Recording With Buddy Guy · Video for Audio, Part 1 · Walter Becker

U.S. $4.95 CANADA $5.95 APRIL 1995

MIX®

PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

SOUND FOR PICTURE SUPPLEMENT

· ISDN Explained

· Todd-AO's Chris Jenkins

· Sound for "Hoop Dreams"

Digital Formats: Pros and Cons

Field Test: *Pro Tools III*

Working with Your Pro Audio Dealer

CATCHING UP WITH AL KOOPER

THE BIG PICTURE

The world's best studio monitors are a picture window. If they perform with accuracy and transparency, you'll not only hear the mix, you'll see it. The new **Alesis Monitor Two™ Studio Reference Monitors** do just that.

Their sonic character was modeled after our TEC Award-winning Monitor One™, so you can mix on either speaker, in any size room, and get the same results. The difference? The Monitor Twos create a larger sound field, the sweet spot is bigger, bass response is deeper, and power handling is greater.

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Monitor Twos are perfect for near to mid field monitoring in project studios, mixing suites, and even large control rooms. Or put them in your personal studio to make it sound virtually cinematic. Their combination of civilized size and serious muscle is due to our exclusive SuperPort™ bass venting technology that delivers accurate low end transients equal to much larger, more expensive systems. In fact, the Monitor Twos cost less than some near field monitors. Which makes the case for owning them, sort of...full bandwidth.

MONITOR TWO™
STUDIO REFERENCE MONITOR

Award winning design team, 40Hz - 18kHz frequency response, 200 watt peak power, mirror-image sets, fun to touch non-slip rubber laminate on the cabinet, and a lot more. For mixes you can see. The Monitor Two is at your Alesis dealer now.

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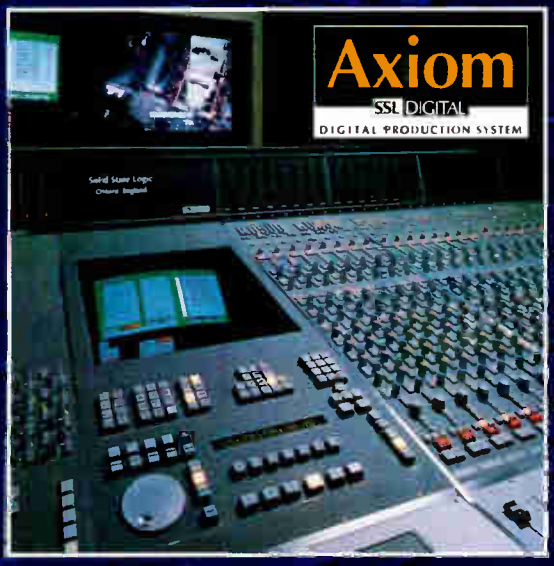

Fully digital, fully automated / resetable production console. Axiom is a single system with integrated multitrack recording, non-destructive drop-ins, editing, sequencing and playback, all with the same high audio quality

The ultimate analogue console. SL 9000 J Series offers a familiar control surface with new, powerful automation capabilities. Plus the option of SSL's DiskTrack™ hard disk multitrack recorder / editor for in-built digital storage and manipulation

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TANNOY

HEAR BELIEVE

The new PBM II series, once again, is setting new standards in the industry. Pioneering new technologies such as **variable thickness, injection molded cones with nitrile rubber surrounds** are but one fine example of our dedication to perfection. The new molded cones are stiffer than conventional cones producing more linear extended low frequency. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange. They are immaculately consistent and durable for years of faithful trouble free use. From the high power polypropylene capacitors to the hardwired minimalist crossover, every component has been carefully selected for the new breed of PBM II series. When leading edge technology is so affordable, *Get Real.* Don't settle for second best.

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APRIL 1995, VOLUME 19, NUMBER 4

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LIVE SOUND

DEPARTMENTS

Cover: Studio E at Waves Sound Recorders, Hollywood, features a Euphonix CS2000 24-fader console fitted with a custom center tub to house one of the facility's three Fairlight MFX-3 workstations. The 24-track, 20-out Fairlight controls Sony 1-inch, D2 and 3/4-inch video decks with time-code control of the Euphonix. Monitors are EV Sentry 100As and Auratones. Room design by Rick Porter/Tamara Rogers (Waves COO), wiring by Advanced Studio Systems, construction by Mighty Todd Construction. **Photo:** Ed Colver.

How to Succeed with a Sonic

Edit and mix

Analog or digital in — Grammy out! It's no coincidence that the majority of the 300 plus recordings nominated for 1995 Grammys were edited on Sonic systems.

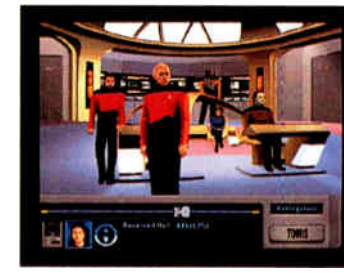
Record of the year All I Wanna Do by Sheryl Crow edited and mastered by Dave Collins, A&M Mastering

Create big sound for

Bullets Over Broadway, Hoop Dreams, Just Cause, Pret-a-Porter, The Jungle Book, Apollo 13 — what do they have in common? The Sonic System — of course! — because it delivers power and speed for dialog, music, and effects editing for film and video projects.

Blast out music

The biggest explosions, the clearest narration, the richest music — the Sonic brings life to audio for CD-ROMs.



Star Trek CD-ROM editing by Mark Waldrep, Pacific Coast Sound Works

Cut radio programs

"I haven't touched a reel to reel in months," says Bob Carlson from KCRW in L.A. That's because building radio programs with his Sonic System is fast, easy, and affordable. Stay tuned around the globe for promos and features prepared on the Sonic.

Beatles Live at the BBC editing, NoNOISE, and premastering by Peter Mew, Abbey Road

Restore priceless recordings

NoNOISE® is used around the world to tackle the problems of tape hiss and ambient noise, clicks and pops, and distortion and crackle. Engineers, artists, and producers wouldn't trust their masters with anything less.

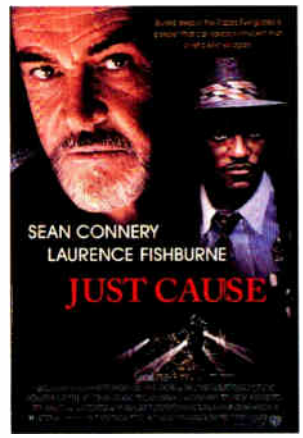
Put the world's next best-seller

It was a dark and stormy night...the project deadline was approaching...the talent was restless. With my Sonic, I recorded readings directly to hard disk, edited alternate takes, layed up effects, and slapped down a multi-track music bed. "No sweat," I said handing over the finished tape. "My Sonic always delivers a happy ending."

SONIC SOLUTIONS

a Grammy® winner

Our precision editing, high-resolution recording (all Sonic systems support 24-bit data), and superb sound quality yield stunning results and kudos all around.



the big screen

Our new UltraSonic Processor provides up to 16 channels with full DSP on a *single* board making multitrack work streamlined and affordable.

Just Cause Sonic System dialog and background editing supervised by Michael Kirchberger, 20 bit music editing by Tom Drescher, Wonder Dog Music

and effects for multimedia

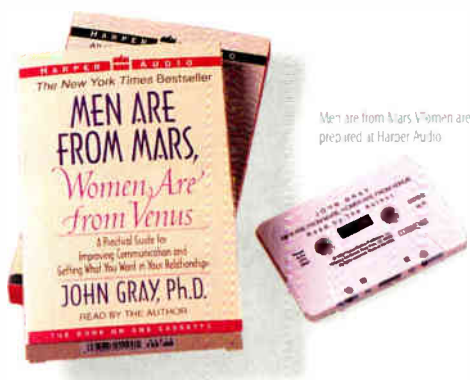
For multimedia pioneers, handling hundreds of soundfiles is all in a day's work for the Sonic. And with a native AIFF file format and OMFI compatibility, the Sonic is the CD-ROM producer's choice.

without a reel to reel

Tune in to AES Radio, the BBC, the CBC, CBS, Danish Radio Dutch Radio, KCRW, KIIS, NPR, Premiere Radio, WDR (Germany), WETA WGBH, and dozens of others

for a platinum release

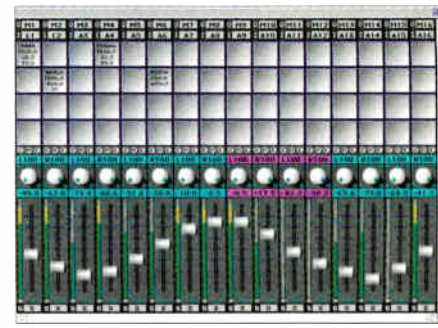
on tape



Men are from Mars Women are from Venus prepared at Harper Audio

The Ultimate in Power: USP

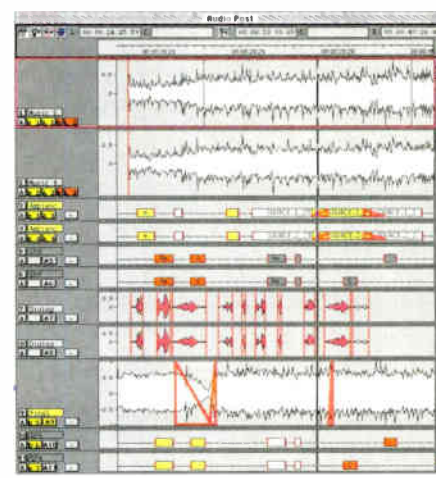
The USP (UltraSonic Processor) puts more digital signal processing power in the hands of audio professionals than any other Mac or PC-based audio workstation.



With a single USP card you get: up to 16 channels of digital I/O, up to 32 channels of playback from a single hard disk, 32 sections of real-time EQ, and elaborate aux/send return capabilities. No additional expansion chassis, kludged piggy-backed boards, or awkward internal cabling required.

The Ultimate in Affordability: SSP

With 2-4 channels of digital I/O, 8-12 channels of disk playback, and 16 sections of real-time EQ all available on one low-cost board, the SSP-3 is the clearest path toward platinum success. At $2995, the SSP-3 is the best DAW value around!



MediaNet: The Digital Media Workgroup's Data-Bahn

MediaNet, our high-speed FDDI/CDDI network, links Sonic systems (or any standard Macintosh or NFS application) in a seamless network. MediaNet is the only network that allows multiple users to share processing resources and hard disks (even the same soundfiles!) at the same time.

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FROM THE EDITOR

I'm Moving to Europe!

I'm not really moving to Europe. It's just that the timecode is always greener on the other side of the ocean, and I'm jealous. Here in North America, we're stuck with NTSC television. Depending on your viewpoint, NTSC could stand for National Television Standards Committee or the old "Never The Same Color" joke. Either way, we view 525-scan-line pictures with a vertical synchronizing rate of 59.94 Hz, which equates to 29.97 frames a second.

In the age of black-and-white television, life was simpler. Pictures were broadcast at 60 Hz and a nice, round frame rate of 30 fps. Once color arrived on the scene, the vertical sync rate was reduced by (what was then thought of as insignificant) 0.06 Hz, a 0.1% difference. No big deal, and this allowed all those black-and-white sets to function normally with the new programming. Night after night, millions of couch potatoes enjoy their favorite shows, without once considering how that "insignificant" 0.1% has driven the current generation of audio production pros to the brink of insanity.

Just a few years ago, the situation was less complex, as most network shows were produced either entirely on video or film. But these days, most productions are hybrids, using the advantage of both media to the fullest extent. Film offers high resolution; video provides inexpensive workprints and the ability to create nearly instantaneous (or at least faster than film) digital effects. It's the best of both worlds—almost. But when you start with 24 fps film, skip-frame it in telecine to 30 fps, edit on video at 29.97 fps, add video optical effects in a tape-to-film transfer (at 24 fps for reinsertion into the film master), and then interlock the audio elements for 29.97 video layback or shooting the 24 fps film optical track, the process can become complicated.

It gets worse. Video personnel often refer 29.97 fps as "30," and unknowing audio engineers might take this literally and use 30 fps time code. After an hour, that 0.1% difference is 108 frames, and even the most inattentive viewer will notice a sync problem of that magnitude. Oh, I forgot to ask: "Was that timecode drop-frame or nondrop?"

Confused? Just keep in mind that PAL (European) TV is 25 fps; film cameras shooting for TV run at 25 fps, and time code is 25 fps. And the picture is better, with 625-line resolution. Now you know why I'm moving to Europe...

In this issue, we spotlight sound for picture, with a special 48-page supplement on the topic. Jeremy Hoenack of Sound Trax Studios examines the problem of SMPTE drift. And we begin "Video for Audio," a series by engineer/author/teleproduction authority Paul McGoldrick. Of course, the NAB Show returns to Las Vegas from April 9-13, and we'll be reporting on all the audio highlights.

See you there!

George Petersen
Editor

BPA INTERNATIONAL Circulation independently audited and verified by Business Publications Audit of Circulation since 1985.

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Our unique continuous-flow manufacturing process ensures the greatest consistency reel-to-reel. Our Total Surface Cleaning system wipes and vacuums every square inch of tape for the highest signal stability. Each roll is fully tested end-to-end to ensure unparalleled uniformity. Even our flanges are the sturdiest you'll find.

With Ampex you also get the largest distribution network in the business backed with customer service that has long been the industry standard.

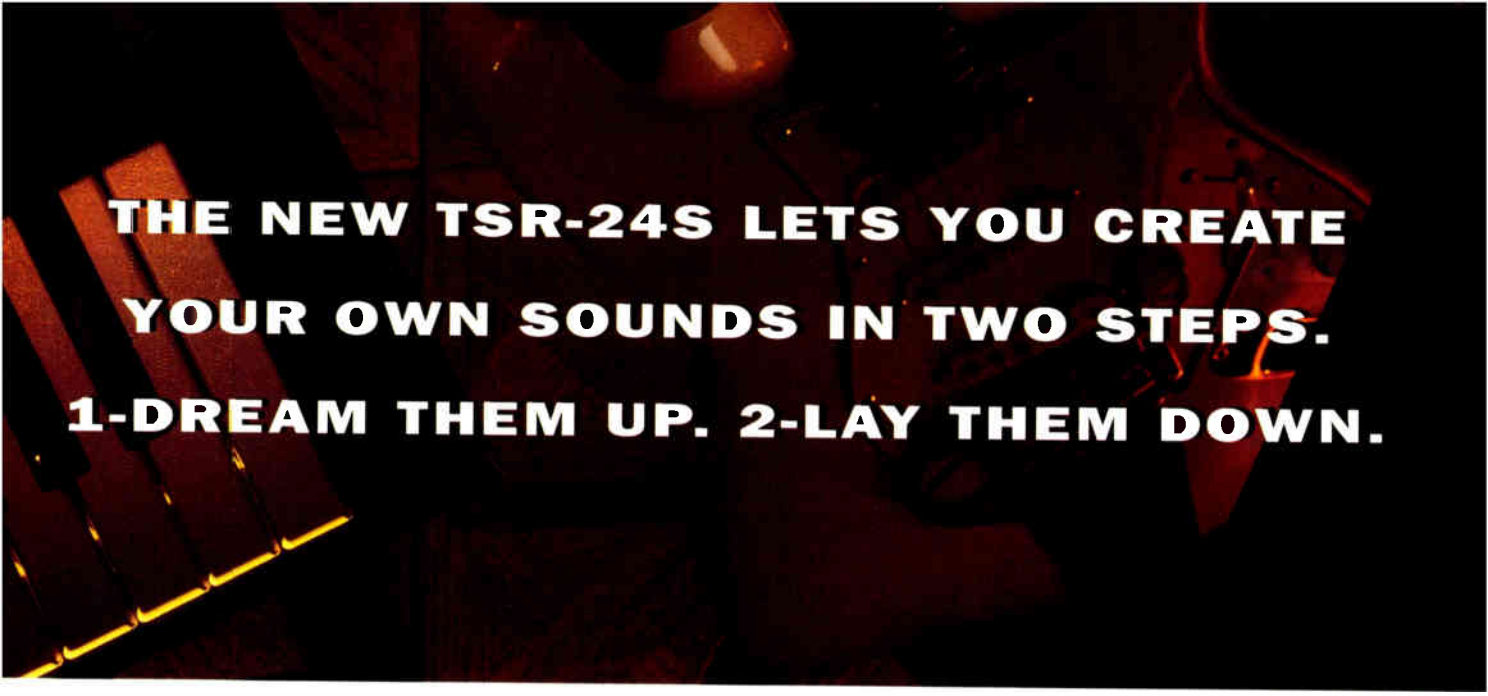
Such attention to detail might seem a bit excessive, until you realize that more records go gold on Ampex tape than on all other tapes combined.

For more information, or the name of your nearest distributor, call **800 227-8443.** Ampex 499 Grand Master Gold. The gold standard.

See us at NAB Booth #S714

AMPEX

Ampex Recording Media Corporation, 401 Broadway, M.S. 22-02, Redwood City, California 94063



With the TSR-24S, frustrating menus and time-consuming steps don't control your programming. You do. Choose the effects you want, in the order you want, then program and listen to them instantly. No catches. Naturally, the TSR-24S has plenty of raw material, with an arsenal of more than 75 effects. Plus, multiple modulation effects

S-DISC™ PROCESSING

SPECIAL EFFECTS

94 DB S/N RATIO

When it comes to sound, not even compact discs are as clean as the TSR-24S. Our Silencer™ digital noise gate wipes out noise by writing digital zeros when there's no signal present.

94 dB

OVER 75 EFFECTS

Gigaverb (the world's most flexible reverb), crystal clear sampling, multitap and modulated delays, multi-phase choruses and flangers, duckers, auto panners, 4-voice phasers, 10 separate EQs, 4 octaves of multi-voiced pitch shifting, arpeggiators, and more.

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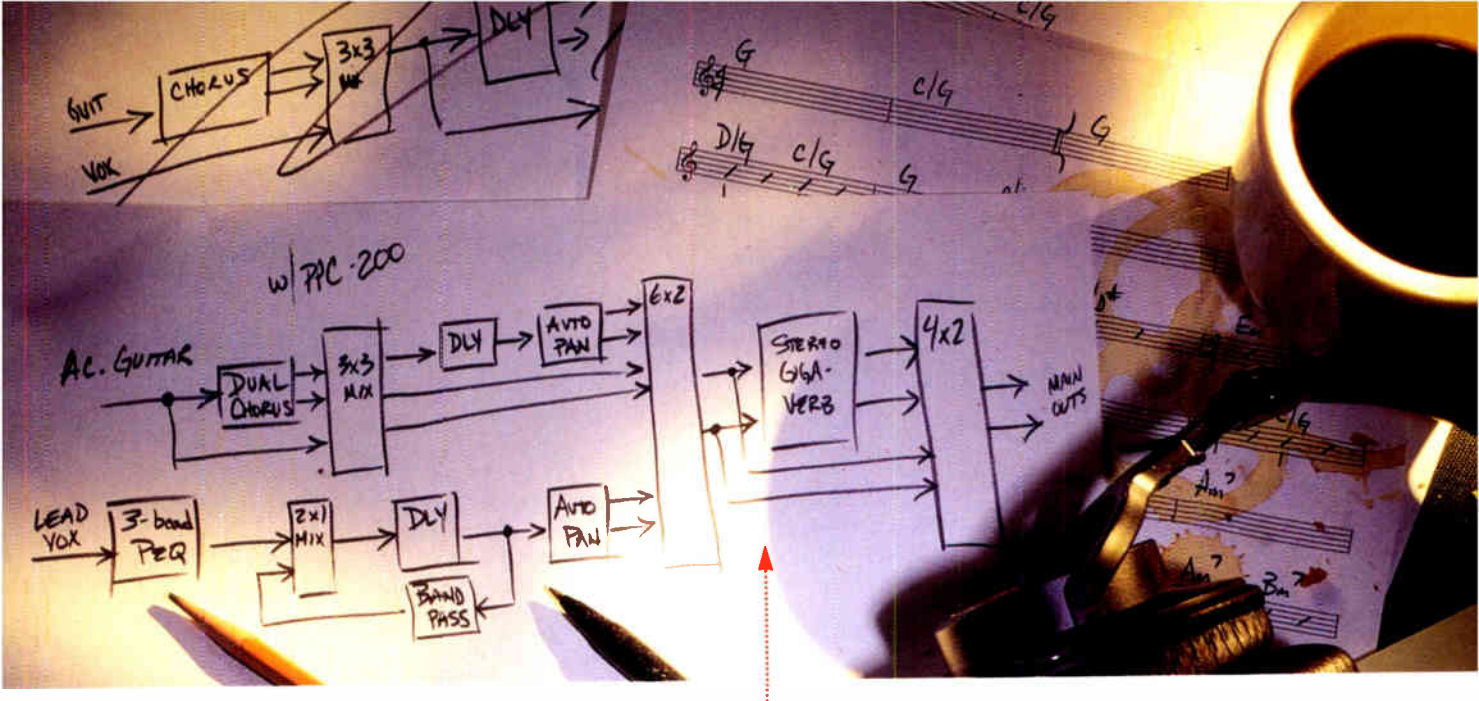
Take true stereo inputs, add four assignable outputs, and you get a lot of routing configurations. Let's see, there's stereo in, quad out; mono in, quad out; dual mono in, dual stereo out...well, you count 'em.

HAVE A TSR-24? *No problem—upgrading is a snap. Just contact your nearest DigiTech dealer.*



capability and instant module/parameter access mean your great ideas become great music in a matter of seconds. No other machine at any price can match its flexibility. But even before you start dreaming up new sounds, you'll have to take the real first step. Drop by your nearest DigiTech dealer today.

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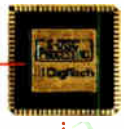
EXPANDABLE

Add the available PPC 200 card, and you'll have the power of two TSR-24S processors. Parallel processing means seamless effect changes and more.

S-DISC™

This chip defines DSP horsepower. S-DISC delivers superior sound, quiet operation and performance unmatched by anything in the market. This incredibly powerful chip was designed specifically for audio.



ALGORITHMS

Want reverb, chorus and flange? Press a couple of buttons. Reverb, chorus and reverb again? Redundant effects are not a problem. Link effects in any order to create algorithms, then program them in nearly limitless combinations.

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CURRENT

1995 TEC AWARDS TO RETURN TO MARRIOTT MARQUIS

The Mix Foundation for Excellence in Audio announced that the Eleventh Annual Technical Excellence and Creativity Awards will be held on Friday, October 6, at the Marriott Marquis in New York City.

Slated for the second night of the Audio Engineering Society convention, the TEC Awards will honor products, people and institutions for their achievements during the 1994 eligibility year.

"The Marriott Marquis, centrally located in Times Square, proved to be a popular choice for the 1993 TEC Awards, and the MFEA is happy to be returning this year," said Hillel Resner, publisher of *Mix* and president of the Mix Foundation for Excellence in Audio. "The TEC Awards debuted in New York in 1984, and in my opinion, there's few places that can top midtown Manhattan in early October."

If you have any questions about the TEC Awards, call Karen Dunn, executive director, at (510) 939-6149.

FAIRLIGHT SHUFFLES TOP MANAGEMENT TEAM

In a major restructuring of its marketing and sales operations, Fairlight ESP Pty Ltd. (Brookvale, Australia) appointed three key managers: John Lancken was named international marketing manager; Nick Cook is the new director, European operations; and Wayne Freeman was appointed CEO of the newly formed Fairlight U.S.A.

David Hannay, managing director of Fairlight, says "John, Nick and Wayne have all built solid reputations in this industry, and between them we have an excellent base from which to capitalize on both existing and emerging markets. In this our 20th year, we are looking to develop our presence in the European television, radio and music industries."

SHURE CELEBRATES 70 YEARS, RESTRUCTURES ENGINEERING

Shure Brothers Inc. (Evanston, Ill.) is celebrating its 70th anniversary this year. Founded as the Shure Radio company in 1925 by S.N. Shure (who still serves as chairman), the company began as a wholesale operation dealing in radio parts. The rechristened Shure Brothers Inc. began manufacturing two-button carbon mics in 1932. Over the years, Shure has diversified to produce a variety of electronic components while continuing to develop its renowned line of microphones.

Shure microphones, past and present

Meanwhile, Shure announced a restructuring of its engineering department. Following the retirement of senior vice president of engineering Bernie Jakobs, Shure promoted chief engineer Ron Thielmann to associate vice president, engineering design. Former engineering associate Paul Jenrick was appointed to the newly created position of director of new product management and design, and John Zhao was promoted to director of research and development.

DIGITAL RADIO POISED TO SWEEP EUROPE

European countries have decided to join forces to launch digital audio broadcasting (DAB) services in the greatest possible number of countries this year. A European platform, the "EuroDab Forum," for the introduction of these services in Europe and all over the world has been established at European Broadcasting Union headquarters in Geneva.

The countries represented are Belgium, Denmark, France, Germany, the Netherlands, Poland, Spain, Sweden, Switzerland and the United Kingdom, along with the European Community and various broadcasting organizations. The EuroDab Forum held its inaugural meeting in Geneva on March 22.

The Forum is endorsing the Eureka 147 system, which is said to provide CD-quality sound. The Forum predicts that the system will gradually supersede analog FM radio. Terrestrial DAB services will commence this year in various European countries on an experimental basis. Test receivers and transmitters are already comercially available, and first-generation consumer receivers will be

—CONTINUED ON PAGE 16

"This is the real thing"

1994 too! Congratulations, Robert

Robert Scovill
--Winner, TEC Award 1992 & 1993,
"Best Sound Reinforcement Engineer"

Neumann's new
KM 184 Microphone
shown actual size

Robert Scovill knows microphones. Named by his peers "Best Sound Reinforcement Engineer" worldwide for two years running, he has mixed for acts like Rush and Def Leppard. His first choice in microphones is Neumann.

"During the pre-production stages of a tour, an incredible number of decisions are placed in my hands. Neumann has made some of these decisions very easy, indeed. There are a lot of look-alikes out there, but Neumann is the real thing."

Introducing the KM 184 - a small diaphragm condenser microphone designed for critical recording and live sound applications. With 20Hz to 20kHz frequency range and 138dB maximum SPL the KM 184 is particularly useful for percussion, cymbals and brass instruments. It is also excellent for capturing the subtle nuances of acoustic guitar and orchestral performances with its extremely quiet (16dB A-weighted) self-noise. Best of all, it has that *Neumann Sound*.

Now, with the KM 184, you have hand-built, legendary Neumann performance for less than $600.* Neumann... the choice of those who can hear the difference.

Neumann USA

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It's 3:00 a.m. and you're home sound asleep. But you're cutting CDs back at the studio, too. What a dream. You have a KODAK Writable CD Audio and CD-ROM Authoring System that lets you master up to 75 quality CDs without even being there. And it can help you make money–day or night–while you tend to other matters (like counting sheep). Why lose sleep over CD mastering?

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Kodak

A Trio of Sound Solutions for CD Mastering

Kodak has three powerful disc-writing systems for MACINTOSH Computers that will make fast work of short-run CD mastering. Whatever your needs, Kodak has a fully integrated system designed to meet your clients' audio requirements and enhance your studio's profitability.

$4,495

KODAK Writable CD Audio & CD-ROM Authoring System 225

Now you can author professional-quality audio CDs on demand. This fully integrated system includes a high-speed (2x) KODAK PCD Writer 225, TOAST CD-DA Recording Software and TOAST CD-ROM Pro Authoring Software, a SCSI cable and a 63-minute KODAK Writable CD disc. The PCD Writers contain an expandable write buffer that enables you to boost internal memory, minimizing the risk of buffer underruns, increasing reliability and reducing wasted discs.

$9,495

KODAK Writable CD Audio & CD-ROM Authoring System 225DT

This remarkable system provides all of the same components as the System 225–and one important addition: a KODAK Disc Transporter. With the Disc Transporter, you can master a large stack of discs while you complete other work around the studio. And it will even enable you to set up unattended disc production runs and write up to 75 discs in CD-ROM Red Book CD-DA format.

$29,995

KODAK Writable CD Audio & CD-ROM Authoring System 600DT

Designed for audio professionals who need the greatest disc-writing speed, reliability and flexibility available, this system features a KODAK PCD Writer 600–the world's fastest CD writer. It can write a 60-minute recording in just 10 minutes! The system also includes the KODAK Disc Transporter, TOAST CD-DA Recording Software and TOAST CD-ROM Pro Authoring Software, a SCSI cable and a 63-minute KODAK Writable CD disc, giving you a highly advanced in-house authoring system.

Each system contains a combination of these components.

SYSTEM COMPONENTS:

KODAK PCD Writer 225/KODAK PCD Writer 600

- KODAK PCD Writer 225 reads and writes CDs at twice the standard rate, providing increased productivity and high data reliability.
- KODAK PCD Writer 600 records write-once CDs at an industry-high 6x speed for the highest productivity.
- Both write discs in any standard CD format.
- Both ensure data read integrity with automatic error detection and correction algorithms.
- Both feature internal bar code readers compatible with KODAK Writable CD Media with INFOGUARD Protection System, providing easy disc identification and tracking.

KODAK Disc Transporter

- Provides high-volume, unattended disc production.
- Automatically selects a disc from an input stack magazine and places it in a KODAK PCD Writer; moves completed discs to an output stack magazine and loads another blank disc, providing a continuous production flow.

KODAK Writable CD Media with INFOGUARD Protection System

- Compatible with all leading CD writers and CD readers.
- Contains a unique bar code that can be read by the KODAK PCD Writers, providing disc security and easy tracking.
- Contains stable organic dye recording layer, protecting your audio data against the effects of light, humidity and temperature.
- Features a gold reflectance layer that's unaffected by oxygen, moisture and solvents, protecting your data for 100 years or more.
- Contains special scratch- and fingerprint-resistant overcoat, ensuring tremendous disc durability.

TOAST CD-DA Recording Software

- Writes audio CDs according to Red Book specs.
- Supports full PQ channel editing (e.g., catalog code, IRSC, pauses between tracks, copy prohibit, etc.).
- Provides for emphasis on/off.
- Provides for write simulation mode.
- Supports AIFF and Sound Designer II file formats.

TOAST CD-ROM Pro Authoring Software

- Supports the following formats: MACINTOSH HFS; ISO 9660; MACINTOSH/ISO Hybrid; CD-ROM XA; Audio; Mixed Mode; Generic; Generic XA; Video CD.
- Ideal for session back-up and archiving to CD.

VISIT OUR BOOTH #17552 AT NAB!

For additional information, check the Writable CD library in the Kodak forum (GO KODAK) on CompuServe or call 1-800-CD-KODAK (1-800-235-6325). In Canada, call 1-800-465-6325, ext. 35505.

INDUSTRY NOTES

Recent promotions at **Alesis Corp.** (Los Angeles) include **Barbara Brown** to chief operating officer/general manager; **Diane Figueroa** to chief financial officer; and **Douglas White** to VP/sales...Chester, PA-based **Community** hired **John Strand** as Asian/Pacific regional sales manager and **Michael Jay Pappas** as Western regional sales manager...New facility for **Mackie Designs**: 20205 144th Ave. NW, Woodinvile, WA 98072...**Tom Der**, former sales and support director at Neotek, founded a new direct sales organization for pro audio manufacturers named **Zero THD**, based in Chicago. Call (312) 665-9066 for more information...**Antony David** joined **Sony Broadcast & Professional Europe** (Basingstoke, Hampshire, UK) as general manager, pro audio...**Philips Key Modules** (San Jose, CA) appointed **Mackenzie Laboratories Inc.** as master distributor for its pro digital/audio product line...**Carver Professional** (Lynwood, WA) hired **Stuart Moffit** as technical support manager...**EMAGIC** (Nevada City, CA) hired **Joel Heppting** as VP of U.S. sales...**Otari Corp.** (Foster City, CA) appointed two new reps: **PCM Marketing** is handling Northern California and northern Nevada, and **Bay Roads Marketing Group** is covering New England and upstate New York...**Jamey Robbins** was promoted to the position of vice president, research and development, at Irvine, CA-based **Pinnacle Micro Inc**...**Lonnie Pastor** was named Central regional sales manager at **Ramsa** (Cypress, CA). He replaces **Greg Braithwaite**, who was recently named Ramsa's national sales and marketing manager...**Crest Consoles** (Paramus, NJ) appointed two new sales reps: **Hudson Marketing**, whose territory encompasses the New York metropolitan area, and **Fault Line Sales**, representing the company in Northern California and northern Nevada. In related news, Crest Consoles presented sales rep of the year awards to **Warman Marketing**, **W3 Marketing** and **Northcoast Marketing**...Wilmington, MA-based **Polydax Speaker Corporation**, a subsidiary of Audax Industries in France, officially changed its name to **Audax of America**. The company retains its previous address and phone numbers...Greenbrae, CA-based **Furman Sound** hired **Joe Territo** as marketing communications specialist and appointed three new reps: **DiModica and Associates** in Florida; **The T.K. Group** in the Rocky Mountain states; and **Pacific Audio Group** added Arizona to its area...The **Electro-Voice Inc.** manufacturing facility in Sevierville, TN, was recently awarded ISO 9002 certification, becoming one of the first U.S. pro audio facilities to attain the prestigious quality classification...The **Electronic Industries Association** and **Consumer Electronics Group** moved its headquarters to 2500 Wilson Blvd., Arlington, VA 22201-3834. Phone (703) 907-7600; fax (703) 907-7601...**Charles Van Horn** was elected executive vice president of the **ITA**...**Kevin Meuse** joined the **Ferrofluidics** (Nashua, NH) FerroSound team as audio products laboratory technician...**Menlo Scientific Acoustics** recently relocated. The new mailing address is P.O. Box 1610, Topanga, CA 90290-1610. Phone (310) 455-2221; fax (310) 455-0923...**Emory Straus** was named consultant/contractor liaison for **BEC Technologies Inc.** (Orlando, FL)...**Dr. Wolfgang Ahnert** will join Don Davis and Pat Brown of **Synergistic Audio Concepts** for a three-day sound engineering seminar in Indianapolis on April 26-28, prior to the NSCA show. Syn-Aud-Con also announced a workshop on the theory and design of high-performance professional loudspeakers, to be held June 22-24 in Nashville. Call (812) 995-8212 for more information...Beginning in fall '95, **University of Massachusetts, Lowell**, will be offering two new Sound Recording Technology graduate programs—Master of Management Science degree in SRT, and a Graduate Certificate program in SRT. Call (508) 934-3850 for more information. ■

—FROM PAGE 12, CURRENT

on the market by the fall.

CONVENTION NEWS

More than 1,000 exhibitors are expected at the National Association of Broadcasters convention, April 9-13 in Las Vegas. The convention will feature more than 250 sessions at 11 stand-alone conferences and an exhibit area in excess of ten football fields. NAB '95 will feature its third annual sister conference and exhibition on multimedia technologies, called NAB MultiMedia World, cosponsored by the Interactive Multimedia Association. Call (202) 429-5350 for more information.

The National Systems Contractors Association conference and expo will take place April 30-May 2 at the Indianapolis Convention Center. As part of the pre-expo educational program, the NSCA is offering a preparation course for NICET Audio Technician Certification. For more information call (708) 598-7070.

The eighth annual International Teleproduction Society forum and exhibition is slated for July 20-23 at the Parc Fifty Five Hotel in San Francisco. Call the ITS at (212) 629-3266 for more information.

CORRECTIONS

In February's "Industry Notes," we printed an incorrect address for the new Sound Associates office. The correct address is 560-F Amsterdam Ave. NE, Atlanta, GA 30306.

Due to a printer's error, two photos in the February "Tour Profile" section were switched: The engineer shown with the Eric Clapton story is actually Lyle Lovett's FOH engineer John Richards, while the engineer shown with the Lovett article is in fact Eric Clapton's FOH engineer Robert Collins.

In the January issue, the photo accompanying our report on the Grammy Recording Forum should have been credited to Jackie West. We regret the errors. ■

Mr. Q. keeps adding new effects to the M5000

The M5000 Digital Audio Mainframe is unlike any other effects processor you have ever seen. By combining TC DARC™ technology with the skills of the best signal processing software engineers around the world, we have created the perfect mix of effects you have access to in the M5000 today.

But what you see is not what you get - you get more! The unique design of the M5000 hardware platform allows for future upgrading of both the software and hardware aspects. It will far outlast any other signal processor you own or can buy today.

Operating the M5000 is a breeze and upgrading it couldn't be simpler. All M5000 owners receive regular, easy to install, software upgrades - featuring the very latest state-of-the-art effects. For example, software release V1.15, our most recent package, includes a comprehensive 4-band Parametric Equalizer, the Digital Taol-box™ option, SMPTE time code patch change and much more! Add to this hardware upgrades like the impressive ATAC Remote Controller and you have a package that is unbeatable.

To some it may look like any other effects processor - but you know better. Call us for a full demonstration 1-800-468-3655 EXT 395

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"Get more done. Make more money. Sleep easier."

I was always fascinated by automation — used to drool at the mega-buck automated consoles at NAMM, AES or elsewhere. But I always passed it off as more envy rather than rational thinking. Sure, automation sounded good — but what would it really do for me? Was it worth the money.

It didn't really hit me till I looked at (and tried) the TASCAM M-3700. First off, the console is priced within reach of most any project studio. That's good. But what it could do — and what it did — really got me. It proved to me that automation is affordable and could help me do more projects and make more money. And, I never have to worry about remembering to log my fader positions and mute points, I can sleep easier at night.

For me, automation isn't a luxury — it's a necessity. We keep track of all of our customers' mixes on disk so we can recall them anytime. Plus, we can provide our customers with multiple mix options — they can A/B test them and make more informed decisions. In the end, they get a product they are more comfortable with because all their "what if" questions have been answered. That means they'll come back.

What makes the M-3700 so affordable is the entire automation system is built into the console. You don't need to dedicate an external computer or other MIDI device to use it. It includes two types of VCA automation. And each is easy to use.

Snapshot automation with 99 scene memory can be set or recalled using keyboard or MIDI program change

Store automated mixes on standard 3½" floppies

Disk drive included at no extra cost

Enter song names or transition times with the DATA ENTRY dial.

MIDI compatible for dynamic real-time fader and mute automation.

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Available in 24 or 32 inputs — Meter bridge optional.

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Impressive Master Section: complete control of AUX sends, Studio and control room monitoring.

First is snapshot automation. At any point during a mix you can take a picture of all fader and mute settings. Think of it as a mixer with a photographic memory. Then there's dynamic automation: real-time recording of your fader and mute movements. Which means if you're fading in and out, bringing up the horns, then vocals and other dynamic movements the console remembers them. Next time, just sit back and listen.

The M-3700 is a great console even without the automation system. But now that I have it — I won't give it up! Until you try an automated console, you'll just keep wondering what it can do for you. Try the M-3700. It comes with all the features you'd expect in a recording console and more. And if you're an automation "power user," JL Cooper's Pro 3700 automation expander works with most any Macintosh computer. You can do more. You can make more money. But you'll need to take the next step to automation and buy the TASCAM M-3700 today. Once you do, you'll sleep easier.

Quality components & rugged design!

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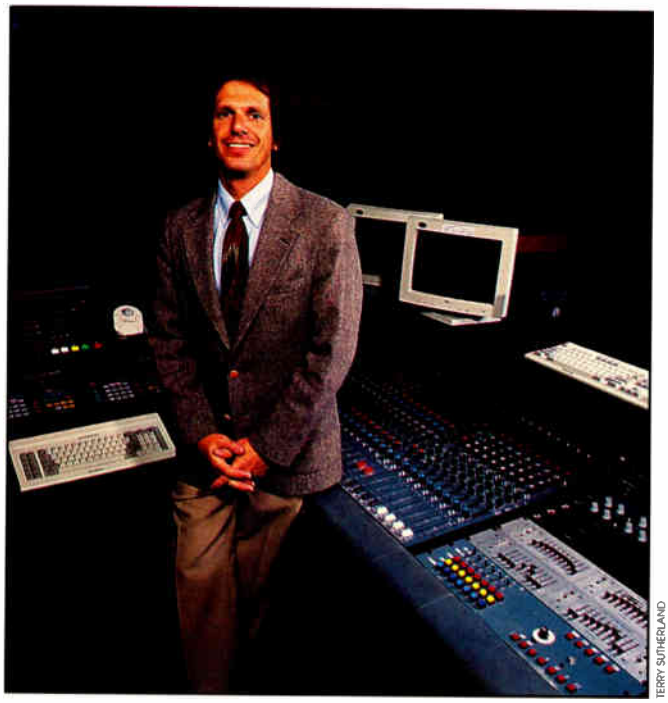
by Steven Corn

SMPTE DRIFT

A CONVERSATION WITH JEREMY HOENACK

SMPTE timecode has been synchronizing the post industry for nearly 20 years. If you stop to think about how much computer technology has advanced since the 1970s, it's remarkable that a standard established so long ago remains relatively unchanged. Originally controlling huge, bulky tape machines, SMPTE code is now used by nearly every format imaginable. Whether used in the new line of hard disk-based systems or in conjunction with the recent 8-track digital multitrack recorders, it functions essentially the same: to synchronize two or more machines to a master time reference, generally a video source.



TERRY SUTHERLAND

Jeremy Hoenack

Regardless of the format, you will have many of the same sync issues and problems. Some of the newer devices may create unique considerations, but the concerns with maintaining sync never really change. Because people who work in facilities that deal with post-production services use many different formats, they are especially aware of the special considerations needed to ensure proper synchronization. [Note: Almost any use of timecode can be considered post-production since you are locking up sound to video. Perhaps the only popular non-post-production use of timecode is when musicians employ virtual synthesizer tracks or need to overdub multiple tracks when recording songs.]

To discuss some of the issues involving timecode use, Jeremy Hoenack volunteered to field some commonly asked questions. Hoenack is the owner and creator of Sound Trax Studios in Burbank, which provides post-production audio services for the film and television industry. Ten years ago, Hoenack was one of the first to enter the hard disk recording scene with the invention of a digital audio editing system called D.A.V.E. (Digital Audio Visual Editor). Using a network of these devices, as well as employing current technologies, Hoenack has built a reputation for providing quality sound editorial and mixing packages for many projects, including *Extreme* (ABC), *Iron Eagle III*, *Time Trax* (TV series), *Tour of Duty* (TV series) and many others.

What is SMPTE drift, and how can you deal with it?

This is when timecode is not synchronous with the frame rate of the film or video. There should be an even mathematical correlation between the SMPTE code and the frame rate. An example of a problem with drift is that from time to time, someone will take an existing videotape and stripe timecode onto it from some timecode generator that is free-running. Since the timecode of the generator is essentially wild, it will not be synchronous with the video itself, i.e., it is not locked to the video. Therefore, the code could be accurate for a while, and then as the video progresses, it

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Tape works – artistically and financially. It's the most cost-effective medium for multitrack music production, and it's easy to work with. Tape isn't going to become obsolete, and neither is your tape machine – analog or digital.

Good reason, then, to come to Studer. We've been making tape machines from the very beginning, and whether you need analog or digital multitrack – or both – we have the highest-return solution.

The new Studer D827 24/48-track DASH recorder (right) sets new standards in digital audio recording – just as its

partner, the A827 (left), offers new levels of quality for analog recording. The Studer D827 digital multitrack offers full field upgradability from 24 to 48-track. With 18-bit converter technology and advanced noise-shaping techniques for the very highest audio quality – in the Studer tradition. There's a unique 24-bit Studer-format recording option – while retaining full compatibility with existing DASH machines. Both analog and digital 827-series machines are always on cue when you need them, thanks to a fast, responsive transport and built-in locator. Enhanced servo control and dynamic tape-handling ensure your masters get the respect they deserve.

With the extended leasing options now available, Studer multitrack recorders are surprisingly affordable. Analog or digital, the Studer 827 series offers the ultimate in sound quality – and the ultimate return on your investment.

Hear Today – Here Tomorrow.

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STARVED FOR LINE INPUTS? FEAST ON

Introducing the ultimate line/keyboard mixer with more inputs than nature ever intended. The new LM-3204 has 16 stereo channels and up to 40 mono inputs. In just 5 rack spaces. Serious input gluttons can add LM-3204E expander units for 80, 120 or even 160 inputs!

The LM-3204 wasn't cooked up by a marketing department. It was designed by keyboard and sequencing nuts who never have enough inputs. It's the line mixer we've always wanted in our own studios.

We cherry-picked the best features from our proven CR-1604 and then blended in new recording and monitoring capabilities. And, even though this is a "line" mixer, we garnished the LM-3204 with two of our highly-respected mic preamps for sampling, voice-overs and single/duo club acts. Yum.

This typically wordy Mackie ad is just a taste of the LM-3204's mega menu of features.

Call tollfree and then digest our brand new 40-page product brochure and Hook-Up Guide. It covers the LM-3204 in delicious detail.

More than just 40 inputs in 5 rack spaces.

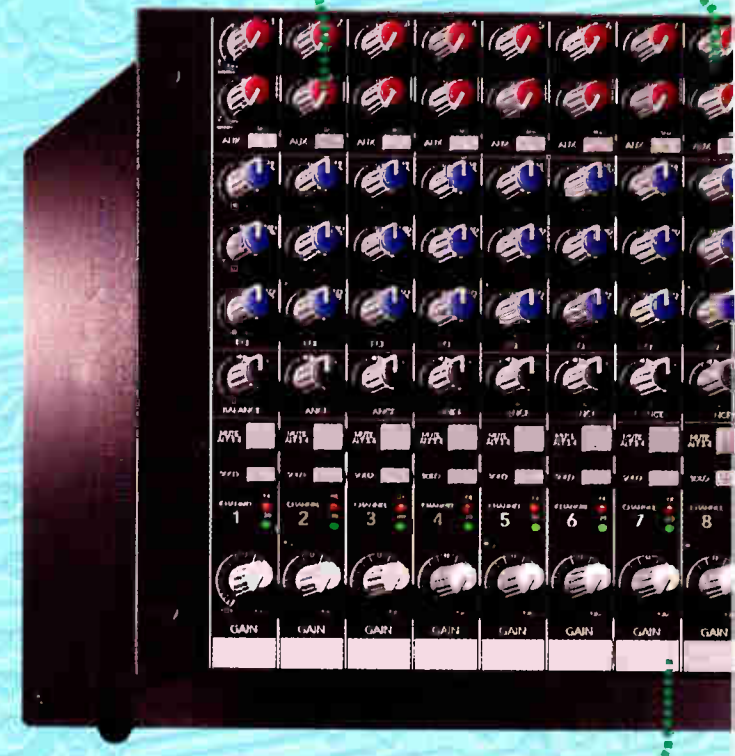
Lots of companies make line mixers[1]. But only our new LM-3204 was built to handle hordes of hot inputs and still have lots of headroom.

The headroom bottleneck in any mixer is the mix amp where signals from all channels are combined. If this circuit overloads, the sound breaks up. (And bringing down the master gain control doesn't help a bit). Product specs can't express a mixer's ability to handle multiple simultaneous inputs. So you find out that you bought a line mixer with poor mix amp headroom only *after* you get it home.

Unless you buy an LM-3204. Its unique mix amp architecture lets you cram sixteen sadistically sizzling stereo inputs into the LM-3204 without getting scratchy garbage at the outputs. Need proof? Consider our CR-1604, MS1202 and 8•Bus consoles. Naturally, the LM-3204 has the same headroom pedigree.

Two mic preamps.

Mackie's mic preamp design has gained a well-deserved reputation among seasoned recording engineers — several even use a CR-1604 or MS1202's preamps instead of those on their ultra-expensive main console[2]. So we added two mic preamps (with phantom power and input trim controls) to the LM-3204. Both preamps can be patched to any of the 16 channels via standard 1/4" phone cords. Perfect for project studio sampling, live sounds orsmall lounge acts.



Signal present LEDs on every channel.

To some, –20dB "blinkies" may seem like a minor feature. To those who work with a mixer day in and day out, it's major cause for celebration.

The LM-3204 features the same "expressive" sensing design that we developed for our 8•Bus console's signal present LEDs. One famous engineer says he can practically run his board based on the behavior of our ultra-responsive LED blinkies.

Monitoring made easy.

