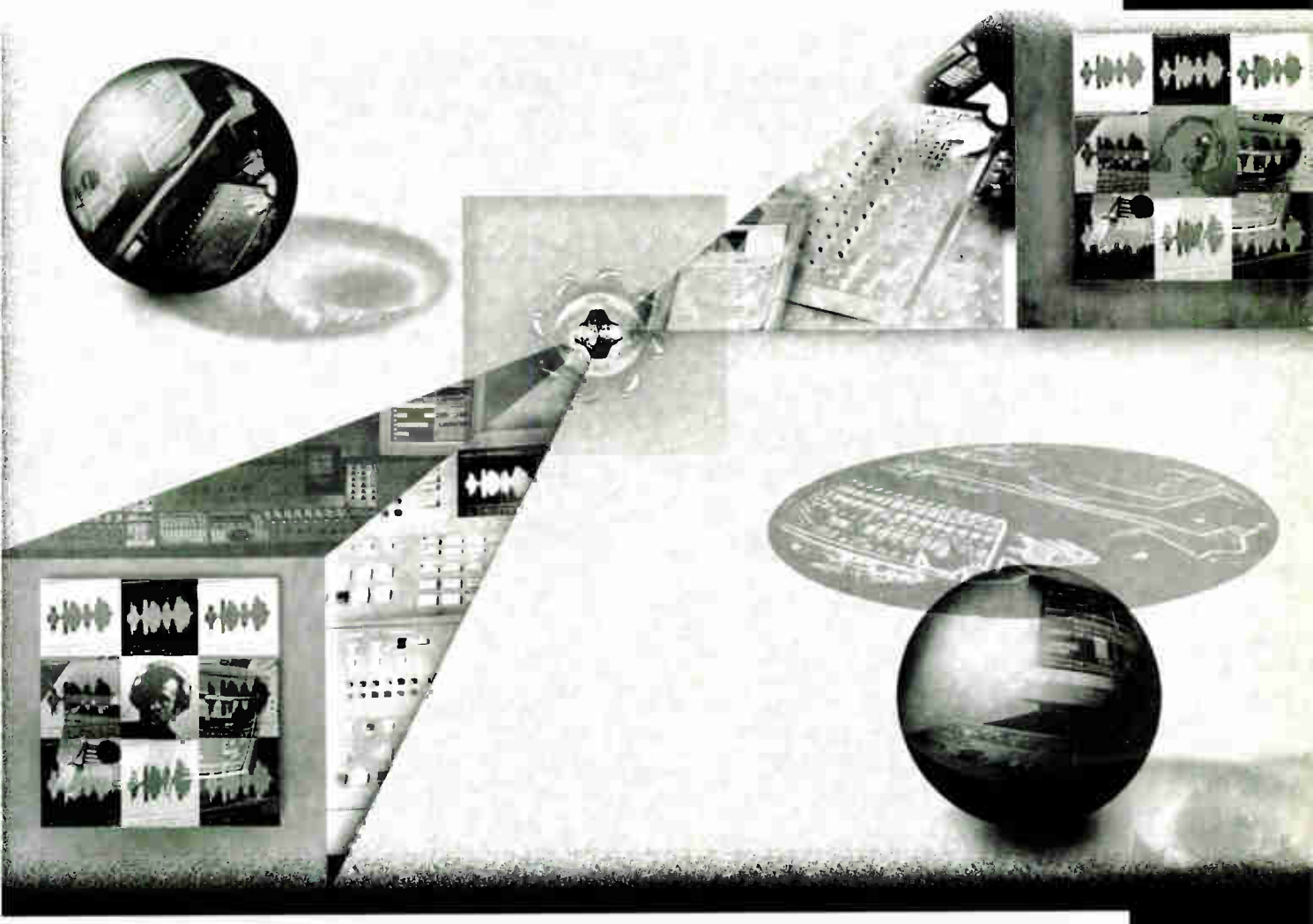

Illustration by Dmitry Panich

The pro audio industry also benefits from advancements in consumer electronics. Thanks in part to competition among consumer audio manufacturers, today's digital converters provide improved audio performance at affordable prices. And if you aren't wild about the sound of a workstation's converters, numerous third-party suppliers are more than willing to sell you something slightly more exotic.

Outwardly, it might seem that the choice of a computer platform (PC, Mac or proprietary) is the most important aspect in the workstation selection process. However, the understanding of how the workstation fits into your production process is far more important than the simple choice of platforms may indicate. For example, if an 8-channel system is intended for in-house production chores at a radio station, then how it integrates with a MIDI sequencer is probably unimportant. The key factors in this installation may be the system's speed and its ease of use for recording narration, production music beds and sound effects—perhaps with the ability to time-shift a 32-second piece down to a 30-second spot. Further, it's unlikely that this particular workstation would be doing second-duty running word processors or spreadsheets, so in this case, the choice of a platform is relatively unimportant.

Stand-alone (no external computer required) systems offer simple out-of-the-box operation, yet may be limited in terms of their expandability, RAM or HD configurations, and display options. At the same time, stand-alone systems are generally easy to move and transport, and may be the ideal choice in portable applications, such as road shows, special venue audio, or direct-to-hard disk recording on location.

If you're looking for a computer-based workstation (rather than a stand-alone system), there is one essential point to consider. The speed and power of certain systems are determined entirely by the CPU. Other systems use outboard processing or cards, which leaves the computer's CPU free to perform more mundane tasks like screen redraws, disk-handling and general housekeeping. It's essential that the potential buyer of any work-

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MULTITRACK AUDIO WORKSTATIONS

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Akai Digital DR8	817/336-5114	Proprietary	$3,495	16-bit	24-bit	1	64 in/64 out (8 units)	AES, S/PDIF, ADAT
AMS Neve AudioFile Spectra	44-1282-457011	Proprietary	$50,000	24-bit	24-bit	Varies	8 in/24 out	AES
Avid Technology Audiovision	800/949-2843	Macintosh	$34,500	16-bit	24-bit	32	16 in/16 out	AES, S/PDIF, Y-2
Digidesign Pro Tools Project™	415/842-7900	Macintosh	$3,490	16-bit	24-bit	1	8 in/8 out	AES, S/PDIF, ADAT
Digidesign Pro Tools® III	415/842-7900	Macintosh	$7,990	16-bit	24-bit	1	64 in/64 out	AES, S/PDIF, ADAT
Digidesign Session 8	415/842-7900	PC	$2,990	16-bit	24-bit	1	8 in/8 out	AES, S/PDIF, ADAT
DAR Delta Plus	44-1-372-742848	Proprietary	£34,500	24-bit	24-bit	1	64 tracks	AES
DAR OMR8	44-1-372-742848	Proprietary	£9,995	24-bit	24-bit	1	8 channels	AES, S/PDIF
DAR Sabre Plus	44-1-372-742848	Proprietary	£15,500	24-bit	24-bit	1	Up to 32 tracks	AES, S/PDIF
DAR Sigma Plus	44-1-372-742848	Proprietary	£39,000	24-bit	24-bit	1	Up to 32 tracks	AES
DAR SoundStation Gold	44-1-372-742848	Proprietary	£52,000	24-bit	24-bit	1	Up to 32 tracks	AES
Doremi Labs Dawn 4	213/874-3411	Macintosh	$14,650	18-bit	16-bit	32	8 in/8 out	AES, S/PDIF
E-mu Systems Darwin	408/438-1921	Proprietary	$3,195	18-bit	24-bit	16	128 in/128 out (16 units)	S/PDIF
Fairlight MFX3	310/287-1400	Proprietary	$25,000	16-bit	24-bit	1	24 in/24 out	AES, S/PDIF, Y-2
Fairlight FAME	310/287-1400	Proprietary	$145,000	16-bit	24-bit	1	24 in/24 out	AES, S/PDIF
Fostex Corp.	800/9-FOSTEX	Proprietary	$9,995	16-bit	24-bit	6	8 in/8 out	AES, S/PDIF, ADAT, SDIF-2
Merging Technologies Pyramix	619/675-9703	PC	$7,000	24-bit	32-bit FP	32	8 channels	AES, S/PDIF, ADAT, TDIF
Metalithic Digital Wings for Audio	415/332-2690	PC	$1,995	16-bit	32-bit	10	8 in/8 out	AES, S/PDIF
Otari RADAR	415/341-5900	Proprietary	$22,400	16-bit	24-bit	1	24 tracks	AES, S/PDIF, ADAT
Roland DM-800	213/685-5141	Proprietary	$6,295	16-bit	24-bit	1	8 in/8 out	S/PDIF
Roland VS-880 HD	213/685-5141	Proprietary	$2,495	16-bit	24-bit	999	8 in/8 out	S/PDIF
SADiE Octavia	615/327-1140	PC	$29,995	24-bit	32-bit FP	25	80 in/80 out (10 units)	AES, S/PDIF
Solid State Logic Axiom	212/315-1111	Proprietary	$378,250	20-bit	24-bit	64	48 in/48 out	AES, S/PDIF, MADI
Solid State Logic Omnimix	212/315-1111	Proprietary	$382,500	16-bit	24-bit	20	38 channels	AES, S/PDIF, MADI
Solid State Logic Scenaria	212/315-1111	Proprietary	$263,500	16-bit	24-bit	20	32 in/32 out	AES, S/PDIF, MADI
Solid State Logic Screensound	212/315-1111	Proprietary	$62,900	16-bit	16-bit	256	32 channels	AES, S/PDIF, MADI
Sonic Solutions Sonic Studio	415/893-8000	Macintosh	$2,995	24-bit	24-bit	100	96 in/96 out	AES, S/PDIF
Soundscape Digital SSHDR1	805/658-7375	PC	$3,250	20-bit	24-bit	Infinite	8 in/8 out	AES, S/PDIF
Spectral AudioEngine	206/487-2931	PC	$4,915	16-bit	24-bit	10	16 in/16 out	AES, S/PDIF, SMDAI
Spectral Prisma	206/487-2931	PC	$3,390	16-bit	32-bit FP	10	8 in/8 out	AES, S/PDIF, SMDAI
Studer Editech Dyaxis II	415/562-0500	Macintosh	$10,950	16-bit	24-bit	1	16 in/16 out	AES, S/PDIF, SDIF-2, Y-2
Studer Editech PostTrio	415/562-0500	Macintosh	$37,500	16-bit	24-bit	1	24 in/24 out	AES, S/PDIF, SDIF-2, Y-2
TimeLine Vista Studioframe DAW-80	619/727-3300	PC	$20,800	16-bit	24-bit	256	24 in/24 out	AES
Vestax HDR-848	707/427-1920	Proprietary	$1,995	16-bit	24-bit	1	8 in/8 out (8 out opt.)	S/PDIF

Note:

The chart lists specs on a variety of available multichannel digital audio workstation systems. The chart includes both computer-based and stand-alone models, and is limited to systems capable of simultaneously recording and/or playing back eight or more audio channels with separate audio outputs for each. In addition to basic information about the various DAWs, phone numbers are provided so you can contact the manufacturers directly for further information. Due to space limitations, systems that combine third-party software—such as digital audio sequencing packages—with other manufacturers' hardware are not included. Additionally, several 8-channel systems—including Krystal from Micro Technology Unlimited (919/870-0344) and V8 from Digital Audio Labs (612/473-7626)—were not shipping at press time, but should be available in the months to come.

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LTC	MIDI	OTHER SYNC PROTOCOLS	MMC	NETWORK CAPABLE	DIGITAL MIXING	EQ IN BASE SYSTEM	DYNAMICS IN BASE	REVERB IN BASE	TIME COMP	COMMENTS
•	•	Bi-phase, VITC 9-pin		•	•	•			•	DC
•	•	Bi-phase, VITC 9-pin	•		Dptional					DC, DR, MU
•		Bi-phase	•	•						DC, DDM
•		DA-88, 9-pin		•	•	•			•	MC, SD, NR, ADR
•	•	ADAT, DA-88		•	•	•				DR, MC, SD, NR, ADR
•	•	ADAT, DA-88		•	•	•	•			MC, DR, SD, NR, ADR, NS
•	•	ADAT, DA-88		•	•	•				DR, MC
•	•			•	•	•			•	DC, ADR
•	•	Bi-phase		•						DC, ADR
•	•			•	•	•			•	DC, ADR
•	•			•	•	•			•	DC, ADR
•	•			•	•	•			•	DC, ADR
•		9-pin		•	•				•	DC, MU, ADR
•	•	ADAT	•	•	•					DC, DR, MC, MU
•	•	9-pin		•	•	•	•		•	DC, ADR
•	•	9-pin	•	•	•	•	•		•	DC, ADR
•	•	ADAT, VITC	•						•	DC
•		ADAT, DA-88	•	•	•	•	•	•		MC
•	•			•	•	•	•	•	•	
•	•	ADAT								DC, MU
•	•	ADAT, DA-88 9-pin	•		•	•				DC
	•		•		•	•		•		DC
•	•			•	•	•	•	•		DC, NR, ADR
•		Bi-phase, 9-pin		•	•	•		•		DC
•				•	•	•		•	•	DC
•		Bi-phase, 9-pin		•	•	•			•	DC, ADR
•		Bi-phase, 9-pin		•	•				•	DC, ADR
•	•	9-pin	•	•	•	•	•		•	MC, HSR, NR, NS
•	•	ADAT, DA-88	•	•	•	•	•			MC
•	•	Tach		•	•	•	•	•	•	DC, MC
•	•	Tach		•	•	•	•		•	DC, MC
•		Bi-phase		•	•	•				DC, OR
•		Bi-phase		•	•	•	•			DC, DR
•	•			•	•	•			•	DC, MM
•	•			•		•	•	•	•	DC, MC, MU

Key to Comments:

DC—dedicated control surface included
OR—optional remote controller
MC—compatible with third-party MIDI controllers
VPR—offers VPR-3 video emulation
HSR—high sampling rate (96 kHz) compatible
SD—compatible with all Sound Designer plug-ins
NR—noise reduction software available
MU—multiple units linkable for more tracks
ADR—automatic dialog replacement capable
NS—noise shaping/redithering software available
ODM—optional digital mixer adds EQ, dynamics, mixing functions
MM—Peavey Media Matrix plug-in available

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station system understand the difference between the two. At first glance, one manufacturer's $8,000 system that requires a $5,000 computer may seem a better bargain than a competing $10,000 system that requires only a $2,000 computer. When making price comparisons, make sure you're comparing oranges with oranges.

Expandability is a major issue in certain applications. In the example of a radio production room, eight tracks is probably sufficient for 99% of the usual production chores, and future expandability may not be an issue. However, in studio and post applications, users never seem to have enough tracks: As soon as you have 24, you'll invariably need 26; of course, once you have 32 tracks, all is fine until the next production, which requires 36 channels. But beyond simply buying more workstation hardware, other options abound for the track-challenged, such as adding8-channel disk-based digital dubbers; sync interfaces to ADATs, DA-88s or other tape-based MDMs; or software for integrating MIDI-based synths or samplers.

Input/output configuration is another consideration. Do you require balanced XLRs or unbalanced ¼-inch terminations in the analog domain? Or AES/EBU, S/PDIF (coaxial or optical), SDIF-2, ADAT-optical or TDIF in the digital realm?

Much has been said over the past couple years regarding software plug-ins, which expand the capabilities of the system. Depending on the program, plug-ins range in price from a few hundred dollars to well over a thousand. The availability of plug-ins is a definite plus, but adding such flexibility may also add a significant cost to a system. The possibility of customizing a system by investing in specialized plug-ins—such as ADR recording, re-dithering and noise reduction enhancements—may be a key purchasing factor for some. But *before* buying any system, listen to the quality of its onboard signal processing, especially in terms of everyday tools, such as equalizers, compressor/limiters, sample rate converters, etc. You may discover that plug-ins are unnecessary; other users may require numerous plug-ins to create a custom work environment. Either way, let *your* production needs dictate the choice.

The same can be said for any system's ability to network into a group of other workstations or interchange common file-sharing formats. Obviously, such needs would be an absolute requirement in certain situations, particularly in post-production. Again, these factors may be of little use in most project studios or smaller facilities.

More and more workstations offer digital mixing capability. Here the trade-off is whether a virtual mixer offers the flexibility or ease of use we're accustomed to with our analog desks. The key here is interfacing, both in terms of input/output configuration and ergonomics: How does the virtual digital mixer cope with adding a little Pultec sweetening or a bit of LA-2A squeeze into a mix? Can a mouse adequately control 24 faders? Answers to such questions are not come by easily. In some applications, virtual mixing is ideal; in others, it is insane. Hardware fader controllers simplify the human interface element to some degree. In other situations, the screen-based approach to mixing is best used as a submixer for complex projects or the entire mixer in simpler applications. While expensive, the ultimate solution is to incorporate a full-blown digital mixer that integrates into both the workstation and the surrounding studio milieu.

The most difficult factor in workstation purchasing is the ergonomics of how you interact with the system.

Unfortunately, the most difficult factor in workstation purchasing is the ergonomics of how you interact with the system. One question only you can answer is whether you think of audio tracks in terms of playlists, cut bins, cues, events, pointers, markers, segments, waveforms, bars, beats, frames, feet, seconds or samples. The advantage of random-access production is editing, and every system has its own approach to the editing process. Unfortunately, all engineers have their own preferred approach to working, and there is no single system that works for everybody.

Perhaps that's one of the reasons that the long-predicted workstation "shakeout" never occurred. But one thing is for sure: With hardware pricing at an all-time low, 1996 is a great time to buy the workstation you need. ■

World Radio History

MIX MAGAZINE PRESENTS

SOUND FOR PICTURE™

FALL 1996

Inside Disney's Post Studios

Skywalker Sound's Gloria Borders

Robert Altman's Jazzy "Kansas City"

Sound for Fox Baseball

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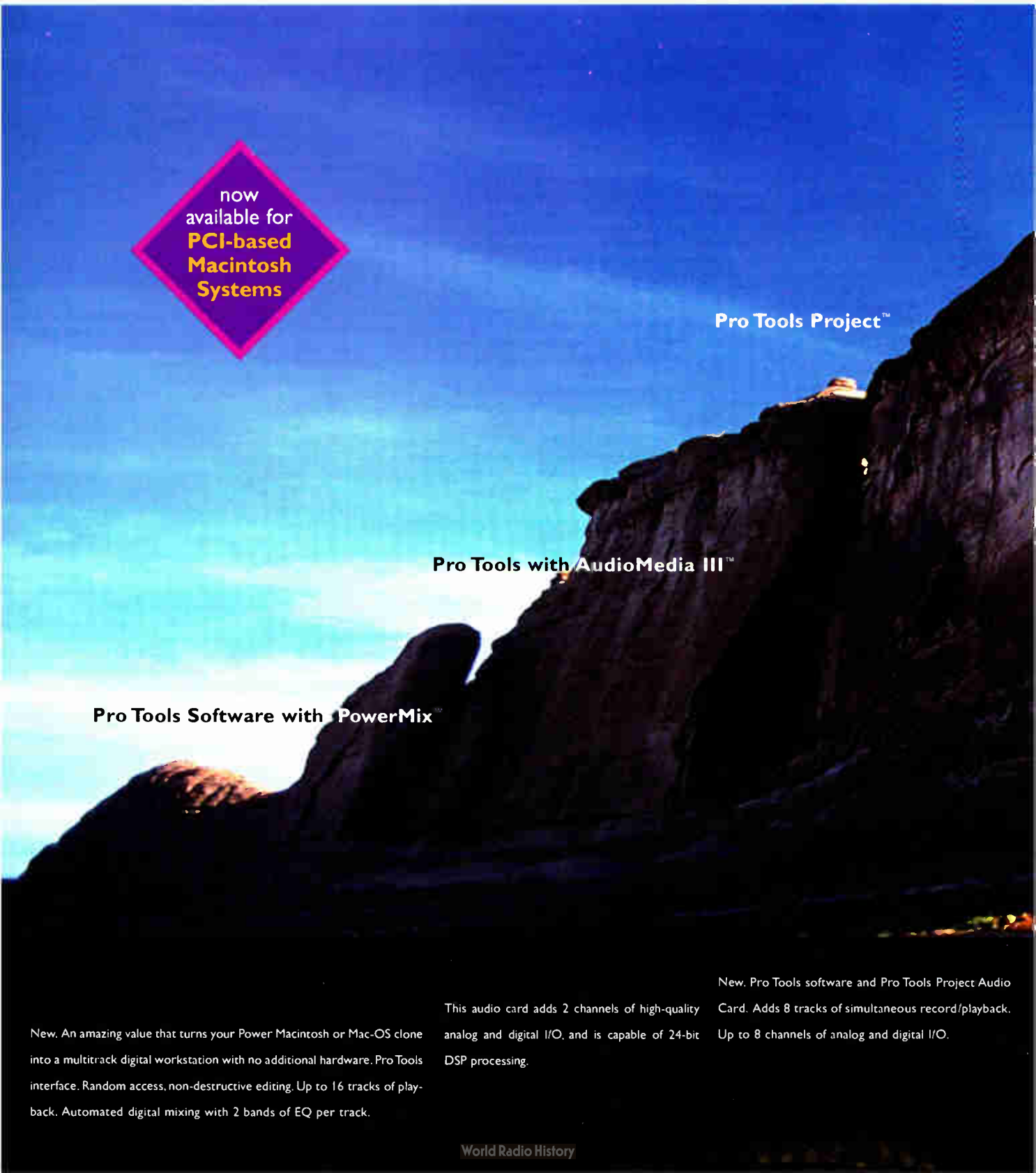

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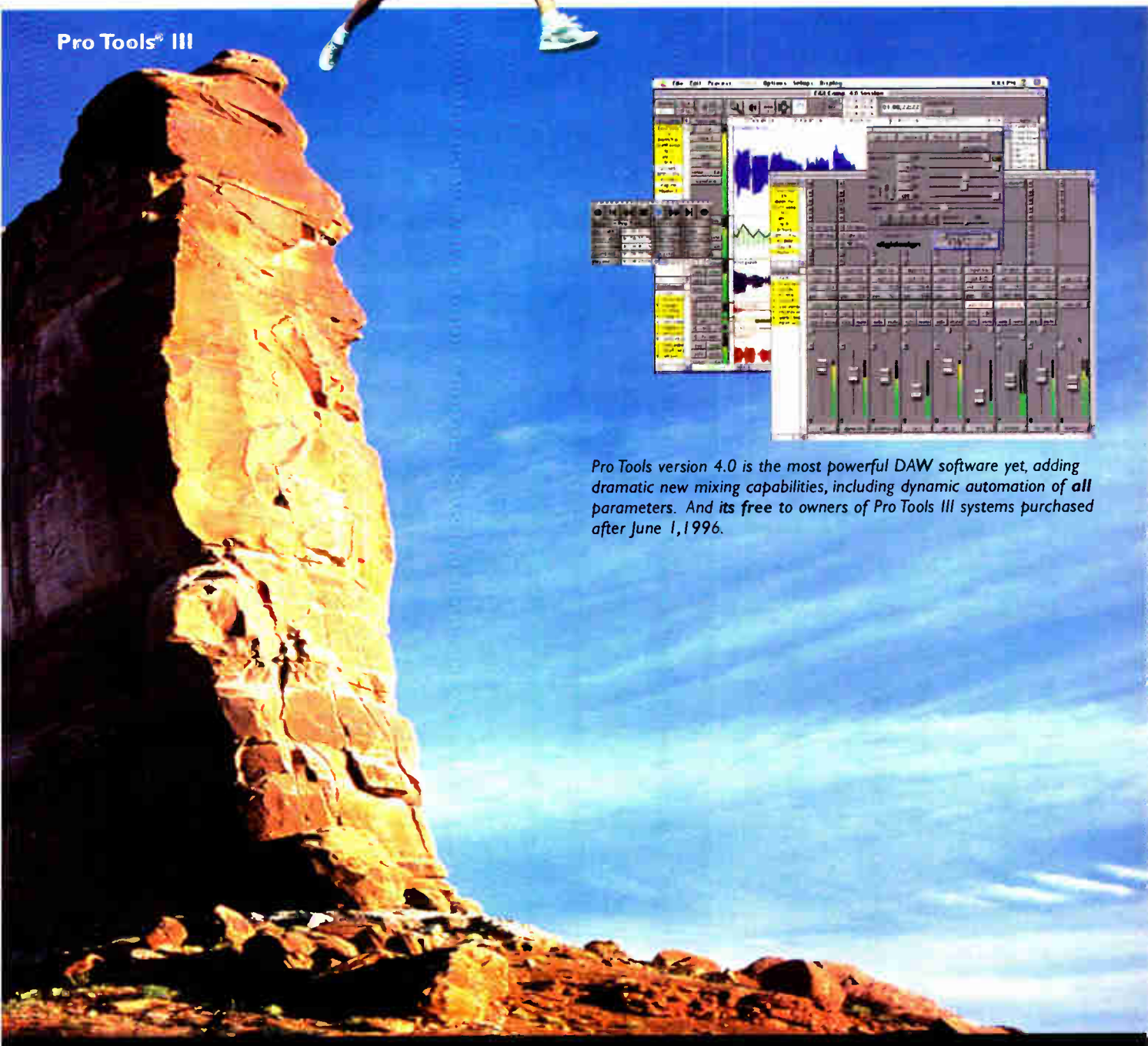

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ON THE COVER

ONE STEP UP ON FOLEY

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With all of the major corporate L.A. studios and most of the independents building their own Foley stages, why would anyone decide to open a recording facility dedicated solely to that one process?

To partners Dan O'Connell and John Cucci, it was simply the logical thing to do. After all, both are acclaimed Foley artists—their combined credits include such creative blockbusters as *Speed*, *Waterworld*, *Legends of the Fall*, *Glory*, *True Lies* and *Natural Born Killers*. O'Connell has 20 years of experience both as a walker and as a consultant on the design of Foley stages, and Cucci, a sound engineer, understands the Foley process from both sides of the glass. Partner Claudette Cucci, a Foley artist since 1987 whose work includes *The Usual Suspects*, *Devil in a Blue Dress*, *Moll Flanders* and Robert Altman's *Kansas City*, rounds out the team and handles the administrative end of the business.

BY MAUREEN DRONEY

Their endeavor, North Hollywood's One Step Up Inc., is a digital Foley stage on the cutting edge of today's top post-production facilities, but you might not guess that by looking around the stage. It's a room stuffed with racks of various styles of old shoes, refrigerators, pots and pans, and literally the kitchen sink.

One Step Up's control room, the domain of mixer James Ashwill and recordist Linda Lew, has a more conventional look. Fitted with a 32x8 Mackie board, Tascam DA-88s, a Lynx synchronizer, and a rack featuring API and GML EQs, its simple, clean lines and modern style contrast with the creative jumble of the recording space.

On the day I dropped in, the crew was completing work on Disney's summer action release, *The Rock*. I learned that One Step Up clients range from large to small, including Disney, Warner Bros., Universal, MGM and Castle Rock, and that their services can range from large to small, as well. "We're multifaceted," explains John Cucci. "We offer complete Foley services under one roof, from proposals to budgeting, scheduling, and finally delivering to the dubbing stage on time."

"We really are one of a kind," states O'Connell. "Not only are we owner/operators, but we also designed and built the facility for the purpose of Foley. We're a combination of all the stages that we've worked on, where we said, 'Let's make it better, let's take it one step up.' Which is how the name came about.

"I think we have the most efficiently set up stage in town. We knew we wanted a big wood floor, with a large cement area, a good-size dirt pit, and a water pit that goes from shallow to deep. Most of the time, when we are working, we take over the stage—we smash wood, there may be broken glass, things are broken all over the place. At most stages, at the end of the day John and I end up backing out of the room because there is nowhere left to walk! At One Step Up, we have solved that problem. We can rotate our props because we have another part of the building for prop storage. That keeps a lot of working space on the floor, and it gives us total access to all our best props, which we've been collecting for years and years.

"Our crew is great. Jimmy [Ashwill, whose credits include *Unforgiven*, *Big*, *True Lies*, *Cliffhanger*, *Waterworld* and many more] I've worked with from

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PHOTO: ED FREEMAN

The Foley stage of One Step Up, filled with a myriad of available devices used in creating audio magic and mayhem for film soundtracks.

Skywalker and Sony. He's the best, and an integral part of the sound.

"We also have Linda Lew, our recordist, who worked for The Saul Zaentz Film Center and Fantasy Recording, and she's excellent," John Cucci adds. "These days, a lot of studios are starting to use recordists less, but we've found it to be a great liaison with the client. It also frees up Jimmy to pay full attention to the sound we are creating.

"We've found ourselves becoming a test site for manufacturing reps," John Cucci continues, "something that's allowed Jimmy to expand his creative area. At most facilities, you'll find mixers complaining that, because of budget problems, Foley gets what's left over in terms of equipment. But here, since we specialize, we try a lot of different approaches, and we are constantly demoing new pieces of gear. Manufacturers seem to recognize that if something works for us, there's a whole new market for it."

The work of the Foley artist has sometimes been differentiated from sound effects creation by describing it as "sounds made by people physically doing something." O'Connell and John Cucci agree that definition no longer holds. "We've crossed the line quite a bit," O'Connell comments. "In *The Rock*, we created car crashes, flying cable cars, explosions, all kinds of things. We design every sound from the ground up; we don't use any library effects. We started out as sweeteners—we would sweeten car crashes, add debris, help out explosions. And through both planning and through accidents, we've figured out how to do things that other people may not necessarily be aware of."

One Step Up opened for business in February 1995, and their first picture was *Forget Paris*. Since then, projects have included MGM's *Fled*, *Sunchasers*, starring Woody Harrelson for Warner Bros., *The Crow II*, *All Dogs Go to Heaven II*, *Head Above Water* with Harvey Keitel, *The Nutty Professor* and *Kansas City*.

"It's gratifying," says John Cucci. "Sound supervisors tell us all the time, 'We gave you the tape, got back a great finished product and didn't have to worry about it.'" Being studio owners and running their own business hasn't changed the creative attitude of the One Step Up team. "We like to think of ourselves as the stuntmen of post-production because we are always crashing through glass and smashing things. That's what we do! We're One Step Up." ■

PHOTO: ED FREEMAN

Partners of One Step Up, Dan O'Connell and John Cucci

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THE WALT DISNEY STUDIOS

ONE-STOP AUDIO POST SERVICES

BY MEL LAMBERT

PHOTOS BY BETSY ANNAS UNLESS OTHERWISE INDICATED

Since 1939, The Walt Disney Studios, headquartered in Burbank's Media District, has provided state-of-the-art production and post-production for film and television. But, until recently, these services were provided in the main for in-house productions; rare indeed was the off-the-lot film or TV production that enjoyed the type of hands-on sound design offered by the facility's team of seasoned audio professionals.

Although the majority of the productions are still for the studio and its various affiliates, almost 20% of work on the lot today is for non-Disney films. "Yes, we have attracted a number of new clients during the past several years," says Chris Carey, VP of post-production services. "And while we continue to primarily support the activities of Disney productions, we like to think that we can offer something exciting for both our own in-house as well as off-lot producers. Since we can provide the five primary functions required for the post-production sound for a film or television show—transfer, sound effects editorial, Foley, ADR and dub-

Above: Supervising sound editor Tim Chau in Edit Bay F; Right: Sound editor Scott Taylor in Edit Bay J

Below: Dave Concours and Ryan Robinson at the AMS Logic 2 in Dubbing Room 6.

A ROOM-BY-ROOM TOUR OF DISNEY STUDIOS

In the early to mid-'90s, most Hollywood film studios began pulling many audio post-production services back to the lots and building state-of-the-art rooms to accommodate the work. Disney, it could be argued, started the approach in the mid-'80s with its emphasis on one-stop post-production services, encompassing editorial, mixing, Foley, ADR, transfers, you name it.

—CONTINUED ON PAGE SEP 10

Lead re-recording mixer Andy D'Addario in Dubbing Stage C

ganization is the key to success for any facility. "These days, well over half of the productions we handle here on the lot are complete packages, where we look after everything for filmmakers." Examples of recent one-stop productions include *Operation: Dumbo Drop*, *Eddie*, *Homeward Bound II* and this fall's new live-action version of the classic animated feature *101 Dalmatians*.

"We have several talented supervising sound editors on staff here," Carey continues, "including Tim Chau—who's supervising *101 Dalmatians* and *Anna Karenina*—and Leslie Shatz, a San Francisco Bay Area editor who worked on *Bram Stoker's Dracula* and who's joining us for a new live-action movie from

bing—we are in good shape to offer full one-stop services for our clients.

"We can gather together the necessary resources here on the lot, including sound supervisors, to turn production sound elements into a finished soundtrack," Carey says, adding that *or-*

WALT DISNEY IMAGINEERING

DIFFERENT STROKES FOR DIFFERENT FOLKS

Walt Disney Imagineering, a division of The Walt Disney Company, places an equal emphasis on state-of-the-art audio technology. Founded in 1952 for the express purpose of planning, designing and building Disneyland Park, today WDI continues to break new ground not only in the theme-park industry but in the new worlds of cyberspace/new media and location-based entertainment.

Encompassing a multitude of disciplines,

—CONTINUED ON PAGE SFP 14

Kurt Kinzel, Joe Herrington and Greg Krueger take a break from producing the final mix, on location, for The ExtraTERROrestrial Alien Encounter at the Magic Kingdom of Walt Disney World in Orlando, Florida.

World Radio History

—FROM PAGE SEP 8, ROOM-BY-ROOM TOUR OF DISNEY STUDIOS

Here is an example of the range of services the facility offers today.

• The **Main Theater**, which was built to mix *Fantasia* in 1940, now houses a 72-input Harrison PP-1 post-production console with GML Moving Fader automation. The spacious room measures some 90x60 feet and features a 45x18-foot screen. Seating is also available for 425 people. In addition to a conventional Magna-Tech 35mm film-dubbing projector, the stage features a pair of Simplex 35/70mm screening projectors that handle both Dolby Digital and DTS playback. The monitoring system is THX-certified.

Walt Disney Studios Main Theater

The machine room houses 32 Magna-Tech 35mm playback units with mono, 3-, 4- and 6-track Teccon heads; 72 channels of Dolby A-type or SR noise reduction are available. Three Magna-Tech 35mm recorders are available in mono, 3-, 4- and 6-track formats, with A-type or SR. Reel-to-reel machines include an Otari DTR-900 PD-format digital 32-track, and an Otari MTR-90 analog 24-track with A-type or SR. Other digital replay and dubbing formats are available upon request throughout the facility.

• **Dubbing Stage A** houses a second 72-input Harrison PP-1 with GML Moving Fader automation. The room measures 65x45 feet, with a 38x17-foot screen and a THX-certified monitoring system. Seating is also available for 125 people. Again, both a Magna-Tech 35mm film-dubbing and a pair of Simplex 35mm screening projectors are available, the latter for Dolby Digital playback.

The companion machine room houses 30 Magna-Tech 35mm playback machines with mono, 3-, 4- and 6-track Teccon heads, plus 96 channels of Dolby A-type or SR. Four Magna-Tech 35mm recorders are available in mono, 3-, 4- and 6-track formats, with A-type or SR. Reel-to-reel machines include a pair of Otari MTR-90 analog 24-tracks with A-type or SR, and an Otari MTR-12 half-inch 4-track with A-type or SR.

• **Dubbing Stage C** houses a 72-input Solid State Logic SL-5000 M Series console with GML Moving Fader automation. The room measures 40x35 feet, with a 28x12-foot screen and a THX-certified monitoring system. A conventional Magna-Tech 35mm film-dubbing projector is augmented with a Simplex 35mm screening projector, plus a Sony U-matic ¾-inch and projector.

The companion machine room houses 30 Magna-Tech 35mm playback units with mono, 3-, 4- and 6-track Teccon heads, plus 96 channels of Dolby A-type or SR. Four Magna-Tech 35mm recorders are available in mono, 3-, 4- and 6-track formats, with A-type or SR. Reel-to-reel machines include three Otari MTR-90 analog 24-tracks and two MTR-12 half-inch 4-tracks, all with A-type or SR.

• **Dubbing Room 6** houses an AMS Neve Logic 2 digital console with integral 24-track AudioFile hard disk recorder/editor. The stage measures 40x26 feet, with an 18x9-foot screen. An ASC Virtual Recorder provides random-access playback from hard disk via a Barco Data 5100 video projector. U-matic and D2 PAL/NTSC machines, plus a Magna-Tech 35mm dubbing projector, are also provided. Other hardware includes a 24-track Digidesign Pro Tools workstation, Sony PCM-3324 DASH-format multitrack, Otari MTR-90 analog 24-track, Magna-Tech 35mm recorders and playback units in various track formats.

• **ADR Stage B** houses a modified Sound Workshop console with Lartec ADR Spotting Pro System, fitted with six mic/line inputs and a 24x2 monitor matrix. The stage measures 40x35 feet, with a 28x12-foot screen. A Magna-Tech 35mm film-dubbing projector is augmented with Sony U-matic ¾-inch VCR and projector.

The machine room houses a Magna-Tech 35mm single-stripe playback unit with Dolby A-type or SR. Two Magna-Tech 35mm recorders are available in mono, 3- or 4-track formats, with A-type or SR. Reel-to-reel machines include an Otari MTR-90 analog 24-track with A-type or SR, an Otari DTR-90 timecode-capable DAT, a Panasonic SV-3700 Pro-DAT, two Otari MTR-12 ½-inch/4-track and ¼-inch/2-tracks with A-type or SR, and a Nagra ¼-inch mono recorder with A-type or SR. In addition, EDnet and APT WorldNet systems are available for linking the stage with studios around the world, allowing voice-over and ADR sessions with talent located either on or off the lot.

• **The Foley Stage** offers direct recording to Digidesign Pro Tools and Avid AudioVision systems, in addition to a 24-track recorder with Dolby SR, and a Tascam DA-88 modular digital multitrack. The stage measures 30x24 feet, with an 8x6-foot screen. A U-matic VCR and projector is augmented by a video streamer. Audio synchronization to video is via a TimeLine Lynx 2 system.

• A number of **Editorial Suites**—six on the main Burbank lot and eight in the new building on Victory—are equipped with a mixture of Digidesign Pro Tools and Avid AudioVision sound-design and editing systems; portable Pro Tools systems are also available for use on the dubbing stages.

• **Room 5** specializes in multistandard Dolby Surround video mixing. A custom Neotek Encore film console with surround-sound monitoring is linked to Magna-Tech 35mm recorders, Otari MTR Series analog 24- and 4-tracks, Digidesign Pro Tools and a variety of digital recorders (including timecode-capable DATs, plus Tascam DA-88 MDMs). Video decks include U-matic VCRs.

• **The Sound Transfer Department** can handle a variety of analog and digital record/replay formats, including Digidesign Pro Tools hard disk, Magna-Tech 35mm film recorders, optical soundtracks (A-type, SR, Dolby Digital and DTS formats), Otari MTR Series 2-, 4- and 24-tracks, plus Sony/Otari timecode DATs, Tascam DA-88 and Alesis ADAT MDMs, Sony PCM-3324 DASH-format multitracks, and Otari DTR-900 PD-format 32-tracks. EDnet and APT WorldNet digital phone patches are also available for audio transfers. ■

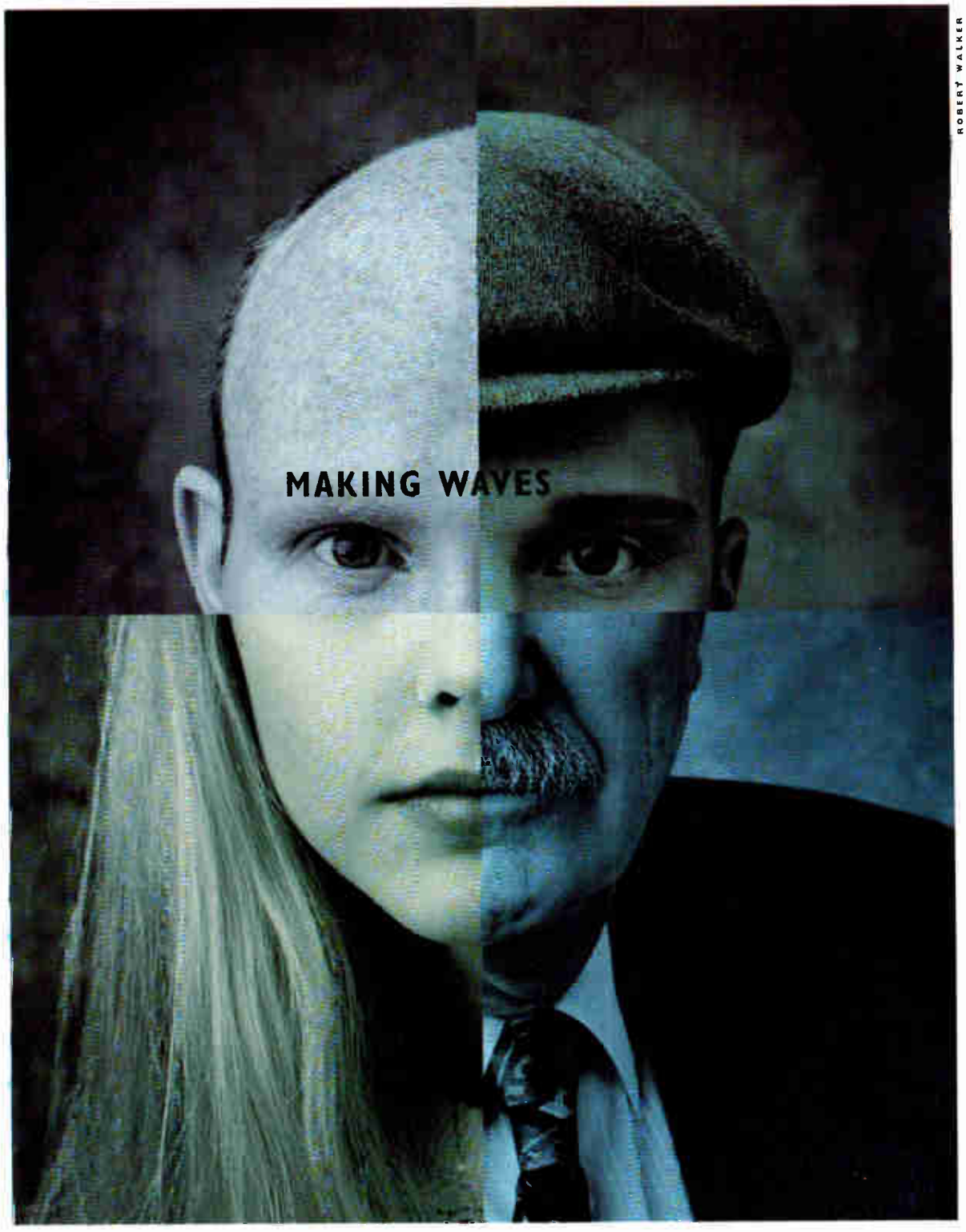

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PHOTO: BETSY ANNAS

Lead re-recording mixer Rick Alexander in Dubbing Stage A

Hollywood Pictures, titled *Deep Rising*. We also have some highly skilled re-recording crews, headed up by lead mixers Terry Porter, Rick Alexander, Andy D'Addario and David Concours." The crews work in, respectively, the facility's Main Dubbing Theater, Dubbing Stage A, Dubbing Stage C and the new all-digital Dubbing Room 6.

TECHNOLOGY-CREATIVE COMBO

Carey says that, to be successful in the competitive world of film and TV post-production, a facility needs to find the people who can work creatively with clients, as well as ensure that the latest technology is being used. "Change is inevitable; change is mandatory," he considers. "No facility in the world is better than Disney at responding to the challenge of finding new ways to utilize new technologies, and developing new production processes.

"Our philosophy is simple: We can offer a complete sound package for films of all budgets," he says. "In other words, we can change the way we work to suit the needs of the film. Obviously, we use the latest technology, but we have developed a 'team approach' that ensures that every project coming onto the lot—whether it's a Disney film or an off-lot production—receives the same degree of creative focus, with an emphasis on using the right tools for the job. It is our aim to establish and maintain a creative and cooperative atmosphere, where we remember that filmmakers are the people we need to please; not ourselves. My most important job as head of this department is to create a productive environment that helps the team achieve its creative goals."

In terms of new technology—the inevitable transition from analog-based to all-digital systems—Disney is certainly aware of its options. "But these are just tools," Carey stresses. "State-of-the-art hardware does *not* make any difference if it is not being used by creative people! But a better tool can allow a craftsperson to work in new and more creative ways. We evaluate new products as they come along and try to make them work in our environment.

ALL-DIGITAL TECHNOLOGIES

A good example of evaluating new technologies in practical, working environments can be found in Dubbing Room 6, which the facility recently opened in a building a couple of miles away from the main complex. The building on Victory Boulevard has been completely gutted and now, in addition to a state-of-the-art film archive, houses a variety of editorial suites and a new dubbing stage. Room 6 houses an AMS Neve Logic 2 digital console with an integral AudioFile hard disk editor. Picture playback is from an ASC Virtual Recorder; replay and mastering are to multiple Digidesign Pro Tools systems, as well as a Sony PCM-3324 DASH-format digital multitrack, Otari MTR-90 analog multitracks, plus familiar Magna-Tech 35mm players and dubbers in mono, 3-, 4- and 6-track formats.

Carey says his choice of the Logic 2 was not so much a matter of *whether* or not to embrace digital technology but more a case of *when*. "While I would be the first to concede that the Logic 2 might not be exactly what we need for traditional film-style dubbing, we need some real-world experience of the current state-of-the-art technology. We needed at least to put a toe in the water!"

Of primary importance, Carey says, is the ability of all-digital systems to reset and automate every user setting. "In theory, we can now turn a room around more quickly from session to session. However, we are finding that this is the kind of promise that needs more development from both us and the manufacturer to become a reality."

By way of an example, actor/director Emilio Estevez is currently completing final mixes on *The War at Home*, a post-Vietnam family drama. "We offered to do Emilio's project on a tighter-than-normal budget so that we could evaluate the use of random-access audio and video playback during mixing of a full-length movie within an all-digital environment," Carey says. "There are obvious advantages and disadvantages to following that approach—one of them being the learning curve that's required with any new system on the dubbing stage—but the reaction so far from the editorial team and mixing crew in Room 6 has been very positive. The predubs went smoothly [during May and June]. No release date is yet set for Emilio's film; it is moving ahead on its own time frame."

In terms of digital audio workstations, Disney Studios has access to a number of Avid AudioVision and Digidesign Pro Tools editing systems, which are being used on an increasing number of film and video projects. "But all components need to relate to film, which—until a better projection medium comes along—is what we normally view on the dubbing stage. We are evaluating a new JVC/Hughes system that looks almost as good as film, and which [with random-access playback from a video server] will speed up the process. But the cost to telecine and store high-resolution images is much too high to be practical.

"In the meantime," Carey continues, "we will continue to integrate nonlin-

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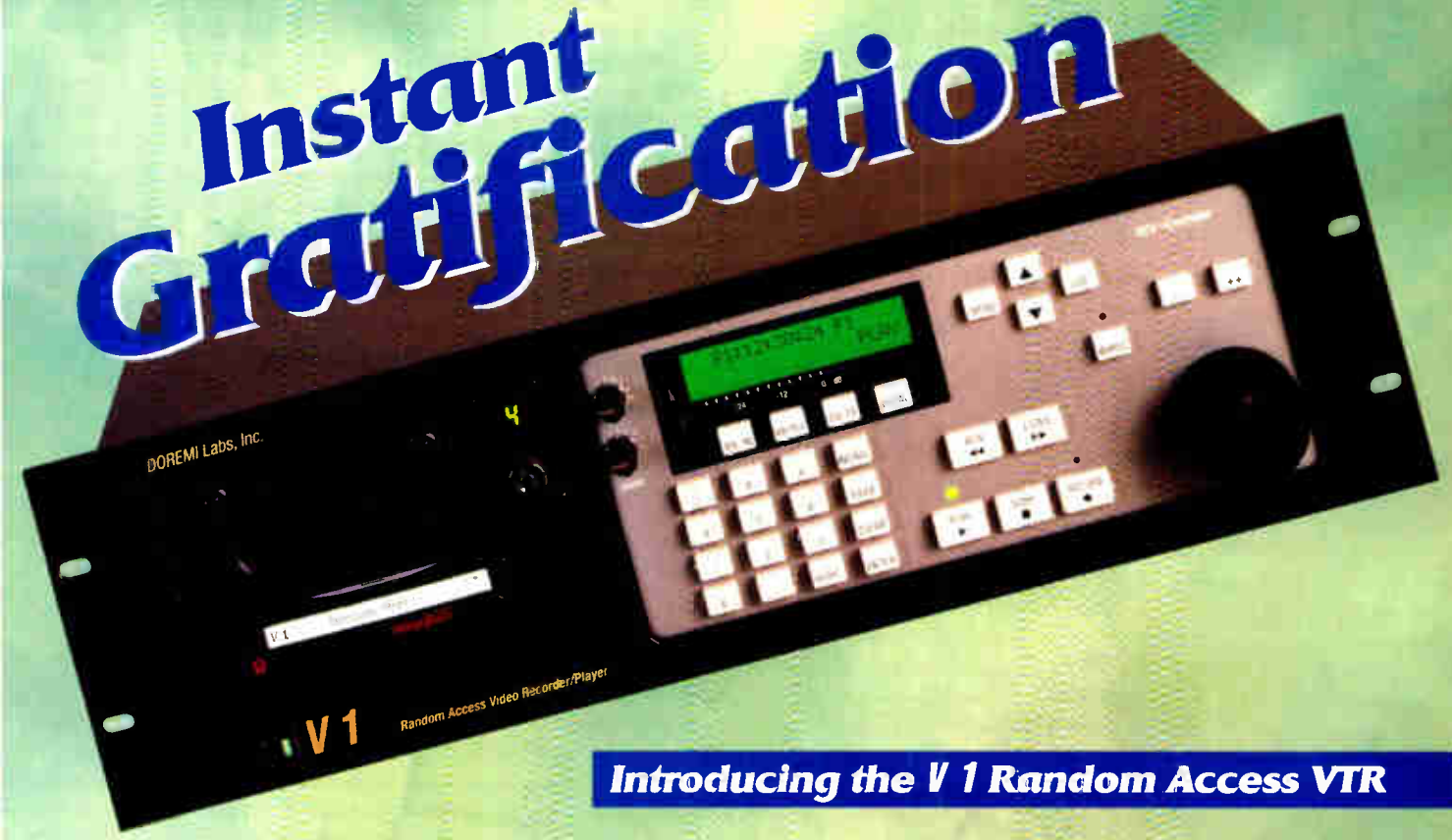

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ear audio recorders and players within the film-dubbing environment. File compatibility remains a major issue for us. Currently, we need to ensure that any playback system can read and write Sound Designer Session Files prepared on our Pro Tools and AudioVision editors.

"We are also looking closely at the various brands of nonlinear digital dubbers [from Dolby, Fairlight, SoundStorm, TimeLine, Sony and others]." These all-digital record-and-replay systems, designed to replace analog 35mm mag dubbers, Carey says, "should read/write a standardized file format and be phase-locked to picture at all playback speeds down to stop, as well as play in reverse. Personally, I think that a properly aligned 6-track dubber with SR is as good if not better than a 16-bit [PCM] recorder—although it may not match a 20-bit system.

"The dubber's user interface should also be very simple; our mixers should *not* handle sound editing on the stage. If a track needs fixing for any reason, it should be handed back to an editor; a dubbing stage is too expensive an environment for us to be handling editing."

In fact, as I discovered during a subsequent tour of Disney Studios, including the new complex on Victory that includes Room 6, at least one stage is being renovated to accommodate the increased amount of editing that needs to take place during a film dub. The facility's flagship stage, The Main Theater, is currently being remodeled, with two new soundproofed editorial preparation areas being built in the rear corners of the room, away from the console. Here, via tielines to other editorial suites and effects libraries, editors will have access to new or replacement sound cues, for example, and then re-edit the music, effects, ADR and Foley elements recorded to the various AudioVision and Sound Tools systems used throughout the complex.

NETWORKING AND ENHANCED INPUT CAPACITY

Looking toward the future, Steve Boze, Disney's chief engineer is evaluating the use of an ATM-based data-transfer network to link the various dubbing

—FROM PAGE SFP 9, DISNEY IMAGINEERING

WDI's team of "Imagineers" is responsible for all phases of a project's development—from master planning and "blue sky" conceptualization to design, engineering, production, construction and final installation.

Disney Theme Parks have introduced many technological landmarks, including "Audio-Animatronics" figures (Walt Disney's Enchanted Tiki Room, 1963) and the first computer-controlled ride (Space Mountain, 1975), while an advanced 3-D motion picture system (unveiled on Magic Journeys, 1982) was pushed to a new level with "Honey, I Shrunk the Audience," which opened in 1994.

WDI continues to research and develop new technologies, creating such innovations as a new Virtual Reality technology, "Disney Vision" for The Aladdin's Magic Carpet VR Adventure at Disneyland, as well as systems and ride vehicles for the Space Mountain at Disneyland Paris, and The Twilight Zone™ Tower of Terror at Disney-MGM Studios, Walt Disney World, Fla. Current projects include three completely new Theme Parks: Disney's Animal Kingdom at Walt Disney World Resort, Tokyo DisneySea (now entering its final design phase) and Disney's California Adventure, a new concept being developed for the Disneyland Resort.