By popular request (and our own experience), the LM-3204 has a Tape Monitor switch plus separate Control Room and Phone

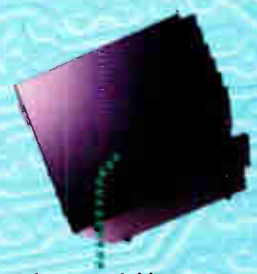
[1] In fact, we were so late in shipping the LM-3204 (what else is new?) that one of our competitors came out with *their* version before we could release the original!

[2] Actually, we can go one better than that. What does Neumann use at trade shows to demo their finest microphones? A Mackie compact mixer with the same mic preamps as the LM-3204.

THE LM-3204.

3-band EQ, *80Hz, 2.5k and 12khz just like our famous CR-1604.*

2 new Secret Buttons *add mixing & monitoring flexibility (see below).*



Stereo AUX Return 3

Source Alt 3/4 button routes ALT 3/4 into Aux Return 3

Aux return 4

Aux Return 4 to Control Room button does just what its name indicates

Solo level control

Some of the 13-LED level indicators

Headphone level control (extra-beefy amp with lots of gain)

Headphone jack

Balance controls (these are stereo channels)

Tape monitor button

Mute/ALT 3-4 buttons

Stereo in-place Solo buttons

Rotary gain controls for each channel

45mm master L/R level faders

Separate CONTROL ROOM fader (independent of the headphone output)

monitoring outputs with their own level controls. For added convenience, we made the Control Room volume adjustment a 45mm fader instead of a rotary knob.

Both Phones and Control Room monitor the main left and right buses. If you press the Tape Monitor button, you hear the output of your tape recorder[3] (or other source plugged into the Tape In jacks). Or monitor the solo bus when any channel's Solo switch is pushed (this also overrides Tape Monitor).

LM-3204 Aux Return Bonus Switches.

Naturally the LM-3204 has our trademark ALT 3/4 extra stereo bus. It also has a special aux return circuit that lets you get even more mileage out of ALT 3/4. Normally, AUX Return 3 is just that: an aux return. But press the SOURCE ALT 3/4 button and the outputs of the ALT 3/4 bus are routed into the Aux Return 3 control and circuitry. This lets you use ALT 3/4 as a pair of submix buses...and then mix 'em back into the main L/R buses.

AUX 4 also has it own trick circuit. If we tell you that it's called the AUX RETURN TO CONTROL ROOM ONLY switch, can you guess what it does? Correct! You win a year's supply of designer earthtone patch cords.

When AUX RETURN TO CONTROL ROOM ONLY is engaged, AUX Return 4 is disconnected from the main left and right buses. It's reconnected to the Control Room Monitor and Headphone circuits. Now you can "wet monitor"[4] or play along to a cue or click feed without having it go onto tape.

[3] Speaking of taping, the LM-3204 has electronically-balanced main outputs capable of driving either –10dBV or +4dBu recorders, 1/4" TS Tape In jacks and unbalanced "RCA"-type Tape In and Tape Out sockets.

Instantly expandable.

When 16 stereo channels aren't enough, add an LM-3204E *Expander*. It's basically an LM-3204 without the master section. It connects in seconds via ribbon cable to provide 40 more inputs. And you can daisy chain two or three LM-34204Es without headroom or noise penalties.

Already making a name for itself among the pros.

It hasn't been out for long, but the LM-3204 is already distinguishing itself by the company it keeps. All the members of *Boyz II Men* are currently using LM-3204s in their project studios. *Saturday Night Live* band drummer Shawn Pelton submixes with one. Keyboard supertechs Terry Lawless (*Madonna, Paula Abdul*) and Russ Achzet (*Moody Blues, Chicago, Jimmy Buffet*) swear by their LM-3204s. Electronic percussion wizard Pat Mastellotto uses an LM-3204 on *King Crimson*'s world tour (he recently sent us a nice postcard from Paris). We could go on and on and on[5].

The affordable line input mixing solution.

The LM-3204 retails for $995[6]. You can add LM-3204Es for $899[6] each.

At this price, there's no excuse not to have enough line inputs. For effects or instrument submixes. As a project studio's mixer. Or for live club performance.

Call us today or visit your nearest Mackie Designs dealer.

[4] *Wet monitoring:* Monitoring with echo or delay but without actually applying the effect to the main left and right outputs.

[5] Indicates use and ownership by individuals but not specific endorsement by the group.

[6] Suggested retail price. Your mileage may vary as part of a balanced diet or when you close cover before striking. Price is higher in Canada.

MACKIE.

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will "drift" out of sync. By the end of a reel (i.e., 10 minutes of program), you could be off anywhere from several frames to several seconds. There is another problem with timecode in that sometimes it is synchronous, but the boundaries are not lined up correctly.

What do you mean by "boundaries"?

Well, the video obviously has clear delineations of its frames. You can see exactly where one frame ends and one frame begins; you can consider the boundaries of the video frame. In timecode, the 80-bit word also has a beginning and an ending, and it has boundaries, as well. Hopefully, the timecode word's boundary is close to the boundary of the video frame. But if that boundary is right in the middle of the video frame, then which address is it? It would be like if you were on a street and there were two houses. And right on the property line, there was one street address. You wouldn't know which house it belonged to. This "misalignment," if you will, of the boundaries can cause problems.

What causes this drift to occur?

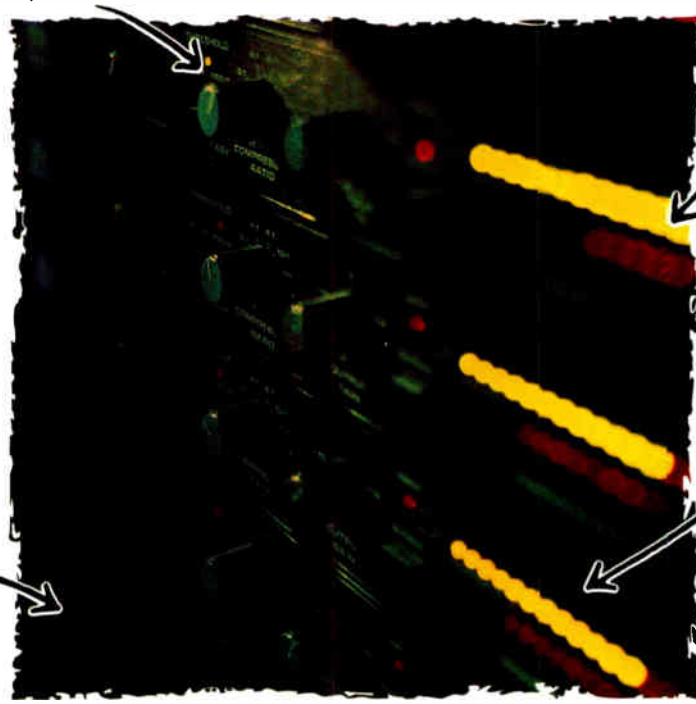
One of the things that causes SMPTE drift is that people make the assumption that since many devices are run under crystal control (e.g., DAT machines, video machines, timecode generators, etc.), they think that they are all very stable. Though the crystals are independently consistent, they are not necessarily all running at exactly the same rate, and they are certainly not in sync with each other.

So one crystal can run at a slightly different speed than another?

Yes, just as one watch can gain five seconds a month and another can gain 15 seconds. Any time that any device is free-running, you have the potential for there being an error due to drift. Even DAT machines and the recent digital multitracks—DA-88s and ADATs—are not to be trusted. We often get ADR or sound dailies that come in on DAT or DA-88 without timecode, and it generally works most of the time. However, if you have a long dialog line or a monolog, you cannot be certain that the end of the line will be in sync with the picture. For short bits of sound, it can be satisfactory, but the sync issue can come into play very quickly. For example, on a dialog line, you would be able to hear a phase-shifting within only a couple of seconds,

"The mark for the highest threshold ever reached without blowing speakers."
CBGBs 1983

"Metering is so visable it drew bugs."
Red Rocks, Colorado 1989



"Easily drove long lines over an acre of land."
Farm Aid, 1986

"A dent from where the thrashers knocked over the rack."
San Francisco, 1992

After 12 Good Years On The Road, We Thought It Was About Time For A Tune-Up.

When the original dbx 160X compressor/limiter was built some 12 years ago, it was built to last. After a slew of tours and out-of-town gigs, we've found that 99% of them are still on the road today. Which isn't bad. But then again, it isn't perfect. (Truth be told, that other 1% wreaked havoc on our egos.) Which is why we've designed the new and improved dbx 160A compressor/limiter. It operates simply and flawlessly to give you the legendary dbx sound by offering superb metering and a choice of hard knee or OverEasy™ compression. It also offers the best output stage for driving long lines. All this is just the right amount of tinkering and tuning to bring the dbx 160A up that extra notch. After all, you shouldn't be the only one on the road giving 100%.

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and you would be able to visibly notice a sync problem in less than a minute.

So if you are able to start two DATs at exactly the same time, they would eventually run out of sync.

Yes, definitely. And the same holds true for any "digital" machine that is not locked to some reference code. With music applications, this is not as significant as far as post-production is concerned. Most of our music is now coming in on either DA-88 or ADAT with timecode. But occasionally, we will get some source or score cues that come in on non-timecoded DATs. Using a prelay system like Pro Tools III, we can assure that the cue will start in the right place, but there is the potential that it will drift slightly by the end of the cue. Luckily, out points on most music cues are not as significant as the in points. The majority of music cues, whether or not it is source music, have some sort of fade on the end. It is only in the case where there is a significant "hit" at the end of a long cue that drift becomes an issue.

But how bad could this drifting be?

A one-hour television show running at 30 fps contains 108,000 frames. This means that, in order to have perfect internal sync, you would need a machine capable of calculating its speed to a precision of six significant digits (remembering your high school math, of course). This is beyond the precision of even the best DAT, DA-88 or ADAT running wild. They will typically have only three significant digits of precision, but even if they had as much as five digits, you could still have a three-second error at the end of an hour show. Since generally a one-frame error is seen as unacceptable (especially in negative cutting), three seconds, or 90 frames, is absurdly inaccurate. This is why you need a house sync or timecode resolver for each device to keep sync over the long haul.

Obviously, drift can be a major problem. How does one deal with it?

You need to make sure that the timecode is literally clocked to the video frame rate. There are many devices that do this clocking. They are generally referred to as timecode generators, and they will read house sync. For example, we just purchased several Pro Tools III systems, which included Digidesign's SMPTE Slave Driver. This device will read house sync and lock up the Pro Tools software so that it is synchronous with the video source. Otherwise, you can tell Pro Tools to begin when it sees a certain timecode number, but then it is off and running under the computer's internal clock. This is not a secure sync situation.

You mentioned "house sync," a common phrase. Could you explain what it means and how it applies to drift?

All professional video equipment needs a video sync signal in order to be locked to a common time reference. This is referred to as house sync, and the most common source is a video black signal, which would then be distributed to all the other machines (e.g., D2, I-inch video, timecode generators, etc.). This would then provide a synchronous reference, and drifting would be eliminated.

It seems that with the advent of computer-based systems like Pro Tools, Avid, Lightworks and D-Vision, you run into the issue of whether or not to trust their internal clocks.

Yes, definitely. People believe that all of these new computer-based systems are more reliable, but they create their own problems, especially the nonlinear visual editing systems. Aside from the issue of trusting the internal clock, a film that is converted to these nonlinear systems for editing requires extensive quality control when cutting negative. We worked on a film called *Redemption* that was edited on one of these systems. We were using an offline output from their editing system while the negative was being cut (a common occurrence to condense a post-production schedule). The cut negative was finished in the middle of our mix, and we switched over from the offline copy to a telecine copy of the cut negative. Well, it simply didn't match. Somewhere down the line, the edit decision list (EDL) was inaccurately assembled, and the wrong film code numbers were given to the sync house. We switched back to the offline copy and finished our mix. The negative was recut, and sync was eventually obtained.

So there are more physical aspects of sync that need to be addressed in addition to digital areas.

Absolutely. Working with the ever-growing digital machines entails closer attention to detail. When we all worked on tape or mag stock, you could see a mistake clearly. Now, everything is just a series of numbers, and it is easier to miss a mistake. While most people would think that computers are eliminating the human element in the equation, they actually create more of a need from a quality-control standpoint.

> All professional audio equipment needs a video sync signal in order to be locked to a common time reference. This is referred to as house sync.

So do you see many changes or any great evolution in the use of timecode?

Actually, not really. There will undoubtedly be refinements. But I believe that the basic use and structure of the timecode reference will continue for many years to come. After all, as I said earlier, there is really only one major function of this code, and that is not going to change. Locking up devices is the same challenge regardless of whether the slave is a ½-inch tape, DAT, DA-88 or 24-track. The only major improvements may lie in the area of software and transports. The reason that the DA-88 chases so quickly (as compared to a 24-track) is that the tape mechanism is much less bulky, and the transport mechanism is, therefore, more durable and efficient. There may be machines coming out that will lock and chase faster, but the actual problems of synchronizing are a long way from radically changing. ■

Steve Corn is director of marketing at Sound Trax Studios; he also composes music for industrials, cable shows, animation and short films.

by Stephen St.Croix

DATA DENSITY

DA DANGEROUS DIGITAL DILEMMA

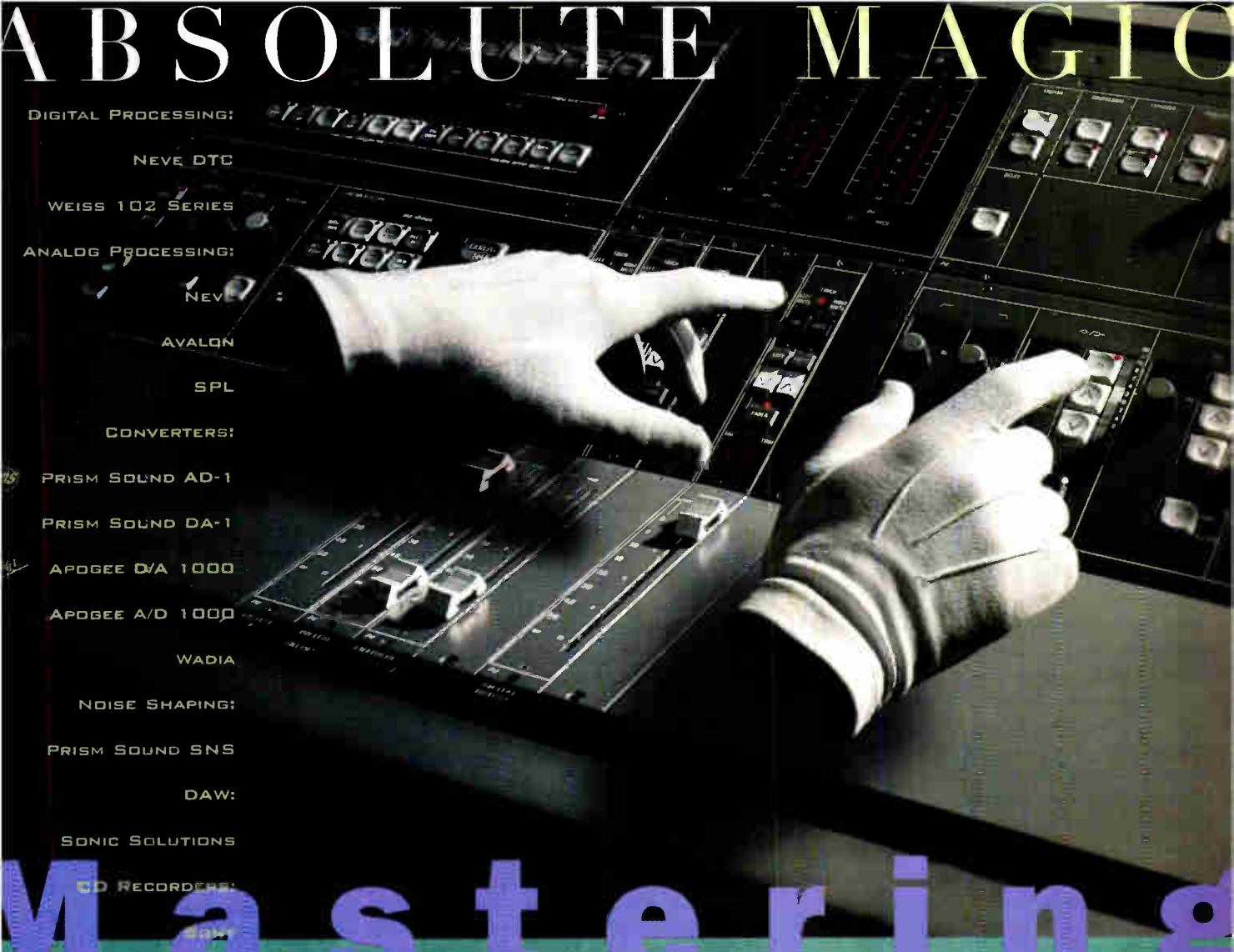
Remember kinescope? The earliest video technology to really be used commercially? Just think, without it we would never have been able to store such classics as Milton Berle, or the famous Johnny Carson show where Ed Ames threw that hatchet dead center into...well, either you remember that one or you don't. Anyway, there was kinescope, in all its wretched, warped, charming splendor, with images that bloomed like tulips in the spring. Actually, since it was TV, I guess it would be Splendor in the Glass. (Sorry, *you* try writing these things every month!) So then the technology improved, and we got our first images that could hold a straight line and not grow 50% when a scene with a little white came along. Then came color and all the little improvements that these major jumps typically get as they buff up. And the same things happened to audio—we've come a long way, maybe. It certainly is quite a path from wire recorders to phase-change optical.

But along the way to our here and now, something happened, and I am not talking about the fact that the Jefferson Airplane became the Jefferson Wheelchair. I am focusing on a trend, an inevitable growth that is at once a blessing and a huge problem.

It used to be that technology grew unbridled, at a rate limited only by our technical forefathers' and foremothers' maximum spawning rate. The Good Ol' Capitalistic Competition Engine guaranteed that we would have new toys, and newer versions of existing toys, at a rate limited only by what was possible in terms of absolute state of the art and human resources. By that terrible serious sentence, I mean the designers were told to make it do more and do it better than the thing that the other guys released last month, and to do it for less. And so they did. Or they became car salesmen. (Come on! Just where did you think car salesmen

ILLUSTRATION: AD McCAULEY

ABSOLUTE MAGIC



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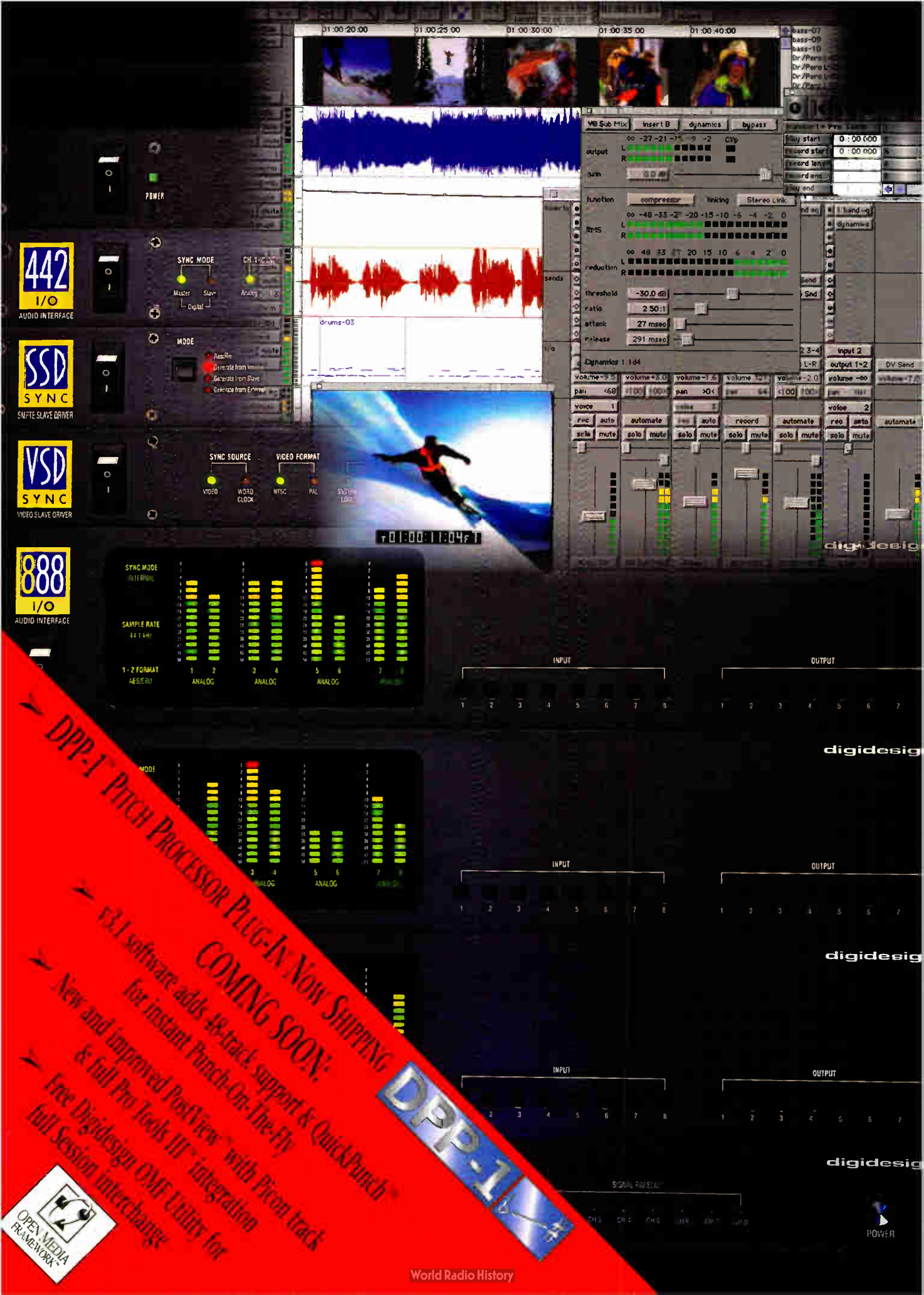

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came from, anyway? I know; you never really stopped to think about it.) What a wonderful and productive time that was. In the technohistory books, it will go down as that naive era when science was driven by equal parts cash and curiosity. But now these trends are in danger, if not already dead, and the new, big, real problem is the data itself. There is just so damned *much* of it! Everybody still wants to improve quality, and we have already developed the technology to do so, but that evil devil, Data Density, has reared its ugly (read/write) head—and has begun to bite.

Higher quality means more data. Lots. And this in turn means more demands on computational speed, transmission bandwidth, and much larger and more compact storage devices and media. More, more, more.

And what is it biting? Holes out of *itself*! Now, after all these years and all the feeble dweeb jokes about the term byte, we come to see that it is the perfect term after all. I propose we move on to the next evolution of the term. As bite changed to byte with the birth of digital, so should byte change to byete (as in goodbye) as we enter the era of destructive compression. As a byte is an 8-bit word, byete would be the 8-bit bite of data removed and lost forever from the datastream by lossy compression schemes.

Higher quality means more data. Not a little more data, either. Lots. And this in turn means more demands on computational speed, transmission bandwidth, and much larger and more compact storage devices and media. More, more, more. And then some more more.

Technology for super-high-density optical storage is here, but since it is literally poisonous, there is a bit of resistance. Please understand that I'm not talking about things getting hung up only because of data standardization—CDs will go 20-bit as soon as the manufacturers are convinced that the public will pay more for it, and not scream *too* loud about having to replace their 500 or so terrible, noisy, scratchy, first-generation, historically interesting, 16-bit, silver aluminum CDs with the new state-of-the-art 20-bit golds. LCD projectors will go up to half-a-million pixels and beyond. Some form of digital HDTV will appear.

I am talking about all of it—the combination of how hard it is to get transmission bandwidth, how hard it is to get 20 real bits on a 5.25-inch CD, how much harder it is to get 450,000 pixels on screen instead of 309,000, or even today's LCD consumer standard of 217,000. Why HDTV changes its definition every 90 days and still never appears on our

—CONTINUED ON PAGE 239

by Philip De Lancie

PACIFIC COAST SOUND WORKS

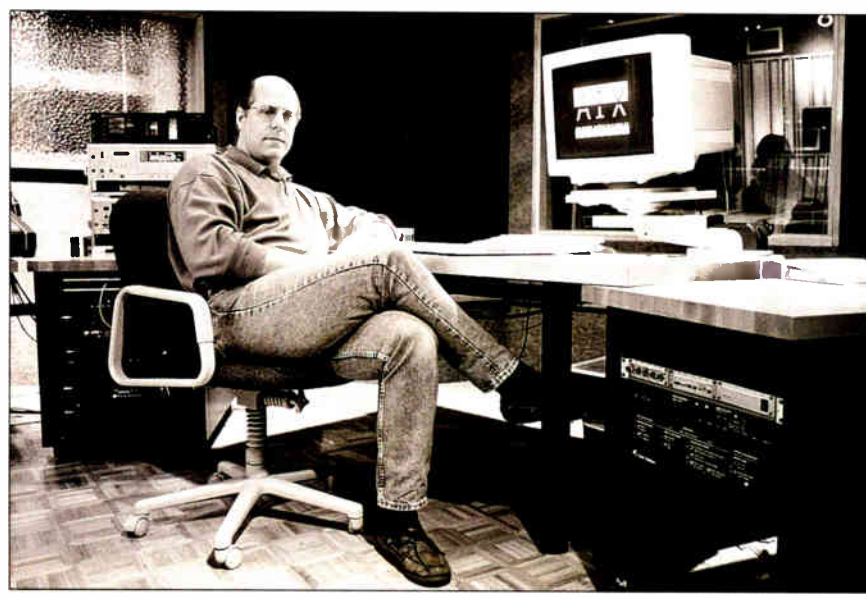
"ANYTHING THAT HAS AUDIO"

The 20th century has often been defined as a time of increasing specialization, with each of us knowing more and more about less and less. But with the much-touted convergence of technology and entertainment, those of us in audio are finding that this old truism doesn't really hold up anymore. These days, the more we learn about a given subject the more paths we find that lead us into related fields. And though some of us stick to our preplanned routes, others follow the side roads into new areas.

Mark Waldrep is one who has followed opportunity and interest into new directions, and in the process, he has built a business that thrives on diversity, crossing the lines between premastering, multimedia, sonic restoration and sound for TV. Waldrep is the founder, president and owner of Pacific Coast Sound Works, a Los Angeles facility he describes as the "Swiss army knife" of audio production. He also recently started the AIX Entertainment label to produce and release music CDs featuring added multimedia material. Waldrep's experience confirms that there is room in today's audio business not only for the specialist but for the renaissance man (or woman), as well.

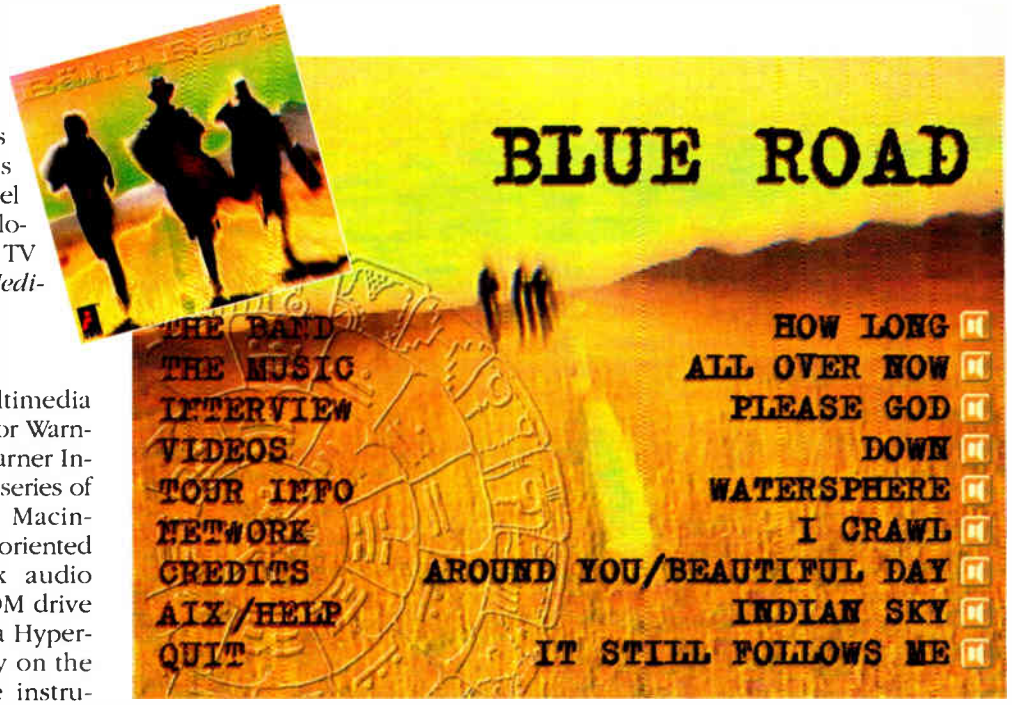
Waldrep started PCSW six years ago in his garage. He was "owner number 20" of Sonic Solutions' Sonic System, which he initially used mostly for complex editing on contemporary classical works. His company has grown to six employees and is equipped with several full-blown Sonic Stations, linked with Sonic's MediaNet. According to Waldrep, PCSW is also the site of the first North American installation of the Sonic Cinema system (see Audio & Multimedia in the February 1994 *Mix*) for preparation of CD-Video (MPEG) titles.

"People ask me what I do," Waldrep says, "and I say 'anything that has audio associated with it.'" His music editing work has expanded



Mark Waldrep, president of Pacific Coast Sound Works and AIX Entertainment

from its original classical base all the way to rap projects for Michael Jackson's new label. PCSW also does NoNoise work for record label clients such as Motown and location recording cleanup for TV shows such as *Dr. Quinn, Medicine Woman.*



***Above, main menu and, below, tune screen of the song "All Over Now" from Bāhu Bāru's i-Trax CD* Blue Road**

AUDIO FOR MULTIMEDIA

PCSW's involvement in multimedia began with Waldrep's work for Warner New Media (now Time Warner Interactive) on the *Audio Notes* series of mixed-mode CD-ROMs for Macintosh. Titles in the classically oriented series combine Red Book audio (playable in either a CD-ROM drive or a CD-Audio player) with a HyperCard "stack" of commentary on the music, explanations of the instruments and orchestration techniques and other information about the composition and the composer (see "Music CD-ROMs" in *Mix*, December '93). Waldrep did the audio recording and editing work on the several hundred audio annotations used as examples on the discs.

Looking back, Waldrep says that a turning point in PCSW's multimedia work came with Time Warner's title on Operation Desert Storm. Rather than the full-fidelity Red Book audio used on the music titles, Warner wanted audio files (AIFF) for playback through end-users' computers (instead of directly from the line-outs of their CD-ROM drives).

"They wanted everything very quickly," he recalls, "because the war was going by." Waldrep did all the processing on individual files using a Sound Tools system. "With a lot of late nights, I managed to get appropriate output using that tool. But it dawned on me, at that point, that to make the process much less painful, we had to come up with some kind of batch-processing or automated procedure to do not only hundreds of files but potentially thousands of files. Not to mention the fact that some of the Sound Tools 8-bit conversion utilities are dreadful in their quality."

Waldrep and a colleague co-wrote a program to handle his needs: "We built some in-house software called Extractor," he explains, "which does DSP processing, dithering, sample rate conversion, file format conversion, automatic file testing, normalizing, truncating, automatic fade-ins and fade-outs. You name it, it's in there. All this stuff can be done to files pulled out of one large file. We can hit a button at night and know that the thing is going to be done in the morning." Waldrep says that Extractor's capabilities "for a long time set us apart from most other audio houses that were stuck using the Digidesign tools."

Using Extractor, PCSW's file preparation process has grown to be an important part of the overall business. "I charge based on the number of files, the length of those files and how far in the process I have to go as far as sample rate or bit resolution conversion," Waldrep says. "It is very cost-effective for the clients to prepare their data in such a way that it is ready to go into Extractor and come out the other end as consistent, ready-to-go files. We start with material on DAT, and we request that it comes in to us with several seconds of digital black between each of the segments." The material on the DAT needs to match a script and a list of file names provided by the client.

Describing the processing chain, Waldrep says, "We pull the stuff in

through a Mac SE-30 running Sound Designer, and out to a large hard drive. And then we run Extractor, which gives you the option to run all the component processing parts. When you hit 'Go,' it will go in and automatically create all the regions in the Sound Designer file." After proofing the result of the extraction for errors, such as sentences that have been mistakenly split in half, the engineer outputs the segments to individual files in a separate folder.

The audio quality of the files depends, of course, on how the Extractor processing parameters are set. "It is a factor of knowing what the realities of playback are on a Macintosh or a Sound Blaster PC card," he explains, "and knowing that it is okay to clip samples or to compress the dynamic range to take most advantage of those 8 bits that you are limited to."

While PCSW doesn't currently use the Sonic System for audio-for-multimedia work, Waldrep says that he is "licensing all the extraction specifications and routines to Sonic to include in their CD-ROM Toolkit, so that most, if not all, of these capabilities will be part of something that should be released by Sonic Solutions as part of the Sonic System."

The productivity made possible by Extractor, Waldrep says, has "resulted in us getting more and more involved in the multimedia side of things. We have worked on all the Time Warner stuff, and developed sort of a service-bureau mentality for Sega, Rocket Science and other big game company people." With audio as a foot in the door, PCSW has expanded into related file preparation, such as Cinepak video compression. "We now have a large contract to do full-length motion pictures for CD-ROM," Waldrep says. "*Terminator* is the first one we are doing. We will be doing four movies a month, hopefully, for Image Entertainment." The titles will play 320x240 video at 20 frames per second off of a double-speed CD-ROM drive, with 22kHz/8-bit stereo audio.

Live performance screen from Civilization's i-Trax EP

Comparing multimedia and premastering, Waldrep says: "Multimedia is a very different sensibility than premastering, where you sit in the main room with critical monitors, using the Sonic and other gear to optimize levels and EQ for making records happen. The premastering clients want to be around. It is the last shot they get at their product before sending it out for posterity."

In multimedia, Waldrep says, "most of the time the clients don't come in. Somebody sends me a tape and a log and asks me to please convert the tape to 22kHz .WAV files and make it sound great. So it really does become sort of that overnight thing: Send me your stuff and pick it up in the morning. There is nothing 'Hollywoody' or interesting about watching somebody convert files."

Tune screen from Civilization's i-Trax EP, with video running in center screen

i-TRAX CDS

Waldrep began to look for new ways to use the multimedia skills of his team about a year ago. "We found ourselves with the ability to do computer graphics—I have a degree in art—in addition to audio, video and authoring," he explains. "So all we needed was to own some content assets to put out some titles. Thus, the morph from the straight service bureau into a label doing for pop artists the same kind of mixed-mode things we started out doing for Warner New Media." The label is AIX Entertainment.

The first fruits of Waldrep's label labors are an EP by the group Civilization and a full-length CD from Bāhu Bāru. The titles combine CD-Audio with multimedia in a format Waldrep calls "i-Trax." The Civilization EP, for instance, includes features such as five full-length videos, five songs, interviews, live concert footage, lyrics and credits. As of this writing, a distribution deal with Navarre is in negotiation.

"The model is not the Bowie, Heart, Peter Gabriel, Prince or Bob Dylan titles," Waldrep explains, "which are primarily CD-ROM products with a featured musical artist associated with them. These are real CDs with great music that give you something extra." By producing the multimedia portion of the discs efficiently, Waldrep is avoiding having to create two products and charge more for the multimedia version. "The record retailers won't have to stock two SKUs, one $10 more than the other because somebody has put this lavish interactive part on. The disks will list at $15.98."

So how can AIX afford to add multimedia features without charging more? "We can do these productions very inexpensively," Waldrep says.

As every performer knows, there are plenty of good musical instruments. But a truly great one is rare indeed. More than mathematically calculated pieces of wood and strings. Such an instrument becomes one with the artist. You know what we mean. So why are we bringing it up? Because now there's a unique piece of electronics that's making performers, producers and engineers feel that very special way. It's the Eventide DSP4000 Ultra-Harmonizer® brand effects processor.

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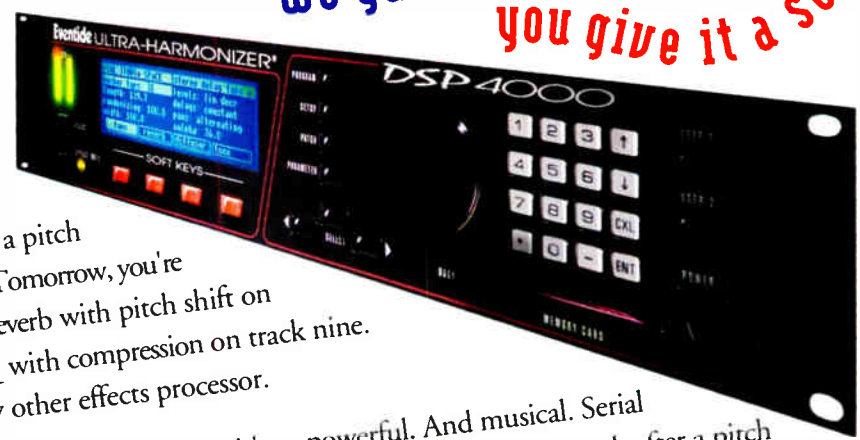

That flexibility is another key to the collaboration that the DSP4000 forms with its owner. The DSP4000 works like you do. Today you're tracking— the DSP4000 is a pitch corrector and subtle de-tuner. Tomorrow, you're mixing — the DSP4000 is a reverb with pitch shift on track one, a parametric EQ with compression on track nine. Try doing all that with any other effects processor.

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While Waldrep's production model may win admiration from the majors, his technical model for combining the audio and data on the disc is raising a few eyebrows. Big players like Sony, Philips, Microsoft and Apple have come out in support of enhancing audio CDs with multimedia using a "stamped multisession" format, which keeps users from inadvertently blasting the data track through their speakers when playing the discs in their CD player. Unfortunately, while Microsoft says all currently sold drives are multisession-capable, only about 60% of the existing installed base of CD-ROM drives can use multisession CDs, and even these drives will require new software drivers.

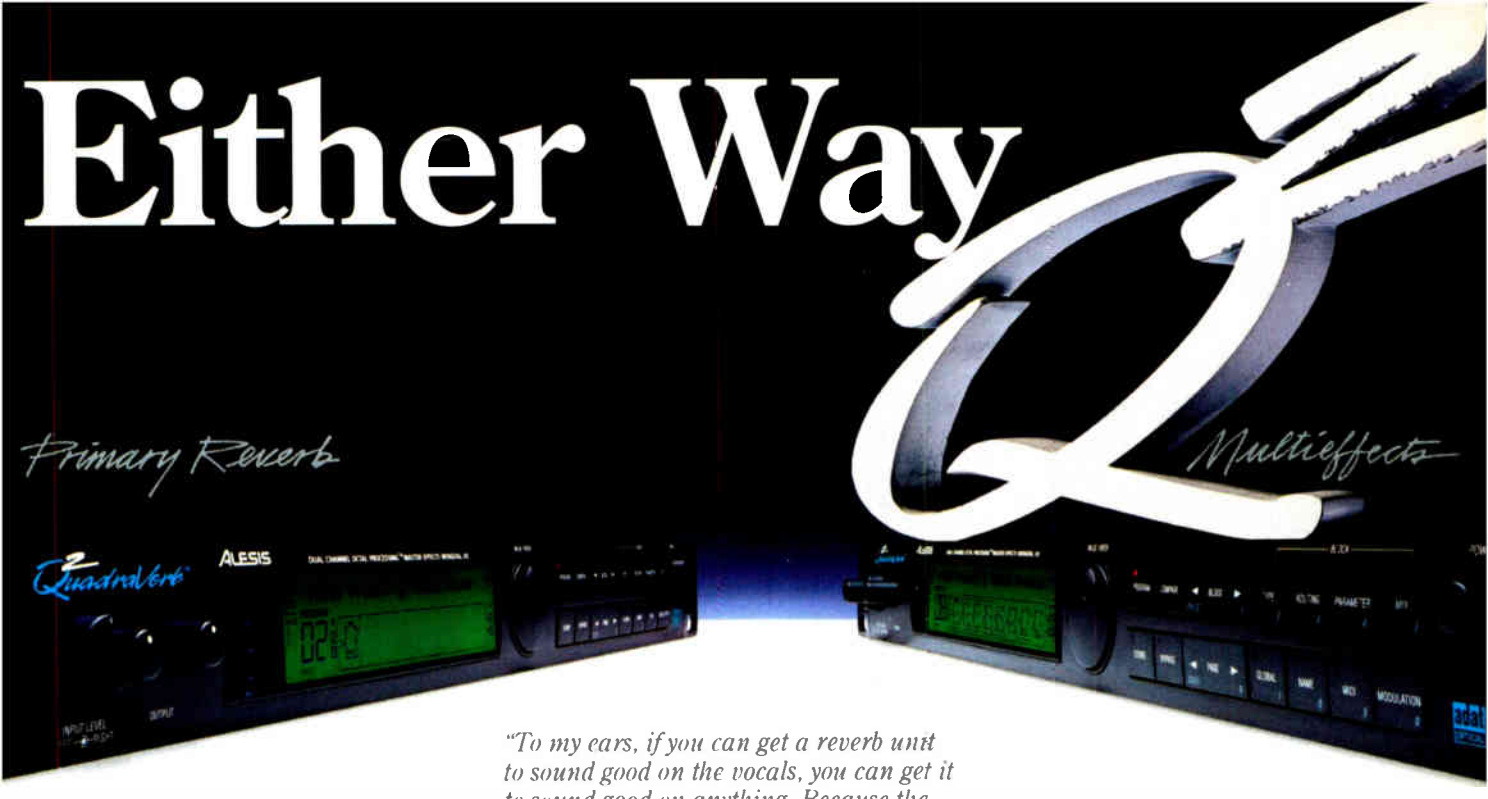
Waldrep is taking a different approach, storing the multimedia data in the "pregap" that precedes the start of track one on an audio CD. This gap is normally two seconds, but can be made as long as needed to store the data. As with the multisession approach, it is not clear that Waldrep's pregap solution will work across the board. "There is not a hundred percent guarantee that all CD-ROM drives will be able to access the data component," he says. "I tried it on a bunch of different CD-ROM drives, and I haven't had it fail yet. But a consumer wouldn't be able to tell until they stick it in their ROM drive and try it."

Pressed for a percentage of CD-ROM drives that could use a pregap disc, Waldrep says, "I am extremely confident that it is far greater than sixty percent, but it is probably somewhat short of ninety-nine percent. I really have no way of 'guesstimating.' If somebody calls up and says they can't play it, I would say that it is an audio CD with an absolutely free enhancement. You are not paying for the multimedia, so I don't think anybody is going to be frustrated enough to take me to task.

"This may be an interim technology," he continues. "It may not be the solution to end all solutions. However, I'm not willing to wait the next six months while the multisession thing gets sorted out, and I believe that the technical frustration associated with the drivers for the numerous different CD-ROM drives will be far more problematic than the occasional person who can't play a mixed-mode disc in the pregap format."

The main concern voiced by major labels over approaches like Waldrep's is that consumers would be able to accidentally scan backward from the start of the music into the data, causing loud, possibly damaging sounds if their systems are turned up. The majors are worried about liability, but Waldrep is unimpressed with their reasoning. i-Trax CDs will have a 2-minute buffer of silence between the data and the start of track one, which he feels is more than sufficient to alleviate any risk. "If somebody scans across the music tracks of a regular CD-Audio," he says, "they will create as much garbage noise as they will by scanning across the data on a mixed-

Either Way



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- Francis Buckley, Independent Engineer: Album, Film and Television

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- Jay Graydon, 2 Time Grammy Winner, Engineer, Producer

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ALESIS STUDIO ELECTRONICS

mode disc. People will never get to the data unless they deliberately try. They would have to hold their finger down for a minute to scan back into the data track."

Regardless of which approach makes more sense technically, Waldrep has no illusions that a small label like AIX can easily buck the Sony/Philips crowd. "I don't think that the industry is going to step on the brakes with multisession, because of the Sony, Philips and Microsoft connection behind it," he says. "They will make their weight known in the marketplace, and the record companies will follow. And I will follow as well. I will be happy to go back and remaster my titles—we are planning to put out two a month—when I know that my customers have overcome the frustration of getting the drivers they need for their setups."

In the meantime, Waldrep's plan to forge ahead with i-Trax has begun to attract some notice. He says he has been contacted about his approach by people from a variety of major labels, and he knows of one major that plans to release a pregap-style multimedia-enhanced CD without waiting for the Sony/Philips multisession standard to be put in place. Waldrep adds, "These are people who have gleaned the fact that this market is going to open up sooner than Sony, Philips and Microsoft can get the ball rolling."

Building on the attention attracted by AIX, Waldrep now hopes to market PCSW's expertise to the record labels to turn out enhanced CDs, which he calls "the CD of the future." The goal, he says, is to "create a situation where we at PCSW are known for this kind of work. I want this place to be known for its creativity, graphic design ability, and abilities with audio, Cinepak and MPEG. I want the record companies to know that AIX Entertainment and PCSW can create product right now that is saleable and viable and can be a preparation for the advent of multisession. We are already in place as an independent developer for those record companies, and we can put the titles out on the shelf for them if they are farsighted enough to see this as a real big market." ■

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

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Digital Multitrack

FORMATS

WEIGHING THE ALTERNATIVES

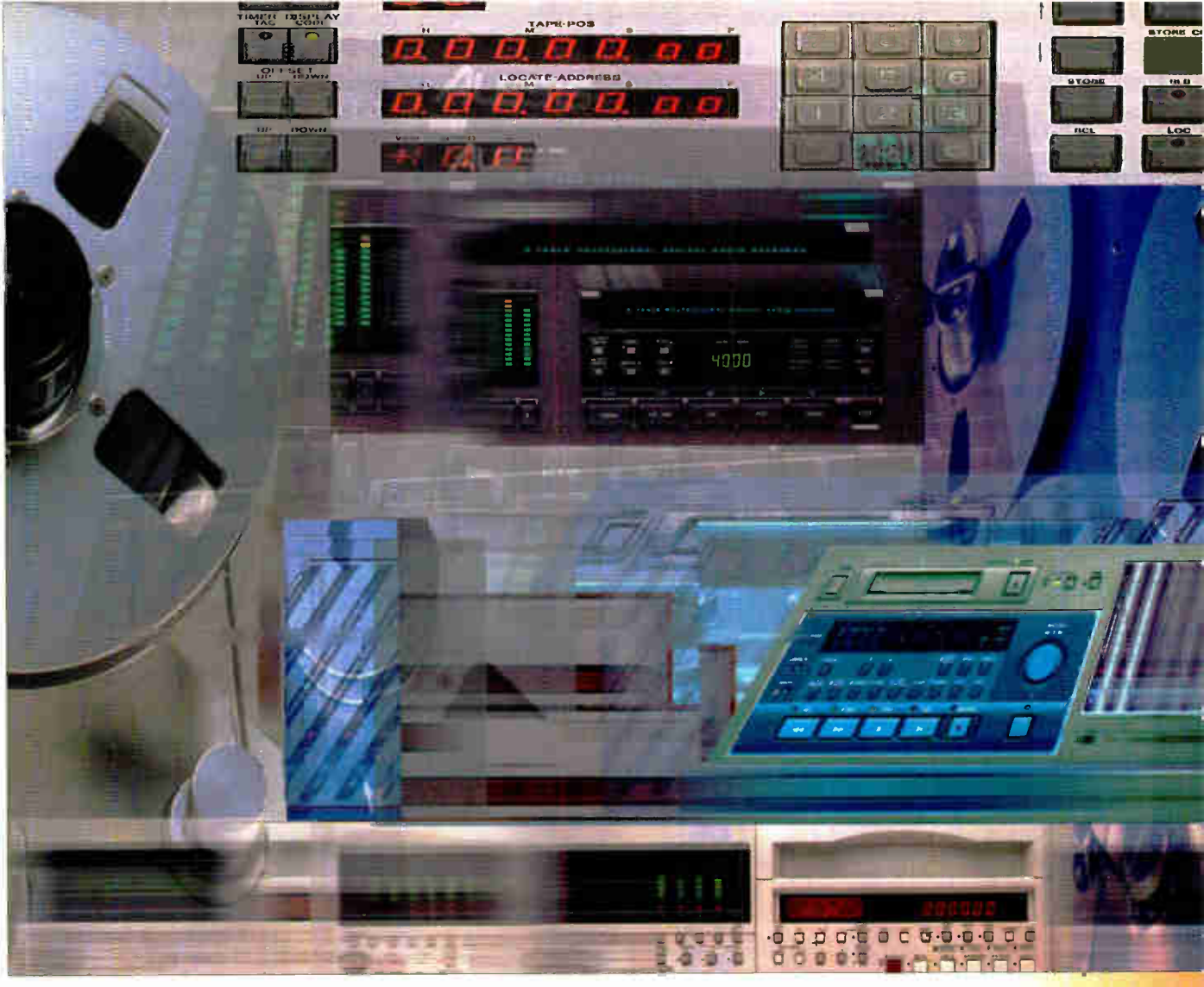
BY GEORGE PETERSEN

Ten years ago, purchasing a digital multitrack was a relatively easy process. The field was essentially limited to either the DASH-format Sony PCM-3324 or Mitsubishi's ProDigi-format X-800 32-track. Hard disk systems were still science fiction, and by 1985, 3M had already discontinued its digital recorder program. Meanwhile, the early Sony and Mitsubishi machines were so expensive that only the elite of the recording community could even consider such a purchase. Everyone else had to wait.