Headquartered in Glendale, Calif., WDI's production and post-production complex features a variety of high-tech sound editorial and mixing areas. While the studios are as well-equipped as any in the world, it's the people—the engineers, editors, mixers, management and vault staff—who make this facility unique. The rooms include:

- **Studio A**, a combination recording studio and re-recording stage designed by WDI and acoustician George Augspurger, is used for sound production for major theme parks, television, theatrical events and music releases. The control room features a 48-channel Neve VRP console with GML moving fader automation and recall, as well as GML, Lexicon, Eventide, Quantec and AMS effects processors. A custom-designed surround-sound monitoring system is also provided.
- **Studio B**, an SFX/Foley/ADR stage recently remodeled by WDI and Augspurger, features a D&R Merlin console. An E-mu Systems E-IV Emulator and various sequencers available for MIDI-based music production. The room also handles ADR, voice-over and narration recordings.
- **Studio C** is a large (52x44x20-foot) yet flexible mixing stage equipped to handle a variety of multichannel/multispeaker productions, as well as more modest tasks. It is described as the only stage in the world specifically developed for nine-screen, 360-degree Circle-Vision productions, and its movable platform allows the room to be reconfigured for traditional re-recording. A 60-channel Neve VR console features GML automation and recall. A 16-channel monitor system, submixers, summing and other custom console modifications allow more than 150 simultaneous source channels. The studio also includes fully automated 3-input, 9-output and configurable panners (up to 16x16).
- **Studio D** offers all-digital editing and mixing on an SSL OmniMix digital production system, with integral sound and VisionTrack picture storage, plus 6-channel monitoring. The system supports any theatrical multitrack format, with MotionTracking surround sound capabilities for placement of individual or grouped sound elements. Also available are Sonic Solutions and AMS AudioFile digital audio workstations, plus support peripherals.
- **Studios E & K** serve as editing suites for CD mastering, small-scale productions, quality control of audio release formats, plus digital editing with Sonic Solutions, AMS AudioFile or Digidesign Pro Tools workstations. Each suite features an 8-channel mixer, timecode DAT, CD player, U-matic VCR and outboard special effects.
- **Studios F, G and M** offer sound-transfer capabilities, including DAT, 24-track analog, 3M 32-track digital DMS and audio-cassette formats. CD, VCR, turntable and laserdisc machines are also available.
- **Video Dubbing/Transfer** handles a variety of formats, including D-2, Beta SP, 1-inch C-Format, U-matic, consumer VCRs, Sony CRV recordable laserdisc, 8mm data tape and PCMCIA disc. ■

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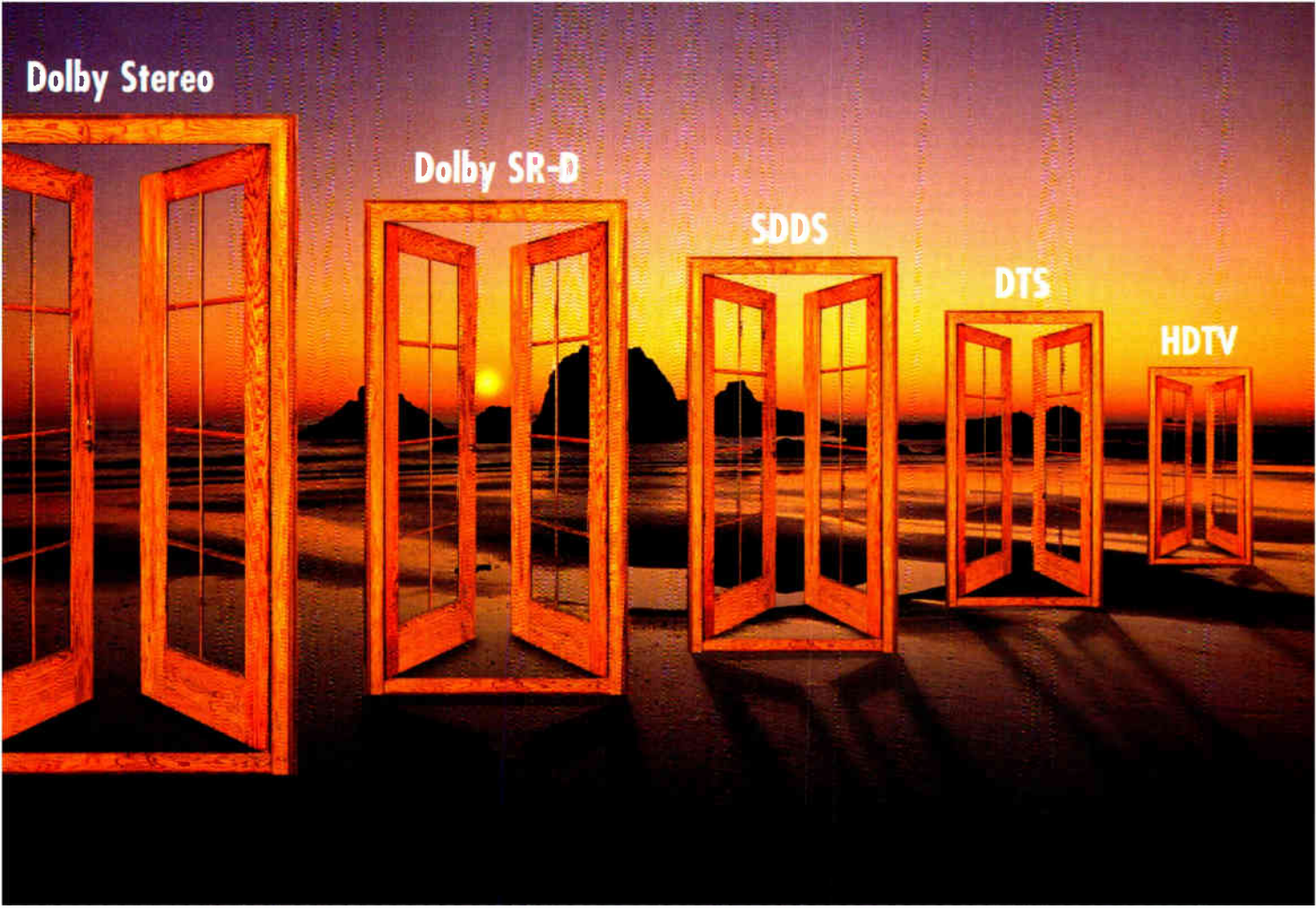

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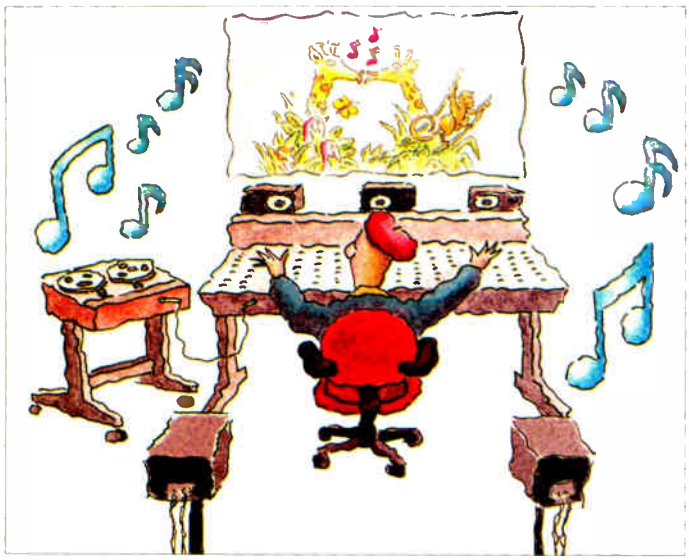

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stages with the facility's complement of editorial rooms, or maybe the main Burbank lot with the new building on Victory Boulevard via a microwave link. In terms of possible replacement of the three analog consoles in the main theaters, Carey concedes that a Logic 2—like the one recently installed in Room 6—would be unsuitable in its current guise for large-format mixing duties, but that with enhancements, Logic 2s could be configured for three-person operation. "But all of our dubbing mixers have made some successful soundtracks on the [Harrison] PP-1 and SSL boards, using GML automation. What we do need urgently is more inputs; today's 6-channel release formats have dramatically increased our requirement to handle many more dialog, music and effects elements." Up until now, 72 input channels may have been sufficient, but "these days we often need 130 or more simultaneous inputs," Carey says.

As a temporary measure, the facility recently used two sidecar consoles for sound effects and dialog during predubs and finals of Disney's new animated feature, *The Hunchback of Notre Dame*, in the Main Theater with re-recording mixers Terry Porter (dialog), Mel Metcalfe (music) and Dean Zupancic (effects). A 48-input Otari Concept I with DiskMix moving-fader automation was linked to the room's main Harrison PP-1 console.

"Because of the increased number of effects and dialog tracks for *Hunchback*, we decided to bring in a portable Concept I to handle the extra [elements]," recalls Boze, with an additional 24-input/12-fader Harrison Series Twelve console for dialog. During final dubbing, 4-track LCRS and 6-track (LCR, plus stereo surrounds and boom) submixes were returned via the Concept I's and SeriesTwelve's output buses to the main PP-1 console as submasters.

"My main focus at the present time," Carey concludes, "is to decide when to upgrade the consoles and ancillary systems; do I do it now, or wait until the next-generation systems are developed? It's a very frustrating time. We seem to be so close but still so far from achieving a viable solution. My instincts tell me that in 12 to 18 months, the field of available products will begin to open up dramatically." Time indeed will tell. ■

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

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TAKING SKYWALKER SOUND, ONE OF THE WORLD'S LEADING POST-PRODUCTION FACILITIES, INTO THE 21ST CENTURY

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About ten months ago, rather quietly, Gloria Borders was promoted to vice-president/general manager of Skywalker Sound. It's a high-profile job that largely goes unnoticed, and the challenge is immense. But it's not as if she's unprepared. She has supervised some of the biggest films of the past decade, including *Forrest Gump* and *Terminator 2*, for which she won an Oscar, and the practical skills she developed over nearly 13 years of editing and supervising should serve her well as she embarks on her second career: bringing Skywalker into the 21st century.

Borders grew up in New Jersey, about an hour outside of Manhattan, and rather typically was introduced to audio through going to every rock 'n' roll show possible. "One foot away from the speakers at Alice Cooper, or whatever," she laughs. "Boy, am I having fun now." She did play piano for five years, and clarinet for two, and then in her junior year of high school began taking documentary filmmaking classes. Rock concerts gave way (well, not all the way) to trips into New York with a Super 8 and a cassette deck. "I used to love to go into the city and just tape all types of city sounds—the homeless in the Bowery, or the hookers on 42nd Street," she says. "A little girl with a tape deck. That was probably one of the first things that got me going on sound. And quickly the sound part of the documentary became more interesting than the fact that I was filming someone passed out on the street."

After two years of pre-law at the University of San Francisco, she switched majors and transferred to San Francisco State to pursue a career in filmmaking, with dreams of becoming a picture editor. Right out of school, she landed a sound editing job in Burlingame, Calif., at a documentary house run by Lee Mendelsohn, who also happened to make the Charles Schulz *Peanuts* animated car-

BY TOM KENNY

World Radio History

PHOTO COURTESY LUCAS DIGITAL LTD

Randy Thom, sound designer (standing), Gloria Borders and Tom Johnson, re-recording mixer

toons. She credits that stint, largely, with her development as an editor, supervisor and now a general manager. "They would cut the picture, hand the sound over to me, and everybody would go on a trip to Hawaii and say, 'See you in week on the dub stage.'" she recalls. "I would have a week to do the soundtrack all by myself. It was a great way to learn how to work with sound and how to make a soundtrack, one that I don't think you have today." Three or four years later she was invited up to the relatively new Skywalker Sound and began cutting dialog on *Return of the Jedi*. Twelve years later, she runs the place.

Borders' office on the third floor of the Tech Building at Skywalker Ranch is a long way from her idyllic second-floor editing bay, where French doors opened onto a grape arbor, overlooking a pond and the sun-baked hills of Marin County. But she merely has a new set of challenges. Borders now oversees a five-mix-room facility; countless edit bays; transfer rooms; a scoring stage that's hosted Journey, Ali Akbar Khan, Boz Scaggs and others in the past few months; a burgeoning commercial sound division; an informal link to Industrial Light & Magic; a Foley stage; and all the various nooks and crannies. The biggest challenge, she says, is to let the world know that Skywalker Sound does not just work on George Lucas movies. The ultimate challenge is taking one of the world's leading post-production facilities into the 21st century. And again, she is in the right place at the right time, because unlike her competitors, she has *Star Wars*.

Skywalker Sound is about to begin a major technical makeover in preparation for the long-awaited *Star Wars* prequels, a three-movie production that begins next year. George Lucas, Borders says, has definite ideas about redefining the state of post-production. Much of the load of implementing these ideas will rest with Borders. If you're in the business, there couldn't be a more exciting place to be.

What was your introduction to Lucasfilm?

I had been working in documentaries in the Bay Area for three or four years, and through a documentary connection I met a woman who was Ben Burtt's assistant on *Jedi*. I had never worked in features before and just said, 'Do you guys need any help? What's going on?' She said to come on up, and I became the dialog assistant on *Jedi*. Because I had already cut so much dialog and effects from being in documentaries, people just started throwing me scenes to cut. It was an incredible opportunity. It never happens that way.

So I was cutting some of the production dialog, some of the ADR, and at the very end, I had some extra time on my hands, and someone said, "Well, why don't you cut the final climactic scene between Luke and Darth Vader, the final sword battle. I said, "Fine, let's go," and I sat down and cut the last battle of effects. Everyone sort of said, "Omigosh, who is this girl? Where did she come from?" Then it was just this great, wonderful success. I don't know where it did all come from, but it really did sound great. And I got to know Ben a little bit better. Like I said, I don't think that would ever happen now; it was just a very, very lucky break.

Right after that, I worked on *Temple of Doom* and became a full editor in dialog. Then my third feature, I was supervising. It was that time period when if you

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were in the right place at the right time, things just happened.

Could that have happened in Hollywood?

Maybe. Here's my take on Hollywood, and maybe it is happening right now. In the last seven months of trying to market Skywalker Sound, I'm learning that any two guys can have a couple of Pro Tools in their garage and they're an immediate sound crew. And there's a lot of low-budget shows that are going to these kinds of groups. So maybe it's an interesting cycle, that we're back to that place where a lot of people can jump in right now. If you are computer-savvy and can work something like a Pro Tools or a WaveFrame, it's a good time.

But, you're not going to jump into Return of the Jedi ***today.***

No, but I was in documentaries for three years. You could work on *Ninja Warrior Part 8*, and it's not a bad way to get started. I mean, I was doing some low-budget documentaries. You just need to get in there.

What forms the base of a well-edited film? Does it start with the dialog track?

I might think that because I was a dialog editor, but even with shows like *72*, or *Jurassic* or *Mission Impossible*, if you can't hear the dialog, you're not only going to lose the audience, but you're probably also going to lose the support of the director and producer. If it sounds really loopy, the audience won't know why, and they're taken out of the picture. Dialog is the foundation that you have to get right. And from a supervising standpoint, it's a wonderful way to meet and really get to know the director. You see right off the bat what scenes he or she thinks are important from a story standpoint. You're going on the ADR stage with him and you know exactly what he feels about the performances and which line he wants or what he's nervous about.

Do you miss that?

I think that was the most fun about supervising—getting to know the director and being with the crew. Working with 12 or 15 people and creating a soundtrack is a wonderful experience. Those 30 to 40 nights in a row till 1 in the morning—I think that was what finally pushed me over into thinking, "You know what, I've been doing this for 30- or 40-day stretches for the last 12 years. I'm ready for something different." But creating something with a small group of people—it's like we're a bunch of gypsies, or we're the circus, or we're putting on a play. It's a great feeling, to see it up there and to actually make it happen, from beginning to middle to end. At the end, after you're done with the 30 nights in a row with somebody, in many ways you're as close to them as you are even to your family. That's fun. I'm essentially with a different bunch of gypsies upstairs now, running the building. And that's fun, too.

Now that you are running the building, what is the biggest challenge?

PHOTO: 1983 COURTESY OF LUCASFILM LTD.

Marketing is such a big deal right now with Skywalker Sound. We are tapping into a whole new area of clients—from *Ninja Warrior Part 8* through *Follow Me Home*, a Sundance film that came out last January, to the medium-budget films that the studios are doing, all the way to *Titanic* or *Jurassic Park: The Lost World*. So we're dealing with all these different clients, and it's interesting because the producers on all of them are becoming very, very interested in the bottom line. Everyone's really hip on what they can get and where. There are some producers who say, "Well, if it's going to be a huge-budgeted show like *Twister* or *Independence Day*, it's going to cost a million dollars; there's nothing we can do about it." But I think that's getting to be a smaller and smaller percentage as the producers become more interested in keeping the film from running away. They're going to look at that post-production schedule at the end and say, "We don't get it. We have this company down in Burbank who'll do it for xyz." That's constantly what we're getting hit with.

Is location still important, what with the use of the Internet and phone lines?

Absolutely. What I found almost impossible to believe when I became general manager is that people were still believing that Skywalker Sound only worked on George Lucas shows. I would hear it years ago and laugh, but once I started knocking on doors, I would hear, "Oh, you work on something other than George's movies. Oh, you have a scoring stage. We didn't know that. Is there someplace to stay up there? You can do something inexpensively?" It's actually been a great experience marketing because we've gotten such positive feedback. And we're entertaining different clients every week who are in awe of the facility and happy to be here. That's the good news. The hard news is that you still have to convince people that it's okay to leave town, that you're not going to miss that important phone call tomorrow from a producer that you should be having lunch with down in L.A.

Yet, you are the ones who essentially pioneered this use of long-distance preview of mixes through T1 lines, on Backdraft.

We offer all the tielines, the accommodations are the most deluxe in the world, the prices are beyond competitive, but it's funny how, in the end, a lot of directors want to sleep in their own bed at night. And that's what you have to work on—you have to keep convincing people how important it is to have Gary Rydstrom or Randy Thom create that sound design that's going to pull at someone's heartstrings and help make that picture even stronger. So it's a constant educational experience: "Might the dragon sound better if you do it up here? Might the dinosaur sound more real? Will the train sound even scarier?" It's a matter of getting the word out that these people are up here to do the best soundtrack they've ever heard.

You've been part of a facility associated with the cutting-edge, both creatively and technologically, since the beginning. How do you maintain the momentum in this transitional time for the industry?

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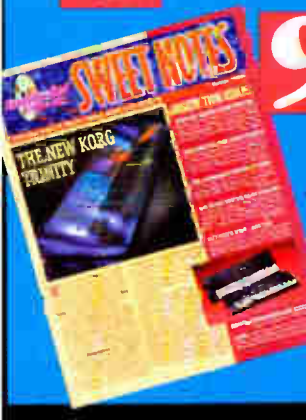

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the best supporter we could possibly have, a landlord, George Lucas. Recently he's become incredibly enthusiastic and excited about the Tech Building—what it could be and what it should be. We've been having meetings over the last couple of months, looking at every square inch of this building, dreaming up ways to redesign and plan where we want it to be three years from now, in time for *Star Wars*. It's been an incredible infusion of energy because we have somebody who really wants to help us make that kind of technology happen. The engineers are buzzing.

The building was originally built in 1987 to be completely digital, and unfortunately nine years ago we weren't really there yet. We're about to start designing the best post-production facility in the world. We're in the process of developing the network that will link Skywalker Sound, ILM and George's cutting rooms in London and Marin County. We want to be able to talk with one another and provide George with any sound or visual effect shot that he needs at a second's notice. It has everybody thinking about where we want to be.

We're about to start building a new mix room in the old Foley room. It's going to be the biggest mix room that we have. It's the perfect shell right now. It's so quiet already you can hear blood pulse through your head, and pretty much all we have to do is bring in the mix console and do the cosmetic changes required and we'll be ready to go. We're hoping that it will be operational by January so we can mix *Lost World* in there. It's that kind of support that we need from George to make that happen. Without it, we wouldn't even be able to contemplate such things.

You're lucky to have a landlord who's so interested in post-production. Many people would argue that he was ahead of his time with the production/post-production techniques used on Young Indy.

When I was first interviewed for the general manager job, George and I had a long conversation about his desire to start redefining what's going on in sound post-production. We both agreed that perhaps it isn't a great idea to have 60 people on the last two or three weeks, working 24-hour shifts and mixing on five stages at once. He said, "Don't you think that what's going to happen in the future is that the sound editor who's working on these digital workstations is going to become so attuned to what they're cutting, and these workstations are becoming so sophisticated, that editors are going to start premixing their own tracks?" A lot of people hate that idea, but George is saying it to someone who for the last 12 years was thinking, "Oh, if I could just grab that fader..." What I think would be the most fantastic development in sound editorial is that the day the picture started shooting, you would have your sound designer or your sound supervisor on one station, your picture editor at another station, your visual effects supervisor at another workstation, and the three of you would go down the path of post-production together, so that by the end of the first rough cut, you could dub it down to something on the workstation, to a DAT or DA-88, and start previewing it. There's no reason why that can't happen.

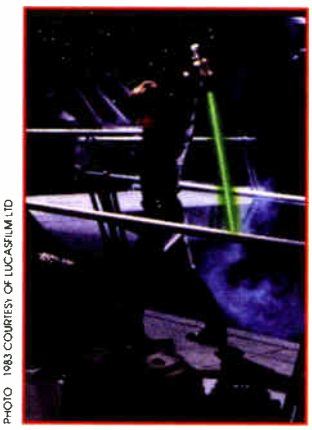

PHOTO 1983 COURTESY OF LUCASFILM LTD

As technology grows and changes, and as we learn how to deal with the certain obstacles that we're dealing with all the time, like picture changes, we will get to a place where the changes are going to float from the picture editing machine to the sound editing machine without the pages of notes and the hours of time. Several companies are working on this picture-change dilemma, and eventually the problem will be solved. That's the main obstacle, and when that gets dealt with, then all of a sudden you could start bringing a couple of sound people in at the very beginning who would sit with the director all the way through. To me it's almost like being back to that original documentary stage of one or two or three people doing the soundtrack—where it doesn't become a factory of 50 people and God-knows-who that person you passed in the hall was, or if it's Tuesday it must be Foley reel 3. When it gets to that level where you can hone down the number of people, where it's more of a personal experience, you have consistency.

But the schizophrenic part of running a facility is that we love big shows. If I could have a show right now that was mixing on every single stage, 24 hours a day, for the next month, I wouldn't have to worry about revenue for the rest of the year. So on the one hand, I'm real excited by George's idea of post-production in the future, and I agree with it, but maybe I shouldn't be running a facility at that point. [laughs]

Let's talk about schedules. I can't go into an editorial house or a mix stage without the crew talking about short schedules. Then I hear the Twister ***crew repeatedly pointing out that they got to mix on a single stage, as if that's a luxury.***

It's terrible that it's gotten to the point that a mix team thinks it's a luxury to work on a single stage throughout a film. Actually, I think it might be a wonderful compliment to Amblin, that they might realize that to get the best product you should do something like that—that sound post-production requires the same amount of respect and support to all of the crew that any other aspect of filmmaking does. Unfortunately, I think sometimes studios are responsible for the crazy schedules, thinking, "Oh, well, even with all the overtime, it will still be cheaper than adding another three weeks to the schedule." I don't really know if that's true. I would really love to see the numbers on some of these shows that are being mixed on five stages at once. If you really looked at the budget of an eight-week cutting schedule and a six-week mix, and everyone went home at 7 o'clock, what would the difference be? I think that what's happening is that the studios are saying, "Well, we're going to stop shooting picture three weeks before the final, and we're going to jam this into five stages premixing, and we're going to start the final one week into the premix." It's just nutty.

When I was supervising *Godfather III*, there were 50 to 60 people on three stages at once, which at that point, I thought, "My gosh, it can't get weirder than this." I became a scheduler, an air traffic controller. I made sure that everything got to the mix on time. The next show I did was *Terminator 2*, and I thought, "Here's a film that's going to be so big that I should really try to cut some of the effects so I feel like I'm a part of this force that's going on." That was a crazy film. The

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last three to four weeks we hired 50 people. Luckily, Gary [Rydstrom] and I had it organized for three months before they even walked in the front door, so it wasn't as awful as it could have been, especially compared to what's going on on some of these summer action pictures, or what I think is the very destructive let's-mix-it-on-four-stages-at-once mentality. No one really has a handle when you start doing it like that. When the studios start making those kinds of decisions, it undercuts any sort of cohesive, creative force that could be taking place. You have Joe cutting reel 1, Tom's on reel 2, and Steve's down the street on reel 3, and Greg is doing reel 4, and God knows how it all fits together. We sort of did that on *Godfather III*. I think when studios see that it can be done, they start doing it all the time. And it's certainly not the cheapest way to go. I can't imagine what these shows are costing when you have editors going 24 hours a day and mixers going 24 hours a day, and on Saturdays and Sundays—you could cut two films for that.

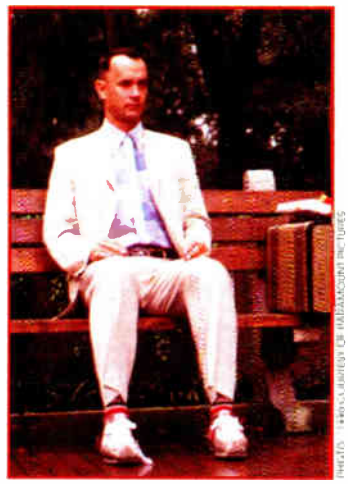

Photo courtesy of Paramount Pictures

Forrest Gump was a nice show for me because Bob [Zemeckis] gave us the time that we needed. We had six or seven people for about eight weeks, and Randy Thom did a fantastic job as sound designer, particularly on the Vietnam sequence. It just worked. Every now and then you get a group of people and you can tell, "This is working, we're getting fantastic stuff." I think that's probably why some supervisors find their set of people, their band of gypsies, and stick with them.

Has technology, the advent of the workstation, changed the way you supervise a film, or had an impact on schedules?

It hasn't yet. There are two interesting issues happening. Some editors are saying that workstations don't mean they are going to cut any faster, it just means that the minute detail that they can go in on in an effect or a line of dialog has increased a thousandfold. Now they can work at a level of detail that they never could before. Yes, they can cut faster, but they are doing so much more than they ever thought possible. So it still takes the same amount of time to cut a scene, be it dialog or effects. Now the producer is coming in and saying, "What's going on? I used to spend $150 a week on your room and equipment, and now I'm spending $1,500 a week, and it's taking the same amount of time." Now that I'm working on the budgets for an entire facility, I can see both sides of the argument. What's happening that's interesting is that you're getting those two guys in a garage who are cutting *Ninja Warrior Part 8*, and they're cutting it in three to four weeks. Sounds okay. Then you have the old school of wanting to spend a week per reel, which has sort of been the standard time frame. And a lot of these producers who were doing *Ninja Warrior* are going to be doing *Twister* in six months, and they're going to look at these two budgets and say, "C'mon." It's changing.

I saw a headline in the San Francisco Chronicle ***that called*** The Rock ***"possibly the loudest film ever made." Newspaper reviewers are noticing it. Consumers are noticing it. And in a recent talk with the*** Twister ***mixers, they were adamant about the fact that the responsibility for decibels on the stage starts with the mixer. Do you agree?***

I agree 100 percent. I was on a show last year that was so loud that one mixer lost his hearing for three weeks. There was another mixer at the board who was wearing ear plugs the whole time, secretly. I would take frequent breaks. It was just unbelievably loud. And not pleasant. Nothing was nice about how it sounded. And it was going into distortion.

I think what happens is you get some directors who think "power equals volume, and emotion equals volume. So let's crank the music, the explosions, whatever, let's crank them so high that it must mean it's exciting and that my movie is okay." It gets to be a fascinating psychological experience. We had a screening at the end of the final, just us with Gary Rydstrom, who had done some sound design but wasn't a part of the mix. At the end, he turned around to the mixers and said, "You have to be out of your minds. This is insane." Everyone sort of shrugged and said, "It's the director." And he said, "Well, you have to say something. This is wrong. It sounds awful." I think the mixer absolutely has to take responsibility for the product at a certain point, and I don't know what needs to happen, but you have to somehow get the director to understand that you're going into distortion, that it's really unpleasant and you're destroying the end product. Maybe we have to take directors by the hand and step by step prove to them that louder is not better.

What can you tell me about Star Wars***? What is the schedule like? Is Ben Burtt returning?***

I don't think any of the crew has been decided yet. But they're going to release the *Star Wars Trilogy Special Edition*, which is a complete remix and a re-enhancement visually by ILM of the original *Star Wars*. A lot of the original negative had deteriorated to such a place that ILM came in and, with George's direction, worked on a lot of shots. Ben is going to remix the sound from the original tracks, bumping up to 6-track. They're going to release that next Presidents Day weekend. Then six weeks later, they plan to release a new version of *Empire* and *Jedi*.

Right now they're saying that 1999 is when the first of the new trilogy will open in theaters, with production starting next year. That will be a big deal, and like I said, that's the big push for completely redefining what this building is all about.

Is that what's exciting? Looking ahead?

Well, it's real exciting for me, but I don't think that's just with Skywalker Sound. I think everybody is looking ahead. I know that Fox wants to upgrade their facility, and I know that Paramount is always looking for ways to upgrade their facility. DreamWorks is happening. There's a lot of mental energy right now that's going into post-production facilities of the future. The positive aspect of all that is that hopefully we're all going to talk to one another, and we'll all come up with something that works better due to all of our participation and cooperation. Although we hope that because we have this huge triple show that we're gearing up for, the post-production and release over the next several years, that we're going to have the best facility in the world.

Is the pressure on, then?

Absolutely. The pressure is on. And you have to have pressure to make it happen. ■

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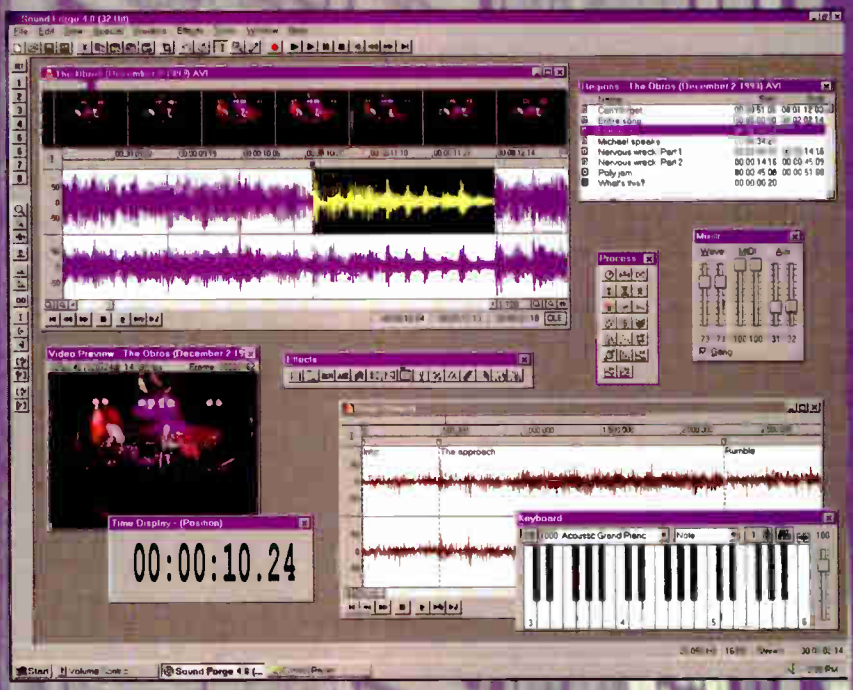

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(Goin' to) KANSAS CITY

Live Jazz From Robert Altman's Youth

It's the end of a Los Angeles press screening for Robert Altman's *Kansas City*. The last, fat-sounding stand-up bass notes fade away, the lights come up, and "Great music!" is the first comment heard in the theater. Not too surprising, because this is a film built around its music, the Kansas City jazz that developed during the Great Depression. Set in 1934, when the "Paris of the Plains" was a wide-open town that ignored Prohibition, the film depicts an era dear to the heart of Altman, who was born in KC in 1926. Dance halls, nightclubs and after-hours joints flourished under gangster owners who understood the value of jazz in attracting customers, and as a teenager, Altman frequented those venues. Now he's used those memories as the basis for *Kansas City*, a Fine-Line picture.

For the soundtrack (released on Verve Records), Altman and record producer Hal Willner assembled 21 of today's top jazz musicians, including bassist Ron Carter, saxophonists Craig Handy and Joshua Redman, and guitarist Mark Whitfield. Recorded by Eric Liljestrand and Le Mobile during a three-week jam session at the Hey Hey Club set, the players performed the music of Duke Ellington, Count Basie and others, highlighted by the re-creation of a legendary all-night "cutting contest" between Coleman Hawkins and Lester Young that's watched from the balcony by a 14-year-old Charlie Parker. The score, composed entirely from those sessions, weaves in and out of the film, transitioning between scenes, setting the background tone and sometimes taking center stage.

Kansas City was dubbed at Studio 3 at Todd-AO West, the former Skywalker South facility in Santa Monica. That's where *Mix* visited with the team of supervising sound editor Richard King, music and dialog mixer Matthew Iadarola and effects mixer Gary Gegan. We also spoke by phone with production mixer John Pritchett.

"The music is the glue that ties all the stories together," says King. "It travels in and out of the scenes, some of which take place in the club, where people are dancing, drinking and carrying on. There was no playback on the set—the music was all recorded live to two 24-tracks and mixed simultaneously to DA-88. There were mics everywhere on the set—hidden, of course—miking the individual instruments separately as well as with room mics."

Pritchett explains how he and Liljestrand orchestrated recording the live sound. "We'd worked together on *Short Cuts*, only this time our collaboration was far deeper, because they decided to do everything live. It didn't start that way—we were going to record the music and then do playback. When we got to take two, which is the take where we would normally have done playback, changing the camera angles

PHOTO MAUREEN DRONEY

L to R: Gary Gegan, Matthew Iadarala and Richard King in Studio 3 at Todd-AO West

BY MAUREEN DRONEY

WORLDRADIOHISTORY

Director Robert Altman with the Hey Hey Club jazz musicians in Kansas City.

PHOTO: ELI REED/FINE LINE FEATURES ©1996

because Bob was always shooting two or three cameras...well, he wanted to go live! So we just took the speakers we'd unpacked for playback and stuck them back in the truck and off we went! We did everything live, including dialog scenes during the shooting and recording of the music.

Johnny Flynn (Steve Buscemi) and the illegal voters

"Eric was in charge of recording whatever the musical configuration was, which were all different," Pritchett continues. "There are some scenes with just two upright bass players, some scenes with a couple of piano players and a few musicians, and ones that had guys sort of rehearsing and noodling around, then going into the music, and incorporating the dialog. Because of the spontaneous miking situation and the inability to show the mics, we had to help Eric by occasionally using some of our microphones to pick up a solo artist. So we hooked up to each other in a duplex way. He would feed me whatever microphones of his that I wanted for that scene, along with timecode, and then I would feed him my timecode and whichever mics of mine he wanted. I was also making a mix the whole time for the purpose of dailies, etc., in which I would use some of his microphones as well as all the others, plus he'd send me his mix. For instance, if we had a dialog scene and the musicians were involved, Eric would mike the musicians and I would mike the dialog, and then I would mix the two till the place where the dialog would start. Then Eric would take over and feed me his mix, while I tried to keep the rest of the dialog on separate tracks as clean as we could make them. I was recording to three machines—the DA-88, and then I recorded my mix to two 2-track DAT recorders, using one as a backup."

King, the supervising sound editor, comments, "We only had about three or four ADR lines, which is a real tribute to John. We ended up using his mix about 10 percent of the time and always had it there for reference. Also, because the production sound was recorded to 8-track, we had a lot of discrete material to work with. In a scene where there are two people talking, both of them might have had body mics with their own channels, and there might be a boom mic over them, and there also might have been a stereo ambience mic collecting everything that was going on in the room. So we loaded all that material and prepared it all. It was the first time I did that, because, typically, your production mixer has one mic, or two at best, and you have one or two channels of dialog material. It was wonderful to have that quantity of discrete material, because it's very hard with ADR to get the performances right—by the time you get to post-production, months have gone by and the actors have completely forgotten about the mood. ADR is always a patch job. With good actors, what they can do on the set is usually far better than what they can do on a looping stage, and that's what Bob Altman goes for."

Carolyn Stilton (Miranda Richardson) in Kansas City, produced and directed by Robert Altman.

There are actually three locations inside the building where the Hey Hey Club is located: the dance hall itself, the gambling room and the office hideout. That meant that the sound of the music had to change to reflect what part of the building the characters were in. Iadarola, who handles both dialog and music, says, "What helped make it possible to go from source to underscore in the same cue, where an on-camera performance transitioned to underscore for the following scene, were the room mics they used. I was given close-ups and two or three different stereo room mics that made it easy to transition and create the feeling of an offstage. Normally, the music separation is between orchestra and solo instruments—in this case, I also had a stereo room pair, which was really great to get an authentic offstage sound or to adjust the perspectives."

In addition to the live soundtrack, multiple tracks of live dialog and almost no ADR, there was a hunt for Depression-era ambience. Antique car sounds, both pass-bys and interiors, were recorded in the desert, the AT&T museum was a source for phone information and roughly two weeks of Foley work was done with Dan O'Connell and John Cucci at One Step Up, where they had period shoes for the walkers "because everybody wore hard leather then," says King. "That was fun stuff, creating a sense of the time and place. Because Bob grew up in Kansas City, it was a very loving re-creation. For instance, the cars sounded very specific—he told us they all backfired because they had bad gas in those days. We just tried to be as authentic as we could—the telephones, teletype machines, trolley cars and train announcements. Bob had a contact in Kansas City who tracked down what all the trains were called, names like the Silver Stream or the Prairie Schooner. We got period timetables, and we had a guy record the announcements. When you see the film, you'll see that time is a real important element—it kind of bounces back and forth, and we wanted to establish very carefully in each scene where we were in the timeline.

"But the idea is not to do a documentary," King continues, "I want to reinforce that. You use the period sounds to create a feel, to enhance the mood of

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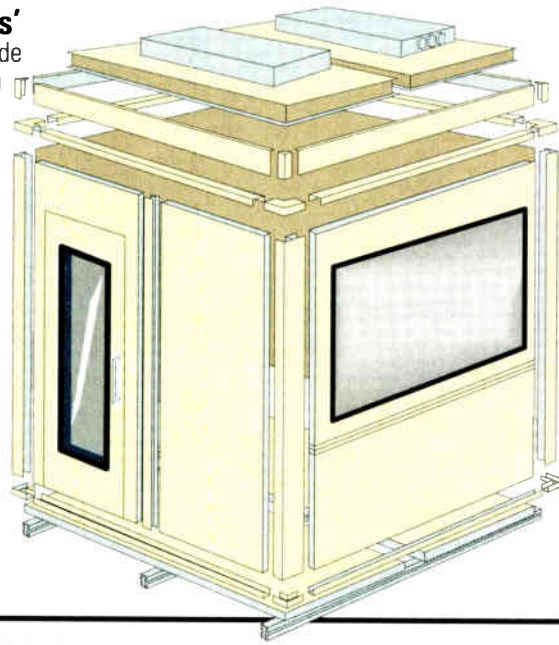

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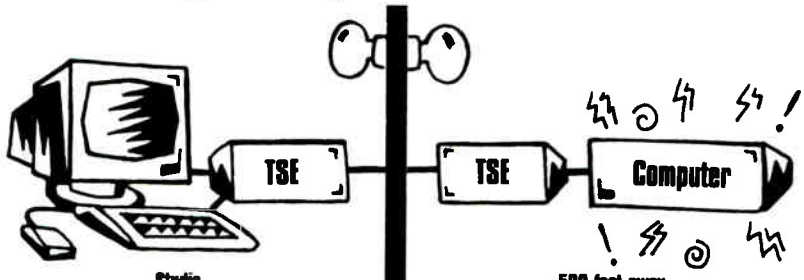

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a scene. There's a scene where a character finds out that his wife has been kidnapped, and the woman who has kidnapped her calls him. He's just gotten off a train in the middle of nowhere—he's in a train station, she's in a movie theater. We create this steam train idle which is like a heartbeat, very rhythmic, and it goes on in his side of the conversation, to help point out the tension in the scene. It's period sounds used for the service of the drama."

No mag film was used for the *Kansas City* project until the print mastering stage. Dialog and sound effects were prepared on Pro Tools, and Foley was shot to DA-88 and prepared on an Avid AudioVision. Effects and backgrounds were brought to the dubbing stage on DA-88, and dialog, group ADR and Foley were brought in on 24-track with Dolby SR. Music was prepared by Dylan Tichenor and played back on the stage directly from Pro Tools. "We also really maxed out what Pro Tools could do as far as data storage," says King. "The 2,000-foot reels are very long, and with effects and dialog, we were dealing with three to five times as much data as usual per line or track. The sessions were huge—we had, at the peak, 25 4-gig drives of data, and they were full."

Pre-production conversations between King, Iadarola and Gegan, who had all worked together previously, were an important part of the process. "Matthew, Richard and I were talking about logistics at a very early point," Gegan says. "We did it on a relatively small stage, where, in order to make full use of the capabilities, you have to plan very carefully. We had to maximize the number of tracks and predub in such a way that it would stay within the capabilities of the console, which had 72 full-function faders and a number of stereo faders without EQ. We had every single fader filled. We mixed to videotape—most film people don't like the idea of working with video [due to lack of resolution and problems with sync], but on this film, at Bob Altman's request, we did. That had to do with cost, and it helped us with speed. We saved probably two or three days in time, just in rewinding and shuttling around. When we did the print master in film, we were quite aware that it took more than twice as long to get from A to B at high-speed. We did have a film print on the stage that we'd use for playback to make sure that we hadn't missed anything. Another reason our reel changes were very short was because we predubbed to two 24-tracks and some

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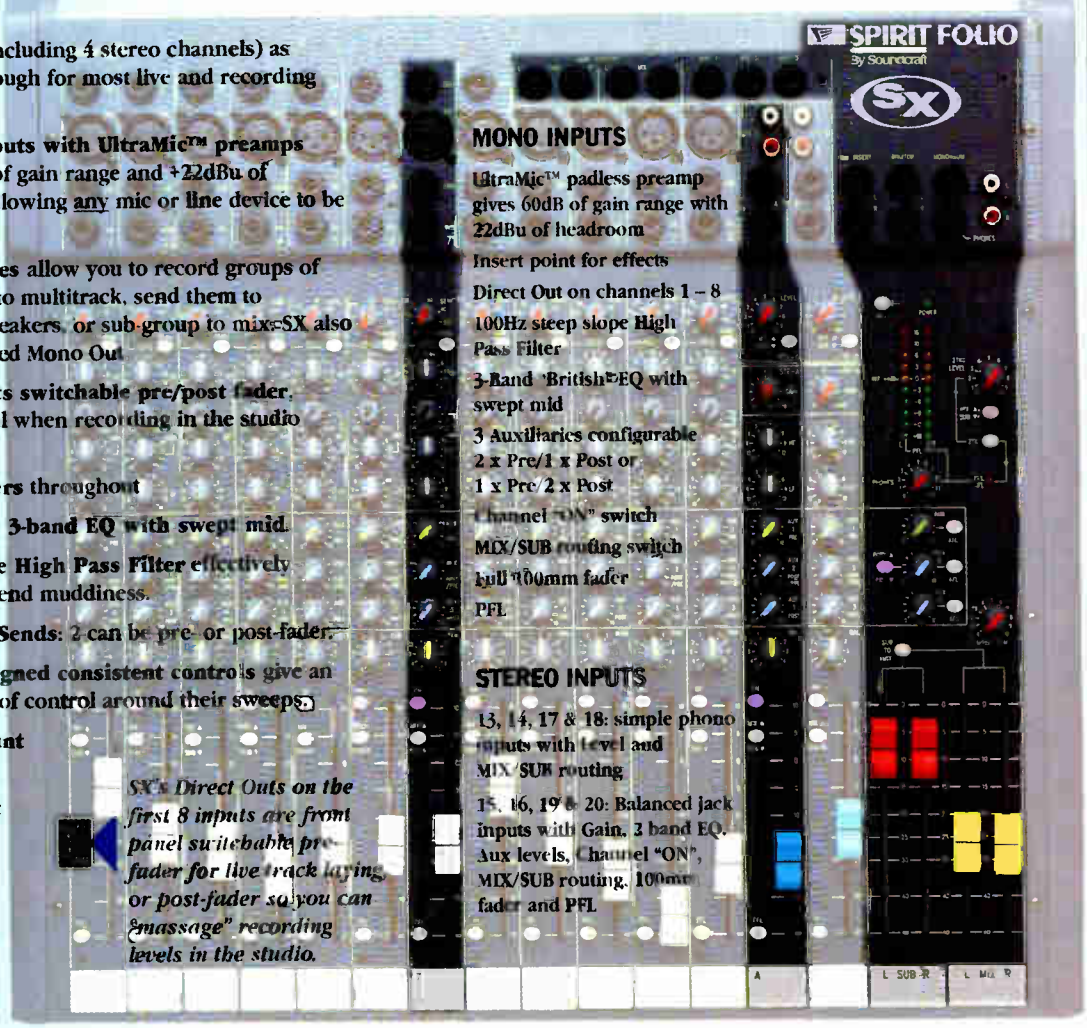

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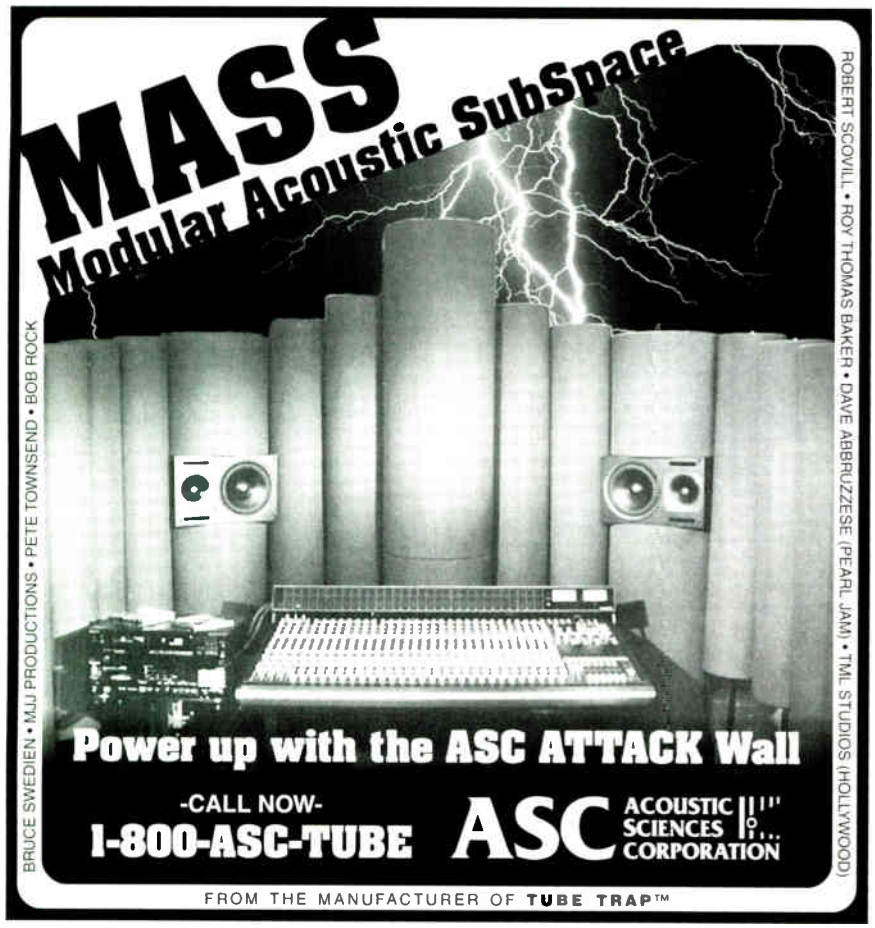

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tracks on the 32-track digital Otari. They are so stable in terms of alignment that they would come up right on. And, of course, with video, you don't have to thread up a projector. That's quite a bit of time saved right there."

Because picture was locked and editing was finalized before dubbing, the team was able to use double reels on the stage, making for half as many reel changeovers, saving 30 to 60 minutes each time.

"With half as many reel changes, we saved a lot of time, but we also found that it made a difference in terms of the way we approached the film," Gegan says. "You dealt with more of the film without interruption, and it was more continuous. Normally, there is a tendency to look at movies in terms of reels, so your approach to mixing it gets broken into chunks. It affects you practically in terms of matching sound levels between reels, but it also affects you in the way you deal with the drama of it. And with the way the musical score weaves in and out, we were working on longer flows, with dramatically a lot more continuity. The tendency was to look at the film as whole.

"We had a bit of trepidation about using video and DA-88—you don't want to deal too much with the unknown," he continues. "We were using Lynx synchronizers, and at first we were running them as individual machines—as many as six, with separate Lynxes so we could offset them separately if we needed to. But we were having a lot of lockup problems, so we finally had to tie them all together onto the timecode generator, like it was one big machine.

"Overall, it was great fun. We had wonderful material to work with and a director who gave us an enormous amount of freedom. He had strong opinions and he got what he wanted, but he also let us try things—spring things on him. He was great about that."

Adds King, "The amazing thing about Bob as a filmmaker is, without being obvious about it, he gets you to do exactly what he wants. He makes you think you're coming up with a lot of stuff yourself, but somehow he's actually gotten you on his wavelength. We didn't feel micromanaged at all. There was a lot of input, but the conclusions that we came to, we were all just heading in the same direction. Which is kind of inevitable, because that's the way Bob makes films. All these people from separate places have a tendency to end up in the same place! He's a lot of fun to work with." ■

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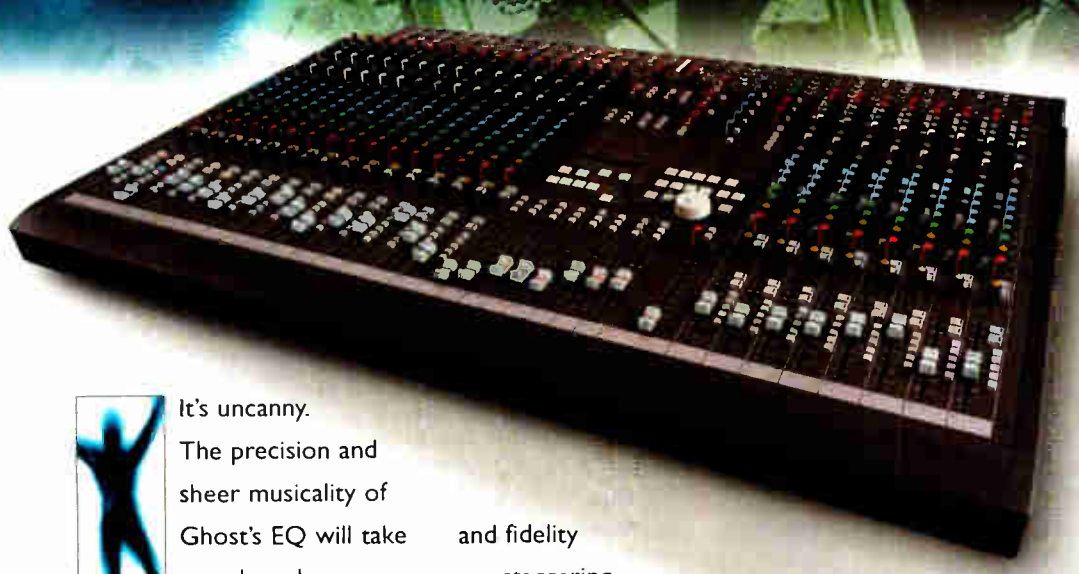
Paranormal EQ



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MIXING THE GREEN MONSTER

SOUND FOR FOX BASEBALL

by Gary Eskow

Of all the home entertainment options, none is better suited to the in-your-face potential of home theater than stadium sports broadcasting. Fifty thousand or more thoughtful cognoscenti giving voice to their every emotion, the sounds and colors of athletic endeavor splashed across acres of verdant fields and concrete canyons...Well, some of the drama is lost if your only connection to the action is a 13-inch screen and a 3-inch speaker.

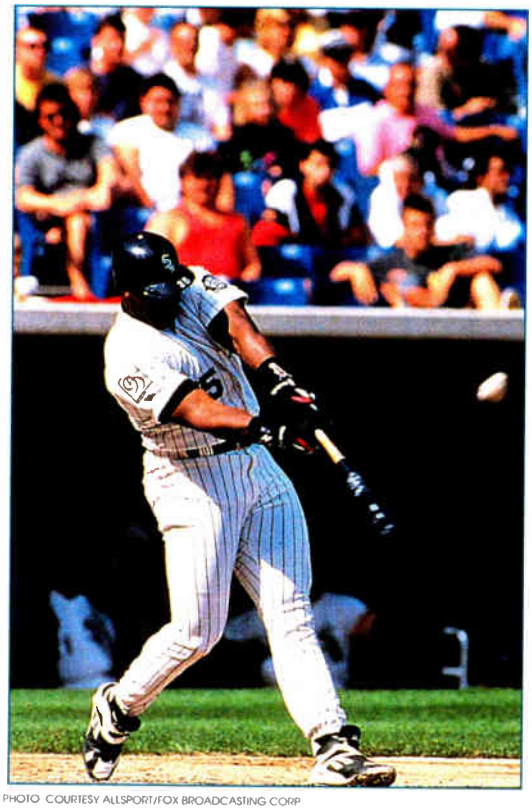
Fox Television is doing its best on the front end. In December 1994, *Mix* covered the network's attempt to jar the average football fan off the couch and into the huddle. Since then, Fox has introduced surround-sound hockey and a glowing puck, based on a conviction that puddles of potential hockey fans are turned off by their inability to follow a tiny black speck whizzing across the screen.

Now, as Fox makes its move as a player in Major League Baseball, the network has come up with yet another twist. Fox's latest effort at engulfing the fan with the sounds of battle includes mics in the outfield walls and in the infield bases. Jerry Gepner, Fox vice president of field operations, says the experiment, now in its infancy, is part of the Fox philosophy. "We're adventurous guys; that's a part of our mentality. Moreover, we believe that audio in televised sports has been underserved. Our belief is that if we're going to televise sports, we should commit to the highest-quality experience, in the audio as well as the video services we provide.

"The technology we can put in the field is much better now, and the home theater equipment that viewers can place in their own receiving environments represents a stunning advance over previous capabilities."

Transmission bandwidth, for one, is much greater than in previous years, and Fox is using Crown PCC 170 boundary mics to send localized sound down the pipeline. The PCC 170, designed to work off of a flat reflecting surface, has been used on occasion as a backboard mic in basketball and is used extensively in Broadway-style productions. Currently, Fox crews are traveling with four PCC 170s and experimenting with placing them in various parts of the outfield walls of different parks.

Different ballparks present different challenges. "How high do you want to place a mic on the Green Monster in Fenway? Can you really use sound to capture a sense of the uniqueness of the left-field wall in Fenway?" Gepner asks. "To be honest, in all cases where we're attempting to expand the way sound is used to optimize the experience for the viewer, we're not always sure of the results. We are, however, confident that our continuing experimentation will yield interesting perspectives to the fans."



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How is a baseball game like a CIA operation? According to Gepner, both enterprises rely on the work of a company called Media Consultants, out of Punta Gorda, Fla. These folks designed the mounting for the mics and transmitters that Fox is implanting in the infield bases. "This company specializes in surveillance systems, and in particular placing miniature systems, the FBI, James Bond kind of stuff. We're using Sennheiser MKE 102 mics, the miniature lavaliers, mounted in the bases, and Sennheiser SK 250 transmitters, which are secured underneath each bag. The mic is threaded through the base, lying flush with the far side, away from contact."

Fox hopes this setup will allow viewers to hear Ken Griffey Jr. peeling down the line as they follow him visually. "We're taking a lot of time to play around," says Gepner, referring to the task of integrating the base mic inputs into an audio mix already replete with crowd sounds and announcer tracks. Learning on the job is definitely a part of the plan, but Gepner says that off-line training is also scheduled. "Our engineers work with videotape and audio, finding ways to use the new tools in the most interesting and effective ways," he says. "Technique is more important than the number of mics we're working with, and we're definitely working hard at mastering our technique."

Fox audio crews also place Sennheiser MKE 102 mics in the camera pits located at the ends of dugouts, and also in the netting behind home plate to catch the crack of the bat and possibly player commentary. "The 102s are really good parabolic reflector mics," comments Gepner. "When 40,000 people start screaming, you need to be able to isolate sound as much as possible."

The Fox audio chain relies on Vyvx's DS3 long-haul signal carrier, principally because the network is almost exclusively digital. "DS3 has plenty of bandwidth for four audio channels, which allows us to transmit a high-quality surround sound mix. Preserving the integrity of the signal is critical," concludes Gepner.

The folks at Fox are hoping that fans flip over the verisimilitude they've been piping into homes this summer and fall, but let's not go overboard. If you go to a game, yell at the umps all you want, but remember, your screams may be broadcast to millions out of the left and right rear channels. ■

Gary Eskow is a New Jersey-based producer and writer.

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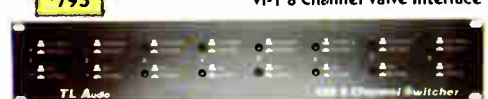

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—FROM PAGE SFP 34, SOUND FOR FILM

they use technophobia as an excuse for being sloppy.

• Know thine start marks. Again, when you were dealing only with film, it was an easy matter to know that the sync pop was 9 feet from the start mark, and the first frame of picture was at 12 feet. And indeed this shouldn't change even though we've thrown in the variables of videotape and timecode. The relationships should stay constant.

You should always regard the first field in which the "picture start" frame in the leader is visible to be the first field of the reel-number-hour timecode (i.e., 02:00:00:00 for reel two), and not one stinking field sooner or later. Ditto for the pop (01:00:06:00) and first frame of picture (01:00:08:00). In addition, to keep everything neat, clean and repeatable, all of these video frames should be "A" frames at telecine, i.e., one film frame on one video frame. And don't forget to give us field-accurate burn-ins of both timecode and footage on all videotapes; the larger the burn-ins, the better.

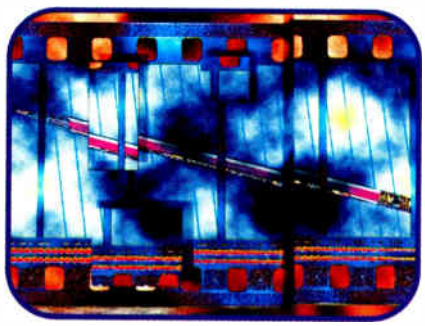
Important note: All of this applies both to videotape copies direct from your edit system ("digital cuts") and to telecine transfers of workprints; if you abide by these rules, then we can start cutting as soon as we get a videotape from you. That is, assuming that the resolution of your digitized image doesn't render lip movements illegible.

• Cut in 2,000-foot reels. In the days when everything was on sprockets, it was very cumbersome to deal with large reels of film on rewinds. But at this point in the game, it's possible to do a movie with the only sprocketed, edited reel being the picture workprint. Hard disks and videotapes don't know from 10-minute or 20-minute reels; torque, inertia and elbow grease don't apply. This, of course, assumes that the guide worktrack will come directly from your nonlinear edit system, and that mag film will only be used on the re-recording stage.

By turning over reels to the sound department in "AB" projection reels, you will save us (that is, the sound editors and re-recording mixers) time and money by reducing the number of reel changeovers. I estimate that this saves at least a day of mixing time on a simple film, maybe even three when there is a lot of premixing involved. Tack on another day if you're mixing to mag. This will also make matters much easier for us by reducing the possibility of our having to match levels during a reel change in the middle of a scene.

At the very least, should you cut the film in 1,000-foot reels because of massive picture changes, try to join the reels prior to the final mix. (Make sure that we get accurate new videotapes of the conformed print!) The most important reason for big reels is that everyone is able to get a better sense of the dynamics and flow of the soundtrack, something that's evident at the finals when the balance of dialog, music and effects is locked into stone.

• Create a master 4-track mag film for each reel. Even if the mix will take place in a nonsprocketed multitrack audio/video picture environment, it is always helpful to have a piece of sprocketed mag reflecting your four audio tracks. (At the very least, the material should be on whatever 8-track modular



digital multitrack format the mix stage prefers.) Not only will this be useful in reviving the odd favorite effect, but it will settle all sync arguments as to how your dialog or music was originally cut. Speaking of which...

• Make sure your music is in sync. The history of film sound is filled with thousands of stories of picture departments cutting to music derived from a nonsync master, only to have it walk out of sync at the mix. (The nadir was perhaps in the mid-'80s, when the arrival of music videos coincided with the beginning of timecode and video in film production.) Again, *before you start editing*, make tests here just like you did with the original sync test described last month. Do a resolved transfer of the music master (I'm speaking here of the God Master, such as a multitrack tape) to mag and then compare this to a mag that has taken a path from the God Master to your ¼-inch playback master to your nonlinear system (loading in as you would for dailies) to whatever format you're delivering your tracks to sound editorial on (DAT, MDM), and then do a resolved transfer of that tape to mag. The two mags should hold exact phase sync for the length of the cue. If this doesn't happen, call in the propeller heads immediately.

While the above situation implies that you have a timecoded (and therefore synchronous) multitrack master as God, you also should be aware of how to *create* a God Master when what you think is God is in fact a false prophet. In plain English, if you are taking music from a 2-track medium with no internal sync-pulse (non-sync ¼-inch, records, CDs, etc.), first make a carefully aligned transfer to Dolby SR-encoded ¼-inch with timecode (the most universally accepted format, and certainly my first choice) or to DAT/MDM with timecode. I say "carefully aligned" because there will be no looking back at this point, so make sure your source is the best-generation master. To keep everything neat, have the first modulation of each cue start on the timecode hour; it pisses me off to get a timecoded master with the downbeat at 13:29:52:12.

DAT has the advantage that it is *possible* for you to do the transfers into a nonlinear edit system from a standard non-timecode (read "less expensive") machine. However, you must make sure that you do the dual-mag test described above before signing off.

As I suggested last month, keep music on track 4, going to track 3 when necessary for overlaps or tight transitions. Put music in tracks 1 and 2 only when it is the sync track (live recording or playback), without which there would be no audio. Cut music in mono to save tracks, since it can and will easily be replaced later on.

• Know your digital audio sample rates and choose them with care. I think it's pretty appalling that the user guides of the nonlinear picture editing systems most popular with feature films have almost nothing written about sampling rates in clear, practical terms. To wit, can you tell me what the sample rate of your system is when referenced to NTSC video? Look in your manual and see if it sheds any light or advice; I doubt it.

Clearly, the long-term goal of those of us in film sound is to replace analog-to-digital and digital-to-analog conversions with digital-to-digital transfers whenever possible. This should, of course, start with the original production recordings (tapes today, who knows what tomorrow) that end up on the hard drives you edit on. One day, it will be standard for sound editors to get those drives from the picture-editing department, allowing us to open up edits without

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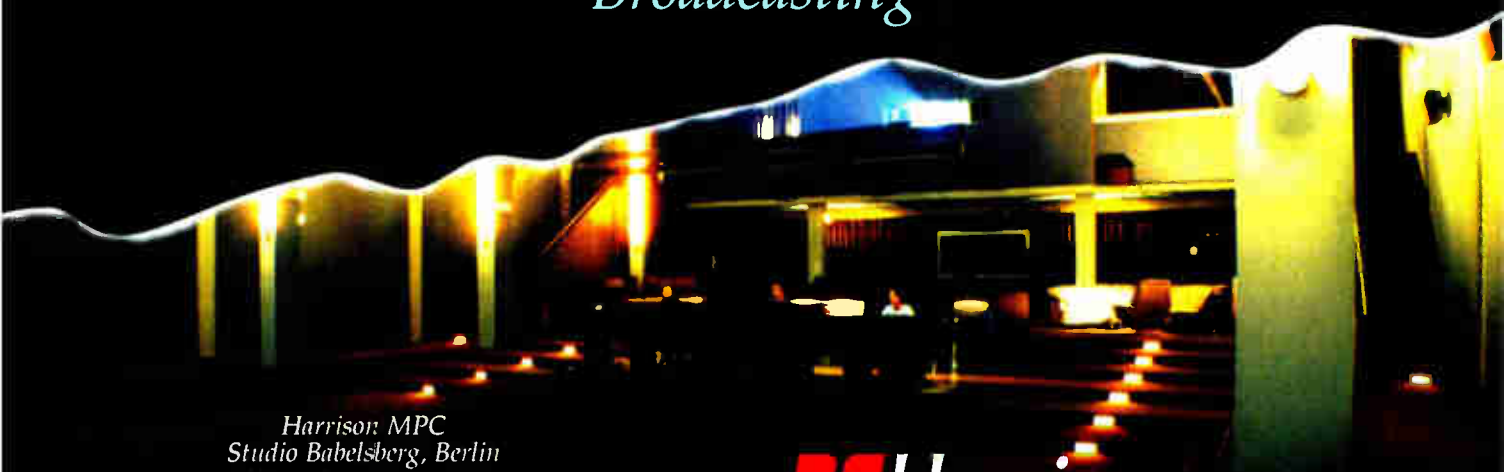

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having to re-transfer a take.

Let's concentrate on the picky underlying principles of how production audio can be transferred digitally to the nonlinear edit system. Issues of timecode are purposely left out of this discussion because digital audio sampling rates have a tenuous and bizarre relationship with timecode frame rates and film frame rates: You can mix and match them. The key thing to remember is that you can do D-to-D transfers only as far the relationship of sample rate to camera speed remains constant.

For example, if the production mixer records with a DAT or MDM at 48.000 kHz (the standard rate of most non-timecode digital decks when you simply go into record) relative to 24.00 frames per second in the field, you can do a synchronous digital transfer into your nonlinear edit system *only* if your sample rate is 47.952 kHz when using an NTSC telecine of your film. Because the film was slowed down 0.1% during telecine, and thus the film speed was 23.97 frames per second, your sample rate at NTSC play speed needs to reflect this change. (The math is similar when working at the 44.1kHz sampling rate: Use 44.1 in the field, slowing down the sample rate to 44.056 when cutting to an NTSC telecine transfer.)

In case it needs to be stated, never run your audio at a sample rate less than 44.1 kHz.

Carrying the equation to my field of post sound, we can accept audio from you digitally only if our sample rates are the same. Therefore, in the equation noted above, if we run our workstations at 48.000 kHz referenced to NTSC color, you can't give us your worktrack on a DAT that was transferred digitally from your edit system, because when we load it into *our* workstation D-to-D, it will be 0.1% too short since we will be playing back at the original 24 fps/48.000 speed.

The solution to the common problem described above is simple: Output your tracks to a digital deck in the analog mode, running at 48 kHz, simply pressing "record." The track can then be loaded into the sound editor's workstation digitally. Remember to always use consistent levels when outputting in this manner.

The above scenario is very common, and this is why it makes sense to run nonlinear picture and sound editing systems at 47.952 kHz at NTSC speed. An equally solid solution is to run digital recorders in the field at 48.048 kHz/24.00 fps, where nonlinear edit systems would conform to the 48.000kHz NTSC digital videotape standard. This would be most notably useful when making programs destined for online editing and indeed when doing all post-production audio for a feature film digitally through a digital console.

Re: working at 44.1 kHz. There is really very little reason to do so since *any* DAT machine is capable of 48kHz recording (via analog or digital inputs), something that cannot be said of 44.1, which some machines can only record and play back digitally.

In case it needs to be stated, *never* run your audio at a sample rate less than 44.1 kHz. The hard disk space that you're saving is just not worth the sound quality loss.

• Be consistent with your version numbers. I have always found it best to change version numbers with each screening or preview, with the first changes that you do after them to a new number. Thus, the day after the version 7 temp, you should do a "save as" V8.0. If you turn over videotapes to us as a specific version, and then you do a change in the track only, increment the version with an alphabetic suffix only, as in 8.1a tells us that the version 8.1 videotape is still good.

As always, *ask* a lot and assume nothing. I hope this two-part letter has been of help to picture editors and assistants, and I'd appreciate your sending favorite sound/picture interface stories to PO Box 24609, New Orleans, LA 70184; fax 504/488-5139, or via e-mail: swelltone@aol.com.

However, please note the following "Larry Blake FAQ," which will be of help to both of us: I will never recommend pieces of equipment ("could you tell me of cheap workstations for PCs," or "can you recommend good speakers for surround sound"), nor will I tell you anything about any recording school (because I've never attended them; you should be talking to their alumni). Also, please don't ask questions about how you can break into film sound or sound recording in general, or how you should go about changing your career. I don't mean to sound rude, but there is simply no answer to those questions, or none that I know of other than to find an apprenticeship position at a place nearby. And with regard to books of mine that will be published at some point before the next millennium, keep posted to this column for future updates. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be that it can be so miserably hot there that he can always pull rank when his wimpy friends in L.A. complain about the smog-filled dry air that passes for summer heat.

—FROM PAGE SEP 35, HASTINGS

the source sounds that I had of the jails themselves had a certain amount of natural reverb on them."

Much of Hastings' staying power in the sound-for-feature-film business can be attributed to Sable's reputation for editing effects and dialog and his knack for keeping up with the latest editing and dubbing technology. In the mid-1980s, he began easing away from Moviolas and started editing effects digitally, first on a Compusonics and then on a PC-based ASR system. From there, the assembled sounds would be dumped to 35mm mag before going into the mix. "Then, three years ago, this whole digital thing took off. Sound One and C5 began buying Sonic Solutions in bulk. So we got some, too," says Sable. Today, Hastings' five-room facility features eight Sonic Solutions digital audio workstations, seven of which are SSP-based, and one of which is a USP system. However, Sable still makes use of the magneto-optical drives on his two ASRs to archive sounds.

Hastings' loading/layback room, which is presided over by Sable's daughter, Lynn, houses an 8-track Sonic Solutions USP system, a Tascam DA-88, Otari MX-5050 and MX-30 analog tape decks, a Panasonic SV-3700 DAT, a 16-channel Spirit Folio 4 mixing board, an E-max sampler, Apogee AD-500 A/D converters (which serve as a clock source for four systems) and Tannoy monitors. "The most important piece of gear we're using, like every-

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one else, is a DA-88 for dumping our EDLs for mixing sources," says Sable. "At the same time, we're also running Sonic in the mix in case we have to make any changes." Hastings will typically prepare an 8-track master on DA-88, which will generally get mixed at Sound One or Todd-AO East. If any Foley work has to be done, Sable will often track it at Sound One, as well.

Sable's editing room contains a 4-track Sonic Solutions SSP workstation, a Macintosh Centris 650, the ASR, an Otari MX-5050, an S-VHS deck for referencing picture, and a pair of Tannoy PBM-6.5s and a Mackie 1202 board for monitoring. Hastings' three other editing suites are similarly equipped with Sonic Solutions DAW's and S-VHS or ¾-inch videotape decks.

Having been supervising sound editor on more than 50 feature films, Sable has amassed a library of more than 40,000 sound effects. To keep track of them all, he uses an IBM-based sound effects database program called Professional Librarian from Leonardo Software. "It also has a cue sheet program, which can import the EDLs from Sonic and print out the cue sheets for us so the editor doesn't have to make one up," Sable explains. Typically, Sable will edit and EQ sound effects on the Sonic and then dump them to a DA-88, where they will be laid in for the final mix.

On his current project, *Joe's Apartment*, a modern-day urban saga of a man and his roach roommates, Sable took his typical approach to sound design. "I make up a list of effects that I know I'm going to need, like little cockroach Foleys and splats. And then I'll spend a weekend or two at my home in the country, recording sounds with a Sony ECM-MS5 microphone and a Sony DAT recorder. It's quiet up there, and I have all the props I need." And what do cockroaches sound like? "Cockroaches should sound hard and squishy. So what makes those sounds? I got some macaroni and soaked it, and that made a kind of hard sound. It wasn't quite *al dente*, but if I started to move it around with my fingers, it got close to what I wanted. I also wanted something squishier to emulate when there's mass movement of cockroaches, so I used some grapefruits. For the wing-flap sounds I did what I usually do, taking a book, flapping it around, speeding it up and EQ'ing it."

Another project that Sable and his crew were hard at work on was Herb Gardner's upcoming film *I'm Not Rappaport*, which stars Walter Matthau and Ossie Davis. "It's mainly a dialog film since it's based on Gardner's play," Sable explains. "There are some key effects in there that establish a mood. Most of the film was shot in Central Park, so there are some standard things like kids, birds, bicycles, roller blades, and since it is Central Park, there's also a jet or helicopter flying overhead." To avoid giving the aural impression that Central Park is a forest in the middle of nowhere, Sable also added sirens, garbage trucks, jackhammers and car horns.

Hastings' extensive list of feature film credits and its investment in digital audio technology have positioned the studio among New York's leading sound-for-picture facilities. "All of us working here come from film and bring everything we know and all the experience that we have to the digital realm," says Sable. "But we still think and work in the same way in terms of performing the same procedures and having a rapport with the people on the picture side." ■

Actors Susan Sarandon and Sean Penn discuss a scene with writer/director Tim Robbins on the set of Dead Man Walking.

PHOTO: DEMMIE STODD/COURTESY GRAMERCY PICTURES

Evan Ambinder is a Mix *contributing editor.*

—FROM PAGE SFP 35, ADMUSIC

have become the owners of Admusic. Hampton, who came to work for the company in 1984, has a degree in music and is a self-described "guitar guy." He's also known for his special brand of jazz, dubbed "Sprint Jazz" by his colleagues, for the more than 100 Sprint ads that he's scored.

Adair joined up with Admusic five years after Hampton. He, too, has a degree in music composition. He started out aiming for a career as a symphonic clarinetist, but working his way through college as a musician, he was exposed to all styles of music and learned to play guitar and saxophone as well as clarinet. He's an ardent jazz aficionado, but his first love is rock 'n' roll, and that's evidenced lately in the campaign for Budweiser featuring indie rock bands. "I've played rock, folk music, classical, jazz and in big bands," he laughs. "And it all ended up being part of what I do now."

With the help of producer Pat Weaver, Hampton and Adair showed me around Admusic, which is also the home of composers Martin Lund and Graham Anderson and senior producer Korbin Kraus. The facility's in-house studio features a DDA AMR 24 console and outboard gear including Summit, Neve and API 550A EQs, and LA-2A, LA-4A and 1176 limiters, and an extensive customized sample library. There is also a Sonic Solutions and Digital Performer-fitted pre-production/composition room where bands sometimes jam on a basic track. Admusic tends to make full use of the building's capabilities: things like miking a drum kit on the patio or whatever else it takes. Another feature the facility is proud of is its ISDN capability, which has been used lately on projects for New Miller Beer, Comet and Nike, regularly linking to sites in New York, Chicago and as far away as Germany.

How do they structure a project? "Most times it's a post score," says Adair. "We'll talk with the client about general direction, throw around ideas and various approaches, then we'll get a rough cut and score to that. We mix the music here, and then they'll take the music, generally a stereo DAT, or on a DA-88 with a stereo mix and whatever separate elements that make sense, to their film mix to use with the other elements. We spend a lot of time and take a lot of care on our mixes; we get as close as we can to record levels, given that we don't have a lot of time to work with."

"It's tricky," adds Hampton. "We are constantly trying to figure out the connection between what we do and what we hear on the air. There are so many variables, from the final mix to the dubs to the compressors and EQ at the stations and it changes from station to station! More than one evening, I'll see a spot on one channel and think, 'Wow, that's great,' and I'll see it on the next channel later that night and go, 'Oh man, how could this be?'"

"Half the time you have to be a film scorer," interjects Adair, "so you are creating something that they can feel but not really hear, and if it calls attention to

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itself, it's blown it. The other half of the time you are producing little records, 30-second songs that have all the integrity of a record production. Now, frequently, what you have to do as well is be historical archivists. For many productions, it's no longer satisfactory to just hear the notes, the client wants to hear the exact recorded sound of whatever era's music you're writing. And that makes sense, because our cultural memory is triggered by sound as well as music. Take the surf sound: For the surf tracks we've done, we have an old RCA ribbon mic that we put up. We get a mono drum sound, then compress it to kingdom come. We'll use old beat-up tube amps that sound great, and when we mix, we may mix everything mono and use tape slap instead of digital gear."

You might call these guys musicologists—one day they're writing for an orchestra, the next day it'll be stripped-down grunge. "We have to know how to relate a concept to its musical realization, and we have to be conversant with the production techniques for those time periods, from Duke Ellington to vintage '60s hi-fi," says Adair. "Someone came in the other day with a request to sound like an old field recording—something like the Smithsonian collection of Delta blues!"

"Then, of course, with having to do all that, we have to do it really fast!" laughs Hampton. "So it's a fine line between leaving ourselves time to experiment and try something cool—to not just crank it out but also to be really efficient and to not take too long. Our crew of engineers is a big part of that; they are great."

The two have also been working on projects in other areas besides advertising, scoring *Just Shoot Me* for TV (that will air this fall), a feature film, an installation at the Olympics and several interactive projects. That's part of the reason they decided to buy Admusic. "We wanted to bring all of our different creative efforts under one roof and coordinate it," explains Adair. "There's a lot of wonderful cross-pollination when you are working in different media simultaneously. We've also been doing a lot of record and song production, and we're connected with a lot of really talented people—we have a lot of resources. We want to keep Admusic and our commercial business going, as well as move toward a bigger picture, adding these other things. The industry is going this way, I think. It's not like all the TV guys are over here and the ad guys are over here—everybody is crossing back and forth a little more now. Things are changing for composers."

Adds Hampton, "You can't stay in tunnel vision in music, in one little niche. We like to have a bunch of different work going on and a lot of really talented people working together. Like on the Budweiser campaign, we've been flying around the country and recording mostly indie bands—all really happening bands, tops in their area.

We've always approached the work we do as a music project, even though it's an ad, because that's where our passion is. And we're finding there's more translation across the fields than we ever thought there would be—being composers is a big part of the job, but another huge part is your client skills."

"The basic skill with clients or bands is the same thing," concludes Adair. "It's being able to listen to them well enough to understand what it is they are really trying to achieve, and then helping them get there. It's about getting inside their heads and figuring it out and then helping them get it on tape." ■

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New Products For Film/Video Sound

AKAI 8-TRACK DUBBER

Akai Digital (Fort Worth, TX) has announced its new DD8 8-track digital recorder, a random-access digital film dubber designed as a plug-and-play replacement for Tascam DA-88s. The DD8 has a 2.6GB magneto-optical drive, allowing for easy removal of data and complete compatibility with Akai's DD1500 recorder/editor. The DD8 eases the transition from tape-based digital dubbing to random-access MO by offering analog I/O on a DA-88-compatible 25-pin D-sub connector. Further options include 8-channel TDIF I/O and connections for a Tascam meter bridge and a Tascam sync interface. Eight expansion slots are available for a variety of timecode, networking and I/O interface cards. Delivering in the fourth quarter of 1996, the DD8 is expected to retail for $5,000.

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MIDAS XL4 BROADCAST MODULE

Midas (distributed by Mark IV Audio, Buchanan, MI) offers a new broadcast version of the XL4 console's communications/monitoring module. Developed in association with Sono Studiotechnik in Germany, the new module provides greater flexibility for monitoring and adding external signals to the XL4 system busing. Features include separate PFL and Solo, PFL input and output level control, two external inputs to the PFL system, outputs for external metering, PFL Solo monitoring on headphones and a switchable 1kHz oscillator.

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EV CINEMA LOUDSPEAKER

Electro-Voice (Buchanan, MI) is delivering its TS992-LX, a THX® approved speaker system for cinema installations. The TS992-LX achieves flat 40 to 20k Hz performance from a 15-inch woofer and DH2As1 HF driver, combined with a THX-

designed electronic crossover. As a plus, the system enclosure is only ten inches deep, which reduces the screen-to-back-wall distance to only 34 inches.

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TIMELINE TIMECODE TUTOR

TimeLine (Vista, CA), designer and manufacturer of synchronization and machine control systems, has published an updated and expanded version of its tutorial on timecode and related topics, *SMPTE Made Simple, a Timecode Tutor From TimeLine*. The new 70-page edition includes a glossary of industry terms and system diagrams for sample applications, and is available free from TimeLine dealers.

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LAFONT TRANSFER CONSOLE

The Lafont Audio Labs FTC84 Transfer Console (distributed by Sascom Marketing Group, Oakville, Ontario) is a dedicated 18-in/8-bus/4-monitor LCRS film and video audio post-production mixer. Designed primarily for machine room installation, the FTC84 features a high gain audio structure (+27dB) adequate for transfer operations among all format film and video formats. The in-line design offers comprehensive solo functions and signal and tone routing and features front panel calibration controls for all signal paths. The rack-mount unit offers nine dual-input modules and a master module section, plus a separate rack-mountable VU metering section. Faders are 100mm conductive plastic; rotary pots may be specified for vertical mounting.

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KYMA UPGRADE

Symbolic Sound Corp. (Champaign, IL) has upgraded the Capybara sound processing and synthesis engine for its Kyma sound design workstation; the price of the entry-level Kyma system has been dropped to $4,400. The new Capybara-66 features double the clock speed and four times the memory of the Capybara-33 hardware it replaces. Current Kyma users can upgrade to the Capybara-66 format. Capybara-66 is an external rack-mount processor with eight expansion slots for cards containing Motorola 56002 DSPs and 3MB of RAM; the system provides sound designers with a software-

based modular synthesizer, sampler and effects processor that can be graphically controlled from a Mac or Windows PC. The entry-level 2-card Kyma system is now one-third more powerful than the previous 3-card system, has four times the sampling RAM, but is 12% less expensive.

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PORTADAT SYNC OPTION

HHB Communications (Portland, ME) has introduced the MS1000 master sync option for the timecode PortaDAT PDR1000TC. The MS1000 provides accurate synching capability between the PortaDAT and timecode film cameras (no more than one frame of drift per ten hours) and is compatible with Aaton cameras via Lemo sockets. The MS1000 also provides the ability to pull up the 29.97 frame rate drop or non-drop to 30 fps.

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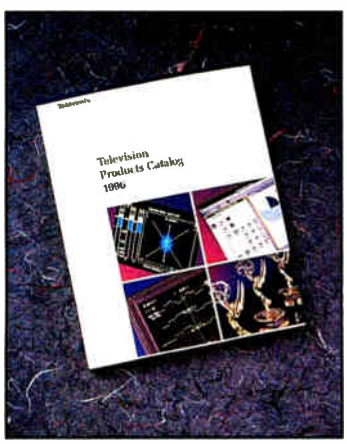

TEKTRONIX CATALOG

Tektronix (Beaverton, OR) offers its 1996 Television Products Catalog. The 224-page soft-cover catalog indexes products both by name and by function and features new products designed to meet customers' needs for video and audio signal analysis in the emerging areas of MPEG compression, RF transmission and serial component video. Extensive application and technical notes are available via a toll-free number, and readers may order the catalog direct from the Tektronix Web site, at www.tek.com/measurement.

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OTARI 360-CD CHANGER

The CDC-0600-2C CD auto changer from Otari Corp. (Foster City, CA) is a two-disc changer capable of storing up to 360 CDs. Designed for broadcast, sound effects storage and retrieval, and background music applications, the CDC-0600-2C features RS-422 and RS-232C interfaces, allowing for remote control of automated track selection and alternate or simultaneous playback functions, and multiple CDC-0600-2C units may be linked for a centrally controlled system. An optional instant-locating RAM board provides nondelayed start-up.

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SOUND FINDER MMC SOFTWARE

Sound Finder by AP Soft (distributed by Sascom Marketing Group, Oakville, Ontario) is a MIDI Machine Control-based software package that can instantly locate and play any sound cue residing on an MMC-compatible storage device. Designed for theater, post and A/V production applications, the system can run three machines simultaneously, including hard disk recorders and tape-based systems that support MMC. Sound Finder's "point and click" architecture eases production and editing of multiple catalog files, each of which may contain up to 128 sound events. Cue lists may be updated or edited from external devices via MIDI program-changes. The Mac software is $399; a Windows 95 version is slated.

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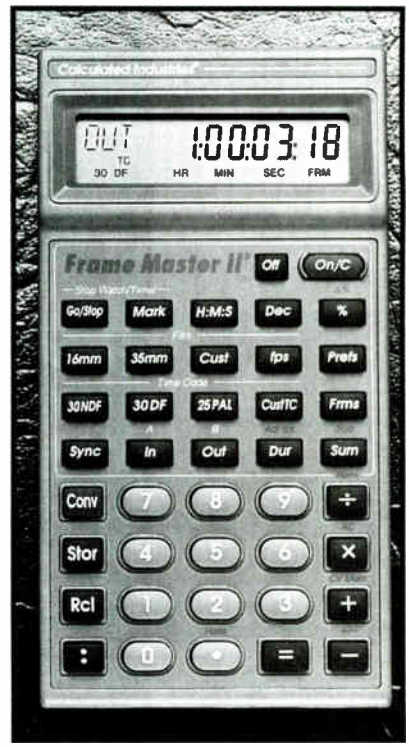
NAGRA-D V2.0

Nagra U.S.A .(Nashville, TN) has released software Version 2.0 for the Nagra-D 4-channel digital recorder. New features include a 96kHz recording option, mirror copy and take number erasure. Mirror copy automates copying between two Nagra-D recorders and copies all directory information and auxiliary data via the two RS-422 ports. The take erasure function allows users to only keep useful takes in the tape directory by allowing the erasure of false starts and unwanted takes. The new software also contains timecode assembly functions, write-protect and an absolute recording time display.

Circle 200 on Reader Service Card

TIMECODE CALCULATOR

The Frame Master II™ timecode calculator from Calc- ulated Industries (Carson City, NV) performs the most needed film and video calculations, including: NTSC/SMPTE timecode (drop and non-drop frame); PAL/SECAM timecode; real-time (hrs:min:sec); 16mm, 35mm and custom feet-frames; and user-definable timecode. The handheld unit converts all formats and includes a stopwatch timer that counts in real time, timecode and feet-frames. The unit will find matching edit points, even in different media and has a telecine-adjusted run time function. Price is $129.95.



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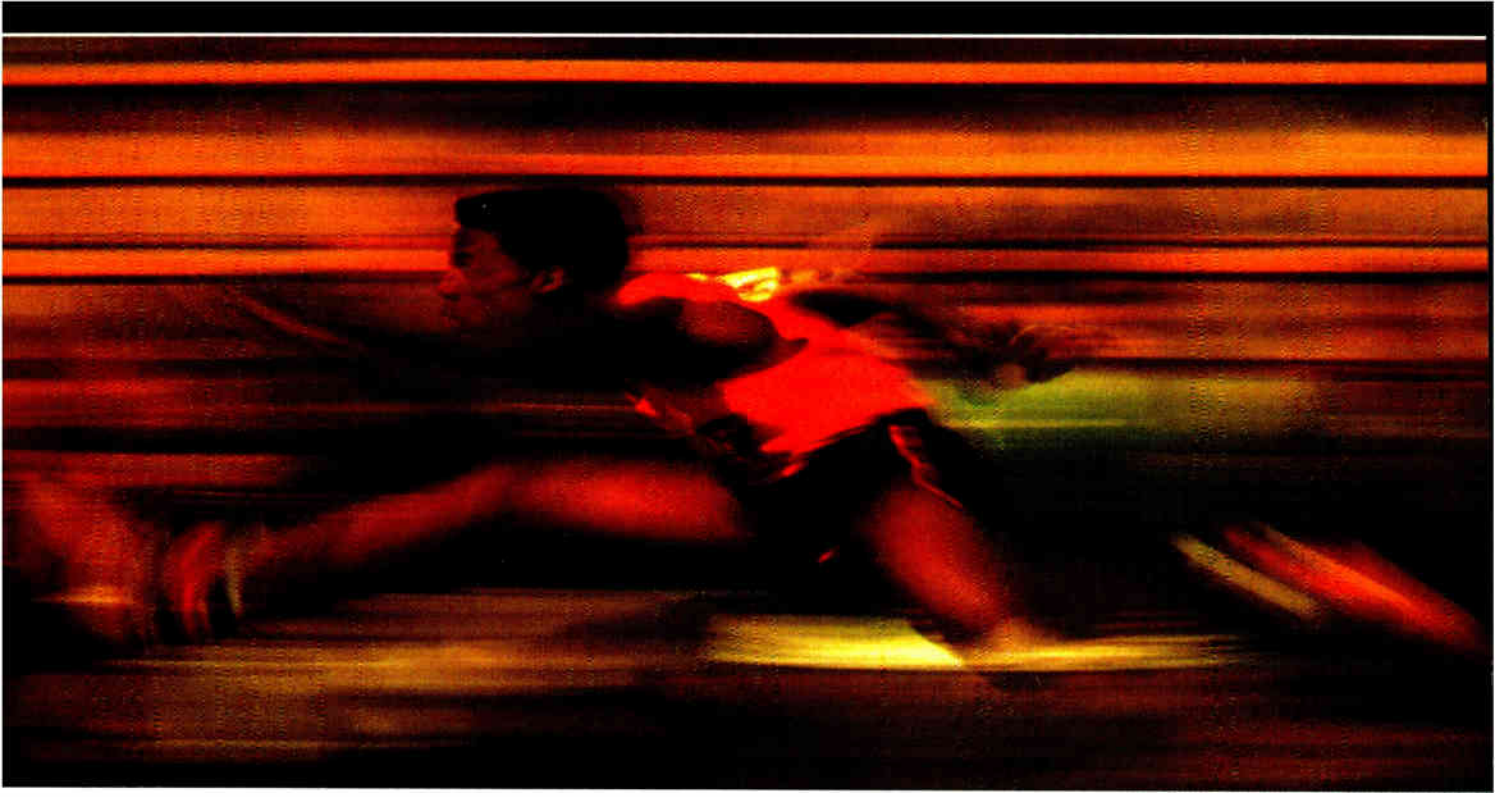

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Broadcast & Post Production

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PREVIEW

ARX PHANTOM SUPPLY

ARX Systems (Victoria, Australia) has released the Phantom Plus, a 4-channel stand-alone 48VDC phantom power supply unit. Housed in an all-steel 1U rack-mount chassis for maximum EMR rejection, the Phantom Plus is designed specifically for microphones and DI boxes that require a reliable ultralow-impedance, regulated DC power supply.

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DIGITECH STUDIO 400

The Studio 400 4-in/4-out multi-effects processor from DigiTech (Sandy, UT) is a 2U device powered by two of DigiTech's S-DISC™ processors and can handle up to eight effects at one time, in any order. Featured are 191 factory presets and 100 user locations including multiple reverbs, delays, choruses, flangers, auto panner, pitch shifting, compression, detune and more. Four independent inputs and outputs are accessible via balanced XLR and ¼-inch connectors; an optional digital I/O provides access via AES/EBU and S/PDIF interfaces. Price is $869.95.

Circle 227 on Reader Service Card

STUDER CD RECORDER

The D741 CD recorder from Studer Professional Audio AG (Regensdorf, Switzerland) is designed for professional studio and mastering applications. Interfaces include analog I/O; AES/EBU and S/PDIF digital I/O; and SCSI-2. Sampling may be switched to match any digital source between 32 and 48 kHz. ISRC codes and catalog numbers can be entered via front panel alphanumeric keys. The SCSI-2 interface allows the D741 to be controlled by digital audio workstations for production of CD-I, CD-ROM XA and CD-BRIDGE format media.

Circle 228 on Reader Service Card

SOUND FORGE PLUGS IN QSOUND

Sonic Foundry (Madison, WI) has teamed with QSound Labs to create three new tools for Sound Forge, the Windows-based digital audio editor. QTools/SF™ comprises three tools: QSYS/SF, which allows placement of mono sound files in a stereo field; QXpander/SF, which can dramatically widen existing stereo images; and QSRC/SF, a high-definition sample rate converter. Download the demo from the QSound Web page at www.qsound.ca.

Circle 229 on Reader Service Card

RANE MOJO SERIES

Rane Corporation (Mukilteo, WA) has introduced the economically priced Mojo Series of 1U signal processors. The MQ 302 is a 30-band ⅓-octave stereo graphic equalizer ($399). The MC 22 is a 2-channel compressor (linkable for stereo) featuring variable threshold and ratio and Rane's Acousticlear circuitry for improved S/N performance ($299). The MX 22 and MX 23 are stereo two- and three-way crossover units with additional mono subwoofer outputs ($299 and $399 respectively). The MH 4 is a 4-channel headphone amp ($299). All Mojo Series units (except the MH 4) are supplied with balanced XLR connectors; MQ 302 and MC 22 also include balanced ¼-inch jacks.

Circle 230 on Reader Service Card

QUESTED MONITORS

Quested Monitoring Systems (distributed by Independence Audio, Mazomanie, WI) introduces four new monitor systems. The VS2205 is a self-powered near-field speaker with two 5-inch woofers and a 28mm ferrofluid-damped softdome HF unit. The bi-amped system offers 150W RMS total and features switchable LF and HF contours. The VS2108 is a larger system with a single 8-inch woofer and a 28mm softdome tweeter and also offers switchable LF and HF contours. The integrated amp delivers 100 W to each component in the two-way system; a non-amplified version is available as the VH2108. The Quested VS1112 is a powered compact 12-inch sub-bass system.

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World Radio History

PREVIEW

OTARI CONCEPT ELITE

Otari Corporation (Foster City, CA) announces its new Concept Elite for music and post recording applications. The digitally controlled analog console includes many features of the Otari Concept 1 console, such as dual input modules, snapshot and VCA automation, and adds new features including dual 4-band parametric EQ on input modules, moving fader automation, simultaneous track assignment from both module paths, and optional panning and assignment for multichannel film formats. The Elite's integrated PC manages automation functions, including image recall, which speeds the accurate resetting of all variable controls; and snapshot recall, which resets all switched console functions. September shipment of the Eagle automation package for the Elite and Status consoles has been promised. Available in 32-, 40- and 48-input frame sizes, the Elite is supplied with integral patchbay. Prices range from $98,000 (with moving faders) to $135,000.

Circle 232 on Reader Service Card

SHORTCUT PERSONAL AUDIO EDITOR

The Shortcut™ Personal Audio Editor™ from 360 Systems (Westlake Village, CA) is a stereo digital editor optimized for quick editing of talk radio, news, promos, etc. Completely self-contained with mic preamps and built-in monitor speakers, the unit features full cut/copy/paste editing via dedicated buttons, multiple clipboards and precision scrubbing. Other features include backlit LCD waveform display, "Bleep" button for inserting tone or a recorded message over obscenities, AES/EBU and S/PDIF digital I/O, analog +4dBU I/O and a printer port. Price is $2,995 for 1.5 hours of storage, $3,495 for 3 hours of storage.

Circle 233 on Reader Service Card

GILTRONICS TUBE PREAMP

The 356 AT by Giltronics (Kauai, HI) is a 2-channel all-tube unit with a mic pre and line amplifier in each channel. All four inputs and four outputs are transformer-balanced XLR. Claimed frequency response is 20 to 20k Hz ±0.2 dB. Front panel controls include input sensitivity, 20dB pad, mic/line internal link and phase invert, as well as switchable phantom power. Versions with four mic preamps (model 4TMP) and four line amps (model 4TLA) are available. Price of the 356 AT is $2,850.

Circle 234 on Reader Service Card

SONY MDM TAPE

The DARS-MP Series digital audio tapes from Sony Electronics, Recording Media and Energy Products Group (Oradell, NJ) comprise 30-, 60- and 113-minute tapes. Designed for the Sony PCM-800 and Tascam DA-88 MDMs, the DARS-MP Series features advanced coating technology to orient metal particles for optimum performance, and a new binder system for improved tape durability and reduced drop-outs.

RECONFIGURABLE PREWIRED PATCH PANEL

The PatchLink™ NYS-NPP ¼-inch modular patch panel system from Neutrik USA (Lakewood, NJ) is a self-contained, fully wired, printed circuit board (PCB) patch panel in a 19-inch 1U rack-mount case. Two rows of 24 ¼-inch jack sockets on both front and back panels mate with standard RS-453 plugs. Vertical pairs of sockets on the front panel are connected via a PCB to the corresponding rear panel pair; configuration of normaled and split signal distribution may be modified by reorienting linked pairs of jacks and their attached PCB in the rack.

Circle 235 on Reader Service Card

TANNOY SYSTEM 600/800

The System 600 and System 800 near-field speakers from Tannoy (distributed by TGI, Kitchener, Ontario) feature phase-coherent dual concentric drivers and octagonal, landscape-oriented cabinets. The System 600 features a 6-inch driver, the System 800 an 8-inch driver. Both units will handle up to 150 W. Quoted frequency response is 52-20k Hz for the 600, 47-20k Hz for the 800 (±3dB).

Circle 236 on Reader Service Card

World Radio History

PREVIEW

MILES MPR-450 AMP

Miles Technology (Niles, MI) introduces the 6-channel MPR-450 power amplifier, a two-rackspace unit providing six independent channels of amplification for a total power output of more than 450 watts continuous. Rear panel switches allow the six channels to be bridged in pairs. Rated at 60 watts into 8 ohms, each MPR-450 channel delivers 75 watts into 4 ohms (150 watts into 8 ohms bridged).

Circle 237 on Reader Service Card

SPIRIT FOLIO NOTEPAD

The Spirit Folio Notepad from Spirit by Soundcraft (Auburn, CA) is a miniature mic/line/phono mixer boasting many professional-quality features for only $249.95. The four mic inputs offer 50 dB of gain, will accept line-level signals and feature 2-band EQ. The two stereo line inputs include switchable RIAA preamps for use with turntables. A post-fade aux send is available on every input, as is 48V phantom power. Separate mix and monitor outputs, peak and VU metering, headphone output and a stereo effects return bus provide the necessary features for both FOH and recording applications.

Circle 238 on Reader Service Card

QSOUND PLUG-INS FOR PRO TOOLS ARE PCI-COMPATIBLE

QSound Labs (Calgary, Alberta) has upgraded its plug-ins for the Digidesign Pro Tools platform; both QSYS/TDM, a mono-to-3D localization tool, and QX/TDM, a stereo soundfield enhancer, are now compatible with PCI-based Macintosh computers. The new versions will run either on NuBus or PCI machines. QSound is also now shipping the QX/SDII plug-in for Digidesign Sound Designer II. QX/SDII enhances the QXpander soundfield enhancer with the addition of a highpass process filter for improved mono compatibility and an output meter for the newly refined dynamic compensation module. QX/SDII is priced at $295; registered QSound owners may upgrade QSound's Pro Tools or SDII plug-ins for a small shipping/handling fee.

Circle 239 on Reader Service Card

HOT OFF THE SHELF

E-mu offers an ADAT sync option card for the Darwin digital hard disk recorder. Featuring two ADAT-compatible 9-pin connectors, the sync option card allows a Darwin to be interfaced with any ADAT-compatible machine or controller, or can sync up to 16 Darwins together. 408/438-1921...**Switchcraft has expanded its Micro-Plug® series** of subminiature two-conductor phone plugs with seven new models. Available in locking and non-locking versions, the plugs feature a wider insulator between tip and sleeve to prevent shorts during insertion. 312/792-2700 or visit www.raytheon.com/re/swc.html...**Pinnacle Micro's new Explorer CD recorder** is $799. The internal 5.25-inch half-height CD-R system (2x recorder, 4x player) for PCs comes with Easy-CD software from Adaptec (Incat) designed for novice users, a backup utility and a blank CD. 714/789-3000 or visit www.pinnaclemicro.com...Juice Goose has two **new rack-mount 20-amp power distribution and voltage spike protection products**. The Rackpower 100-20A™ ($260) and Rackpower 200-20A™ ($329) feature eight power outlets, a multistage filter pack and three-way voltage spike protection covering hot, neutral and ground. 713/772-1404...Studio Audio's **SADiE digital editing system** is compatible with MO recorders from Studer and Genex. Recordings made on both the Studer D-424 and Genex GX-2000 magneto-optical recorders will be instantly editable on the SADiE system without further transfers. Call 615/327-1140...**Passport Designs Encore composing and publishing software**, Version 4.1 features dozens of new synth presets and a pitch indicator that identifies notes by name and octave. Priced at $595, Encore 4.1 is available as an upgrade to registered users for $49. Call 415/349-6224...**The WHo DId THaT Music Library** includes compositions by award-winning artists and has 311 separate cues on 15 CDs. 310/442-1444...Now shipping: Version 5.0 of **Cakewalk Music Software's** entire Cakewalk line. Registered Cakewalk users should contact Cakewalk Music Software directly for upgrade information. 617/926-2480...**The Music Bakery adds five new categories** to its catalog of buy-out production music. All CDs are encoded with AirWorks Media's Tune-Builder self-editing music software. A free demo CD is available from 800/229-0313; or download excerpts from www.musicbakery.com...**The Hollywood Edge** announces *Animal Trax*, a ten-CD collection of animal noises and sound effects. 800/292-3755.

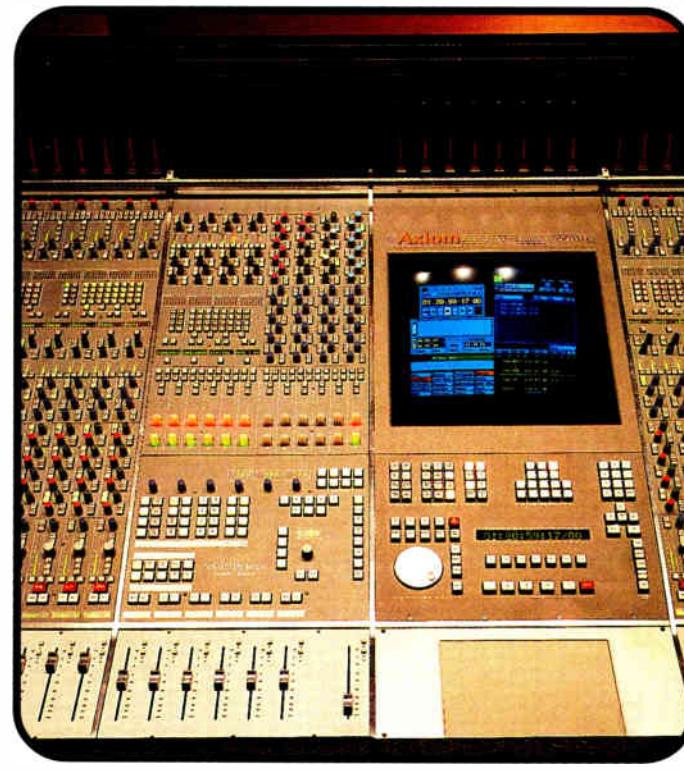
CORRECTION

Our July "Hot Off the Shelf" omitted the phone number for The Sterling Preamp, which allows studio interfacing of any ¼-inch mono signal to Leslie® 122 and 122A speaker cabinets. It's available through C.A.E. (415/348-2737). The company also supplies footswitches, tubes and replacement parts for Leslie speakers.

World Radio History

SOLID STATE LOGIC AXIOM

DIGITAL PRODUCTION SYSTEM V2.0



From its inception, SSL's Axiom was designed to make the user's transition from analog to digital as painless as possible. Axiom is laid out to look and behave like a conventional console, but with some elegant extra functionality.

In developing Axiom, Solid State Logic started with a work surface that resembles familiar analog designs, then listened carefully to user reactions. With the introduction of Version 2.0 operating software, Axiom has made the transition into a powerful, compact yet extremely flexible multichannel mixing and processing engine, which also features a random-access hard disk recorder/editor. In many ways, access to a digital production system such as Axiom will revolutionize the way that recording, broadcasting and production facilities compete with one another.

SSL's key design aims for Axiom were threefold. The company sought to provide a control surface that offered a single knob per function; large-scale integration of hard disk storage and retrieval; and the ability to set up and recall a variety of user configurations that mimic familiar, analog-based topologies.

In essence, Axiom is a fully digital, fully automated mixing system that can be supplied in console frame sizes from 48 to 96 channel sources, with up to 128 channels of integral DiskTrack hard disk audio storage/editing. A typical music-recording configuration might consist of a 48-channel control surface, 48 tracks of DiskTrack, 56 analog-format I/Os, 24 AES/EBU-format digital I/Os and 24 remote mic preamps with built-in A/D converters. Analog and digital I/Os can be expanded using additional Remote Input/Output stations (RIOs); mic preamps/ADCs are also expandable in blocks of 12. Analog RIOs offer between eight and 48 inputs/outputs, expandable in increments of eight I/Os. Digital RIOs provide between 24 and 96 I/Os (in AES/EBU pairs), expandable in increments of 24. Sample-rate conversion (SRC) is standard within the processor's eight channels of internal digital I/O and will handle any sampling rates between 25 kHz and 55 kHz. (Additional SRC digital input channels may be fitted to digital RIOs.)

Axiom is a synchronous system operating at a 48kHz sample rate, video-locked. (If unavailable, Axiom contains its own generator and can handle all sync distribution and timing, including RIOs and mic amps.) A patented HiWay link connects multichannel digital audio or sync information between RIO units 150 meters (500 feet) or more apart. HiWay comprises two coaxial cables that each carry 96 channels of high-speed multiplexed audio (96 sends plus 96 returns); a third cable carries Ethernet control signals. The 100-meter range can be extended via Ethernet repeaters. A new fiber-optic option, FreeWay, extends the remote audio capability to 2 km (1.25 miles).

A unique Resource Management System provides shared access to a comprehensive collection of analog and digital input and outputs, plus assignable hard disk storage; the combination offers a number of creative advantages, both in terms of enhanced audio quality as well as improved cost-effectiveness of operating a multifunction facility. Multiple Axiom systems can share audio storage and I/O resources. (By the way, Axiom's Resource Manager can also share resources with SSL's new SL9000 J Series analog board, and import J Series automation data. And the new Axiom Preparation Station–see sidebar–provides shared access to an Axiom's DiskTrack for recording, editing and inload. APS can also share I/O resources with an Axiom, thereby removing the need for duplication of hardware.)

On a cursory glance, Axiom resembles an automated SL4000,

BY MEL LAMBERT

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MORE HITS ARE MADE ON STUDER TAPE MACHINES.

The A 827 analog & D 827 digital recorders show that open-reel is an excellent business investment – and results demonstrate that Studer is the smartest choice of all.

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TAKE A LOOK at the production credits for *Billboard's* No. 1 singles, almost any week of the year, and you'll see the same story: *more hits are produced on Studer tape machines than on all other open-reel recorders combined*.*

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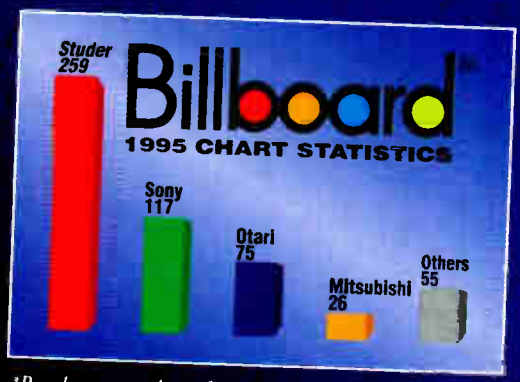

**Based on an analysis of Billboard's Production Credits charts for 1995, Studer machines are used on many more hit records than any other open-reel recorder ("Others" includes both open reel, MDMs and disk-based systems).*

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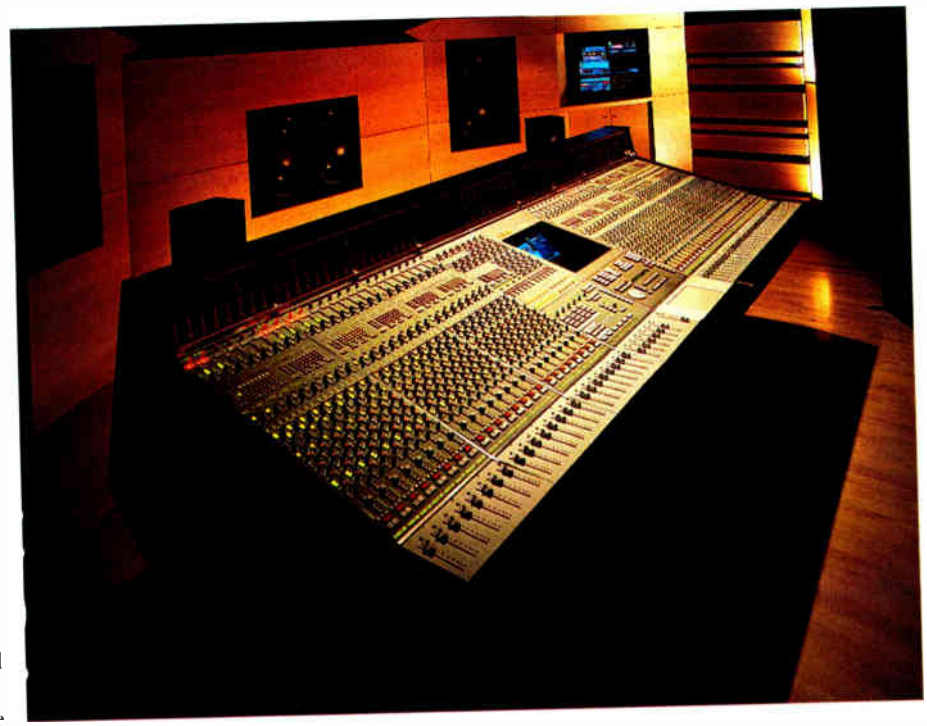
6000 or 8000 Series console; look closer and the differences become readily apparent. The mix automation and recall systems are an order of magnitude more comprehensive and, since the code was developed pretty much from scratch, offer an elegant and, to my mind, more transparent user interface than the much-modified G Series Studio Computer and Total Recall featured on SSL's analog designs. SSL's optional VisionTrack random-access digital video system eliminates tape spooling or lock-up delay, and adds the creative advantage of non-destructive video recording and editing.