But the situation has changed dramatically. Disk-based recorders are not only affordable but plentiful, with dozens of systems available from manufacturers worldwide. And the digital multitrack tape picture has broadened, with reel-to-reel decks and modular digital multitrack designs bringing digital to the masses. Options abound in 1995, so let's examine some of the choices in tape-based digital systems.

GETTING REEL

Reel-to-reel digital recorders have always represented the upper crust of studio decks, and a large user base of the DASH and ProDigi formats exists in top studios worldwide. All reel-to-reel digital multitracks also include analog tracks for recording SMPTE timecode or cue information. The decision to go—or *not* go—with a reel-to-reel system (Otari, Sony or Studer) may be dictated solely by price. The *least* expensive DASH-format machine, Sony's PCM-3324S 24-track, carries a retail tag of $62,830 for a base unit—*without* options such as remote controllers, digital I/O cards, SMPTE timecode reader/generator/synchronizer and RAM playback for editing/track-bouncing functions.



PHOTOMONTAGE BY TIM GLEASON

The PCM-3324S is compatible with double-density, 48-track DASH recorders, such as Sony's PCM-3348 and Studer's D827 MCH. A session can begin on a 24-track machine and continue on a 48-track deck, where the original tracks play back normally and the 48-track recorder lays down the data for tracks 25-48 in between the first 24 tracks.

Sony has delivered well over 100 of its flagship, 48-track PCM-3348 recorders (introduced in 1988) throughout North America. Features include a multiple ping-pong mode for bouncing up to 48 tracks simultaneously within the machine; built-in SMPTE timecode reader/generator and expanded sample memory—20 seconds of 16-bit stereo audio (or 40 seconds mono), with manual or external source triggering and reverse sample playback. An internal synchronizer handles sample-accurate lockup of multiple PCM-3348s. Also standard is a dedicated electronic edit mode for dual-machine assembly editing in the digital domain. Suggested list price is $252,350, with remote, chase sync and analog/digital I/O.

Studer's D827 MCH can be ordered as a basic 24-track machine and later retrofitted to 48-track operation as budgets allow. The basic machine (24- or 48-track) in the standard configuration is sold without converters (presumably for use with external converters and/or a digital console) and includes onboard SMPTE synchronization (with full editing capabilities), as well as 56-channel MADI and 2-channel AES/EBU interfaces. Options include an A/D converter package that uses advanced noise-shaping techniques to impart many of the benefits of 18-bit conversion for storage on the 16-bit DASH format. The A/D converters are available in groups of eight channels, with and without noise shaping. The D/A converters are also available in 8-channel blocks but do not require noise-shaping circuitry, as the noise shaping is a single-ended process (encode-only), with no decoding necessary. A 48-track

machine retails for $195,000, including autolocator and noise-shaping converters.

Otari's DTR-900-II records 32 tracks on 1-inch tape and is compatible with earlier Otari digital multitracks as well as the (now-discontinued) Mitsubishi X-850 and X-880 PD-format machines. Pro user net pricing is $150,000, including Apogee filters in the A/D and D/A sections and a comprehensive remote. All session data—such as autolocator information and channel setups—can be stored on the tape and loaded into the remote. Also standard are parallel and serial control ports, built-in SMPTE reader/generator, digital overdubbing and ping-pong capabilities, simultaneous recording from digital and analog inputs (if desired) and a transport that resolves to any common time-base reference, such as composite video or line frequency.

WHAT'S NEW IN DAT RECORDERS

by James D'Angelo

When considering digital formats and standards, it seems to be a good occasion to take a peek at the new DAT recorders that have come on the market over the past six months. For the most part, what's new is in features—confidence metering, RAM-based instant start, timecode capabilities and inputs—and on the horizon, look for higher sampling frequencies (already offered by Pioneer) and higher bit resolution.

Panasonic's latest pro DAT machine, the SV-4100, offers instant start and external sync capabilities. Because of its onboard, 8-megabit memory, which holds about five seconds of audio data, the SV-4100 can be used in many applications where conventional DAT recorders cannot. It provides RAM stereo scrubbing so that a user can adjust the Quick Start position with one-frame (30Hz) resolution over a range of 50 frames. Also, without playing the tape itself, the user can monitor the level of stored data to check the start position. The $2,695 unit also provides AES and S/PDIF digital ports and five-mode external sync for use in video post-production and stereo submix recording.

New from Fostex are the D-5 Studio DAT and the D-25 Digital Master Recorder DAT. The D-25 is

a professional studio recorder featuring four-head, read-after-write confidence monitoring, insert editing (punch-in/out), as well as pre- and post-striping of timecode. The unit will chase sync to master timecode, and, with its 16MB onboard RAM, it can provide instant start and RAM scrub functions. Priced at $7,995, the D-25 provides pull-up/down conversions, RS-422 port with VTR emulation and a large fluorescent status display.

The D-5 offers fewer features than the D-25 but provides high-speed subcode information search, three sampling frequencies (32/44.1/48 kHz) and AES/EBU and S/PDIF digital I/O. Priced at $1,495, the D-5 features a four-motor transport, GPI trigger and Q code recording, which can initiate recording directly from CD start codes.

New from Tascam are the DA-30 MkII DAT master recorder and the DA-P1 portable DAT recorder. Designed for the studio, the DA-30 MkII provides three sampling frequencies (48, 44.1 and 32 kHz), a data/shuttle wheel providing bi-directional, variable speed control, and fast program search. The unit also can automatically calibrate itself to accept either +4dBm balanced or -10dBv unbalanced signals and has a front-panel SCMS defeat switch. Retail is $1,499.

Tascam's DA-P1 portable DAT recorder ($1,799) was designed for field recording and features a two-head design, two direct-drive motors, XLR mic/line inputs (with phantom power), RCA ins and outs, onboard mic limiter and 20dB pad, 48/44.1/32 kHz recording and S/PDIF digital I/O (SCMS-free).

Pioneer's D-9601 pro studio DAT recorder allows recording at 96/88.2/48/44.1/32kHz and features balanced XLR inputs/outputs and AES/EBU and S/PDIF I/O. A 20-bit recording option is in the works. For 88.2/96 kHz sampling, the tape speed is doubled, so a 120-minute DAT cassette provides one hour of recording. The double-speed feature can also be used to duplicate regular DATs in half the time. Although unveiled at last year's AES in San Francisco, the D-9601's pricing and availablity has not yet been announced.

Paving new territory in professional portable DAT machines, HHB Communications has released two new models, the PortaDAT PDR1000 ($4,595) and the PortaDAT PDR1000TC, a timecode version priced at $6,995. The non-timecode version has four heads for true confidence metering, a newly developed nickel-metal-hydride rechargeable battery (up to two hours of power), phantom powering, balanced XLR inputs, three sample rates, S/PDIF and AES/EBU digital I/Os, a built-in limiter, internal monitor speaker, and an extensive set of indexing features. The PDR1000TC has all the features of the PDR1000 but can record, generate and reference to timecode in all international standards. ■

MDMS

The modular digital multitrack revolution actually began with the Akai A-DAM and Yamaha DMR8 systems, but both have been discontinued. This leaves the field open to the ADAT (Alesis/Fostex) and the Tascam/Sony DTRS (sometimes referred to as D8) formats. Based on a concept of interlocking up to 16 8-track recorder modules for up to 128 tracks, the modular digital multitrack movement has evolved from a phenomenon to a full-blown revolution, with more than 50,000 MDM units in use worldwide.

Priced at $2,995, the Alesis ADAT is also compatible with the Fostex RD-8 and records more than 40 minutes on a 120-minute S-VHS cassette, going over an hour with a 180-minute tape. At suggested retail, a complete 24-track digital system (three ADATs and a BRC remote controller) costs less than $10,500. Priced at $1,495, the BRC controller adds essential functions—such as multichannel editing, video and/or MIDI synchronization, programmable pre/post-roll, multipoint autolocation, track delays (up to 170 ms), track-bouncing, etc.—that are lacking in the basic ADAT recorder.

—CONTINUED ON PAGE 223

TAPE VS. DISK: TAKING SIDES

Before getting sidetracked into the oft-repeated disk vs. tape debate, a few points need to be made clear: Both tape- and disk-based systems have their strengths and weaknesses. Typically, tape-based systems are better suited to traditional recording settings, such as long-form concert recordings, pop music albums and so on.

Offering random access, with unmatched editing capabilities, near-instantaneous sync to external sources (SMPTE, MIDI, etc.) and the ability to move and slip individual track elements in time, disk-based systems have been welcomed into the broadcast and film production environments, as well as rap and alternative music facilities, where looping and cut/paste functions are essential.

Here are a few other points to consider:

Tape doesn't crash, and tape players/recorders tend to have more longevity than disk-based systems. To illustrate this, I still have libraries of data on 5.25- and 8-inch disks—although disk manufacturers may offer a long-life warranty on the media, it's a moot point if you can't find working hardware.

Tape does not require load-in or load-out time. The tape goes on the recorder, and in a matter of minutes, you can be into a session. To be perfectly fair, more and more disk-based systems are offering removable media options, and as the prices seem to spiral down, the maximum storage density is on the rise.

Tape maintains the advantage in "memory capacity." In choosing a system for multitrack recording of five shows a week during a three-month concert tour, storage and

—CONTINUED ON PAGE 225

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MIX MAGAZINE PRESENTS

SOUND FOR PICTURE

SPRING 1995

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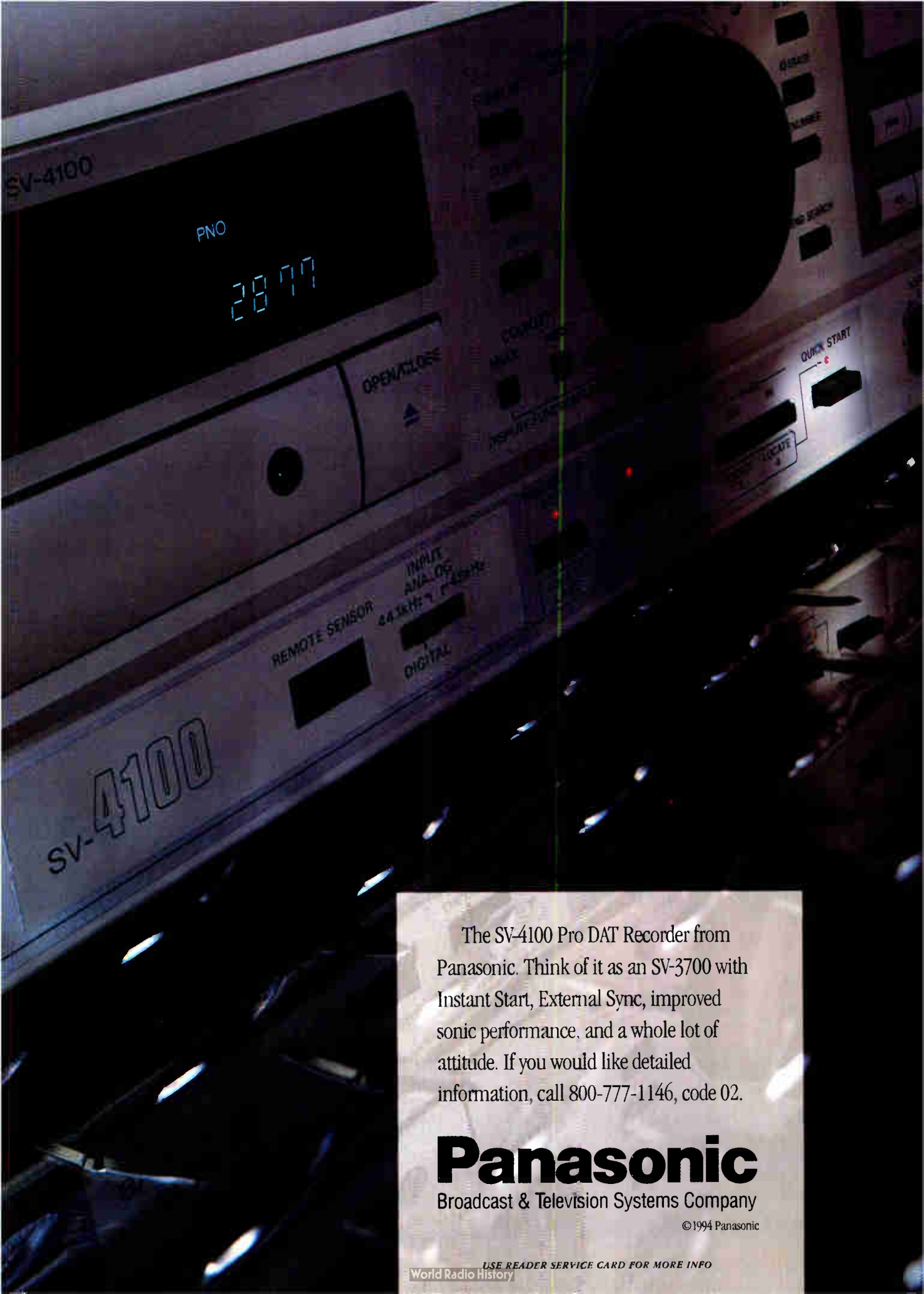

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Sound One

Last year, 60 feature films passed through New York's Sound One. Sixty! That's more than one a week, and they ranged from the big-budget *Interview With a Vampire* to the art-house favorite *Eat, Drink, Man, Woman* to the low-budget media darling *Laws of Gravity*. By contrast, the busiest film house in Los Angeles mixed about 20.

On our Sound for Picture supplement cover is the sprocketless Studio A, featuring a Neve VR60 console with custom VSP panel and Flying Faders automation. To the right is one of the facility's 20 Tascam DA-88s, which have replaced Magna-Tech dubbers in two of the company's six mix stages. (Studio F was completed in March as part of an 18-month, $6-million upgrade.) To the left is one of the company's 17 Sonic Solutions Sonic Systems, which are linked faciltywide through Sonic's MediaNet in the world's largest FDDI network of digital audio workstations. For the recent mix on Robert Altman's *Ready to Wear*, all dialog and effects were played back from the Tascams, while music was fired directly from the Sonic.

The 70,000-square-foot megacomplex (soon to become 79,000 with the addition of the penthouse floor in August) is housed in the historic Brill Building at the corner of 49th and Broadway. Besides the six re-recording stages, Sound One maintains two ADR studios, a Foley studio, three digital editing suites, 85 (!) editing rooms, four transfer rooms, a film-to-tape suite, and virtually any other support service imaginable, including guest office suites. "We do everything," says company president/CEO Jeremy Koch. "We do storage; we run; we deliver; we shine shoes; we'll paint your house. [Laughs] We're basically cottage industry people, not corporate people."

PHOTO: STEVE ELMORE

One of the three digital editing suites at Sound One, featuring a MediaNet-linked Sonic Solutions Sonic System and Tascam DA-88.

The community feel at Sound One has attracted a talented staff, and to keep the talent (and the clients) happy and up-to-date, the company has turned around and made massive investments in technology and comfort. The decision to go with the Sonic Solutions workstations was driven primarily by the network capability ("A sound editor in an edit room can pull an effect, insert it, and fly it into the mix without ever leaving the room," Koch says, "which is essential for the way we work.") and the promise of cost-efficient expansion, as well as the fact that they believed it would still be viable in five years. Still, they don't claim to be technology-leaders, according to chief engineer Mel Zelniker, despite the fact that they had sprocketless stages up and running more than a year ago.

"We would agree with what people are saying about the Tascams being an interim step," Zelniker says, "but it's a nice interim step. It's very cost-efficient, and it came through at the right price at the right time. When the first client came to us with a pile of DA-88 cassettes and a ¾-inch tape and asked, 'Can I mix with these?' we were ready for them. We saw it coming. Magneto-optical technology is not there yet. But just as we can see direct ADR and Foley recording to the workstations, we can also see MO on the horizon, and it's something we have to position ourselves for. But we try to stay one step back from the bleeding edge."

Although Sound One has been in business for 25 years, it's the phenomenal growth of the past ten years that has moved them from a last-place position to a point where they now serve roughly 90% of the New York film mix market. The recently completed expansion and refurbishment has resulted in a 40% revenue increase for the company. Despite their dominance, there seems to be no danger of complacency, with talk about branching into new areas, including long-form television and high-end commercial spots.

"New York is growing," Koch says. "I'm seeing currents moving that could be very interesting for New York. Just look at the February 20 issue of *New York* magazine. People are rediscovering how great New York is to work in and live in. Paramount and Sony have shifted here. Miramax has always been here. The new DreamWorks SKG, with Spielberg, Katzenberg and Geffen...It's a good place to be. The time is right, and we're very happy to be right where we are." ■

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BY TOM KENNY

POST SCRIPT

SOUND FOR FILM

Balancing Film Sound on The Cutting Edge

PART 3

by Larry Blake

This is part three of a four-part column discussing ways in which recent music-recording innovations such as modular digital multitracks and high-quality, low-cost consoles can be used in film and TV post-production.

If it were not for its elaborate monitoring requirements, theatrical film soundtracks could be mixed on standard recording consoles with few modifications. Then you start laundry-listing the litany of film-specific monitoring issues: individually assigning any of 24 recorder channels to any of six speaker channels (LCR, LS, RS, sub); track arming, muting, soloing, and comparing bus/tape on these 24 channels, individually or in groups; monitoring and (sometimes) recording through a cinema studio unit (such as a Dolby DS-4 or DTS Tower). This is not your record mix, nor is it your father's film mix. Less than 10 years ago, top-flight film dubbing console makers assumed that you would be recording three LCRS stems on three 4-track recorders. Trying to do otherwise was a pain in the butt.

As I said last month, the comprehensive monitoring section of consoles such as the Otari Premiere, Harrison PP-10 and Solid State Logic SL5000M is a main part of why they cost so much and why people find that cost justifiable. (Being able to then bill the room out at $1,000-plus per hour doesn't hurt, either.)

I say all of this to make it clear that the mythical re-recording studio that we're building will fall short of your Class-A Hollywood studio in flexibility, but there will be no doubt as to who will come out on top in the Bang for the Bucks department. Your basic equipment complement of eight modular digital multitracks (six for playback, two for recording), two 8-bus consoles (one 32-in, the other 24-in) will cost you less than $50,000, not including patchbays or video or outboard equipment. But, again, we're still coming up short on the monitoring end.

ILLUSTRATION: TIM GLEASON

There are two solutions to this problem, one recommended and more expensive, the other perhaps a bit silly but effective nonetheless. My recommended solution is that you get a 24x6 matrix, either by building one yourself or purchasing one off the shelf. (I know our current setup has only 16 recording channels, but you should not preclude yourself from being able to add another 8-bus console/MDM recorder.) In addition to the basic matrix assignments, your unit will have to have a switchable insert point for a Dolby or DTS unit, mutes for individual speaker channels, and overall dim (-20) and mute. Your main fader level needs to either be indicated in an LED SPL display (i.e., 85 being your normal setting) or on a rugged, detented pot whose 12 o'clock position is 85. (Precise level setting for individual channels should be done with multi-turn trim pots.)

It's important to have metering across the six speaker buses. I like a combination of VU and peak, the former for precise setup, and the latter to tell at a glance what's going on in the mix. Again, you might ask yourself, what with the meters on your consoles and your recorder's meter bridge, why the need for six (or 12) more meters? The answer is that you have to assure yourself of unity gain at every step of the way: a 0 VU, -20dBfs tone from your MDM "dubber" should stay at 0/-20 all the way from

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"Hoop Dreams" Keeps It Raw

by Tom Kenny

Something exciting happens when you enter the Chicagoland gymnasiums in *Hoop Dreams*. The energy picks up, the rock-pep band kicks in, and the crowds explode. The cramped, noisy quarters of the inner-city projects and the hustle-bustle of the playground give way to the rubber-sole squeaks and bleacher-stomping mayhem of the basketball floor—the stage for William Gates and Arthur Agee, the teenage protagonists of Kartemquin Films' award-winning documentary.

Produced by Steve James, Frederick Marx and Peter Gilbert, and directed by James, *Hoop Dreams* follows two Chicago youngsters from their days on the asphalt courts, when they're being actively recruited by city and private high schools, to the time they leave for college. Their dream of playing in the NBA is still there by movie's end, but it's been tempered by the more realistic dream of breaking out of the urban cycle of poverty and unemployment.

The film was originally going to be a 30-minute educational short, focusing on one kid and the role of basketball as an escape from the everday reality of the city. But the story demanded more, and the filmmakers eventually

—CONTINUED ON PAGE SFP 11

PHOTO E. GEORGES/c OURTESY MIRAMAX FILMS

Left: The gritty, inner-city game comes to life in a scene from* Hoop Dreams; *Below: the Zenith Audio Services crew for* Hoop Dreams*—Back row: Clark Hayes, Margaret Marvin, Jim Moore, Cory Coken, and the front row: Rick Coken, Patti Repenn and Chuck Rapp

Sony Goes To the Movies

by Dan Daley

Mike Katz, the chief projectionist at Sony Theatres' new flagship complex near Lincoln Center in Manhattan, is walking through the upper lobby of this opulent and expensive attempt at regaining the glory days of great cinema houses. "Over there was the jazz combo on opening night," he recalls of the evening in late November 1994, when Sony, which acquired the Loews chain of theaters as part of its purchase of Columbia Pictures, threw a bash the likes of which would have seemed appropriate to Errol Flynn

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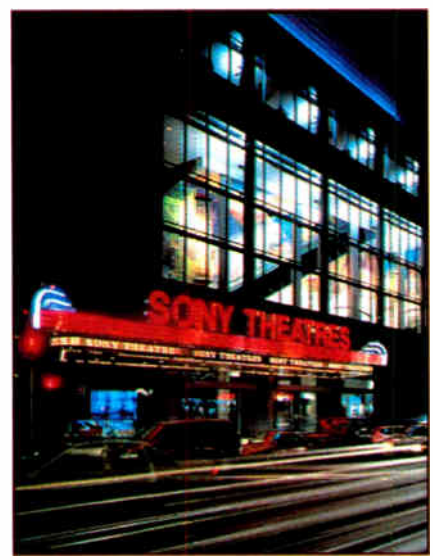
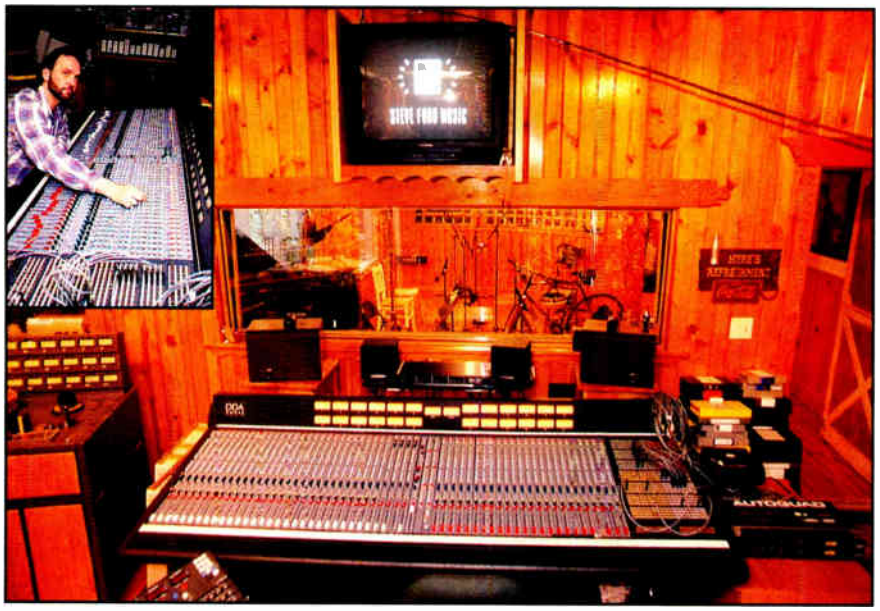


PHOTOS BY MARCO LORENZETTI OF KORA/HEDRICH-BLESSING



FACILITY SPOTLIGHT:

Commercial Chameleon Steve Ford Music

by Tom Kenny

When your commercial music clients are Leo Burnett, DDB Needham, Hal Riney and the rest of the agencies that drive the advertising market, you have to know when to adopt the button-down approach and when to let the eccentricity fly. It's a balancing game, and a facility has to be aware that what works for Hallmark Hall of Fame doesn't necessarily work for Reebok. That applies not only to the music tracks, but to the comfort level provided facility-wide—from the receptionist, to the second, to the mixer.

At Steve Ford Music in Chicago, located on Clark Street near the heart of the agency district, there's a real sense of professionalism coupled with a slightly off-kilter sense of humor. It's evident in their newsletter, which features the Adventures of Lynn the Mannequin, and it comes across in their reel, which depicts, among others, a series of wacky product-demo spots for Cheer detergent (where ironic music plays a key role), lively spots for Reebok, and a touching, storylike spot for Hallmark.

Steve Ford first opened shop in a live/work loft in 1985, after a stint as an advertising copywriter. At the time, he had a mic, a Tascam 80-8 8-track, a piano, a couple of synths and a video player. He would compose the music at home (after unplugging the phone and dealing with dirty laundry), then go to facilities such as Chicago Recording Co. and River North to record.

Sometimes, Ford would go north to Evanston and record at Studio Media, where he worked with Sam Fishkin, a staff engineer who was making the transition to independent. Fishkin sometimes helped out back at the loft, and when Ford decided to move to Clark Street in 1989, he enlisted Fishkin's help in picking out equipment and designing the space.

"The original room has been dubbed The Lodge," Fishkin says. "We had a complete teardown and buildup within this new loft space—double walls, lots of glass block, even a curved glass-block wall between the studio and the lobby. There's wainscotting all around the interior, and the control room has a mantel and a fireplace. The front wall is lacquered with bullett shellack, so it's really in the tradition of a Wisconsin lodge. There are wood carvings of fish above the doorways, a moose head above the mantel. I bought Steve a long fishing pole that dangles from the TV to the doorway. The whole ambience is Steve's look. It's very comfortable."

Decor plays an important role in commercial music houses: Composers and clients have to be comfortable. In light of any acoustic anomalies, reference monitoring becomes increasingly important. "This is advertising music, so it never gets played on a 15-inch woofer anywhere in the world," Fishkin says. "We're using bookshelf-sized B&W 805Hs. I started Steve with B&W 560s, speakers that I really loved and had done a number of mixes on. Then I heard these new 805s—the old, famous 800 Series that Abbey Road uses and the mastering guys use, based on that tweeter with a little R2D2 nodule on top and a bookshelf-size Kevlar woofer. These speakers are fantastic, but I don't know anyone else in America who's using them. They're completely musical, and they rock."

The console in The Lodge was a DDA DMR-12, 44-input in a 56-input frame, but that's been moved to the second room and replaced with a fully loaded 56-input DMR-12 with four extra stereo modules. The original JH-16 24-track has also been moved to the second room and replaced with a "hot-rodded" JH-24.

"The DDA is what we call a 'splint' console, or a hybrid split and in-line board," Fishkin explains. "It's a split design, but since it's a double-line input—you can use auxes 7 and 8 as either a flip of the other or as an effects return. The left and right EQs are identical. We use the left-hand side as either synth or mic inputs, and the right-hand side as our 24-track monitor and mix half. That allows us to be building a mix on the right side as we're still recording. Or when we're building the mix on the right side and we have to throw something on tape, we don't have to change our status if we have to reprint a synth. It's very much like film work, and we still assemble things from the ground up, piece by piece."

The second room, The Cabin, opened in January 1994 with essentially the same equipment package, including the keyboard and synth module credenzas (custom-built by OmniCraft). Both rooms run SampleCell and Opcode's StudioVision Pro A12-track Sonic Solutions Sonic System rolls between the two. The Cabin was built to accommodate the three staff composers but quickly turned into a mix suite. A writing room is in the works.

Ford is not a "tech guy"; he composes at the piano. The other two writers, P.J. Hanke and Steve Mullen, build more on the computer than Ford, but the whole design and approach are geared so that technology does not get in the way of the creative process. Commercial music houses can be flavor-of-the-month, and Ford feels fortunate that he's had some of the same clients since the late '80s, especially in this age of bud-

—CONTINUED ON PAGE SFP 11

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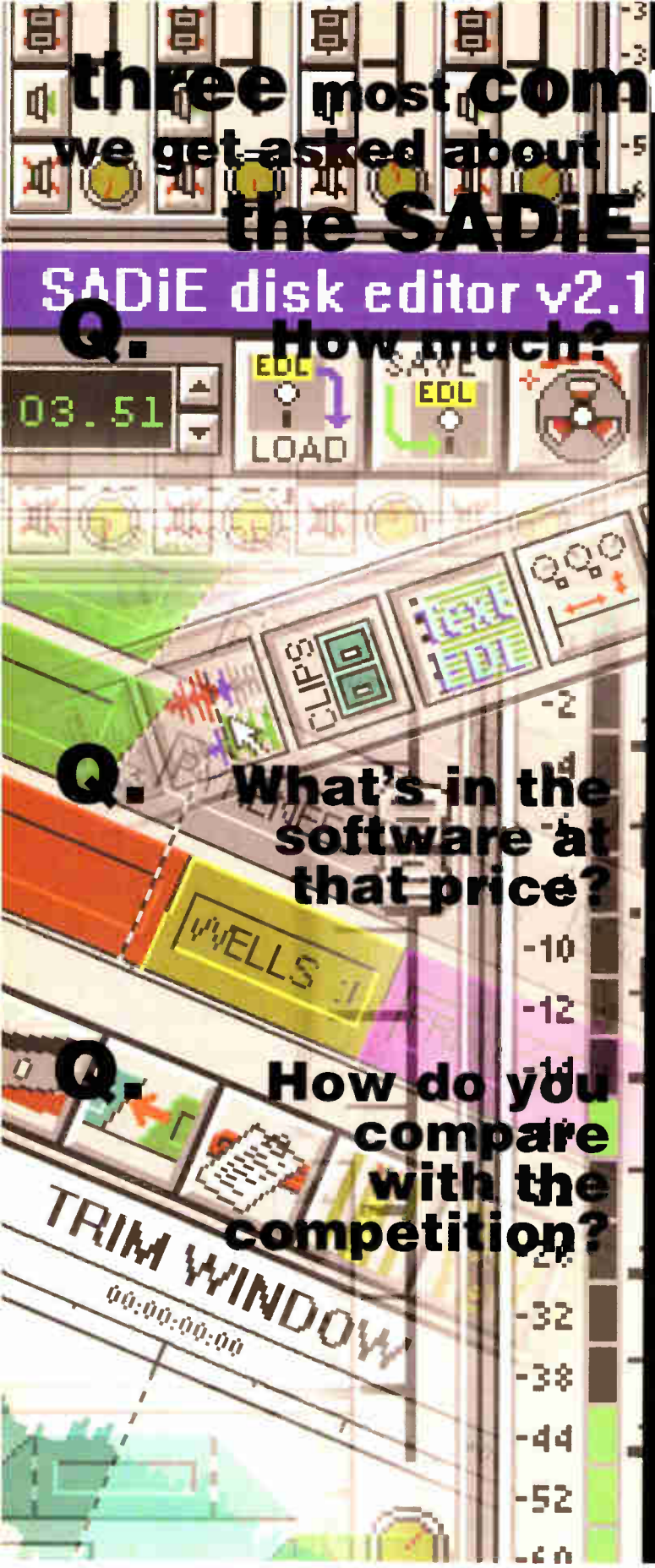

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—FROM PAGE SFP 8, STEVE FORD MUSIC

get-cutting and ever-tighter deadlines.

"The commercial market in Chicago has changed over the past nine years," Ford says. "Fortunately, we have work year-round because Chicago isn't based on one type of advertising, like cars or fashion. Chicago is heavy on packaged goods, and they advertise all the time. But I think there's more fear in corporate America in general, which has trickled down from the clients to the agencies. And they're more cautious now. From my end, budgets aren't as loose as they once were. And on a demo, you have to get as much down as you can to show where you're going—you can't just do a piano track anymore. It's just like an editing room: They expect to see the whole thing, and they expect to hear the whole thing.

"Also, deadlines are much tighter now. It's not unusual for me to get a call where they ask, 'What are you doing this afternoon?' Basically, asking if I can do a track on the fly. And much of what we do is overnight, including orchestral work. You have to conceive it, run it by the client, book the players, so on and so forth. There's a lot of late nights in the commercial music world." ■

—FROM PAGE SFP 6, SOUND FOR FILM

console input to console output to recorder input to recorder ouput (with your remote in the "input" position) to monitor matrix input to cinema processor input to cinema processor output to monitor matrix output. The levels (from "recorder output" point forward) shouldn't change when playing the same tone from your recorder (remote now switched to "tape").

The silly, simple solution would be to get another 24-input, 8-bus board for monitoring only. Once you find unity gain on each of the 16 recorder outputs and each of the six speaker sends (console outputs), tape all the faders down! While you will be giving up a modicum of flexibility, you will be able to get up to speed very quickly and cheaply.

Last month, I jumped directly to the final mix because finals are the *sine qua non* of a modern film or TV mix—you have to end up with a master that comprises separate dialog, music, and effects stems. Getting there is another issue. Premixing, which can be defined as making a mix of original, edited tracks prior to the final mix, is necessary either when the number of cut tracks exceeds the number of board inputs or when material is complicated. Busy sound effects films will have up to 400 individual 35mm units (some mono, some stereo) per reel, which need to end up as a 4- or 6-track sound effects stem.

On the other hand, while dialog and ADR will rarely take up more than, say, 24 tracks, sometimes the most complicated and tricky parts of a film mix can involve making a handful of dialog and ADR tracks match in a seamless flow. In these instances, premixing is highly recommended because you will be able to focus on the overall balance of dialog, music and sound effects during the final mix without diluting your attention and energies with niggling, elaborate and nerve-wracking fader/EQ moves. Having made the macro decisions during premixing enables you to actually enjoy a final mix and its broader strokes.

The classic problem with premixing is that you commit yourself, reducing your options in the final mix. There are simple solutions here. First, never tie together all of your BGs in one premix. You can be sure that at some point, the director will want you to "lower the crickets" while keeping the wind where it is. Or lower the obnoxious buzz in the industrial BG while raising the drone.

I usually have one full-blown BG premix LCRS (or with stereo surrounds, as the case may be) and a second LR pair with which to split potentially troublesome material off. Apply the same philosophy if you are premixing hard effects: Don't have just one FX predub. And while I would generally advise premixing dialog if you have the time, you should try to keep adjacent lines checkerboarded and split to give you greater control during the final. Another tip: I generally lower the monitor when premixing BGs so I will print them hotter; their ultimate level is often so low that there is no VU meter deflection, and you want to have something besides thermal noise at finals.

In part four next month, I will wrap up this series, discussing the crucial last step of print mastering in all its forms, including the need (or lack thereof) of 35mm mag film. As always, please send your comments directly to PO Box 24609, New Orleans, LA 70184, fax (504) 488-5139, or via the Internet: swelltone@aol.com. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although a taste of the pecan waffles at the Camellia Grill would be a good start.

—FROM PAGE SFP 7, HOOP DREAMS

wound up with more than 250 hours of footage, which they edited into a tight two-and-a-half hours for the educational and home video markets. When it won the Grand Jury Prize at the 1994 Sundance Festival, Kartemquin picked up theatrical distribution. And one year later, Siskel and Ebert called it the best movie of 1994.

The filmmaking is so rich and absorbing that it's easy to forget *Hoop Dreams* is a relatively low-budget documentary—recorded with a mono Nagra and often shot with a single camera. In the bump up to a theatrical version, audio played a significant role.

"Their first intention was a release primarily for the educational and social market, not necessarily the theater," explains Ric Coken, president of Zenith Audio Services in Chicago and chief re-recording mixer. "Our first approach was pretty much for video release. It was a stereo track without very much stereo because of the realism they wanted—they wanted to lean as much on the location track as possible and not try to re-create reality. So when we were working on the video version, we were attempting to employ enough dynamic range to get the excitement of the games. But when you're dealing with video, your dynamic range is limited.

"At one point during the video mix, I turned to the filmmakers and said, 'Guys, if this ever goes theatrical, instead of just using dynamic range, we can do so much more by adding space to it, which means stereo and surround.' So I took a couple of minutes to throw ideas at them in the middle of the mix. I kicked a bit of the crowds into the surrounds without the tracks really laid out properly, and it just brought so much more life to it. We started talking about using the surrounds to

draw this contrast between everyday life and the games that they really wanted. Dynamic range wasn't enough. Score wasn't the answer because it would take us out of the reality. And sure enough, when they got the theatrical release, they came back to do it right. Very impressive. My hat's off to them. A lot of people are just ready to move on to the next project, but they were committed to this, and we actually went back into the original takes to pull more sound."

According to Coken, the filmmakers didn't want it to sound "Hollywood." They didn't want pristine recordings because they felt that would detract from the story. The editors at Zenith did use their four Sonic Systems to clean up what Coken called "distractions" in the production tracks, but they didn't spend a lot of time with NoNoise, which was as much a creative decision as it was a budgetary consideration. They did, however, use audio in a rather unconventional way.

"We weren't trying to create a fake stereo as much as we were trying to use the two tracks," Coken explains. "Instead of a left-right scenario, I could put an audience on one side of the room and an audience on the other, and I could put one behind me. So instead of location stereo, I have multiple monos. The second step was that we wanted to feel like we were in their environments. When we went to these ballgames, it was big to these kids, so we went with the multiple-mono scenario and the surrounds. In a couple of cases we used the B.A.S.E. spatial enhancer across the front so we could take the room and say, 'Here's how the kids feel.' They go from this noisy environment at home to what is to them literally bigger than life. The producers wanted to maintain the narrow scope of the track for the darkness we were trying to create in their daily environments. Then, when we hit the games, they wanted to just open the room. It was such a radical use—if you go from mono to stereo, mono to stereo, your room is just imploding on you all the time. And that was the effect they wanted. It was just the opposite of what we always go out of our way to create. We wanted the room to explode big and then implode when we go back into the apartments. It was a gas to do because you spend so much of your life avoiding that scenario, to really be able to lean on it was a rush. And the sound editors did a great job of taking the location sounds and ID'ing the right games and the right-size crowds."

The emphasis on raw reality meant nearly complete reliance on the production tracks for backgrounds. There was no ADR, obviously, no loop groups, and no background walla for the high school hallway scenes. They didn't go into the Cabrini Green projects and get street noise, nor did they go out and record "clean" basketball crowds. With 250 hours in the field, the audio was there; it just had to be found.

"The door guards," Coken says. "When the kids enter the schools in the morning, they have to pass these guards, and we had to get that texture, where we hear what they're saying while not losing the chaotic-

ness of it all. There's so much texture that I wouldn't have wanted to create it from scratch. I found one track where he's reasonably clean, but it doesn't have enough of the chaotic hallway. So we said, 'Let's not go into the library and pick up locker slams and general walla. Let's not bring a loop group in. These guys covered everything. It's out there somewhere. Let's go find it.'

"Sometimes we as editors and mixers get so hung up on re-creating everything perfectly that we actually destroy the reality of an environment," Coken says in summation. "Sometimes we forget that the rawness of a sound enhances the feeling we want to give the viewer." ■

—FROM PAGE SEP 7, SONY THEATRES

and Mary Pickford's contemporaries. "Lots of movie stars, black ties, spotlights, limos. It was a real Hollywood party."

Katz himself is more bemused than wistful. This Flushing boy has been threading mag stock in this city for 15 years as a card-carrying union projectionist. While he acknowledges being a bit awed at the scope of Sony's (the company removed the Loews' name from the chain last year) venture, you get the sense that, no matter how many millions are involved here, to him it's still the movies.

The new Sony Lincoln Center complex—nine theaters with three more planned to open later this year, plus an IMAX 3-D installation—is a logical response to the onslaught of home theater. Roughly 465,000 large-screen, stereo projection television sets were sold in the U.S. in 1993, according to the EIA, up from 404,000 the year before. Nearly 10 million stereo televisions were sold in 1993. It takes theaters like this to get people out of their bunkers and into the seats, particularly at the eight dollars a pop it costs in Manhattan.

And it takes sound. Lots of it. Big sound. Sony apparently made a major investment in audio playback systems. The larger-than-average rooms boom from the 2,000 watts being fed into the EV 880D subwoofers. The lead theater, the Premiere, sports four such boxes for a total of 8,000 watts, each of which has an additional 3dB boost at 23 Hz, thanks to a specially designed resistive network to the EV XEQ2 electronic crossover.

That mod and all the other audio components of Sony's Lincoln Center complex were specified, compiled and readied by Boston Light & Sound, a 17-year-old sales and consulting company in Boston that has become Sony's primary East Coast cinematic system installer. Larry Shaw, BL&S vice president and co-owner, believes it to be the largest system install ever done by Sony or by his company. "What you have to know about building theaters is that, in this business, there are very few equipment brand options," Shaw explains. "There's EV and JBL for speakers, Dolby for playback. It's not like in a recording studio where you can try 27 different kinds of something before you choose. What really sets this [theater] apart, aside from the size, is that all three major digital playback systems are represented in a single complex, and that they have an almost unbelievable amount of power behind them."

Each theater auditorium has, as might be expected, Sony's own Sony Dynamic Digital Sound (SDDS); in addition, each theater has either Digital Theater Sound (DTS) or Dolby's

SR•D system; and all theaters are equipped with one of Dolby's analog playback decoders, either a CP65 or a CP200. The Premiere room has all three, and it's also the one certified THX room of the complex. Considering the consistency of the reproduction platforms—all EV boxes, mainly the PS550 DLX cabinets—Sony's installation becomes a sort of flat track for comparing the systems. As theater sound goes, this is the ultimate smorgasbord.

Once the specifications, both for audio and for the Christie platters and Simplex projection systems for film, were approved by Sony, the BL&S crew assembled the components in Boston, providing wiring harnesses and a detailed blueprint for connections and equipment placement. These were shipped to New York and handed over to an electrical contractor. And in New York, that's definitely a union contractor.

"This was an incredibly flawless installation," says Shaw. "The only real problem came when we had shipped or directed manufacturers to ship the components. We use UPS, which is a Teamsters operation. But for some reason, the wrong Teamster local for UPS in New York was used. None of the union guys at the site would unload the boxes, and we're talking about hundreds of small boxes coming in from all over. They had to be sent back to their shipping points and then reshipped through the correct Teamsters local for UPS. I mean, we're a union shop up here, and I still can't explain it. Working in New York is always a funny thing."

The primary thing that sets this installation apart is the comprehensiveness of the audio formats. Film is threaded through readers for each format mounted atop the Simplex projectors. Depending on which format a print is using, audio is read from the optical tracks on the film itself (such as with the Dolby SR•D system), or, in the case of DTS, is stored on a CD-ROM drive locked to a 30 fps timecode track on the film's optical track. Sony's SDDS is the one 8-track-capable system, and its behind-the-screen L/LC/C/RC/R configuration required additional speaker

PHOTOS BY MARCO LORENZETTI OF K. GABRIEL CH BLESSING

arrays, as well as software to blend the LC and RC channels in for non-8-track mixes. The IMAX installation includes the first 3-D visual and audio system (see the December 1994 *Mix*).

The main installation was carried out by contractors and supervised by BL&S. However, the sound systems undergo constant tweaking by each film studio, according to Shaw, which sends in technicians to adjust the audio to better accommodate each print. While the architects designed the auditoriums to be as acoustically dead as possible, Shaw notes that some tuning had to be done. The Premiere room, which sports New York's first dedicated theater balcony in many years, required three zones of equalization—one for the balcony, one below it and one for the orchestra area, using Klark-Teknik DN 360B ⅓-octave stereo equalizers. The QSC crossovers (QSC crossovers and EX Series power amps are used exclusively throughout the installation) have a plug-in module that automatically compensates for high-frequency loss in speakers behind the screens.

Back to Mike Katz and his co-projectionist, Ray Selfridge. As they walk through the labyrinthian projection complex—a series of rooms whose projectors are ported onto the various theaters and which are connected by concrete passageways—they provide a running commentary on the various digital audio systems. Both seem pleased overall with the operation of all three. Katz notes, however, that the main problem has been one of error-correction, and that mostly with the DTS system and based on the inherent robustness (or lack thereof) of the film media.

"The problem is that the tracks are part of the film itself, and film lives in a harsh environment. It's constantly being handled by people and machinery and being subjected to high levels of heat. These are not small theaters, and the lamps on the Simplexes are hot. After a while, on occasion, the film isn't able to hold the track, and it loses sync." When that occurs, the backup analog tracks that each print holds automatically kick in. Katz says the transition to analog is usually seamless. "But if you're in a point in the movie when multiple channels are being used, a trained ear can hear the matrix collapse into four tracks," he explains. "The thing is, these are all relatively new digital formats, and no one knows what the print life is for the audio tracks and how long you have before it degrades to the point where you can't correct for it."