In addition, the setting up of the entire console topology is controlled by a relatively simple set of user-programmable files within the central Resource Manager pages. In other words, a user can develop project-specific signal paths from a variety of inputs or disk tracks, connecting via assignable processing blocks, including EQ, dynamics control and effects processing. The combination of such assignable flexibility, an all-digital signal path and integral DiskTrack hard disk record/playback makes Axiom an extremely powerful, innovative and responsive system.



User controls are totally resettable, and feature circular LED displays that show the current settings of each knob. Channel-strip layouts and overall color schemes closely mimic those of existing SSL G/J Series analog boards. All of these assignable system parameters are scanned and updated either statically as system snapshots, or automated dynamically against timecode; it takes but a fraction of a second to reset the entire system. Moving-fader automation is standard.

Axiom employs a new design of remote mic preamp and converter in a RIO package. Each has 12 inputs and can be mounted remotely from the main processor; multiple units may be connected together to provide up to 72 microphone inputs using a single HiWay link. Each channel strip has remote preamp controls, input meter, input impedance adjust and 48V phantom powering. New for V2.0 is a useful insert function that drops a 16Hz or 60Hz highpass filter (3 dB down point) into the signal path. In addition, a new "unbreakable" limiter holds the input level with in a fraction of a dB of clip, without overload.

An Axiom Project File contains all the information necessary to reconstruct a specific project, including the console's working environment, and complements Exabyte tapes containing the audio records. Stored data includes audio files and take histories; audio fader grouping and channel names; automation modes and data; effects settings; serial machine configuration/records; snapshot memories; and source routing, plus patchbay configuration. Automation data can be edited using the built-in VDU, which displays time-dependent fader levels and other system data. For rapid changes in configuration between Projects, Axiom provides user-definable reset memories, in addition to macro functions and total dynamic automation.

DIFFERENT CONFIGURATIONS, DIFFERENT APPLICATIONS

Axiom is available in several versions, differing primarily in terms of channel-monitoring and related functions. The Music version provides Solo-in-Place and cut keys, together with provision for Solo-Isolating any channel. A Broadcast version uses two buses to provide console-wide stereo AFL and stereo PFL, and its record-enable function is relocated to one of the smaller input control keys. A Film Mixing version includes a Bus/Tape panel for 2-/3-operator configurations, with individual control of motion control, joystick panning, PEC/Direct switching and group masters at dedicated music, effects and/or dialog sections. A Surround Sound/Monitor Select panel provides selection of monitoring formats, speaker muting and other functions. Dynamic automation of surround-sound panning is also available on all channels.

Each channel strip has dedicated, nonassignable controls for a 4-band parametric EQ section; access to eight aux sends; a dynamics section (gating/compression/expansion/limiting); digital effects processing (integral reverb, delay and ambience programs); plus comprehensive panning between up to eight output buses or stems (dependent upon the application). Pan controls can be remapped via system software to provide stereo, LCR, LCRS or more complex panning; preset pan laws and output busing can be modified and stored for later use.

The EQ section provides four identical bands between 5 Hz and 20 kHz that can be set to highpass, lowpass, high-shelf or low-shelf profiles; a deep notch; or to one of four fully parametric settings. As well as determining the setting of each control from its knob position and markings, more precise information is available from Axiom's VDU screen, which automatically switches to display the settings for the selected channel. The 3-band dynamics section allows concurrent gating/compression, as well as sidechain linking, sidechain pre/post-EQ, and ability to copy settings between channels. Each dynamics section features a dedicated main-chain delay (up to

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1,000 samples) that provides feed-forward operation.

A dedicated effects processor can be called up by any channel strip, to provide time-domain DSP, with 24 reverb/echo/delay processors and 24 delay-only processors, assignable to any console channel. Operation of both reverbs and delays is click-free, enabling settings to be manually or automatically adjusted during a mix. An array of 64 preset buttons provide rapid access to favorite effects settings.

Delay time is continuously variable up to 1.3 seconds in 156ns steps (equivalent to 1/128th of an audio sample). Usefully, each control is geared in three stages to allow fast changes, fine and extra-fine adjustment. (In this way, spot mics can be set up to be truly time-coincident with a master pair, for example.) Assignable controls provide access to echo and reverb settings, including dry path, delayed path and reverb path; plus room size, RT60 and reverb filter characteristics. All delay and level balance settings may be dynamically automated and may be reset using snapshots.

A major upgrade for V2.0 is that users can now store up to 64 individually labeled EQ, dynamics and effects settings per operator; favorite parameter setups can also be offloaded to floppy drive for use on other Axiom systems.

Axiom can serve as a master controller for outboard audio and video transports via serial/parallel ports. Slaves can be offset to the master and can taken off/online as necessary. Available machine setups include DCTM (SSL's parallel interface used on its analog systems); VPR3 for TimeLine Lynx Modules and ATRs/VTRs; plus conventional Sony 9-pin.

Upon system initialization, the available DiskTrack storage is assigned to the control surface as one track per channel strip for replay, or direct recording to hard disk. Editing of different takes is also possible, via a simple "multi-take" or layer-based interface. Once digitized, input signals can be routed within Axiom to several destinations, while being si-

AXIOM PREPARATION STATION

INDEPENDENT AUDIO RECORDING/PRELAY

One of Axiom's advantages is its integral DiskTrack hard disk recorder/editor. For a number of applications, such as video and film post-production, there is the additional need to record, edit and prelay audio independently of mixing. The Axiom Preparation Station (APS) is a desktop unit that provides shared access to DiskTrack for recording, editing and prelay. APS can select up to 24 tracks from the maximum 128 available with DiskTrack; the remaining tracks continue to be available to Axiom. In a similar way, APS shares Axiom's I/O resources, removing the need for duplication of inputs and outputs.

Addition of an APS unit as an extension to DiskTrack frees Axiom for large-scale mixing projects, while allowing program preparation to be conducted in a cost-effective manner through shared resources.

The axiom Preparation Station provides: Audio recording, editing and prelay for up to 24 hard disk tracks (selected from up to 128 tracks available with DiskTrack); video recording to hard disk; audio conforming and reconforming to standard EDLs; and shared access to Axiom's inputs and outputs.

APS connects via two HiWay links directly to DiskTrack to access recording and routing resources. It comprises a high-resolution screen plus a pen and tablet interface with a keyboard. Audio import of third-party sound files includes Digidesign Sound Designer II (Pro Tools), Lightworks, Waveframe, Apple .AIFF and Microsoft .WAV.

APS can also directly read an EDL floppy disk, automatically load the required sounds from source tapes, then conform the audio to picture. List management and picture cueing facilities are provided for ADR and Foley. Multiple takes are made non-destructively, allowing any take to be auditioned quickly and simply. In addition to recording and editing audio, APS provides a number of automation modes. ■

World Radio History

If our marketing department had been as talented as our engineers, you'd probably be using a Prisma™ workstation right now.

The alternative workstation.

Okay, granted, there are already a lot of digital audio workstations out there. Some are so expensive that you can only afford one for six editors. Some are little more than PC sound cards that can't lock to picture without timecode drift. Some are so complicated that after you've bought a Mac™, 5 add-in boards, a bus expansion box and 12 pieces of software, it almost nearly works most of the time.

That's why you should explore our radically different approach. Admittedly, we're guilty of spending far more time perfecting our products than advertising them. But today, a growing number of major post production facilities and recording studios are reaping the benefits of our meticulous engineering. They also rave about our great service and quick support – available without having to wait on hold for hours.

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Prisma™ is our one-card hardware platform that frees up your CPU by handling all processing and signal flow on board. Its DSP capabilities are so massive that plug-ins aren't even an issue. Invest in Prisma hardware and then choose the Windows®-based software package that fits your applications and budget. Each has an elegant, hands-on interface that's free from frustrating pull-down menus, and floating window clutter.

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Express™ is a creative tool for broadcast and commercial production with a no-frills interface so simple to use that even a program director could learn it. It uses Producer's hot-key shortcuts to reduce the learning curve if you upgrade.

Producer™‡ takes the software recording studio paradigm to a new level. Its studio-friendly look and feel removes the impediments to creativity found in many current workstations.

StudioTracks™ **XP** has the tools you need for serious, hardball film and video post production, sound design, dialog editing and Foley work. XP stands for Cross Platform: StudioTracks runs on both Prisma and Spectral's even-more-powerful AudioEngine™ hardware, too.

Above: Producer Edit panel, below: Mixer panel

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*via linked CPUs

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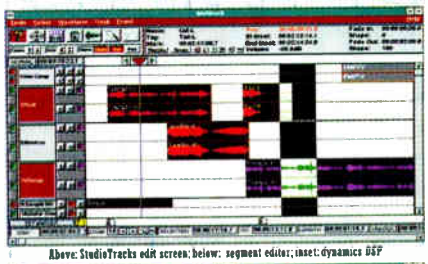
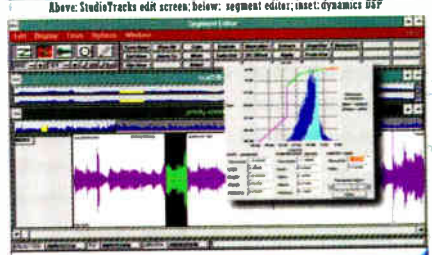
‡The software program Formerly Known As Prisma Music. Our ***previous*** Marketing Department did it.



Above: StudioTracks edit screen; below: segment editor; inset: dynamics DSP



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multaneously recorded to disk; in this way, you can record a dry, unprocessed signal to disk while simultaneously experimenting with various processed versions in a trial mix.

DiskTrack can also be accessed concurrently, allowing simultaneous record *and* replay from the same track, thereby dramatically streamlining drop-ins or pick-up recordings. As a buffer is provided ahead of the disk store, a late punch can be corrected simply by moving the nondestructive drop-in/out points, even after the event. Using a Free Play utility, audio can be replayed instantly by simply bringing up the selected channel fader. This is handy as an effects-playback track during post session, or for looping solos and backgrounds during a music date.

Axiom's control surface layout can be augmented with additional control elements, according to the specific application at hand. Mix-to-picture and film-dubbing facilities, for example, can be supplied with different application-specific control sections that feature familiar PEC/Direct switching and group masters for dedicated DME submixes, plus individual transport control and joysticks. Panning laws, output selection and control room monitoring are also available for various multichannel re-recording formats, including Dolby Surround, DTS, Dolby SR•D, SDDS and others.

ASSIGNABLE BANK SWITCING

Given SSL's "one control per function; one function per control" philosophy, an average module width may present problems for certain applications. In remote recording, broadcast trucks and small control rooms, space is often restricted. In a mix-to-picture session, we need to stay pretty much in the center of the console's surround-monitoring "sweet spot." For such applications,the ability to control a large number of inputs from a central position offers significant advantages.

SSL's solution was simple: Retain the one-control-per-function design, but extend their use when space/gymnastics restrictions require accessing more input sources than are provided on discrete channel strips. In the V2.0 software release, users simply reload a new set of utilities from MO drive, add the necessary hardware I/O resources, and call up/develop the corresponding system configuration file, to create an even more flexible system.

With more input sources than channel strips, a dedicated Upper/Lower button per channel strip can bring the second, alternate channel onto the surface; in addition, a master control switches the entire console between these two status conditions. This user-friendly, simple arrangement can be mastered within a couple of minutes.

A facility can set up an Axiom where one or more bays of channel strips can be set up to control, via a Bank Switch mode, two separate sets of channels. (An array of eight channel strips, in SSL lingo, comprises a bay.) A mobile truck, for example, might benefit from a user interface that features four mono bays and a stereo bay of channel strips—48 simultaneous control elements, plus a master-control section—but bank-switchable for assignable control of a maximum of 96 possible mono or stereo input sources. For example, many signal inputs, such as audience mics on a live concert date, could be set and then laid off to a virtual fader bank. Subgroup master controls could then be laid up to an accessible section for fine control of overall balances.

A new Bay Swap mode enables eight channel strips to be swapped across the console and assigned to a Master Bank, either to the left or right

—CONTINUED ON PAGE 208

It happens. You're in the studio, the juices are flowing. You're just getting to the perfect mix...suddenly, your near-field monitors blow. Now you're facing downtime and an expensive repair because burned out voice coils are not usually covered under warranty.

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World Radio History

PIONEER D-9601

96kHz DIGITAL AUDIO TAPE DECK

Audio manufacturers occasionally introduce products that represent the absolute cutting-edge limit of technology, even though such products may not have enough market appeal to be truly successful. For example, Sennheiser's Orpheus tube headphone system offers truly amazing audio performance and design aesthetics. However, with a price tag of $14,900, the chances of Orpheus becoming a runaway commercial success are about zero. The Pioneer D-9601 high-sampling DAT recorder is the latest example of such a high-concept, low-commercial-potential product.

Unveiled publicly in 1994, the D-9601 languished as a "home stereo" product for several years. Simply put, there are no applications for this product in the consumer realm: No prerecorded 96kHz DAT tapes have ever been available, and there are no convenient sources (radio broadcasts, CD releases) for consumers to record that would make use of the potential of the deck's 48kHz bandwidth. Pioneer made a half-hearted effort to sell the D-9601 to professional users in North America, but its limited experience in the pro market and the lack of a solid pro dealer base seemed to spell the end of the D-9601. Meanwhile, London-based pro audio supplier/distributor HHB Communications (manufacturer of the popular PortaDAT recorders) was enjoying steady D-9601 sales throughout Europe. Based on this success, HHB became the North American distributor, and the decks are now available through its U.S. headquarters.

Housed in a three-rackspace chassis, the D-9601 presents a front panel that is simple and unmysterious. In fact, the only thing that sets it apart from a usual DAT transport is a 5-position switch for selecting four sample rates (44.1/48/88.2/96 kHz) or a special "2x" mode for connecting two D-9601 decks for duplicating 44.1 or 48kHz tapes at half real time. The rear panel has balanced analog I/O on XLR jacks (pin 2 hot); AES/EBU (XLR) and IEC958 (S/PDIF coaxial) digital I/O; RS-422 I/O ports (for Sony 9-pin or ES-Bus control); and an 8-pin DIN jack for connecting a hard-wired remote (not included). A full-function infrared wireless remote is standard. Also on the rear panel are two banks of recessed DIP switches for selecting various custom user configurations, such as wireless remote defeat, ES-Bus or Sony 9-pin control, and -10 or +4 levels for the analog inputs or outputs.

The most interesting of these user DIP settings routes the digital output of a 96- or 88.2kHz tape though a downsampling rate converter—resulting in a 48- or 44.1kHz sample rate at the AES/EBU output. Therefore, any tapes recorded at the high rates can still be copied to today's 44.1/48kHz gear, while still keeping a high sample rate master for archiving and future format possibilities. This is an invaluable feature.

Ready to try the deck in session, I found setup not much different from that for a typical DAT deck. Most users will be using the D-9601's onboard A/D converters rather than the typical converter du jour, unless you just happen to have an 88.1/96kHz unit lying around (I didn't have one, so all

BY GEORGE PETERSEN

World Radio History

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tests with the deck used the stock converter set). Speaking of converters, the D-9601 features 1-bit pulse flow D/As, linear 1-bit A/Ds and a clever clock circuit that suppresses the directional swing of the clock signal axis.

At the high sample rates, the D-9601 uses standard DAT tapes but runs at double speed, so a DAT120 tape yields one hour of record time. Whether recording at high or conventional sample rates, the D-9601's audio reproduction was superb. The soundstage was well-defined, and its handling of fast transients and low-level detail was first-class throughout. However, the most noticeable aspect of the D-9601 comes when comparing its high sample rate performance against standard 44.1/48kHz reproduction. The difference was apparent to anyone who A/B'd the two sources: When recording using mics with a sufficiently broad frequency response, the increased clarity and "bite" of the upper harmonics was unmistakable to even the casual listener. In all cases, the D-9601 provided a sense of a live performance, even when reproducing obviously midrange sources, such as vocals, flute and classical guitar.

There are a few minor points about the D-9601 that annoyed me. The LED ladder level display is bright and clear but is fairly coarse, having only 15 steps between -60 and 0 dB. The location of the downsampling switch (a back panel DIP) is inconvenient, and, in homage to its consumer lineage, the analog recording levels are controlled by a combination of a Stereo Record Level control and a left/right Record Balance knob. On the plus side, the front panel does include a Copy ID switch that lets users choose between Copy Permit, Copy Inhibit or Single Copy (SCMS) modes.

At a retail price of $1,999, the Pioneer D-9601 costs only a few hundred dollars more than its competition, yet it offers unique features that may cause serious pros to give this deck consideration. Obviously, no one knows exactly what formats the future may bring, but higher sampling rates may well become standard. Today's mix engineers and producers may want to hedge their bets and run a 96kHz copy at the same time as conventional studio DATs.

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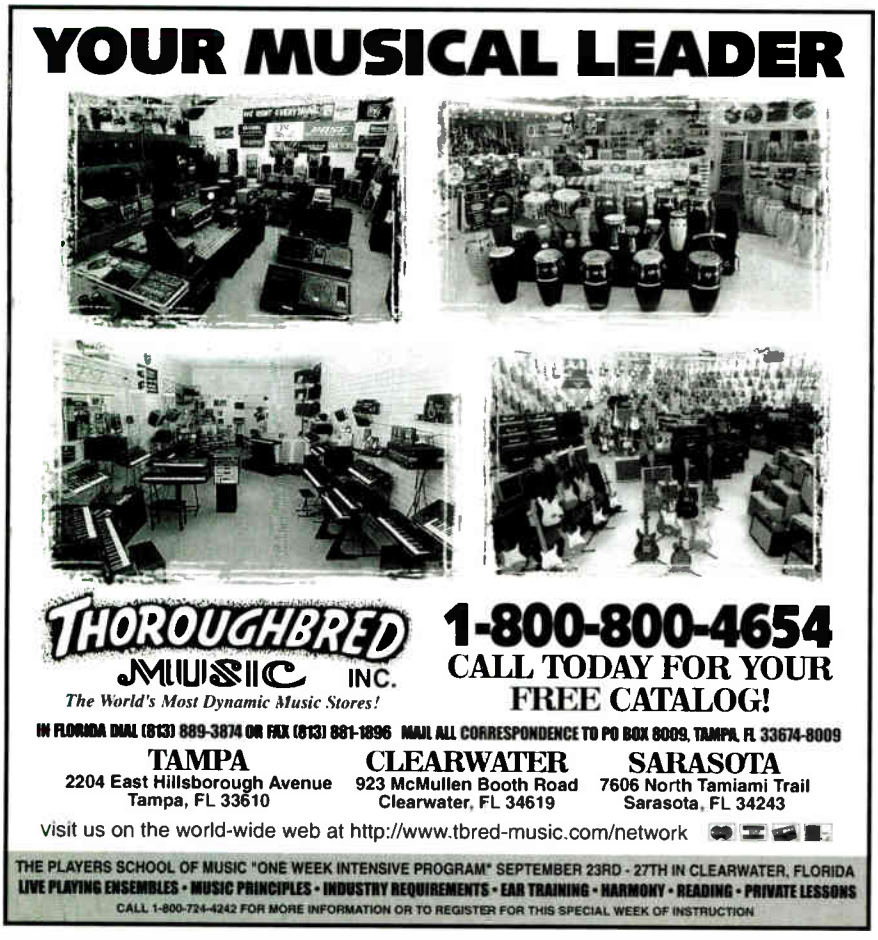

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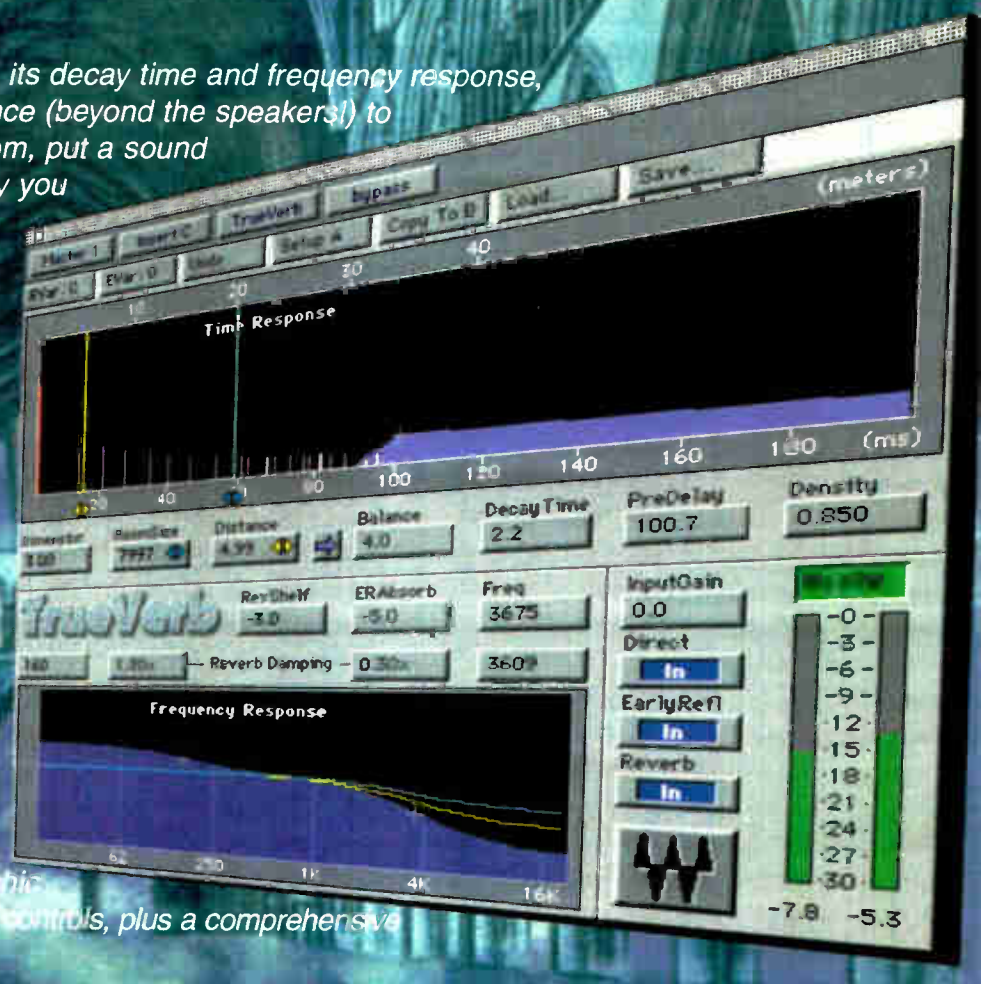

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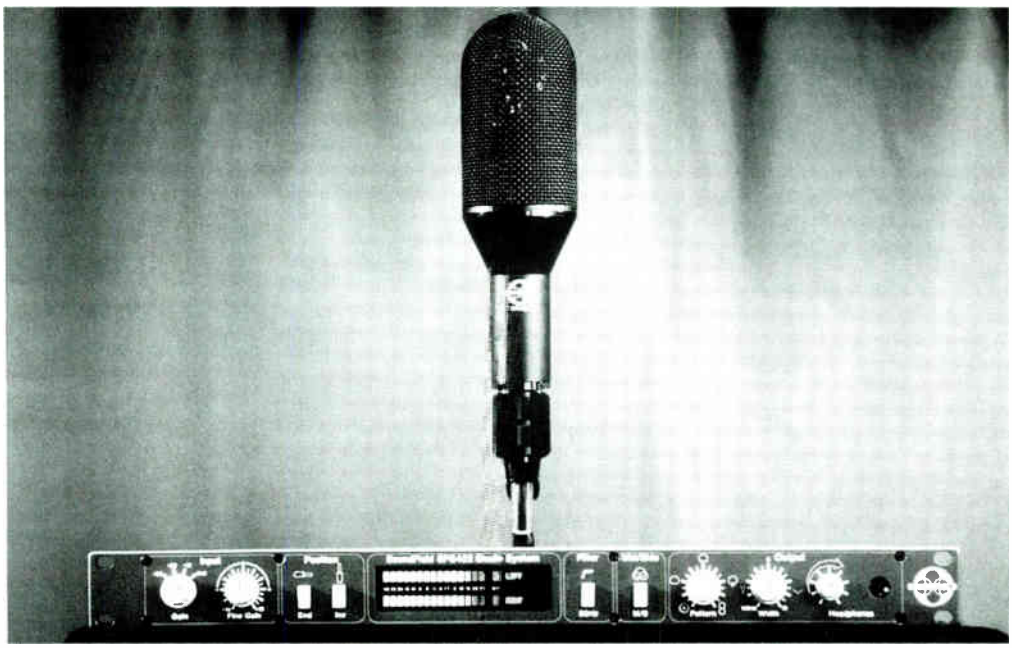
SOUNDFIELD SPS 422

STUDIO MICROPHONE SYSTEM



SoundField, which started out as a British government-sponsored research organization (and has been owned in succession by Calrec, AMS and Siemens), has finally emerged as its own company. With the SPS 422, its latest and least expensive stereo microphone system ($3,500 list), SoundField hopes to introduce its innovative technology to customers who may have balked at the price of previous models.

Each of the three systems SoundField currently offers includes a microphone and a control unit. The flagship MKV, which lists for $7,750, has a control unit laden with features. The SPS 422 costs less than half of that but comes with the identical microphone included with the MKV and a comparatively simple (and easy to use) control unit. Another model, the ST 250 ($5,000) features battery powering for easy portability.

Developed as a result of extensive psychoacoustic research, each SoundField microphone is capable of recording 360° via a unique tetrahedral array of four capsules. The benefits of four capsules include improved spatial imaging and the elimination of phasing effects that can occur with two spaced microphones, or even with two capsules within a single microphone. The signals from the SoundField's four capsules are sent to the control unit, which compensates for the distance between them and assembles the information into two balanced XLR line-level outputs.

The SPS 422's 1U rack-mountable control unit supplies power to the mic and provides two main controls: pattern and width. The pattern knob cycles from omni through the various cardioids to figure-8; the width knob smoothly cycles from mono to full stereo spread. Theoretically, the output from the four capsules could be tailored by the control unit into any number of different "virtual" mics. In fact, it creates two based on the Mid/Side model of stereo recording. The pattern knob controls the shape of the mid signal, whereas the width knob controls the volume of the side signal, which remains in figure-8. Finally, the signals are assembled by the unit's matrixing circuitry prior to output. A demonstration program downloadable from SoundField's Web site (proaudio.co.uk/sndfield.html) shows the effects of both knobs on the patterns, stereo field and equivalent coincident pair.

Acknowledging the growth of digital recording, SoundField has improved specifications in recent years. The microphone that ships with the SPS 422 produces an equivalent self noise (at cardioid) of 14 dBA SPL, which yields an A-weighted signal-to-noise ratio of 80 dB. Two gain buttons, Coarse (from -30 dB to 0 in 10dB steps) and Fine, control the input. At -30 dB, the unit's sensitivity is rated at 122 dB, with a maximum input for less than 0.5% THD of 145 dB SPL. The frequency range is flat from 20 to 20k Hz; an 80Hz highpass filter optionally restricts low frequencies.

The SPS 422's control unit presents a series of knobs, buttons and

—CONTINUED ON PAGE 239

BY ARTHUR BLOOM

World Radio History

NEXO PS SERIES

With the proliferation of contemporary manufactured speaker systems, users have come to expect a certain level of sound quality. The Nexo PS Series, introduced at the Las Vegas NSCA show two years ago, provides uncolored reproduction of prerecorded material and transparent reinforcement of live music. The speakers are a joy to listen to, and the sound quality is exhilarating.

When used with the LS1000 subwoofer, the Nexo PS Series is a two-box, three-way system. A simple stereo setup, comprising four enclosures plus the associated TD controller, lists for $11,697. We reviewed a stereo PS system at Key Largo, an established nightclub in the Old Town section of Portland, Ore. Many touring veterans will recall this 250-capacity club's high ceilings, brick walls and wood floor. Owner Tony Demicoli, one of those people who makes others instantly feel at home, has run the club for 18 years. The existing house system consists of a pair of Northwest's "Mohawk"-style enclosures, loaded with double-15s, double-10s and a 2-inch flat-front Fiberglas horn, and flown from the ceiling. The system is powered with a Crown DC 150 (highs), a DC 300 (mids) and a Sundholm (lows). The Nexo system easily outperformed the club's speakers, and the most impressive aspect, after the sound quality, was the amount of sound coming out of such a small system.

The PS15 is a 64-pound trapezoidal Baltic birch enclosure, measuring just over 2 feet tall. It houses a proprietary 6-ohm, 15-inch woofer, and a 3-inch titanium compression driver coupled to an asymmetrical 2-inch exit CD horn. The horn's pattern narrows from 100° at the bottom to 50° at the top, and its 55° vertical dispersion is tilted down slightly. For frequencies above 1 kHz, this narrowing short- to long-throw pattern evens out the front-to-back coverage in typical venues and worked extremely well in our trial.

Besides the two 15° side angles, the PS15 enclosure has an extra angle on one side, allowing it to be used as a floor monitor also, angled at 45° from the base. When used as a wedge, the PS15's asymmetrical CD horn can be rotated 90°, presenting wide dispersion up close and narrow further back, reducing stage wash and feedback.

A built-in stand adapter on the bottom of the PS15 allows it to be mounted either on a tripod or directly over the LS1000 sub by using a 1¾-inch-diameter mast, which fits into a similar 4-inch-deep fixture on the sub's top. For the review, the subs were placed on the floor to each side of the stage, and 5-foot structural aluminum tubing masts were used, placing the bottom of the PS15 cabinet at just under eight feet off the ground. Both cabinets are constructed with internal hardware and cutouts to accept optional aircraft-style flying track. There are also four points on the back of the PS15 to accept Omnimount 100 Series brackets for permanent installation; this system seems to be a contractor's dream.

The cabinets have two four-wire Speakon™ connectors in parallel, with the first pair of wires carrying the subwoofer signal and the second pair the PS15 signal, allowing either cabinet to loop through to the other. The LS1000 subwoofer's single 4-ohm, 18-inch sits sideways in the cabinet, loading into two differently tuned chambers, both ported toward the

BY MARK FRINK

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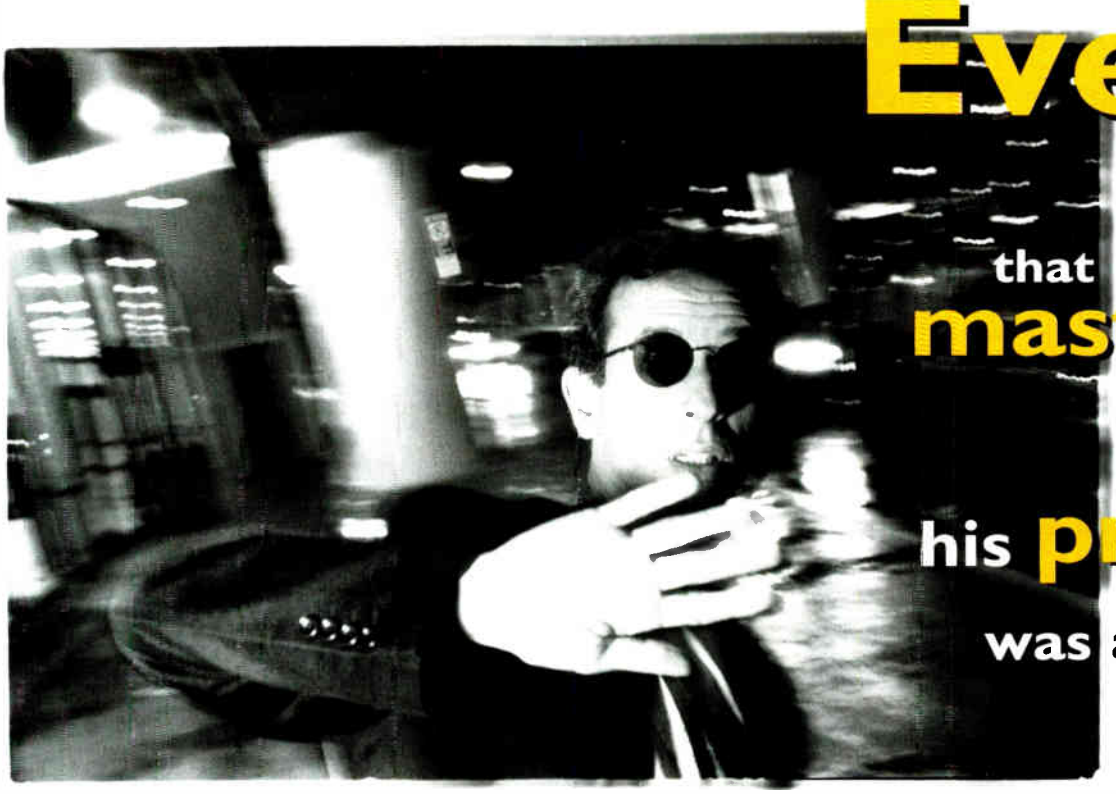

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Sound designer Leslie Shatz narrowly escapes camera barrage

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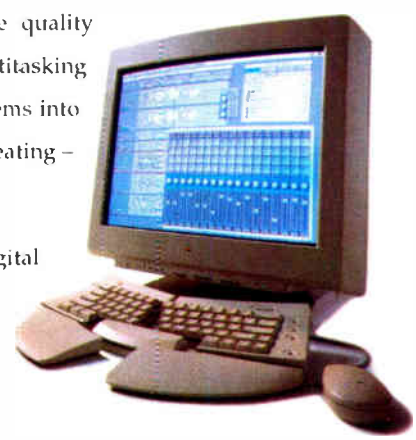

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Apollo 13 sound edited at Hastings Sound and Wonder Dog Music. *Dead Man Walking* sound edited at Hastings Sound

World Radio History

SOUNDCHECK

CLUB SOUND SPOTLIGHT

PHOTOS: ADAM BLACKBURN

Iridium jazz club, New York City.
Right: Iridium Jazz Room manager Richard Okon

This month, *Mix* tips its proverbial hat to a few of the happening clubs around the country. One of the things that makes these venues noteworthy is a commitment to high-quality audio. That may sound obvious—they are all music clubs—but when you think about it, it's practically noble for club owners to invest their money in system upgrades when really they'd make a whole lot more money by installing a few extra taps of microbrew.

But this seems to be the time for clubs to shine, while so many artists in heavy MTV rotation are club acts that took off (Joan Osborne, Green Day, and this month's tour profile, Alanis Morissette, for example). So, check out the four club spotlights below, and make sure to visit as many of them as you can, before your only recourse is to watch your favorite singer/songwriter on a 50-foot monitor from the 97th row.

NEW YORK CITY'S IRIDIUM JAZZ CLUB

With a postcard view of Lincoln Center, Iridium's ground-floor restaurant at 44 West 63rd Street is a hipster's delight. Its broad-paned windows twist and undulate around the building's corner facade as if reflected in a funhouse mirror, making the mottled glow from neo-Deco light fixtures all the more sinister. Descending into the downstairs jazz room, it's easy to see how *New York* magazine was seduced into naming the Iridium Best New Jazz Club of 1995. Arriving at the club in the midst of a late-winter snow, I soon found comfort in the cool strains of the Wallace Roney Quintet and the handsomely stocked bar. Since last year's closing of Fat Tuesday's, the Iridium is now host to the Les Paul Trio on Monday nights.

Essentially a rectangle, but missing one corner that makes up the foyer, the room holds 130 people at tables and another half-dozen at the bar. Originally set next to the foyer, the stage has been moved to a 20-foot-wide, 9-foot-deep inset on one of the short sides of the room; stage height is limited by the basement club's low ceiling. The stage area is lined with convoluted acoustic foam, and there is a small room behind for equipment storage.

The unique sound system is well-suited to the room's shape. There are four loudspeakers firing into the main part of the room and a fifth in the bar area, all by Professional Audio Systems. Installer Burt Rosen of Audio-Video Technologies selected them for their natural,

—CONTINUED ON PAGE 150

World Radio History

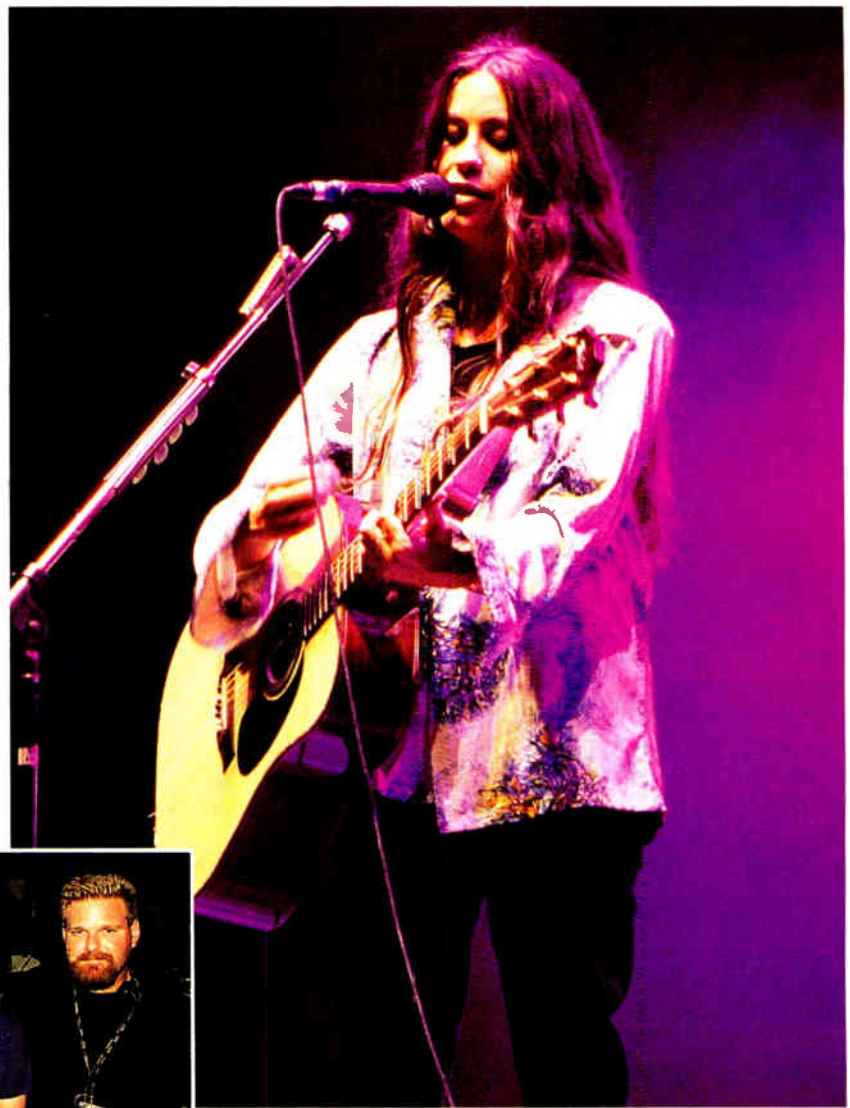
ALANIS MORISSETTE

From the Clubs to the Sheds

Alanis Morissette kicked off her summer tour at Portland's Rose Garden, taking a couple of days to put together the "Intellectual Intercourse" arena show. After winning four Grammys and selling 10 million albums for Maverick Records, her career has taken the express elevator to the penthouse. Her lyrics have a message that resonates with a young female audience looking for an alternative to Love (Courtney that is).

Renato Petruzziello, who hails from Montreal, has been mixing Morissette since last fall, when they were doing 400-seat clubs. He hooked up with her while mixing Canadian artist Sass Jordan, who opened for Steve Perry, another act managed by Morissette's manager, Scott Welch. Petruzziello modestly attributes his enviable gig to being in the right place at the right time. "My best advice is to be prepared," he says. "These things can happen."

The front-of-house console is a Yamaha PM-4000. A Summit Audio DCL-200 stereo tube compressor is used for Morissette's vocal and spare. "I had to use something else over in Europe, and I could tell the difference right away," Petruzziello comments. "I would have to ride her [voice] more instead of making the compressor work for me." Another vocal insert just added to the rack is the BSS DPR-901. "I find it allows me to leave her channel almost flat, taking out a little extra 1 kHz or proximity effect only when it's needed," he explains. "I just put it in line with the Summit." Other inserts include dbx 160A compressors used on background vocals, the two kick mics, snare top and bottom, and bass mic and DI. Four Drawmer DS 201 gates are used on the drums. A dbx 900 Series frame has 903 compressors and 904 gates for the support act, who also shared the effects.



PHOTOS: STEVE JENNINGS

L to R: system engineer David Moncrieffe, F.O.H. engineer Renato Petruzziello, monitor engineer Randy "Randbo" Bryant, tech. Mike Adams

Effects include a Roland SDE-3000 used for occasional vocal delays, an Eventide H-3000 used at a few cents pitch shift for vocal thickening, a Lexicon PCM-80 used on vocals for reverb, chorus and delay, and a PCM-70 used as a thick chorus or a second reverb on vocals. A Yamaha SPX-1000 is used on a tight room setting for the drums.

BY MARK FRINK

—CONTINUED ON PAGE 154

World Radio History

—FROM PAGE 148, SOUNDCHECK

home-audio sound and open high end. Flanking the stage are a pair of PAS Pi-152A speakers, each loaded with a 12 and a coaxial 2-inch Radian. The other three speakers—two halfway down the long sides of the rectangular room and the third flown above the bar—sport similar components but have the drivers separated and aligned laterally. A stacked pair of 15-inch PAS subwoofers are flush-mounted in the wall, just off stage right.

Rane components are used for crossover and room equalization. A Crest FA-601 amplifier powers the horns, and an FA-901 drives the 12s. Three BGW Performance Series 2 amplifiers power the remaining house speakers and monitors. The first PS 2 powers the two subs, the second the side speakers, and the third powers a pair of Community CSX-28 monitors, hung from a ceiling cavity and aimed down toward the front edge of the stage. A third monitor, a powered Yamaha wedge, rests on the floor to the right of the club's 7-foot Baldwin piano.

A shiny new Mackie SR24•4 console, used for both mains and monitors, is located in the rear of the room near the entrance. Microphones include a well-cared-for selection of Shure SM57's and 58s, and an Audio-Technica ATM-35, which club manager Richard Okun—usually found wearing the hats of both engineer and host—likes to use on acoustic bass. DIs are Whirlwind Directors. Okun claims not to be a "sound guy," but his modesty didn't seem to bother any of the patrons. Rosen deliberately assembled a basic system that is relatively easy for a non-engineer to cope with and that also satisfies jazz audiophiles. —*Adam Blackburn*

MICHIGAN'S MEMPHIS SMOKE BLUES, BARBECUE & GREAT SOUND

Memphis Smoke, a new club just outside of Detroit in Royal Oak, Mich., delivers on its promise of "Smokin' Blues and Barbecue." Designed as an authentic roadhouse that pays tribute to the cuisine and culture of Memphis, Tennessee, the club hosts a range of national and local live blues acts.

The club was conceived by the Michigan-based Mr. B's Restaurant Group, and special care went into Memphis Smoke's look, menu and house sound system. The owners worked closely with Advanced Lighting & Sound Inc., the Troy, Mich.-based company selected to develop and install the front-of-house system. Advanced's primary goal was to create a system capable of reproducing the unique blues style cleanly and accurately. "Mr. B's wanted sound at the club to be as good as the food, which is excellent," explains Bob Minchella, who managed the project for Advanced. "What they definitely did not want was a typical bar system with loudspeakers simply stacked stage left and right. We conceived a system providing more 'concert' type sound as opposed to a 'bar' sound."

PHOTOS: BOB MINCHELLA

Club promotional director Jay Jolley at the mix position in Memphis Smoke

The public area of the club consists of a single-level, 4,000-square-foot rectangular room with a capacity for more than 250 people. A 12x22-foot stage at one end of the room is raised less than a foot off the floor, with tables only a few feet from the front edge of the stage. In addition to achieving desired sound quality, the room's layout dictated flying the main loudspeakers to keep them out of sightlines. The proximity of the tables to the slightly raised stage also made low-profile stage monitors a must, also in the interest of maximized views.

Jay Jolley and Advanced Lighting and Sound's Bob Minchella

EAW KF300 Virtual Array Loudspeakers, with companion EAW MX Series processors, are flown in left and right cluster arrays above the stage. Each cluster includes two full-range KF300s flanking an EAW SB330 Virtual Array subwoofer. All of these loudspeakers are Neutrik Speakon-connected, mounted close to the ceiling with ATM flyware and angled slightly downward. Two EAW DS123Hi compact loudspeakers are flown from the ceiling along both side walls and act as a zone system.

The system's Crest CA Series amplifiers are mounted in Middle Atlantic Slim 5 racks stored in an adjacent room near the stage. Each subwoofer is driven by a CA6 in bridged mono, with the KF300is loudspeakers bi-amped with a CA6 for mid/high and a CA12 for lows. The house mix position, located adjacent to stage right, is centered around the Soundtracs Solo Live 24x8 console that also serves as the monitor system console. Two custom racks beneath the console, with Plexiglas covers that limit access, secure all processing gear and source devices, including DMX, video cassette recorder, and cassette and CD players. House equalization is supplied by Rane GE30 ⅓-octave graphic EQs. ⅓-octave EQs were selected to allow quick and easy tailoring by visiting house mixers. A Rocktron Intelliverb supplies vocal effects, with a Zoom 1202 for drum effects and other potential needs.

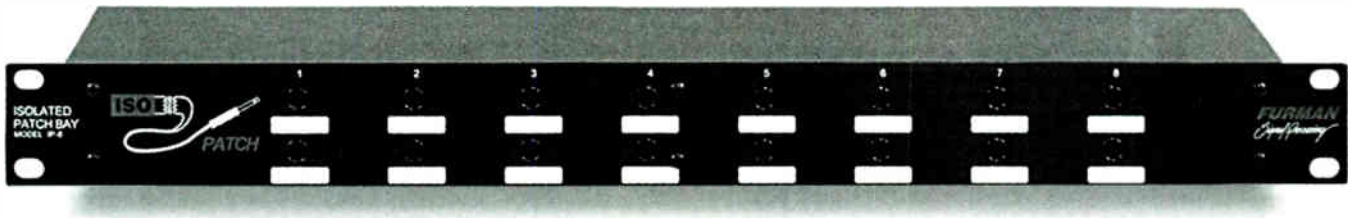
The Soundtracs console was modified by Advanced to accommodate four

—CONTINUED ON PAGE 156

World Radio History

Are there flies inside your speakers, or do you need a Furman Iso-Patch™?

Get rid of buzz and hum caused by ground loops with the new Furman IP-8 and IP-2!



Furman IP-8 Isolated Patch Bay

The new IT-1220 provides any studio or stage with quiet, balanced power.

The Furman IT-1220 is a rack mount, 20 Amp Balanced Isolation Transformer designed to provide ultra-quiet power to an entire studio.

It can make your audio system dramatically less susceptible to hum pickup, with a typical 10 to 15 dB improvement in noise floor—a result often surpassing that obtainable from complicated star grounding schemes with heavy buss bars and ground rods.

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The back panel of the IT-1220 provides 12 isolated AC outlets for your equipment. The front panel provides two more, plus a three-color, 20-LED voltmeter.

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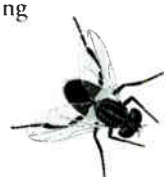
Of course, any band or studio with a rack full of equipment can be plagued by buzz and hum.

Furman's new Iso-Patch series gives you a solution—by (temporarily or permanently) isolating your rack components from each other to break ground loops, and put an end to buzz and hum.



IP-2 Dual Isolator

How does an Iso-Patch work? Simple. Each of its input/output module features a low-distortion isolation transformer, which isolates line level audio signals, breaks ground loops—and puts an end to those annoying noises.

The eight channel IP-8 Iso-Patch Isolated Patch Bay looks and works like an ordinary patch bay with standard, half-normalled 1/4" jacks. The IP-2 is a two-channel version, small enough to fit in any tool kit—and priced so low you can afford more than one.

See the new Iso-Patch series at your dealer today, or call, write or fax us for a free Iso-Patch data sheet and a copy of our catalog.

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World Radio History

power-packed inputs which include 4-band parametric eq, 8 aux sends, and its own limiter/compressor/gate. 02R automation can remember every setting and movement of all of this stuff on all 40 inputs and bus outputs so you can instantly recall and recreate your mix in fine detail. As a digital console, 02R can be digitally connected with the new breed of digital multitrack tape and non-linear recorders for astonishing sonic transparency.

In a related story, the Yamaha ProMix 01, having received AV Video's Platinum Award for outstanding technological achievement in the audio hardware category, the Mix Foundation's Tech Award for technical excellence in the small mixer category and Electronic Musician's Editor's Choice Award, has also been singled out for investigation by the same government agency. Agency Director, Melinda Rubinesky, no relation, stated that there seemed to be a disturbing pattern of unrealistically high value for low cost in a number of Yamaha's products. "This fact strengthens our case" stated the Director.

When asked for comment, Yamaha explained that they were studying or considering the idea of making their products less competitive.

02R

Evil Spirits Inhabit New Yamaha Piano Tone Generator

Beelzebub. Mephisto. Satan. Gossip says Yamaha must be selling out to this dark source—how else could it take over 100 years of keyboard manufacturing and shrink it into an 8 inch box.

Yamaha sources say their P50-m piano tone generator is simply a matter of advanced electronics and acoustic piano know-how. But who believes those corporate types anyway.

No, this reporter is witness to some peculiar activity outside the Yamaha plant late at night. Deep, evil laughs have accompanied frenzied piano solos emitting from the Yamaha R&D lab. While Yamaha claims that it has compressed over 11MB of wave ROM into 6MB of space and added 3-band EQ and 40 types of effects, this newspaper has evidence suggesting that by using the P50-m's simple panel switches, you are actually awakening the undead who would just as soon steal your soul as play your music.

P50-M Piano Tone Generator

MAN BUILDS ELECTRIC CAR IN BACK YARD, COMPETES WITH AUTO INDUSTRY

Norman Futzmeyer thinks he has the answer to the gas crisis. Over the last three years, he has developed his own version of an electric automobile that he contends has a longer range than any of the auto industry giants.

The most important element of this car is, of course, the power. My car is powered by a Yamaha P3500 amplifier because it has an extraordinary watts-per-dollar ratio, it can run non-stop and it delivers whopping power—150 watts per channel into 8 ohms in stereo mode. Of course, stereo isn't so important when you're tooling down the highway."

P3500 Amplifier

Another difference, Norman points out, is that with other cars you have to recharge every 200 miles. But his car, the Futzmobile GT, comes standard with a 400 mile long extension cord. "Who has time to stop!"

Norman is planning more models in the near future, all using Yamaha P-Series amplifiers. They all provide hi-power BTL coupled mono mode, versatile and reliable connectors (phone jack and XLR) with heavy-duty binding posts and barrier strips, thorough circuit protection and a small size that fits easily into the rack in the Futzmobile trunk.

There's one more advantage the big guys don't give you," adds Norman. "You can't plug their car into a set of speakers."

Atlantis Discovered! "Aliens Partying There!"

An Institute Oceana of Tibet submarine last week discovered the long lost city under the sea just three miles off the coast of Kuala Lumpur. Lewis Chen and Clark Ming, submarine pilots, heard the unmistakable sound of "Louie Louie" reverberating through the watery atmosphere. Following the music, they discovered an underwater utopia peopled with a water-logged colony of alien party goers.

"These creatures were shimmying around in time with the music," explained Lewis. "And we could hear it perfectly from 40 leagues away. They had some awesome speakers."

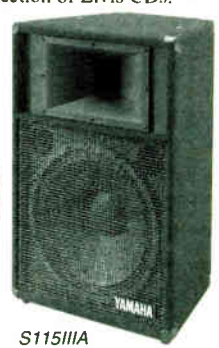
An Inquisitioner exclusive two weeks ago, reporting UFO sightings outside a Yamaha Pro Audio dealer, now takes on extra significance. The store owner claimed that "extremely wet five legged creatures just waltzed in and took our whole stock of Yamaha Club Series, Oak Series and Piezo Series front of house and subwoofer speakers. They left the monitor speakers."

Lewis, who communicated with the aliens from the Triffid Nebula, told the Inquisitioner, "Their ancestors first visited Atlantis hundreds of years ago and told them it's a great party town. These guys brought their own beer but had no room for the musical gear. They had to pick that up here."

The aliens apparently chose the Yamaha Club Series III speakers because their 2" titanium compression driver and 60" horn reminded them of their mother. However, they were pleasantly surprised by the speakers smooth crossover, metal corner protectors, trapezoid box for smooth array arcs, non-resonant cover grills, stand mount sockets and polyswitches for protection against too much power.

"They're very friendly," commented Clark. "And they have a huge selection of Elvis CDs."

SM110III



S115IIIA

FLESH EATING PETUNIA LIKES NEW RBX

While devastating a small urban community in Des Moines, the large carnivorous flower stopped for a brief moment outside a local music store. "I just had to check out one of the new RBX basses." "After reading the reviews I couldn't believe that those boy's over at Yamaha could deliver so much bass for so little cash!" The flower was last seen...

FOR MORE INFORMATION ABOUT ANY OF THE PRODUCTS SHOWN IN THIS ISSUE PLEASE Call (800) 291-4214 ext.821 or visit us at www.yamaha.com.

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World Radio History

ANIMALS SING TOGETHER TO SAVE ENVIRONMENT

"Goats don't particularly like lions; they tend to get eaten by them," explains Zed Mundo, who overcame this and many other roadblocks to produce the hit song "We Are The Animals," completely sung by members of the animal kingdom.

"I got a coyote and a rabbit in the same room to sing a duet and it got pretty hairy. That's when I knew I had to figure out a different way," he said.

The song's co-writer, Franco Ziff, suggested the answer. "I advised him to try the new Yamaha MD4 digital four track recorder. At just $1199 the MD4 is the least expensive digital multitrack, and that's the limit of what we could afford. Sonically, it's vastly superior to cassette multitracks."

Mundo carefully wove the dynamic song's fabric together on the MD4. He mixed and edited 790 different animals vocals and bounced them from track to track with zero loss of sonic quality. "Working with the MD4, it's like I have more than four tracks at any give time because I can combine completed tracks onto any track—even if there's audio on it—without losing that track. Also, I didn't need to save a track for MIDI timecode. The MD4 sends that out separately," Mundo reported.

The MD4's MIDI timecode was a saving grace as Ziff composed the music's haunting theme on a Yamaha QY700 using 80 tracks of his own.

Bill Dider, an engineer at Banana Records, was impressed with the recording quality. "When I heard it was coming in off a portable multitrack, I thought we'd have to redo the whole shebang. But we're talking studio quality here. Flat frequency response from 20 Hz-20 kHz, 44.1 sampling rate and there's no audible distortion. And I never could tell where he made his edits thanks to the MD4's precision editing functions. Good thing. I wasn't looking forward to re-recording that rattlesnake."

The song has so far raised $5 million to help the environment. We may do a follow up," Mundo said, "but with no monkey this time. What a prima donna."

MD4

Yamaha 02R Receives Too Many Awards. Currently Under investigation for Foul Play!

In an announcement that may shake the industry, Harley Rubinesky announced at a press conference held at the offices of the US Department of Unfair Practices and Wishful Thinking, that the Yamaha 02R Digital mixing Console was under investigation. He continued, "In it's young life, the 02R has received every conceivable award available to such a product." What was most disturbing, however, stated Rubinesky, was the fact the Yamaha 02R had received awards such as Post Magazine's prestigious "Producer's Choice Award" in the audio mixer category, where it's competition included mixers costing more than $200,000.00. This is especially suspect when you consider that the Yamaha 02R retails for less than $10,000.00 as a complete system. Rubinesky continued with a long list of awards garnered by the 02R, including...EQ Magazine's Best In Show award, '95 AES Show and The Radio World Cool Stuff Award, NAB '96. Not only is the price discrepancy so wide between the 02R and it's nearest competition, continued Rubinesky, taken on it's own the 02R delivers too much value to be credible. For example, the Yamaha 02R has 40

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The Inquisitioner

Nobody Expects The Inquisitioner. Vol.8 Issue 1143

CONSUMER ADVOCATE WARNS, "DON'T BUY YAMAHA RM800!"

"I went to the local dealer to buy one and was shocked by what I found!"

Getting a free pair Yamaha NS10M Studio speakers with the purchase of a Yamaha RM800-16 or RM800-24 (free with the possible exception of the postage to return the coupon claiming the above–we know he'll read this.), was more than well known consumer advocate, Ralph Rubinesky could take. Ralph warned that consumers should be careful in considering the purchase of the Yamaha RM800 Mixing Console. Ralph admits he is suspicious by nature and that Yamaha's latest offering has got him spooked. "I have learned over the years, commented Rubinesky, that if something seems too good to be true, it probably is."

Ralph explained, " I decided to start taping my nationally syndicated show at home. This required that I purchase a lot of gear, including a mixing console. Being a consumer advocate, I read all the reviews on various mixers and found the Yamaha RM800 to be just the value and performance I needed. In fact, it was almost too good to be true:

"Sound... is exceptional (particularly the low noise and sensitive EQ) for a board in this class." "Inexpensive, great sound, very versatile" says EQ Magazine.

"As the first eight bus recording mixer to come in under $2,000...it offers the home studio market more features per dollar than any other mixer in its class." states Electronic Musician.

"I went to the local dealer to buy one and was shocked by what I found! "I was offered the RM800 at a great price. I said I'd take it. But the salesman insisted that I fill out a coupon to receive a pair of Yamaha NS10s, the world standard for recording monitors—a $478.00 value—free of charge! This was after I had already agreed to buy the mixer. The salesman said that all I had to do was fill out a coupon and send it to Yamaha and they would ship the NS10s directly to me!"

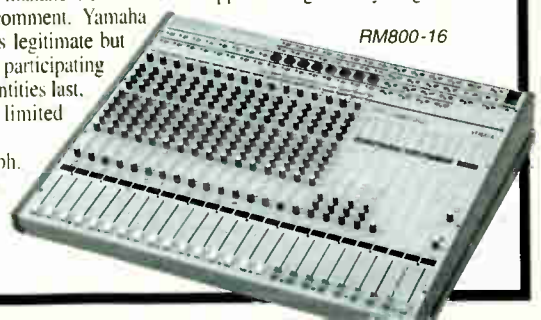
Ralph seemed clearly shaken. "Then, to put the final nail in the coffin, they offered to finance the deal, for six months, same as cash!"

When asked if he bought the Yamaha RM800, Ralph said ...

"Yes! What, are you crazy? I wanted to buy before they changed their minds, ran out, or discovered their mistake. For the smart shopper, timing is everything!"

When asked to comment, Yamaha stated that the deal was legitimate but that it was available at participating dealers only, while quantities last, and that it was a limited time offer.

"See," said Ralph. (call 1-800-291-4214 ext. 821 for your closest participating dealer)



RM800-16

World Radio History

—FROM PAGE 149. ALANIS MORISSETTE

Although her in-ear monitors are wireless, Morissette prefers to use a hard-wired microphone. She changed over to an Audix OM-5 a couple of months before the Portland show. "It's great for background rejection because of its tighter pattern and has a powerful sound that helps it cut through the mix," Petruzziello says. "Our monitor engineer, Randy Bryant, likes it also."

Drummer Taylor Hawkins' kit is miked with two AKG 414s for overheads and AKG 460s on hi-hat and wind chimes. A Beyer M88 is used in the kick drum along with a Shure SM91. "The M88 gives me the attack, and the 91 gives the round sound of the drum," Petruzziello explains. "I've found the best thing is to use a little double-sided tape to keep the 91 from moving, and then the M88 above it, maybe just off to the side a little." The toms are miked with Shure SM98s, and Beta 57s are used on snare top and bottom. Chris Chaney's 4x10 Eden bass cabinet is miked with a Sennheiser 421 in addition to a Countryman DI. Over at stage right, Jesse Tobias plays a variety of older classic Fender guitars through several Orange amps, miked with three Shure SM57s. On stage left, Nick Lashley, who doubles on acoustic guitar, plays a Strat through a Marshall and a Peavey Classic, miked at about four inches with a pair of Sennheiser 409s. It couldn't be much simpler.

Showco's Randy Bryant mixes monitors on a Ramsa WR-S840 with eight channels of Klark-Teknik DN 360 graphics. Morissette wears Future Sonics Ear Monitors® custom ear phones, with Bryant monitoring on a spare Radio Station receiver on the same frequency. Each of Morissette's musicians has a pair of Showco's Stage Reference monitors, along with two pairs of FR-1 four-way enclosures used for sidefills. A pair of B-1 single-18 subs are used to supplement the drum mix, along with two Future Sonics "Shakers" mounted to the drum stool.

Monitor processing includes several dbx 905 parametric modules providing equalization for background vocals and acoustic guitars. Other inserts include two Drawmer DS-201 gates used on drums, and a Klark-Teknik DN 504 quad compressor used on bass and Morissette's vocal. Effects are simply a Sony MUR-201 digital reverb used for vocals and a Yamaha SPX-90 for delay.

Showco crew chief and system engineer Dave Moncrieffe is assisted by fourth man Mike Adams, who wires up the stage. The FOH system is a typical Showco PRISM rig—eight columns by four rows deep. There are six PRISM dual-18 sub enclosures per side with three two-way near-fill enclosures arrayed on top of them. The near-fills are delayed 22 milliseconds by a pair of JBL 7922 digital delays in the FOH rack. The system is powered with 19 amp racks, each housing the Crown PSA-2 and MA-2400 amps.

Morissette has added a handful of new songs to her now-familiar material, and the show sensibly includes an unplugged, breakdown section in the middle of the set. This tour transports the flavor and intimacy of a showcase club set to the arena. The audio production makes use of standard equipment favorites in all categories to deliver the performance's energy to a roomful of enthusiastic teenagers and some of their parents, many of whom sang right along to "You Oughta Know," the award-winning track that started it all. ■

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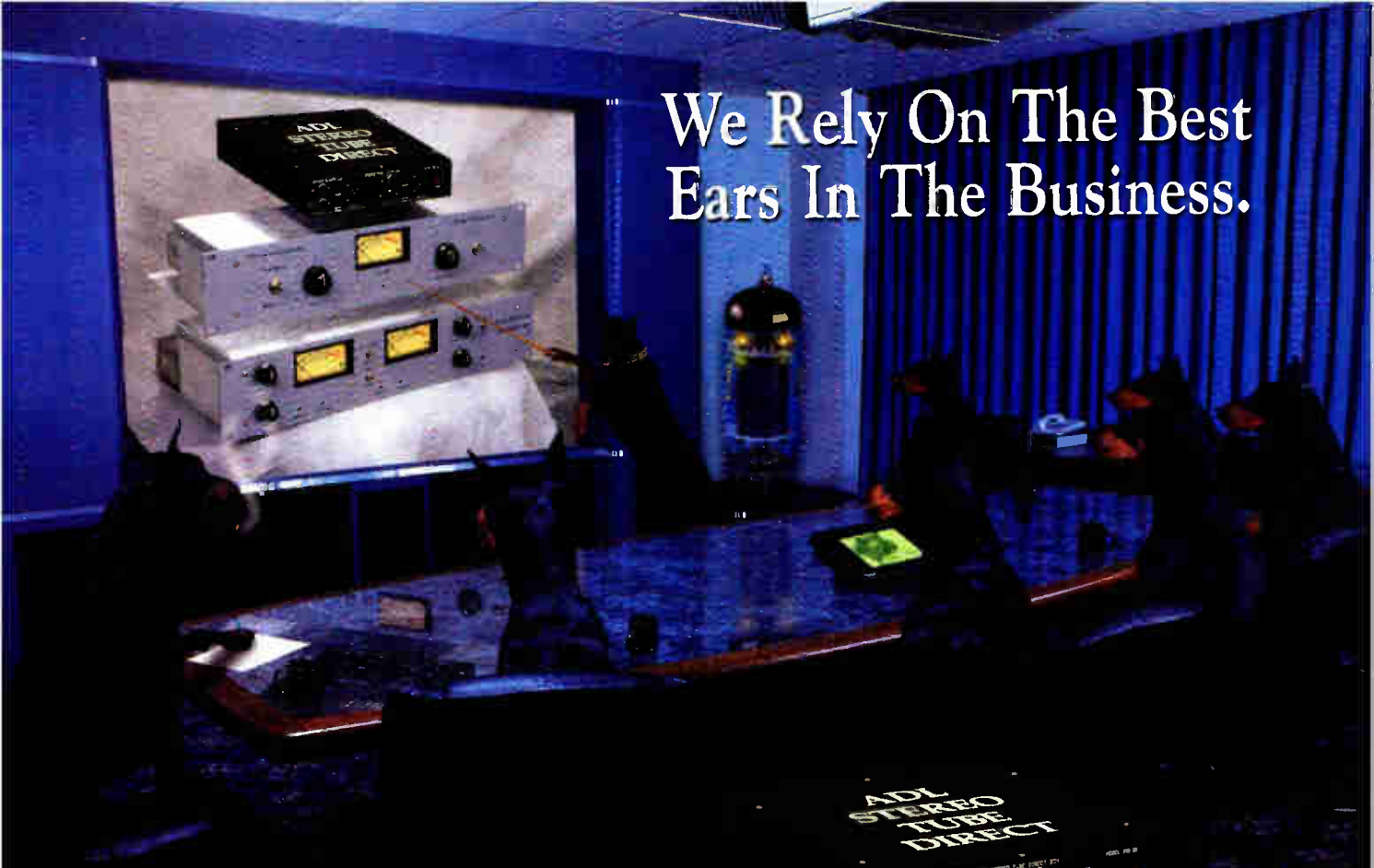

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Many manufacturers combine solid state circuits with tubes (known as hybrid circuitry). This may be less expensive, but certainly ***will not*** 'warm up' or 'fatten' your sound like an ALL-TUBE product. **Anthony DeMaria Labs** is the company that brings you the finest hand-built, pure-tube equipment in the world. Of course, you don't have to take our word for it. Check out our client list and hear the difference!

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—FROM PAGE 150, SOUNDCHECK

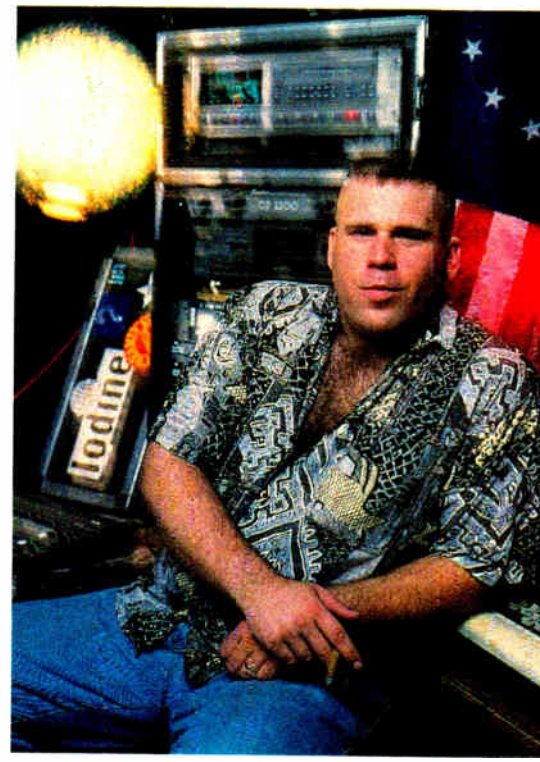
individual monitor mixes. Those mixes feed four EAW low-profile stage monitors. Three EAW SM200iH monitors, each less than 15-inches high, line the front of the stage. An EAW SM500iV monitor, delivering added low-frequency punch, is used at the drum position. "The SM200s sound just great," Minchella notes. "We've heard compliments about them from a number of visiting musicians." Crest CA9 amplifiers drive the woofers in each monitor, and CA6s are used for 2-inch exit compression drivers. All monitor sends have individual Rane PE17 parametric EQs and Rane AC22B crossover channels.

"The owners have been thrilled with the system from the start," Minchella says. "They were glad that it was done right. From a technical standpoint, it really paid off for us to have a vision and then to communicate it so that the customer fully understood why things were being done as they were." —*Rod James*

THE EXIT INN
ROCK'S ANCHOR IN NASHVILLE

Since 1971, the Exit Inn has been almost the only place where touring non-country performers can touch down in Nashville and not have to wear hats and boots. The square room is characterized by a stately sort of dinginess, like a dowager who is never really comfortable with the work lights on. It's also known for a tight low end and a remarkable sonic clarity that was present even as scores of rented P.A. systems passed through it before the owners settled on a permanent system three years ago. Local sound engineer Kevin McGinty, who ran sound at the club several years ago, installed and wired four Renkus-Heinz CE3 trapezoidal boxes in a flown array above the center of the stage, with four Renkus-Heinz C2 subs on the stage itself. The system is wired for dual stereo (cabinets alternate L, R, L, R) with a total coverage angle of about 45 degrees out to either side from the center of the stage.

"With that [dual stereo] setup, you don't lose the image when you pan hard left and right," explains Frank Sass, the Exit Inn's chief sound mixer for the last four years. "You don't have to be in the center of the room to get the stereo image." Which is a good thing, considering that the crowd has access right to the edge of the stage; and with the



Frank Sass at The Exit Inn, Nashville

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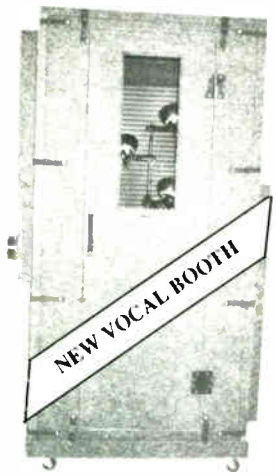

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bathrooms located right next to it and at the same level, the crowd sometimes has even more access than usual. "It's not unusual to see someone walk out of the bathroom and right up to the guitar player onstage," Sass laughs.

The main system is powered by a Crest 7001 for the highs, a pair of Crest 8001 amps for the mids and lows and a 9001 for the subs. The entire system is wired using Mogami cabling. As Sass explains it, the Renkus-Heinz mains system is a processed one, using integral Renkus-Heinz speaker controllers—two X-310TSCs and an X-120—as crossovers. "The X-120 sends everything over 80 Hz on up to the next set of controllers," he says. "In addition, [the controllers] give us built-in speaker protection circuitry."

The mix position is at the far left of mid-room, where Sass runs a 32x4x2 Soundtracs Solo FOH console. Adjacent to the FOH console is an Alesis ADAT XT, which is occasionally joined by a second one for live recordings. "The console has direct post-fader outputs," Sass explains. "If I can fit the band onto the first 17 channels of the console, I'll use a series of subgroups and outputs to go direct to tape and then use the next eight channels of the board as tape returns and feed those to the main system. So in effect, the tape machines get the signal before the house P.A. does when we're recording." The rest of the outboard racks hold Klark-Teknik DN 500, dbx 160 and 166A, and Aphex compressors; Aphex 105 gates; and signal processing including Yamaha SPX-90II, Korg SDD2000 sampling delay and an Alesis MidiVerb.

Sass runs the Peavey 24x8 MkIV monitor mixer from the stage. Five sub-group mixes are fed through four Rane ME 60 dual-channel EQs and Klark-Teknik DN800 crossovers to the monitors, which are a combination of 15-inch EV-loaded Horizons and JBL Cabaret cabinets loaded with JBL 2226 speakers and Renkus-Heinz horns. The monitors are bi-amped, using BGW 750A, 750B, 750C and 250D amps for lows and mids and a Rane MA-6S for the highs; a switch to Crown 2400 and 2600 amps is scheduled.

The microphone collection includes the usual club fare, such as Shure 57s and 58s, Sennheiser 441s and AKG D-112s. Sass has a particular fondness for the new Shure Beta Series.

The club has undergone some acoustical treatment during the last year. The rear walls above the front bar have had absorptive padding installed, and the wall behind the stage opposite has had deadening treatment applied, as a counter to the room's stone floors, wooden walls and raftered ceiling. A dropped ceiling above the bar has also been removed, which Sass says opens the room's high end up considerably.

The Exit Inn, however, is less defined by its system than by the procession of engineers who pass through. Sass has no problem relinquishing control of the board to individual bands' engineers, and chose a Klark-Teknik DN3600 programmable equalizer for the rack, which allows multiple EQ curves to be set, stored and recalled by each band in the course of a night. "So you can switch easily between an acoustic set and Luscious Jackson doing heavy bass dance music," says Sass. "The room can handle it, and the system can handle it. It's a matter of making the transition between different types of performers easy for them and their sound people."

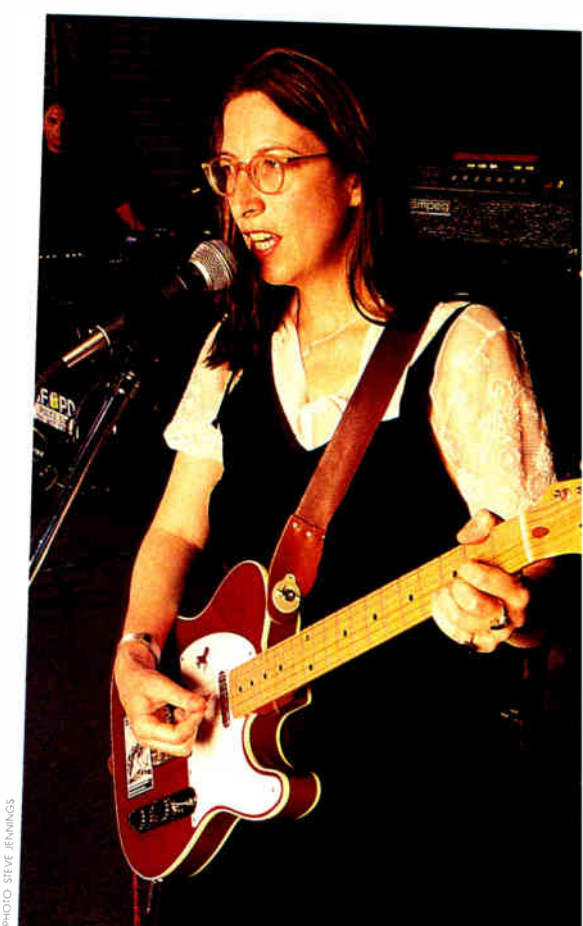

PHOTO: STEVE JENNINGS

Syd Straw onstage at Slim's

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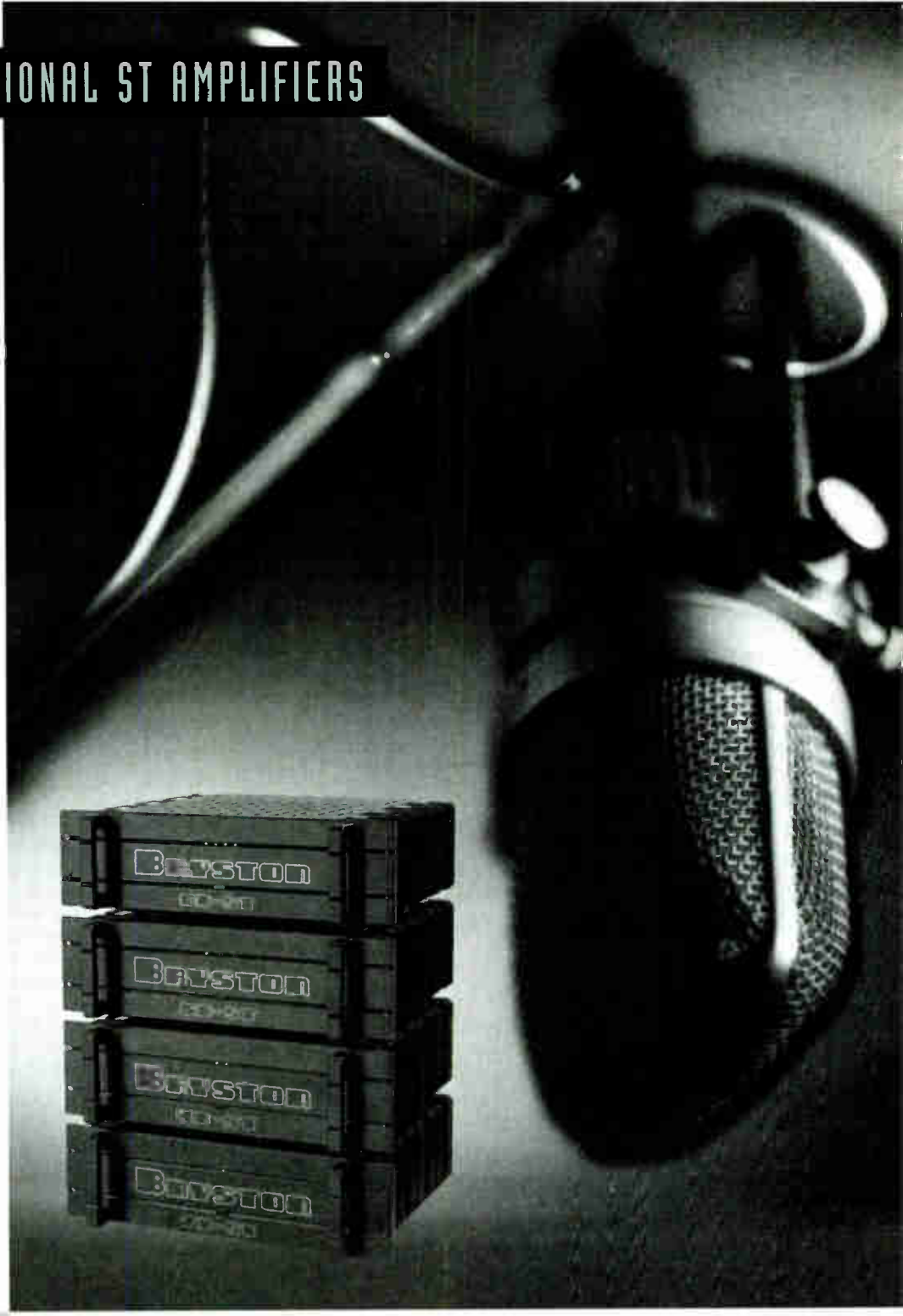

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Those performers have included Drivin' n' Cryin', Jason & the Scorchers, Junior Brown, The Mavericks, Steve Earle and a host of other Nashville and non-Nashville acts. The club's history includes a stint as the premier room for touring club acts throughout the '70s and '80s. More recently, Exit Inn has been the main refuge for Nashville's vibrant but often frustrated alternative music scene, which has attracted similar acts from around the country, such as The Delevantes. "I've thought about moving the soundboard to a different location," says Sass, "but the club has been going seven nights a week since I've been there, and there's just no time to do it." —*Dan Daley*

SAN FRANCISCO'S SLIM'S

It used to be that what San Francisco's Slim's lacked in fidelity it made up for in personality. But recent system refurbishments have cleaned up the sound and increased the room coverage so that Slim's shows have become pretty much pure pleasure for audiences and visiting engineers. This old-fashioned little red-brick venue, situated on 11th St., a few blocks south of Market St., received a lot of new gear this year, including JBL's Array speaker system.

The new arrangement includes two JBL 4894s per side in the air and two sub boxes per side on the floor. The club also received all new JBL amps and the company's bi-amped 4890 monitors. At the same time, Slim's acquired a Soundcraft Vienna front-of-house console, which was previously

—CONTINUED ON PAGE 220

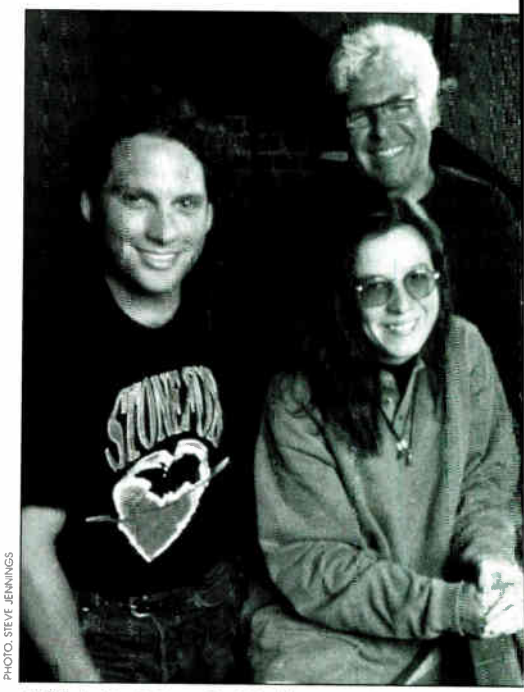

PHOTO: STEVE JENNINGS

At Slim's, L to R: Jason Brodsky, house engineer; Sue Kearney, production manager; Alex Bendahan, house engineer

QUICKTIPS

Dual-compressor audio mixing...In my salad days of club mixing, back in the '70s, all I had was a couple of dbx 160x compressor/limiters for processing at the old Rusty Nail Inn out in the tobacco fields of western Massachusetts. In the grand tradition of stereo club consoles with mono speaker systems, the instruments are panned to one side of the mix and the vocals to the other, creating two mono sub masters that are summed at the board's mono output. No surprise there. Inserting a compressor into each side of the board is also not remarkable. This process creates group compression of vocals on one "submaster" and instruments on the other. Anyone who knows how to tastefully use a compressor will light up no more than a few dB of gain reduction in general, keeping it all natural-sounding. By slaving or linking the instrument compressor to the vocal compressor, it will copy the gain reduction on the vocals to the instruments, pushing down the instrument mix when the vocals hit the compressor by that same amount. By judiciously using light compression ratios, it is possible to get a measure of automatic mixing that allows a strong instrument mix that makes way for the vocals. The vocal intelligibility increases, while the band will still sound full. Since the vocal sub tends to run higher than the instruments, any lead instruments can be panned either partially or fully to the vocal side, to put them on top of the mix when they take a solo, without touching their level. Because your entire mix goes through these two compressors, the use of marginal units may prove unsatisfactory. Another caveat is that this technique requires some fine-tuning of relative submaster levels. It won't perform with all types of music, but you'll be astonished at how well it can work. ■

—*Mark Frink*

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❑ The MP110 DIRECT DRIVE is a little single channel tube mic preamp. It has a high quality input transformer, variable gain and output level controls, +48 volt phantom power, 20 dB input pad, and phase reverse. It also has a little price - $230 retail.

❑ For impedance matching, recording direct, running an instrument direct to a mixing board, or for warming up a digital mix, we recommend the ADB3 Stereo Active Direct Box. It has two channels, each with a ground lift, +/-20 dB of gain, a 20 dB pad, and transformer coupled XLR outputs. Only $200 retail.

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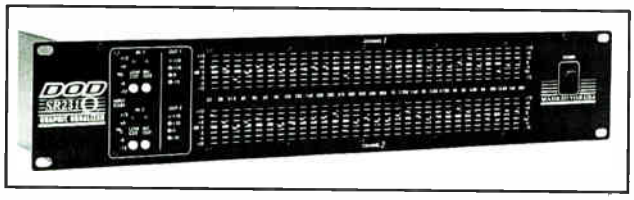

DOD 31-BAND GRAPHIC EQ

DOD Electronics (Sandy, UT) has introduced the SR213Q, a 2-channel, 31-band graphic equalizer. The 2U unit offers ±12 dB of control per band and ±12 dB of input gain make-up/cut. LED meters monitor output levels; individual switches allow noiseless insertion of EQ and additional lowcut filters (12 dB/octave, 3 dB down at 50 Hz). I/O connectors are balanced or unbalanced ¼-inch; XLRs are optional. Price is $349.95.

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MARTIN AUDIO MINI MONITOR

The WM0.5 Stage Monitor from Martin Audio (distributed by TGI North America, Kitchener, Ontario) is a miniature passive, two-way stage monitor designed for situations requiring visually unobtrusive monitors. The WM0.5 contains an 8-inch woofer and a 1-inch ferrofluid-cooled HF compression driver on a 50°x70° horn that is oriented for maximum dispersion in the vertical axis when the unit is placed on the floor. Price is $895.

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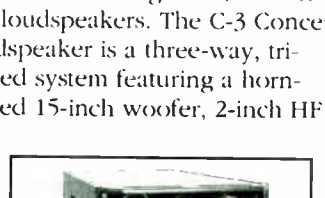
APOGEE LOUDSPEAKER SYSTEMS

Apogee Sound (Petaluma, CA) has introduced two high-SPL, smaller format loudspeakers. The C-3 Concert Loudspeaker is a three-way, tri-amped system featuring a horn-loaded 15-inch woofer, 2-inch HF driver on a CD horn and a 1-inch HF horn/driver combination. The 15° trapezoidal enclosure is constructed of Finland birch ply and can be specified with rigging hardware and a choice of speaker connectors. Price is $2,825. The AE-11 subwoofer (same footprint as Apogee's AE-15 sub) has two 15-inch woofers, in a computer-designed Planar Coupling Technology configuration. Price is $2,214.



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KLIPSCH KP-102 SPEAKER

The KP-102, a new compact two-way speaker from Klipsch Professional (Hope, AK), features an 8-inch woofer and a Tractrix Wave™ horn-loaded 1-inch HF compression driver. The system is designed for theater surround, under-balcony fill, sidefill and near-field applications. The trapezoidal cabinet is constructed of ¾-inch 9-ply plywood and is lined with acoustic foam. Power handling is a maximum of 100 watts, with a continuous 115dB SPL output. Klipsch Limiter Protection (KLiP™) circuitry protects the HF unit. Supplied in black for $269, the KP-102 is available in white for $279.

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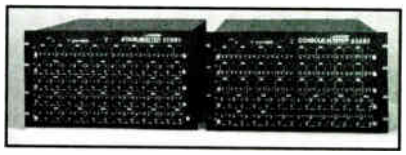
FIBER-OPTIC MIC SPLITTER

Otari Corporation (Foster City, CA) announces its Lightwinder™ fiber-optic wiring system, a digital mic splitter system for live sound, remote recording and broadcast. Consisting of Stage Master and Console Master rackmount units connected by fiber-optic cable, the system provides 48 inputs (sends) and 16 outputs (returns), each switchable to mic or line levels. A/D converters are 20-bit delta sigma, 64x oversampling. The Stage Master features high-quality mic preamps with input pad, gain adjust and phantom power, and a mic level split for monitor consoles. A digital throughput provides an additional split for recording/broadcast applications. Cable runs of 5,000 feet are possible.



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YORKVILLE TX SERIES

The TX Series large-format speakers from Yorkville (Pickering, Ontario) are designed for touring and large-venue applications. Features include 13-ply Baltic birch construction, Speakon™ connectors, integral ATM Fly-Ware™ hardware, trapezoidal enclosure designs and external rackmount multichannel processors ($729 to $849) with XLR I/O connections. The TX8 three-way cabinet ($2,799) has two 15-inch woofers, one 8-inch midrange cone driver and a 2-inch HF unit. The TX8S is a dual 18-inch sub box ($2,199). The TX4 is a bi-amped system with one 15-inch woofer and a 2-inch HF unit ($1,499). The TX2M floor monitor ($1,349) and the TX3 (not priced) are bi-amped systems, each containing one 12-inch woofer and a 2-inch HF unit.

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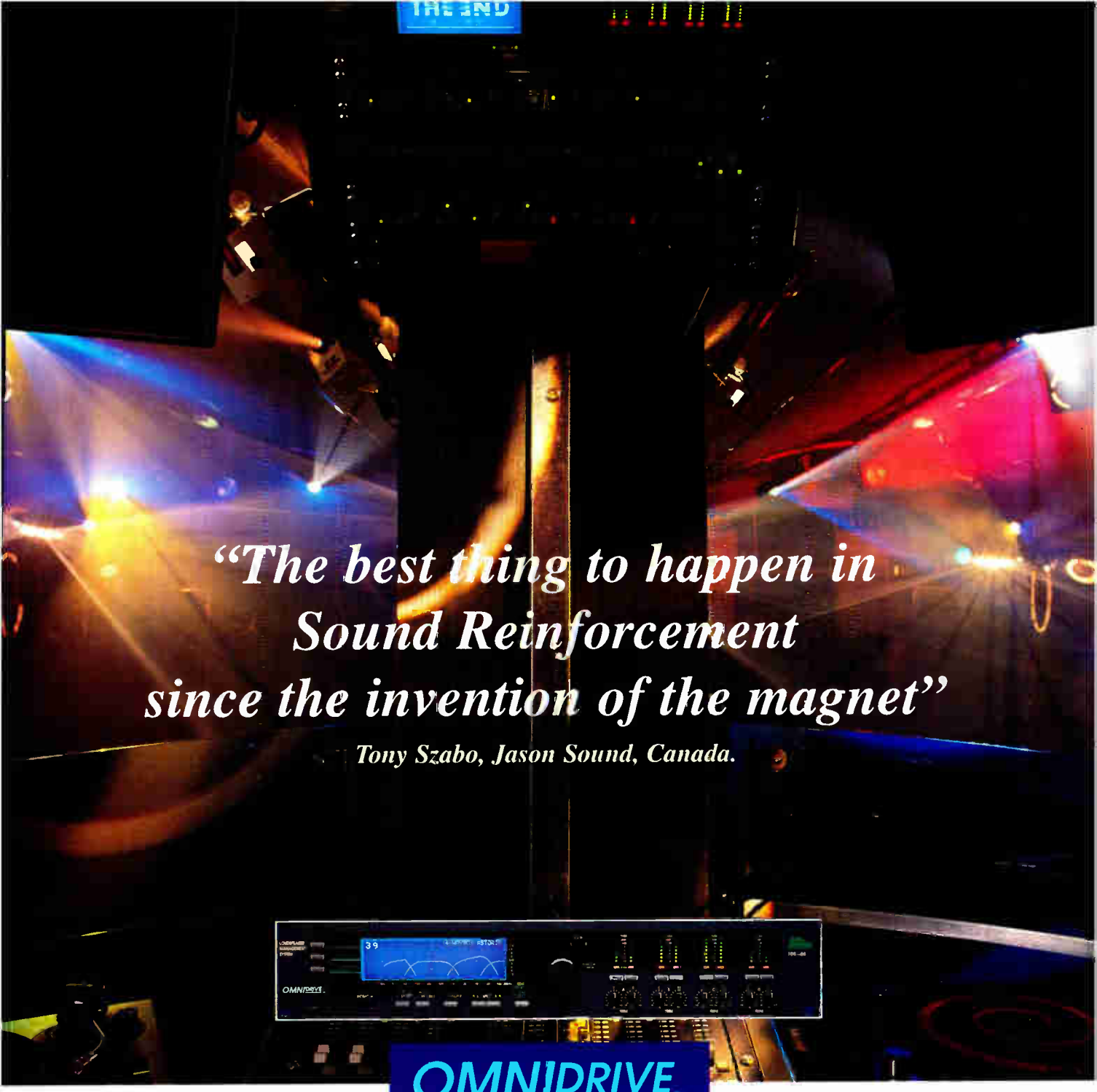

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BY BLAIR JACKSON

RECORDING NOTES

The Hartwick Trio in Sonic Recording Studios

THE HARTWICK TRIO

RECORDING AND EDITING ON HARD DISK

by David J. Saia

My partners and I own Sonic Recording Studios in Philadelphia. We were recently contracted to record the Hartwick Trio, which is made up of three members of the Philadelphia Orchestra: Hirono Oka (violin), Robert Cafaro (cello) and Jungeun Kim (piano). The trio came to us looking for a suitable space in which to record their first CD for release by Hartwick College in Oneonta, N.Y. I proposed that they try Sonic's Studio A, which includes a Yamaha grand piano. Studio A is a large, wooden room (40x48 feet; 19-foot ceiling) with excellent acoustics and a 20-foot curved wall, and it wasn't long into their demo rehearsal that the telltale smiles of approval appeared and we began preparations for the project.

We did have some initial concerns, mainly noise and flexibility. The solution to the noise issue was obvious—digital recording was the only choice. Just six months earlier we had joined the '90s and ventured past ADATs into the world of hard disk recording. In conjunction with Curious Productions of Philadelphia, Sonic had put in place a 16-channel/32-track Pro Tools III system (see sidebar).

As to flexibility, this debate centered on a philosophical issue—the nature of classical recordings in general. There have been countless classical recordings made to a single pair of tracks, whether recorded in a huge concert hall or a huge recording studio. In fact, in preparing for this recording and listening to countless CDs, I came to realize that our perception of true classical music has been shaped by the fact that the usual way that we hear classical music is in this format—a recording created with a pair of mics (or two) in a huge, rich space. This is not to say that this approach is inadequate. Quite the contrary. For most of its history, classical music has been heard exclusively in concert halls that were specifically designed to project the combined sonic energy of 120 or more musicians. The great composers treated the orchestra and the hall, the context in which you hear an orchestra, as the medium itself. The orchestra and concert hall are akin to the canvas and brush for the fine visual artist and define the limits and range of expression. The traditional classical composer writes music to be heard in this manner, and until the invention of the multitrack, we have most commonly recorded it to be heard in the same way.

—CONTINUED ON PAGE 176

World Radio History

"¡CUBANISMO!"

Trumpet player Jesus Alemany (center, in white) and the rest of the ¡Cubanismo! *band*

by Barbara Schultz

Reading Adam Blackburn's story about the Roy Hargrove Quintet's trip to Cuba in last month's *Mix* put me of a mind to hear some hot Cuban jazz. And I found it. Trumpet player Jesus Alemany's *¡Cubanismo!* is a sizzling collection of Cuban dance music, released this summer on Rykodisc's Hannibal label. The album, which was recorded in May of '95, features traditional rumba, cha-cha, *son*, *danzon* and *pa'ca* tunes, composed by various members of Alemany's band and arranged on-the-fly in the *descarga* (jam) tradition developed by Cuban jazz players of the '40s.

¡Cubanismo! was produced by the head of the Hannibal label, Joe Boyd, and recorded and mixed by engineer Jerry Boys of London's Livingston Studios (April '96 *Mix*). Almost all of the recording was done live in Havana's Egrem Studios. "The room we used is a very, very big live room built in the late '50s by RCA," says Boys. "It was probably designed for big band recording, and it hasn't changed much, other than the fact it has a modern mixing console in it." The console Boys used at Egrem is an Amek Mozart. The room is also fitted with

—CONTINUED ON PAGE 172

JAZZ & HIP HOP MEET IN "THE NEW GROOVE"

by Blair Jackson

The marriage of jazz and hip hop is old news by now. There have been dozens, maybe hundreds, of hip hop records that have (legally and illegally) incorporated sampled riffs and phrases from both classic and obscure jazz recordings. The band US3 has been one of the most successful (both commercially and artistically) in making use of jazz samples, and appropriately enough they recorded for Blue Note Records. One of the best known and oldest labels specializing in jazz, Blue Note has now gone a step beyond US3's sonic manipulations with the release last spring of *The New Groove: The Blue Note Remix Project*. The brainchild of the label's director of A&R/marketing Keith Thompson, *The New Groove* presents eleven jazz recordings, mostly from the late '60s and the '70s, remixed and placed in often startling new hip hop settings, complete with raps.

"The Blue Note label is about jazz musicians expressing themselves in a way that's unique and artistic," says Thompson, who has a background as a jazz sax player himself. "Obviously there's improvisation, but beyond that all the rules are gone. Whether you have an electric piano or a turntable or, in the case of Bobby McFerrin, his chest, the artists do what they have to do to communicate. *The New Groove* is another step along those lines. It's a way for great jazz to be heard by a younger audience that may not have experience with jazz but that knows hip hop.

"US3 was able to take established masters—basically 2-track masters—and use them in ways that they need-

—CONTINUED ON PAGE 175

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They Make Records That Break Records.

Producers Chris Kimsey (left) and Eddie Kramer at New York's Electric Lady Studios.

Twenty years after its release, "Frampton Comes Alive" still holds the record for the best selling live album in history.

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Kramer's work with Jimi Hendrix is legendary. Not only has he recorded 11 Hendrix albums, but he collaborated with Jimi to build a rock shrine: Electric Lady Studios.

Kimsey's credits are equally impressive. To date, he's been behind the board on nine Rolling Stones albums, in addition to his work with scores of other internationally acclaimed artists.

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And although the music they've recorded has changed over the years, their choice in microphones hasn't.

"I've been a big Shure fan since the mid sixties," says Kimsey. "Today I use them more than ever — for both studio and live recording. There's a very high comfort factor."

"Success over time comes from constantly reinventing yourself," adds Kramer, "something Shure has done consistently through the years." Which is why Kramer and Kimsey are frequent users of newer Shure models like the SM98A, SM91A and VP88 condensers and Beta dynamics — along with performance-proven favorites like the SM7, SM81, SM57 and SM58.

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LEE DORSEY'S "WORKING IN A COAL MINE"

by Blair Jackson

New Orleans has always been a great music town. It is the birthplace of jazz. It was home to scads of phenomenal R&B artists in the '40s and '50s, to some of rock 'n' roll's early pioneers, and since the late '60s the city has produced untold numbers of fine rock, funk, gospel and jazz performers who have made an impact on virtually every strain of popular music. Still, there is a perception that for all the fabulous music that has come out of New Orleans, relatively few of its native sons and daughters have enjoyed much national success. And that's because the city has always been somewhat insular, moving to its own rhythms, with many musicians content to stay within its friendly confines rather than tackling the rigors required to "make it" in the music business—i.e. selling out in New York, L.A. or Nashville. Fats Domino hit it big for a few years, of course, but most of the city's big names in R&B and blues enjoyed only limited success outside the parishes: Earl King, Huey "Piano" Smith, Roy Brown, Irma Thomas, Smiley Lewis, Sugar Boy Crawford, Ernie K. Doe, and the list goes on. And then there's Lee Dorsey, who landed a string of hits on the pop and R&B charts in the '60s. His career is in some ways typical of the mid-level phenoms who emerged from New Orleans in the '50s and '60s.

Dorsey was born in New Orleans' Ninth Ward, where one of his best friends was Fats Domino: "We used to tease him 'cause he couldn't play after school," Dorsey told author Jeff Hannusch in the indispensible history of the city's R&B scene, *I Hear You Knockin'*. "His mom made him come home and practice on that raggedy piano." (Let that be a lesson to all you aspiring players!) When Dorsey was 10, his father moved the family to Portland, Oregon, and it was there that Lee spent his high school years. He was drafted into the Navy during World War II, serving as a gunner on a destroyer in the Pacific until he was shot in the leg by a divebombing Japanese Zero plane.

PHOTO MICHAEL OCHS ARCHIVES

After the war Dorsey became a professional boxer, of all things, and quickly established himself as one of the Northwest's most feared feather- and lightweights, under the name Kid Chocolate. "I liked boxing. I never once got whupped," he told Hannusch. "I was a dirty fighter. I been knocked out on my feet, and guys hit me again and brought me back." He retired undefeated in 1955, much to the chagrin of his manager, then he packed up his possessions and returned to New Orleans, where he studied body and fender work under the GI Bill.

His body and fender business was going well when, in 1957, a local independent record producer, Reynauld Richard, came into the shop and heard Dorsey singing as he worked. "I was up under a car singin' and hammerin' away, and he said, 'Hey, you wanna make a record?'" Dorsey remembered. "I said, 'Sure.' I didn't think he was serious. But he was. That evening he left $50 and told me to come down to Cosimo's studio on Governor Nicholls [Street]. I went down that evening after I cleaned up from work. I didn't have any songs, but Richard asked me if I could write a poem...So I wrote 'Rock, Pretty Baby' and 'Lonely Evening,' and as it turned out they made a little bit of noise."

Engineer Cosimo Matassa [see *Mix*, March '96 for an in-depth interview] ran the hottest studio in town—literally. His room, equipped with 3-track recorders, home-built mixers, a decent selection of mics and an old EMT plate reverb, had no air conditioning. "So in the summer I'd buy a couple of tons of ice and put it on a plastic sheet in the driveway next to the studio," Cosimo told Hannusch. "I'd put big window fans behind the ice and blow the air in through the widows a couple of hours before the sessions." Cosimo engineered much of the best music to come out of New Orleans in the '50s and '60s, and for a while he also had his own record label, Rex, distributed

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problem getting body and fender work," Dorsey said. "I had the tools and I knew the work. I never knew if I was a better body and fender man or a vocalist." Even today, Toussaint remembers Dorsey as "a wonderful body and fender man; really one of the best in the area." And when I spoke to Cosimo, he fondly recalled, "Lee could do anything with cars. His nickname was Cadillac Shorty. He'd get two or three junk cadillacs, put 'em together and build himself a Cadillac."

In 1965, Marshall Sehorn returned to New Olreans and once more sought out Dorsey and Toussaint. By this time, Cosimo's studio was known as Jazz City and it had moved to Camp Street. It still didn't have any air conditioning, but it was certainly the coolest place in town to work, musically speaking. With Toussaint producing and leading the sessions, Dorsey cut a tune called "Ride Your Pony," which again thrust him into the limelight. This also marked the beginning of the long, extremely fruitful partnership between Toussaint and Sehorn. In the mid-'60s, Toussaint wrote a number of cool, playful tunes for Dorsey, including such charting songs on the Amy Bell label as "Get Out of My Life, Woman," "Holy Cow" and "Working in a Coal Mine," which cracked the R&B Top Five in the summer of '66.

"There was a certain kind of song that Lee was very good at putting across," Toussaint told me. "He had a smile in his voice; you could hear it plainly, and I wrote for that. I wrote it for his voice and personality. One of the things I loved about Lee is that I could write any kind of song for him. He wasn't too cool or too hip to do light-hearted songs. Like some R&B singers would be too cool to sing about 'working in the coal mine.'"

The song in question "came to me at the office Marshall and I had on Saint Phillips Street," Toussaint recalls. "I just got this idea—'workin' in the coal mine, goin' down down,' only it was about five times faster than the way we recorded it. I don't know why it came to me. I didn't have any experience in a coal mine. I didn't have any picture in my mind of what it was all about. It was just an idea that came to me, and as it turned out it was a pretty good one," he adds with typical understatement.

Cosimo adds, "One of the brilliant things about Allen is that he would write so Lee wouldn't have to really sing. If you listen to those songs he wrote for Lee, you could actually talk most of those parts; Lee is half-talking, half-singing. It's not that his range was so bad, but Allen definitely protected him from over-extending himself."

Cosimo notes that Toussaint liked to cut live whenever possible. "We did some bouncing, but most things were live. By '66 we did some punching in. By then we were recording on 8-track." The studio had a hybrid MCI recorder but still had a custom 8-input console that was occasionally augmented with 4-input mixers. Cosimo says that typically he used either a Neumann U47 or a Telefunken 251 on Dorsey's lead vocal. On the session for "Working in a Coal Mine," the session players included June Gardner on drums, Walter Payton on bass, Roy Montrell (who played with Fats for years) on guitar, and Toussaint on piano. Toussaint and Willie Harper sang the background vocals (as an overdub) and the metallic clang that gives the tune so much of its personality was Toussaint's brother Vincent hitting a microphone stand."

"Lee's sessions were generally pretty smooth," Cosimo says. "He was a good guy to work with, and of course Allen's a great taskmaster. He knows how to keep it movin'."

Toussaint returns the compliment: "It was always wonderful to be at Cosimo's. He was a hit-maker for us. We would

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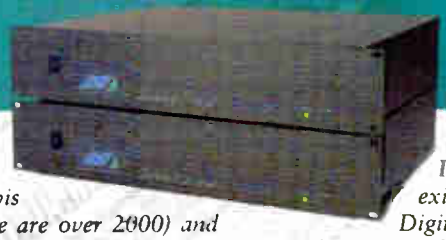

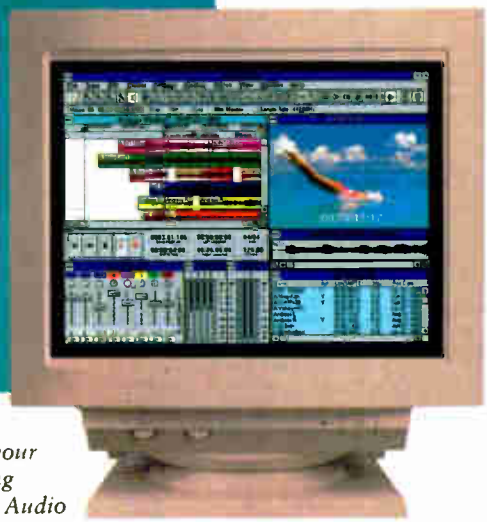

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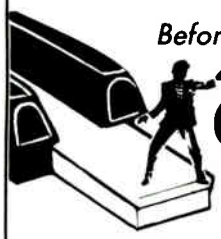

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do something over and over and over again until we got something we liked. But it was never tedious. With Cosimo, because he was so good and so enthusiastic and was such a good presence, it always felt like we were 'on.' This was *the place*, you know what I mean? This is where things really happened."

Dorsey's career peaked around the time of "Working in a Coal Mine." He enjoyed enormous popularity in Europe for a while, even opening shows for both The Beatles and the Rolling Stones. He worked only sporadically in music during the '70s, and in 1979 he was critically injured in a motorcycle accident. Still, he managed to play the 1980 New Orleans Jazz Festival sitting in a wheelchair, and he opened an entire American tour by The Clash later that year. He never stopped working on cars and never stopped singing all together, either. Dorsey died of emphysema in 1986.

Allen Toussaint has had a helluva career since those early days down at Cosimo's studio. In addition to working with the cream of New Orleans musicians, he cut hit records with The Band, the Pointer Sisters, Frankie Beverly, Etta James, Gladys Knight, Joe Cocker, Boz Scaggs and many others. His songs have been covered by artists from every genre—no doubt you've heard Devo's 1981 version of "Working In a Coal Mine," to choose perhaps the weirdest (and most apt) example. Since 1973, Toussaint's done most of his work at the studio he and Sehorn built, Sea-Saint. He's also made several very appealing albums under his own name, the most recent of which, a wonderful, upbeat CD called *Connected*, was released in June on a new label he co-founded, NYNO (for New York-New Orleans) Records.

For an excellent compilation of Dorsey's best work, check out *Holy Cow!* on the Arista label. It'll have you smilin' in no time—just like Lee. ■

—FROM PAGE 165, "¡CUBANISMO!"

a Studer A80 MkIV tape machine, which Boys used to record the sessions (at 15 ips to Ampex 456 tape with Dolby SR). The monitors at Egrem are Westlake BBSM 15 mains and SM8 near-fields. Boys says he used mainly the near-fields, because he found the mains in an awkward relationship to his position at the board.

"The equipment they have is very good quality," says Boys, "but they didn't have enough of it. They had mainly Neumann microphones, but not enough to go around." Boys brought six of his own Neumann mics and some outboard gear to supplement the studio's setup. On Alemany's trumpet, the most prominently featured instrument on the recording, he used a Neumann TLM170, which he says he placed "a good five or six feet away from the trumpet. Cuban brass players all play very loudly and very brightly. And also to get a bit of the room sound on it. I used very light compression with an 1176, I think, and pretty much whatever you hear on the record is very close to the original sound. There wasn't a lot of EQ on any of it. A little bit of added reverb, but the room itself has quite a bright sound to it—a second or second-and-a-quarter reverb time.

"Mainly, we just sat the musicians out in the middle of the room in a way that was comfortable for them," he continues, "and we didn't worry too much about leak. We felt that some leak was an attribute. We tried to give it the character of more of a '50s-style big band recording, rather than a modern salsa-type record."