Both Katz and Selfridge are typical of contemporary cinema projectionists. There's more to it now than simply changing carbon arcs and watching that the cigarettes don't burn the film. "You have to know the mechanical and electronic aspects of a lot of systems," says Selfridge. "How the discs are loaded, how to repair a CD drive, how the systems operate in case of failure, how to keep them clean to avoid that, where the data and sync tracks are located for each system. DTS uses SMPTE timecode, but SDDS uses a proprietary timecode that's located on a different part of the optical track." Both say they they have to attend the myriad of seminars offered by each manufacturer to stay current. Selfridge even noted the radio-style cart system in a rack that's synchronized with a light show that kicks off each film performance. "One thing I will say," he adds, surveying the technology. "When you go to the movies here, you really go to the movies." ■

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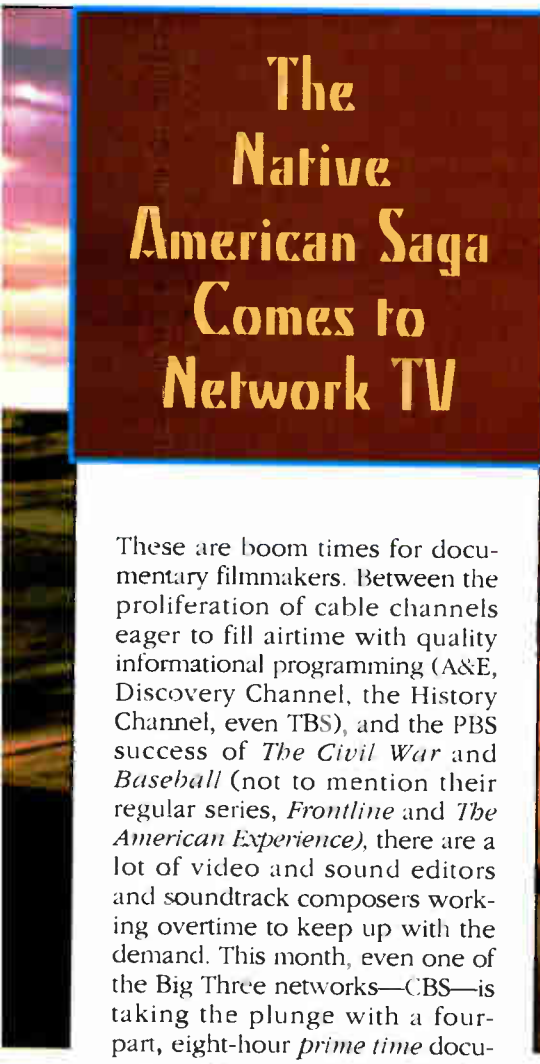

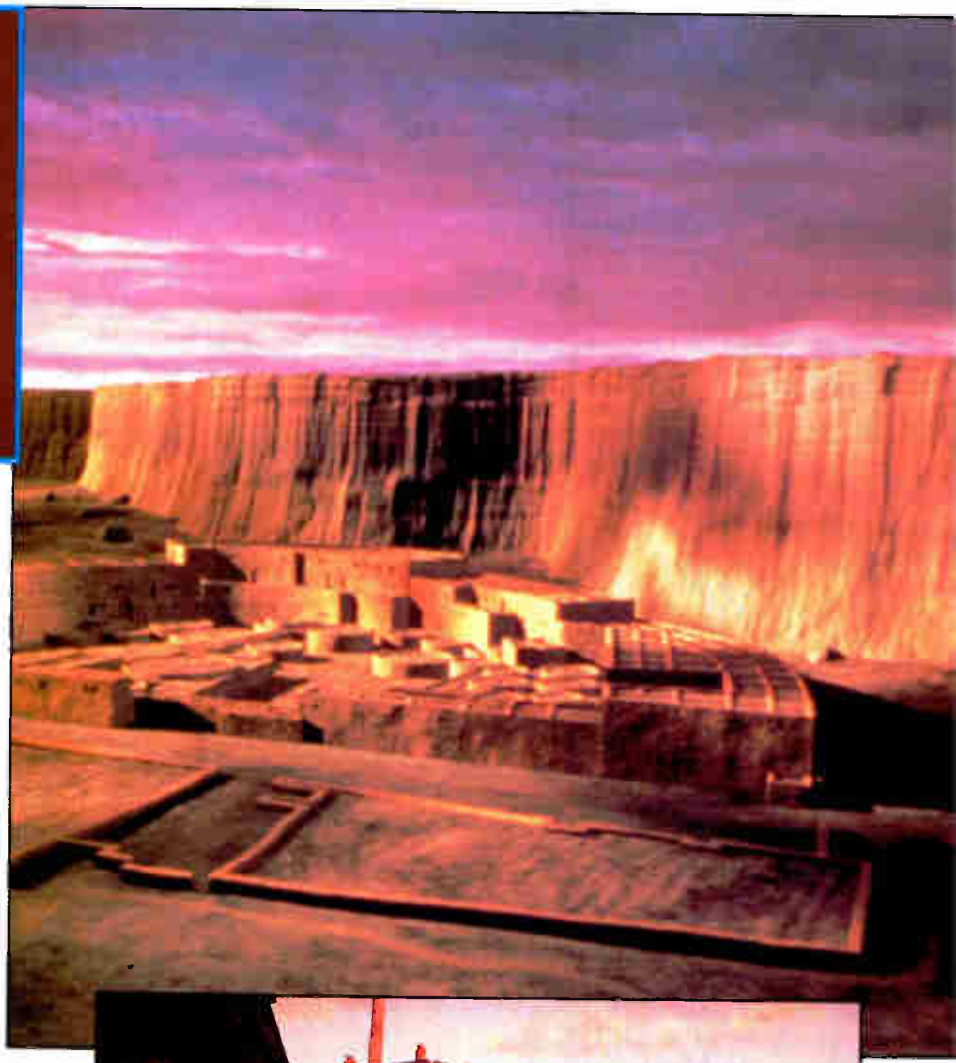

These are boom times for documentary filmmakers. Between the proliferation of cable channels eager to fill airtime with quality informational programming (A&E, Discovery Channel, the History Channel, even TBS), and the PBS success of *The Civil War* and *Baseball* (not to mention their regular series, *Frontline* and *The American Experience*), there are a lot of video and sound editors and soundtrack composers working overtime to keep up with the demand. This month, even one of the Big Three networks—CBS—is taking the plunge with a four-part, eight-hour *prime time* documentary series on Native Americans, called *500 Nations* and produced by Kevin Costner's production company.

This isn't exactly a groundbreaking idea. In the past two years, we've seen multipart cable

Right: A CGI animation shot from the film of an Indian village as it would have appeared in its day and (above) a similarly created image of a Pueblo city

BY BLAIR JACKSON

Left: composer Peter Buffett;
Below: Mayan head from ancient times

series like *The Native Americans* and *How the West Was Lost* offer sympathetic views of the tragic decline of the continent's native cultures. Like those programs, *500 Nations* uses a mixture of period paintings, photo stills and writings by Native Americans and white settlers and soldiers (read by celebrities, of course) to tell its story, but the CBS series' higher budget is reflected in some striking computer animation that, combined with live action footage, will allow viewers to get a clearer picture of how America's first tribes lived before they were decimated and displaced. And by appearing on network TV, *500 Nations* has the potential to reach a truly huge audience.

The task of scoring the series fell to Milwaukee-based composer Peter Buffett, who has put out several albums of new age music and runs a company specializing in commercial music, called Independent Sound. Buffett ended up producing more than four hours of music for *500 Nations*, and the miracle is that he worked virtually alone most of the time—just a man and his Synclavier. Amazingly, this was Buffett's first major scoring job.

But it was a small previous credit that helped him land the job. "I had a couple of records out on Narada [the new age label], and one night I saw a thing on *Entertainment Tonight* about how Kevin Costner was making this movie about Indians," Buffett remembers. "It was *Dances with Wolves*, of course, and because I had loosely formulated some of my own musical concepts around Native American music, a lightbulb went off and I decided I should try to get my CD to him. I figured this is what I was waiting for. Through friends of

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friends and college buddies and wives of college buddies, I eventually got the CD to Costner. That alone was a major miracle. His music supervisor for *Dances with Wolves* called me up and told me that he and Costner really liked my music, but they didn't know where that was going to lead. We talked very briefly about me maybe scoring the film, but that didn't seem to be too practical. I didn't have any experience, really, for one thing. So I thought that was the end of it. I was just happy they'd liked my music and thought maybe someone might remember me up the road. But then I got a call [from Costner] saying there was one scene they wanted me to write some music for. It was the fire dance scene, where Costner's character dances around the fire. I was lucky to get a scene that people remembered!"

Around that time, Costner and his partner, Jim Wilson, told Buffett about their prospective documentary series, *500 Nations*, but again, it looked as though it wasn't in the cards for Buffett to play a major role in its creation. Initially, Robbie Robertson, the former leader of The Band and part Mohawk himself, was tapped to write the music for the show. But when production bogged down in the early stages, Robertson left the project and went on to write music for TBS's *The Native Americans* (which was being put together by a friend of his), and then Wilson came back and offered the job to Buffett in December of '93. "The first thing Jack Leustig [director of *500 Nations*] said to me was, 'How can you do this in Milwaukee, while we're all out in L.A.?'" Buffett says. "I had always thought that when the time came, I could make the move to L.A., if only temporarily, so that's what I did. I also had to tell [the producers] how much my work was going to cost, and to be honest I didn't have a clue. I knew I'd just have to figure it out."

Buffett rented a room in the former Skywalker South's (now Todd-AO West) Santa Monica facility, which was equipped with a Synclavier loaded with 16 tracks of Direct-to-Disk, a small Trident board, and a pair of Alesis ADATs. While the film editors were assembling the show on a trio of Avid systems at Pathway Productions in North Hollywood, Buffett spent his first couple of months in L.A. meeting with director Leustig and supervising sound editor Susan Crutcher, discussing musical ideas for the program. Buffett says that from the beginning, he and Leustig agreed that there was no point in trying to make the music historically "accurate," rather, they would blend elements of contemporary styles with source music that was evocative of the visuals.

"You can't kill yourself trying to be politically correct," Buffett says. "We're not Native Americans. In a lot of cases we don't really know how things looked or sounded or how people acted. We're going on written words, many of them written by white people. Of course, there were Native American researchers, and [the writers] used as many true sources as they could and tried to be as factually correct as they could, but still, we were telling a story, and we wanted that story to be told in a way that was both appealing and accessible. I used *Passion*, [Peter Gabriel's] music from *The Last Temptation of Christ*, as a template to some extent, in the sense that we were using instrumentation that evoked the place and, to some degree, the era, but that's as far as it went. Then you incorporate that into a somewhat modern, or at least interesting, form. I just went with my gut. I didn't sit down and listen to hours of Native American music and try to re-create that. In fact, I didn't use Indian drums much at all. I used Taiko drums, I used drums from all over the world. I pushed the drama instead of going for authenticity, to some extent. If we were re-createing a scene that talked about a sun dance done by some nation on the plains, then you use that; you don't fake that. But when you're pushing drama in a storyline, you do what gets people subliminally."

During his first month in L.A., Buffett wrote six pieces "just to see if I was on the right track," he says, and some of that was then used as temp music while the editors were working feverishly to complete a finished cut. Once the editing was complete, with the narration in place, Buffett began the systematic process of scoring each hour of the series by sitting down with Leustig and Crutcher, watching the locked show and taking copious notes from their discussions.

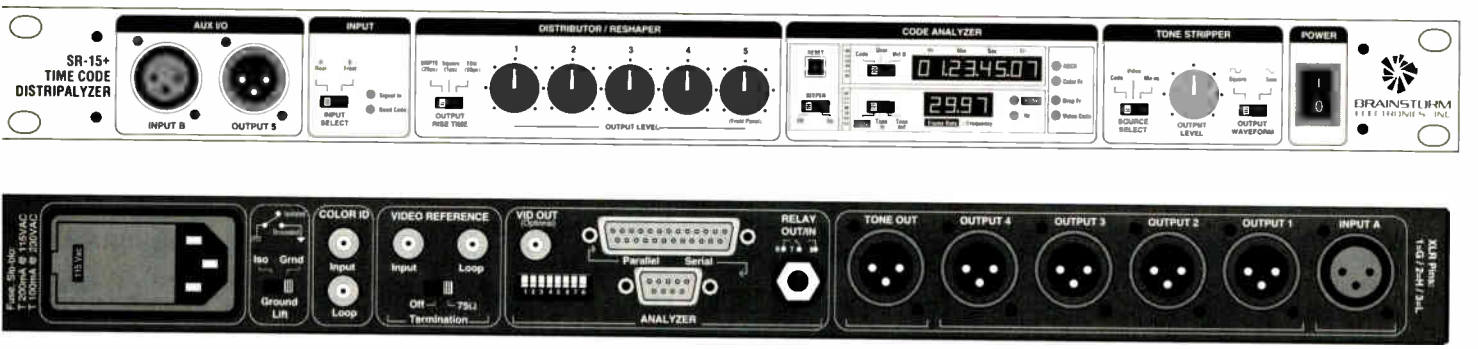
"Then I'd go home and say, 'Oh

by George Petersen

BRAINSTORM SR-15+

TIME CODE DISTRIPALYZER

Whether a project is a feature film or a 30-second commercial spot, production and post-production personnel need to work together to create a successful end product. And in the modern production environment, SMPTE timecode is one constant that keeps everything in sync. However, during the production process, the various elements—dialog, music and effects tracks, and video workprints



—may be created using improper or damaged timecode information. This may stem from a lack of communication, through neglect or simply a lack of understanding about how the other members of the team work, but whatever the cause, the result is wasted production time and a lot of finger-pointing to determine who's at fault.

For example, when video editors talk about 30-frame timecode, they are usually referring to 29.97 fps timecode; for them, the "30" figure is mere shorthand. Now, the audio crew may assume that 30 fps means 30.00 fps, and when the difference between 30.00 and 29.97 (0.03 frames, or 0.1%) is multiplied over a one-hour project (108,000 frames), the discrepancy is approximately 108 frames—more than three seconds! Because tests have shown that audiences can detect dialog that is two frames out of sync, 108 frames clearly represents a disastrous situation.

In addition to dealing with wrong frame rates (and the drop-frame vs. nondrop-frame dilemma), other common timecode problems come from weak, misshapen or out-of-phase SMPTE signals on tape, and dropouts or other errors in the timecode datastream. If problems do occur, it's too easy to blame the last step in the chain, and too often this occurs without knowledge of the extent of the problem, or whether a "problem" actually exists at all. And before a solution can be applied, two issues need to be addressed: identifying the problem and finding the solution.

Designed specifically for such timecode problems is the Brainstorm SR-15+ Time Code Distripalyzer. Housed in a single-rackspace chassis and priced at $1,490, the SR-15+ offers a timecode distributor/reshaper; pilot tone stripper; and a timecode analyzer that displays the frame rate and format of incoming code, monitors video sync and indicates timecode errors through an audible buzz-

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er, front-panel display and/or a written report. Parallel and serial ports are provided for connecting the SR-15+ to either a Mac, PC or Centronics printer.

The SR-15+ is not difficult to use. The front panel has XLR jacks for timecode input and output (another input and four more buffered TC outputs are also on the back panel), with LEDs for timecode present and "good" code. Five output-level controls allow adjusting the level of each reshaped timecode output from "off" to +12 dBu, and the rise time of the outputs can be set to 1, 25 or 50 microseconds for square wave, SMPTE or EBU standards. An 8-character alphanumeric display can be switched to indicate timecode (hours/minutes/seconds/frames), user bits or video phase; this display also shows error types as they happen, as well as faulty addresses.

A smaller, 4-digit display can be switched to indicate the timecode frame rate or frequency of the stripped tone. Other LEDs indicate user bit status (ASCII, hex or color frame flags), standard or drop-frame code and whether the timecode phase is synchronous with the video frame. The stripper section has a tone output level pot, source select (whether tone is created from TC, video or AC mains) and a sine/square wave shape select for the output tone.

On the front panel is a switch for disabling a beep tone that occurs whenever the "good code" LED lights. I was afraid that the beep would equate to a 127dB air raid siren, but fortunately, it wasn't overly obnoxious unless the unit is fed a constant string of bad code.

The rear panel is straightforward: AC input with 115/230 VAC operation, XLR timecode input and four XLR TC outputs, tone output parallel and serial ports, ground lift switch and BNC connectors for video reference in/loop (with 75-ohm termination), color field ID pulse (in and loop) and an optional composite video output for displaying the TC error reports or creating a window-burn timecode display. By the way, all the XLRs on the unit are balanced, pin #2 hot and can be used unbalanced by disregarding the pin #3 connection.

A useful touch on the rear panel is a ¼-inch TRS jack for relay in/out functions. As an output, the latter allows for access to an internal relay that triggers whenever the "good code" LED lights. As an input, the jack is connected to the analyzer, so each closure from an external switch or relay is reported, along with its corresponding timecode address.

Inside the SR-15+, five jumpers allow the user to "customize" the unit to various configurations. These include changing the timecode inputs (normally wired so that either the front *or* rear input feeds both the reshaper and analyzer) so the rear input is reshaped; the front feeds the analyzer only. The tone output can be routed to become a sixth timecode output; the ¼-inch relay jack can be set for input or output functions; and the relay output can be switched from latching to momentary operation. A bank of eight DIP switches on the rear panel reserves six for future upgrades; one switch changes the serial port to send timecode addresses as ASCII characters, rather than a regular timecode report; and the other handles PAL color sequence

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selecting (I didn't have much need for that feature).

The SR-15+ manual is complete and well-written, and it includes not only hookup and application information but also pin outs for creating custom cables to connect an Apple ImageWriter or other serial printer for making hard copies of timecode reports. The process is even easier using the parallel port with a Centronics printer. I achieved excellent results using a low-tech Epson FX-80 dot-matrix printer that was lying around my studio. A hard copy report is created whenever a printer is connected and set to be "online."

BRAINSTORM SR-15+ Ver 3.05
Time Code Distripalyzer
TIME CODE REPORT

Alternate Bit Width Window

*** FORMAT ***
30 Drop Frame
Color Bit active
User bits: HEX
01234567

*** VIDEO REFERENCE ***
Present
"V" drive at bit 79

*** START TIME ***
01.00.00.00

*** ADDRESS ERRORS ***

01.12.36.05	Drop out
01.18.41.23	Bad bits: 28
01.18.41.27	Frame repeated
01.23.45.07	Code stopped

*** SUMMARY ***
VIDEO SYNC: Code Properly Synced
COLOR: Field 1 locked with color ID pulse

*** END TIME ***
01.23.45.07
END OF REPORT

Typical timecode report

The procedure occurs in real time, as timecode is fed into the SR-15+; unfortunately, it is not possible to create a report after the tape has run. However, the SR-15+ keeps the first five errors in memory, and these (and their corresponding addresses) can be read from the front-panel display. If the printer was offline while the tape was running, and you later require a full report, you can always replay the tape and generate a hard copy. Alternatively, reports can be sent directly to any computer running modem software at 9600 baud. In such cases, no modem is necessary; just connect the computer's serial port directly to the SR-15+.

Whether linked to a PC or printer, the data presented in a timecode report is the same. It includes frame count and drop/nondrop status; color and parity bits; user bit format; user bit message; video reference present/absent; start time (first valid time code address); list of errors with addresses where each occurred; video sync present/absent; color framing; and end time (last valid time code address). Once reports are sent to a computer, they can be saved to disk or printed.

The stripper function provides the ability to extract a 59.94, 50, 60 or 62.50Hz audio tone (sine or square wave) from incoming timecode or video signals. Although this is a nice addition, I suspect most users will rarely need this feature, unless they spend a lot of time synching sprocketed 24 fps film transports with 25 fps PAL (European standard) video. If you don't need this function, a quick internal jumper change and the stripper output becomes a sixth TC output.

Aside from occasionally analyzing timecode, the main use of the SR-15+ is as a reshaped timecode distribution system. The five timecode outputs—six if the stripper is disabled—were ample in my studio, reshaping the code output from my Sony BVU-800 and feeding it to console automation, MIDI sequencer, workstation and transport synchronizer (to control analog and digital tape transports). The SR-15+ reshaped to cover long sections of poor-quality timecode flawlessly, and the five buffered timecode outs provided solid, stable code, even when routed through 200 feet of cable, which should be good news for remote recording or broadcast users.

In sum, the Brainstorm SR-15+ packs a wallop of flexibility and functionality into a diminutive one-rack-space package. At an affordable $1,490, it's a powerful problem-solver that should put an end to the finger-pointing, conjecture and headaches that accompany timecode and sync problems. I like that.

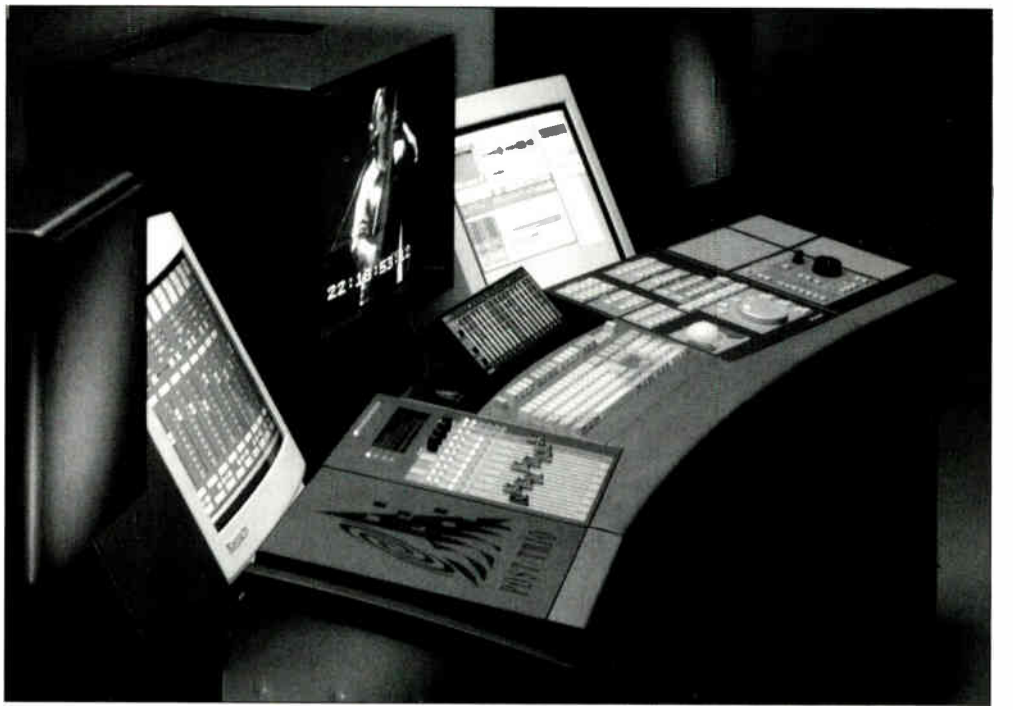
Distributed by Audio Intervisual Design, 1155 N. La Brea Avenue, West Hollywood, CA 90038; (213) 845-1155; fax: (213) 845-1170. ■

New Products For Film/Video Sound

STUDER EDITECH POSTTRIO

Studer Editech's (Menlo Park, CA) PostTrio offers 8 to 24 simultaneous record/play channels, up to 72 I/O channels and up to 48 mixer strips. The expandable system has removable disk drives, Lexicon NuVerb reverb and Multi-Desk controller with moving fader automation, routable summing buses and extensive studio communication/monitoring functions.

Circle 190 on Reader Service Card



AVID EXPANDS DIGITAL AUDIO

Avid Technology (Tewksbury, MA) demonstrated its new family of compatible, integrated digital audio products, which address each step of the audio post-production process. Based on Version 3.0 software, Avid's expanded audio product family incorporates new Avid-designed hardware, which lets users play up to 16 channels of audio and video from a single disk. Also available are new, low-cost digital player/recorder (DPR) configurations for AudioVision and AudioStation, as well as numerous user interface and functionality enhancements.

Circle 191 on Reader Service Card

OTARI PICMIX

Otari Corporation (Foster City, CA) debuted PicMix, a mix-to-picture multiformat surround monitor and panning system. Designed to allow full film mix monitoring for integration into any audio console, the monitoring system includes a Master Rack unit that handles eight audio channels, each with two audio inputs—bus/tape, direct/playback, PEC/direct, etc. Each of these channels can be assigned to one of the eight monitoring buses provided (Left, Center, Right, Surround, Left Surround, Right Surround, Boom/SubWoofer, eXtra). The PicMix Panning System consists of an audio rack and one or more panner controllers.

Circle 192 on Reader Service Card

ASCC-SYSTEMS USM

ASCC-Systems (Chicago) debuted the Universal Sound Switch Matrix (USM), designed to distribute, mix, delay and set levels on high-performance analog and digital audio signals to be used as a DeltaStereophony-System. USM offers the ability to mix and distribute up to 16 input signals on up to 32 outputs, so that separate level settings and delay times can be chosen for each node of the matrix independently. The unit works in the digital domain to avoid signal deterioration. Suggested retail ranges between $40,000 and $90,000, including the license fee.

Circle 193 on Reader Service Card

ANTEX ELECTRONICS WINDOWS EDITOR

Antex Electronics (Gardena, CA) announced NuWave, a full-featured, Windows-based digital audio editor designed specifically to edit multiple-format, compressed audio files, including those created by Antex digital audio adapters and other compatible adapters. NuWave supports .WAV compression formats, including Dolby AC-2, MPEG Layer I/II and MS-ADPCM, as well as standard 8- and 16-bit PCM.

Circle 194 on Reader Service Card

ADAMS-SMITH SUPER CONTROLLER

Designed to control every analog or digital transport, workstation, film dubber or MIDI device in the studio, the Super Controller by Adams-Smith (Hudson, MA) allows audio engineers to cue and roll from specific points, arm individual tracks, establish correct offsets, make tight insert or assemble edits, and, with modern transports, perform these feats without the use of external synchronizers or specific machine remotes. Retail is $17,800.

Circle 196 on Reader Service Card

BELDEN DIGITAL SERIAL CABLES

Belden (Richmond, IN) introduced a line of cables designed to accommodate serial digital video and digital audio transmissions. Called Belden Brilliance, the cables meet the latest AES/EBU and serial digital video standards. The #1694A serial digital video cable is a low-loss, 75-ohm co-ax. The #1696A high-flex, 110-ohm, AES/EBU digital audio interconnect cable permits stable transmissions of 3Mb and 6Mb/sec digital audio over extended distances.

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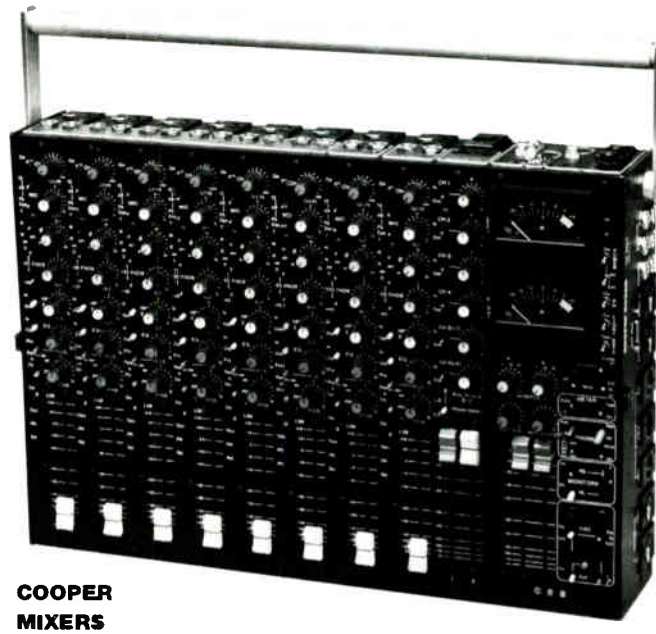

COOPER MIXERS

Cooper Sound Systems (San Juan Capistrano, CA) unveiled a new, extended-chassis version of its CS106+1 professional audio mixer. The CS108+1 audio mixer features six to nine modular input channels with mono or stereo modules (with M/S decoders) and the new aux module, CSD-2. Cooper also announced its ENG-style 4-channel mixer. Designed to operate as an over-the-shoulder-style unit with all controls accessible from the front and side panels, it features switchable analog meters, transformer-coupled ins/outs, optional insert points, channel outs and more.

Circle 197 on Reader Service Card

TELECAST ADDER

Telecast Fiber Systems (Worcester, MA) introduced Adder 882, a high-performance, bi-directional, fiber-optic audio and data multiplexer. With the ability to simultaneously transmit eight broadcast-quality audio channels plus eight high-speed RS-422 data/control channels, both ways over a single optical fiber, the Adder 882 is a pair of two-rackspace enclosures fitted with 16 three-pin XLR audio connectors and eight duplex DB-9 data connectors on each unit. The Adder 882 has a range of 10 km without repeaters or amplifiers.

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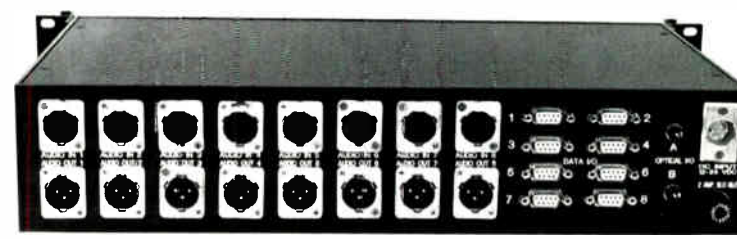


Todd-AO's CHRIS JENKINS

MIX

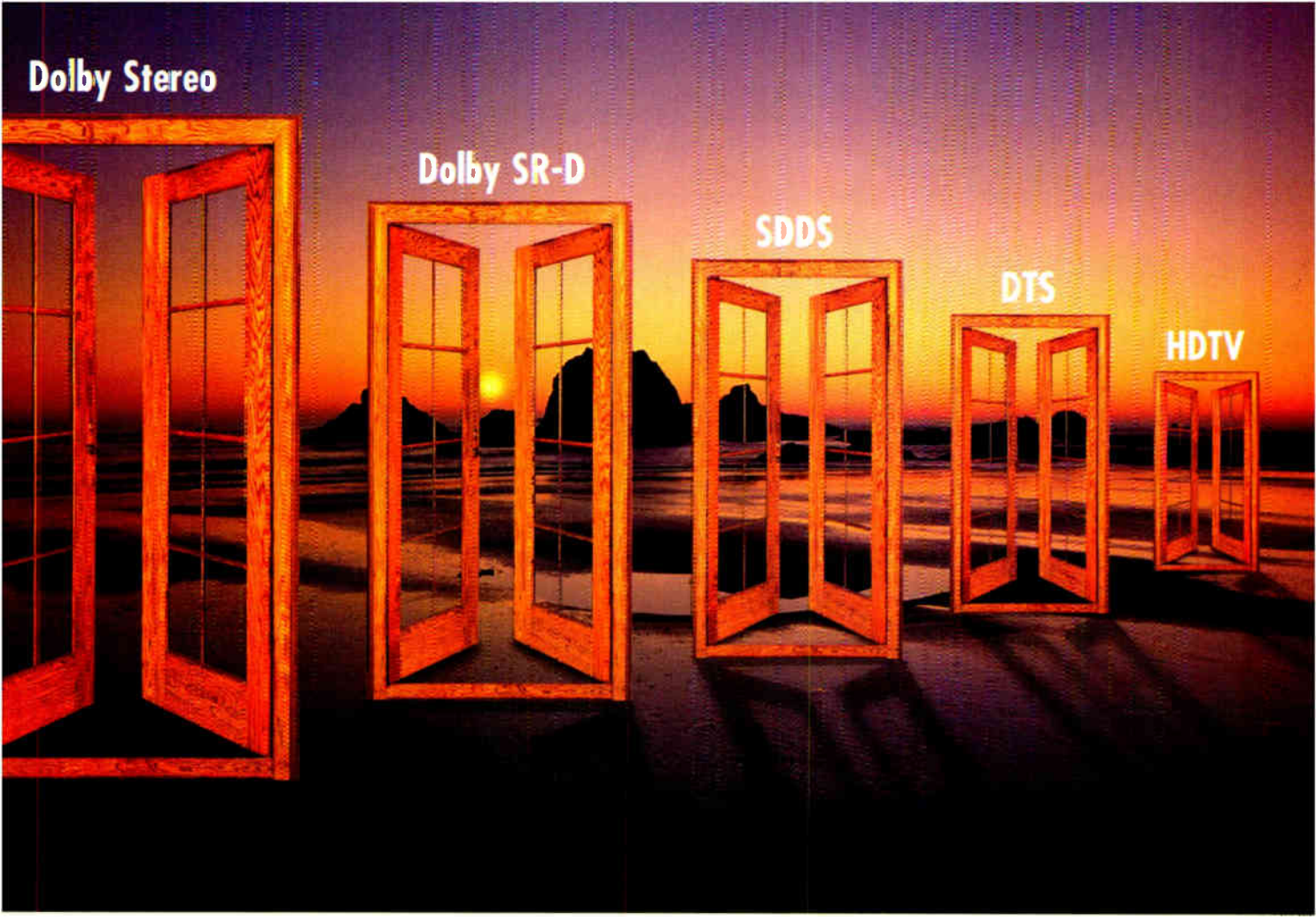
MIX

MANAGING THE MIX

BY MEL LAMBERT

In the film mixing business, there are names that require little introduction. Todd-AO/Glen Glenn has been in business for many decades as one of the world's leading sound editing and re-recording facilities. Chris Jenkins has been with that facility for almost 20 years, first in the camera department, then in the sound department. His rise through the ranks has been nothing short of meteoric. Now one of the most respected film re-recording mixers in the industry, he also serves as company president, a duality that is not without its own stresses and compromises.

A musician has a sense of what sounds good; and if you have good eye, hand and ear coordination, then you are going to be good as a re-recording engineer.



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Rising to the challenge of fulfilling these organizational and creative roles, Jenkins has worked on literally dozens of innovative films, including *Star Trek: Generations*, *Star Trek V*, *The Firm*, *Scent of a Woman*, *A League of Their Own*, *U2: Rattle & Hum*, *Against All Odds*, *Thief*, *Robin Hood*, *Havana*, *Robocop 2*, and *The Fabulous Baker Boys*, as well as numerous TV and music video projects. He received an Academy Award nomination for *Dick Tracy*, and he won the coveted Oscar for *Last of the Mohicans* and *Out of Africa*.

We caught up with this busy executive at his office in Todd-AO/Glen Glenn's Hollywood facility.

How did you get your start in pro audio? I understand that you were a guitar player and still like to go down to The House of Blues here in L.A. to hear good music?

It was just a part of growing up. I come from a town in Connecticut where everybody played. The Beatles had such an incredible influence on our lives—when they were on *The Ed Sullivan Show*, we imitated them with pots and pans and rakes for guitars. So I became a guitarist. At the University of New Hampshire, I moved into a house with a really good bunch of jazz players; I was really a rock 'n' roll player with a feel for the blues. In college, I met guys who were much more polished players. After college, I wanted to keep on playing, so I came here [Los Angeles] in 1976 to be a studio player. A friend of my father's, Salah Hassenein, who's one of my mentors, put me in touch with Freddie Hynes at Todd-AO.

I came to L.A. thinking that I would be a studio player for Todd-AO, which, of course, was pretty naive. So...I waited about a year-and-a-half, and Freddie got me a job in Todd-AO's camera department. Then into the sound department as a loader, then a recordist, and then I learned 35mm and 70mm soundtrack printing. It was a really opportune time to come into the movie business, because it's very much a union-based industry; if your father wasn't in it, you weren't gonna get in. There was no reason to believe someone from my background could come to Hollywood and get into the sound business. When I first walked into the machine room or a dubbing studio, I didn't know what they were doing! I was used to reel-to-reel tape machines, and there were "pictures" in the [optical] soundtrack; I just didn't have a clue. I had no sense that the background that I had would have any real place in doing re-recording.

Led Zeppelin had just finished [re-recording] their movie, *The Song Remains the Same*, on [Todd-AO's]

PHOTO LIZ EARLS

Stage B with Jack Woltz; Stage A had been dark for maybe a year before that. I sat in, and I got a chance to work with Jack. But I'm not an "engineer"—like Bill Ritter, or Dave Tourkow, or Clay Davis, or John Bonner—and I didn't study electronics. I knew what I wanted, and I knew what sounded good. A musician has a sense of what sounds good; and if you've got good eye, hand and ear coordination—where the minutiae of behavior on a screen 40 feet away is just intrinsically translated into knowing where to put the fader the first time—then you are going to be good as a re-recording engineer. It's really an amazing gift.

My mentor, Buzz Knudsen, started out as a baseball player. Before his day, for many years, the engineers had somewhat limited musical or artistic background. Then rock 'n' roll hit, and music became very important. I did a movie with the Grateful Dead, [who] loved it here. So the guys came in from the record business. Then we did *A Star Is Born*, which Buzz mixed, and I was the recordist.

How did you get your first experience of mixing a movie?

On a picture called *Cloud Dancer*, which was produced by Melvin Simon—a movie about stunt flying, with David Carradine. I was asked to come on as the effects mixer. The lead on that put-together crew was Jim Corbett, who's now at Mix Magic, and Don McDougal who's one of the music mixers here. I hit it off okay on that project, and then I did probably a year with Buzz. My first screen credit was *1941*, which was a great experience to mix. Buzz was really intelligent about training people. He did something that most people just didn't do: He taught you how to mix. He physically sat you down next to him, and he said, "Just shut up and watch; soak it up." He would talk you through, and he would tell you what was going on. He was the best guy. During the mix, he wouldn't just bring you in on the side. The only way to learn to mix is to do it with the client.

Does your position as an active, hands-on mixer and facility president help you keep up to date with developments in the film post industry?

With hardware changing the way it is, we're all focused very heavily on technology these days. I'm not clear on whether that's proper at the moment. We're doing a lot of things technologically that aren't important, and they logarithmically propagate the necessity to keep doing it. Sound is becoming more important—maybe for the wrong reasons; we're "explosion happy!" Never mind the quality, feel how loud it is. To me, it's very artificial.

But there's a huge amount of friction you bear from the administrative side. I think it'd be a great project to start something from scratch again. What is a dubbing center? It would be fun to step back and remove yourself from the day-to-day issues and find out if you can just focus again on what you're trying to achieve. From the time you come in the front door with the production soundtrack, to the time you watch it with the audience or on videotape a year later, what was it that should have happened? I think that it takes complete immersion and reinvention to do that really well.

"Big and loud" seems to be the paradigm for film sound.

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But we've done some movies that were just the opposite, and we've won Academy Awards for films that were subtler. This morning, I was with the producers from *Rob Roy*, which is a picture that has a really strong fabric. It's a beautiful story, set in Scotland and Ireland, with Liam Neeson. I'm going to mix it. We've worked with [director] Michael [Cayton-Jones] before, and he's really done a bang-up job. The composer is Carter Burwell, who's kind of offbeat. This is the type of movie that would be the "ultimate sound picture" for us.

I recall Richard Portman once saying that our industry could benefit from a "Director of Sound," just as we have a DP on a film who is responsible for capturing the visuals. The DS could then oversee every aspect of the soundtrack, from pre-production to the dub. A good idea?

Well, it is a useful concept and one that we have been moving toward, because I feel that we could do a better job if we had control of more aspects of the soundtrack production. When we bought Glen Glenn, we secured their editorial department. We were then able to go to [directors like] Sydney Pollack and Mark Rosenberg and say that we can handle sound editing as well as the dub. Nobody was doing it before like that.

They were happy to try to have it under one roof. Also, we can use one person to cut an entire show, so we're sound directors in that sense. Really, Buzz and I—from the studio side of it—handle the continuity and consistency of the project. In the past, for the big effects shows, it was usually 15 or 20 guys working in parallel. Everybody got a reel, and the best editor got the best reel. Now, one editor cuts all the dialog. We've talked about the layout of the cue sheets; they know how I work, way ahead of time. We also have our new scoring stage [on the CBS-Radford lot, Studio City; the former Evergreen facility] and can liaise more closely with the composers and music editors.

How do you prepare for a mix?

We try to develop an overall "feel" for the movie, in terms of sound. We might talk about sound for previous films we've done here—*Heaven's Gate* or *Last of the Mohicans*. We go pull out our laserdiscs. Michael Mann calls it "creating the vocabu-

lary." You learn what parameters you're dealing with when you start looking at the movie.

Speaking of Michael Mann, you mixed what I consider to be his best work,* Thief. *How did you find the experience?

I enjoyed it very much. We did something really unusual on *Thief*: what we called "harmonized effects." We spent weeks musically pitching the sound effects we wanted in the movie—taking saws, drills, car engines and all that—and making them into musical instruments. Tangerine Dream [film score] was also very influential.

It just so happens that four weeks ago [late December 1994], MGM-UA came in to remix a *Thief* laserdisc release, with Michael and Jimmy Caan doing sidebar dialog. But there were long sections on the master where the effects or music were missing—the last 13 minutes of a big, important reel with no music or effects in it. We had an M&E—in those days we would mix the final to one mag recorder and then, right after we got it signed off, we would rewind the elements and remix again, with no automation and no stems, a music and effects master. We would just put up the faders and make sure they sounded exactly the same; it was all done again as close as you could remember to how you did it with music and effects, but no dialog.

So we had one of those M&E masters and the dialog premixes. Michael [Mann] is very particular about sound; he hears things in his head in a way that nobody else does. Sydney Pollack and Michael fix behavior in mixing; sometimes only they hear it because only they know what did happen when that actress in one take was perfect, but the next time she did it, her reading was off. You'll do a playback with Michael, and, all of a sudden, he's stopped listening and is caught up in the little piece of somebody's acting, or a little piece of music that doesn't quite add up. I just stop whenever I see him doing that. I know his body language; he's off somewhere else, still trying to solve something that probably didn't work in the script or from an actor, or from a piece of set design.

For the remix of the *Thief* reel, he came in that same night to re-record 12 minutes of audio from a movie that he worked probably 12 days on [in 1981]. There's an amazing thing that happens when you've heard something a lot on a mixing stage—you know what a syllable will sound like every time from there on. It all came together very quickly; your brain doesn't seem to forget things like that, even after more than 12 to 13 years. I still know today what it sounds like, exactly.

It is a very bread-and-butter thing that we do here: We're trying to tell a story and to manage the tracks so that we can be as creative as possible all the time.

Were you tempted to make a comment like, "If only we could remix this again, we might be able to make it sound better?"

If it was with other people, you might. You go through steps with Michael during mixing where you "create" mixes. The difference between your dialog predubs or your first music pass and where it ends up is so far apart. With Michael, you'll mix the reels, and then you start to mix the movie. You get these huge racks of masters that you make; endless takes of things where you like a little bit of this and a little bit from that. It's sort of like sound editing to get the best takes together. His quality of hearing, his tone memory is astonishing.

You've mentioned Michael Mann and Sydney Pollack, two people who in your opinion occupy the high ground, with a wider appreciation of how the sound elements fit together. Anybody else you would name in that category?

Martin Brest and Michael Mann, especially, appreciate how a small change of EQ or level can affect things. Penny Marshall is very much the same way. Contentwise, Penny can change the plot of a movie in the way that she works with looping. She records a huge amount of dialog in order to allow her to change. The first movie we did with her was *Big*, and depending on how she wanted the last two lines of the dialog to go in the movie—the scene where Tom Hanks comes back as a kid—she had looped probably 40 or 50 takes. She could change a line and change the direction in which the movie was going.

She's really going at the "conception of dialog," the use of dialog and its changeability. Over-the-shoulders stuff; someone turns a head, you have ten loop lines in. "I'd like to carry your food." "I like your Jeep." Totally unrelated lines of dialog that Penny knows she may want later. Garry Marshall is the same way; he came from a dialog background. Penny gets the benefit of a seven- or eight-week mix, because it's about performance and dialog. Movies are very word-driven, and so it takes a really skilled approach to handle dialog mixing.

Martin Brest's *Scent of a Woman* is probably the best mix I've ever done from that standpoint; it was all dialog.

Do you think it's important for people who are working in music, dialog or sound effects editorial to appreciate what it is you handle on the re-recording stage?

Other way around. The sound editors are going to be the new mixers. In the future, we won't draw from the machine room. Todd-AO runs a digital audio workstation school every summer. We track about 40 to 50 people, out of which we take the best couple and put them into the

company. We have probably 35 or 40 editors working full-time, and those are the next mixers.

You can take their work, put the faders up at zero, push go, and 90 percent of the professionals who walk into the room would say that it sounds great. Using workstations, we can replace the bunch of dialog trims hanging in a bin, with all the levels all over the place. Before we had workstations, if you put it up and tried to do a run from the beginning of a reel to the end, it was a total nightmare. But now you can put it up, sit back and watch the story. If you're doing something that you haven't seen before, you can understand the performances, push "rewind" and then start doing the selections. It's not about making it sound good, but selecting the right takes.

We seem to be transitioning more and more in that direction. Todd-AO, like many facilities, is moving toward "The Sprocketless Room," where random-access, disk-based or MO-based recorders will replace linear multitrack or mag transports. Is this the wave of the future?

Yes, it's proliferating. Shawn [Murphy, scoring engineer] just made his first recording directly to a Sonic System. Shawn is very, very critical of all hard disk systems. Finally, there's something that does sound good to his ears; it still doesn't sound as good as the analog, but very, very close.

That is the wave of the future: ship a box of hard disks back to the stage. Here we own 50 [Otari] MTR-90s, and we just refuse to buy another one. Now we have our Tascam DA-88s and Fairlight MFX systems. Fairlight is developing with us the most important element in the mix studio: the digital dummy. We want a simple record/playback machine; something that will replace the [35mm mag] Magna-Techs and allow us to simply plug in a hard drive and be ready to go. Then, at the end of a mix, we just unplug the drive and hand it to the transfer department. The simplicity of media is what counts.

What about mixing systems? You have analog SSL, Neve and ADM boards here at Todd-AO. Are you looking at digital consoles?

We're ready to go with digital consoles, but we haven't seen anything that we really believe is there yet. A piano is still a piano, and has been for centuries for a very good reason—the eye, hand and ear relationship. A mixing console is no different. You can use those Scenarias and Omnimixes, and the control surfaces can vary. You can achieve what you're trying to do but you have to keep some of the rudimentary tools.

A piano is still a piano, and has been for centuries for a very good reason—the eye, hand and ear relationship. A mixing console is no different.

I don't have the answer yet. I know I can do it both ways. It's just the mind-set of organizing information, and that's where I fall off the digital console and virtual interface bandwagon. The key to what we do is mixing in the studio. When you go down to the stage, you want to have as few interruptions as possible; toggling a switch or answering a phone. That's the dichotomy, the hard part of what I do. I'm not good at it, but I work hard at trying to keep the other interruptions away from it. If you have to tell Penny [Marshall]: "Hang on a second, I've got Danny DeVito's seventh reading way down under here," it's going to hold things up. Or having to load another disc or MO in order to find the right effects element.

Currently, all we really want in audio post is automation: automated EQ, automated routing and switching; automated levels. We don't design consoles ourselves. We use them, so I don't have a lot of patience for first and second and third generations of consoles. It is a very bread-and-butter thing that we do here: We're trying to tell a story and to manage the tracks so that we can be as creative as possible all the time. I think that's what console-design people need to focus on.

But you have been able to bring more creativity to the mixing process; to tell a story in a way that couldn't be done before, because we didn't know how to bring all these elements together on the soundtrack.

Completely true. Storytelling is done much better. It's like telling folk tales at night in the forest. When all the elements are right—the fire's burning just right, the sky's the right color, and the birds are chirping back in the woods—that moment you can create and re-create beautifully today in a way that you might not have been able to in the past. You might have just gotten the perfect take once before, but you compromised a lot of other things on the track. What technology serves now is the preservation of the "Perfect Night in the Forest" storytelling, and it allows you to embellish and change.

See this piece of tape here [holds up half-inch VHS]? This is by a UCLA film student named Joel Mendiaz, and he's done an amazing 15-minute movie. This guy is brilliant, and he's got a totally sound-driven short film about a guy who is totally entranced by the way he looks, and wondering if he's crazy with voices in his head. We're going to make a 4-track, split-surround mix. It'll be so far removed from films like *True Lies*, as an example of what movie-making is about. I'm excited about what I can bring to it from the sound perspective. This is what Todd-AO has to offer; we should be capable of handling either Joel's student film, or a *True Lies*.

Do you take advantage of the wider range of options that SR•D, DTS, SDDS and the other discrete formats have to offer? Do those formats modify the way that you bring the soundtrack together, knowing that you can now give audiences a whole aural treat?

Absolutely. It's completely liberating for a mixer, because it's what we've always had in the studio. The big

International Gazette

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The Studio 5000 takes its predecessor, the amazing DHP-55, a step further. With new features and programs crafted by studio pros, the Studio 5000 is sure to stir your creative urges. Here's what the people who make their living in the studio have to say about it.

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DHP-55 review
SOUND AND RECORDING MAGAZINE, JAPAN

"I immediately started doing things I never was able to do with my other processors"
KIM BULLARD

Excellent Pitch Shifting

John Ross, President of LA's Digital Sound and Picture needs quality pitch shifting for Foley without the artifacts of competitor's products: "... the 5000 sounds natural, just like 2 inch tape at half speed. We require high quality products for simple applications. The Studio 5000 fits in very well indeed." Digital Sound and Picture is an advanced facility using a Lan-based digital audio network and multiple digital audio workstations.

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Five time Emmy award winning composer and producer Dominic Messinger says the Studio 5000 "makes the normal exotic". He uses it to sweeten mixes by using the regenerative pitch shifting Mix Imager programs. On drums he adds depth with detuning and dynamic filtering effects.

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DOMINIC MESSINGER, 5 TIME EMMY AWARD-WINNER, COMPOSER & PRODUCER

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Clif Brigden, engineer for Thomas Dolby uses the Studio 5000 on Dolby's upcoming album and interactive video projects. "It sounds wicked right out of the box but lets you get to and change every parameter to make your own unique noises."

Leading Edge Special Effects

The Studio 5000 adds a futuristic edge to new animated series 'Phantom 2040'. Producer/composer Gerald O'Brien explains: "The 5000's Lush Chord Shifting algorithm is used on the main theme vocals while guitar and bass tracks get cabinet emulation and special effects. The robot voices are created using combinations of pitch shifting, flange and chorus." Gerald has scored over 22 shows including the successful Cobra series. His songwriting clients include Manhatten Transfer, Hall and Oates and Deborah Harry.

"Imagine what music will sound like in 40 years - that's what we're working to create."
GERALD O'BRIEN

Guitar Effects

"They asked for a Jimi Hendrix type cue to go with a 60's acid experience... I quickly called up the Voodoo Wah program... and they loved it!" Larry Brown, TV composer, producer and Emmy winner uses the Studio 5000 to closely emulate guitars with his synthesizers.

Fast

"I have to write a lot of music in a short period of time and the Studio 5000 really helps me to achieve that" says Kim Bullard, writer, producer and session musician. He's using the Studio 5000 to help create the soundtrack for the upcoming film, 'Taxandria.'

"Sounds so deep, I'm still looking for the bottom."
CLIF BRIGDEN, ENGINEER FOR THOMAS DOLBY

Record Quality

The Studio 5000 gives Kim Bullard the detailed sound he demands. "A soundtrack album is also part of the Taxandria project so the cues have to be record quality" he says.

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rage in movies now is "big boom"—subwoofers. It's sort of the new toy for non-matrix formats. With DTS, it's the sixth channel: just subwoofer. But the real advantage is the extended frequency response available from these new formats.

Dolby did a great service for many years, because it allowed producers to have more prints out in stereo. But, for a long time, it had much less to do with what sounds good than what anybody was willing to admit. Mixers really hate the Dolby [4:2:4] matrix; it did its job, and we're very pleased to move on to the next step. Now a release print sounds just like the master. You're not dealing with bad optical tracks. When I first started with Todd-AO, we had 6-track. I still pull out *Oklahoma!* or *South Pacific* or *The Sound of Music*, where you hear the way the score's recorded with just six mics. We got lost with multitrack and with Dolby Stereo. The processes improved some things, but they lost sight of a lot of important factors.

We mix for, let's say, five weeks, and then we only get a day or two to master each format. You'll do your six-track [SR•D or DTS] master, which is easy because it's just a direct copy; you might noodle around a little bit or do this and that. Then you get another day to do the [optical] SR, and half a day to do the A-type [optical]. All of a sudden, in reverse proportion to what's going to be seen, you get to spend time making masters. So if most people are going to see it in [Dolby Stereo], we should be spending the most time on what the largest amount of people are going to see. Because of the vanity of the business, we're really not doing that.

Are you hinting that the 2-channel LtRt Dolby Surround mix most people hear is going to be a compromise?

Sure. And you gamble with it a lot in terms of levels. I want things to have impact quietly as well as loud, and you're just gambling that you're going to get it playing properly in the theater. At some point, you have to decide who you're mixing for, and you have to use yourself as the audience. But you have to believe that your instincts are right for these things, because today's [discrete] formats carry your intentions much better than with the optical mix. Luckily, we work on movies that generally have wide releases in the showcase theaters.

It is said that "production follows the negative home." Is Hollywood still the center of the movie-making industry? Even though digital tielines between remote editorial and mixing facilities allow directors to view work in progress, is Hollywood still important?

I don't see any benefit in splitting the community. This is still a very interactive process; I want the relationship between the director and the mixer to be maintained. I don't know how it would work having a TV screen from Portland talking to you about the mix as it was going along. There's something missing in that approach.

To me, as an operator and as a studio owner, the idea that I don't need to buy real estate is maybe one good advantage. I can use telephone lines and hard drives to transfer materials—it is convenient to have our new editorial rooms [at the former Skywalker South facilities in the Lantana Center in Santa Monica]—but we need to be close to the directors and production offices.

I have an acquaintance who was hired to do a study on where the motion picture business will be in 20 years, and Northern California was their answer, because the emerging technologies in training and development are not happening in Hollywood now. And, according to the study, the centers that will attract people are based in Silicon Valley.

Is there one piece of equipment or process you don't currently have that you would like to have available?

Yes, I'd like to have the Sonic Solutions NoNoise on a single button. We have it, but it breaks my heart that it doesn't get used more. We're going to road-case it to put on the stage. It stops the traffic dead when you use NoNoise, but you can't spend that much time. So I'd like real-time NoNoise on an in/out switch for cleaning up noise on dialog.

There's some devices I've gotten in the last few years that have allowed me to do some problem-solving that you couldn't do before. On *The Firm*, we used the new Focusrite Red 2 equalizers. We got to a scene in the front that wouldn't mix; a big scene between Tom Cruise and his [screen] wife. We flat out couldn't clean up the dialog. Sydney [Pollack] wouldn't believe the track was so screwed up. We took it to the source tapes, and then we called the production mixer. It was a really big, pivotal scene in the movie, and we couldn't dig the dialog out, levelwise. It was an outside scene late at night, where [Cruise] gets her out of the house, into the backyard. We worked for a day on it, and I finally got in a couple of these Red 2 equalizers, and, sure enough, that was it.

I'm also looking for something that will let me do a quick digital copy. Like contact-printing in photography, you should be able to run a soundtrack, peel off a copy of it and have it available as fast as possible. We do it now with the Tascam DA-88s, but it means moving patch cords. I'd love to see somebody come up with a way of being able to make a quick digital copy, with total confidence.

Let's not forget random-access hard-drive recorders as a replacement for multitrack and mag dubbers?

To me, that will be the most significant development. It will change the whole architecture of this company, because we don't need the machine room. Because of digital technology, the whole sociological fabric that makes up this company is going to go through a big change. It isn't just in the mixing stages; it's in the whole proposition of the studio, the architecture, the transportation side of it, the use of space.

The reason I still mix is something that my father taught me. When I was a teenager, he said that most people in our society are going to be in service jobs; you're going to push a pen across a desk, or you're going to write a policy, or you'll do a legal brief. But his father was an engineer who worked on the Erie Canal and built bridges and dams. He created something. If you can walk away at the end of each day having created something tangible, my father suggested, then you will have a much more fulfilling career. At the end of the day, there is a soundtrack that wasn't there when you started; something permanent that can have an influence on people's lives. ■

Former editor of Recording Engineer-Producer *magazine Mel Lambert currently heads up Media&Marketing, a consulting service for pro audio firms and facilities.*

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Understanding ISDN

WE'VE ALL DONE IT. The record label in New York doesn't quite like the new mix, so we have to send them a DAT master overnight. The deadline for getting it to the label is today, and now there is no chance to make it on time. Even worse, we've missed the deadline for all those lovely overnight services. Someone mentions that they could drive all night and part of tomorrow and have it there by noon. You know you're desperate when you consider it.

ISDN, or Integrated Services Digital Network, has been around for a number of years, but now it is ready for prime time. With an audio or video source and a codec (compression-decompression) box (such as one from CCS, Dolby, Re America or Telos), you can send digital audio around the world in real time. Basically, ISDN is the futuristic digital replacement to the analog telephone line. Except, it is offered and touted by the regional Bell telephone companies today. Its popularity stems from the fact that it is the cheapest and most accessible way for virtually anyone to gain access to a wide-area, all-digital network. It is also the digital transfer medium

BY JAMES D'ANGELO

of choice for the U.S., Europe, Japan, Australia and elsewhere.

The Basic Rate Service of ISDN is a single digital line broken down into three channels: two bearer channels (B-channels), which transfer data at 64 kbits each, and one data channel (D-channel), which moves at 16 kbits. This basic configuration is sometimes called 2B+D. These days, though, the phone companies work on a bandwidth-on-demand concept, and the user can request data transfer rates in multiples of 64 kbits. So, a studio with a larger budget or greater demand for audio/video transfer may order the equivalent of three ISDN lines and use them simultaneously to transfer larger amounts of data or a less compressed signal.

Integrated Services Digital Network has been around for a number of years, but now it is ready for prime time.

Pricing for ISDN services varies by state. Monthly charges for the service range from $27 to $100 for the basic service (up to $250 for installation) and go up with each additional line. In California, where the service is the least expensive, the state decided years ago to commit to the new technology and has pushed to keep prices down and accessibility high. Unfortunately, as the consumer purchases more and more bandwidth (more lines), there is no real break in price. The price of the ISDN PRI, or Primary Rate connection, which transfers data at 1.5 Mbits, can be prohibitively high (approximately $800 dollars for the installation and about the same amount for the monthly service fee). Still, this type of service is used by many large commercial studios and film houses to send dailies and mixes over long distances in real time.

CODECS

For the purposes of digital audio, it is important to remember that one ISDN line cannot

transfer CD-quality stereo audio unless it is processed through a codec. The codec compresses the data almost 12 to one and sends it over the ISDN line to another codec that decompresses the data for playback or storage on conventional audio systems.

The big problem with this scenario is that codecs are not perfect. A 12:1 compression ratio is considered by many professionals to be unacceptable for studios and, in some cases, even broadcast. Also, after a couple of transmissions (i.e., compression/decompression stages), an audio signal starts sounding distorted and strange. This sounds similar to the distortion obtained when pumping a signal through repetitive A/D and D/A conversions, but codec distortion is far more noticeable. The rule of thumb when dealing with high compression ratios is to avoid compressing data more than once. If the signal has to be sent back and forth, it becomes necessary to lower the burden of the compression by purchasing more ISDN lines, which effectively increases the bandwidth. Two ISDN lines allow for 6:1 compression; and three lines, a 4:1 compression, and so on. So, to get uncompressed audio transfer, the ISDN 1.5Mbit/sec Primary Rate connection is the bare minimum. But as stated before, this can become expensive.

FULL-FEATURED CODECS

To combat the problem of expensive ISDN bills, the big codec companies (CCS, Dolby, Re America and Telos) have begun releasing second-generation codecs. These tout new and improved compression algorithms that color the signal (audio or video) less and less, and some even use the ISDN line connectivity to provide intelligence and compatibility with newer compression schemes. In response to feedback from users in the film, video and pro audio communities, these new codecs offer easier-to-use interfaces, more inexpensive solutions, all-in-one packaging and compatibility with professional systems. They have also bundled previously expensive goodies such as SMPTE, terminal adapters and AES/EBU digital inputs and outputs.

The new CDQ Prima Series from CCS (Holmdel, N.J.) is addressing many of the current problems with ISDN data transfer. These new units, billed as "The World's First Intelligent Codecs," offer full support for real-time, 20Hz to 20kHz audio combined with complete SMPTE timecode delivery. Uses would include commercial production, mix approval, ADR and numerous remote applications. The picture or master audio tape can be synched to the ISDN transfer, and the talent can cut vocals, guitars or whatever from across the globe.

The Comrex (Acton, Mass.) DX230E and DX230D ISO/MPEG Layer II Digital Audio Encoder and Decoder transfer audio over digital transmission paths as low as 112 kbits per second. Like most of the other products, they feature digital inputs/outputs and 18-bit A/D and D/A converters for sending predigitized or analog audio.

Dolby Labs (San Francisco) has simplified the ISDN audio transfer process with its DolbyFax system. Comprising a Dolby AC-2 encoder/decoder pair at either end of an ISDN phone line, along with a

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terminal adapter, DolbyFax is a complete package that makes the transmission of audio over phone lines no more complex than operating a fax machine. However, the system uses proprietary Dolby compression, so users on both ends must have a Dolby system.

The Re America (Westlake, Ohio) 662 and 663 Musicam Encoder and Decoder Series features three built-in ISDN terminal adapters and inverse multiplexing capabilities to facilitate the use of more than one ISDN line, which takes the load off of the compression algorithms. With three ISDN lines, the user can transfer data up to 384 kbits. Re America uses the ISO MPEG Layer II compression for audio signals and can be interfaced through a configurable digital input/output (AES/EBU or S/PDIF).

The Zephyr unit by Telos (Cleveland, Ohio) has been a flagship codec for a few years. The unit is one of the first to provide a feature-rich codec box at a reasonable price. Using the ISO/MPEG Layer III compression for audio transmission, the unit provides complete metering for both the send and receive audio paths, as well as an audio limiter to prevent those annoying digital aliasing and peak noises.

COMPATIBILITY

Because compatibility between all the codecs is a big issue, the CCS Prima Series allows for compression algorithms to be installed by dialing up CCS and putting the unit "online." This is also a great way to avoid obsolescence. As new algorithms are developed, the Prima Series is able to import the compression software over the ISDN link, avoiding the typical hardware upgrade or studio downtime.

Unfortunately, all the main codec companies follow their own drummers when it comes to compression (Dolby's compression is proprietary; others use the MPEG levels I and II; others use MPEG III). And none of them can talk to each other. So, if you are trying to send a file to another location or studio that uses a different form of compression algorithm, you are forced to use what is known as a bridging service. These services have access to all the common compression algorithms, and they will decompress the data they receive from you and recompress it in the new format for transfer to the

FLYING THE EUPHONIX

5 MINUTES IN THE PILOT'S SEAT

Take a seat at the Euphonix CS2000. Seventy-two faders are in reach without stretching or moving your chair. The top knob on the channel strip is adjustable without bending your back. The surface is cool and comfortable and the large color flat screen casts a warm glow on your face.

Load the 'title' you started last week into the console from the removable cartridge disk. All those hours of meticulous work have been carefully preserved. Hit the console 'locate' button and select the top of the piece. Forty-eight tracks of digital tape are commanded to the cue. Press 'play' and the room instantly fills with the familiar mix - same EQ's, same dynamics, same reverbs and delays, same everything. Last week suddenly seems like a just few seconds ago. As you listen to your work you can't help thinking **"without a Euphonix, I'd still be twiddling console knobs and resetting my outboard gear!"**

Forget about SnapShot Recall and Total Automation for a minute and just listen to the sound. That's where the Euphonix really soars - that smooth, rich, high-resolution, analog sound. "How do they do it?" you ask yourself, **"Euphonix has built a high-end analog desk that has everything you thought you needed digital for."** You already know that Euphonix consoles are found in many of the world's finest studios and have earned a reputation for unbeatable sound quality.

Back to work. You make some minor adjustments to the overall balance. **Faders, pans, mutes, and solos are all where you would expect them to be on the desk in front of you - no awkward paging or techno interfaces.** This console feels like most traditional consoles for basic mixing. But when you need to get a little deeper into individual tracks there's nothing like it.

Without moving an inch from the center mix position you reach over and solo a track. The track needs a little improvement in this passage so you set the tape machines to cycle with a couple of key presses. It sounds wrong, too aggressive. Glance at the screen and you'll notice a sharp peak in the track's EQ response curve. Grab the 'HM gain' knob and back off the boost a little. Then take the 'HM Q' down a little. It sounds much better and the curve doesn't look so radical anymore. Now the smoothness is there but it still sounds a little squashed. Hit the 'Dyn' button and back off the compression ratio knob a little. The GainBall on the screen isn't pumping so hard and now it sounds perfect. With automated SnapShots enabled, those EQ and dynamics adjustments are automatically saved just before the next cue. **No tricky key press sequences are required - no hassle.** As the tape rolls through the next cue, a new set of EQ's and Dynamics are instantly recalled. They sound just like they did last week - perfect. How did you ever manage without this feature?

Next challenge. A track needs editing and you need to do it on the workstation. **Since your favorite workstation is communicating with your console this is going to be easy.** Without moving from the center of the mix position you locate the track to the problem spot, route the audio over to the workstation input and hit record at the appropriate time. Roll your chair over to the workstation and make your edits. As you play back the track from the workstation, both tape and console instantly locate and play exactly as they did when the track was on tape. Move back to the center of the desk, assign the workstation track back to tape, locate the machines, and drop it back in. It's Fixed.

Now you realize the plate reverb effect at the next cue isn't quite right. Again, you cycle the tape through the cue. **While the piece is continuously cycling you hit the program change button for your favorite digital reverb right on the desk in front of you.** Step through a couple of algorithms until the right one fits. Finally it sounds perfect so you turn off the cycling and let the tape roll into the next cue. The reverb program change is automatically saved.

Your five minute session is nearly over and you still need to fix that automated ride on the voice track. The moves were perfect but the overall level isn't up enough in the mix. Hit the 'trim' and 'write through' buttons and then punch in on the voice fader. As you trim up the fader on the channel strip you notice the central assignable moving fader playing the same moves, just offset a little higher. The overall level is now exactly where you want it. Hit the 'stop' button and your trim is automatically saved as a new pass.

Your time is up. Press the 'save title' button and your work is neatly buttoned up and put back on the removable disk. Congratulations! You've landed safely after completing more work in five minutes than you ever thought possible. The studio is now free for the next quick-turn project and you're free to go to the beach.

desired location. The problem is that bridging violates rule number one of codecs: avoid compressing the data more than once. So, until the world is all one happy place, and everyone can use each other's compression schemes, look for a codec that's compatible with the places to which you will be transferring data.

VIDEO IS ANOTHER BEAST

The world of post-production for film is another beast altogether. Codecs and ISDN have been used for years to do long-distance Automatic Dialog Replacement (ADR) sessions. The technology is ideally suited for sending a high-quality mono audio signal with some SMPTE or accompanying sound so that an actor in Budapest can lay down vocals in Los Angeles. We've all heard the anecdotes about some famous actor cutting tracks from another country, how they saved their studio money, etc. But, the envelope of signal transfer is being pushed again. No longer satisfied with mere audio transfers, the major movie studios are looking to send video dailies over phone lines. Recently, John Hughes, the director of *Home Alone* was working on post-production for his remake of *A Miracle on 34th Street*. Over a 45-megabit, DS-3 data pipe (the equivalent of approximately 40 ISDN lines), the editors at LucasFilm sent real-time video dailies to his office in Chicago. The video was compressed using proprietary Avid Technology algorithms, and six tracks of sound were compressed using Dolby's AC-2 audio compression. The result was a picture and sound package in Chicago, sent from Los Angeles, that was good enough to check the edits.

ALTERNATIVES TO REAL-TIME TRANSFERS

Unless you have access to a DS-3 data pipe, don't expect to get good-quality, real-time video transfers over telco lines. And other than leasing some satellite time, a more affordable alternative is to step out of real time and transfer the files as fast as you can without sacrificing quality. For reasonable video transfer quality, it would take at least four ISDN lines half an hour to transfer one minute of video. To some, this might seem unacceptable, but for those people in commercial production and other short-format video, a four-minute file can be transferred in about two hours, which is certainly fast enough for most applications. The rates are cheaper at night, so you can send the file while you're sleeping, and your counterpart 2,000 miles away can pick it up first thing in the morning.

Additionally, there are certain applications or fastidious users who refuse to compress their music. For them, the expense and delays of transferring audio are still a reality, but for the rest of us, there is a real-world, rather inexpensive solution for transmitting our recordings. The local phone companies are competing to roll out their ISDN packages and, in some instances, actually advertising their features. This is a dramatic difference from just a couple of years ago, when you'd be lucky to find a tech at the local phone companies who understood the terminology associated with wide-area, all-digital communications. ■

James D'Angelo is the technical editor of Mix.

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by Mr. Bonzai

AL KOOPER

"SOUL OF A MAN"

Producer, writer, B-3 terrorist, dark songbird, Al Kooper starts off the liner notes to his first live solo album *Soul of a Man*: "Am I fifty already? Someone please help me over to the typewriter. *Okay, okay, I'll use the walker!*" This double CD is a living, breathing, explosive document of Kooper's birthday party reunion at NYC's Bottom Line with his old Blues Project; the original Blood, Sweat & Tears; his current band The Rekooperators; plus special guests Johnnie Johnson, John Sebastian and a fine bunch of smokin' pros. The bash was captured by engineers Koostер McAllister, Steve Rosenthal and their gang of technoids.

The Kooper touch sweeps across decades of American music, including his snappy beginning with the Royal Teens (post "Short Shorts"), co-writing the Number One 1965 hit "This Diamond Ring," his organ work with Bob Dylan on *Highway 61 Revisited* and *Blonde On Blonde*, his *Super Session* with Mike Bloomfield and Stephen Stills, producing Lynyrd Skynyrd, cutting with the Rolling Stones and Jimi Hendrix, scoring the progressive *Crime Story* TV series, and generally sounding better than ever today. Kooper and I lunched back in the '80s, so recently he asked, "Mr. Bonzai, how long do I have to wait to have lunch again?" I'm hungry, how about you?

Bonzai: After all these years, are you finally getting the respect you deserve?
Kooper: Naaah, but I'm getting to make the records I want to make.
Bonzai: How did you put together such a great bunch of musicians for this birthday concert?
Kooper: Not without help—from Allen Pepper, owner of The Bottom Line, and Danny Kapilian, executive road manager extraordinaire.
Bonzai: How long had it been since the Blues Project got together?
Kooper: We've played together over the years—that regrouping was not as unusual as getting together with Blood, Sweat & Tears, which only got together one other time since the '60s, in 1993. We had an amazing show, played the album from start to finish in sequence, with the aid of a string quartet, background singers and the original producer. I didn't record it, so that was the inspiration for this record.
Bonzai: Would you consider *Soul of a Man* a historically important album?
Kooper: You mean like Winston Churchill or Hitler? No. To me, it's a payback to my fans for putting up with all this madness through the years. This one has everything I

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thought the fans would want.

Bonzai: Who is this guitar player, Jimmy Vivino?

Kooper: Jimmy has been my soul partner for the last ten years. He's helped me immeasurably with my music, and I've imparted what wisdom I could to him. He plays guitar in the Conan O'Brien band every night, which has screwed up my touring. He's a fantastic player.

Bonzai: What's the difference between the Blues Project and Blood, Sweat & Tears?

Kooper: Blues Project was very punky for the time, a very punky band at its best.

Bonzai: What was your first single?

Kooper: "Violets Of Dawn": I make some fun of it on the record, but it's one of my favorite tracks. Kids today that emulate the music of the '60s have to try real hard to get that sound. We can do it with our eyes shut. It's sort of an art form to play that music. Tom Petty and The Heartbreakers may be the best at it, of the people who weren't actually there.

Blood, Sweat & Tears was a more polished pop music band, with a lot of influences. The writing period gave it focus. I wrote a bunch of songs that related to each other, and with the other songs I picked, it fit together really well.

Bonzai: *Child Is Father to the Man*—what does that mean?

Kooper: Music is constantly reinventing itself, to be the same thing again, with variances.

Bonzai: Was it a treat playing with Johnnie Johnson?

Kooper: It was. He was on the last album, and we got along great.

Bonzai: What did he bring to modern music?

Kooper: A tap on the shoulder, saying, "Yo, I'm what you listened to when you were 13 years old." I had no problem with that, and it was just a thrill to play with a guy who I was copying when I was 13. The piano work on the Chuck Berry records is textbook blues playing. He and Otis Spann were my two biggest influences.

Bonzai: And by the age of 15 you were in the Royal Teens?

Kooper: Fourteen, but who's counting. It was good for me and gave me focus. I knew what I wanted to do, and I got right to work.

Bonzai: And by 1965, you had penned the classic "This Diamond Ring"?

Kooper: Actually, it was written in 1962 but came out in '65.

Bonzai: Was Hal Blaine playing drums on that, or Jim Keltner?

Kooper: Jim Keltner, and it was one of his first. I had nothing to do with that record, other than writing. I didn't particularly care for it.

Bonzai: Do you still get royalties?

Kooper: Yes, but there are three writers on it, so it isn't as lucrative as it could have been. But it is approaching its two millionth play on the radio.

Bonzai: In your opinion, why did your performance with Bob Dylan and Mike Bloomfield at the Newport Folk Festival in 1965 cause such an uproar?

Kooper: I think my fly was open [laughs]. Seriously, first of all, it was very chaotic—we had never performed together live and only rehearsed once the night before. It was sloppy and not what people were expecting. But I believe the booing thing was misinterpreted—the reason people booed us was because Dylan only played three songs. He was the star of the three-day event, and many people in the audience endured things they didn't want to see so that they could see Dylan. Everybody else played 45 minutes to an hour, and he only played 15 minutes.

> I'm not a shocking type of guy. I'm just a crusader of music for music's sake. It's even more important to do that now than ever before.

Bonzai: So it wasn't the electric thing?

Kooper: I don't think so. Now, coinciding with that, behind the scenes the directors of the festival were arguing about so much electricity, drummers and that sort of thing. But that wasn't known by the audience. The Chambers Brothers played; Paul Butterfield played; all with drums and guitars, and they didn't get booed. So, I don't think it was the purist thing. I think it was the fact that they waited three days to see Bob Dylan and he only played 15 minutes. They

were pissed off, and of course, no one prepared them for the fact that he would be electrified.

When we played Forest Hills later that summer, they had read that they were supposed to boo us. I understand that, because they were just following what they were told to do by the newspapers. "Like a Rolling Stone" was Number One by that time, so they booed us, and then they sang along. The next week, we played the Hollywood Bowl to no boos—must have been because of the much cooler West Coast.

KEVIN KNIGHT

Bonzai: You played piano and organ on "You Can't Always Get What You Want," but how did you come to play the French Horn?

Kooper: I studied at the University of Bridgeport.

Bonzai: Did you graduate?

Kooper: Hell, no. I would have liked to graduate, but the curriculum was designed for teaching music, which I knew I wouldn't do.

Bonzai: Was there anything unusual at that Rolling Stones session?

Kooper: The thing I remember the most was the dinner break. They had a van bring in everything under the sun: lamb chops, curry, salads, soups. It was the most elaborate studio meal I had ever had in my life, and I was very impressed. Even Dylan didn't go further than cheeseburgers. It was a very nice session, and I have Nicky Hopkins to thank for it, because I was in England and he was in the United States. I think they called me because he wasn't there.

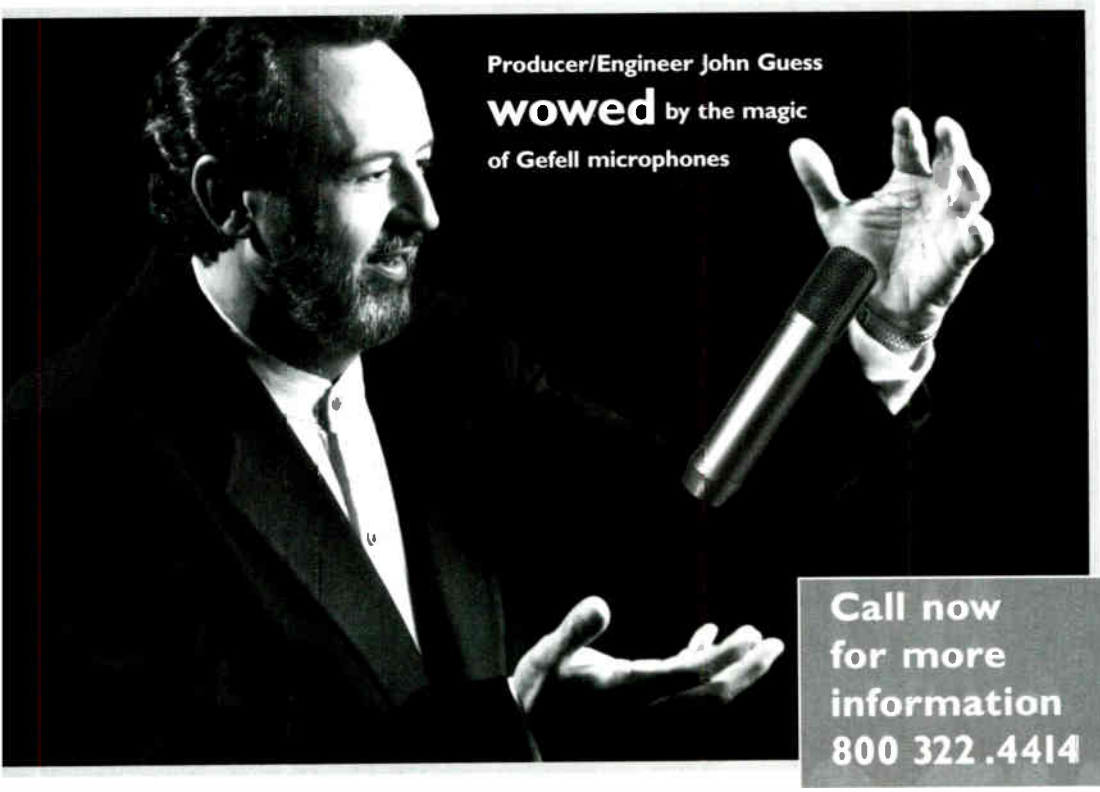
Bonzai: You dedicate this album to Nicky, as well as Harry Nilsson, Mike Bloomfield and Danny Gatton...

Kooper: Because I miss them.

Bonzai: How are you doing?

Kooper: I'm doing fine.

Why do they call it Gefell



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Bonzai: Do you still have an ulcer?
Kooper: Oh, yeah.
Bonzai: Do you still have insomnia?
Kooper: Yes, and now it's finally properly documented: Stephen King dedicated his new book, *Insomnia*, to me. He also did the liner notes for the last album.
Bonzai: Do you guys hang out a lot?
Kooper: Not a lot, because he lives in Maine, and I live in Tennessee.
Bonzai: When are you coming back to California?
Kooper: Never, not even for the NAMM show, which I haven't missed for 14 years. The earthquake scared

> I just try to put out a record that's exactly what I want it to be. To me, that's what successful means.

the hell out of me. It was a life and death warning, and it was not wasted on me. The quake was at 4:30, and I was in the air at noon.
Bonzai: Who packed your bags?
Kooper: I did, and not very well. I was staying at my lawyer's house, and he sent me my soiled underwear shortly thereafter. A memento of that earthquake.
Bonzai: What is your basic computer music setup?
Kooper: Currently, I'm running all my music stuff on a Mac Classic II, which is now completely antiquated, because I can't use the latest edition of my sequencer. I'm using an old version of Performer 4.2. I have to get a PowerMac for my main system, and then I'll be able to relegate my old IIci to my music work and run Performer 5.2. I have quite a collection of equipment, which started with that TV series I scored, *Crime Story*. That's where I got into computer music. I have a lot of Korg stuff —a Korg M1R, an O1/W, a Wavestation, three EX-8000s. I use my Yamaha TX7 for bass on just about everything, Alesis D4 for my drum kit.

—CONTINUED ON PAGE 220

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—D&R ORION REVIEW, MIX MAGAZINE

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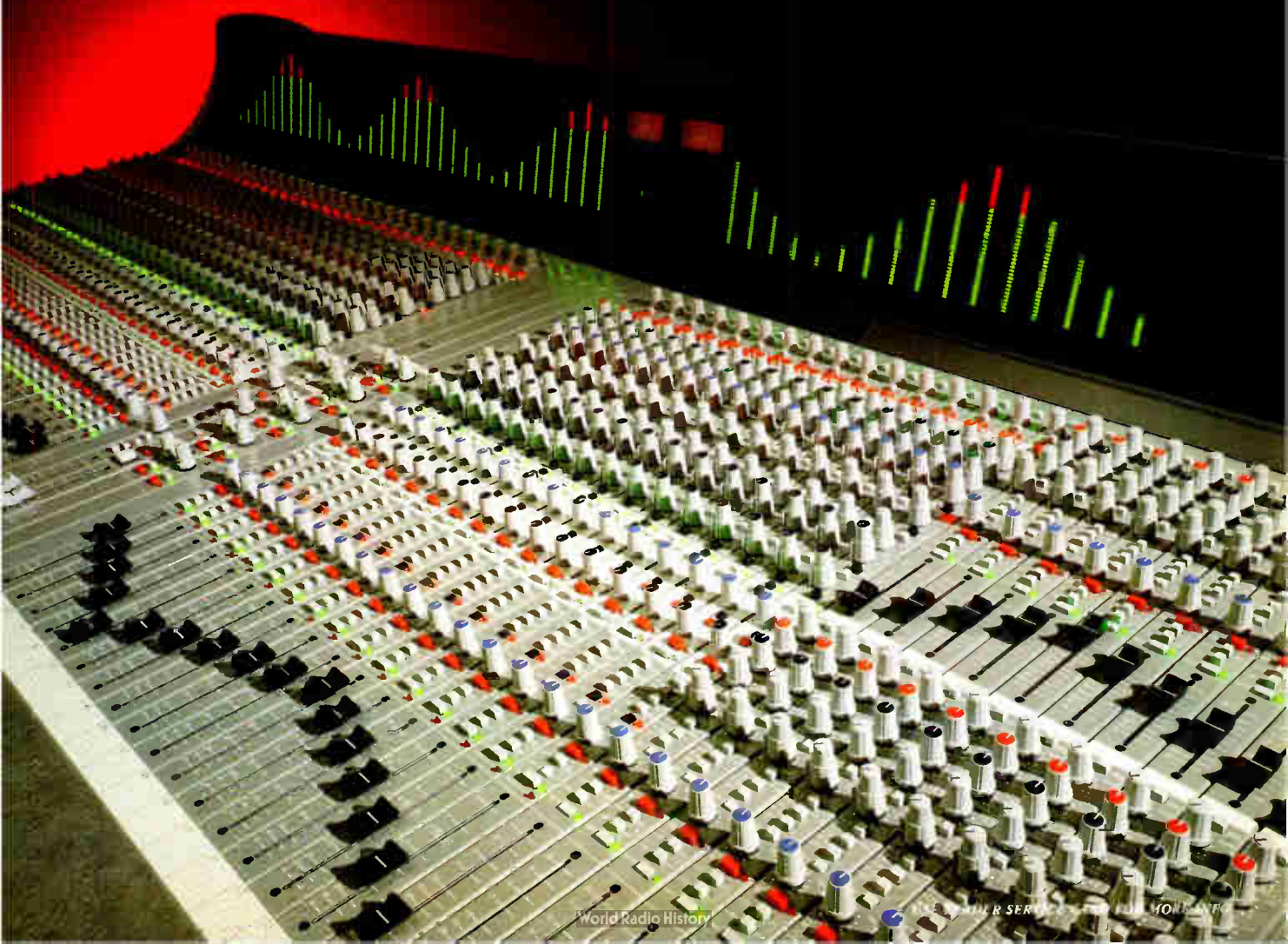


Video for Audio

PART I: THE VIDEO SIGNAL

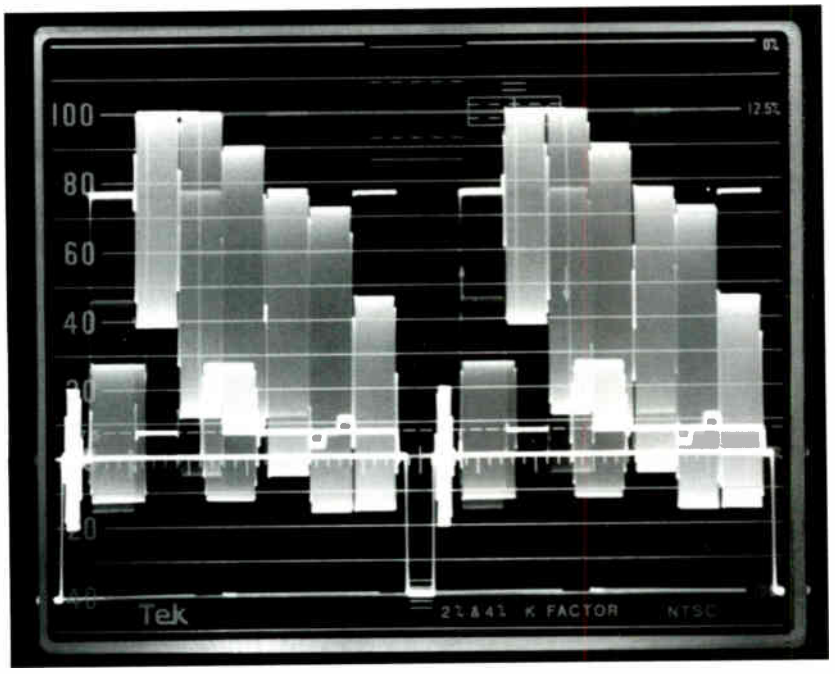
BY PAUL McGOLDRICK

[Editor's Note: This month, we launch a new series, by industry veteran Paul McGoldrick, entitled Video for Audio. Yes, you read it right: Video for Audio. And no, we have no plans to turn Mix *into a video journal. Yet at the same time, the notion of presenting some video fundamentals to the audio community is not without merit, as knowing a little more about the picture side of the business can only help foster a better understanding among all the players on the team. Also, this series is designed for the working audio engineer: We've made a few assumptions about typical* Mix *readers and avoided the bonehead "What is a helical scan?" approach, instead focusing on issues that relate to real life in the post lane. —GP]*

There is no audio-visual programming without both audio and video: A fact that is often neglected in the production world, where audio is often treated as the poor stepchild. Over the next few months, we are turning the tables and looking at video as the add-on to audio: What is happening to the video that can distract from the more important audio?

While we don't want to get bogged down in the theory of video, we do want to get an understanding of what video is like in real life and, at least, to begin to understand how problems with the video signal occur and can be recognized. (The less time devoted to troubleshooting the video, the more that can be devoted to the audio, right?) We'll start with a quick look at the various flavors of "video" and the pitfalls common to each.

An analog video signal can be in two basic forms, composite and component. Composite is exactly what the word says—a mixture of the various parts needed for a complete, accurate display (i.e., red, green, blue and sync mixed together on one line).



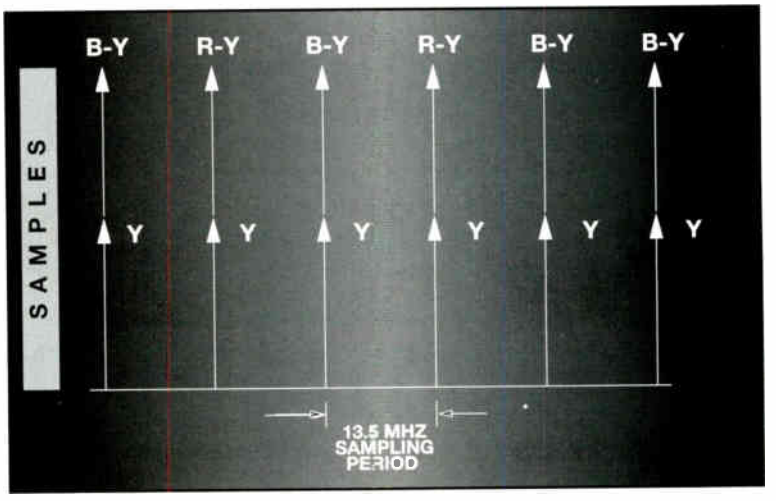
Top, Figure 1: Waveform monitor display of one line of SMPTE color bars, in NTSC composite format

Below, Figure 2: Picture monitor display of SMPTE color bars with waveform monitor display inlaid

Below right, Figure 3: Vectorscope display of SMPTE Color Bars

Figure 4: Co-siting of alternate color-difference samples in 4:2:2 digital component video

All photos are courtesy of Tektronix



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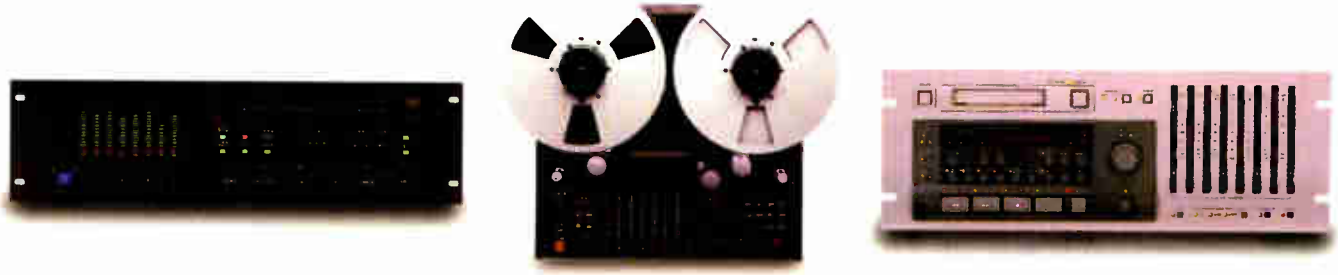

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Figure 5: Digital "eye" display for evaluating the integrity of the digital system

The important constituents are the positive-going, visible video, the negative-going synchronizing pulses (for fly-back at the end of each line and each field), and the color burst appearing at the beginning of each active line.

Today's composite video is a compromise color system that was designed to allow earlier monochrome receivers to use the signal as well. NTSC (National Television Standards Committee) is used in the U.S., Canada, Korea, Japan and parts of South America. PAL (Phase Alternate Line) is used in most of Europe, a lot of Africa, Israel and most of Asia. SECAM (SEquential Coleur Avec Memoire) is used in France, French territories, the countries that formerly made up the Soviet Union and most of the Middle East.

All sorts of problems can occur in synchronizing parts of the video signal, including precipient events caused by timing (to be covered later in this series). Those problems can cause visible deterioration of the picture, often associated with image stability. For the purposes of this article, however, we want to look at image problems caused by purely picture effects.

The two main parts of the active video signal are luminance and chrominance. Luminance represents the black-to-white content of the image; it is merely the picture as it would appear as a black-and-white image. Chrominance represents the color content of the picture. The manner in which these two signals (luminance and chrominance) are combined or separated creates most

of the inherent problems of composite video. In order to view the performance of the system (without trusting your eyes), two signal-monitoring devices are used: the waveform monitor and the vectorscope.

THE WAVEFORM MONITOR

Fig. 1 shows the waveform monitor display of one line of SMPTE color bars. This is a standard line-up and test signal for operational use (shown in picture form in Fig. 2). The white bar—at the leading edge of the line—sits correctly on the 100 IRE graticule of the display. At the end of the line, black is at the correct 7.5 IRE setup point. The color bars themselves are filled with the chrominance. The yellow and cyan bars peak at 100 IRE. The average amplitude of these bars (which is visible on the monitor if the lowpass filter is switched in) represents the luminance level of the bar.

When setting up real pictures, we should be concentrating on the picture quality on the picture monitor, while also verifying that no luminance information goes above 100 IRE or below the 7.5 IRE setup on the waveform monitor. Any information that goes beyond these limits will likely be clipped at the first video processor in the chain.

THE VECTORSCOPE

The vectorscope is an analysis tool for chrominance. The composite video signal is separated, and the two axes of the chrominance are displayed. Small boxes on the graticule show the location of perfect color bars, with the color burst lying along the left axis. With the SMPTE bars displayed in Fig. 3, we also see vectors along the I and Q axes. The center of the display represents a lack of chrominance—where, say, white and black bars would fall on the display. If you follow the trace from the center, you can see the transition to yellow (YL) and then to cyan (CY), green (G), magenta (MG), red (R), blue (B) and then back to the center for black. The vectorscope is vitally important for initial setup of most source and encoding equipment, and for timing of signals so that they are coincident for color accuracy. Most users have little interest in the vectorscope display during normal program production unless the material is highly saturated. This can occur when an image contains an abundance of computer-generated images.

COMBINING THE SIGNALS

As noted earlier, it is the combining of luminance and chrominance—and then later separating them—that causes continual problems in video quality. These effects include dot-crawl and cross-color.

Component analog video overcomes the need for encoding and decoding within the production chain by maintaining the primary signals as separate channels. There are two main component systems with a number of subsets. The first uses color television's primary colors of red, green and blue (RGB); the second uses luminance (Y) and the two color-difference signals of blue-minus-luminance (B-Y) and red-minus-luminance (R-Y). These three signals allow for the mathematical solution of any required signal while removing a lot of redundancy.

RGB systems require full-bandwidth processing for all three channels. They therefore normally use identical equipment in each and cause few operational problems after their initial installation. Some monitoring problems can occur when sync pulses are carried in different locations or in some cases are not carried at all (there being no recog-

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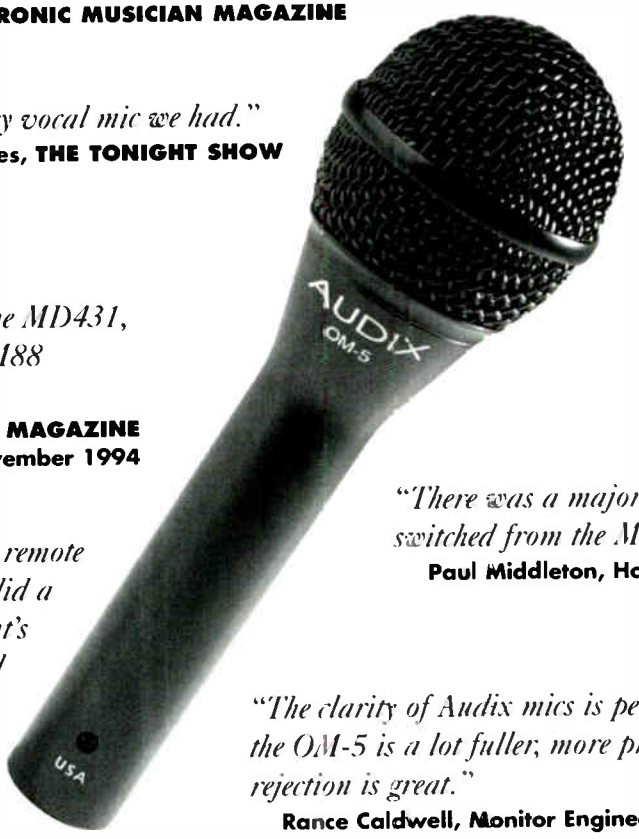

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nized "standard" for RGB systems).

COMPONENT VIDEO

Component recorders—using luminance/color-difference signals—are probably the most common video-capture systems today. There are differences between the signals within the two main offerings (Betacam from Sony and others, and M-II from Panasonic), but those differences are basically invisible to the user. It is important in both formats that the component inputs and outputs be used whenever possible, to preserve the component status.

There are component waveform monitors and vectorscopes available. There are also instruments that can be switched between composite and component. All instruments are provided with switching between RGB and the two main color-difference formats. Most people have problems reading component waveform monitors, probably because of years of looking at a composite display. As a result, manufacturers are slowly moving to more intuitive devices with alarms, color changes in the displays, etc., when items are out of tolerance. But, in general, we are still looking for luminance to be between 0 and 0.7 volts and for the color-difference channels to be falling within a similar range with swings from -0.35 to +0.35 V. The vectorscope is invaluable during setup, particularly for accurately checking channel balance. With no color burst on a component signal, however, the instrument cannot be used for timing. It is important that the channels of the waveform display be overlaid in order to set such timing.

The day-to-day problems of component analog work tend to be in these areas of channel balance and timing. A component recorder cannot be tested properly with composite signals, a message that test-equipment manufacturers have been hawking to mostly deaf ears for some years. When there are quality problems on tape interchange between machines, this is often the cause.

Most failures in component systems tend to creep up on the user, with amplifiers in individual channels dying slowly and being compensated for by gradual increases in other locations. Other problems associated with having three times the number of cables and three times

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the number of connectors should have been sorted out at the time the system was installed. If they haven't, tiny things can bug the performance of a component area on an almost continual basis.

DIGITAL VIDEO

Non-compressed digital video in television (as opposed to computer) technology also has two basic forms: composite and component. Composite digital is the most direct system, being a direct quantization of the active video in a composite analog system. It is an 8-bit system. The great thing about composite digital is that it can be carried on a single wideband coaxial cable, and that in a recording situation, the machine can be literally a plug-in replacement for, say, a 1-inch machine. With composite analog inputs and outputs, the digital interior is transparent to the user. This has its good and bad points: Machine formats or labels are not necessarily good descriptors of the video format itself. So, for example, while a D-2 machine is a composite digital recorder, composite digital is not necessarily D-2.

One continually annoying problem with D-2 is that with only eight bits, it is not possible to set up both white and black correctly, simultaneously. Repeated generations can make this worse unless it is watched. D-2 signals are, effectively, Radio Frequency (RF) signals, and not all video engineers fully understand how they should be handled or what care needs to be taken in matching, for instance, impedances and the quality of connectors. Finally, like all digital systems, there is no warning of a crash; the output is either usable or it is not. When it is gone, it cannot, of course, be re-created.