The basic tracks were laid in five days, followed by three days of overdubs. Boys also spent a couple of days fiddling with the studio's Lexicon 300 to find a way to emulate the sound of the studio once he returned to the UK to mix. "I worked out a program that sort of mimicked the sound of the room," he explains, "so where I had things that had been very close-miked that I wanted to put into the same perspective as the instruments that were leaking, I could put a bit of this Lexicon on, and you'd hardly know the difference."

Back at Livingston, Boys mixed in his Studio 1 on the SSL 4056 G console, to analog half-inch at 30 ips. "There were some surprises when we got back," says Boys. "We'd recorded the bass, which is an upright bass, with both a mic and DI on it, expecting to use quite a bit of the microphone, but in the end, we used pretty much all the DI. This was partly because of separation and partly because in the end it just seemed to suit the record. And I did a bit of light compression here and there to tighten the sound up. A little bit of EQ, but nothing dramatic."

Since this project, Boys has been back to Cuba twice more to record a solo album by *¡Cubanismo!*'s piano

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player, Alfredo Rodriguez, and a follow-up collection with the whole band. "Cuba is a very interesting place," says Boys. "The musicianship is just astounding; there are just brilliant players. The country itself is very poor, of course, although I have to say I'd rather be very poor there than I would a lot of other places. It's fun, and there's a great vibe to the place." ■

—FROM PAGE 165, "THE NEW GROOVE"

ed to use them in order to create something new around them. And that was cool—taking a CD and working with that. How I wanted to differentiate this remix project from US3 is that this is genuinely a remix. We went back to the multitracks and worked from those. The songs that we chose still have their [original] titles, and they're still by the artists that recorded them, although the remixers have added things, too. But, for example, on the Donald Byrd song, 'Kofi' [from 1969], you get the Lew Tabackin [flute] solo, and even though Girl Mystic is rappin', the Frank Foster [tenor] and the Donald Byrd [trumpet] solos are behind her in each of those verses. In other words, we tried to keep the integrity of the original. I said to all of the remixers, I don't want this to become *your* thing—I want you to make their thing sound like what you would do, but I don't want you to just take it over."

Thompson started with a list of 30 potential producers/remixers and a wish-list of songs from the Blue Note catalog. (Actually, Cannonball Adderly's "Hummin'" was on Capitol, which is under the same corporate umbrella as Blue Note.) Eventually he trimmed the list down and contacted the original artists (or in the case of deceased musicians, their estates) to get their permission to have their work transformed by such established and up-and-coming producers as Large Professor, Diamond D, G.U.R.U., Easy Mo Bee, Michael Franti and a handful of others.

"As I selected the songs, I took the original masters—which in the case of Lonnie Smith ["Move Your Hand," 1969], was an 8-track (others were 16-track or 24-track)—and bounced them over to 24-track, except for one that I bounced over to 32. What that did was give the remixers some flexibility to bring things up and down. There were a couple of tunes I wanted to do where I couldn't find the multitrack, and I really didn't want to use the 2-track masters because that was too much like

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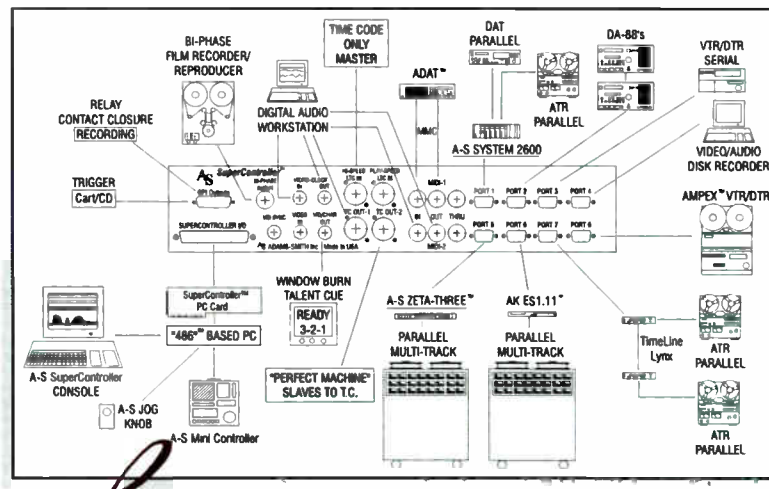

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Blue Note's Keith Thompson

what US3 had done. But on two tunes we were forced to use a DAT—Ronnie Laws' 'Friends and Strangers' [1977] and the Jacky Terrasson track ['Mixed Feelings (The New Groove),' which is a splendid outtake from Terrasson's recent direct-to-2-track album *Reach*]. The Angel [remixer on "Kofi"] specifically asked for ADAT, and some of the others went over to ADAT on their own, but most were able to work off the 2-inch with no problem.

"My direction to the producers was simple," Thompson continues. "In the raps, speak to the essence of what this song is about. In the case of 'Move Your Hand,' what Michael [Franti] did was brilliant. And actually he's a guy I never even spoke to in advance because I knew he'd do something cool. But I didn't want Horace Silver to pick up 'Sophisticated Hippie' [Silver's '75 recording, retooled here by Easy Mo Bee] and find out his song had turned into a conversation about 'I'm slingin' this and I'm slingin' that' or 'I'm hangin' on the corner with my afro and my bell bottoms,' when the truth of the matter is 'Sophisticated Hippie' is about Duke Ellington. I also said no profanity."

The remixes were done in many different studios, including Capitol, Hollywood Sound and The Crack House in L.A.; Power Play, Soundtracks, D&D, Platinum Island, Unique Recording and Axis in New York; Philadelphia's Sigma Sound; Black Militia (San Francisco); and Matrix Maison Rouge (London). In addition to the remixers previously mentioned, The Unmah, The Roots, L.G. Experience and DJ Smash contributed to the project.

Jazz fans will no doubt have mixed feelings about the disc that Thompson has put together. Some songs still have most of the flavor of the originals, but others are seriously altered, and of course the omnipresent hip hop beat means the rhythmic subtitles of most of the originals have been all but eliminated—hip hop is, almost by definition, rhythmically limited. Thompson is aware that the purists might not approve of the liberties taken by the remixers, but he says, "You have to look at the spirit and the reasons for this project. I've always wanted to see where jazz was going to go. Hip hop is here to stay, and there's no reason younger people shouldn't be into jazz just because they don't hear it in a way that's familiar to them. It sounds foreign to them. But jazz and hip hop come from the same revolutionary spirit, which is away from the mainstream.

"As the sentinel for this project it was my honor and duty to protect the integrity of these artists and songs. Secondly, because these artists have been sampled so many times and more often than not never received a dime, this was an opportunity to put them up front in a genre of music that has basically paid tribute to them by imitation or actually ripping them off. Lastly, since 1980, the Reagan era, we've seen the demise of music in the schools in such a way that music appreciation is practically a thing of the past—to the point where Bobby McFerrin shouted out at the Grammy's 'Take a boom box and play some music for your kids so they'll learn something!' When we came up there were marching bands in the high schools, concert and classical groups in the schools. Kids don't have the same chance to learn the music that they once did. So anything I can do to broaden people's view of music and show them something cool they might not have heard, I'm going to do it." ■

—FROM PAGE 164, THE HARTWICK TRIO

My problem in approaching this recording was that, although Sonic has a great live room with wonderful and musical acoustics, it is not a concert hall. If I put up a pair of C-12s in an M-S stereo orientation, I will hear the effects of "interesting" acoustics, but not a true and balanced stereo. The room was not designed to project sound from a "stage" area into a hall. I suppose we could have had a classical trio in one weekend and moved them around the room for a day or so until we heard the closest thing to true stereo. I had misgivings about this approach because it seemed we would be going for a compromised version of the real thing. We all wanted something more from the project.

Over the years, I have recorded many string sections and solo violins or cellos as overdubbed tracks in rock, jazz or folk music. When you use these instruments in this way, you hear something you never really appreciate in the strict classical context—the amazing textures created by a bow across a string. It is one thing to hear a solo violin when you're 50 feet (or yards) away in a hall with three seconds of decay, but it is quite another to stand five feet away and hear what the musician hears. The power and detail in the sound of a solo violin or cello are often lost in the great halls, and even to a degree in the churches and schools where chamber groups are often heard.

After listening to other recordings of the three pieces selected for the project, and realizing their differences from a cultural and historical perspective, we decided to not try recording in the traditional context, but rather shape each piece according to the direct sounds of each instrument and use room mics to accentuate that in the mix. We even changed the traditional presentation of the trio. Normally, the piano is oriented so that the open side faces the violin and cello, but we spun the piano 180 degrees. This significantly reduced the bleed into the violin and cello mics, and vice versa. It was an adjustment for the trio, but not a major one. Now, no single pair of mics

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LOS ANGELES RECORDING WORKSHOP

captured the entire trio. We were truly multitrack.

We wound up with ten tracks: four tracks of room mics B&K 4007s (distant, 12 to 16 feet up) and two Neumann U-89s (proximal, nine feet up in omni or wide-cardioid) and six direct mics, including KM-84s on the Steinway and AKG C-12s on the violin and cello, plus two Crown PZMs (one under the cello and one under the piano). All this was fed through Canare star quad cabling to Sonic's 44-input API console (circa 1978). A Tube-Tech compressor was lightly used on the violin and cello mics with channel filters; very minimal EQ was used throughout. The inputs were patched directly to Pro Tools via channel direct outs. A DL mult was used to feed the ADAT backup, which ran continuously.

Using hard disk as a medium for recording, editing and storage requires some adjustment. Once you get past the idea that your recording is not tangible, and that even though you can't write on its tape box, it does in fact exist, you have to decide how best to use the computer's storage capacity. Our Pro Tools system has approximately 8.5 gigs of hard disk space, divided into A and B drives, or "voices," as Pro Tools tracks must be allocated to specific drives, which, in our case, was a maximum of 4.2 gigs of storage per voice. We had never used Pro Tools to record such large numbers of tracks for 15-plus-minute takes before.

The system was using 50 megs of hard disk space for each minute of music recorded: 5 megs per mono minute over ten tracks. This would fill up the hard drives quickly. One ten-minute take would fill 500 megs, allowing only eight or nine such takes before switching drives. Therefore, we split the disc allocation between voices (drives): room mics and piano on the A voices, and the remainder on the B voices. (The latest upgrade of Pro Tools allows for daisy-chaining of all drives, but it was not yet available at the time the recording took place). This allowed for a more realistic recording scheme and filled the drives more efficiently. All of the mics were moved slightly for each piece recorded, with their positions marked and recorded on videotape.

This plan worked smoothly, and we were all impressed with the efficiency of the system and the consistency of the product. There was definitely a lack of the warmth that I am used to from tape, despite coming from API mic preamps,

—CONTINUED ON PAGE 219

World Radio History

STEREO DIES

Wahoo, NE. April 1999. John Q. Stereo dies. Best known for being able to fit into two narrow grooves on a circular piece of vinyl, J.Q. Stereo is survived by multiple children of the Digital age who, although they loved their father, have no patience for numbers under **four**. In fact, they much prefer the number **5.1**. Truly sorry about their father's untimely demise, they are joyfully spending their inheritance on six channel surround systems for every room of their new homes.

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COAST TO COAST

L.A. GRAPEVINE

PHOTO: MAUREEN DRONEY

(L to R) Oasis Mastering engineers Gene Grimaldi and Eddy Schreyer; assistant studio manager Cynthia Catanta; and studio manager Steve Baerwitz

by Maureen Droney

Stopped in to visit with mastering engineer **Eddy Schreyer at his new Oasis Mastering facility in Studio City**, which has been booked solid since opening for business in early May. "We've been working on several projects a day," Schreyer tells us, "with only three days off since we mailed out our announcements on Memorial Day, thanks to my loyal clientele. I am very flattered to be so busy this soon."

Those recent sessions have included the *Phenomenon* soundtrack featuring the current Baby Face-produced single "Change The World" by Eric Clapton, along with cuts by Bryan Ferry and Peter Gabriel; projects for Hootie & the Blowfish, Take 6, Tracy Chapman, Lionel Richie and Ronnie James Dio. All were done in Studio One. The second room, awaiting its console on the day I visited, is slated to be online in August. The facility, when complete, will have two full mastering rooms, each sharing a separate equipment room which holds the CPUs, hard drives, CD cutters and Exabyte and 1630 recording systems. There are also three editing rooms, a full kitchen, and plenty of free parking.

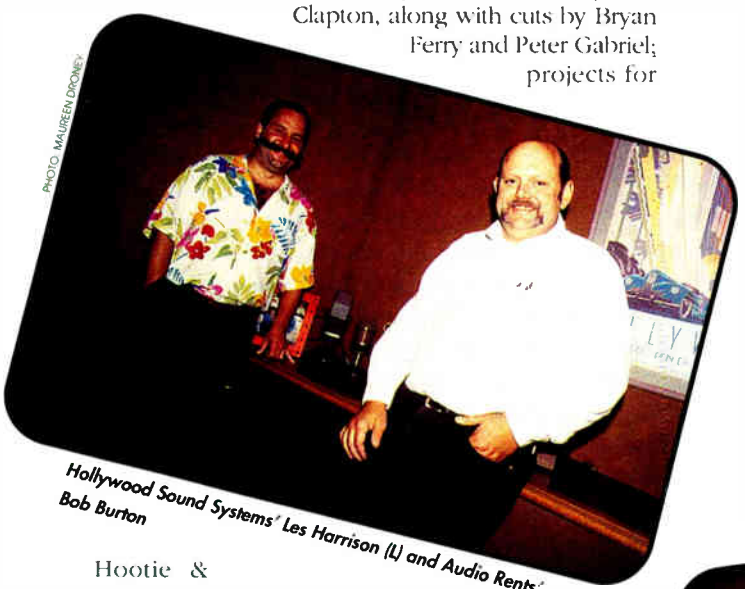

PHOTO: MAUREEN DRONEY

Hollywood Sound Systems' Les Harrison (L) and Audio Rents' Bob Burton

The spacious, hardwood maple-faced mastering suites were created by collaboration—a combination of design by David Manley and concepts developed over Schreyer's years of engineering. The rooms feature custom Manley consoles, along with a plethora of other Manley gear, including A-to-D converters, gold DAC and mastering EQP and MEQ equalizers. Monitors are by Tannoy: dual 15 mains bi-amped with

—CONTINUED ON PAGE 184

NY METRO

by Dan Daley

From small things, baby, big things one day come—The rehearsal rooms of New York have long been a fascination for me, especially since I spent a large portion of my youth in them. While the trade magazines tend to overlook them, I've followed their course to some degree and the recent opening of **Gallery Studios** shows what can happen if you stay with it.

Gallery, a recording studio-cum-art space on West 22nd Street, opened in April as an extension of Smash Studios, one floor below in the same building. The five-and-a-half-year-old Smash itself is an outgrowth of the rehearsal studio business started by owner Clay Sheff. While rehearsal studios historically are a capital-intensive business—with serious degradation of that

—CONTINUED ON PAGE 188

PHOTO: GERI BAUER PHOTOGRAPHICS

Studio VP of sales Victor Moore leans over Branford Marsalis at New York's Manhattan Center Studios. Marsalis tracked and mixed the latest by his band Buckshot LeFonque in the Neve VR72-equipped Studios 4 and 7 with help from engineer Robert Hunter (front).

World Radio History

SESSIONS & STUDIO NEWS

PHOTO: LIBBA GILLUM

Producer Johnny Sandlin (L) and legendary blues guitarist Johnny Jenkins recorded Jenkins' new Capricorn Records set, **Blessed Blues,** *at Sandlin's Duck Tape Studios in Decatur, Ga. The backing band included Muscle Shoals Rhythm Section members David Hood and William Howse.*

NORTH CENTRAL

TVT artists **Gravity Kills** stopped in at Chicago's **WarZone Recorders** to remix a song for the *Escape from L.A.* soundtrack on Atlantic. **Van Christie** and **Jason McNinch** engineered the mix. **Fareed Haque** was also in recording and mixing his upcoming Blue Note/Capitol release with engineer **Matt Warren** and assistants **Garibaldi** and **Steven Moore**...Recent mixing and mastering activity at J. Walter Thompson's **900 Studio Z** in Chicago included bands **Raw**, **M.O.B.** and **Star Capone** working with producer/engineer **John Zwierzko** and assistant **Gary Yek**...Recent sessions at **The Chicago Recording Company** included **Alice Cooper** working on a special for VH-1 and a live album for Hollywood Records with producer **Julian Raymond** and engineer **Chris Shepard**. Local faves the **Smoking Popes** recorded their second Capitol release with producer **Jerry Finn** and engineer **Phil Bonnet**...At **Chicago Trax** Recording, Ministry's **Al Jourgensen** produced the new **Lard** album (featuring Jello Biafra) on Alternative Tentacles. **Brad Kopplin** engineered. Producer/engineer **Critter** put the final touches on three new **Sponge** singles for Sony Music...At **Smart Studios** in Madison, WI, **Garbage** remixed tracks with producer/engineer (and bandmember) **Butch Vig**. **Mike Zirkel** assisted. **The Jayhawks** were also in mixing with **Brian Paulson** and assistant **Mark Haines**...

SOUTHEAST

At **Sound Emporium** in Nashville, the ever-soulful **Delbert McClinton** was in tracking and working on overdubs for his forthcoming album on Rising Tide Records with **Emory Gordy** and **Gary Nicholson** producing and **Russ Martin** and **Marc Frigo** engineering...Super-tenor **Placido Domingo** mixed his current project with producer **Bebu Silvetti**, engineer **Carlos Nieto** and assistant **Marcelo Añez** at **Crescent Moon** in Miami...Here's a great match: R&B legend **Etta James** came into **Masterfonics** in Nashville for overdub work with producer **Barry Beckett**, for the Private Music label...Lava records/Atlantic artists **Muse** mixed a dozen songs from their forthcoming debut album at **Reflection Sound Studios** in Charlotte, NC. Producer/engineer **Steve Haigler** was at the board, with assistance from staffer **Tracey Schroeder**...At **Criteria** in Miami, the **Bee Gees** and producer/engineer **Hugh Padgham** were stayin' alive and completing mixes for a forthcoming project. Assisting were **John Merchant** and **Chris Carroll**...

At New York facility KMA, producer David Anthony checked out the Yamaha 02R (manned by engineer Richard Joseph) as studio owner Mike Kissel hammered home a point during work on a project for vocal combo Millenium, on David Foster's 143 label.

NORTHWEST

San Francisco hard rockers **Fifty Lashes** recorded their latest self-produced CD, *Power Hitter*, at **The Blue Room** in San Francisco...Country/rock group **There Ya' Go** were in at Portland's **Recording Associates** tracking a new album project. Producing and engineering was **Bob Stoutenburg**...ex-Talking Head **Jerry Harrison** continues his close association with **The Plant** in Sausalito, CA. He's been working there recently with the hot Pittsburgh band **Rusted Root**...**MIDI Tracks Studio** in Northglenn, CO, has been busy tracking Sputnik Records artist **Jerry Giddens**, of Walking Wounded fame. **Bill Thomas** produced and engineered the sessions, assisted by **Scott Christensen** and **Dylan Jones**...

—CONTINUED ON PAGE 193

World Radio History

NASHVILLE SKYLINE

by Dan Daley

After three years of sometimes agonizingly slow construction and several political changes, **Ocean Way/Nashville was slated to open at the end of August.** Now a joint venture between L.A.'s Ocean Way/Record One owner Allen Sides and L.A./Memphis studio owner Gary Belz (engineer Bill Schnee was involved briefly at one point), Ocean Way/Nashville is slated to have three studios located in what was once the Tony Alamo church complex on Seventeenth Avenue South (Music Row), designed jointly by Sides and studio:bauton. The main studio is in the former church itself and will feature a 78x48-foot room with 30-foot ceilings and likely the first U.S. installation of the Sony Oxford digital console, as well as three-channel-plus surround monitoring, patterned after Record One's monitoring system. A smaller but still substantial studio will be located on the second floor of the three-story rectory building, now joined to the church by a glassed atrium, similar to the design at London's Air Studios. The rectory's ground floor will have a small in-house production studio with a customized API console; the top floor will house offices. There will also be three sizable client lounges.

In the three years that Sides and Belz have taken to build Ocean Way/Nashville, the market there has changed significantly: Masterfonics brought the Tom Hidley-designed Tracking Room online, and Starstruck Entertainment opened two new SSL 9000 J-equipped rooms designed by Harris/Grant. That, however, makes it all the better, said Sides. "More high-end studios in Nashville just makes it a better market," he told me. "The rooms I'm opening there are larger even than the new ones that have opened recently. I have no doubt that this is going to work quite well."

Ocean Way/Nashville will also have no affiliation with the House Of Blues club chain, in which Belz is a major investor. Belz' Kiva Studios in Memphis and Kiva West in L.A. are now House Of Blues Studios, and were part of his investment buy-in. There was a point at which his and Sides' studio-under-construction in Nashville was under consideration for the same status. However, Sides said that that is no longer the case.

New mastering facility on the Row—Erik Wolf opened **Wolf Mastering** on 16th Avenue South in June. The custom mastering suite is centered on a SADiE workstation system and also offers Apogee 20-bit converters, Mytek digital metering, Meyer HD-1 monitoring, and digital and analog equalization and compression for PMCD, Exabyte and DAT masters. Prior to opening his own facility, Wolf, a 20-year mastering veteran, spent five years working as a mastering engineer for Bernie Grundman in Los Angeles.

Wolf came to Nashville three years ago and worked here for Randy Kling's Disc Mastering. When plans for a second room there fell through, Wolf said he still saw a niche for a mid-priced, experienced mastering facility in Nashville, one that was less costly than the traditional local mastering houses but that had more technical capability and expertise than the hard disk-based project-type mastering operations that have sprouted recently. "For instance, this is a songwriter town," he explains. "There are tons of writers out there with ten or 20 years' worth of demos on all sorts of formats. I offer a service where I'll put them all onto one CD and smooth them out to make the collection sound consistent." Wolf is starting out at $50 per hour.

While the big news a few months ago was Diamond Rio cutting to a Fairlight hard disk system, making theirs the first major label country release to be done in that format, the notion is rapidly filtering down to independent productions. The Nashville Mandolin Ensemble's second release will be a Christmas recording for Sony Records, and it was done on a down-market hard disk system, the Roland DM-800, at Sound Emporium. The irony of an orchestra playing scores of vintage wood instruments to a hard disk recorder was not lost on Ensemble leader Butch Baldassari, who co-produced the recording with conductor Paul Zonn. Engineer Mark Lambert used his DM-800 system for the project. "The thing is, we burn a lot of space doing a lot of takes," said Baldassari. "Using the hard disk system was less expensive [than tape] in the long run because we could do as many takes as we wanted, slave off to a DA-88, pick takes, edit them on Pro Tools and then assemble them. It's definitely the way things are going here."

The 1996 Summer NAMM Show returned for a third year to Nashville, July 12-14. Some basic data: 510 exhibit booths for an anticipated 15,000 attendees in 95,000 square feet at the city's Convention Center; the first annual Music City Street Parade to kick the chow off, featuring a marching band and Shriners on little motorcycles and a Hank Sr. clone; a manually pedaled, vaudeville-esque piano-cycle; and Epiphone's Guitar Marathon attempt to break the world record for the largest guitar jam, a title currently held by Vancouver—2,000 pickers paying $5 each to follow Chet Atkins, Steve Earle and Jeff Baxter playing "Heartbreak Hotel" for 75 minutes non-stop. Some party. ■

PHOTO: BURGESS PHOTOGRAPHY

Singer/songwriter Jim Lauderdale (L) recorded his new Upstart Records release, Persimmons, with co-producer/engineer Tim Coats at Moondog Studios, Nashville.

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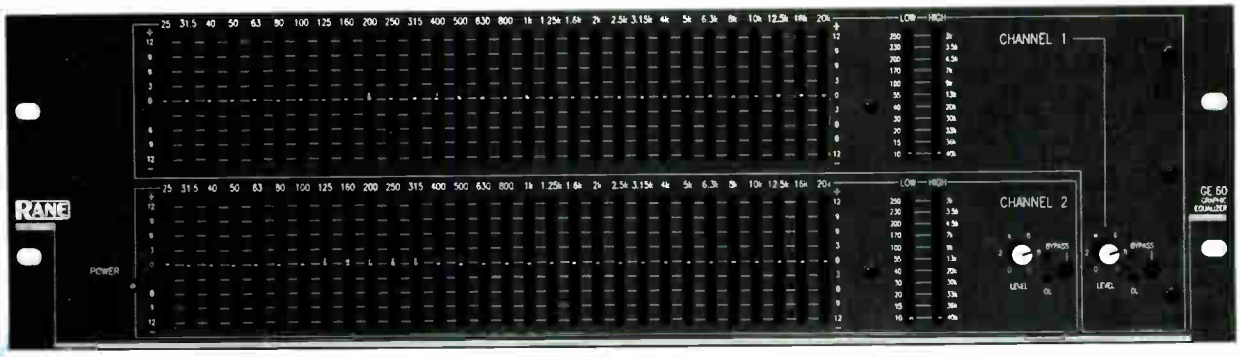

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—FROM PAGE 180, L.A. GRAPEVINE

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"This really started on a consultation basis," explains Schreyer, who has been mastering records for 17 years, working on all styles of music; his credits include Hootie & the Blowfish's *Cracked Rear View*, *Boyz II Men II*, Tracy Chapman's *New Beginning*, Offspring's *Smash*, Hammer's *Too Legit To Quit*, Alice in Chains' *Dirt*, John Hiatt's *Walk On*, and the soundtrack for *Waiting to Exhale*. "I was asked what I'd do if I was to build a mastering studio. And of course I had personal preferences to address, and lots of ideas, although the actual acoustic design is primarily by David Manley. For instance, for comfort's sake I wanted a slightly larger room than is typically done. I wanted the entrance door to the room behind my listening position rather than between the monitors. Further, we designed double-hung sliding doors for the rooms, which we believe give us a better sound seal than hinged doors. We also designed a very short audio path so all the processing equipment is racked in the console. Manley designed some really incredible acoustic features in the rooms, including curved-front Hemholtz wall corners and adjustable side walls. It's amazing—we have free-standing speakers and you cannot hear the corners!"

Ergonomics were of paramount importance to Schreyer, leading to what is a first in my experience—a retractable computer monitor mounted in the center of the 35-inch high console. "I didn't want to break my neck looking to the side at the monitor while I'm working, so we devised this setup," he says. "This helps maintain far better imaging and symmetry of the stereo playback at my listening position. Then I can raise the monitor up for easy viewing while editing."

Oasis opened up looking toward the future. "We're finding the design of our rooms is also ideal for mastering theater surround sound," says Schreyer. "For example, we've been demonstrating the DTS 5.1 playback system. [5.1 being three front speakers, two sides, with the .1 a mono subwoofer below the front center speaker.] We mastered several blues projects for Shattered Records in stereo. Bobby Owsinski, the producer/engineer, also mixed 5.1 versions of those projects and we used those mixes for our 5.1 playback demos. I can tell you it's awesome—you think you're on stage with the musicians. This isn't quad, or any kind of pseudo multi-speaker jive—everything about it is amazingly real. We think the motion picture companies will be at the forefront of developing this media. DVD and 5.1 go hand in hand for all of us to enjoy. Hopefully in a few years you will be able to rent 5.1 DVD's as an alternative to VHS stereo video tapes. It's a market that we feel is going to happen. I believe that the record companies will follow suit, and we are positioning ourselves to be ready for it."

In Hollywood, Audio Rents and Hollywood Sound Systems have moved into the space formerly occupied by the Group IV recording studios. I first met Les Harrison, president of Hollywood Sound Systems, recently when I was trying to track down a pair of Cole microphones—a mic connoisseur and collector, he had the only two in town available for rent.

Hollywood Sound Systems doesn't advertise anywhere, so I might be forgiven for not knowing exactly what they do. Harrison explains, "You might say we're kind of like a speakeasy; you have to know we're here—everything comes by word of mouth. Our primary business is equipment rental and sales. We also install and staff shows for spe-

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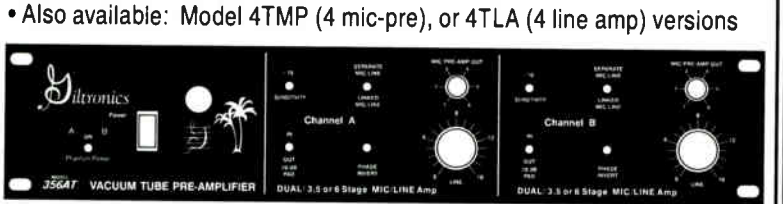

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cial events. Basically, we have two kinds of customers—the ones who know exactly what they want and just tell us what they need and when, and the people for whom we put the package together and staff the show. When the company began 33 years ago we were in installations and rental, and when I came on board 19 years ago the primary focus was systems sales—we did things like Disney's Epcot in Florida and Magic Mountain. We also rented sound equipment—in those days we were one of the only places you could go. There were really only two companies around, Audio Rents and Hollywood Sound Systems. Now we share a building! Audio Rents' primary business is now motion picture post-production, while our business is varied. We do all kinds of things—live shows, TV systems, music playback systems, corporate events, stockholders meetings and special events. An example might be the Caltech graduation, which is technically quite involved. I think we used something like eight delay zones and 45 speakers for it—that's the kind of thing we're good at. We don't do the [Great Western] Forum, shows that require great big boxes of touring sound—there are other guys that do that well. Instead of giant Turbosound speakers we might use our Apogee AE-5s or SSMs, both very expensive smaller speakers. A customer who is a production manager recently said to me, 'You know, you have the reputation of being the high tech sound company.' And I thought, 'I like that, I'll accept that description.'"

What was the studio at Group IV is now the site of the company's inventory—speakers, consoles (DMC 1000, Yamaha PM4000s and 3000s, including some small frame ones, and all sizes of Mackies, to name a few) distribution systems, the largest stock of Otari cart machines in the U.S., the hard disk Digicart and Instant Replay, DAT machines, monitors from Tannoy to Genelec, EQs, effects boxes, studio headsets for string sessions, stands and booms, you name it—even ring-down systems for the producer's phone! And, of course, microphones. "We have a lot of what's current in the microphone world," Harrison says, "and we turn stuff over a lot. I keep my inventory in really good shape, and I sell it before it gets beat up. We don't put out a big glossy rate sheet and equipment list, and one reason is, they get out of date too fast—our inventory is always changing."

The former Group IV control room has been kept intact, and is now set up

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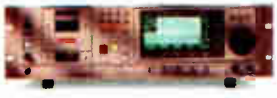

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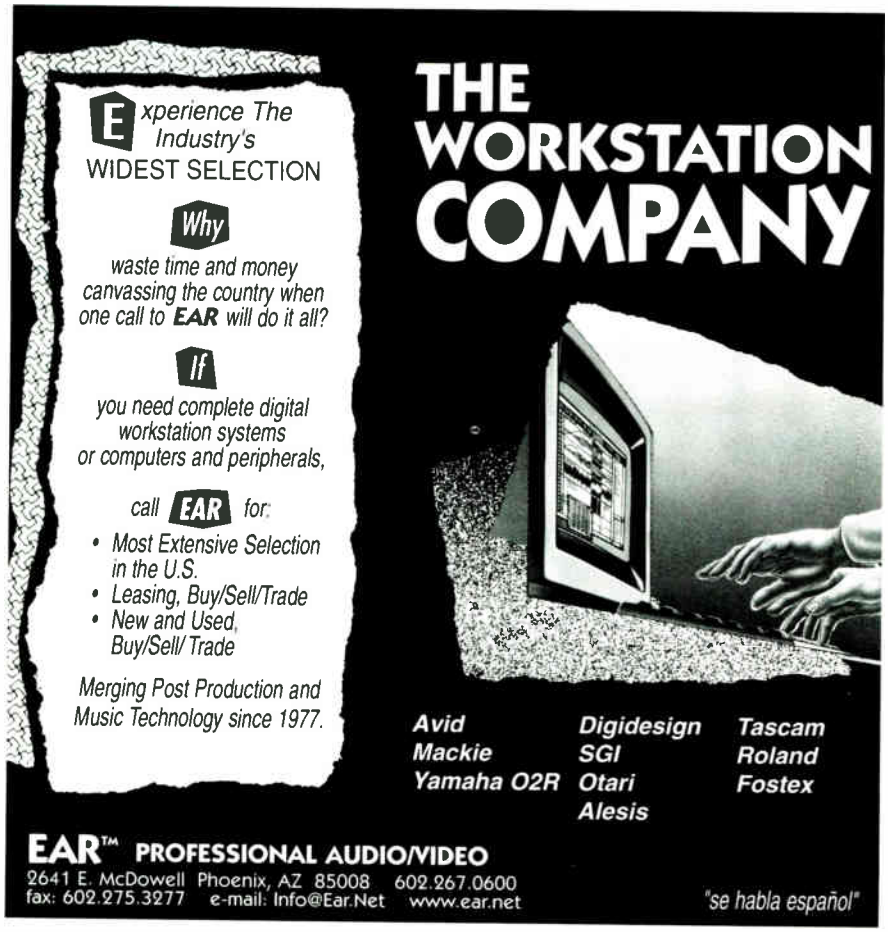

for testing and critical listening. On the day I was in there were Yamaha 02R and DMC 1000 digital mixers set up, with the staff doing comparison tests on various wireless setups by recording an actor in different environments in and around the building.

"We are in many ways like a hardware store," explains Harrison, "because what a music recordist would use a certain mic for, a film mixer or a person in television would use something else. Where you would find it appropriate to your application, they would reach for another tool. So my feeling is, these are all tools and we are the hardware store providing the tools to sound professionals. I want our company, and thus our customers, to be able to grow with the tools, and one way I'm establishing that is by having an environment where we and our customers can come in and listen to products—because it's so subjective. ■

Fax L.A. news to Maureen Droney at 818/346-3062.

—FROM PAGE 180, NY METRO

capital likely due to clients using the Marshall amp as an ashtray—Sheff used a series of endorsement deals with manufacturers like Yamaha drums and A-T microphones to keep his equipment new at a minimal cost. Better equipment in the rehearsal rooms—there are eight now—led to better clients, which utilized his recording capability in adjacent Smash. The facility's success led to Sheff and financial partner Bruce Hoernecke opening Gallery this year, which features a Trident Series 90 console with Moving Faders automation, Studer A827 multitrack and A20 2-track, new and vintage outboard, and Quested monitoring, surrounded by a 35x30 live recording room with brick and wood surfaces and an antique Steinway mahogany grand piano. Smash's Trident Series 24 console and Tascam ATR-80 serve a lower-budget clientele, while Gallery catches many of the same clients as they move upward. "It's been a case of building a business, following a lot of the same clients as their careers progress," says Sheff. "But the rehearsal business has definitely been the basis for a lot of this."

New York is an expensive town, and studios here have had a long tradition of adding on ancillary businesses to augment their revenues. I've mentioned tape duplication and CD-R, small mastering facilities, and even proprietary record labels in this space before. But one

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that's unique is TMF (Too Much Fun) Studios, which shares space and ownership with All American Alchemy, a company that custom designs and builds audio panels—mic panels, patchbays, interfaces, etc. While the panel business was started first several years ago, it provided survival income to partners Mark Richardson and Rob Paustain for the two years it took them to hand-build the one-room, MCI/MTR-90/DA-88-equipped TMF and grow it into a 5,000-square-foot space on East 12th Street. Studios and manufacturers that have ordered custom panels from them include Soundtracks, Hit Factory, Axis, Battery, Platinum Island, Unique and Solid State Logic. "The panel business was an outgrowth of the tech work I had been doing at studios up until then," says Richardson, who performed that service last at Platinum Island before going into business with Paustain, an R&B/dance mixer and engineer. This year is the first that the studio's revenues have exceeded those of the panel business, but both remain active pursuits for the company. "With the cost of rent and leases in New York, a studio has to have other sources of income, especially in the start-up phase," Richardson says. "It takes two to three years for a new studio to get word-of-mouth going. We used loans to build the studio with, but the panel business is what provided us with a substantial portion of our personal incomes."

Speaking of other sources of revenue, mixer/producer Shane "The Doctor" Farber, who has **Sound Doctor**, a small studio inside Sound On Sound Studios, is using his new Web site (www.jeepjazz.com) as both a virtual brochure for his services (complete with bio and discography) and as a virtual storefront, from which he's selling his custom drum, guitar and other sounds on disc and tape, and an array of clothing bearing his JeepJazz logo. There is also a location on the page at which unsigned acts can load in material for playback from the Web site, for a fee.

Whether anyone buys these services or merchandise, it underscores not so much the potential of the Web but the potential for the myriad ways pro audio people can devise alternative revenue schemes for themselves, their products and services, and their facilities.

Could SoHo be becoming EOSO (East of Silicon Valley)? More than existing studios adding multimedia capability, New York is seeing dedicated MM startups. A prime example is **Interaudio**, a new two-room MM-dedicated audio studio on John Street in lower Manhattan. Started by Chris Bertolotti and partner Brian Jones (the same team that built the recording facilities for MusicPen and did sound design there on high-sales ROM products like Microsoft's Magic Schoolbus), Interaudio was established with what Bertolotti calls "a mission to provide soup-to-nuts audio recording and processing for the multimedia industry in New York." The two suites are based around a Mackie 32 console, 32 tracks of ADAT, Mac-based Logic Audio hard drive recording/editing and PC-based Sound Forge and Cakewalk programs, as well as Pro Tools for both platforms. "The people who designed high-profile game programs like Jaguar and Playstation knew what they needed in terms of audio, but a lot of ROM developers don't," explains Bertolotti. "They're paying more attention now to the quality of voice-overs, sound design and editing. And that's the niche we believe that's developing in New York and that we can fill." It's a niche they've already filled for their initial clients, including Windsor

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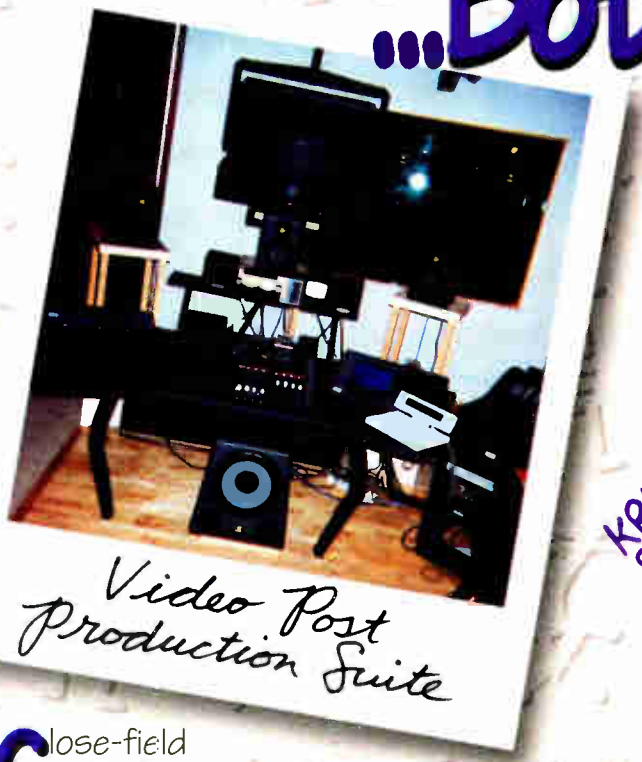

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Digital, Microsoft and AT&T.

What the MM world hasn't settled on yet is rates. Bertolotti does not discuss rates specifically, but does say that it's a function of the overall project budget, and that revenue growth in multimedia audio is partially a matter of exposing clients to the audio possibilities they may not yet be aware of, such as sound for interactive clickers. "It's a creative budget-structured approach to determining our own rates," he says. "It's largely based on what the client has to spend on the project itself." ■

Fax your New York news to Daley at 615/646-0102 or e-mail danwriter@aol.com.

Rockers Mexico 70 recorded their new LP in Saline, Mich., with producer Tim Patalan (Sponge). Pictured (L to R) are Patalan, Rick Duce, Jimmy Risk, Warren James, Mark Barrett and Mick Bund.

—FROM PAGE 181, SESSIONS

SOUTHERN CALIFORNIA

Activity at **Mad Dog Studios** in Burbank included Dwight Yoakam's producer/guitarist **Pete Anderson** working on a solo album for Little Dog Records, and co-producing the new effort from singer **Joe Lynn White** with **Dusty Wakeman**...Those titans of '70s pop **Ron and Howard Albert** were in at **Ocean Studios** in Burbank producing the latest spin from Geffen Records artist (and longtime Ozzy guitarist) **Zakk Wylde**. **Greg Goldman** engineered, assisted by **Erich Gobel**...At **NRG** in North Hollywood, **Rob Cavallo** was working in Studio B for a mix session with snotty 'n' rich pop-punkers **Green Day**. **Jerry Finn** engineered, **Lisa Lewis** assisted...Producer **Shaun LaBelle** and engineer **Rob Chiarelli** were in at **Enterprise Studios** in Burbank mixing a track called "Baby I'm Gone" from Arista Records artist **Infiniti**. **Jeff Griffin** assisted...At

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MIX

North Hollywood's Blue Palm Studios, Bob Tucker mixed Sunshine TV's program *On Tour*, featuring Tears For Fears, Meatloaf, Lush, Cowboy Junkies and others. Also working on that project was engineer Paul Dugre...Christian thrush Amy Grant was tracking her latest at The Village Recorder in L.A. with producer Wayne Kirkpatrick and engineer Dan Marnien...

SOUTHWEST

Top gospel artist Barbara Johnson Tucker did recording and mix work on her new live album, *Order My Steps*, at Rivendell Recorders in Houston. Horace Young produced and Troy Warren engineered... Reelsound Recording, based in Austin, handled the audio for the Dave Matthews Band's MTV broadcast from New Orleans. New York remote king Randy Ezratty engineered, with some help from producer Steve Lillywhite. Also part of the audio crew were Greg Klinginsmith, Gordon Garrison, Sam Harper and Malcolm Harper...

NORTHEAST

Through the years they've seen (and recorded) it all at Trod Nossel Studios in Wallingford, CT, but this was a first for them: The Police Pipes & Drums of Waterbury, CT, came in—20 bagpipers strong—and cut an album there. Engineering were Richard Robinson, Howard Jeffrey and Moe Robitaille...Jazz

PHOTO: ALISON SHAW

In search of an idyllic setting in which to work on new material, James Taylor set up an impromptu studio (equipped with a Yamaha 02R console and Tascam DA-88 recorders) in a rustic house on Martha's Vineyard. Taylor (R) is pictured with co-producer/engineer Frank Filipetti at the 02R.

World Radio History

In Studio A at New York facility Sear Sound, owner Walter Sear is flanked by engineer Danny Kopelson (L) and producer Craig Street during sessions for young artist Jeremy Toback's new RCA/BMG release.

made Absolute 2 near-field speakers...**Bay Records Recording Studios** in Berkeley, CA, has put in 24-tracks of **Alesis ADAT XT**, as well as a BRC controller and an AI-1 digital interface. This is to supplement the studio's 24-track analog (with Dolby SR) capability...New Sony recorders for Nashville's **Woodland Studios**: a 3348 DASH format digital 48-track, a digital 24-track and three PCM 800 MDMs...Calum Malcolm, Scottish producer and owner of Edinburgh's Castle Sound Studios, recently purchased a pair of **Tannoy AMS 8** active near-fields for use as part of his mobile recording system. ■

singer **Jimmy Scott** was in New York's **Sear Sound** with producer **Craig Street** and engineer **Danny Koppelson** working on his next Warner Bros. album. Piano phenom **Jacky Terrasson** spearheaded the trio behind Little Jimmy...R&B songstress **Nancy Wilson** worked on her next CBS/Sony release with producer/songwriter **Skip Scarborough** at Baltimore, MD, facility **Secret Sound**. Studio owner John Grant added his guitar work to a cut...ex-J. Geils belter **Peter Wolf**'s fine new album, *Long Line*, was mixed at **Normandy Sound** (Warren, RI) by **Tom Soares**, with additional work by **Phil Greene**...**Bob Power** has finished production of the latest album by Kedar Entertainment/Universal Records artist **Erykah Badu** at **Battery Studio** in New York...**Nuno Bettencourt** was in at Boston's **Sound Techniques** putting the finishing touches on his A&M solo debut with producer **Anthony Resta** and engineers **Bob St. John, Carl Nappa** and **Ted Paduck**...At **Victory Recording Studios** in Philadelphia, producers "Little" **Louie Vega** and **Kenny "Dope" Gonzalez** and arranger **Vincent Montana Jr.** cut live strings for The Braxtons and Nu Yorican Soul with **Gene Leone** engineering and **Don Sabra** assisting...

STUDIO NEWS

The Amherst, NH-based mobile TV production company **Game Creek** purchased a 60-channel **Calrec S Series** console for its new trailer...In other remote news, **Reelsound Recording** of Austin, TX, ordered six Sony PCM-800 digital recorders to assist in their audio/video work...**Norman Blake**—singer, guitarist and songwriter from Scotland's popular band Teenage Fanclub—installed a 24-channel **Soundcraft Spirit** console in his home studio in Glasgow. He also installed British-

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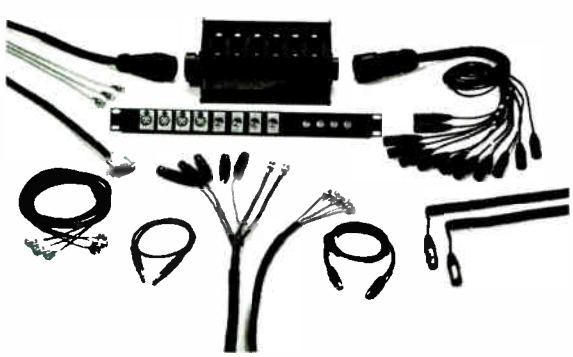

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—FROM PAGE 18, EAT YOUR SQUASH

you need is neighborly wall banging and phone calls. So you need an extremely reliable, stable level for half the night. Answer: Get a compressor and deal with it.

2) You have one of those insane car audio systems like I do, and the fact of life is that there's a dismally small amount of dynamic range available in a moving car. If the CD has too much dynamic range, you won't hear the quiet parts. Answer: Get a compressor and deal with it.

Sing along with me: "96 decibels on the disk, 96 decibels. Take one away, and next time you play, 95 decibels on the disk..."

3) Radio play. You need the maximum apparent competitive loudness on the air, because everyone else has it. You want to squish the hell out of your song so that the radio station won't. Answer: Come on. Do a just-for-radio-promo-mix with a dynamic range of one. That's how it's done; money for nothin' and music for free. Then release the real mix with a few more dB.

That's about it, the only reasons that I can think of off-hand to waste musical dynamics. So with these three far-reaching exceptions, I agree with their plea.

But here we are as an industry routinely shipping our wonderful new 96dB media with 20 dB of dynamics encoded on it, even while others work on newer 20- and 24-bit super CDs. For what? 20 dB of dynamic range again? Where's the fun in that? Where's the *expression*? The air, the emotion, the surprise?

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SSC measures his world's dynamics in cat purrs to nitrous oxide Harley Davidsons. He does not want that taken away from him a single day before he loses it naturally.

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—FROM PAGE 50, GEORGE DUKE

called me about ten years ago to work on his album. I put something together; he loved it, and I got a chance to play with him in Montreux.

But Miles had been my main influence all the way back to when I first heard him in 1957 as a child. To me, he was like Frank Zappa but on a different level, because he kept changing styles. I would listen to his records, and then I would go see him live, and the music would be radically different. It would be way faster, more complex, and it had stuff I'd never heard on records. I realized you don't always have to go out and play the record. He introduced me to a whole new way of thinking which people need to get into now. The music nowadays is stagnant in many ways.

Bonzai: What's your advice to keep the music scene bold, adventuresome?

Duke: Well, it certainly isn't a bold time for music. It's a scary time, because if you want a recording contract, you really have to play ball—but on the other hand, you just can't bend over totally. Seems to me that musicians need to create their own voices, and not be followers. We need some leaders out there that can take the music to another level.

Right now, just about everything is very soft and lazy, puts people to sleep. That's wonderful; I like soft music; I like to relax—but we also need music that makes a statement, and is bold.

I really believe that a band could come along now and do it—some young guys who knew their instruments and had the audacity and veracity. I'm thinking about when we had Return to Forever, the Mahavishnu Orchestra, the Cobham-Duke Band. These bands made serious musical statements, and I think it could happen again, but is there anybody out there doing it?

The jazz players have gone back to the '40s and '50s. Nobody has picked up from the point where the Chick Corea's and those guys took it. I guess there's no support for it. But if there was a strong young band, I think it could happen again, maybe in a different way.

Bonzai: Do you foresee the record business changing?

Duke: I was talking to my product manager at Warner Bros., and she said that they are really looking at alternate ways of promoting records. Evidently the "soft" music format is not selling records anymore. They need to find a new way of getting to the people. I was amazed when I did a thing with QVC the other day to sell some records. I never had done it before, but we put a package together, I went on TV for half an hour and we sold out all our product.

Bonzai: Where was this?

Duke: The Home Shopping Network [laughs]—yes, George Duke on the Home Shopping Network. I rattled off a couple of tunes by myself on the piano, and the announcer had my albums there, and he was selling them. He packaged my new record with the orchestra, *Muir Woods Suite*, and my previous album *Illusions*, and sold them as a unit. We sold them all, and it was quite an experience. I guess we were just reaching places where you have to go miles to find a record store, and we got to a whole new set of people.

Musicians have to start doing music and not thinking of the consequences. Otherwise, music is not going to grow.

Bonzai: So, you were slotted between the cubic zirconium and the Ginsu knives?

Duke: [Laughs] Yes, and the baseball cards.

Bonzai: Your new orchestral album is quite ambitious—recorded in Montreux in 1993?

Duke: Yes, we decided to wait to release it because I had the album *Snapshot* out and it was doing well. We didn't want to follow with something that was a left turn. We waited to put it out, and I'm planning to go out and do some orchestral tours. We've got some nice offers from the Atlanta Symphony, the Cleveland Symphony and the London Philharmonic. It takes about 18 months to put something like this together, but it's not the kind of record that gets a hit single with a bullet. I'm hoping that it will just stick around. I wanted to challenge myself because I'm at the time in my life where I don't want to keep doing the same things.

Bonzai: It's kind of highbrow music, isn't it?

Duke: Highbrow? Well, it's not for everybody, but I wasn't concerned with that. Radio was the last thing I was thinking about. At a certain point, musicians have to start doing music and not thinking of the consequences. Otherwise, music is not going to grow.

Bonzai: You're a musician, singer, producer, arranger...What is your first love?

Duke: Playing acoustic piano. That's what I like the best, no doubt about it. After that, I like playing music with my synthesizers and creating with all kinds of styles. Composer vs. performer vs. producer—it really depends on the day and what side of the bed I get up on. I get as much enjoyment sitting in the studio watching Natalie Cole sing "Love Letters." She sang the stew out of that song last night!

Bonzai: As a producer, what do you bring to the project?

Duke: Each artist is different. I have to bring whatever the song needs, or the artist needs. They're all very different. Working with Al Jarreau is as different as night and day from working with Natalie. Two totally different personalities. But they're all different. Some people require more coaxing; some don't. They have it together—you just have to guide the ship. Other times, you have to get in the trenches and tell someone, "Sing this line, do this." You have to be prepared to go the full length and give whatever it takes. You may just lay back and let the artist explore.

What I like to do is just guide the ship—I'd rather not get in the trenches and tell the artist what to do. I love to work with artists like Natalie and Al, where you can guide the ship and maybe give them an idea and let them run with it. It might be something they just never thought of. "Al, what about trying this with that note?" He says, "Yeah..." And then he runs with the idea. That's what I like.

Bonzai: So, are you sitting pretty these days?

Duke: So far. I'd like some more hits, but I'm doing okay. I've decided to work with artists that have some talent and something to say, whether they're big-selling artists or not. The important thing is to make music and work with musicians and singers who really know their craft. ■

Roving editor Mr. Bonzai learned everything he knows about the creative use of fresh fruit and household appliances from Frank Zappa.

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—FROM PAGE 26, THE RIGHTS STUFF

network wants to re-release the series on DVD in five years, they won't have to negotiate the rights all over again.

The other solution is even simpler: re-record the track from scratch, using MIDI. Do you still need convincing that with the right gear in the right hands, astonishingly good-sounding music can be produced with MIDI, even classical music? If you don't believe that yet, go to your local music school and listen to some of the kids' composition and orchestration exercises that they're doing in the computer labs. Then hire one of those kids, or one of their teachers. They program, you mix. The talent is out there. Most of it is doing games, industrials, spots, techno and cheapo horror flicks, but there are a lot of classically trained musicians who would really shine given the opportunity to play orchestra conductor with their MIDI gear. And if they've been doing anything at all with video, they already know about synchronization and how to make things fit.

Scenario number two: A software company is preparing to put out a series of computer games based on a blockbuster movie. Through various mergers, acquisitions, leveraged buyouts and other scams that make America what it is today, the software company and the studio that owns the movie find themselves under the same corporate umbrella. Licensing the characters, the scripts, the visual backgrounds, even the voices of the characters (some supplied by the original actors, who haven't worked since the movie came out, and some replaced by imitators) is a snap. What's missing? The music. The composer, no slouch in the "keeping what's mine" department, never granted any rights to the studio outside of film and video synchronization. He's not about to now, and he's way too busy (and too expensive) to devote time to writing new music for some silly game.

The software company puts out a call for anyone who can write, fast and cheap, in the composer's style. Since the composer, while brilliant, is highly derivative of other well-known (and dead) composers, it's not a hard assignment. Because there's little direct sync, the new composer can work without picture, just writing cues to overall timings, filling the need to accentuate moods or types of action without nailing every hit. In fact, the company can hire several composers and mix and

World Radio History

match their work as needed. The music needs to be recorded, digitized and perhaps processed so that it sounds good at 22 kHz with 8-bit resolution—all jobs for us audio types.