COMPOSITE DIGITAL

Composite digital has proven to be reasonably popular in NTSC countries for transmission suites—as a direct replacement for Type C machines. It has not been at all popular in the "pure" PAL countries, who are holdouts for component digital. Their argument is that any composite digital system is really only a perpetuation of most of the problems of the existing composite analog systems, because at some stage, the signal was encoded into the composite form, and at some stage, it will be decoded back to component for display. Transmission and recording systems for composite digital are also designed with the removal of the deterministic portions of the signal (with information that repeats—like line synchronization pulses—it should only be necessary to transmit the "where it should be" information so it can be regenerated at reception), and this can make instabilities difficult to locate.

Component digital systems are all based on color-difference signals. In the international standards centered around CCIR-601, the luminance and color-difference channels are sampled at different frequencies, but cosited. Fig. 4 illustrates the process. At 13.5MHz sampling, luminance is sampled at each point, whereas the lower-bandwidth, color-difference signals are alternately sampled—giving each an effective sampling frequency of 6.75 MHz. This gives rise to the coding as 4:2:2 (D-1). There are also 4:4:4 systems and, when an alpha channel is added, either 4:2:2:4 or 4:4:4:4. All are specified as 10-bit systems (but 8-bit systems are allowed), and there has been a scarcity of 10-bit recording systems. So far, 4:2:2 video is the best we have seen in the everyday video world, and it is the benchmark for

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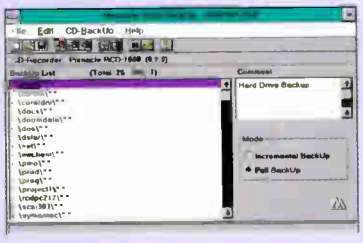

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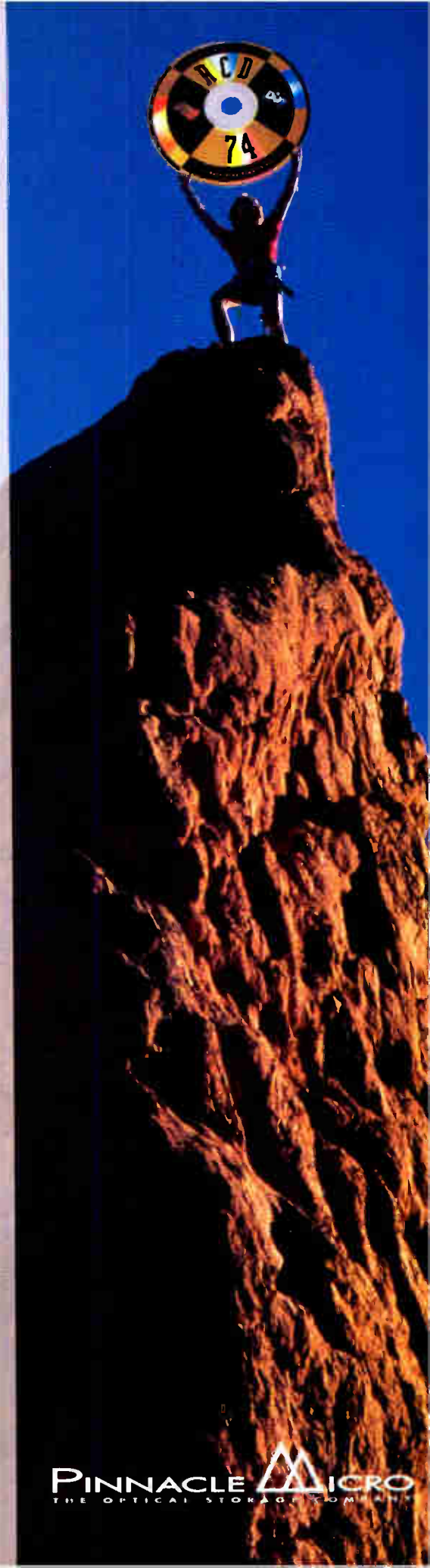

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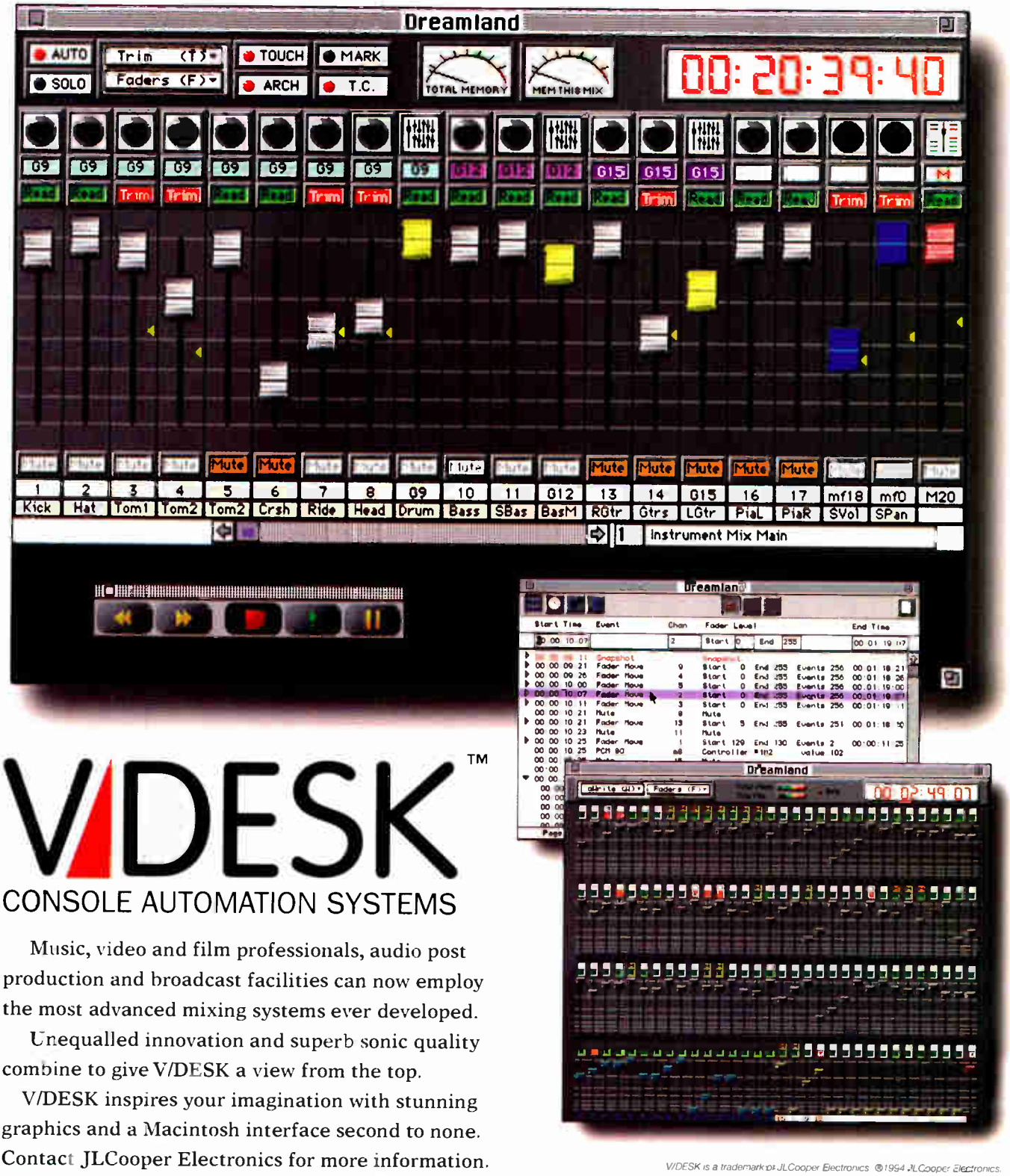

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other systems.

Problems do occur in component digital. Interface problems are common, particularly as the connector decided upon was the computer DB-25 connector. In various phases of the specification, these connectors have had slide locks or screw locks. Both create problems unless the cable weight is taken off the connector itself. The cable needs to be carefully obtained; if the conductors are twisted inside, as in most computer cable, the permitted run before timing problems occur can be very short—maybe only 15 feet. The input to another piece of equipment should reclock the signal as well as offer the correct termination. More problems occur if it does not. If processing is at eight bits and the original signal is ten bits, the bit train should be rounded off, not truncated. Shielding of all component digital equipment is vital. One of the harmonics of 13.5 MHz falls, conveniently, right on an international aircraft distress frequency, and interference there is not something either the FAA or FCC takes lightly.

With affordable component digital recording becoming a reality, more and more systems will be built. To carry the signals over more than a few dozen feet, the signal will be converted to serial, instead of parallel, and will be on a high-bandwidth coaxial cable. This also allows for easy routing switcher operations, reducing at each stage the likelihood that the signal would need to be converted back to a lower-quality system.

Test equipment for the digital world is still very much evolving, with much discussion among users and manufacturers as to what is useful and what is not. Fig. 5 looks into this future with a digital eye display, showing at least that the ability to discretely separate samples has been maintained.

Now that we've outlined the basic types of video you may encounter, next time, we'll examine how the audio and video elements of programming interact in an editing situation. ■

Paul McGoldrick is a technical and marketing consultant who has been in the broadcast industry for 30 years.

NEW PRODUCTS

ELECTRO-VOICE RE2000 CONDENSER MIC

Electro-Voice (Buchanan, MI) introduces the RE2000, a true condenser studio microphone. The single-pattern cardioid transducer is a short-D, high-efficiency unit offering the high output of a large diaphragm and better transient response of a smaller diaphragm. The RE2000's low-mass diaphragm is ultrathin, gold-sputtered and environmentally stabilized. A switchable 10dB pad allows the mic to handle 148dB SPLs, and the mic includes a clip-on pop screen and an outboard power supply for an internal heating element that eliminates excessive humidity at the capsule.

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SAMSON PL 1602 MIXER

Samson Technologies (Hicksville, NY) is shipping its new PL 1602, a 16-input (8 stereo channel), 2-bus line mixer housed in a two-rackspace steel chassis. It has 56mm faders on both bus outputs, along with two low-noise mic inputs, 2-band EQ with ±15dB boost or cut, two aux sends, two stereo aux returns, and balanced inputs and outputs and a headphone out. Retail is $299.99.

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DB TECHNOLOGIES 22-BIT A/D

dB Technologies Inc. (dist. by Audio Intervisual Design, West Hollywood, CA) introduces the Model AD122 Stereophonic Analog to Digital Converter. With conversion up to 22 bits, -122dB noise floor and and a THD+N spec said to be 0.00009%, the unit combines linearity, fast and accurate transient response and very small quantization steps. AES/EBU digital and word clock sync are standard; S/PDIF is optional.

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FURMAN PRO SERIES

Furman Sound (Greenbrae, CA) announces its PRO Series of power conditioners, with three 20-amp/2,400-watt rackmount models designed for digital audio and video applications. A unique combination of MOVs, gas-discharge tubes, fast-blow fuses, high-voltage inductors and capacitors, and precise high-inrush magnetic circuit breakers protects against transients, high-frequency noise and nearby lightning strikes. All models have eight spaced rear outlets to accommodate bulky plug-mounted power supplies. Retail ranges from $359 to $469.

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SPIRIT NEAR-FIELD MONITORS

Spirit Corporation (Sandy, UT) has introduced its Absolute 2 near-field speakers. Featuring a 6.5-inch, cast-frame bass driver and 1-inch, soft-dome high-frequency tweeter using a ferrofluid-cooled voice coil, the monitors are rated at 100 watts of continuous power and offer a frequency response of 45-20k Hz.

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FOCUSRITE RED 6
Focusrite (distributed by Group One Ltd., Farmingdale, NY) announces the Red 6 module, a mono mic-pre and equalizer. The circuits in the Red 6 are identical to those found in the acclaimed Focusrite ISA 110 mic-pre and EQ. As with other Red modules, Red 6 is a two-rackspace unit, with integral power supply, housed in a red aluminum and stainless steel chassis. Retail is $2,500.
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CAD EQUITEK E-300
Conneaut Audio Devices (CAD, of Conneaut, OH) has introduced the E-300 Equitek Series large-diaphragm studio condenser microphone. With 1.1-inch, gold-sputtered diaphragms and 148dB SPL capacity with pad, the unit is switchable for cardioid, omni or figure-8 polar patterns. The frequency response is 10-20k Hz with a dynamic range of 132 dB. Targeted retail is $995.
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DBX 290 STEREO REVERB
dbx (Sandy, UT) releases its 290 digital stereo reverb. Developed for studio and live applications, the 290 offers true stereo reverb in a very simple user interface. The unit features push-button access to select reverb type, room size and color, with LEDs to indicate the selected settings. Reverb types include room, hall, cathedral, plate and several gated reverbs.
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DCE PROJECT PATCH
David Carroll Electronics (Richmond, CA) has released Project Patch™, a patchbay system designed specifically for project studios. The unit combines a high-quality Audio Accessories Mini patchbay with special 8-channel connectors and standard cables available for interfacing to the Tascam DA-88, Alesis ADAT or Fostex RD-8. XLR and ¼-inch breakout cables for interfacing to synths, mixers, signal processing, etc., are also available.
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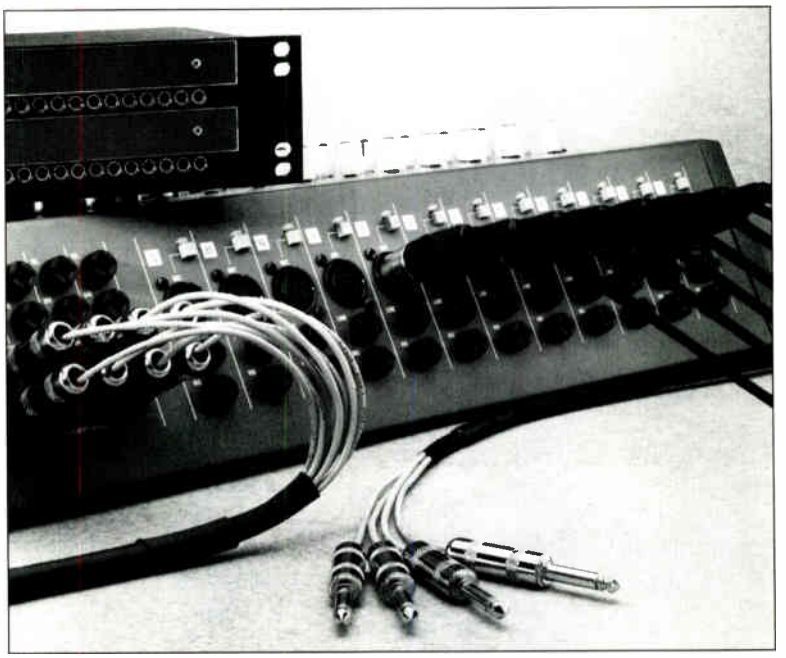

THE MASTERING LAB PREAMPLIFIER
The Mastering Lab (Los Angeles, CA) has introduced a single-rackspace, mono microphone preamplifier. With a 10-40k Hz frequency response, and 0.003% THD (at 1 kHz), the unit uses high-end electronics (polystyrene film caps, low-noise metal film resistors, long-life/silver-plated switches and solid core interconnect wire). Retail is $1,995.
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DYNATEK INFINIDISC
DynaTek Automation Systems (Bedford, Nova Scotia) announces the *infini*DISC high-capacity CD-ROM library system. Handling up to 2,750 disks, the unit has a modular design, consisting of a disc carousel module, a drive module and a main controller module. Each disc module can house up to 250 CD titles or blank media; each drive module can hold up to four CD readers or two CD recorders; and the controller can control up to 12 modules. *infini*DISC supports Mac, DOS/Windows, UNIX and Novell systems.
Circle 236 on Reader Service Card

JENSEN AUDIO INTERFACE
New from Jensen Transformers Inc. (Van Nuys, CA) is the JT-CPI-2 consumer to pro interface. Designed to connect a pair of unbalanced IHF "consumer" (-10 dBV nominal) outputs to balanced (+4 dBu nominal) inputs, the unit eliminates hum and buzz or other sonic degradation. By avoiding the use of coupling capacitors, the unit allows for a wide bandwidth and low-phase distortion signal to pass. Up to four units (8 channels) can mount in one rackspace.
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AMB TUBE-BUFFERED DI
New from The John Hardy Company (Evanston, IL) is the Tube-Buffered Direct Injection Box, which extracts the musical details of musical interfaces without degrading the sound. The single-channel unit is AC-powered. It is built into a 7x4x1.5-inch chassis, uses a vacuum tube input stage and handles very high input levels without compromise in quality. Retail is $595.
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EMPIRICAL LABS DISTRESSOR
From Empirical Labs (Garfield, NJ) comes the Distressor, a classic knee compressor. With programmable analog distortion/warmth, distortion indicator lights, a built-in sidechain EQ and eight compression curves, the unit is a single-rackspace mono compressor that can be strapped for stereo operation. It features ¼-inch and XLR-balanced connections and switchable 110/220 VAC operation.
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AUDIO PRECISION GAT-1
The GAT-1 GPIB-to-APIB Command Translator by Audio Precision (Beaverton, OR) allows test equipment using the proprietary Audio Precision Interface Bus (APIB) to operate in response to commands from IEEE-488 General Purpose Interface Bus (GPIB) controllers. With this unit, owners of APIB-based System One may operate all test and measurement functions using either the existing APIB interface or a GPIB controller. Retail is $1,850.
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ESOTERIC SOUND PHONO DECKS
The Esoteric Sound (Downers Grove, IL) BES-2, 33/78 Disc Deck for audiophiles is a no-compromise turntable. With a high-density polymer platter to dampen vibrations, the unit uses a special low-torque motor to reduce mechanical noise. The precision arm has a fixed headshell design to maximize coupling between the arm and the pickup. Retail is $665. Also from Esoteric Sound is the ATEN, a low-cost 16-inch transcription turntable. The ATEN is belt-driven with six speeds, pitch control, dust cover and a magnetic pickup with LP and 78 styli. Retail is $530.
Circle 241 on Reader Service Card

EMAGIC TDM EXTENSION
Emagic (Nevada City, CA) has introduced the TDM Extension for Logic Audio Macintosh. The TDM Extension allows Logic Audio to run on the Digidesign Pro Tools III system with 16 to 48 tracks of digital audio available. It also expands the feature set of Logic Audio by supporting up to 48 tracks of digital audio, and it allows for an unlimited number of plug-ins per track, up to four pre/post sends per track, etc. Retail is $249.
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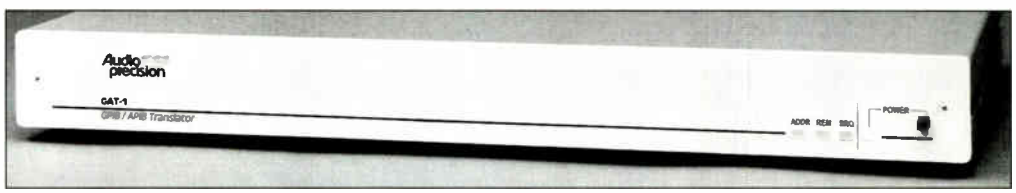
HOT OFF THE SHELF

Techno Lab's Digicon 2 copybit remover eliminates the copy bit (SCMS) to simplify DAT/DAT or DAT/workstation transfers. It also includes an errorcode counter for digital audio error checks of DAT tapes. (402) 895-7382...**Neutrik A and B Series XLR connectors** feature a compact design and come in a variety of chassis-mount configurations. (908) 901-9488...**MCM Electronics'** 324-page catalog includes components, connectors, test gear, VCR parts and more. Call (800) 543-4330 for a free copy...**CAI's CD ColorScribe 6000**, the first full-color printer for CD-Recordable media. Price is $2,995. (408) 254-0395...**ProMusic** has released three new production music CDs (DED Good Music Library, Logical Choice and Justement) as well as MegaDisc ($69.95), with 380 sound effects. (407) 995-0331...**Panasonic Factory Automation's** catalog offers a summary of features and specifications for their line of test gear. (317) 580-3250...**ITT Pomona's 1995 Electronic Test Accessories Catalog** contains 172 pages of over 3,800 products. (909) 469-2900...**FirstCom/Music House/Chappell's** adds 18 new CD titles to its Personal Music Library. Call (800) 858-8880 or (214) 934-2222 for a demo...**Sescom's CT-6 professional audio/video cable tester** indicates shorts, polarity problems, opens and intermittents. Price is $125. (702) 565-3400...**Gepco's Gepcord line** of packaged audio and video cable assemblies is designed to free engineers from assembling finished cable and connector assemblies themselves. (312) 733-9555...The first edition of Sypha's ***The Nonlinear Buyer's Guide*** ($35) gives details on over 150 nonlinear video systems, both online and offline. Call (818) 992-4481 to order. **Music Workshop** ($39.95) is a Windows CD-ROM with 450 MB of ready-to-run music-related programs, pro software demos, samples, utilities, converters, drivers, patches and players. (510) 674-0783. ■



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by Paul Potyen

DIGIDESIGN PRO TOOLS III

DIGITAL RECORDING/EDITING SYSTEM

Digidesign has been a pioneer in the advancement of random-access digital tools for the pro audio community over the past several years, first with its TEC Award-winning Sound Tools stereo recording/editing system for the Macintosh, then with its multichannel Pro Tools systems. And with the release of Pro Tools III, the company is showing no signs of resting on its laurels. Announced at the November AES show and released in December, the Pro Tools III Digital Audio Recording System heralds a new era in digital audio workstation technology. With a base price of less than $8,000, this software/hardware system for the Macintosh offers unprecedented power and flexibility for the money.

The basic Pro Tools III is built around a $6,995 "core system," which consists of these elements:

- One "Disk I/O" (a NuBus card that supports SCSI hard disk connection for up to 16 tracks of record/play for one or more hard disks, and support for one 8-channel audio interface);
- One "DSP Farm" (a NuBus card that supplies the hardware-processing power for mixing and plug-ins);
- Pro Tools 3.0 application software;
- TDM-enabling software and bundled DSP plug-ins;
- DAE, the Digidesign audio operating system, which provides platform-wide compatibility for audio applications and DSP effect plug-ins.

The system must also include at least one audio interface—either the 882 I/O or the 888 I/O. Priced at $2,995, the 888 I/O offers eight balanced XLR ins/outs and eight AES/EBU ins/outs. Any combination

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The PCM-80 is based on a new hardware platform featuring the very latest in proprietary digital signal processing. It's a true-stereo processor with balanced analog I/O as well as digital interfacing – you can even mix the two sets of inputs together. Its 24-bit digital bus ensures the finest resolution within the PCM-80's multiple-DSP architecture.

Onto this powerful platform, we built brand-new algorithms offering a virtually unlimited palette of sounds – some based on your favorite PCM-70 programs, plus many entirely new effects. There's an immense range of chorusing, panning and delay-based programs which can be combined with Lexicon's famous reverberation for startling, other-worldly sounds. There are even dynamic spatialization effects.

Perhaps the most impressive feature of the new PCM-80 is its unique Dynamic Patching™ matrix, which takes the PCM-80 into new sonic realms. Dynamic Patching provides incredibly powerful, synthesizer-like control over your effects. It maps data from external and internal controllers such as footswitches, envelope generators, MIDI controllers, tempo and LFO's – even the input signal itself – to any effect parameter. With up to 10 patches per effect, and an amazing eight steps per patch, the control possibilities become almost unlimited.

There's also a 'tempo' mode for every program which can drive almost any element of the PCM-80's effects. Delay lines, LFO's and Lexicon's unique Time Switches can all be quickly aligned to the tempo of your piece, with both rhythmic and absolute time values. You can source the tempo from MIDI, or generate MIDI clock from your own tap.

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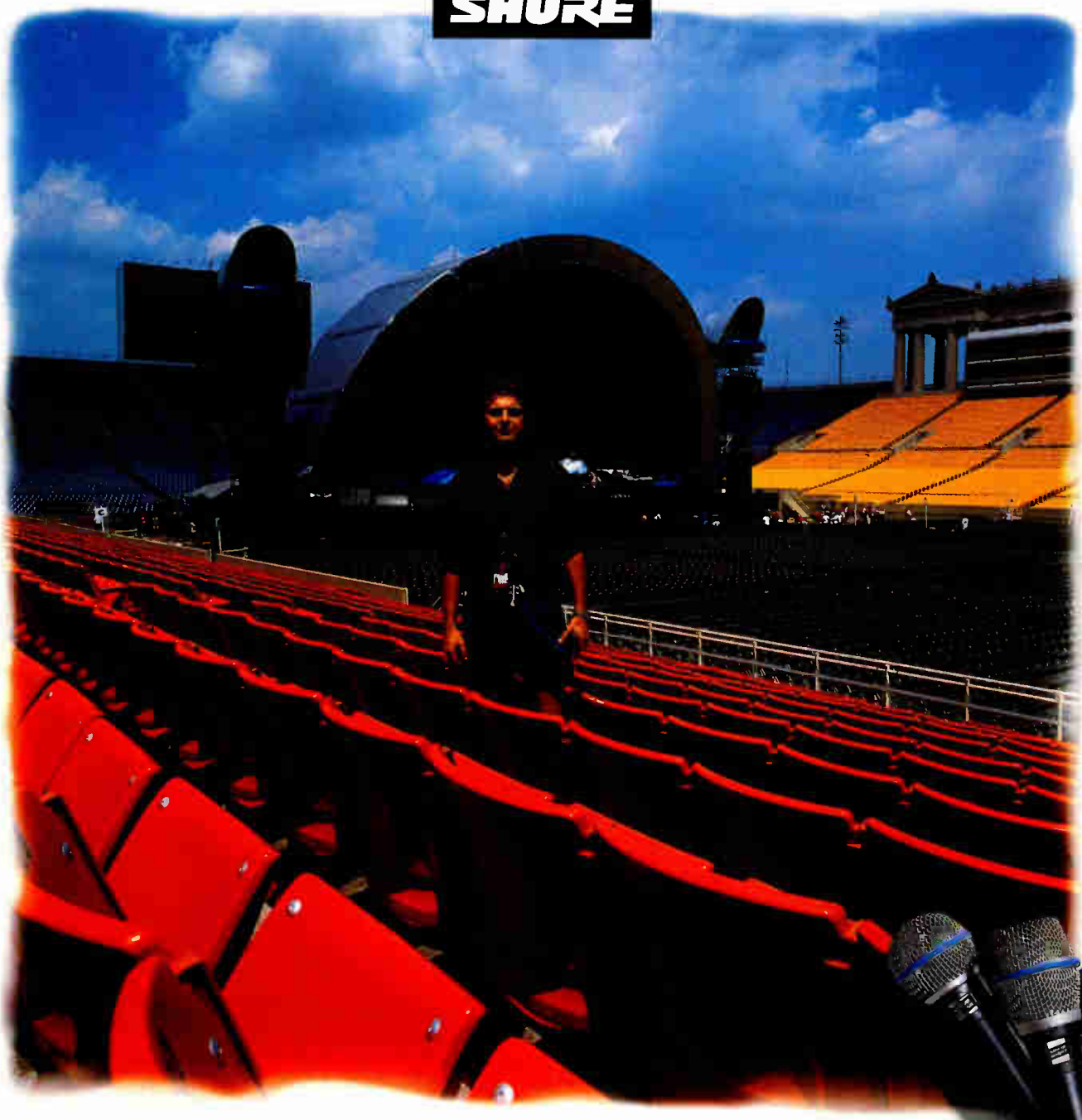

Seth Goldman, Pink Floyd Monitor Engineer, Soldier Field, Chicago.

of pairs of channels can be assigned as either an analog or digital input from within the Pro Tools software. Additionally, two channels of coaxial S/PDIF are selectable on inputs 1 and 2. Digital outputs are continuously active, even if the inputs are set to analog.

A lower-cost alternative at $995, the 882 I/O has eight balanced analog I/O channels (via ¼-inch TRS jacks) and S/PDIF digital I/O. The choice of analog or digital input for channels 1 and 2 is made in the Pro Tools software; inputs 3 through 8 are always analog.

The core system provides 16 digital tracks and support for eight channels of system I/O using either audio interface. However, serious users will want to consider an expanded system. And expandability is what makes Pro Tools III an outstanding investment. With additional hardware, up to 48 disk-based audio tracks and 64 analog or digital I/O channels are available. Disk tracks are added in 16-track increments by purchasing a Pro Tools III Expansion Kit, which includes a Disk I/O and a DSP Farm. Each Expansion Kit provides support for 16 additional tracks of record/play capability, as well as support for an additional 8-channel audio interface.

To add I/O without adding disk tracks, you can opt for a Digidesign Bridge I/O, a $1,395 NuBus card that connects into the Digidesign TDM Bus, providing an additional eight channels of system I/O when connected to either type of audio interface.

Pro Tools III is designed to run on a standard NuBus-equipped Macintosh with a 68040 processor (Centris 650 or later) or Power Macintosh 7100 or 8100, with at least 16 MB of RAM, System 7.1 or higher, a 12-inch or larger grayscale monitor and lots of hard drive space. At this point, a few observations are in order. First, if you are thinking of an expanded system, chances are you'll quickly run out of NuBus slots. Several companies make NuBus expansion chassis, but your best bet is Digidesign's own Expansion Chassis, which, depending on the Macintosh model, offers from nine to 12 additional NuBus slots. Second, Power Macs using Pro Tools III currently run in Emulation mode—not Native mode. This means that you are not taking advantage of the faster processor that these new models feature. So my advice is this: If you are going to buy a new Mac that will be used *solely* for Pro Tools III, you'll be better off with a Quadra. Third, don't even think about a 12-inch monitor. I tried the system with 16- and 20-inch monitors, and there's more information than will fit on even the 20-inch. Ideally, you'll want two monitors (not counting a video monitor if you're using the system for audio post).

SETTING UP

Installing a system this complex is never trivial, but I was up and running in a day with a minimum amount of frustration. The system I tested consisted of the core system described above with the 888 I/O, and an additional 882 I/O, Bridge I/O and a second DSP Farm card. All Digidesign NuBus cards were installed in a Digidesign Expansion Chassis attached to a Quadra 840AV with 24 MB of RAM. I used both a Maxtor 1.2GB Panther drive and a Micropolis 1.2GB drive to store the audio for my Pro Tools sessions. The drives that are used for digital audio *must* be attached to the Disk I/O card, rather than the standard SCSI bus. (In fact, if there is no hard drive attached to the Disk I/O, you won't even be able to open your Pro Tools session.) Neither drive choked when playing as many as 16 channels of audio—a pretty remarkable feat! If you experience throughput problems, you can store your audio on multiple hard drives, thereby lowering the data rate to/from each drive.

The manual was clear and helpful in explaining system setup and configuration. (Digidesign also provides a useful training video with the package.) I encountered most of my difficulties in configuring the Expansion Chassis and connecting it to the Macintosh. As the Expansion Chassis manual explains, each model of Mac has a different NuBus architecture. Unfortunately, the manual has not been updated to include pertinent information on the newer Mac models, like the 840AV I was using. Also, the NuBus specs require the Expansion Chassis Cable to be *very* short, which greatly limits the physical placement of certain items.

The company recommends using metal grounding tabs that are provided for making secure ground connections to the cards installed in the Chassis. But the holes for the self-tapping screws were either too big, so they stripped out, or too small, so I couldn't screw them on. And finally,

the cable connector into the Mac is—how shall I put it—nonstandard and less than solid-feeling. The result was that I didn't know that it was incorrectly plugged in until I tried to start the Pro Tools app, at which time the computer crashed.

However, the minor frustrations of setup were more than outweighed by the pleasure of using the system. Digi's TDM architecture is an important piece of technology that makes it possible to have a *complete* state-of-the-art random-access digital studio on the Macintosh desktop. The Pro Tools III Mix window (Fig. 1) shows that each of 16 audio channels has a user-selectable input, output, and up to five pre/post-fader sends and five pre-fader unity-gain inserts. Any channel can be sent to any output, or to any of up to 16 buses. Insert points can be used for analog and digital hardware devices (via the analog and digital Audio Interface I/Os), as well as software-based digital effects. Pro Tools ships with three types of software plug-ins: EQ (1-band and 4-band); Dynamics (compressor, expander, upward expander, gate and peak limiter); and Mod Delay (short delay, slap delay and medium delay). In addition, Digidesign—and third parties—offers additional plug-ins for Pro Tools (and other applications that support TDM, such as EMAGIC Logic Audio and Steinberg CuBase). The system I evaluated also included D-Verb, Digidesign's TDM reverb plug-in (see sidebar).

There are definitely limits to how many of these features you can use in a session. But the beauty of the TDM architecture is that it allows you to increase the processing power of your Pro Tools system in a modular way simply by adding more DSP Farm NuBus cards. Each DSP Farm contains four Motorola 56001 DSP chips. The processing power is dynamically allocated to any number of functions, depending on the mixing environment you set up. For example, at least two DSP chips are used for mixing; four stereo dynamics effects will eat up another DSP chip; each D-Verb requires another chip. Each send, return or auxiliary input will use additional DSP. So, careful session planning before starting to record is highly recommended. As in a conventional mixing environment, it makes more sense—for example—to bus all channels requiring a specific reverb setting to a single bus, and to mix in the amount on the individual sends, than it does to create a reverb insert for each channel. I found, even with the extra DSP Farm, that I maxed out my DSP with the setup you see in Figs. 1 and 2.

USING THE SYSTEM

Pro Tools III can be configured in any number of ways. As it has multiple I/Os, one choice to be made before beginning a session is whether you need direct outputs or stereo pairs. The former is appropriate for multi-

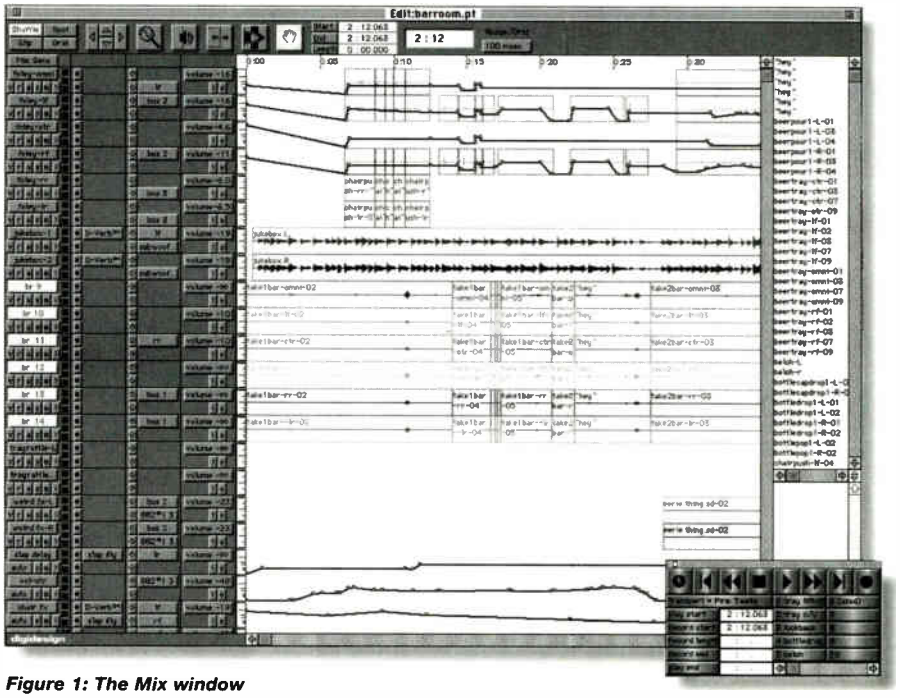

Figure 1: The Mix window

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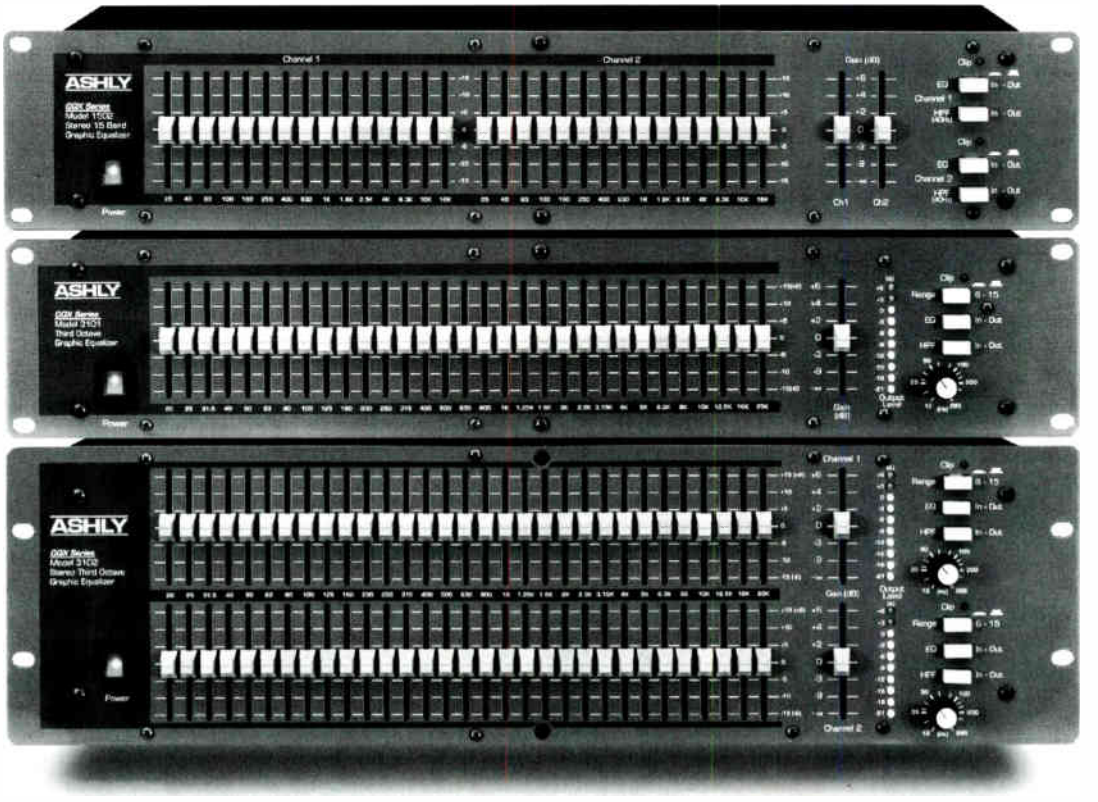

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channel output, and the latter is better suited for stereo mixing. Therefore, stereo panning is available only when "stereo pairs" are chosen in the setup menu.

As in previous versions of Pro Tools, the primary work environment is provided by three windows: the Transport, Mix and Edit. The Transport window provides control of your virtual transport and up to 100 user-definable autolocate points. The scroll bar at the bottom of the Transport window allows the points to be viewed ten at a time. Keyboard equivalents are also available for Record, Play, Stop and Return.

The Edit window provides a visual representation of tracks along a timeline. The far right has a list of regions created by recording, editing or importing existing audio. Using the Grabber tool (the highlighted icon at the top), you can drag a region from the regions list to any location in the Edit window. The Slip/Shuffle/Spot/

D-VERB REVERB SOFTWARE

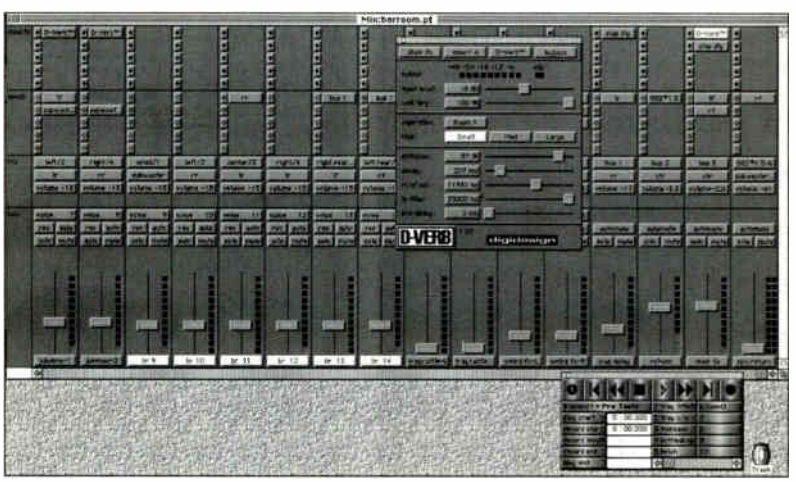
Digidesign's D-Verb plug-in adds high-quality, 24-bit software-based reverb processing to the Pro Tools TDM system, using the digital signal processing power of your system's DSP Farm card(s). Its significant advantage over traditional hardware-based reverb devices is that a single D-Verb plug-in can be used to create multiple reverb processors, provided you have enough DSP power. D-Verb operates much like a conventional outboard reverb device, with the added benefit of processing signals entirely in the digital domain.

As with the standard TDM plug-ins that come with Pro Tools, all D-Verb features are adjustable from within Pro Tools. You simply select D-Verb from the Insert pop-up menu for the channel you want to use (see below). Seven reverb algorithms are provided: Plate, Hall, Cathedral, Room 1, Room 2, Ambience and Nonlinear, each with individually adjustable parameters. Users can tweak the input level, wet/dry mix, reverb algorithm, room size and other settings while the track is playing. The output meter and its indicator let you monitor the level: It *is* possible to clip the signal, as Pro Tools inserts are pre-fader.

Pro Tools' Copy Effect Parameters command allows copying and pasting current D-Verb settings (or any other currently displayed plug-in) from the current track to a corresponding plug-in on a different track.

D-Verb's algorithms are of high quality, and the variety and editability of the settings make it an extremely valuable tool in the TDM environment. Priced at $495, it's well worth the investment.

—Paul Potyen



D-Verb parameter window

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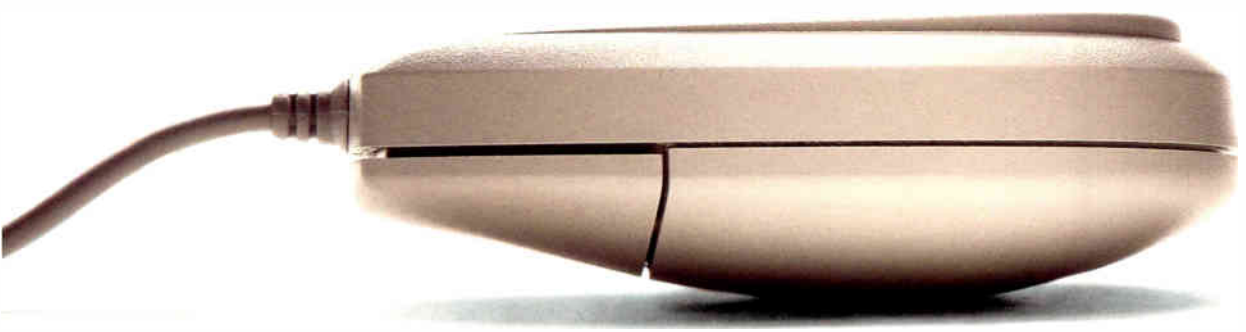

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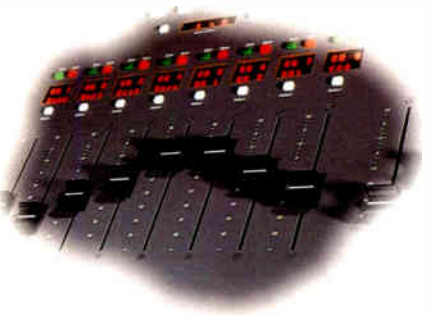

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Push the ten long-throw faders and turn the seven large rotary encoders to control levels, pans, EQ—all DSP functions. Then watch the controls "dance" as you listen to your automated mix. Use up to 999 snapshots for each mix or save it dynamically. We know what moves you.

FOUNDATION

The Removable Project Environment puts everything in the palm of your hand.
Foundation's removable disk system stores all audio, edit, mix and project data. It even knows the reel and sub-frame you were last listening to. In a matter of seconds your work is loaded with "total recall" and you're online, ready to go.

The Foundation 2000™. Blending Breakthrough Engineering With Cutting-Edge Performance.

Built by the same engineering team that pioneered digital audio workstations, Foundation stands alone as third generation technology. Its real-time audio computing architecture supports 16 channels of continuous playback from a single hard drive, 24-bit data paths, 56-bit DSP resolution and patent-pending innovations such as STAR™ Bus digital routing. The ultimate genius of Foundation, however, is that it does exactly what you want it to do—simply, quickly, and reliably. And, of course, your total investment is backed by Fostex's complete worldwide service and support.

The most connections in the industry.
Foundation adds value to the equipment you already own. In addition to the full complement of analog and digital audio I/O's, Foundation speaks Sony 9-pin with VTR's and video editors. Built-in LTC/VITC readers deliver frame-accurate picture scrubbing and instant lock up.

When It Comes To Flexibility, We Bend Over Backwards.

As your needs change, Foundation adapts. I/O DSP modules are completely modular and upgradable. Start at $14,995 with the '2000LX' and its 8 analog inputs/outputs. Or go for the 'Max' with 18 inputs and 20 outputs in both analog and AES/EBU, SDIF-2, and ADAT™ digital formats. Need more tracks? Cascade multiple systems together for a mega-track super-Foundation. Want to mix it down digitally? Add a Fostex ACE Card for massive DSP and digital mixing power. Need to transfer your files to another platform? S/Link™ translation/transfer software even lets you do it over a network.

Just your basic world-class digital recorder/editor.
Fostex matches the standard Foundation edit controller with the smaller frame (4U-high) 2000RE. Sharing work is easy because it uses the same 'RPE' file format as all Foundations. Uncompromised quality, unsurpassed value. You'll want more than one.

The Foundation RE. It's About High Performance. It's About Tactile Engineering. It's About $9,000.

The Foundation 2000RE features all the flexibility of the Foundation 2000's event-based audio editing software, including Timeflex™ time compression/expansion, ergonomic user interface, synchronization, machine control and superb 16-channel audio quality—without the real-time digital mixing features that are redundant for studios with automated mixing consoles. Now the powerful Foundation technology is affordable to project studios and multi-machine facilities searching for high performance digital audio editors at a low price.

FOSTEX

Fostex Corporation of America 15431 Blackburn Avenue, Norwalk, California 90650, U.S.A. Telephone: (310) 921-1112 Fax: (310) 802-1964

Grid buttons (top, far left) control how regions can be moved within the Edit window.

Any audio track can be scrubbed with the Scrubber tool, and scrubbed tracks are heard at full volume in Solo mode. The Trimmer tool can shorten or expand regions or groups of regions. Any set of regions can be highlighted and played or edited this way. The Nudge/Grid Units Selector (upper right) offers a way to use the "+" and "-" keys on the Mac numeric keypad to nudge selected regions forward and back in time by the selected amount. When working with video, frames or seconds can be selected as your unit of time measure. Tracks can be viewed as waveforms, region blocks or with a superimposed volume automation graph. Tracks can also be grouped for editing purposes by shift-clicking on the Track name; these can be locked in place to avoid accidental changes.

The Mix window shows a more traditional recording console paradigm. The example in Fig. 2 shows a mix environment for a multichannel sound-for-picture session. A pop-up menu appears when you select a send or insert. Fig. 2 shows that the track called Weird FX-L is being bused to several destinations, and we can see the window for the selected 882#1 output 3, which is physically connected to a Yamaha SPX90 via the 882 Audio Interface. As shown, you can select pre, post and level of the signal to the bus. The Yamaha stereo effect is being returned to inputs 5 and 6 of the 882. At the far right, inputs 5 and 6 come up on the SPX return track. This, and any other auxiliary tracks you create, lets you do two great things: It does not use up audio channels, and you can automate the level of the effect, just as you can automate any track. In the bottom of the Mix window are three auxiliary tracks, each with its own volume automation. (Using Pro Tools in Stereo mode, you also have the ability to automate panning.) Automation can be performed either by manually drawing and editing the line graph or by using a MIDI controller, such as the JLCooper Fadermaster, to record your fader moves in real time as you listen to your mix. Both methods were intuitive and had their relative merits.

Much of the same information can be seen from both the Mix and Edit windows, and each can be modified to show an expanded or abbreviated version. This is typical of the flexibility and multiple ways that Pro Tools software lets you work.

Master Faders are like auxiliary inputs in that they don't take up a voice, but unlike aux inputs, they don't require any DSP power. As with conventional mixing techniques, they can be used to control output mix levels, submix levels and effects-sends levels. These can also control submaster levels while bouncing to disk in real time and are available in mono or stereo.

As you might expect, Pro Tools lets you mix directly to your hard disk. The Bounce to Disk command lets you choose either selected premixes (what you hear is what you get) or your entire mix, creating a mono, stereo (best for Sound Tools) or split stereo (best for Pro Tools) Sound Designer file in 8-, 16- or 24-bit resolution. Digitally bounced premixes are among the several ways to overcome the 16-voice limitation of a basic system. (Up to 55 virtual tracks

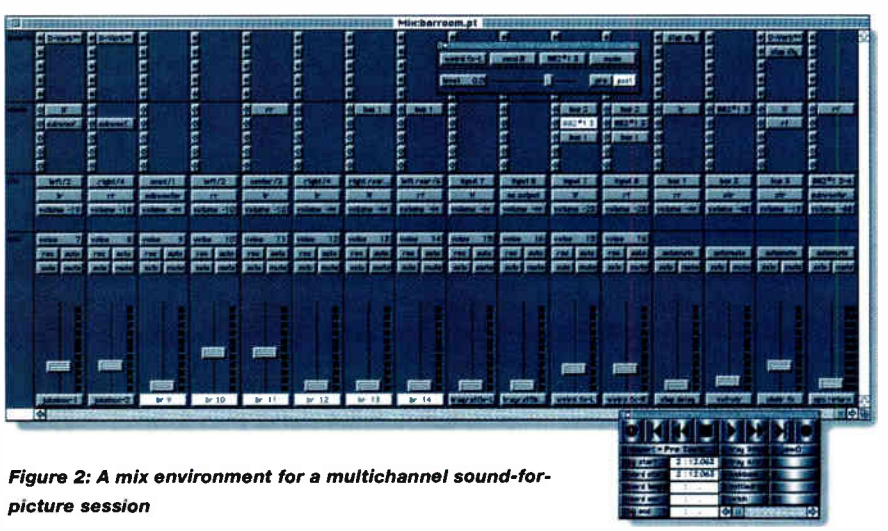

Figure 2: A mix environment for a multichannel sound-for-picture session

are possible in a session for each Disk I/O card.) And with a DAT or CD Recorder and Digidesign's MasterList CD software, you can easily produce a finished audio product that never sees the light of analog day!

File management can be a huge issue in the multitrack hard disk environment. Digidesign has addressed that issue elegantly, giving users the option of selecting unused audio (or even used audio if you prefer) and letting it be removed from your session or deleted entirely from your hard disk. The process is well-designed and unambiguous, with appropriate warnings when you are about to do something permanent.

WORKING WITH PICTURE

If you plan to use Pro Tools as a music-only environment, you may not need anything else (except maybe a good acoustic space and monitoring system). However, the system can also be a valuable part of an existing production environment with its own mixing console and outboard gear. With the Digidesign SMPTE Slave Driver, Pro Tools III can achieve high-quality direct hardware synchronization with LTC-equipped audio transports. And it's worth mentioning that Digidesign is coming out with an ADAT Interface Accessory Kit.

Pro Tools is a valuable tool for post-production and is capable of trigger-synching to external devices with SMPTE (via MIDI Time Code). For more reliable continuous synchronization using LTC SMPTE timecode, Digidesign's SMPTE Slave Driver can be used with video transports as well as the previously mentioned audio decks. For stable synchronization with professional video systems using video sync, the Video Slave Driver is a third option. For my evaluation, I used an inexpensive MIDI interface and SMPTE-to-MIDI converter to lock Pro Tools to a Panasonic AG-7750 video deck and a Tascam DA-88 modular digital multitrack. I found that the system provided reliable synchronization during the entire production process, which involved synchronizing sequences of approximately a minute in length. And spotting, moving and editing audio to the video was, for the most part, efficient and enjoyable.

One of Pro Tools III's most significant improvements over versions of Pro Tools software is response time. Waveform redraw time was reduced; newly recorded tracks appeared almost instantly; and switching between the Edit and Mix windows took one to two seconds, depending on the timeline and the number of tracks.

Once Pro Tools was up and running, I experienced remarkably smooth sailing, considering the number of new features that this software offers. Using it an average of 40 hours per week for more than a month, I experienced three or four nonrepeatable crashes, and only an occasional anomaly, such as the mysterious 12dB pad that appeared on a bus. Quitting and reopening solved that problem.

But even a month of full-time use is not enough to explore every nuance of a system of this complexity. Aside from using the FaderMaster to control mixes via MIDI, I only briefly touched upon the program's MIDI features. I was able to import a Standard MIDI File into a session, where the MIDI tracks appeared in the Edit and Mix windows alongside audio tracks. MIDI tracks can also be edited in the same way as audio tracks. But, just as with audio sample editing, detailed MIDI editing is designed to be handled by other applications.

Digidesign's telephone technical support is competent and helpful, but woefully understaffed; the line seemed to be busy about 75% of the time. When I did get through, I was often given the choice of waiting for up to 20 minutes or receiving a call back in several hours.

One particularly enlightening section of the 422-page User's Guide is Chapter J, "Mixing." It contains several examples of how to set up a mixing environment to perform useful tasks, such as "Using Auxiliary Inputs to Mix External Audio Sources," and "Applying a Plug-In Insert to All Channels in a Submix"—highly recommended reading to get you up to speed on the capabilities of the system.

Pro Tools III brings powerful, full-function random-access digital audio production to the Macintosh at an unprecedented price. Joe Bob says check it out!

Digidesign, 1360 Willow Rd., Menlo Park, CA 94025; (415) 688-0600; fax (415) 327-0777. ■

Paul "Joe Bob" Potyen is a Mix *contributing editor and producer at ESCAtech, a multimedia developer specializing in sound.*

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Only Akai offers you this range of professional sampling options. No matter whether your budget is small or large, there is an S-series sampler just right for you. And with every one you are assured of getting the sound quality and reliability that comes as part of every sampler that carries the Akai name. In any field there is only one real leader, and in samplers that's Akai.

S01

The great values start here, with the most affordable 16-bit sampler available anywhere. With expandable memory, great sound quality, and a simple editing interface, the S01 offers a lot for only $849.00 (suggested list). We even include sample and program editing software (Mac & PC) for free!

S2800 / S2800STUDIO

TheS2800 is your affordable entry into the ranks of high-performance stereo samplers. Its 32 voices, large graphical waveform display, and powerful sample editing functions make this a fantastic bargain, now listing for just $1429.00. The S2800STUDIO provides 8MB RAM, SCSI, and digital I/O for only $2225.00.

S3000

If you require even more output and expansion options, the S3000 can accomodate you. It comes equipped with 8MB memory (exp. to 32MB), SCSI, digital I/O, 20-bit D/A stereo outs, 8 assignable outputs, digital effects, timestretch, resonant filters, and lots of other cool stuff. And it's equipped with a new list price: $3995.00.

S3200

The S3200 offers all the same outputs and connectivity of the S3000, while adding even more power: a second set of filters (multimode) for each voice, reverb, stereo direct to disk recording, and a built-in SMPTE time code reader/generator. There's even an option for a 3.5" magneto optical drive (as seen above). And now all this incredible power arrives with a list price of $4595.00.

CD3000s

Possibly the single most flexible sampling instrument ever, the CD3000s can handle just about anything. It features a built-in CD drive which will access both CD-ROM and audio CD-based sound libraries, as well as stereo analog sampling inputs. And just for good measure, we ship the CD3000s with no less than five CD-ROMs of great sounds! All this for just $3150.00.

New this Winter is the Version 2.0 operating system which allows the S2800, S2800STUDIO, S3000, S3200, and CD3000s models to read Roland® and E-mu® CD-ROM sound libraries!

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by Mel Lambert

FOSTEX FOUNDATION 2000

DIGITAL RECORDING, EDITING AND MIXING SYSTEM

In a multiroom audio-for-video/film post house, a great deal can be said for tailoring a workstation's size and complexity to suit a specific job, whether it's dialog, sound effects or Foley editing. In other applications, such as music editing, users may require a multitrack input/output configuration with extended virtual track capacity, sophisticated EQ and dynamics control.

Designing a system capable of a wide range of audio recording, editing and mixing functions is not without its own set of deliberations. The Fostex Foundation 2000 Series looks set to dominate the high ground of the music-recording and audio-for-video/film marketplace, simply because it is remarkably easy to use; it can be supplied in a selection of fixed and expandable configurations that will accommodate a wide variety of recording, editing, mixing and DSP functions; and, thanks to 18-bit delta-sigma A/D and D/A converters, it does not compromise audio quality.

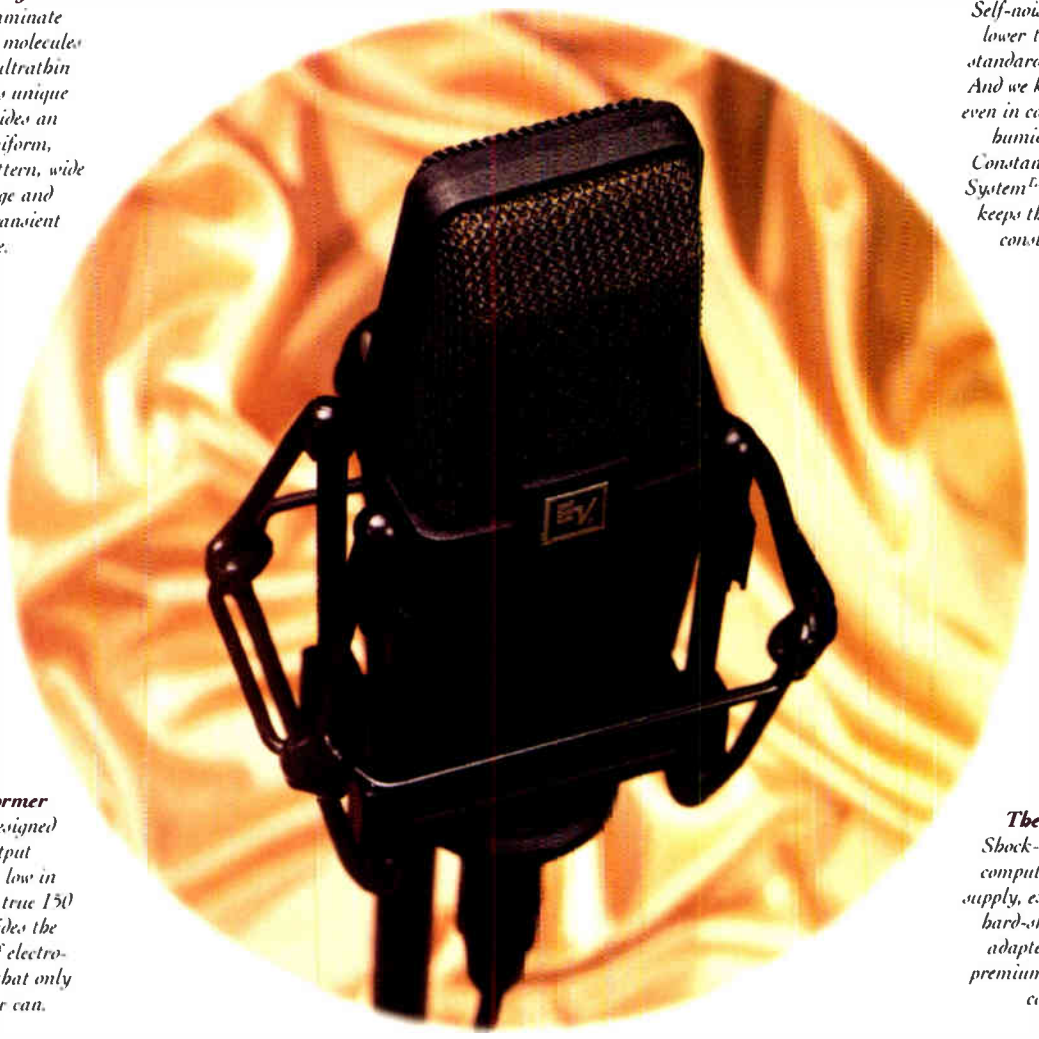
EXPANDABLE SYSTEM FUNCTIONS

The most basic Foundation 2000RE system ($8,995) includes a self-contained (no computer required) random-access digital audio recorder and editor. The base unit can either be used as a stand-alone system or integrated within a multimachine environment, and comes with with timecode chase-sync, MIDI Ma-

RE2000

The Diaphragm
We vacuum-laminate gold—just a few molecules thick—to our ultrathin diaphragm. Its unique diameter provides an extremely uniform, supercardioid pattern, wide dynamic range and exceptional transient response.

The Performance
Self-noise is 5 to 10 dB lower than "industry standard" microphones. And we keep it that way even in conditions of high humidity with our Constant Environment System™ (CES), which keeps the element at a constant 125 °F.



The Transformer
Our custom-designed Jensen® output transformer is low in distortion and a true 150 ohms. It provides the high rejection of electromagnetic noise that only a transformer can.

The Amenities
Shock-mount system, computer-grade power supply, external pop filter, hard-shell case, stand adapter and 20 ft. of premium cable with gold connectors.

The Awe-Inspiring, Uncompromising Studio Condenser Microphone

Even before its introduction, the RE2000 had earned an amazing reputation and an enthusiastic following. Its exacting performance elicited accolades from professionals who thought they had heard it all.

"The RE2000 has a richness of sound I have experienced only along the lines of a tube mic"— David Esch, Eschicago

"The perfect mic for recording any acoustic string instrument."—
John Beland, Flying Burrito Brothers

"The RE2000 has the warmth of a tube mic—extremely quiet and sensitive, allowing me to pickup low-level material without adding noise."—
Scott Weber, Buena Vista Sound, Walt Disney Studios

"The RE2000 has a crisp, clean and quiet response. I used less EQ to achieve what I look for. What goes in...comes out! It's also extremely versatile...from vocals to acoustic guitars to trumpets and violins."—
Tom Cusic, TM Century, Dallas, TX

"I think it's one of the most versatile I've ever used."— Roy Thomas Baker, Producer

In fact, all of these professionals asked one remarkably familiar question:

"When can I get one of my own?"

It's available now! And once you've heard it, we expect you'll be inspired to send us an accolade or two as well.

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WITH WORD-OF-MOUTH LIKE THIS, WHO NEEDS AN AD AGENCY?

"The ProMix 01 gives me the flexibility to control all the elements of a show from my computer. Superb sonic quality and remarkable features, you just can't beat it."

- Stan Miller, Sound Designer, Neil Diamond Tour

"I bought four of them for the Steely Dan Tour, and I haven't shut up about the 01 yet."

Roger Nichols, Engineer, Steely Dan

"Bottom line, the ProMix really does live up to all the hype. It's very quiet, it sounds great, it operates very cleanly." "One of the most amazing introductions in years."

- Recording Magazine, October 1994

"I did my latest project on the ProMix. And it's one of my best sounding yet. The ProMix 01 is really great!"

-Hans Zimmer, Composer, The Lion King

"ProMix 01 stands every chance of becoming a landmark product, changing the way a lot of people currently work."

- Studio Sound And Broadcast Engineering, July 1994

"We're not normally violent, but in this case, we're willing to make an exception. We're not letting this mixer go."

- Mix Magazine, November 1994

"Premium sound quality with all the trimmin's. Yamaha has come through again."

- Steve Porcaro, Songwriter/Musician/Producer

"As a sound designer, I create illusions. Yet, the power and flexibility of the ProMix is no illusion. It most certainly contributes to the prestige of Machine Head."

- Stephen Dewey, Sound Designer/Founder, Machine Head

"After working with ProMix 01, I am convinced its sound, quality and flexibility rivals that of mixing consoles costing many times more."

- Calvin L. Harris, Engineer/Producer - Lionel Richie, Diana Ross, Stevie Wonder

"My two ProMix 01s store all the parameters of my mix and play it back exactly as I heard it at the moment of creation. More importantly, they sound great!"

- David Schwartz, Composer for Northern Exposure

"Yamaha has done it again, just as it did in the early '80s with the DX-7 keyboard. It has created a cool piece of gear that does more, does it better, and costs less."

- EQ Magazine, December 1994

"It took Yamaha to create a brilliant sounding digital mixer with full MIDI control. I have no doubt that the ProMix 01 will quickly become an industry standard."

- Jeff Bova, Keyboardist/Arranger/Composer - Vanessa Williams, Robert Palmer

"Clean, quiet, powerful. The best words I can think of to describe the ProMix 01, the latest addition to my toolbox."

-Tom Jung, Producer/Engineer/President, DMP Records

If you think the ProMix 01 sounds good here, wait 'til you hear it in action. Call our 800 # and send for your free CD of The ProMix Sessions, produced and engineered by Tom Jung, President of DMP Records. Our ad agency thought we needed to say something clever here, but we told them we had enough opinions already. To order your CD, call 1-800-937-7171, Ext. 450.

YAMAHA 20 BIT TECHNOLOGY

YAMAHA

Smart Mixing.

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chine Control and 9-pin serial VTR/ATR control functions. This base unit, which cannot be expanded to add extra functions, is fitted with eight analog ins/outs, eight channels of SDIF-2, AES/EBU and S/PDIF format I/O, plus an 8-channel ADAT "Light Pipe" I/O port. In this format, as a simple recorder/editor, users can simultaneously input up to eight sources, record them to hard disk and connect the unit's eight tracks to an analog console for mixing.

The Foundation 2000's Edit Controller can be attached to the unit's six-rackspace main processor unit or remotely located. The rear of the rack has slots for connecting various analog or digital I/O modules (both AES/EBU and S/PDIF format ports are standard on the latter), processing cards, MIDI I/O and sync/machine control modules.

One of the 2000's unique features, referred to as a Removable Project Environment (RPE), allows all audio, edit, mix and project data to be stored on removable hard disk cartridges or magneto-optical drives. A standard removable 540MB hard drive provides 90 track-minutes of mono sound file storage; removable 1.2GB drives are also available. (Background off-loading and restoring are via SCSI-capable Wang DAT drives.) Alternatively, users can mount any fixed 5.25-inch, half-height, SCSI-capable device, including MO drives, in the front-panel frame; additional drives can be added via a SCSI expansion port located on the rear panel.

As all Foundations share the same file format, facilities can easily exchange sound files and automation data between, for example, satellite 2000RE editors and fully configured 2000 editing and mixing "motherships." As I discovered, you simply hit a single button on the 2000's control surface, and the drive winds down and is immediately available for use by another system. Elegance personified.

For example, the $15,000 Foundation 2000LX comprises the basic 8-track random-access recorder/editor, 8x8 analog I/O, edit controller and system software; the Foundation 2000LS, which costs $16k, adds a synchronization module. Both the LX and LS, in turn, can be upgraded to a Foundation 2000's standard configuration ($30k) with the addition of an 8x2x2 digital mixing card, 2x4 analog I/O (2-channel inputs, and a L/R plus stereo monitor mix), AES/EBU and S/PDIF-format I/O ports, plus extended software. A maximum configuration Foundation 2000 ($40k) adds the DFM Moving Fader Controller and companion software.

The 2000LX is targeted at radio stations and project studios that might not require extensive machine control and timecode sync, while the 2000LS with sync board might be more appropriate for facilities that regularly lock up as master or slave to video sources.

All Foundations are capable of handling 16 channels summed to eight disk tracks, each of which comprises two "voices" offering real-time crossfades during playback. A proprietary disk-operating system ensures that Foundation drives provide full data bandwidth in all situations; during my evaluation sessions, there was never an occasion when a track muted because the SCSI II pipelines were overtaxed or the operating system ran out of processing power.

Delta-sigma converters offer 18-bit resolution, with the A/Ds using 64-times oversampling and the D/As 8-

times. All playback signals sounded clean and transparent during my evaluation sessions, without glitches or other anomalies.

Modular, plug-in Algorithmic Compute Engine processing cards are available in a variety of formats and levels of complexity. ACE cards connect to the front of the Foundation's main unit; six slots are available for DSP/mixing expansion. ACE Card 1 provides real-time digital mixing within Foundation (providing two independent stereo mix buses), as well as eight simultaneous channels of 3-band parametric EQ. ACE Card 2 provides an 8-bus, 8x8x2x2 mixer plus eight channels of dynamics processing (compressor, limiter and noise gate). Additional ACE cards upgrade the EQ to provide 4-band parametric functions with high- and low-frequency filters, additional aux sends and returns (two sends/four returns using a reconfigured 8x8 multichannel analog I/O board), plus multitasking time expansion/compression.

Level, bus pan and output routing are controlled from the Foundation's user interface or external controllers. All editing and mixing events are stored within Foundation as snapshots against timecode, or in the case of mix, EQ and pan information, as dynamic data accurate to a subframe.

Extensive machine control and sync options allow Foundation to operate within a mixed audio/video environment. The master processor can lock to word clock, video sync, LTC (all domestic 30 fps drop/nondrop, 29.97 fps drop/nondrop, 24 fps and 25 fps varieties) and VITC. Using a high-speed LTC and VITC timecode reader, Foundation chases timecode with audio output in both forward and reverse directions. In addition, it supports "hard lock" when following slower-than-play-speed sources. MIDI and RS-422/9-pin control protocols are supported, for communicating with external transports or controllers. Foundation also supports an RS-422 VTR emulation mode for use under external control from a video editing system.

GPI inputs are also offered for triggering Edit Controller functions, including Stop, Play, Rewind, Fast Forward, Punch-In/Out, Locate to the current time, Set In/Out Points to the current time. In this way, Foundation can be controlled from devices that are not capable of serial machine control, or from footswitches.

Foundation DFM Dancing Fader Mixing System

The new DFM, a prototype of which I was able to try out at the recent Winter NAMM Show in Anaheim, is an assignable mixer control surface for the Foundation 2000 that features moving faders and automation of all mixer/DSP settings. Priced at $8,995, the Dancing Fader Mixing system is a small assignable control surface that houses ten servo-driven faders. Dimensions are 5x24x18 inches. Individual LED readouts display each fader's current function and assignment.

Fostex DFM™ (Dancing Fader Mixing System)

A set of large illuminated mode switches can be used to recall and reset any Foundation mixer parameter, such as channel strips, monitor, aux sends/returns and mix bus outputs.

An LED menu screen also provides more detailed control of DSP and mixer automation modes. Seven large rotary encoders provide quick access to assignable parameters such as parametric EQ, panning, and compression/limiting. All DSP and mixer parameters can be saved in one of 999 snapshots. In addition, all faders and pan positions can be continuously automated against MIDI-based timing references.

The current user software provides 3-band parametric EQ, with center frequencies in the LF band from 25 to 800 Hz, MF 125 to 4.0k Hz, and HF 625 to 20k Hz; Q is adjustable between 0.1 and 3, with ±18dB cut/boost at each center frequency. A software update available by early summer will offer four bands of parametric EQ with highpass/lowpass filters.

The ten servo-driven faders—eight labeled as Channels, plus an L/R Master and Monitor Master—can be assigned to input/replay channels to provide an 8-in/stereo out mixer; to master bus outputs; to control a separate stereo mix from disk tracks; to control level adjustments for the two aux sends per channel, plus four auxiliary returns; and for a future expansion mode that will control additional DSP functions, such as reverb and delay.

DEDICATED EDIT CONTROLLER

Foundation's Edit Controller is a work of art. Unlike many other workstation systems, it offers dedicated buttons for recording, editing, transport and external machine-control functions. The controller is solid in appearance, well-built and gives every appearance of being able to withstand a great deal of abuse in the studio. To the left are familiar Stop, Start, Forward, Rewind and Record transport buttons.

A touch-sensitive, electroluminescent screen (ELS) in the center of the unit offers software-controlled buttons for visual segment display, metering, mixing and other functions. The ELS provides touch selection of Track Displays (object-oriented/waveform); Mixer functions (I/O assignment, level and pan assignment); Metering (assignment and ballistics); Reel Library (allowing selection to the Now Line of prerecorded and prelabeled sound elements); and various System Utilities. While the touch-sensitive screen is reasonably small, a separate video output can be connected to a standard NTSC/PAL video display.

I had no problems reading the various displays on the ELS window—including up to eight tracks/16 voices of either object-oriented or waveform displays—and could read

all legends from a convenient seated position. A dedicated jog/shuttle knob provides smooth and realistic-sounding audio scrubbing, as well as fast access to video frames on a companion VCR or laserdisc player. A plug-in keyboard is also available for labeling tracks and other vital operations, but no mouse is necessary to navigate through the system's screen-driven functions.

Because audio cues can be displayed on the touchscreen as either familiar waveforms or segments showing the volume envelope of each event, editing is achieved by simply touching the required event and then selecting the appropriate front-panel button(s). Tracks Display shows either 1, 2, 4 or 8 tracks at a time. The built-in librarian store of audio segments is easy to use, and up to 500 soft markers can target specific sound segments. Dedicated keys select the paste conditions, allowing segments to be moved very rapidly from one part of the project to another. Fade-in/out profiles can also be selected using dedicated keys, then modified if necessary to provide different crossfade times or log/linear profiles.

Every audio event being replayed by Foundation possesses an "envelope" visible on the Tracks Display that acts as a window on the original recorded audio. The event envelope is described by its Start, End, Fade To, Fade From and Sync parameters that now define all information about the segment's amplitude and timing references. In addition, a Gain button adjusts the playback level of the event. While the envelope can change the event's playback characteristics, these changes do not alter the underlying audio.

A pair of large multisegment displays show the current time playback location (in either h:m:s:f timecode, or feet and frames for 16/35mm film-based projects), and a user-programmed register for "go-to" sequences. (The lower display is also toggled to show, for example, preroll settings.) A companion keypad can be used to enter target playback locations or store the current playback location in a series of user-programmable registers. A series of LEDs show the current status of timecode, word clock and video lock.

Events can be trimmed to adjust the overall shape of the event envelope and aligned to new timing references. Audio can be trimmed off the beginning of an event without changing its sync relationship to the rest of a track, or used to move the entire element forward or backward with reference to the "now" line. (Cues from a production dialog reel, for example, can be loaded into Foundation with variable-length "handles," which comprise material both before and after the prescribed timecode labels. In this way, a cue can be "opened" up to extract more information ahead of or after the original in/out designations.)

All buttons and displays on the Edit Controller are labeled clearly and unambiguously, and I was comfortable with operations within 40 minutes of first signing onto the system. Anyone who has used a reel-to-reel deck and the most simple PC-based editor will be up to speed on a Foundation system within a very short time!

In the near future, Foundation will also be controllable by new versions of The Synclavier Company's Edit-View and S/Link software interfaces, the result of a recent joint development agreement between the two companies. S/Link 2.0 batch-file format translation software will convert

audio and EDL files between Synclavier/PostPro, Avid OMF-Interchange, Digidesign Sound Designer I/II and Fostex RPE formats, as well as between AIFF/AIFC, .WAV, SND, MOD and VOC multimedia file types. The first Foundation-compatible version of S/Link 2.0 provides Foundation users with OMFI exchange of media and EDLs.

Internal digital mixing, on systems fitted with the appropriate hardware, can be controlled either from the touchscreen—which, while clumsy, at least allows channel/track levels and pan to be set to static values—or an external MIDI-based system, such as the Fostex Mixtab. Alternately, users can select the more sophisticated DFM Controller, which offers servo-driven faders. (See sidebar for more details.)

IN-USE SESSION NOTES

At first sight, the Foundation 2000 Edit Controller looks very simplistic, which, to my mind, is one of its strong points. The controller does not intimidate the user, nor does it slow down the learning curve. Button labels are well chosen to explain their use simply and succinctly. The touch-sensitive ELS display scrolls instantly and is easy to see from just about any viewing angle. You are never more than two prehensile digit stabs from the required display, meaning that very soon you push the manual to one side and begin to operate the system intuitively. (By the way, the Foundation's user guide and service manual are very well-written indeed and could serve as a lesson to all workstation manufacturers.)

An event can be split at the current time to create two independent events; both halves of the event retain the original name, sync point and underlying audio, until changed by the user. Cut, Copy and Paste buttons are self-explanatory, while Ripple causes an event held in the clipboard to be inserted into the track at the now line, with subsequent events sliding down to make room for the inserted event.

Events can reside on the current reel and/or in the companion library. If an event isn't named before being saved in the library, a name is automatically assigned to it. Storing events can be auditioned from the library simply by selecting them and touching a front-panel button.

Foundation can also send MIDI Time Code and send/receive MIDI Machine Control messages. It locks faultlessly to conventional timecode and video-sync sources. Not once during my evaluations were there any time delays between external VTRs and serial-controllable multitrack sources. The system also locks up via word clock or digital ports from external digital sources, including ADAT and DA-88 transports.

All in all, the Foundation 2000 is one of most powerful, easy-to-learn digital audio workstations that I have used in a long, long time. In terms of creative power and value for money, I don't think that it has any serious competition.

ACKNOWLEDGMENTS

My sincere thanks to Gordon Ecker, Lance Brown and Jay Nierenberg at Soundstorm, Burbank, Calif., for their patience during my several evaluation sessions on the facility's collection of Foundations. (Their current count is eight systems, with more on order, as the shop is called upon to handle an increasing workload of sound editorial projects for film and video clients.) ■

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Dealing With Dealers

How to Work With Your Pro Audio Supplier

BY CHRIS STONE

To ensure success in this very competitive business, you need as many trustworthy allies as you can find. Committed practitioners who provide meaningful assistance to help you be more efficient and effective are rare. One of the most important of these allies is your professional audio dealer. These are the unsung heroes who service your product needs and sell the better audio products. Many of us mistreat them and take them for granted because we think if we don't they will take advantage of us. Wrong.

The pro audio dealer's role has gone largely unnoticed, yet they are an important segment in our rapidly changing and dynamic industry. Consider some advice from a guy who has worked with many and even been a dealer. Find yourself a dealer in your area whom you can trust and stick to him or her like glue! They can save you a lot of money and, as an advisor, help you make the right product decisions, which can help you become more successful. Treat them right—just like any of the other providers in your business—and they will be there for you when you really need them. If they aren't, they won't last long in our super-competitive business.

We spoke to four of the best dealers in major U.S. audio markets—Audio Intervisual Design (A.I.D.) in Los Angeles, Milam Audio in Pekin, Ill. (near Chi-

Pro Audio Dealers Face The '90s: Two Stories

by Blair Jackson

THE OLD PRO: AUDIOTECHNIQUES

There is no market more diverse and competitive than New York City, so it's no surprise to learn that the pro audio dealers who succeed there rely on a combination of smart buying for different niches, good word-of-mouth from repeat customers, and staying on top of the latest trends to keep the customers coming. AudioTechniques has been on the scene for nearly 25 years now, and for the last six has been owned by another New York music business legend, Manny's. A.T.'s president since the acquisition, Doug Cook, was a 20-year vet of Manny's himself and has seen the quiet convergence of the pro audio and M.I. worlds first-hand. Like most pro audio dealers these days, AudioTech-

—CONTINUED ON PAGE 149

Illustration: Andrew Shachat

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cago), Corner Music in Nashville and Sam Ash Professional in New York City—to find out how to deal most effectively with your pro audio dealer. As might be expected, these dedicated service-providers have a lot of common problems and shared feelings about our industry—where it is going and how they can help get it there.

They all want long-term relationships with clients who are willing to pay them a fair price for the equipment. In return, they provide equipment information, product service, training, free loaners if available when something breaks, credit terms, which they can give or arrange, and a decent stock of inventory. Many will even get out of bed when you call late at night and help you with your emergency equipment breakdown until it is resolved. These people do a lot more than sell boxes.

The way *not* to treat them is illustrated by one dealer's true story: "A potential new customer asked us to come over to his studio and do a demo of a complex piece of gear and to train his operators in how to use it properly, which we did. After keeping our unit, at no charge, long enough to determine he really wanted to purchase it, he then asked us to sell it to him on credit with payment not due for at least 90 days, at the lowest price he had found anywhere in the country. Upon checking his credit references, we found he was a perpetual slow pay so we had to explain that we could not do what he asked. After he went somewhere else and bought the equipment for cash, he got upset with us because we would not come to pick it up and get it fixed when it broke and also give him our free demo unit to use until his unit was returned from the manufacturer." Bummer for the dealer.

What dealers *do* want is to be treated like a member of your team. They want to be given a chance to bid on *all* your equipment purchases and to have you understand the value of their product service, equipment training and knowledge of the best products available for your business. For them to serve you properly, there has to be an understanding of what is a fair price for both of you in any given situation. The balance between your need for a lower price, better credit terms, product service and training obviously differs between buying an expensive workstation and a microphone. Your dealer wants to work with you, but just like you, dealers need to make a profit to stay in business. If you work with them for your mutual benefit, hopefully everybody will win.

We asked this dedicated group of geographically diverse professionals to educate us about what it is that they provide for the audio equipment end-user in order to justify this request for a "partnership," rather than the "let the buyer beware" philosophy of many less service-oriented supplier/buyer relationships.

Jim Pace and Jeff Evans from A.I.D. in Los Angeles summarize it well, suggesting that "with today's complex technology, don't underestimate the value of product service and training. The cost of training is a good example. If the gear is complex, as most is today, the customer should understand that he is going to count on us to train his people and to solve his operator-error problems as they occur. There is a cost involved for us to provide training just as there is a cost in providing product service and loaners if the gear breaks. We do not just sell a box. The value of after-sale training and service is just as important as the

lowest price. We cannot provide this and still meet a mail-order price. The customer must understand that there is a real cost to him if he has to provide his own training and product service from the outside sources available. Purchasing the gear from us at a fair price provides the customer with an insurance policy that if he needs help we will be there for him whenever he needs us."

Tim Finnegan, general manager of Sam Ash Professional in New York City, explains, "Our objective is to service our clients as satisfactorily as possible. For us to be effective, we must know what the needs of our clients are. We work at keeping an open dialog with our customers to learn these needs so we may service them better. Each of our salespeople visits our clients as much as is necessary to keep the client informed. Our clients are our friends. We value their trust that we will inform them of what we believe will be of interest and importance to them and that we know not to interrupt their business unnecessarily with product information they probably don't need."

Okay, fine. But what about new products that are affecting our industry? How do these dealers determine which new products to represent? What are the important trends that they feel the end-user needs to know about? How can they save the customer time and money in this area?

John Downs, of Corner Music in Nashville, comments, "Since I am also a studio owner and an end-user, our clients and I guide each other. I furnish them with my experience with the latest developments, train them on the use of the new items, and then they share their tricks with me. We look for products with longevity and stability. We want the product to still give us some money next year. We don't need any more doorstops. My clients trust me, so if the new product I recommend doesn't work, I have to take it back. Right now, the big deal here is digital audio workstations. Which one is best for our kind of market is still the big question. The other emerging area we see here is the new upper echelon of tube gear. Because we rent gear, do our own service and keep demo gear, our client base will answer the 'which one' question for us. Furnishing replacement items while we fix their broken one is a key to success in our business because it gives us an opportunity to let the manufacturer know what is wrong with its product and at the same time, let our clients know what to watch out for."

Ken Musselman, sales manager of Milam Audio, near Chicago, explains, "Trying to determine new trends in technology and how it will affect our customers is one of our biggest jobs. We pick new products to represent primarily from 'hands on' experience. We want to know how a new piece of equipment operates, how it sounds, where it stands financially compared to similar products, and how stable the manufacturer is before we recommend it to our clients. We not only discuss customer needs with the manufacturers, but we will put the end-user directly in contact with manufacturers to discuss features that would improve the product for a particular application. This is one reason we see a continual upgrade in product software along with new hardware releases. In terms of hot new products, there are a number of them exploding into the mar-

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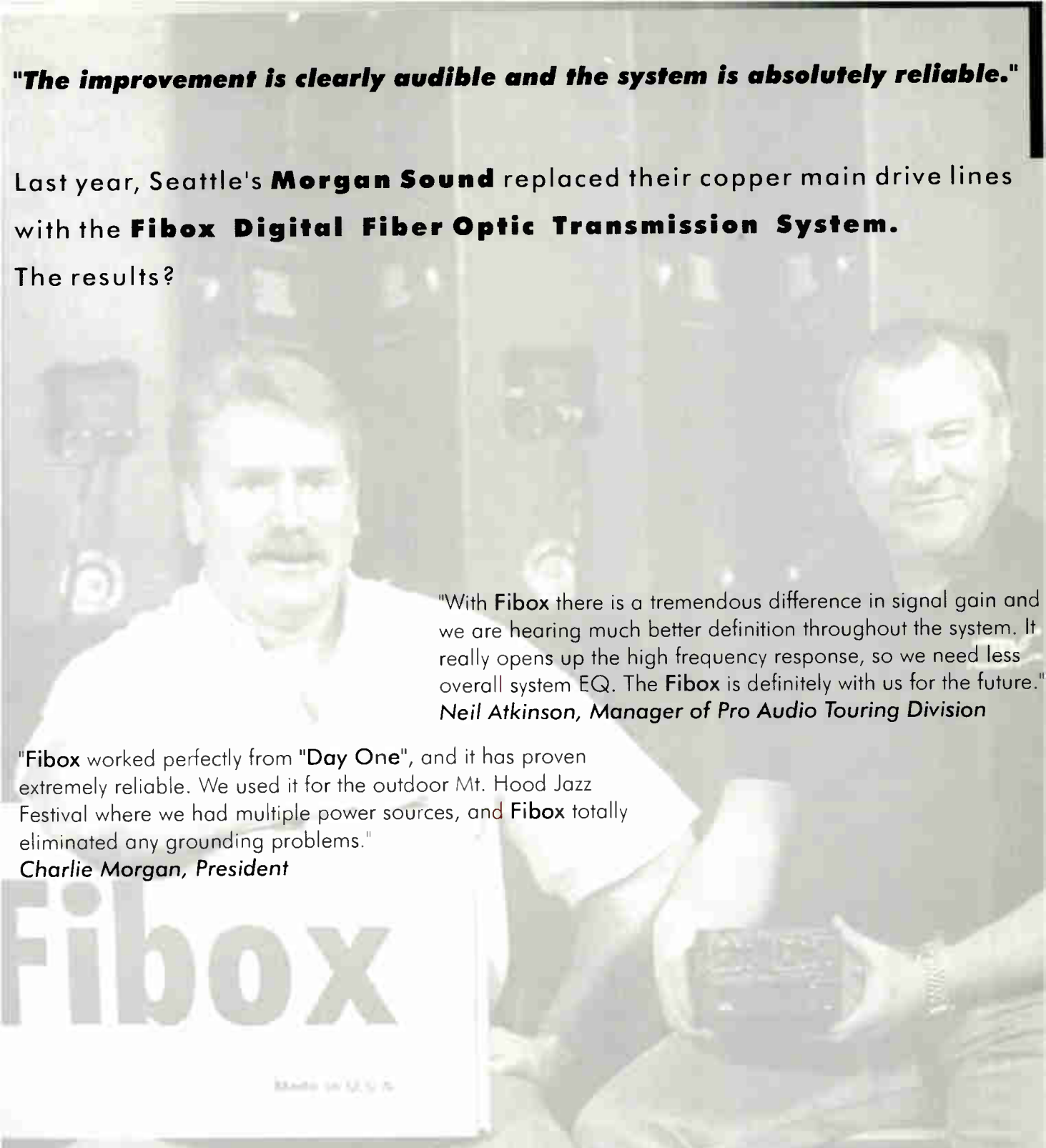

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ketplace because everyone is moving into the digital world. If I had to choose one or two lines, I would say the Otari RADAR and the Fostex Foundation platform are moving into the next digital generation of cost-effective professional equipment. As far as stimulating interest, we are doing on-site demos for anyone willing to push the buttons. Once you drive either one of these products around the block for 15 minutes, you will find out that these products create the interest."

Finnegan says Sam Ash Professional goes even further to show their clients the new trends and upcoming products. On February 4, they held a mini trade show in New York City called "Digiworld," sponsored by themselves and Digidesign. More than 25 different manufacturers of audio, video and multimedia products were present to display how they interact with and support the Digidesign Pro Tools TDM platform. Now that is service to your customer base!

When we ask these dealers what the major problems are with manufacturers, they answer almost in a single voice: The major gripe with new products is that manufacturers make promises of delivery that they can't keep. The dealer passes these promises on to his customer; the manufacturer does not deliver or delivers an underdeveloped product, and the dealer has to take the resulting flak. All of these dealers believe that they are responsible for product performance to their clients, regardless of whether the manufacturer has performed as promised. Their common warning is not to plan a session based on delivery promises for a new product because the risk is just too great.

The old adage that "pioneers get arrows, usually in the back" certainly applies here. If you are going to be the first one in your market to have a new item, be ready to have a lot of patience and spend a lot of time helping the manufacturer and the dealer make it work right. This is another very good reason not to purchase your gear on price alone. You are going to need the product specialists, technicians and operator instructors that only the full-service dealer can supply.

The other serious gripe about manufacturers is product support from the customer service departments. Some of them apparently don't know the meaning of TLC and,

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* Source: Music Trades (7/94), Inc. Magazine (10/93), Music Inc. (5/94)

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thus, spend more time trying to blame the user for the problem rather than making a genuine effort to quickly fix it. Getting the manufacturer's personnel out into the field to see what actually is going on is what these dealers want. Traveling with the dealer's salespeople not only educates the manufacturer, but adds prestige to the dealer and his salesperson because they are able to introduce the person who makes the product directly to their client, the end-user. Everybody wins with that one.

The other lesson manufacturers could learn from dealers is whether they are making product that the customer wants. Evans explains it well: "We have to be very particular about what we sell to our clients. If a manufacturer has the greatest machine in the world that makes only chocolate milkshakes, and our client does not like chocolate, we can't sell it to him. The manufacturer has to understand that. Our customers are busy. Otherwise we can't afford to have them as customers. We have to be sure to take up their time only when it is important to *them*.

"The manufacturer needs to spend more time in the real world of users," Evans continues, "traveling to clients with the dealers, to understand how his products fit into the overall scheme of things and how many end-users really need it and will buy it. No matter how sincere the manufacturer is, their understanding of their product is stilted by what they think [that product is], vs. what the users say it is based on real-world experience. We talk to an average of 100 manufacturers about their products. Ten to 15 of those we talk to every other day. That is the only way we can stay in touch with the reality of what the client wants and needs."

If you get together with a group of pro audio salespeople, the war stories could go on for days. One that points out the knowledge and customer service these people provide comes from Musselman: "We got a call from a studio owner with a problem that he had ongoing for a long time. Nothing he did would resolve the noise he had in his system. He didn't purchase his console from us but decided to call us anyway because he was stuck. After explaining all his unsuccessful efforts at a meticulous grounding system, we made a simple suggestion that he isolate the water pipe coming into the building with a section of nonconductive pipe and establish a new building ground. The results were instant quiet and a new customer for life. No charge."

Pace of A.I.D. sums it all up this way: "We talk clients through problems all the time. That's what we do. We use our client network to help each other in times of stress. It works, and that is a major reason why we have client loyalty. We get customers from all over the country who call us when they have a problem because they know we will do everything we can to immediately solve their problem, no matter what time of day it is. We like to know that when those same customers need a product, which we sell, that they will try to come us. It is that simple."

You scratch my back, I'll scratch yours. That works, and sometimes it is even fun. ■

Chris Stone has been a studio owner and pro audio dealer, and he has consulted with several manufacturers in the industry.

—FROM PAGE 140, PRO AUDIO DEALERS

niques finds itself catering to both large professional studios and musicians setting up their own project studios.

"One thing that stands out in my mind between a pro audio dealer and an M.I. location," Cook observes, "is the clientele I was dealing with in the music store more often than not were people who were using the products themselves, and they had an emotional attachment to this thing they just bought and took out of the box and plugged in. And a lot of the project studio people are that way still. But at AudioTechniques now, a lot of the people we deal with are studio owners or chief engineers who are literally making a living with this equipment, and when the weekend comes they want out of there and they don't really want to hear about this equipment. There isn't the same kind of emotional attachment. There is more of a return-on-the-investment-type attitude about the equipment. I'm not saying that's better or worse. But it's a way of thinking, and it's something we as a pro audio dealer have to be able to address."

Although Cook says he looks at AudioTechniques as a *pro* audio dealer, "I have to admit that the hottest things we're selling right now are small-format machines like ADATs and DA-88s. What we said ten years ago—that the digital era is upon us—really actually happened only about a year or so ago, because of these machines. Also, we sell a lot of DAT machines because by now, it's a format that has been completely accepted in the pro area; it's a standard. At the same time, though, we still sell a lot of what you might call more traditional pro audio equipment; that stuff doesn't go away. And basically, we still live in an analog world."

Increasingly, Cook and his cohorts are seeing big and small studios putting together hybrid analog/digital systems, matching old tube gear with the latest bit-technology gizmos. As Cook puts it, "We have some of our real old clients who still collect things like Ampex 300s on the one hand but also have a Sonic Solutions system there and they want to talk to you about that, too. The end-users today certainly have more of a breadth of knowledge in the overall technology that's out there. And a dealer has to make sure he's got all the different areas, old and new, covered in his sales staff. We have some younger people who are very well-versed in the computer area, but I also have guys who have been in the business for many, many years who can really address the classic audio needs of our clients."

Staying on top as a business means staying on top of technology, so that explains why AudioTechniques has gone out of its way, for example, to help its customers get into the world of ISDN technology. "ISDN at this time is still like black magic to a lot of people," Cook comments. "I joke that ISDN stands for 'I Still Don't Know,' because it is an intimidating area for a lot of people. The fact is, I could sell codecs—which are the actual boxes that act as a telephone receiver and transmitter between the digital lines—all day, but that's not going to help anybody, because once they call the phone company, nobody there knows what to do about getting them the line, or anything like that. So that's where we come in as a value-added retailer, so to speak. We do the whole turn-key system, where we'll sell you the codec, we'll battle the phone company—and it's not just the New York phone com-

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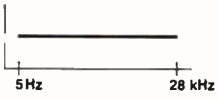

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pany; it's the one on the other end of the line, too—to make sure they're compatible with the different types of switching networks and things like that. So though manufacturers can probably sell these codecs directly, it's in the best interests of the recording studios or production centers to deal with someone like us, to actually step them through the whole process."

In keeping with their philosophy of trying to educate the public they sell to, AudioTechniques has also sponsored seminars and workshops on topics ranging from ISDN to microphone tips. "These seminars don't generate a lot of revenue," Cook says, "but I feel that as a dealer we have a certain obligation to the New York pro audio community to give back some of the profits we've made over the years in the form of knowledge. And while that may sound very altruistic, it's also a lot of fun for us." And it's one more way to keep that competitive edge in a tough, fast-moving market.

THE NEW KID: CUTTING EDGE AUDIO

Most major markets have established players who have earned their reputations and large client bases through years of successful business. Cutting Edge Audio is a recent addition to the ranks of pro audio dealers in the large San Francisco Bay Area market, and they have managed to thrive the past year and a half by identifying a new kind of client base and making savvy decisions about which equipment lines they choose to carry. Unlike many dealers, Cutting Edge doesn't have a flashy store/showroom loaded with product, and they aren't as heavily inventoried as some of their competitors. But the four main principals in the company—Jeff Briss, Sig Knapstad, Brian Botel and Tom Richardson—are all local pro audio veterans, with years of experience between them, and in some cases, loyal customers they've serviced at other jobs.

"We're kind of lean and mean—I don't know if that's an '80s or '90s thing," says Jeff Briss. "We try to be very specific. Frankly, we started this to be a Digidesign dealer. We considered everything else to be an accessory to that, be it Neumann mics or Mackie boards or DA-88s or whatever. I think because we had a focus along those lines, it's made it so we didn't have to stock a bit of everything. And there have been times when we've lost deals because we didn't have something in stock at that moment, and that will always be the case, even if we had a two-million-dollar inventory. But I think because we're not so heavily inventoried, we can invest in something like Avid AudioVision and have a working demo here and all the accessories. And because we're in good shape financially and not on credit-hold with any manufacturers, we can get the equipment we need when we need it. It might even be quicker to overnight something than to inventory a bunch of things we don't want, in order to have the few things we do want. It's a delicate balancing act."