Scenario number three, my personal favorite: A company gets the idea to build stand-alone kiosks for health and fitness facilities that will create personalized exercise videotapes for clients. With a computer, a huge hard disk filled with images and a touchscreen, a trainer can select which exercises, how many of them, how fast to do them, how long to pause between sets, and even whether the image on the screen will be male or female. The computer spits out the images in real time, and they're recorded on a built-in VHS deck. The tape pops out, and the client (or if it's a medical office, the client's insurance company) pays for it and takes it home. If the system needs to be updated or the repertoire changed or expanded, the company puts the new software and images on a CD and distributes it to all the facilities that bought the system. They then slide the disc into the unit's internal CD-ROM drive and follow the instructions. This is cool: a real-world, highly practical and helpful application of that nebulous thing called "multimedia."

That CD-ROM drive can, of course, be used for something else: audio. The videotapes, the company reasons quite correctly, will be a lot more appealing if there's a music track on them. So a subroutine in the computer extracts digital audio from a CD in the drive and records it onto the videotape along with the picture. The sales team out on the road who are pushing the concept at clinics and health clubs are telling potential buyers they can put anything they want on the tapes: Steely Dan, Madonna, Pachelbel, Grand Funk Railroad, NWA, whatever. Until someone taps them on the shoulder and whispers "Copyright!"

There are four criteria generally recognized for evaluating "fair use" of a copyrighted work, and this scenario manages to flunk all of them. It's not derivative, it's not literary (like a review), it's not educational, and it's certainly not noncommercial. In fact, it's about as blatant a violation of copyright as you can imagine, and the company realized, about a month away from ship date, that they had better do something about it or they were going to get nailed.

To their infinite credit, they called me. My assignment, and I did choose to accept it, was to produce, in a week, some 35 minutes of original instrumental music encompassing styles from funk to lite jazz to new age to rock 'n' roll, all of which I kept on my Mac in a folder called "Music To Not Get Sued By." They paid me well, they were pleased with the results, I granted them unlimited use for their specific line of products and kept all other rights (hey, I may make an album from some of it some day), and we all went away happy. See why this was my favorite scenario?

Probably the only thing that's safe to say about copyright law and practice is that, five or ten years from now, it will be different. But hopefully, the need to produce new music and other audio material, and the ability to get paid for it, will remain as important as it is now. However things shake out, it's to our advantage to realize that sometimes there's much more to this copyright stuff than meets the eye, and if we're smart, we'll make it work for us. ■

Paul Lehrman is trying to figure out how he can claim trademark rights on the term Fair Use.

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—FROM PAGE 30, AES AND APRS

the On-Air 2000, its first digital on-air console. The first U.S. installation goes to Turner broadcasting, but what interested me more is whether Studer could possibly turn this high-performance/low-cost (about $28,000) broadcast board into an affordable 8-bus digital wonder for the studio market.

The Unintentional Pun award surely goes to Belgian company Amptec, which unveiled its "STONE-D 001" digital mixer. The compact (analog 8-bus sized) console looks essentially like any analog mixer you've ever mixed on, with knobs and faders where you'd expect them. Inside there's a 32-bit floating-point DSP architecture with 24-bit A/D converters and 20-bit D/A converters. The company currently has no plans for U.S. marketing, but such things have a habit of changing when the right product shows up. We'll keep you posted...

The worst part of walking around offshore shows is seeing products that are unavailable back home. Dutch company Technica del Arte unveiled its Lupa digital console; German manufacturer Lawo showed its high-end MC Series digital mixers; and Mandozzi Electronica (Ponte Capriasca, Switzerland) announced its PDT32 digital desk. A few European imports are heading our way: QSC is distributing the StageTec Cantus, Amek's DMS digital mixers are slated for U.S. deliveries, and HHB is marketing Audio/Design's mini-digital mixers in the U.S. Meanwhile, Harrison has entered a joint agreement with Germany's Klotz Digital to develop the Harrison Digital Series 12, which offers the option of analog or digital operations from the familiar Series 12 mixing controller. Including Solid State Logic's Axiom and Scenaria digital systems and Yamaha's 02R, I counted at least 20 digital mixers at AES. Vive la revolution!

AES just wouldn't be AES without new partnership alliances: Digidesign and Mackie announced a joint product strategy to develop a low-cost hardware control surface for Pro Tools and other Digidesign products. Scheduled for release later this year, the product will feature touch-sensitive fader technology, transport controls and basic editing functionality.

Dolby Drive

Ready for a digital dubber? You could have stopped by the Dolby booth for a first look at Dolby's Digital Drive, an 8-channel film dubber replacement

—FROM PAGE 30, NEW DIRECTIONS

pressor, a 2-channel outboard processor designed by Rupert Neve. Using digital control of analog circuitry for precise repeatibility of settings, the 9098 Compressor also provides an Ambience mode that is designed to reduce excessive reverberation or background noise without gating the signal.

Ironically, the biggest news from Audio 96 didn't come from products: For 1997, the APRS show will combine with the Vision, an exhibition focusing on broadcast, film and post-production technology. This expanded new event, known as Vision and Audio 97, will be held at the Earl's Court convention center from November 4-6, 1997. Mark your calendars now. ■

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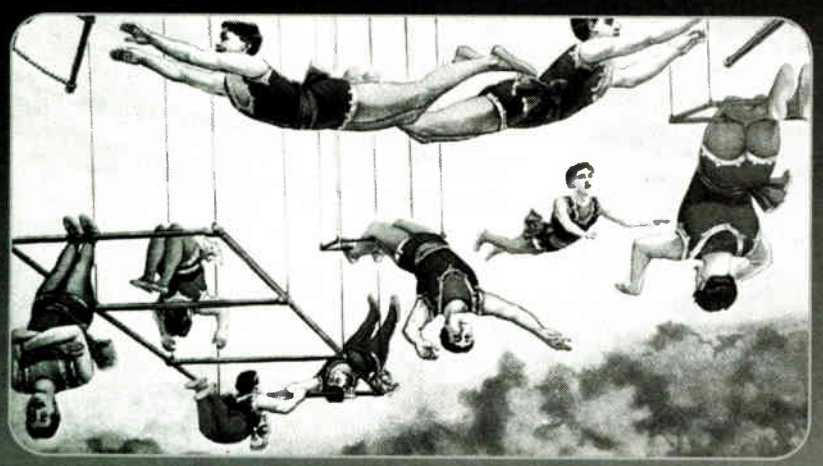

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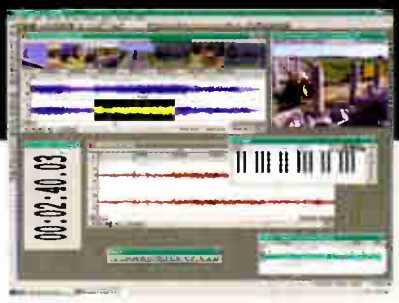

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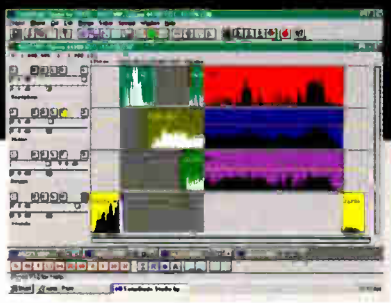

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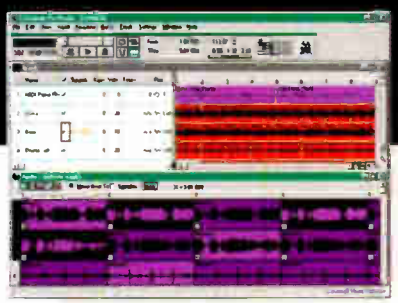

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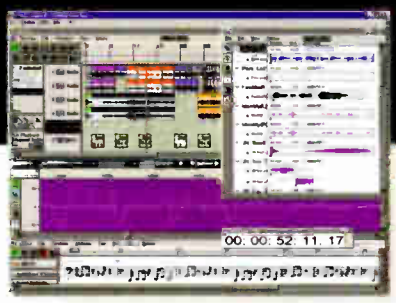

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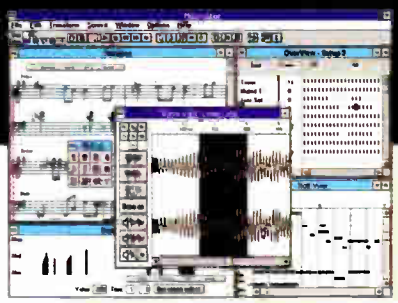

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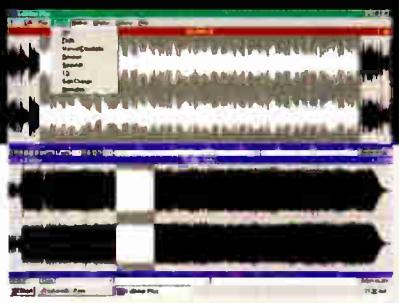

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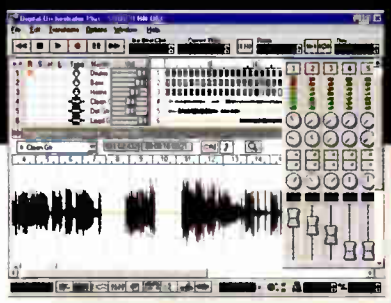

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in a four-rackspace package. The recorder will be priced around $12,000; a play-only version will also be available and deliveries should begin later this year. UK-based Genex (distributed by HHB) launched its GX8000, an 8-track magneto-optical recorder that offers 8- to 24-bit recording in a three-rackspace chassis. Otari showed a prototype of its PD800 8-track dubber comprising a three-rackspace hardware processor, a VGA display and a remote controller with jogwheel, meters, transport controls and a QWERTY keyboard.

At last year's AES show in New York, tube gear was hot; at the 100th AES, digital was coming on strong. Berlin's Junger Audio (U.S. distribution to be announced soon) demo'd its e07, which has two channels of *analog-sounding* 4-band digital equalization with parametric mids and high/low shelving. Each of the e07's filter bands can be used as a dynamic equalizer for digital de-essing, or as a standard EQ, and an internal digital limiter prevents clipping. The 24-bit processor also includes an 88.2/96kHz high sampling mode.

Danish homeboys TC Electronic used AES as the launch pad for the Studio Finalizer, a single-rackspace tool kit that is designed to enhance the dynamics of a recording during the mixing or mastering phase. The unit combines a 20-bit A/D converter with 16-bit dithering, noise shaping, a 5-band stereo parametric EQ, 3-band stereo compressor/limiter/expander, normalizing function, stereo enhancement and de-essing. Also provided is a phase correlation and high-res peak meter, with an optional digital fader.

Perhaps the biggest surprise at AES was the debut of Penny & Giles' Digital One-Stop, a multichannel, 24-bit (32-bit FP internal) digital audio processor offering simultaneous manipulation of up to 16 audio channels. Housed in a two-rackspace chassis, Digital One-Stop combines a hardware-based expandable mainframe approach, where a single front panel interface can control multiple units. All processing is handled via P&G's Pythagoras Audio software, which includes suites of processors such as Dynamics, EQ and Studio—linked by soft-wired patching, routing and cloning of multiple processors. And you thought these guys only made faders...Whew!

The 101st AES returns to Los Angeles November 8-11, 1996, at the Los Angeles Convention Center. And the next Euro-AES takes place in Munich, next winter. Pack your snowshoes! ■

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130 West 42nd St., Suite 952
New York, NY 10036
(212) 997-0206; Fax (212) 997-0481

Recent projects feature former Rolling Stones guitarist Mick Taylor, Sasha, Carlos Alomar, Lenny Pickett, Robin Clark, Steve Ferrone, T.M. Stevens, Vivian Cherry, and Tawatha Agee. The engineer is Nenad Gracanin, and the producer is Sasha. Studios feature SSL 4064, G Series computer, Studer A827, Sony PCM 3324, Sony PCM 800s, state-of-the-art recording, mixdown and mastering. Highest possible quality is our main concern.

Performance Recording

Orland Hills, IL
(708) 349-9471; Fax (708) 349-5015

Founded in 1995, in collaboration with ouR® House Inc., Performance Recording was developed primarily as a studio for artist C/D and demo recording. The studio is equipped in part with an Otari 2"-24 MTR-100, 32 tracks of ADAT XT, an Amek Big console, Genelec monitors and literally a "Who's Who" of outboard solid-state and tube processing equipment. An extensive collection of vintage tube and condenser microphones, several amps and a B-3 organ round out the gear. The studio was recently tuned by Bob Hodas. Dyaxis digital editing and CDR writing are also available.

Gravity Studios

2250 W. North Ave., 1st Fl.
Chicago, IL 60647
Tel/Fax (312) 862-1880

In the heart of Chicago's Wicker Park, Gravity's secluded facility provides a true creative haven. Featuring a brick live room and three iso's, Gravity is ideal for tracking. For mixing, a large-frame, fully automated AMEK Big is flanked by a Studer A-800 MkIII and names like Summit, Quantec, TC, Eventide, Genelec and Apogee. Clients include Smashing Pumpkins, Veruca Salt, Poi Dog Pondering and Loud Lucy.

Hotdish Mastering

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e-mail: hotdish1@bitstream.net

Mastering services from simple transfers to delivery formats (1630, CD-R, Exabyte) to fully tailored program-dependent polishing. Other services: digital editing/sweetening/restoration/archiving. Flat rate prices/brokering available. Custom-designed monitor environment flat from 23 Hz to 30+ kHz. 24-bit signal path includes Sonic Solutions, TC Electronic M5000. Analog formats accepted. Customer satisfaction is our primary goal. Contact Phil Mendelsohn for more information.

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PRIVATE STUDIOS

Private Studios

705 W. Western Ave.
Urbana, IL 61801
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Private Studios features the Midwest's only Amek Mozart console with Rupert Neve modules and 48-track analog and digital recording. Private has one of the largest collections of vintage microphones and outboard gear in the country. We regularly work for Warner Bros., Sire, Atlantic, Island, CBS, Charisma, Reprise, Zoo, Profile and Roadrunner. We are surprisingly affordable and provide an extremely comfortable place to work.

Sound/Mirror

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We are a fully digital location recording, post-production and CD-mastering company specializing in classical and acoustic music. We do extensive field recording around the world and have been involved in complete recording projects for nearly every major classical label over the past 20 years. Full location recording with PCM-9000; post-production with Sonic Solutions, Lexicon Opus and Sony DAE-3000 and more. Your recording may be our next Grammy nominee.

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R/J Recording & Sound

P.O. Box 302 Geneva, IL 60134
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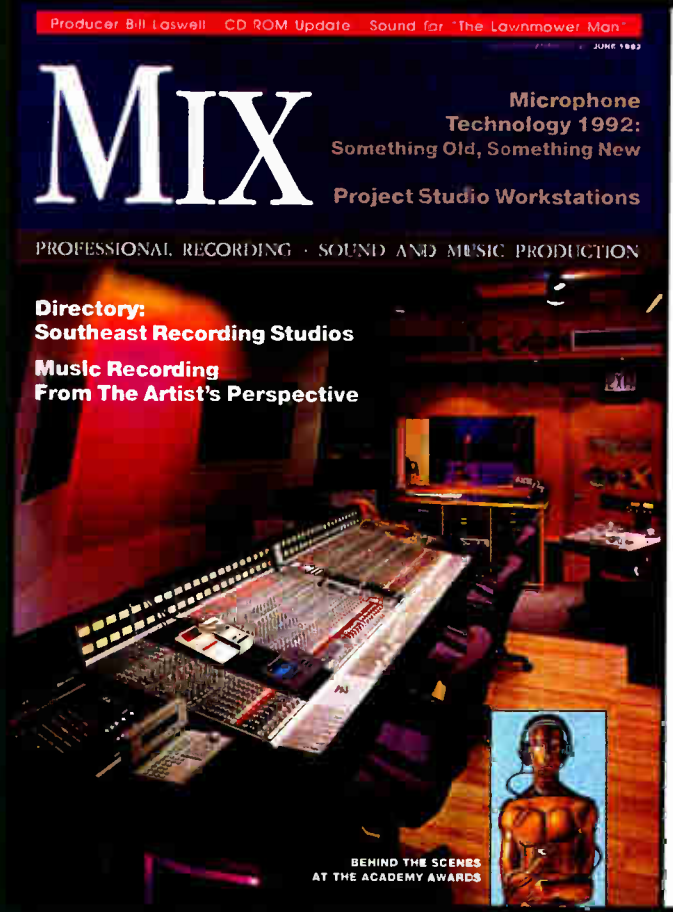
We pride ourselves on the highest quality in every facet of our business: recording studio, full tech rehearsal facility, on-location digital recording, and sound reinforcement for corporate events, seminars, local and national entertainment, country fairs and concerts. Clients include Mandy Patinkin, Out of the Gray, Greg Kihn Band, Mel Torme, Maynard Ferguson and more. Soundcraft consoles and multiple systems, along with a friendly staff have earned us the reputation as "the most consistent high-quality sound company in Chicagoland."



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The Complete Guide to Manufacturing Packaging Mastering Compact Discs Cassettes.

—FROM PAGE 138, SSL AXIOM

of the master section, where they are close to the central, "sweet-spot" mix position and also close to vital communications plus transport controls.

I refrain from referring to the V2.0 concept as based on "layers," simply because that would limit the sources to strips as being comprised of maybe two, three or four preprogrammed inputs/disk tracks that we can cycle through on an individual or global basis. Instead, because the user sets up the board on an entirely custom basis, laying it out from either a fresh setup page or, more likely, by customizing a basic console topology, you always know what is passing through which channel strip, simply because you have instant access to the setup pages or can look at the scribble strip located in each strip. Inputs to a channel strip can be set up as mono or stereo sources. All in all, Axiom's designers have managed to retain the elegance of its original concepts with a realization that space is often at a premium, or users often need to maintain a fixed, central location.

Other refinements offered in V2.0 are also useful: Extended Panning allows any channel to pan simultaneously to multiple-format mix buses; a new Fader-to-Aux function for simplified setting up of foldback mixes, etc.; and Dual Signal paths per channel strip, for extended input capabilities.

AXIOM V2.0 SOFTWARE AT A GLANCE

Axiom 2.0 offers so many new features that it's impossible to go into detail on all of them. Here are a few of the key enhancements.

ACCESS

- Channel Banking provides access to more channels in a smaller frame size.
- Bay Swapping provides "sweet-spot" mixing.
- Extended monitor configuration and talkback custom options that enable client-specific setups to be stored and recalled, including enhanced macro control of output configurations.
- Fiber-optic FreeWays.
- S/PDIF and AES/EBU digital I/Os.
- Enhanced Mic Amp II, with filter and limiter.

CONTROL FEATURES

- 64 presets for EQ, dynamics and effects processing, per operator, with master settings libraries.
- Integrated mix routing and panning.
- Assignment of pan format to any channel.
- Film monitor panel, with PEC/direct switching.
- Joystick panners, in pairs, tied to any channel.
- Automation mode range, enabling individual or global recording of fader, group, pan, EQ, dynamics, effects and aux controls, for each operating mode, including Cycle Fill, Cycle End, Rollback, Absolute/Autoglide Snap, etc.
- Master mode for accurate video/film locate in fast-wind modes, by driving master source to location and then playing catch-up to timecode/tach output.
- Improved Slave modes enable biphase control for improved lock to timecode.

DISKTRACK

- Stereo editing in overview mode, with 60 levels of undo, copy/swap and other enhancements, including edit mix with waveform display.
- Open File Import via SSL-format EDLs. ■

FLEXIBLE OUTPUT ASSIGNMENTS FOR MULTICHANNEL MIXING

Axiom has comprehensive input source routing, and its output routing is equally flexible. Via front panel pan knobs to drive multiple surround sound and related outputs, each channel path can address as many as 80 output destinations: eight Program in banks of four eight-bus stems; eight Monitor; and 64 fully programmable buses. Local and Remote outputs are handled, through DiskTrack, to analog or digital RIOs, and assigned using an Audio Master routing panel in the same way as routing sources to channels. Each output

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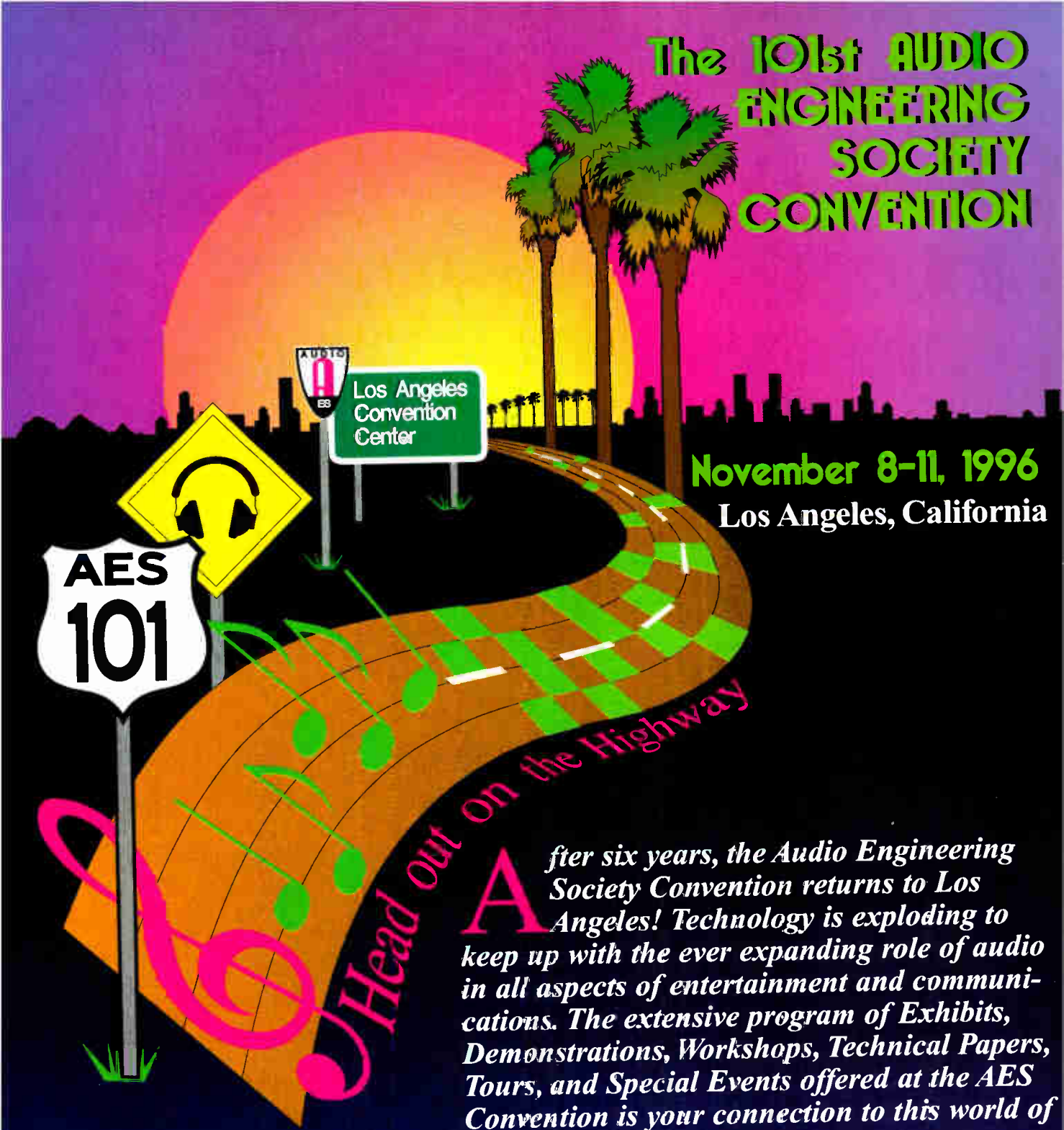

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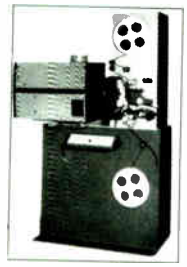

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can be assigned any source, including main mixes, monitor mixes and CombiMixes. Each CombiMix comprises a digital mix of three inputs selected from any source signal or internal mix. The mixed output features a master level control, and can itself be routed freely as a source to channels or to other CombiMixes.

CombiMix input A is provided with a useful independent gain control and switchable phase inversion; the former allows variable mixes, for example, to blend talkback with a muted cue signal. The phase inversion might be used to subtract a channel from a program mix to generate a mix-minus or clean-feed.

Axiom's monitoring can accommodate a wide range of applications, from mono up to eight-channel surround. A main monitor selector is augmented by four external selectors that can be used separately or merged to form larger selectors. Selections are multichannel and enable surround sound monitor processing to be inserted. For film applications, multichannel Source/Tape comparisons and Mix-in-Context monitor additions are provided.

For channel grouping, Axiom offers six dedicated group faders, together with a master fader within the center section. These Hard groups can be augmented with Soft groups, a function that allows any channel to serve as a group master for any other channel. Hierarchical layers of groups can also be implemented. AFL and Solo monitoring follows the group hierarchy; touching the AFL key for a hard or soft group master causes all slave and sub-slave channels to switch to AFL monitor.

Axiom's pan control operates in two fully automated planes to suit a variety of preprogrammed stereo and surround sound formats. The main rotary control can be switched to implement a conventional Left/Right or Front/Surround pan. Pan behavior, including the number and positions of speaker channels, and its pan law, is determined by a master system configuration file. Specific bus channels can be isolated from panning entirely, a useful feature when handling feeds to other outputs, such as subwoofer feeds. As an alternative to rotary controls, panning for any channel may be controlled by optional automated joysticks. A screen-based panning display can also be controlled directly with Axiom's familiar pen and tablet.

Sends from any channel to multitrack output buses can be mono, or any format up to the eight channels. Where more than one multitrack destination is selected from any channel, the user can choose which stereo outputs from the channel are sent to tape. Each channel is also equipped with eight mono aux sends, arranged in pairs, and switchable pre/post-fader. Aux pairs can be linked to form stereo sends with gain and pan controls. All aux settings are dynamically automated, and can be snapshot reset.

Axiom can also provide extra aux sends via eight Bay Sub-Mixes, or BSMs. (A 96-channel Axiom provides 96 Bay Sub-Mixes, eight per bay.) Mono/stereo Aux configuration is determined independently for each bay. All aux sends and Sub-Mixes are available at Axiom's center section for independently controlled track bounces, cue sends, clean feeds and direct outputs, etc. All in all, a very flexible system that makes most use of Axiom's I/O routing topology.

THE BOTTOM LINE

With Axiom, SSL has retained the familiarity of an analog console control surface and added an integral hard disk recorder. In this way, anyone used to working with automated analog designs could sit down at an Axiom and—within a couple of minutes—be fully comfortable with the user interface and screen displays.

The philosophy of "one control per function; one function per control," plus the powerful bay-switch-and-swap modes offered in Version 2.0, means that users can instantly reach for the targeted control without paging through multiple layers and assignment screens. Yet despite its potential complexity, the system's easy-to-master configuration setups ensure consistent, repeatable topologies to be recalled from session to session, dependent upon the proposed application.

Axiom is a truly remarkable achievement, and one that is destined to move forward the creativity event horizon for recording, broadcast and post-production professionals. It combines the highest degree of digital signal processing and recording functionality I have yet experienced in a studio product.

Solid State Logic Inc.; 320 West 46th Street, 2nd Floor, New York, NY 10036; 212/315-1111; fax 212/315-0251. ■

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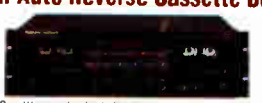
TASCAM
102 MKII / 103
Stereo Mixdown Cassette Decks

Best values for musicians, studio operators and production houses: the 102 MKII and the 103 consistently produce only the highest quality tape recorded output.

They Feature:
- 60dB signal-to-noise ratio combines with wide frequency response for high-fidelity sound reproduction using any type of cassette tape
- Industry-standard Dolby B/C noise reduction and Dolby HX Pro sound technology extends high frequency performance up to 6dB and minimizes distortion.
- Advanced bias -sensing electronics automatically chooses optimal recording settings for the type of tape you load in—Normal, Metal or CrO2
- Record/Mute autospacer automatically inserts 4 seconds of silence between songs or broadcast segments
- Multi-function display clearly indicates transport mode, tape counter position, tape type and level indicator
- Multi-counter with both tape counter and run-time modes
- Independent L and R stereo level controls and master record level control

Tascam 103 Advanced Features:
- 3-head system allows you to record on a tape and monitor it at the same time, without rewinding
- MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction

202 MKIII
Dual Auto Reverse Cassette Deck



The 202 MKIII provides high-fidelity sound reproduction and a wide frequency response, as well as a host of features that help you dub, edit, record or playback onto/from one or two cassettes easily and efficiently.
- Normal speed and high-speed dubbing
- Autospacer automatically inserts 4 seconds of silence between songs or broadcast segments for pro quality tapes
- Incorporates Dolby HX Pro sound technology to extend high frequency performance and minimize distortion on Normal, Metal and CrO2 tape
- Allows you to quickly and easily create a professional-sounding composite tape from several sources. Functions like Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks you want.
- Twin two-head cassette decks in a durable rack-mount housing that can be used separately or in tandem during recording and playback for total flexibility
  - *Play* material on deck 1 while deck 2 records on one or both sides
  - *Record* simultaneously on both decks from an external master
  - *Play* back both sides of one or both decks in a continuous loop, up to five times
  - *Auto Reverse* automatically reverses tape direction during playback and record
  - *Repeat* rewinds tape and allows infinite looping during playback
  - *Timer* switch for unattended record/playback (timer required)

New! 302
Double Auto Reverse Cassette Deck

All the features of the 202 MKIII, the new 302 adds even more recording and playback flexibility. Thats because the 302 is actually two fully independent cassette decks. Both decks have their own set of interface connectors, transport control keys and noise reducing functions.
- Auto-reverse capability on both decks
- Individual/simultaneous record capability–both decks
- Independent RCA unbalanced in/out for each deck
- Cascade and Control I/O let you link up to 10 additional machines for multiple dubbing or long playing record and playback applications

CD-601
Professional CD Player

Frame-accurate cueing precision, extremely high-fidelity and a small form factor make the CD-601 ideal for post-production applications where sound effects and music are "flown-in" from compact discs. The CD-601 integrates with most post-production equipment including mixers, video editors and computer studio controllers.
- Balanced XLR and unbalanced RCA outputs
- Precision cueing control and Auto cue
- Linear motor-driven pick-ups eliminate dead air
- Optional RC-601 remote control adds additional features and conveniences
- Optional BU-2 RAM for instant start and seamless loops up to three minutes

marantz

PMD-101/201/221/222/430
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. And when played back at 1/2 speed, the pitch is lowered by exactly one octave, so the notes are still musically correct—ideal for figuring out complicated solos or picking patterns.
- By recording at 1/2 speed, a three hour meeting can be recorded on a single tape. A built-in microphone and automatic level control make operation simple, and built-in speaker makes transcription convenient.
- 1/2 speed recording is equally ideal for churches: because 90 minutes can be recorded on a single side of tape—no interrupting your recording to flip the tape over. Line inputs make it easy to use and connect to your existing sound system.
- 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	—	—	—	—	Yes
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	—
Half-Speed Playback	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

Telex

ACC2000/4000 Series Cassette Duplicators

Designed for high performance and high production, Telex's ACC Series (ACC2000/ACC4000) and (ACC2000 XL/ACC4000 XL) of expandable duplicators also offer easy maintenance and unsurpassed ease of use. The ACC2000 is a two -channel monaural duplicator, the ACC4000 is a four-channel stereo duplicator. Each produces 3 copies from a cassette master at 16 times normal speed and each can expand up to 27 copy positions (with additional copy modules). With the extra copy modules, you can duplicate up to 27 copies of a C-60 original in less than two minutes. And they copy both sides at once. The XL Series feature "Extended Life" cassette heads for increased performance and wear characteristics. They also offer improvements in wow and flutter, frequency response, signal-to-ratio and bias. Additionally the ACC4000 XL allows for either chrome or ferric cassette duplication. XL- models are available in stereo (ACC4000 XL) or mono (ACC2000 XL) versions.

Fingertip Operation
- Individual rotary audio level controls allow for an increase or decrease of audio levels as the master translates to the copies.
- Peak reading LED indicators allow quick and accurate monitoring of audio fluctuations.
- Side A or A/B select button let you set up for duplication of either 1 side or both sides of a cassette at once.
- 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 (AUTD mode) or manually.
  –In AUTD mode the copy button activates the entire rewind/copy/rewind sequence. In manual it starts copying immediately.

Easy Maintenance:
- Slanted work surface and unique "heads-up" cassette plattorm allow less oxide build up on the heads and makes cassette loading and unloading much easier.
- Each cassette position has a three point tape guidance system that eliminates skew problems. Plus, when a tape is inserted, each cassette position is activated to 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 and a switch on the back engages the head and pinch roller for convenient cleaning.

ACC2000 Mono MasterModule:
- 1/2 track,two-channel monaural duplicator produces 3 copies from a cassette master at 30ips (16X normal speed).
- Expands up to 27 copy positions by adding ACC2000 copy modules (four positions each).
- Erase heads in the copy positions automatically erase existing audio as new material is being recorded.
- Track select,short tape indicators,auto/manual operation.
- Includes removable power cord and protective dust cover.

ACC2000 XL Mono Master Module:
- Same features as ACC2000, *plus*– Extended Life cassette heads.

ACC4000 Stereo Master Module:
- 1/4 track, four-channel stereo duplicator. Same features as ACC2000 Mono Master Module.

ACC4000 XL Stereo Master Module:
- All features as ACC4000, *plus*– Extended Life cassette heads. Can be configured for chrome or ferric cassette duplication.

ACC2000 Mono Copy Module:
- 1/2 track, two-channel monaural copy module.
- Each module has four copy positions with erase heads and controls for side select.
- LED displays indicate end-of -tape status for each pocket.
- Includes ribbon cables for connection to ACC2000 master and other copy modules.
- Includes removable power cord and protective dust cover.

ACC2000 XL Mono Copy Module:
- Same features as ACC2000 Copy Module, *plus*–Extended Life cassette heads. Connects to ACC2000 XL Master Module.

ACC4000 Stereo Copy Module:
- 1/4 track,four-channel copy module. Has all the features of the ACC2000 Copy Module.

ACC4000 XL Stereo Copy Module:
- Same as the ACC4000Copy Module, *plus*–Extended Life heads. Configurable for chrome or ferric cassette duplication.

Copyette EH Series Duplicators

The popular Copyette series produces high quality, low cost cassettes in large quantities at nearly 16 times normal speed. This means you can reproduce both sides of a C-60 tape in less than two minutes. Available in two versions, the Copyettes are capable of duplicating either one cassette or three at a time. In addition each are available in both mono and stereo models. They couldn't be easier to use. You simply insert the cassettes, press the START switch and they do the rest. They rewind all tapes to the beginning, copy, then rewind to the beginning again before stopping. The whole process can be stopped at any time by pressing the CYCLE button. Side Select feature allows you to set them up to copy one side of a tape or both sides at once.

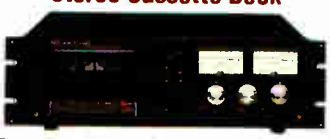
Stereo Copyette 1•2•1

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. It also has an optical, non-reflective end-of -tape sensing system that provides gentle tape handling. A mono version is also available.

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. A mono

TASCAM
112 MKII
Stereo Cassette Deck



The classic "no frills" production workhorse, the 112 MK II is a 2-head cost effective deck for musicians and production studios. Extremely rugged and reliable, the 112 MK II is ideal for production mastering and mixdown. It also features a parallel port for external control an and optional balanced connector kit means it is flexible enough to integrate into any production studio.
- Utilizes Dolby B or C noise reduction with Dolby HX Pro
- Automatically selects proper bias type, so you get optimal recording & playbank response with Normal, Metal or CrO2 tape.
- Gear independent input dials let you dial in stereo VU calibration with one dial. You can also adjust for channel specific calibration.
- Offers two Autolocator buttons and a MEMO IN control. Thes controls allow you to select two points on any tape for one button forward/reverse to wherever the action is. Additionally, RTZ (return to zero) quickly spools the tape back to 0000 on the tape counter.
- Rear-mounted RCA input/output jacks for easy connection to high-quality sources.
- Optional LA-112 connector provides additional balanced or unbalanced XLR inputs and outputs. Installation is simple and requires no special tools.
- 25-pin D sub connector (parallel port) on the back, links the deck to the optional RC-134 remote control unit or for fader start from any mixer that use the same protocol.

112R MKII
Bi-Directional
Stereo Cassette Deck

The 112R MKII is a sonically uncompromising, auto reversing and continuous play cassette deck. It offers the finest independent head auto-reverse design at this price level, plus it has extra dubbing and editing features that make it ideal for long program recording.

All the features of the 112 MK II *plus*—
- Three-head transport with separate high-performance record and playback heads. Manufactured from resilient Cobalt Amorphous materials, the independently-operating heads combine with precision FG servo direct-drive capstan motors to provide the highest standards of reproduction quality and performance.
- Frequency response is 25 Hz to kHz with less than 1% total harmonic distortion.
- Equipped with Hysteresis Tension Servo Control (HTSC) the 112R MKII virtually eliminates wow and flutter. HTSC is an advanced servo control system that maintains consistent back tension on the tape all through the reel, combatting inconsistencies brought on by extreme temperatures and humidity.
- Super Acculign Rotating Head System alllows recording or playback tape direction to be changed with one button. A single-screw azimuth adjustment makes it easy to maintain the head alignment after many hours of continuous use.
- For unattended record/playback of material that is longer than one side of a tape, there are two features that spare you from constantly attending to the deck:
  —Auto Reverse mode plays or records in both directions before stopping, switching sides on the fly.
  —Continuous Reverse mode allows you to loop the tape during; layback up to 5 times, or record in both directions, without pausing to flip the tape and re-engage the record mechanism. Bothfeatures are accessible from the front panel, with one-button selection.

122R MKIII
3-Head Stereo Cassette Deck

The standard for production and broadcast facilities, the 122 MKIII features smooth faultless tape handling mechanisms, a three head transport with high-performance Cobalt Amorphous record/playback heads and precision servo direct-drive capstan motors.

All the features of the 112R MK II (no reverse of course) *plus*—
- XLR balanced and unbalanced RCA inputs and outputs are selectable with the flip of a back-panel switch. There are 1/4-inch inputs on the front panel for simple and direct plug-in of line-level gear.
- MPX filter button eliminates polot and sub carrier broadcast tones that can interfere with Dolby noise reduction.
- Bias and level fine tuning for each channel. These tuners can be used in conjunction with the one-touch 400 Hz or 10 kHz oscillator adjustment signals to get proper VU calibration before or during each recording session.
- Record/mute autospacer automatically inserts 4 sec. of silence between songs or broadcast segments for pro quality tapes.

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ALESIS
3630 Compressor

The 3630 provides two full-featured professional compressor/limiters in one rack space. Ideal for any application from studio recording and mixing to live sound reinforcement and broadcast
- Dual mono or linkable true stereo operation.
- Choose between RMS and peak compression styles as well as hard knee /soft knee characteristics
- Dual 12-segment LEDs display gain reduction and input/output levels.
- Each channel's built-in noise gate has an adjustable threshold and close rate to ensure clean, transparent performance.
- Variable attack and release times and a sidechain function for "ducking" in broadcast applications

t.c.electronic
Wizard M2000
Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and six different routing modes. There are 250 factory programs including reverb, pitch delay, delay, chorus, flang, phase, ambience, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit analog conversion AES/EBU and S/POIF digital inputs/outputs, "Wizard" help menus, 16-bit dithering tools, Tap and MIDI tempo modes and single page parameter editing.
- The array of enhanced pitch shift (up to 8 voices), chorus, and delay effects are characterized by their precision and versatility. Everything from the fine and subtle to the wide and spectacular is handled with equal superiority. The algorithms in the dynamics section (compressor, limiter, expander, gate and de-esser) are unique as stand-alone effects, but are particularly useful in combination with other effects. Those might be de-esser/room, gated hall or compressed pitch. The possibilities are endless.
- Tempo Tap function lets you match effects to the beat. Tempo can be adjusted in beats-per-minute and sub-divided any way you like—even in triplets. The tempo can also be read from MIDI.
- Preset "Gilding" (morphing) function ensures seamless transition between effects. Very useful in live and mixing situations.

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 and remote trucks.
- 6-1/2 inch (165mm) low frequency driver provides solid, powerful bass response to 50 Hz and a pure titanium 1-inch dome handles high frequency response to 20 kHz
- Both transducers are magnetically shielded, allowing use in close proximity to video monitors.
- Dividing network incorporates protection circuitry to prevent system damage and utilizes high quality components including bypass capacitors for outstanding transient accuracy
- Molded of dense polypropylene foam, with a choice of black, gray or white finish
- Pleasing enclosure allows it to easily fit into any environment.
- A host of mounting systems including ceiling, rack and tripod allow positioning in exactly the right spot for best performance.

4200 Series
Studio Monitors

The 4200 Series are console-top monitor models designed specifically for use in the near field. Both the 6.5-inch (4206) and the 8-inch (4208) offer exceptional sonic performance, setting the standard for today's multi-purpose studio environment
- Unique Multi-Radial sculptured baffle directs the axial output of the individual components for optimum summing at the most common listening distance (approx. 3 to 5 ft).
- The baffle also positions the transducers to achive alignment of their acoustic centers so that low, mid and high frequency information reaches your ears at the same point in time, resulting in superb imaging and greatly reduce phase distortion.
- Curved surface of the ABS baffle serves to direct possible reflections of the shorter wavelengths away from the listening position, eliminating baffle diffraction distortion.
- Vertical alignment of the transducers across the baffle center produces natural mirror-imaging.
- Pure titanium diaphragm high frequency transducer provides smooth, extended response.
- Magnet assembly is shielded, allowing placement near magnetically sensitive equipment like CRT's, tape recorders, etc.
- Low frequency components also feature magnetic shielding making the 4200 Series monitors ideal for use in video post production facilities as well as music recording studios.

FOSTEX
XR-5/XR-7 Multitrackers

XR-5 Features:
- High-speed (3-3/4 ips) four-track (2-tracks simultaneously) recorder with built-in Dolby noise reduction (can be turned off)
- Pitch controller varies the tape speed within a range of ±12%
- Punch in/out function makes corrections and phrase insertions when necessary, can be done easily with optional footswitch
- Four inputs accommodate two microphones in channels one and two. Has convenient insert points for connecting a compressor/limiter and other devices for the mic channels.
- Each channel is equipped with two-point high/low shelving equalizers to help shape the sound, and an AUX send function for processing ambient system effects
- Trim function lets you switch High/Mid/Low input levels for channels one and two.
- Alternate Mix mode lets you independently select the signal from the input jack or the tape playback. Prefader effect send, inline monitor & other functions are also possible using this mode
- Post foldback (monitor) send function routes the foldback signal to the AUX send. When the foldback is activated you can actually mixdown at the same time you add reverb to a tape
- MIDI/TAPE multi-mix mode supports MIDI synchronization. Together with the Alternate Mix mode the XR-5 can simultaneously mix all MIDI sound source output with tape playback sound and effect output while monitoring!

The XR-7 has all the features of the XR-5 *plus*—
- 6 inputs, plus the ability to record four tracks simultaneously
- Dolby C noise reduction plus dual speed recording
- During recording, Channe's 5 and 6 are the primary inputs for microphones and acoustic instruments. They have trim controls and mid-sweep EQ. During mixdown, these channels act as the main stereo L/R bus.
- Auto rehearsal mode let's you concentrate on the music instead of the machine.

TASCAM
PORTA 03 MKII Ministudio

The easiest way to get into multitrack recording, the PORTA 03 is an extremely economical 4-track recorder that lets you overdub as well as mixdown to standard cassettes
- 4-track recorder with integrated two channel mixer
- Two 1/4-inch MIC/LINE inputs with trim control
- Extended dynamic range with Dolby B noise reduction
- 3-digit tape counter keeps track where you are on the tape
- Master level control for the entire mix, and the level sent to LINE OUT for stereo mixdown
- Track selector indicates which of the 4 tracks you're recording to
- SAFE selection keeps you from inadvertently recording over tracks you've recorded earlier
- Headphone jack for comfortable monitoring
- RCA output jacks for mixdown to cassette

PORTA 07 Ministudio

The PORTA 07 packs high-end features into a compact and economical package. Achieves great sound with high speed tape transport, high-low EQ and DBX noise reduction
- 4-track recorder with integrated four channel mixer
- Two 1/4-inch LINE inputs and two 1/4-inch MIC/LINE inputs with trim control.
- Separate high and low EQ for each track provides 10dB of boost or cut.
- dbx noise reduction for improved signal-to-noise ratio
- Punch-in/out manually or with optional RC-30 footswitch
- Effects send with stereo return can be applied in varying amounts to all four channels
- "Bounce or "ping pong" a submix of multiple mono or stereo tracks onto a single empty track, leaving the original submix tracks free to overdub new material onto. You can even add a "live" track to the submix while you're bouncing down, to squeeze in yet another track.

424 MKII Portastudio

The 424 is premium Portastudio that takes multitrack recording to the next level. Features superior audio quality, balanced XLR inputs, enhanced equalization and a big-studio style AUX section

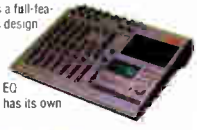
All the features of the PORTA 07 *plus*—
- 4-track recorder with 8-input mixer (4 mono MIC/LINE inputs with 1/4-inch and balanced XLR jacks and 2 stereo inputs with 1/4" jacks.)
- Separate 3-band EQ section for each of the four mono channels with 10dB of boost or cut and sweepable midrange
- Auto Punch in/out with rehearsal, plus a Repeat switch lets you set up a tape loop that goes over the same area of a tape while you practice your punch-in/out and overdub moves—without committing a single note to tape
- Two independent dedicated AUX sends let you use more effects or use one as tape cue during tracking
- Dual-speeds, logic-controlled tape transport system improves tape handling and sound quality. Select 3-3/4 inch per second HIGH speed for the best possible recording quality or NORMAL 1-7/8 ips speed
- Monitor output makes it easy to connect an external monitor amplifier without repatching—at mixdown
- Tape DIRECT OUTS are provided for integration with external mixers

MIDI Musicians Take Note—If you've got MIDI keyboards, drum machines and sound modules in your set up, you can exploit the power of "virtual tracking" with either the PORTA 07 or 424/464/488 Portastudio. You can use a MIDI synchronizer like the Tascam MTS-30 MIDI-Tape Synchronizer to record (stripe) a code onto track 4 (track 8 with the 488). Just select SYNC mode on the DBX switch and record the tone to tape. After striping the tape with FSK or Song Position Pointer information, all your MIDI instruments will faithfully follow the tape during playback and recording, even if you slow or speed the tape using the PITCH controls. The big benefit is that your MIDI tracks (called virtual tracks) don't actually have to be recorded until final mixdown, giving you lots more unused tracks to record on.

464 Portastudio

The functionality of a pro recording studio in a small, lightweight package, the 464 Portastudio is a full-featured eight input, four-track cassette recorder complete with a 12x2 internal mixer and dual bass design that lets you create separate recording and cue mixes

All the features of the 424 MK II *plus*—
- 4-track recorder with 12-input mixer (4 mono MIC/LINE with 1/4-inch and balanced XLR jacks, 4 stereo 1/4" jack pairs
- Channels 1-4 offer High and Low shelving EQs and a sweepable Mid EQ. Tracks 5-6 and 6-7 have shelving EQ only, while 9-10, 11-12 are best used with input that has its own internal EQ



488 MKII Portastudio

When 4 tracks are just not enough, then you need the perfect creative tool—the 488 MKII Portastudio. The most cost-effective 8-track recorder on the market, the 488 not only offers additional capacity but versatile capability and intuitive operation for easy capturing & manipulation of your ideas. Whether recording acoustic or electronic instruments or vocals, the 488 offers maximum creative freedom to produce your best work. With all the functionality of a professional studio, the 488 may be the ultimate demo recording machine.

All the features of the 464 MK II *plus*—
- Includes phantom power for use with high-quality condenser microphones
- Built-in mixer features low-noise circuitry, with 12 inputs and 2 group busses. There is a separate input for your stereo master recorder.
- Each of the 8 main input channels includes individual 3-band equalizers. You get Hi and Low shelving EQs, plus a semi-parametric sweepable midrange EQ.
- Unique multi-mix mode with the capability of handling up to 20 inputs at mixdown.
- The only 8-track cassette that offers a servo controlled tape transport complete with electronic braking. Equipped with a high-performance Hysteresis Tension Servo Controlled (HTSC) tape transport, the 488 delivers better sound than the first 8-track reel-to-reel machines.
- HTSC maintains precise and consistent tape tension from the beginning until the end of the tape. It actually dynamically adjusts the back tension on the tape as it moves from one end to the other, allowing precise locating capability.

ALESIS
Monitor One
Near Field Studio Reference Monitor

Designed by engineers with decades of experience, the award winning Monitor One provides the last critical link in the recording studio's signal chain, giving you an accurate reproduction of what is being recorded
- Delivers excellent image and transient reproduction, powerful bass, and smooth, extended high frequency detail
- Exclusive SuperPort speaker venting technology eliminates the "choking" effect of port turbulence for solid high-power bass transients and extended low frequency response
- Ferrofluid cooled 1" silk-dome driver eliminates the harshness and ear fatigue associated with metal or plastic tweeters, making it easy to mix on for extended periods
- Monitor One's powerful bass incorporates a proprietary 6.5" low frequency driver with a mineral-filled polypropylene cone and a 1.5" voice coil wound on a high-temperature Kapton former
- They come in a mirror-image left/right pair covered with a non-slip rubber textured laminate for stable mounting.

Monitor Two
Mid Field Studio Reference Monitor

With much of today's popular music demanding more bass at louder volumes than a small near field monitor can possibly produce—the Monitor Two delivers—at a price no higher than many of these smaller speakers
- Utilizes a 10" three way speaker design with a unique asymmetrical crossover to maintain the same accurate tonal balance and imaging of the Monitor One—but with a much larger sound field.
- 10" low frequency driver incorporates Alesis' SuperPort speaker technology to provide powerful, extended bass.
- 5" mid frequency driver offers exceptional mid frequency detail
- 1" silk dome high frequency driver delivers a broad but 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

TANNOY
PBM Series II
Reference Monitors

The PBM II Series is the industry standard for reference monitors. They feature advanced technologies such as variable thickness, injection molded cones with nitrile rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected indicators. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability and most important, real world accuracy

PBM 5 II
- Custom 5" injection-molded bass driver with a nitrile rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange
- Woofer blends seamlessly with the ¾" polymide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density medite for minimal resonance and features an anti-diffraction radiused front baffle design.

PBM 6.5 II
- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment
- 6.5" lowfrequency driver and ¾" tweeter are fed by a completely redesigned hardwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response
- Fully radiused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

PBM 8 II
- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors and components available
- Full cross-braced matrix medite structure virtually eliminates cabinet resonance as a factor
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities

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SPIRIT

FOLIO LITE
Compact Professional Mixing Console

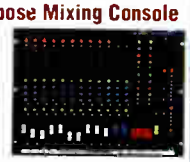
- 12 inputs as standard (up to 16 at mixdown)
- 4 mono channels & 4 stereo channels
- Inserts on all mono inputs and mix outputs
- Ultra low-noise (-129 dB EIN) mic inputs
- Musically responsive 2-band EQ
- 2 Aux sends on all channels. Aux 1 switchable pre/post fader
- PFL Sisolo on all inputs, dedicated tape return
- Headphone socket and discreteL/R outputs for monitors
- 10-segment three color bar graph metering
- Consistent high performance controls, global phantom powering
- Optional rack mounting panel and PortaPower Unit

FOLIO SI
Stereo Input Mixing Console

All features of Folio Lite PLUS—

- 18 inputs as standard (20 including stereo returns)
- 8 stereo channels and 2 mono channels, with 60mm faders
- Comprehensive 3-band EQ on inputs 1-14
- High pass filter on mono inputs
- Dedicated tape return and control room outputs
- Insert points on L and R master outputs
- 12-segment bar graph metering
- Main outputs are ground compensated and impedance balanced
- Free standing or rackmount versions available
- Optional Porta Power unit allows battery powered operation from various sources

FOLIO RAC PAC
4-Bus Multi-Purpose Mixing Console



- 14 input channels with up to 28 inputs at mixdown
- 2 stereo inputs with 60mm faders and 2-band EQ
- Low-noise (-129 dB) mic inputs
- Comprehensive 3-band EQ with swept Mid, plus high pass filter on every mono input
- 6 versatile Aux sends, 4 dedicated fully-fledged stereo returns plus 2 stereo effects returns
- Stereo solo-in-place (PFL) on every input channel
- Direct outputs on each mono channel for recording direct to multitracks
- Dedicated 2-track tape return routable to mix
- Global phantom powering, compact 8U rack-mount design

POWERSTATION
Powered Mixer

Studio quality mixing, with integrated power amp and effects provide an all-in-one solution for live performance.

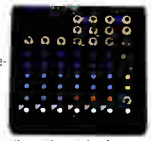
- 8 mono and 2 stereo input channels
- 18 inputs at mixdown, including tape and effects returns
- Bullet-proof UltraMic pre-amps with 60 dB gain range for stunning signal handling capability
- High-spec 265W +265W (RMS) power amp
- Built-in Lexicon effects mixer
- Consistent high performance controls, PFL solo on all channels
- 3-band EQ with swept mid-frequency on mono channels
- 2 auxiliaries for effects and foldback
- 7-band precision dual graphic EQ
- High pass filter on mono inputs
- 40 Hz subsonic filter on outputs to protect speaker cabinets
- 48v phantom power
- Inserts on mono channels and main outputs
- Separate power amp input to amplify external sources
- Dedicated record outs and tape returns, dedicated mono output
- Rugged steel chassis, hinged cover for protection

PROTRACKER
In-Line Multitrack Recording Console

- In-line monitoring signal format – 2 discrete inputs per channel
- 8 channels with 60mm faders
- Expansion sockets for daisy-chaining ProTrackers
- High quality, high gain mic pre-amp (-129 dB), 5Hz-150kHz) with switchable 48v phantom power on every input
- Switchable high pass filter on every channel
- Built-in limiter (300ms attack time/3 sec release) selectable on every channel. Overload and limiter indicators on each channel.
- Insert and aux switchable between channel and monitor paths
- Aux globally switchable pre/post fader
- Monitor fader and pan control
- Balanced tape & send/return, switchable between -4dB &-10dB
- Separate pre -fade insert and return sockets, eliminating the need for Y-cables
- Inputs switchable to mix to allow simultaneous front -of -housing mixing and recording
- Mix routable to tape sends 7/8 for simultaneous 2-track recording on a single multi-track, without effecting multitrack feeds from channels 1 to 6
- Headphone monitoring of 2-track return, aux,7/8 or mix
- Monitor outputs follow headphone output
- Mix output & 2-track return accept +4dB XLRs or -1C dB RCA phonos

SAMSON® MIXPAD 9

Ultra-Compact 9-Channel Audio Mixer

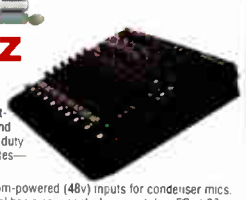


A remarkably compact 9-channel mixer the MIXPAD 9 offers professional audio performance and a wide range of user-intensive features. It boasts low noise and distortion specifications includes wide-range gain trim controls for both mic and line inputs and provides exceptionally low group delay over the full frequency bandwidth for a more transparent open sound. It also has a very high slew rate—usually found only on larger, more expensive mixing consoles—allowing it to react very quickly to transients and maintain a crisp, articulate sound. It offers phantom power (48v) for use with condenser microphones and an in-line power supply eliminates magnetically-induced hum.

- 3 mic/line inputs and 3 stereo channels (total 9 inputs).
- 2 auxiliary sends for effects and two Stereo returns.
- Independent 2-band shelved EQ, pan control for mono channels and balance control for stereo channels.
- Adjustable mic input trims allow use with a wide variety of mics
- Phantom powered XLR mic input connectors
- Peak LEDs for left and right main outputs.
- Extremely durable, extruded aluminum chassis.

MACKIE.

MICRO SERIES 1202-VLZ
12-Channel Ultra-Compact Mic/Line Mixer



Usually the performance and durability of smaller mixers drops in direct proportion to their price. Fortunately, Mackie's fanatical approach to pro sound engineering has resulted in the Micro Series 1202-VLZ, an affordable small mixer with studio specifications and rugged construction. It delivers no-compromise, non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio stations, broadcast studios and editing suites—where nothing must ever go wrong.

- Working S/N ratio of 90dB, distortion below 0.025% across the entire audio spectrum and +28 dB balanced line drivers.
- 4 mono channels with discrete, balanced balanced mic/line inputs and 4 stereo channels (12 inputs total).
- Line inputs and outputs work with any line level, from instrument level, to semi-pro -10dB, to professional +4dB
- Switchable phantom-powered (48v) inputs for condenser mics.
- Every input channel has a gain control, pan pot, low EQ at 80 Hz, high EQ at 12.5 kHz and two aux sends with 20dE gain
- Master section includes two stereo returns, headphone level control and metering
- Sealed rotary pots resist and other contaminants.

NEW! MS1402-VLZ
14 x 2 Compact Mic/Line Mixer

Mackie's fanatical engineers have done it again. Balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room feature. Nice long 60mm faders, six studio-quality mic preamps and extra Alt 3-4 stereo bus—in less than 1 3 square feet of space.

- Studio grade mic preamps (chs. 1-6) with high headroom, low noise and phantom power. Also incorporate low cut filters to cut mic handling thumps, pops and wind noise. Lets you safely use low shelving EQ on vocals.
- Trim controls (ch 1-6) with ultra wide range (+10 to -40dB) handle everything from hot digital multitrack feeds to whispering lead singers and older, low output keyboards.
- Pan control with constant loudness and high L/R attenuation so you can pan hard left or right without bleed-through
- Two aux sends per channel with 15dB extra gain above Unity.
- 60mm log-taper faders are accurate along their whole length of travel and employ a new long-wearing contact material for longer fader life & uper resistance to dust, smoke etc
- Control room/phone matrix adds incredible tape monitoring, mixdown and five sound versatility.
- Mute switch routes channel output to extra ALT 3-4 stereo bus. Use it for feeding multitrack recorder channels, creating a sub-group via controlroom/phones matrix, monitoring a signal before bringing it into the main mix or creating a " mix minus "
- Solid steel chassis instead of aluminum or plastic

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.

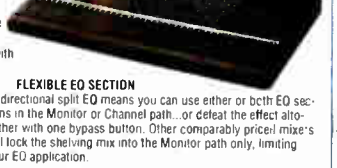
NEW! CR-1604 VLZ
16-Channel Mic-Line Mixer

The hands-down choice for major touring groups, studio session players, as well as broadcast and sound contracting. The new CR-1604 VLZ features everything you would expect from a larger console, and then some! 24 usable line inputs with special headroom/ ultra-low noise Unityplus circuitry, seven AUX sends, 3-bandEQ, constant power pan controls, 10-segment LED output metering and discrete front end phantom-powered mic inputs.

- Lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range). Many drummers consider it the only mixer capable of handling the attack and transients of acoustic and electronic drums.
- Genuine studio-grade phantom powered, balanced input mic preamps on channels 1-6. All CR-1604 VLZ (and optional XLR10 for ten more) discrete input mic preamp stages incorporate four conjugate-pair, large-emitter geometry transistors. So, whether recording nature sound effects or heavy metal, miking flutes or kick drums, you get the quietest, cleanest results possible.
- True 4-bus design with channel assigns to 1-2, 3-4 or main L-R.
- 3-band EQ with mid-frequency sweep and low cut switch.
- AFL/PFL solo and mute switches with overload andsignal present indicators
- Rear panel features include insert points and 1/4-inch /XLR connectors on every channel, as well as RCA tape inputs/cutputs.
- New, standard size channel trim pots are found at the top of each channel.
- Rotary input/output "pod" allowing three different positions for set-up.

TASCAM

M2600 MKII Series
16/24/32-Channel 8-Bus Mixers



LOW NOISE CIRCUITRY

- Combining completely redesigned low noise circuitry with Absolute Sound Transparency™ the M-2600 delivers high-quality, extremely clean sound. No matter how many times your signal goes through the M-2600, it won't be colored or altered. The signal remains as close to the original as possible. The only coloring you hear is what you add with creative EQ and your outboard signal processing gear.
- Double reinforced grounding system eliminates any hum. World-class power supply provides higher voltage output for better headroom and higher S/N ratio.

PREMIUM QUALITY MIC PRE-AMPS

- The M-2600's mic pre-amps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel.
- Accepts balanced or unbalanced 1/4" inputs, and low-impedance XLR jacks. Better still, the TRiM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the -20 dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug in anything – keyboards, guitars, basses, active or passive microphones, samplers and more.

THE BEST AUX SECTION IN THE BUSINESS

Versatile AUX section has 8 sends total, 2 in stereo. Send signal in stereo or mono, pre-or post-fader. Available all at once. Return signal through any of 6 stereo paths.

FLEXIBLE EQ SECTION

Bi-directional split EQ means you can use either or both EQ sections in the Monitor or Channel path...or defeat the effect altogether with one bypass button. Other comparably priced mixers will lock the shelving mix into the Monitor path only, limiting your EQ application.

ADVANCED SIGNAL ROUTING OPTIONS

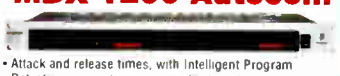
Direct channel input switching. Assign to one of eight busses, direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching.

ERGONOMIC DESIGN

The M-2600 has a big studio feel. All buttons are tightly spring loaded, lock into place and accomodate even the biggest fingers. The faders and knobs have a tight, smooth "expensive" feel and are easy to see, reach and manipulate. Center detents assure zero positions for EQ and PAN knobs. Smooth long throw 100mm faders glide nicely yet allow you to position them securely without fear of accidentally slipping to another position.

BEHRINGER

MDX 1200 Autocom



- Attack and release times, with Intelligent Program Detection, prevents common adjustment errors.
- Newly-developed, powerful 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.

Stewart

Power Amplifiers
PA-1000
PA-1400
PA-1800

- High frequency switch mode power supply fully charges 120,000 times per second (1000 times faster than most power supplies) requiring far less capacitance for filtering and storage.
- High speed recharging also reduces power supply "sagging" that afflicts other designs.
- Incredibly efficient, 5 PA-1000 or PA-1400's (4 PA-1800's) can be run on one standard 20 amp circuit. No need for staggered turn-on configurations or other preventive measures when using multiple amp set-ups
- They produce smooth and uncolored sound, while offering very full detailed low end response and tons of horsepower.
- Each amp carries a full 5 year warranty on parts and labor

PA-1000 weighs 9 lbs, is 15" deep and occupies one standard rack space. Delivers 1000 watts into 4Ω when bridged to mono

PA-1400 weighs 16 lbs, is 15" deep and takes 2 standard rack spaces. Delivers 1400 watts into 4Ω when bridged to mono.

PA-1800 weighs 17 lbs, is 17" deep and takes two rack spaces. Delivers 1800 watts into 4Ω when bridged to mono.

BGW

Performance Series Amplifiers

Performance Series 1
300 Watt Power Amplifier

- Measuring only 3.5 inches high and weighing 26 pounds, the Series 1 delivers more than 150 watts per channel.
- Its welded steel chassis is unbelievably strong while a custom heat sink extension provides exceptional thermal capacity
- An internal fan provides quiet background noise levels for critical monitoring applications and when pushed hard the cooling system insures continuous cool operation even in the most demanding situations.
- Active balanced inputs with both XLR and 1/4" phone jacks.
- Supplied with quality 5-way binding posts for highly reliable speaker connection
- Front panel handles are reversible for either rack mount installation or easy handling.
- LEDs are provided for signal presence and clip indication; the detented gain controls have large knobs for easy front panel adjustments.

Performance Series 2
600-Watt Power Amplifier

- Same as above except the Series 2 weighs 32 pounds and delivers more than 300 watts per channel

Performance Series 4
1200-Watt Power Amplifier

- Same as above except the Series 4 weighs 53 pounds and delivers more than 600 watts per channel
- Has a switch selectable clipping eliminator that prevents damage to the speakers

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TASCAM
DA-P1 Portable DAT Recorder

- Rotary two head design and two direct drive motors for the best transport in its class
- XLR-balanced mic/line inputs (with phantom power) accept signal levels from -60dB to +4dB.
- Analog line inputs & outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enable direct digital transfers
- Uses next generation A/D & D/A converters for amazing quality
- Supports 32/44.1/48kHz sample rates & SCMS-free recording.
- MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- TRS jack & level control to monitor sound with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter & 1 battery.

SONY
TCD-D8
DAT Walkman Player/Recorder

- Long Play (LP) mode allows 4 hours of record/playback of 12-bit audio on a single DAT cassette
- Equipped with digital coaxial and optical input connector. Also has analog Mic and Line inputs.
- High-speed Automatic Music Sensor search function finds & plays tracks, skips forward or back up to 99 tracks, all at 100x normal speed.
- Digital Volume Limiter System increases listening comfort & sound quality by automatically adjusting for sudden level changes.
- Two-speed cue-review lets you hear sound while player is in fast-wind modes, up to 3x or 25x normal speed.
- LCD display with backlit windows clearly shows recording level, track number, operating status and 4-segment battery indicator, even in low ambient light conditions.
- Optional RM-D3K System Adapter Kit for complete digital interface. It has input/output connectors for both the optical cable & the coaxial cable. Also includes a wireless remote control.

TCD-D10 PRO II
Portable DAT Recorder

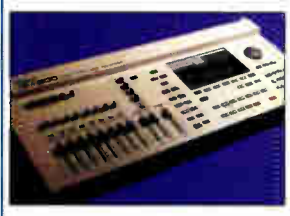
- Has balanced XLR input, switchable mic (-60dB) or line (+4dB) inputs. A 12-pin digital connector provides interfacing with AES/EBU digital signals of 32/44.1/48.0 kHz sampling rates.
- Comprehensive self-diagnostics function constantly monitors the rotation of the head drum, capstan and reels. The tape transport mode and load/unload time are continuously checked as well.
- Up to 99 start IDs can be recorded in the subcode area. When the record button is pressed, the start ID is recorded automatically for 9 seconds. During recording, it can also be added manually to any position of the tape. Search for start IDs is 100X normal speed.
- 20-segment digital peak level meters include overload indicators. Closely tracks input signal for accurate level indications.
- During playback, the date and time of recording is displayed.
- Has a record-level limiter with a fast attack time of 300ms. Mic attenuator prevents distortion by suppressing signal level 20 dB.
- Immediate playback is possible through a built-in speaker.
- Supplied wired remote controller also accepts a mic holder. Two mic stand screw adapters are also supplied.
- Supplied NP-22H rechargeable battery provides 1.5 hours of operation. Optional NPA-D10 battery adapter enables 1 hour on AA batt. Supplied ACP-88 AC adapter operates on 100-240v 50/60 Hz.

HHB
PORTADAT
PDR1000/PDR1000TC
Professional Portable DAT Recorders

- Direct drive transport with 4 heads for confidence monitoring.
- 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 balanced XLR
- Left/Right channel mic input attenuation selector(0dB/-30dB)
- 48v phantom power, built-in limiter & internal monitor speaker.
- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status, ID number, tape source status and machine status
- Supplied Nickel Metal Hydride rechargeable battery powers the PDR1000 for two hours. The battery has no "memory effect" and is charged in two hours with the supplied AC Adapter/charger

PDR1000TC Additional Features:
In addition to all the features of the PDR1000 recorder, the PDR1000TC is equipped to record, generate and reference to time code in all existing international standards.
- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
- External syncronization to video, field sync and word sync

Roland® DM-800
Digital Audio Workstation



A compact, stand-alone multi-track disk recorder that provides an amazing array of features at an unbelievably low price. Whether for music production, post production or broadcast, the DM-800 lets your work easier and faster. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing, to rotation track-bouncing, to final mixdown. It fully supports SMPTE and MIDI time codes and also features a built-in Sample Rate Resolver to synchronously lock to any time code.

HIGHEST QUALITY SOUND
- Sampling rates of 48/44.1/32 kHz • 24-bit internal processing
- 18-Bit A/D and D/A with 128 and 8 times oversampling

POWERFUL EDITING
- Time compression, pitch compression
- Non-destructive cutting, erasing, copying
- Fast looping for music or ambiance editing
- Six levels of waveform zoom
- Optional RS-422 interface

FLEXIBLE I/O STRUCTURE
- Full digital patch bay
- Stereo AUX send buss, 2 stereo AUX returns
- Digital stereo input and two digital stereo outputs • Direct channel outs
- 4 balanced analog inputs with gain controls and 4 balanced analog outputs

ACCURATE SYNCHRONIZATION
- Frame accurate sync to any time code
- Generates/reads SMPTE time code—24,25, 29.97 (Drop/non-drop) and 30 frames per second. • Locks to MTC

FULL AUTOMATION
- Microscope editing of automation data
- Dynamic and snapshot automation of level, pan, 2-band EQ, including frequency select, boost and cut •Phase level editing of level, crosslade and fade in/out

MIDI FEATURES:
- MIDI machine control • Internal tempo maps •MIDI clock and song position pointer output •8 MIDI triggers for instant phrase playback •MIDI trigger of record and punch in/out • Tempo maps from external sequences, MIDI or tap input.

RECORDING OPTIONS
- Records to standard SCSI hard drives
- Up to 24 hours recording time possible
- Uses MD,Syquest or Jazz drives for fast project change overs

TRIGGER FEATURES
- Trigger mode to play any combination of 8 tracks for vocal fly ins or sound effects placements
- Advanced trigger mode for live operation with preset or dial up cue of phrases to be played one after another

PROJECT CATALOGING
- Up to 150 projects on line at once
- Cataloging of sound effects and projects
- Easy transfer of sounds from one project to another

VIDEO OUT
- Composite, S-video, digital RGB output
- All track overview with infinite level of project zoom
- Views of phrase and waveform editing
- Very accurate level meters
- Track status and time location

Digital Multi-Track Recorders

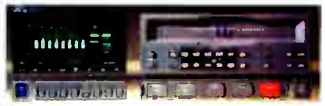
TASCAM DA-88

The first thing you notice about the eight channel DA-88 is the size of the cassette - it's a small Hi-8 video cassette. You'll also notice the recording time - up to 120 minutes. These are just 2 of the advantages of the DA-88's innovative use of 8mm technology
- ATF system ensures no tracking errors or loss of synchronization. All eight tracks of audio are perfectly synchronized. It also guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks - whether you have one deck or sixteen (up to 128 tracks!)
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48KHz .The frequency response is flat from 20Hz to 20KHz while the dynamic range exceeds 92dB.
- Execute seamless Punch-ins and Punch- outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks to generate special effects or compensate for poor timing.

SONY PCM-800

- Flawless sound quality, outstanding reliability and professional audio interfacing with AES/EBU digital I/O and XLR analog I/O connections.
- Combines audio functions such as precise auto punch in/out digital cross fade technology, external synchronization with SMPTE/EBU time code and selectable sampling frequencies of 44.1 and 48kHz.
- Shuttle dial for precise tape control, variable speed playback of 6% in 0.1% increments and a flat frequency response from 20Hz to 20kHz
- Operate up to 16 PCM-800's in perfect sync with optional RCC-S1 sync cables,for up to 128 channels of digital audio recording.
- Optional DABK-801 Sync Board provides SMPTE/EBU time code generation and chase sync. It locks to the incoming time code with subframe accurate offset— ideal for audio-follow-video applications. Also synchronizes to external video reference signal
- Optional RM-D800 provides comprehensive remote control over all PCM-800 functions. The RM-D800 can control up to six units for up to 48 channels of digital audio.

ALESIS adat xt
8-Track Digital Audio Recorder



An incredibly affordable tool, the ADAT-XT sets the standard in modular digital multitrack recording. With new features & enhanced capabilities, the ADAT-XT operates up to four times faster than the original ADAT, offers an intelligent software-controlled tape transport and provides onboard digital editing and flexible autolocation.

Stunning Audio:
- Incorporates ultra-high fidelity 18-bit, 128 X oversampling A/D converters which provide better-than-CD audio quality.
- For outputs, the D/A converters provide 20-bit, 8x oversampling performance for a flatter frequency spectrum, improved phase response and much less low-amplitude distortion
- 20 Hz to 20kHz ±0.5dB frequency response, 92dB S/N ratio, crosstalk between channels better than -90dB @ 1kHz.

Onboard Autolocator with Auto Record:
- Onboard 10-point autolocate system provides quick access to multiple tape locations. Four specialized locate points make your recording sessions quicker and easier.
- Auto play the moment any autolocation point is reached. Auto Return automatically rewinds at the end of a loop.
- Auto Record function lets you automate punch-in/punch-out times that are accurate to 1/100th of a second.
- Rehearse Mode allows you to enter or exit record modes without actually laying tracks to tape.
- To record on the fly, you can even use the individual Record Enable buttons to punch in and out of tracks.
- Includes remote control with transport and locate functions, offers a footswitch jack for hands-free punch-in.

Intelligent Transport:
- Advanced transport software continuously monitors autolocation performance and the head constantly reads ADAT's built-in sample-accurate time code—even in fast wind modes.
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.

Flexible Inputs and Outputs:
- Servo-balanced 56-pin ELCD connector operates at +4dB to interface with consoles with +4 dB bal/unbal inputs/outputs. Also unbalanced -10dB inputs/outputs (phono connectors).
- Has an electronic patch bay built-in so it can be used with stereo and 4-bus consoles.
- Multiple Optical Digital I/O carries up to eight tracks at once. The digital I/O combined with the ADAT Synchronization Interface make it completely compatible with any ADAT-format recorder or other devices that use Alesis' proprietary digital protocol.

Digital Editor:
- Make flawless copy/paste digital edits between machines or even within a single unit. Track Copy feature makes a digital clone of any track (or group of tracks) and copies it to any other track (or group) on the same recorder. This allows you to assemble composite tracks for digital editing.
- Use multiple ADAT-XTs and Tape Offset lets you copy and paste not only track to track, but from location to location. Tape Offset assembles your project with a minimum of repetitive overdubbing and changes the tape position of a slave XT to its master, so you can "fly" audio to different locations on each tape.
- Track Delay can delay the time reference of a track by up to 170ms. Also easily change sthe groove of a tune. Track Delay is individually adjustable on each channel and is excellent for fixing slight timing errors in recorded tracks (player lags behind or rushes the beat). In recordings with multiple microphones, you can time-align each track, precisely compensating for the spacing between mics with accuracy to 0.0001 seconds.

Panasonic
SV-3800/SV-4100
Professional DAT Recorders

Designed for professional applications, the SV-3800/SV-4100 have highly accurate and reliable transport systems with search speeds up to 400X normal, and 20-bit D/A converters to satisfy the highest professional expectations both in terms of sound and functionality.

SV-3800 Features:
- Recording via analog inputs offers sampling rates of 44.1 or 48kHz. When recording through digital inputs, it automatically clocks to incoming frequencies of 32/44.1 or 48kHz
- XLR-balanced digital inputs/outputs plus consumer format coaxial and optical inputs/outputs. XLR-balanced analog stereo inputs/outputs. Output level is selectable between +4db and -10db. The input level is +4db
- Built-in shuttle wheel has two variable speed ranges .3 to 15x in Play mode and 1/2 to 3x normal speed in Pause mode
- High speed transport enables searching up to 250x normal speed. Search up to 400x normal speed is possible once the tape has been scanned in Play, FF or REV mode. This ensures access to any point on a two-hour DAT in under 30 seconds
- Ramped record mute and unmute with three seconds fade-in and five seconds fade-out provides automatic level changes at the start and end of a recording.
- Comprehensive display includes program numbers, absolute time, program time, remaining time and Table of Contents

SV-4100 Has all the features of the SV-3800 Plus—:
Offers enhanced performance required for professional production, broadcast and live-sound systems. Features such as instant start, external sync capability and enhanced system diagnostics make the SV-4100 the DAT quality standard

FOSTEX
D-5
Digital Master Recorder

With professional features and a consumer price tag, the D-5 satisfies a lot of requirements. It records or playsback four hours of music, includes optical and digital input/output, and TOC functions that are as easy to use as a CD player. It's also equipped with basic pro features such as ID editing function, GPI and XLR connectors and 300X speed locate and search functions

- Playback/record audio with32/44.1/48 kHz sampling in SP (standard play) mode. Equipped with LP (long play) mode, it can play/record at 32 kHz up to 4 hrs. on a 120 minute cassette
- Analog interface includes switchable (+4dB/-10dB) balanced and unbalanced XLR inputs and outputs
- AES/EBU digital interface (XLR) for professional use and optical (S/PDIF) input/output for consumer/semi-pro connections
- 5-pin GPI input connector allows Play, Stop & S-ID search to be implemented through commands from an external source
- Records CD-Q code sync ID, enabling precise music start up. When performing digital signal transfer from CD through it's optical input, the D5 precisely records S-IDs according to the track number and index information of the CD-Q code. So even if there is a break in the middle of a song or there isn't a non-recorded section between two songs, you can locate to the S-ID location (eg beginning of song) precisely.

D-10
Digital Master Recorder

- Switchable 44.1 and 48kHz sampling frequecies
- Analog interface includes switchable XLR-balanced (+4dB) and unbalanced RCA -(10dB) inputs and outputs.
- Equipped with and XLR-balanced AES/EBU digital interface and optical (S/PDIF) input/output conforming to IEC consumer
- Built-in 8MB RAM (4 MB x 2) offers instant start as well as scrubbing at 1m/second accuracy.
- Advanced jog/shuttle for precision cueing and monitoring
- Auto Cue provides automatic locating to the exact start of audio modulation during ID search and tape loading.
- Universal GPI input/output enables easy and fast assemble editing, based on A-time between a pair of D-10s
- Switchable 2-position reference level -12dB/-20dB
- Start and Skip IDs as well as up to 799 P-NDs can be recorded and played back
- 10-digit key-pad lets you store and recall 100 cue points
- Continuous or peak reading level meters can display available headroom with an accuracy of ±0 1dB
- Reads and displays A-time or Pro R-time, also provides PCM monitoring
- Optional 8333 interface card adds timecode and RS-422 (X 2) functionality to the D-10:
  -Reads an external timecode and records on the sub-code area
  -Reproduces and outputs the timecode from sub-code area
  -Switchable RS-422 and ESbus protocols. Using the ESbus, up to 16 D-10s can be daisy chained.

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—FROM PAGE 146, NEXO SPEAKERS

front. These unobtrusive, innocent-looking enclosures measure 2 feet deep, 20 inches tall and 31 inches wide. The LS1000 provides impressive response down to 30 Hz, and the combined response of the system exceeds that of contemporary entertainment systems that many music lovers have come to expect in their homes—many listeners' first reaction was that the Nexo system would sound good in their living rooms. So flat is the system's response that it was often run without any equalization.

Nexo recommends amplifiers with 550 to 1,200 watts for running a single PS15, or 1,000 to 1,800 watts for running two per channel (the PS15's internal 900Hz passive crossover presents a nominal 8-ohm load). The system reviewed was powered by two QSC PowerLight 4.0 amplifiers, with 38 dB of gain. (A PowerLight 1.8 would have been fine, as well.) The first part of the review was in mono, with all four speakers run on a single PowerLight 4.0 for a week, with two subs on one channel and two PS15s on the other. The system was then run in stereo, on two amps, and there was more than enough headroom for even the loudest program material—the PowerLight's -20dB signal would light, but the -10dB indicators would not.

SERVO-CONTROLLED SYSTEM

A stereo system requires one TD controller. A front panel switch engages the subs, crossing them over at 80 Hz. The marvelously simple design allows the user to simply turn the subs on or off, and vary their level depending on the ratio of tops-to-subs used. The only other user-adjustable parameter is a recessed trim-pot on the front that increases the amount of protection.

The Nexo PS is a servo-controlled system, which limits the power by continually monitoring the amp's output to the speakers through sense lines connected back to the stereo controller. The TD controller is connected by three sense lines to the amp's outputs. If these lines become disconnected, the controller falls back into a preset protection mode. A switch on the back of the controller adjusts for the amp gain, so that amps with higher gain won't lower the signal-to-noise ratio.

The TD controller front panel has three green LED indicators to show signal presence on the three sense lines and red for indication of peak-limiter action. A yellow VLF indicator on the sub channel shows when its protection engages. Similarly, there are two more yellow LEDs to indicate when LF or HF protection for the PS15s is working. Rather than employ VCAs or sliding crossover points, these circuits employ gentle voltage-controlled equalizers to cut down a few dB of danger frequencies. The controller's back panel has two balanced XLR inputs and three outputs for left, right and subs. An earth-lift switch permits disconnection of audio ground from the chassis.

Not reviewed here is a companion PS15 bass enclosure ($2,249 list) that's designed to increase levels in the low mids for applications where only a single PS15 is used. Also not reviewed is the smaller PS10 system, which employs a scaled down design, using a 10- and a 1-inch, and a 15-inch subwoofer. A PS10 system lists for $8,397, including the stereo controller, and would be perfect for smaller clubs and lounges that offer a combination of live acoustic music and digital program sources.

Nexo, distributed by QMI, 7 October Hill Road, Holliston, MA 01746; 508/429-6881; fax 508/429-7135. ■

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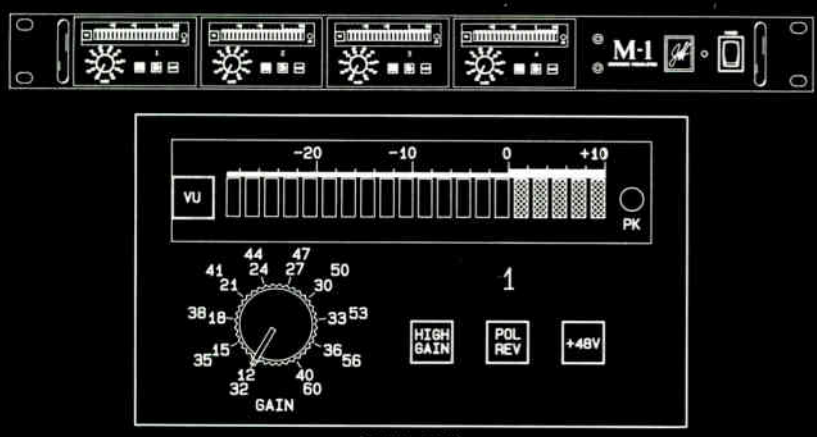

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—FROM PAGE 178, THE HARTWICK TRIO

but it was not something that was unworkable or hard to get used to. The fun began with the backup process. Though we are a large studio, Pro Tools is a relatively new addition, and we do not as yet have the resources for an optical drive backup system, which can do 6 gigs per hour. We are forced to use Data DAT drive backup using Retrospec software. The system is very reliable but very, very slow, especially for the amount of data we needed to generate. After each day's recording, we had 6.5 to 8 gigs of music to back up so the drives could be cleared for the next day's work. This took anywhere from eight to 12 hours per night, and required someone to come in periodically to switch tapes. The maximum we could fit on a single Data DAT tape, despite all manufacturer's claims, was 4.3 gigs. After the Retrospec program backs up to tape, it then compares the tape to the hard drive to verify the data. The "compare" process takes exactly as long as the backup. At 10.2 megs per minute...you do the math.

Despite the ridiculously long backup time, the system worked flawlessly when restoring for the mix. Because the trio recorded different pieces each day, it was necessary to extract from the backup DATs particular takes from each piece. That is, for the first piece, the performances were spread over three days, along with takes from other pieces. They all needed to be restored at one time, and our system won't hold three whole days' work. The trio marked the score with selected takes, and we were able to restore only the takes needed for mixing by consulting our log sheets. I can't emphasize enough the importance of both time and take references on paper and audio slates on disc for each take, along with accurate descriptions of the attempted take and the result. In this case, without it we would have been sunk. We were able to restore all relevant takes from three days of recording for a particular piece and have them available at one time so we could compensate for any differences that we found—and there were some, both from a performance and technical standpoint. We also blended in some TC M5000 reverb to add additional depth to the spaces recorded. The nonlinear nature of the medium made mixing go quite quickly, and we were able to bypass SSL automation and take advantage of Pro Tools' volume graph "automation" to perform subtle volume rides and overall level compensations, which was all that was really necessary.

Where Pro Tools clearly excelled was in the editing process. There were a considerable number of edits in certain movements, due to their musical difficulty and complexity. We decided that it would be simpler to edit after mixing. Edits across 10 tracks would take longer (more chances to hear the edit) and be cumbersome from a computer operation standpoint. This proved to be the simplest approach, and Pro Tools allowed for virtually any edit you could imagine and in a completely nondestructive format. The auto-fades between edits (1 to 3 milliseconds) and the ability to make edits across two channels at slightly different times allowed for a nearly seamless final product. In my opinion, the possibilities, flexibility and nondestructive nature of this medium clearly replace tape as an acceptable format for audio editing. In retrospect, though cumbersome, editing before mixing may have been a foolproof method of matching levels, perhaps with the SSL automation. I'll save that for the next project.

After editing, the masters were prepared for CD using Waves™ plug-ins: the Ultra-maximizer allowed us to raise the overall level for disc without radically changing the dynamic nature of the music, and the Q10 ten-band parametric allowed us to fine-tune the pieces and add the requisite air to the spaces we mixed into the music. Waves also makes a stereo imager, or S1, which allows you to see a visual representation of the stereo spectrum and manipulate it in terms of width, depth and stereo center. You can completely shift the stereo image without phase problems. Though I have tried it on popular music, the possibilities for ensemble recording are tremendous. One short piece recorded for the Hartwick project, *Three Nocturnes* by Ernest Bloch, was written to describe an approaching storm and has very dynamic and dramatic moments. I used the S1 to create an almost surreal perspective that, in combination with an unusual TC reverb, made for wonderful results.

We are all very proud of the product and pleased with Pro Tools as a digital platform on which to work. Hopefully, the A Ds will improve as time goes on, for if there is a weak spot, that is it. Hartwick College planned to release the CD in June 1996, and with luck proceed to the trio's next album. ■

David J. Saia is an engineer/producer and co-owner of Sonic Recording Studios, Philadelphia. For more information on the project, contact Hartwick College at 800/388-0337.

SONIC GEAR

The Sonic/Curious Productions Pro Tools rig is housed primarily in Studio D, the digital editing suite. The system is portable and easily removable from Studio D in two custom racks: the computers and hard drives in one spring-loaded rack and the Pro Tools hardware and patchbay in the other.

The hardware rack also contains interface panels with Canon DLs for all audio connections, as well as AES/EBU, SMPTE, S/PDIF and Studio D connections. The interface scheme allows the system to be set up quickly and fully integrate into any of Sonic's three other rooms. Pro Tools is interfaced with the API in Studio A, as control room A sits nearly adjacent to Studio D. This allows simultaneous recording of A room projects to both 2-inch and Pro Tools. Also, analog 24-track dumps from Studio A for editing purposes are available immediately, without a patch cord. In fact, the Pro Tools operator can be located in the A control room with just a monitor, trackball and keyboard and control nearly all Studio D equipment.

Mixing for the Hartwick project was performed in Studio B on a 4000 Series SSL, with monitoring on Dynaudio M-3s. Though it is possible to mix entirely within Pro Tools, the SSL allowed for more efficient and user-friendly balancing between takes, which was critical to the editing process. Going briefly analog also allowed use of outboard compression (Tube-Tech, 1176, LA-2A, etc.) and a choice of 20-bit reverbs (TC M5000, DSP-4000, etc.). The mixed product was then transferred digitally back into Pro Tools for editing and then maximized for CD release using Waves plug-ins. ■

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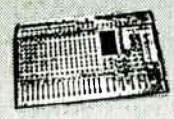

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—FROM PAGE 160, SOUNDCHECK

used for Greg Allman tours, and a brand-new Yamaha 3210 monitor board. Other new gear includes a BSS Omnidrive and BSS 318 monitor crossovers. Installation of the new system was performed by Sound Image president Dave Shadoan and JBL representative Steve Rosefield.

"Before, you had to fight with our system," explains Slim's production manager, Sue Kearney. "What we didn't have before was low end. What we didn't have before was a clean, precise sound; now you can get that." Kearney, whose experience includes FOH gigs for the San Francisco Blues Festival, Bill Graham Presents and an ongoing position with the Tommy Castro Band, has been part of the Slim's staff since 1993. She says that, with the new system, "Wherever you walk in the room, there's great coverage and you get a good feel for what the artists are putting across. We used to get downtrodden because our sound system was wonky, but now you can cleanly get 120 at front of house...if you really want to hurt yourself that bad."

Slim's gets a variety of local bands and internationally known acts—mainly roots-based rock—every week. Right around press time, visiting artists included Toots & The Maytals, John Mayall, Curveball, Golden Smog and Syd Straw, who is out promoting her latest release, *War and Peace* on Capricorn Records. *Mix* went to Straw's show and found Kearney's observations about the new gear to be pretty apt. The sound is a lot cleaner, all over the room, than it was with the previous system.

The show itself was highly entertaining. Straw and her band (Missouri's Skeletons, who appear on the album) played a few of the new songs and also quite a few covers of artists ranging from Wreckless Eric to Sonny Bono. Straw also chatted with the audience quite a bit about the latest crop of woman rockers. She did an imitation of Tori Amos that basically involved sitting spread-eagle at a keyboard. She also said that "If Alanis Morissette is going to be the voice of a generation, she should start writing her own songs." The Slim's crowd ate it up, for the most part, though one random jackass near the stage got so rude that Straw had to have him tossed out...that's life in clubland. —*Barbara Schultz* ■

World Radio History

NEWSFLASHES

Eastern Stage (West Babylon, NY) is providing gear to this summer's Widespread Panic and The Horde tours. BSS reports that both tours will employ its Varicurve and Omnidrive signal processing systems. **Snow Sound** (Berlin, CT) is also using BSS gear on Phish's summer tour...The **Historic State Theatre** of Minneapolis ordered a new loudspeaker system from Turbosound. The new system will include eight TFS-780H Flashlight mid/high enclosures and four TFL-760H Flood mid/highs, as well as two TFL-760HM downfills, eight TSW-718 bass bins, four LMS-700 system controllers and 22 Impact speakers for surround sound...The **Luxor** is a new 30,000-square-foot nightclub in Toronto. The venue, which is decorated to suit its ancient Egyptian name, is divided into four areas: a main dance floor, second dance/pool room, two DJ booths and sidefills. The main area's JBL loudspeaker system includes 16 Architectural Series CD-1028 subwoofers, eight AS4725 mid-top cabinets and eight 2404 high-frequency drivers...B.B. King's springtime dates in Canada were handled by sound company **AOI Pro Sound**. The tour used a Soundcraft Vienna II front-of-house console, a Soundcraft SM12 monitor console and the JBL Array loudspeaker system...**Tapestry Sound** (NYC) provided audio for American Express' annual corporate awards banquet. The event, hosted by Ben Vereen, was held in February at Florida's **Orlando World Center**. Tapestry used a 40-channel Allen & Heath GL4 console. A GL4 was also brought in to Seattle's Jazz Alley nightclub for a recent visit by the Yellowjackets...A Sabine FBX-901 Feedback Exterminator has been installed in the **Orlando Arena**... Bag End loudspeaker and ELF systems were recently installed in **ABC Television's TV-1** production facility (NYC), the **Grand Theater** in the MGM Grand Hotel (Las Vegas) and **Todd AO/Glen Glenn Sound** (Hollywood). ■

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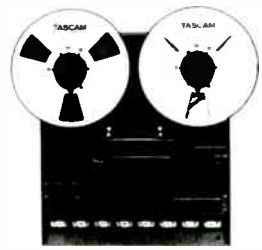

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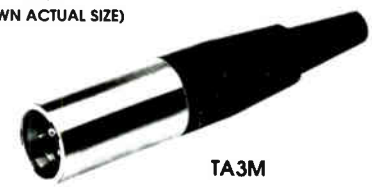

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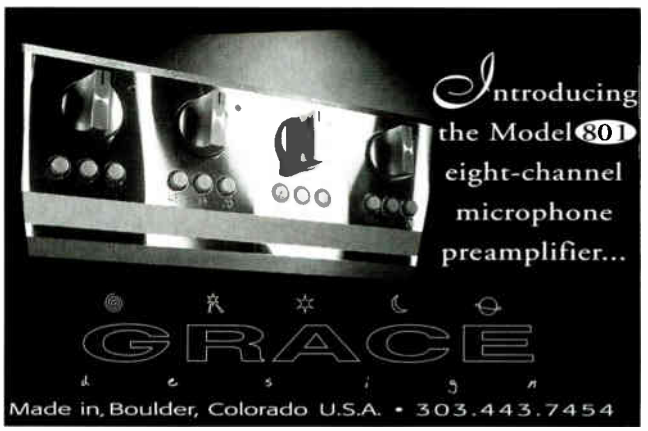

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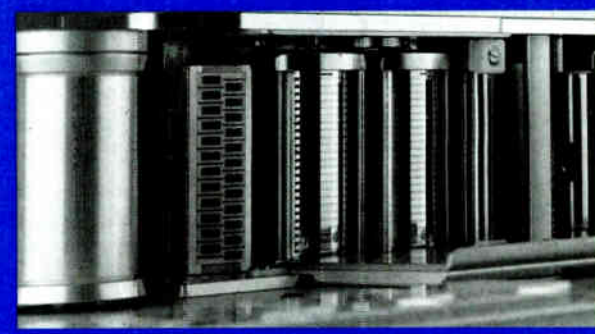

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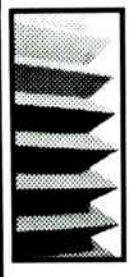

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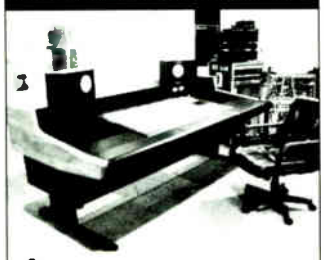

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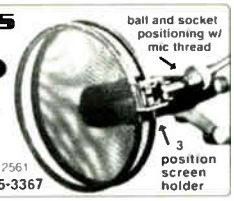

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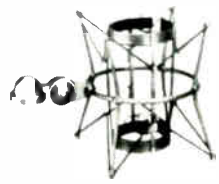

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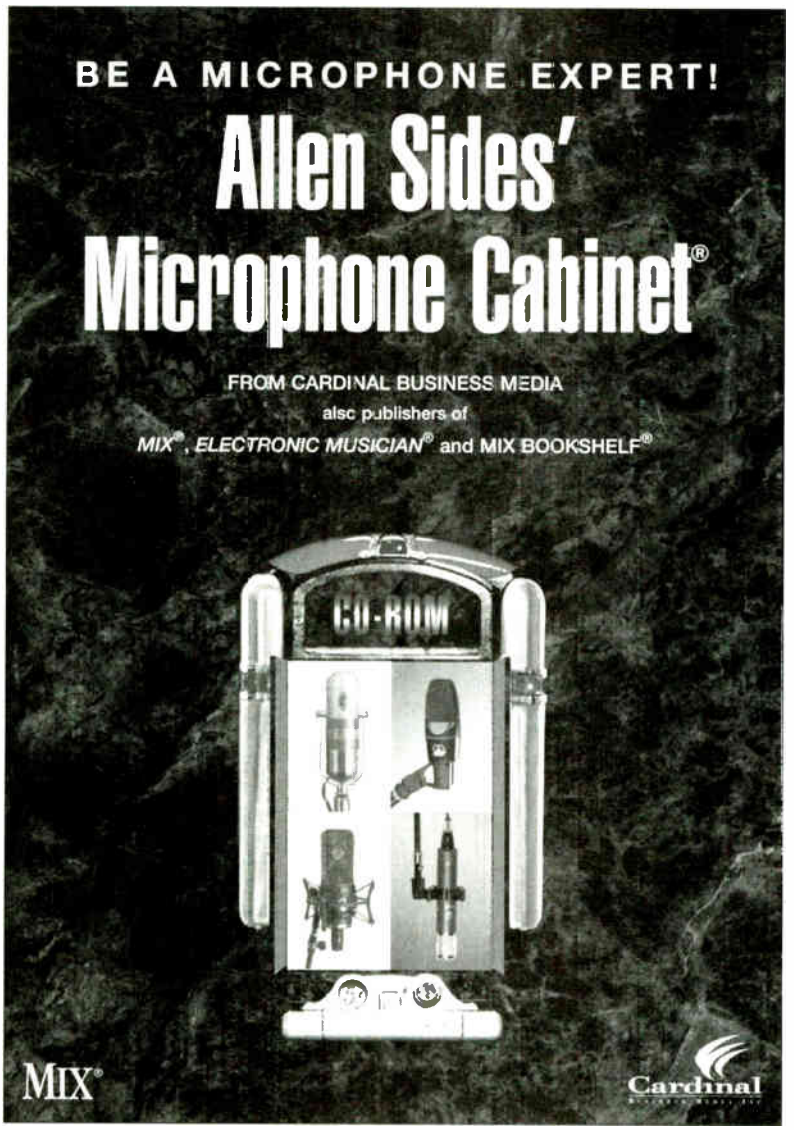

Allen Sides has recorded and mixed sessions for dozens of world-class artists such as Ry Cooder, Count Basie, Ray Charles, Sinead O'Connor and Brian Setzer

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!

David Gibson
Founder and Chief Administrator
California Recording Institute

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Wesley Bulla
Coordinator of Recording Studio Curriculum
Belmont University

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David Miles Huber
Author and musician

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- 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.

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—FROM PAGE 145, SOUNDFIELD

a display meter. In addition to patern, width and gain, there is a headphone volume control with a minimum headphone output per side of 400 ohms. Two buttons redefine the front of the microphone: Inverted maintains the relative positions of the left and right signal when the mic is upside down, and Endfire, where the tip becomes the front. Aside from the filter, the only other button is marked Mid/Side, which bypasses the unit's internal matrixing and sends an undecoded mid/side signal—rather than left/right—to the outputs.

My only criticism of the control unit is that the on/off switch is in the rear. I had to de-rack the unit each time I plug ged in the microphone or turned it on. Nonetheless, my experience confirmed that the SPS 422 is a flexible, accurate, sensitive and quiet system with sensational stereo capabilities.

In practice, the SPS 422 system is simple and elegant to use. You set up the mic, attach it to the control unit with the included 20-meter cable, and adjust the parameters while monitoring the signal through control room speakers or the unit's headphone jack. In effect, you are able to alter and aim the equivalent of a set of microphones while monitoring the results in real time. I found it useful to first find a pattern that yields the proper balance between the source and ambient sound in mono, and then increase the stereo width to the preferred level.

I used the system to record two orchestras, a choir, a string quartet, a piano duet, an acoustic guitar and a pop vocal. For my first test, I recorded a rehearsal of the New Haven Symphony Orchestra with pianist Gustavo Romero. I placed the mic about 20 feet in front of the center of the orchestra and connected the outputs of the control unit directly into the balanced line inputs of a Tascam DA-P1 DAT recorder. Because the piano was centered in front, its volume often overwhelmed the orchestra. Although the recording would have been improved by fortifying the orchestral balance through the use of additional mics, I found that a figure-8 pattern with a wide stereo spread—in essence, the Blumlein technique—yielded impressive results.

In this case, as in all of my tests, I found that the recording had a spatial depth beyond simple L/R panned stereo. Furthermore, the microphone was remarkably accurate and lucid. Many summers ago, when Gustavo Romero and I were both students at the Aspen Music Festival, we happened to be listening to the radio one day. He not only recognized the piece, but also its performer, Van Cliburn, because each note in the rapid upper register passages was so characteristically enunciated. Throughout his performance of Rachmaninoff's *Variations on a Theme by Paganini* with the New Haven Syphony Orchestra, Gustavo similarly "spelled out" each note in the rapidfire passages, which the SPS 422 recorded with almost painful accuracy.

A recording of Jack Vees' Piano Trio for two Yamaha acoustic MIDI grand pianos further illustrated the transparent character of this mic. Since Gene Kimball, the chief recording engineer at Yale University, had already recorded the Piano Trio for a forthcoming CD on CRI, I had a basis for comparison. Because the pianos were played by a Macintosh running Performer, the performances were identical. Also, both of us recorded onto Tascam DA-P1s. However, Gene's choice of microphones and preamps, two B&K 4006 omnis with 1272 Neve preamps, provided a dramatic contrast.

I set the SPS 422's pattern to supercardioid and placed the mic between and above the pianos (lids removed), whereas Gene had located each B&K over a single lid-free piano. Though I preferred the stereo field produced by the SPS 422 to the stark panning of the B&Ks, this reflects methods as much as microphones. Focusing on the characteristics of the mics themselves, I found the B&K/Neve combination produced a warmer, bassier sound, almost turning the Yamahas into Bechsteins. The SPS 422, while brighter, thinner and less flattering, offered greater accuracy, definition and punch.

During a rehearsal of the Manhattan String Quartet, I set up the mic several feet in front of and above the musicians. Subsequently reviewing the tape, I can hear and see where each player sits as they play, so perfectly is each situated and blended in the stereo field. Listening to this example, there is no question that SoundField's extensive psychoacoustic research is more than a mere marketing claim.

I also achieved excellent results when recording the 77-member Yale Glee Club choir in a sold-out performance at the 2,685-seat Woolsey Hall. I was able to set up quickly and "mix" the show simply by changing the microphone's parameters. For instance, I used wide stereo cardioid during an ensemble piece and changed the pattern to omni for applause and also when soloists walked toward the front of the stage and effectively "behind" the microphone, which I had positioned just in front of the midpoint of the choir's semicircle. Because hanging the microphone was impractical, I used its optional shock mount, which proved essential for isolating the mic from the effects of stage rumble and shifting feet. I could have used the integral highpass filter to eradicate rumble, but it would also have cut bass notes below 80 Hz.

As a pop vocal mic, the SPS 422 holds its own in the company of its large condenser brethren. When recording Kimberly Eden, whose alternative style lies somewhere between Tracy Chapman and Rickie Lee Jones, the mic captured her crooning with sweetness and depth. I found that using the mic in stereo for a lead vocal added a subtle presence worth the extra track.

Best of all was a recording I made of John Boulet playing his Contreras classical guitar in a flamenco style. With the mic closely positioned just above the sound hole, I was able to record a three-dimensional sound field in which the intimacy and grit of the guitar were sensuously embraced by the rich reverb of the oddly shaped marble room in which he played. With the mic placed between John and his wife Lenore as they played guitar duets, the mix was spacious and natural.

Throughout my tests, I had the sensation that an engineer far more experienced than I lived within the control unit, making me look better than I deserved. The SPS 422 microphone system, however, is far more than "stereo for dummies." I suspect that many users will agree with SoundField's claim that its system provides stereo recording capabilities that are superior to conventional methods. Certainly, a SoundField microphone system would complement any fine collection. And for the project studio owner looking to buy a large condenser and stereo pair, the SPS 422 provides one-stop shopping and, at $3,500, makes a sound investment.

SoundField is distributed in the U.S. by QMI, 25 South Street, Hopkinton, MA 01748; 508/429-6881; fax 508/435-4243; Web site:www.proaudio.co.uk/sndfield.html. ■

Arthur Bloom is a composer, producer and, from time to time, doctoral candidate at Yale University.

World Radio History

FEEDBACK

LESS IS MORE

I found the article on the post-production sound for *Twister* (July '96) interesting, but as another Los Angeles-based re-recording mixer, I take exception to the idea that these re-recording mixers are the only ones that "are very conscious of not hurting the audience." On the contrary, most crews are; it is those who are not so conscious that are the exception. As Steve Maslow quite rightly points out, the overall level on the dubbing stage is wholly in the hands of the mixers. The point about the digital 5.1 formats is that they have finally made this true. Previously, directors and editors were often asking for more, when the recording medium was incapable of delivering it. Now, however, the recordable dynamic range has been so improved that the mixers have complete control.

I agree, too, that there has been something of a backlash against movies that are too loud. Inevitably when the level ceiling that we had lived with for so long was removed there was some indulgence in excess. Just as inevitably, this tendency has abated as mixers have learned to appreciate the real potential of these formats. But what has been disturbing me lately is the increasing prevalence of phalanxes of compressors and limiters to achieve this. These devices have their place, but when used on everything they lead to sterile, lifeless tracks. Many of the highly acclaimed, Oscar-winning dubs seem to suffer from the indiscriminate gain reduction of compressors rather than the discerning gain reduction available from a creative mixer and his faders.

Chris David
chrisd1004@aol.com

SUITABLE FOR HUMAN CONSUMPTION

I was certainly absorbed by, and agreed with, all that Paul Lehrman had to say in his article "Manual Labors: Twelve Steps to Better Documentation," in your June '96 issue, until the last "step," which advised including the documentation writer in the development process. At that point, I lost my reserve and pounded the air with my fist, yelling "Yes! Yes!" For me, this was Lehrman's strongest point by far. It addresses the single most important element of product design; that is, to make the product "accessible," as Zappa used to say.

Product development must follow the patterns of human use, and the best way to know the proper way to use a given product is to let the uninformed tell you what's missing. I'd like to see product design be in completely modular form, at least until the documentation writer, the user, and a lot of other folk, down to the pet chihuahua, have had at it, and torn it to bits for its illogic (the state of most released products). I'm reminded of a classic story of a campus designer who did not install walkways. He was resoundingly criticized, until his own philosophy proved out. After a few months, the students' naturally developed traffic flow patterns had already beaten the correct paths, and there the designer laid walkways.

Roger Cloud
cloud98765@aol.com

HEADS OR TAILS

Having just read the article entitled "Yes, Master," in the June 1996 issue, I have a couple of comments to make: In all my years in professional studios (17 and counting), I have never encountered green hold-down tape. Admittedly, I haven't seen it all, but more surprising is the comment that red tape indicates a tail-wound tape. In my experience, Red = Heads, Blue = Tails.

Another handy tip when dealing with hold-down tape: Because it's so difficult to peel the hold-down tape off the leader tape, especially on ¼-inch reels, we always make a little tab by folding the hold-down tape over onto itself for ½-inch or so, then attaching the hold-down tape to the end of the reel with the tab facing into the tape pack. Just lift the tab and off it comes. Very neat and clean.

Lastly, if you're going to use leader tape with arrows on it, the least you can do is get the arrows pointing in the direction of play. Time and time again, we get tapes with the arrows pointing the wrong way, and invariably, my esteem for the studio that generated that tape (not the assistant who committed the crime) is lessened. It is a fact that the first impression a studio makes is often from the condition of the documentation and the tapes themselves, and when tapes arrive with no hold-down, no tones, arrows in the wrong direction, mismarked or unmarked tapes, it indicates that the studio just doesn't care about their clients' investment in those tapes. It is management's responsibility to establish some kind of procedure for labeling and documentation, and when studio management can't maintain even the simplest standards, it reflects badly on the studio as a whole.

Robert Knox
Time Machine Studios
Manchester, Vt.

An editing error caused the tape-color confusion. Mix*'s apologies to our readers and to the article's author, Mr. Fry.*

SHURE MICS

On page 175 of July 1996 *Mix*, an article by Mark Frink talks about the similarity of the Beta 56 to the SM56. This really is inaccurate. The Beta 56 is really similar to the 545SH. Both the 545SH and the Beta 56 mics are connected to a similar pistol grip-style mount (like the old 55SH "Elvis mic" without the switch).

The SM56 body mount, on the other hand, was a cylindrical type with an XLR connector that featured an additional shock mount. Shure Bros. also didn't really stay accurate with the designation of the 56 because there is no body mount currently manufactured like the SM56. There are no parts left either for the pivoting body part of the SM56, according to Shure.

So, all four mics might pivot, but the SM56 is clearly different in design, look and the additional shock-mount function.

David Anderson
Seminole, Fla.

Send Feedback to Mix, *6400 Hollis St. #12, Emeryville, CA 94608; fax (510) 653-5142; or 74673,3672@compuserve.com*

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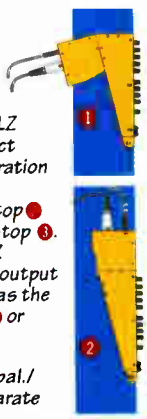

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