Briss refers to the art of choosing which gear to sell to his customers as "cherrypicking. We try to take the best of this and the best of that. Some company may make a great mixer, but some of their other things aren't as good. Some other company may make a great EQ. I like to be able to take the best of various brands, and that makes it a lot easier to represent them honestly. This job is a constant juggling of what's new, how prices are going up and down, and know-

ing where our customers are trying to go in their work. We really try to find out in as much detail as we can about exactly what our customers are doing—if they're doing audio post, maybe model X is what they want; if they're recording a few demos for themselves, that suggests some other equipment."

In general, Briss believes that buyers are more savvy today than they used to be, "and there are certainly more opinions out there about what's good and what's not. There are more magazines, and then there are all the BBS's that are going on, making information available to more people. At the same time, it's become more difficult to be cohesive about all the information that's out there, and that's what we're pretty good at. I think it's hard for people on the outside to get a handle on the whole scope of what's available to them now, particularly on the software-driven devices. What works with what? That's the hardest thing."

Adds Sig Knapstad, the company's computer/software specialist, "I feel sorry for anyone just trying to get into this stuff. It's phenomenal the stuff you need to know now. You have to know about computers, you have to know about hard drives, disk utility programs. You have to know about MIDI; you have to know about timecode; you have to start knowing more about video and digital video. It's intense. Those worlds are all colliding."

Although Cutting Edge does a good deal of business in the traditional sectors of the audio business—consoles big (Amek, Soundcraft, Otari) and small (Mackie); mics, reverbs, etc.—one definitely senses from talking to Briss and Knapstad that they believe their future, and indeed the future of pro audio, lies in software-based technologies. "Most of our work seems to be multimedia-related," Briss says. "And it's not just CD-ROM people. A lot of it is game developers, who are one of our biggest customer groups. We seem to have a very good 'in' with Digidesign products. Then there are all the independents, people with their own distribution, freelancers. It's kind of a small community, really, but it's growing fast, and almost all of them use the same tools. I think in the future people will be incorporating more video production tools [in their work]. So many of our customers, particularly a lot of those

game people, are doing advanced audio for their video."

"Some video workstations are doing an okay job of some audio editing, and a lot of the interfaces are very similar, so it would be easy for us to get into [video]." Knapstad adds. "We've already gone through the work of learning how to work with large companies, learning how to configure computer-based systems and working with software."

Adds Cutting Edge's Brian Botel, "My focus when we started was consoles, but so much of what we're involved with is software-based that recently I've been designing virtual studios without consoles. Especially since Pro Tools III came out last fall, with all its mixing capabilities, what we're really looking at is consoles as control surfaces and routers basically. That's where I see the trend. There are a lot of control surfaces on the horizon: Digi has one; Sonic Solutions has been looking at different things; there's the Tactile Technologies board that looks very interesting, and Euphonix could certainly make some mini kind of version that would fit in with this idea."

Still, at the end of the day, the Cutting Edge gang agree that what will always make or break a pro audio dealer is the service it offers its customers. "We spend a lot of time hand-holding, and that has a price because when we sell a system, we include in the price telephone support, pager numbers, runners if they're available, and so on," Briss says. "Or if the customer prefers it, he can have it at this lower price and here's the tech support number for the factory. But that's getting harder and harder for customers to deal with. If a company's hot, their support gets overloaded. I hear from a lot of people that they can't get through to Digidesign; they can't get through to Opcode; they can't get through to Alesis; you have to fax them. They're just overwhelmed."

"I have a pager that's on 24 hours a day," Knapstad says. "One Saturday night, I got paged between 9 and 10 at night from New York, South Dakota and L.A. One person's computer had died, and they were trying to resurrect it; the other two were simply operational problems—'how do I do this or that?' But all of them were in the middle of sessions and they needed help right then. Our telephone bills are very high. But for the people who need that—which ultimately at one time or another is anybody—I think it's worth a lot. There will always be people who don't want to pay extra for that service or who want to save sales tax by going out of state or something like that—and if you're looking at an $8,000 or $10,000 workstation, you're talking about a lot of sales tax. But at the same time, if you're down, you're *down*, and what is your time worth at that point?"

"Because everything is moving so fast, particularly in the software area, I view myself as being a protector of my cleints, to make sure that manufacturer claims are accurate and that things really work and are integrated," concludes Brian Botel. "I don't see the job of a dealer as being just a middle man who displays a bunch of stuff from different manufacturers. Now, dealers need to be on the front lines, testing things before the customer purchases it, to make sure they're putting their money in the right place, and in a way, trying to be their guardian angel." ■

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by Dan Daley

FRANCIS DANIEL

Two of the partners of Music Works/Anchor Recording: Courtney Small (left) and founder Augustus "Gussie" Clarke

BUILT FOR REGGAE

MUSIC WORKS IN KINGSTON, JAMAICA

No one, including most of its residents, will tell you that Kingston is the garden spot of the world. Surrounded by some of the lushest greenery and best coffee-growing mountains in the West Indies, the capital of Jamaica, a little over an hour's flying time from Miami and due south of Cuba, is a quintessentially Third World metropolis. But it is also the global headquarters—or, to use T.S. Eliot's phrase, "the still point of the turning world"—of reggae, which has infused a number of other, more mainstream genres with its groove and its personally/politically provocative lyric content. You do not live in a place like Kingston without developing a point of view about life and the world and the way things are.

Augustus Clarke has lived there for some time, coming from rural St. Mary's on another part of the 146-mile-long island. His point of view incorporates a kind of nondenominational spirituality and the sort of hard-edged, realistic business sense of studio owners worldwide. Gussie, as he is known, has a substantial reggae resume. He's produced a number of leading acts, including several that have broken through to pop music. Maxi Priest is probably the best known, climbing the U.S. and British charts in 1992 and 1993. Others include Shabba Ranks, Freddie McGregor, Coco Tea, J.S. Lodge, Lady G. and Dean Fraser. Gussie says he has transcended the technology race, though, and his primary investment of late has been in talent. "I don't worry 'bout the money," he explains in his thick but elegant Jamaican patois. "You find people you believe in and do what it takes to develop them. And the money, it comes."

Despite his oft-repeated philosophy that "the song makes the artist," Gussie recently enlarged his small studio and renamed it Music Works/Anchor Recording Ltd. The original

—CONTINUED ON PAGE 160

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FACILITY SPOTLIGHT

Galaxy Studios

Galaxy Studios in Mol, Belgium, celebrated the grand opening of its expanded facilities in February. Formerly a one-studio, music-recording house, the Galaxy complex now comprises three control rooms, three studios, two vocal booths, a pre-production suite that doubles as a mastering room, and residential accommodations. What's most fascinating about this ambitious redesign is that the new rooms can be mixed and matched to suit specific projects and were built onto the existing building.

Galaxy's managing director, Wilfried Van Baelen, began the design process with a desire for enough space for orchestral recording and a fantasy that involved the addition of several large recording rooms and a few control rooms. Early consultation with UK architect David Hawkins of Eastlake Audio revealed the pitfalls of Van Baelen's plan: Isolation of more than 60 dB would be extremely difficult to achieve,

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though Van Baelen felt that more than 70 dB would be required. Eric Desart of Gerber BV, Munich, Germany (a firm specializing in solving industrial sound problems), and Professor Vermeir of the Building and Acoustics Department of the University of Leuven prepared extensive calculations that enabled Eastlake to arrive at some original architectural solutions.

Van Baelen says that the unusual structural qualities of the building are not apparent to the observer, "but what you don't see is that control rooms 1 and 3 are completely detached in concrete bunkers that weigh approximately 300 tons each and rest on steel springs that had to be specially designed." According to Van Baelen, the springs have already recoiled by 2.4 centimeters and will probably go down another 0.5 millimeters during the next 50 years. "The metal fatigue has been taken into account from the beginning, and each spring is covered by a thick rubber buffer at the top and bottom to avert high-frequency sounds," he says. "To achieve this, we first had to make a heavy foundation in which the wooden construction was placed. We then poured the control room floor. After five weeks, the plate was dry and was jacked up by using hydraulic equipment. The wood was then torn out from underneath, and the springs were set in place. Then the whole construction was lowered onto the springs, and normal construction continued. This was the only way we could hope to achieve an isolation value higher than 75 to 80 dB."

Thick, double-paned windows were also designed to separate the new rooms, in an effort to achieve the desired isolation level without sacrificing low-frequency sounds. Desart arranged for a German glass manufacturer to produce 10.5-gauge panes, each of which weighed more than a ton. Van Baelen's brother, engineer Guido Van Baelen, who supervised the construction of the expansion, designed special equipment just to lift the panes so that they could be installed.

It seems that nearly everything had to be reinvented for this project. "When we came to tackle the air conditioning," Wilfried Van Baelen says, "we had to overcome the need for a large-capacity system while retaining the level of soundproofing. This we did by developing dampers that are totally unique. There are broad air channels in the walls that deliver fresh air at a very low air speed. Just to give you an idea, until recently, the recognized 'silent studio' was ZDF in Germany, where they had achieved a noise ratio value of 5. The NR curve reflects the low-frequency sound levels of air conditioning systems. The lower frequencies always present most of the problems. We achieved a value of -15—far below the threshold of audibility; we pursued a noise factor of that of a microphone, but have gone far below that original target."

Now that the two-year construction project is complete, Van Baelen says that the linear absorption in the control rooms is straight from 30 to 18k Hz and that isolation up to 90 dB has been achieved. Studio 1 is approximately 806 square feet; Studio 2, the original room, is about 455 square feet, and the Main Hall (Studio 3) occupies about 3,540 square feet.

Control Room 1 is equipped with a 126-channel Neve Capricorn digital console. Other featured equipment

includes a Sony DASH PCM 3348 multitrack tape machine, a Fostex D20 timecode DAT and Genelec 1035 and 1031 reference monitors.

Control Room 2's 52-channel Amek Angela is equipped with Optifile HHD automation. This room also contains multitracks from MCI and Sony, Genelec monitors and outboard gear from Tubetech, Lexicon, Yamaha, UREI, JBL, Roland and Aphex.

Control Room 3 has an AMS/Neve 51 console with 24 inputs, Sony DASH PCM 3348 and PCM-7030 recorders and Genelec 1035 and 1031A monitors. Galaxy's mastering/preproduction room offers a Sonic Solutions editing system, Genelec and Quad monitoring and Sony PCM 7030 and 7050 recorders.

Galaxy also offers mics from Neumann, Schoeps, Bruel & Kjaer, AKG, Shure and Sennheiser and an extensive collection of MIDI gear and musical instruments (a Steinway Concert D resides in the Main Hall and a Yamaha Conservatory piano in Studio 2). Recent sessions at Galaxy Studios have included European artists Deus, Soul Sister, Dinky Toys, Dana Winner and John Elliot Gardener recording Verdi's *Requiem* for Phillips Classics. —*Barbara Schultz*

Audio engineer Guido Van Baelen and general manager Wilfried Van Baelen

—FROM PAGE 155, MUSIC WORKS

Music Works, which he founded in 1979 in Kingston, has moved into record manufacturing and music publishing, a logical extension of production and studio ownership, and a trend that's being mirrored in other genres and on other continents.

Gussie's epiphany came in the late 1970s, when, after producing "Pass the Dutchie" for local reggae act the Mighty Diamonds, he saw the song become a huge international hit for the British reggae group Musical Youth. "I realized that you had to do more than just own the studio and develop and produce the acts," he says, noting that Kingston alone has nearly 50 recording studios of varying size and technological sophistication. "You had to have the copyrights, as well." Anchor also houses offices that will handle artist management and other related enterprises.

Nonetheless, the studio remains a critical component. The original Music Works was started with money he got from trading a sound system he had been building since high school. Jamaica, and the Caribbean in general, experienced a rapid proliferation of studios in the '70s, as reggae songs gained the interest of American and British artists (e.g., Eric Clapton's "I Shot the Sheriff"), and regional artists began having pop chart successes of their own (Bob Marley & The Wailers, Peter Tosh, Jimmy Cliff, to name just a few). Multitracking was limited to 4- and 8-track systems, with some records being made directly to 2-track. Despite the number of studios in Jamaica today, none uses digital storage media beyond DAT, and consoles tend to be of the workhorse variety.

Anchor Recording follows the pattern, with two Otari MTR-100 24-track decks and a 40-input Amek Mozart. But, observes Gussie, that level of technology still puts Anchor at the apex of the island's technology base, and capital is conserved for the other activities of the business.

Much thought went into the design of the two-room facility, particularly

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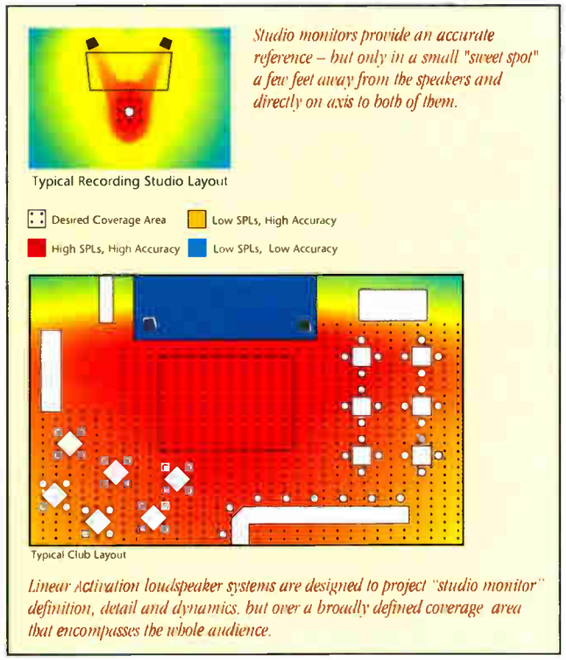
THE NEAR FIELD: TWO DEFINITIONS

In the studio, "nearfield" means a spot where the direct output from the loudspeakers is the only factor determining sound quality. Room reflections arrive so late and are so much softer than the direct sound that they play no part in the listening experience. Studio nearfields are designed to operate at a distance of 1 – 4m (three to fifteen feet) and provide a reference to one or two listeners. Because the coverage area is so small (about one square foot, the size of the average human head) and reflected sound is not a factor, the only essential requirement for speakers of this type is flat on-axis frequency response. This can achieved through the use of active or passive equalization. High SPL output capability is not required, since the listening distance is so short.



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Linear Activation loudspeaker systems are designed to project "studio monitor" definition, detail and dynamics, but over a broadly defined coverage area that encompasses the whole audience.

In typical live sound reinforcement applications such as clubs, corporate presentations, or worship services, "nearfield" means the entire listening area within roughly 15 – 65 feet from the loudspeakers. Much of the audience will actually be closer to the side or rear walls than to the speakers, so the reverberant field is a major part of the sound. The coverage area is hundreds or even thousands of square feet – extremely high output capability is required to provide "adequate" levels throughout such a space. Sound quality should be consistent throughout, so that all listeners can hear and appreciate the performance. When the reverberant field is very different in tonal balance from the direct sound, the ear is confused, intelligibility is low and the sound quality is perceived as "hollow" or "harsh." Hours of tweaking with equalizers cannot solve this problem, because equalizers cannot change the dispersion and coverage angles of the loudspeaker system.

TOTAL ACOUSTIC OUTPUT

Linear Activation design recognizes that it is the loudspeaker's total acoustic output that determines how it activates a given listening area. When total acoustic output is optimized, coverage is consistent, the spectral content of the reverberant field matches that of the direct sound field (as it would in an unamplified performance) and every member of the audience can have a satisfying listening experience.

One of the keys to Linear Activation design is the requirement that the dispersion angle as well as the on axis amplitude remain consistent throughout the frequency range. Consistent coverage angle must be designed into the system from the beginning – it cannot be added later with equalizers.

In the course of optimizing the total acoustic output of the new LA Series of Linear Activation systems, EAW engineers have developed innovations such as the Elliptic Conical Waveguide used to control high frequency dispersion. But these new technologies are only useful because they are integrated into professional loudspeaker systems that produce Linear Activation of a small to medium size venue.

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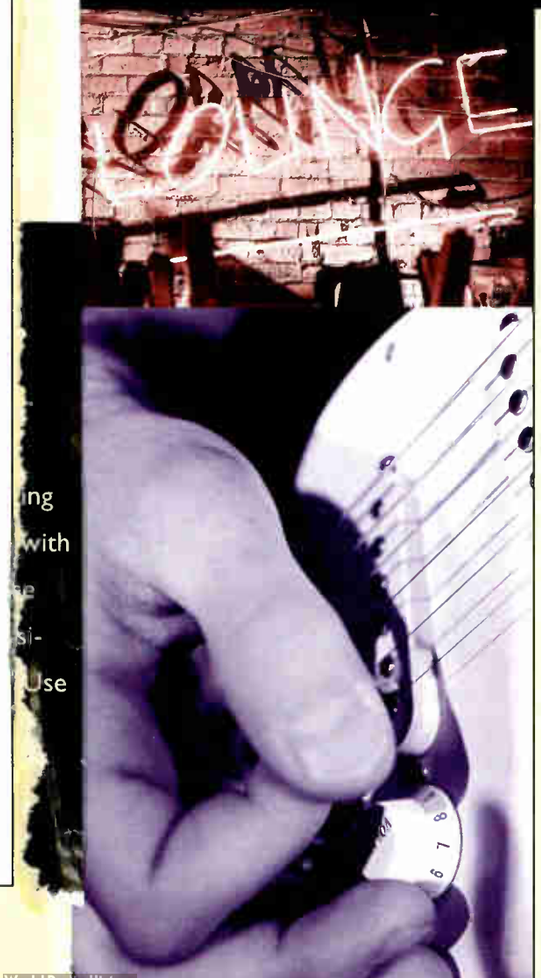

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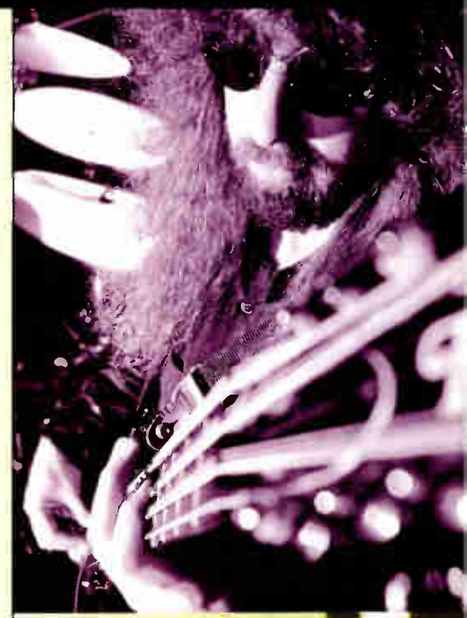

LA

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for the main studio's acoustics. "The thing about reggae, it has to feel right," says Steven Stanley, a leading reggae engineer (Maxi Priest, Ziggy Marley, Jimmy Cliff) and a former staffer at Compass Point Studios in The Bahamas. "You don't care about the little things, little problems on a track; you care that the feel is there and that the bottom and the groove are right." (In lieu of automation, Stanley will often submix track groups with certain EQ, effect and level changes to another 24-track deck, so that when they pass the heads, the parameters are already recorded.)

The control room in Studio 2 is quite large (24x29 feet with a 12-foot ceiling), and the State of the Art Electronik (SOTA) monitoring system, designed by SOTA owner Claude Fortier, was specifically designed to reproduce low frequencies as articulately as possible, while keeping other frequency ranges clear. The Series CF 4000 array is a modified version of what Fortier devised for the IMAX broad-screen version of the Rolling Stones' "Steel Wheels" tour film. The system is built without horns and with a specialized, patented crossover that Fortier says eliminates low-end phase and linearity problems and does so at high SPL values with virtually no distortion.

Volume is a distinct function of the feel that engineer Stanley referred to. "It's really more like an audiophile system than a commercial one," Fortier explains. The amping is four-way, with four Crown power amps generating a total of nearly 10,000 watts. Each array consists of four 18-inch speakers in two parallel mountings and a series of five ever-smaller tweeters (down to 1.25 inches) running down the center spine of the high-density fiberboard enclosures, each of which weighs in at nearly 500 pounds, unloaded. An additional bin of 18-inch subwoofers is built into the wall below the enclosures. Finally, another subwoofer bin is positioned on the floor next to and beneath the console, used in conjunction with the SOTA CF 150 close-field monitors. "In our type of music, most of the engineers believe louder is better," Gussie says.

The speaker mountings, like the rest of the studio design, were planned by Francis Daniel of the acoustical firm Shen, Milson, Wilke and studio designers ARcoustics. The mountings are soffitted atop columns of poured concrete and mechanically divorced from the building. The disengagement of physical surfaces appears to be successful: While the solar plexus was being punched with a low end approaching 120 dB, the marble floors were absolutely still to the touch. The console, however, reflected the power; during one test run, a meter on the Amek shook loose.

LOTS OF CONTROL ROOM

Daniel's design provides for a rather large live control room, with a sunken floor between the console dais and the speaker mountings to accommodate players while keeping the speaker throw field clear of obstructions between the soffits and the console. The rear wall is completely diffracted with RPG systems, with a large-sawtooth ceiling of ARcoustics' own Reflexsorber design to provide absorption in one direction and diffusion in another.

As large as the control room is, the recording room seems that much smaller on the other side of the dou-

ble-glass divider. Daniel worked to optimize this specification from Gussie, who notes that reggae producers and engineers have wholly embraced direct recording for the music, thus requiring little in the way of acoustical spaces. That, he explains, is a function of the dense, crowded percussion endemic to reggae, which favors short, fast decaying ambiences. And, added Stanley, "I like electronic percussion because you never have to worry about getting a great groove going and then having the drummer drop time."

Several other local engineers backed up Stanley's assessment of contemporary reggae tracking, estimating that live recording spaces now account for a very small percentage of reggae work, a trend based as much on economics as artistic choice.

The wide placement of the main monitors and the relatively long distance to the sweet spot was based on an equilateral triangle. "A larger window into the recording room, as specified by Gussie, necessitated a wider placement of the speakers, and that in turn had its effect on the total area of the control room," Daniel explains.

Historically, reggae has been produced in smaller recording environments due to lower budgets. While visits by pop icons to the Caribbean are well-publicized, they tend to stay only for short periods, coming to avail themselves of the local musicians and engineers' mixing techniques, which can best be defined by the depth and definition on the low end.

Monitoring systems, meanwhile, have been quietly but purposefully adapted to the frequency demands of different types of music. Fortier recalled an installation in a Nashville mastering house a decade ago in which the drivers kept blowing out. "Country music mixes tended to emphasize male vocals, around the 1kHz range," he says. "We found that we had to adapt the speakers to where they were mixing, and we had to do the same thing in this case."

The initial plan called for the subwoofers to be placed out in the control room, freestanding. "There was no way to predict the final interaction of the subwoofers with the rest of the design," Daniel says, "so I wanted to have them movable in order to be able to tune the room." Pragmatism overtook theory, however, when Gussie pointed out that the free-standing subs might quickly become end tables for players, who were less concerned with acoustical theory than with getting the feel right. The final tuning of the room utilized Jennifer Warnes' version of Leonard Cohen's "Bird on a Wire" track from the 1993 *Famous Blue Raincoat* tribute record, as recorded on a B&K reference CD. "That track has become kind of a standard for this sort of thing," Daniel says, with a nod of agreement from Fortier, who adds, "You can listen to it over and over again without getting tired."

Despite the fact that Anchor Recording has three rooms—the main new studio, a second, smaller Soundcraft Sapphyre room (whose ceiling and speaker soffits were refurbished by Daniel), and a diminutive preproduction studio in the same building—the primary thrust of the facility is still toward Gussie's in-house

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productions. He is placing little emphasis in his marketing plan on for-hire clientele. "If they come, that's fine, but this is mainly for the records we're doing ourselves," he says.

"It's really designed for the convenience of the local market," Gussie adds. "Whoever comes after that, that's great. But we're not specifically going after a foreign market, and we feel no real need to advertise outside the community." However, Gussie is in the planning stages of another facility, perhaps in Negril, a resort town on the far western shore of the island. The second facility would be a two-studio complex, one of whose rooms would likely have a more elaborate console in order to attract a broader range of clientele.

Gussie purposely chose his mix of mid-priced technology for both his own tastes and the budgets of the local industry. Average hourly rates in Jamaican studios—and that includes Music Works when it's being used for-hire—are in the $600 to $1,000 Jamaican dollar range, approximately U.S. $30 per hour at the prevailing exchange rate of 32:1. "We could have gone higher tech, but who in Jamaica would have been able to afford it?" Gussie asks. "We would have priced the local industry out and then been at the mercy of larger market forces as we had to look to offshore clients to help make it profitable. And while the level of technology is higher [in Jamaica] than it has been in past years, state-of-the-art is a relative thing." ■

Dan Daley is Mix*'s East Coast editor. And he made it through customs jus' fine, mon.*

BITS AND PIECES

NORTH AND SOUTH AMERICA

Master's Workshop (Rexdale, ON) added a Tascam DA-88 and R-DAT and upgraded the console at its Magnetic South location at Queen and River Streets. The facility also reports getting the contract to do soundtrack production for the planned CBS series based on Harlequin romance novels...Airwaves Sound Design of Vancouver, BC, added a 56-channel

—CONTINUED ON PAGE 222

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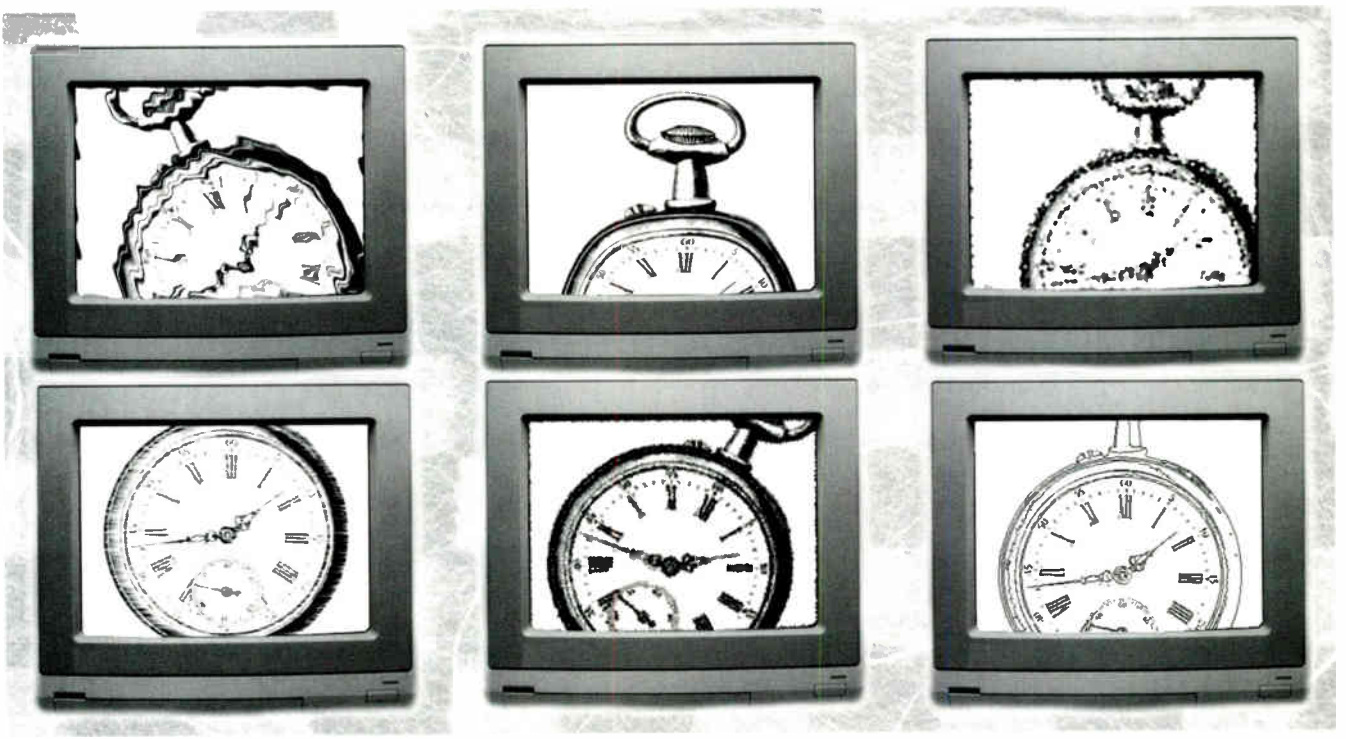
by Dan Daley



Is It Live, or Is It Synchronized?

There is a niche in this business that few people are aware of that can be expressed in this burlesque riddle: "What has 80 arms, 80 legs, video, audio and a timecode track?" The answer is the unique, almost odd, but very robust submarket of designing audio for live presentations. What most of us remember only from high school hygiene class—the slide shows run by the pencil necks in the A/V department—has evolved, on the corporate level, into some rather spectacular presentations. The theme park versions are the most widely viewed ("Hello, I'm Abraham Lincoln and a close personal friend of Walt Disney"), but car manufacturers and copier machine marketers have also been known to give Las Vegas a run for its money, with presentations replete with singers, dancers, chorus lines, laser shows and smoke machines. In fact, sometimes they do it in Las Vegas.

Actually, corporate presentations are not typically all that elaborate, but they do need to have all the elements timed, and coordinating between live and prerecorded elements can be challenging, to say the least. The business is segmented into levels based on budgets. And it's become apparent that the project studio is perfectly suited for this niche.

On the basic level is an operation like Sweet Potato Music, a recent start-up company whose creative head is Paul Guzzone. Sweet Potato has done corporate presentations for Toyota, Xerox, Fuji and Apple in its relatively short existence. Budgets generally run under $10,000, and Guzzone handles the audio using a pair of

PHOTO MONTAGE LINDA GOUGH

Mackie consoles (1604 and a 1202) feeding a single Alesis ADAT from his Brooklyn, N.Y., project studio.

"What you're doing is creating what's known in the business as a 'module,'" Guzzone says. "It's a holdover from the analog days, when that was what you'd put into a slide projector—a carousel or module full of presentation slides." Those used to be synchronized manually using a beep tone. Guzzone, however, takes rough video cuts from production houses on stereo VHS tapes, with a voice-over on one track and 30 fps, nondrop SMPTE code on the other. That same track may later be used to trigger lights and video projectors, but at this stage, the timecode track is simply used as an equally rough position guide. Because Sweet Potato has no timecode-capable DAT deck, Guzzone will supply finished audio to his client on a regular DAT, along with a mono version on the former VO track of the VHS tape. The whole thing is then usually dumped to a hard disk-based video editing system.

With no timecode to refer to, the sync is often slippery, but acceptably so, maintains Guzzone. "With a 30-second spot, this way is no problem," he says. "When you're working on 12-minute pieces, which is quite often normal for these kinds of shows, then drift is an issue, but one the production houses are used to. Basically, at this level, SMPTE is more of a guide than synchronization method."

THE VEGAS CONNECTION

The upper levels of the business are handled by larger facilities, many of which are project studios. Brielle Music, in Manhattan, has an Amek Mozart and 24-track analog decks. Owner Jon Brielle has scored presentation shows for clients including Ford, Lincoln-Mercury and Jaguar (in Paris, at the Louvre, no less) and designed the audio for a long-running extravaganza in Las Vegas called "Enter The Night," which features prerecorded tracks playing in sync with 40 live musicians. The budgets can run into the hundreds of thousands of dollars.

"You're using both MIDI and SMPTE timecode on jobs like these, but not usually together," Brielle explains. "It depends on who's doing the programming. It's a decision usually made between the technical ends of the project, not the ultimate clients." Synchronization issues in this field have to take into account what types of visual elements are going to be used and what their triggering needs are. Laser systems generally use SMPTE, Brielle says, but standard lights and video cues can be done with MTC. And often, the lighting and other visual programmers will generate their own MIDI clocks while assembling the final projects.

Strangely enough, many presentations are moving toward Beta as the final playback format, which may or may not present problems. "Beta has two analog and two digital tracks," explains Brielle. "What I've found happening is that the programmers don't want audio on a separate source format; they want it on the video. And the video people are forever using the analog tracks for the audio and the digital ones for all sorts of other things. And if you try to switch them, you end up screwing up their programming. You beg and scream for them to use the digital tracks for the audio, because otherwise the sound is like off a cassette."

> Coordinating between live and prerecorded elements can be challenging, to say the least.

For the Las Vegas show, Brielle provided the audio on an ADAT. One track contained a click to cue the live musicians; the other tracks included a stereo mix of the prerecorded music stems, a background vocal mix to fatten up the live vocals, a lead vocal track for lip sync (to cover for an unexpected absence of a primary singer), a sound effects track and a timecode track, which is also used to trigger lights and other elements at specific cue points.

The main issue, though, says Brielle, is that the scoring for this type of work is usually done before the finished product is assembled, rather than scoring to picture. "In an ideal world, it would be the other way

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around," he says. "It's very simple for them, though. In effect, they're programming you."

NOW THAT'S A BUDGET

Jeff Roth's Focused Audio in San Francisco grabbed a sort of brass ring of this niche when his firm did sound design, dialog editing and mixing on a Microsoft presentation for America's favorite billionaire, Bill Gates. This presentation, shown at Comdex last November, was designed to have the speaker interact with a prerecorded video narrative, which was to illustrate Gates' vision of a computerized future. During the story, Gates would talk to the onscreen characters and take center stage during several pauses in the program.

Although the sound effects and cues were many and varied, and spotting was critical within the quick-cut approach taken by producers Bravura Films, the project ultimately was assembled more like a feature film than anything else. "We mixed it on large speakers, the JBL 4330s with two 10-inch woofers and a Bi-Radial horn, because it was designed for a theatrical presentation," Roth recalls, noting that a small-speaker mix was later added for future showings of the program sans Gates.

The timecode was a standard 30 fps nondrop, and Roth simply handed over a timecoded copy to the client. The timecode, Roth says, was used to cue the stills and coordinate the video/still interplay during the presentation.

"There was a letterbox version of the presentation playing in the hall," Roth explains. "And that ran in sync with a video-style satellite feed that was sent to Microsoft locations worldwide. Between segments—when the video went black and Gates would talk about a certain technology—frame-store stills would come up on screen to illustrate what he was talking about. And that was all triggered by timecode."

Aside from illustrating the fact that the industry has more niches than seem immediately apparent, the fact that synchronization has impact beyond the conventional studio provides a somewhat new perspective. As Guzzone puts it, "Timecode can be whatever anyone wants it to be." ■

Dan Daley is Mix*'s East Coast editor, in both still and video form.*

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by Mark Frink

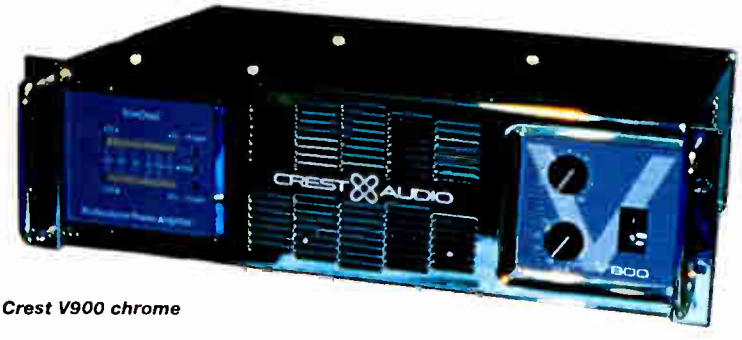
SOUNDCHECK

EON Power 10 and 15 speaker

BIG NEWS FROM NAMM

Well, I won't make any jokes about the crowd at this year's winter NAMM show. Let's just say that despite a noticeable decrease in spandex and centerfolds compared to previous shows, everyone I spoke with was doing very brisk business. Our industry seems to be extremely healthy, with some manufacturers taking more orders at this show than they shipped in all of the previous year. What follows are some highlights of the show, from the live sound perspective.

Mackie of Woodinville, Wash., recently moved into its third new building in as many years, to keep up with demand. The company introduced several new products at NAMM, including its new SR24•4 "4-bus," 4x2x1 live mixer. It is only 20.5 inches wide, so it will fit on top of your rack very nicely. This is the club or rehearsal mixer many of you have been waiting for, and I'll bet it could be used as a multiple-mix monitor console in a pinch (or a tight club). Its 20 balanced mic/line-input channels have TRS inserts, 60mm faders, a 75Hz low-cut filter and 3-band EQ with sweepable mids. There are also two stereo inputs with fixed 4-band EQ on faders, as well as four stereo aux returns over the master section on pots. There are six auxiliaries: two pre, two post and two that are switchable. On the L/R bus, there's LED metering that can be switched to aux 1 and 2, and it meters any PFL signal. In addition to the stereo bus, the four submasters can also be assigned to the mono output. All outputs are balanced, and there are inserts on the four subs and on the L/R bus. One "Mackie-ism" is the additional "air" EQ on subs 1 and 2, which boosts 10 to 15 kHz by up to 10 dB; some of you might remember something similar on the old Tapco 6100 Series. Pricing falls between the 8-bus and 1604; lower than you might think.



Crest V900 chrome

Woodworx of Greensboro, N.C., was showing its new MAX line of speakers, which includes trapezoidal cabinets and floor wedges, with both single and double 12s, called the MAX 1.5A, 1.5M, 2.5A and 2.5M. There is also a three-way trapezoidal MAX 3.5A with two 12s and two 10s, and a new companion double-15 sub called the MAX 5.0. All the full-range enclosures incorporate a CAD-designed, controlled-pattern wave guide developed to achieve smooth arraying and uniform pattern control across its bandwidth. The 150-watt, high-frequency driver has a 3-inch diaphragm. The 12s are custom 600-watt, high-excursion drivers that are typical of those used in Roadworx's national touring systems. The furniture-quality enclosures are made of 13-ply Baltic birch, have contoured corners and double-thickness baffleboard construction, and include flush-mounted Aeroquip™ L-track hardware for rigging. Also new is the one-space MXC-42 4-channel, two-way crossover/controller. It incorporates phase alignment and EQ contouring for four channels of MAX Series speakers.

Sony (Montvale, N.J.) introduced its new WRT-867A UHF wireless hand-held microphone, which has a smaller body than the WRT-810/830 transmitters and a much shorter antenna instead of the previous "whip." The channel-select switches and LCD channel indicator are now

—CONTINUED ON PAGE 177

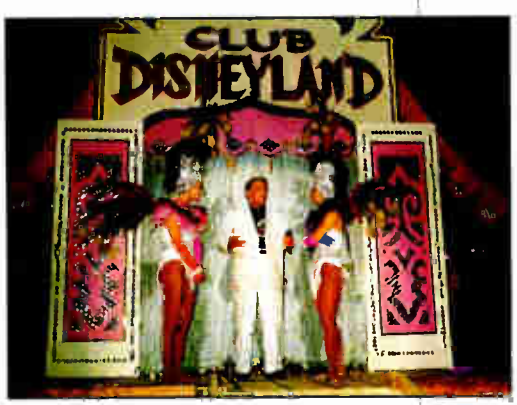
CREST PHOTO: GEORGE PETERSEN

Super Bowl Sound

Better than the Game (As Usual)

by Mark Frink

Super Bowl XXIX at Joe Robbie Stadium in Miami was one of the biggest routs ever; the 49ers had scored four of their seven touchdowns by half-time. In addition to the game, there was a full-blown theatrical production by Disney that was a high-tech cross between a three-ring circus and a Broadway show. Besides the musical performing artists, there was a cast of thousands of dancers and actors, plus parachutists and stuntmen with pyrotechnics, and lasers that, together, made for a half-time show that upstaged the game itself. The sound system was sponsored by JBL for the second year in a row, with sound services provided through Miami's Best Audio and supplemented by Roadworx, of Greensboro, N.C. I found myself at the 50-yard line in the course of my duties, doing sound for Tony Bennett, who performed at the half-time show, and I would be remiss if I didn't fill you in on some of the technical details of the show.



Tony Bennett's half-time performance

The control center for the half-time sound system was located under the stadium bleachers, with racks containing 13 sets of processing for the system's 13 zones. JBL ES 52000 crossovers fed Aphex 120A distro amps that drove the signal out to the amps on the field. BSS TCS-803 delays, BSS FCS 926 "Varicurve" equalizers and UREI LA-12 compressor/limiters processed the signal for each zone coming from the main Soundcraft console, high up in the stadium. This year, the system was SIMM'd in a process that took an entire day, though last year, the system was TEF'd. The clarity and intelligibility were amazing.

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and the speaker system delivered an incredible amount of SPL for its size.

The main speaker system at the side of the field was hung from two 30-foot-high towers made of a horizontal truss section supported by two vertical sections that were quickly erected at each 35-yard line, just for the pregame. Each of these two arrays consisted of three zones of JBL 4892 Concert Series array speakers, with four columns of four speakers facing both across the field and back at the bleachers behind, and two columns of speakers angled up, toward the end zone. A seventh zone was the two clusters of 4893 subwoofers below, at the extreme edge of the field, loaded against the bleacher wall.

Six more zones were the 10-foot custom delay carts that were rolled onto the field: two at each end zone, and two on the opposite side of the field from the main arrays, facing in the same direction as the stage. Each delay cart consisted of two rows of three JBL 4894 Array Series enclosures along with three 2451 compression drivers on 2353 biradial horns mounted above them. Like the rest of the system, they were powered with JBL MPA 1100 and MPA 600 amps sitting right on the carts. The carts held the bottom row of speakers at a 10° angle. The top row and the horns were at a 20° angle and folded back down onto the cart when rolling on and off the field. Total mains power was estimated by JBL's Gary Hardesty at 165 kilowatts.

Although all performances at the Super Bowl in recent years have been pretaped and lip-synched, Bennett broke with tradition and sang his rendition of "Caravan" live. The rest of the show was on tape, including Bennett's backing orchestra and the Ralph Sharon Trio he always travels with. Bennett chose a new microphone by Audix, after auditioning many other models by several manufacturers, as well as specially modified versions of the OM-1, OM-2, OM-3 and OM-5. The new Bennett dynamic mic, which does not yet have a name, was designed by Audix's Fred Bijh specifically to have minimal proximity effect, minimal sibilance, a smooth frequency response and an open, natural sound.

Roadworx's Kent Lieske ran the Soundcraft SM-12 console for the stage monitors for both halftime and pregame from the 50-yard line, using White 4650 equalizers. Dana Byrd was the system technician, ensuring that cables were correctly run and patched, which is all accomplished in a few short minutes, having been fully rehearsed during the two preceding days. The set was comprised of ten aluminum and steel carts on trailer wheels that make up the stage in sections. They roll in and connect to each other to form the stage, and eight more "ramp" carts connect at the front and sides. At the end of the first half, these carts were all quickly rolled into position by a stage

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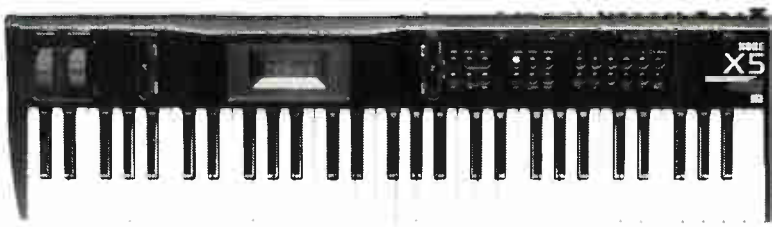

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crew of volunteers and strapped together by the stage technicians.

Woodworx MAX 1.5M monitors mounted in the set were used by Tony Bennett, Patti LaBelle, Arturo Sandoval and Miami Sound Machine's half-time performances. Most of the stage monitors were slung underneath and fired up through the perforated decking. The amp racks were also mounted in the carts, along with dimmers and pyro-control cables and mortars. The wedges were powered by AB Systems' 9160 amps for the lows and by 4-channel AB 644 amps for the highs with TDM-manufactured MAX controller/crossovers. Four of the new JBL 4892 array series floor monitors were used for the downstage area. All five wedge mixes were delayed by as much as 84 milliseconds, depending on their location relative to the mains, using Audio Digital delay lines, and the monitor cue mix was delayed 273 milliseconds with a BSS TCS-803 due to its location across the field from the mains. These mixes were used with different wedges in other field locations on small risers for the pregame show performances, with correspondingly different delay settings.

The pregame appearances by Jimmy Buffett's Island Boys, Sergio Mendez, and Hank Williams Jr. were all pretaped, as is normal for this type of production. Tape playback was from a Tascam DA-88 digital 8-track. Kathie Lee Gifford also performed to her recording of the national anthem at the pregame show, monitoring with Future Sonics wireless at-the-ear monitors along with monitor wedges for backup. Marty Garcia was on hand to assist with the fitting and supervise the frequency coordination. Another pair of Future Sonics ear monitors was used onstage as a wireless production line during the half-time setup by Westchester, N.Y.'s Mike Ward, who mixes for Bernadette Peters and techs with Masque Sound when he's at home. Ward was the stage technician for the show and was responsible for checking Tony Bennett's microphone and that the wedges were receiving pink noise prior to the show's start, among other duties. The entire show went off like clockwork, as it must in front of such a large audience. The added stress of using a live microphone was inconsequential to the crew, who handled everything in stride, as if it were just an ordinary day on a tour. ■

—FROM PAGE 172, NAMM NEWS

mounted inside the housing to prevent misoperation and to clean up its look. It uses a single AA alkaline battery for four hours of continuous use. It also uses the "channel 68" group of frequencies in the Sony UHF line and is compatible with previous Sony WRR-820/840 tuners. It employs the same directional dynamic capsule employed in the company's new F-780 hardwired mic, also introduced at the show. The capsule has a rising

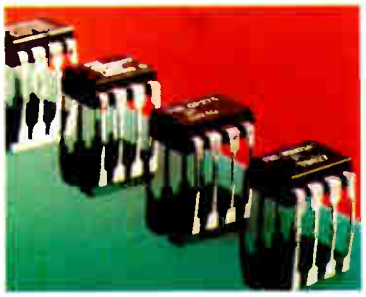
response at 1 kHz and a presence peak around 7 kHz.

Future Sonics of Pineville, Pa., was showing its new W700 wireless At Ear Monitor (AEM™) system, which uses 32 UHF channels and lists for under $5,600. Also shown was the new Hardliner™ HAR100 hard-wired stereo amp with VCA belt-pack listing for under $1,400. It has 5-pin DIN connectors on the back for looping through other Future Sonics units and an internal cue bus switcher that allows the engineer to listen to multiple systems. Its amp has binding posts, can drive 8-ohm loads at 40 watts and can also be used with near-field speakers. VCA control of output stage from the belt-pack allows the artist to control the level, while permitting the engineer to monitor at the artist's level through the cue bus.

Woodworx Max 3.5A

Pendulum Audio of Gillette, N.J., has managed to squeeze the electronics normally found in an active DI box into the two connector ends of an 18-foot cable that has a male XLR on one end and a ¼-inch on the other. It looks like an adapter cable, but it's really the simplest active preamp for piezo transducers possible. It runs on standard phantom power from any mixing board and plugs right into the end-pin jack of an acoustic guitar. Another product from Pendulum you might not be acquainted with is the SPS-1 Stereo Preamp System, an evolution of the previous single-channel, four-band parametric HZ-10SE acoustic preamp for which this small company has become famous with serious acoustic players. Its two 3-band parametric channels can be used independently or can blend two inputs from the same instrument using the pan controls in the master section. It also has a stereo-effects loop that can either "mix in" the effect or "replace" it in-line. Its XLR-balanced outputs have a ground lift switch. It has a tuner output, and its stereo monitor output can be either the mix or just one channel, and it has a phase reverse and a headphone jack. There's also an instrument mute and effects footswitch jack. Each channel has XLR mic inputs with phantom power and phase reverse, an insert jack and TRS balanced direct outs. There's even a switch that allows the player to blend two pickups to one channel and use an external instrument or vocal mic in the second channel.

EAW (Whitinsville, Mass.) introduced its new "LA" Series of full-range speaker systems by showing the new LA325. It is a three-way design incorporating two 15-inch lows, two 6.5-inch mids and a proprietary 2-inch compression driver on an Elliptic Conical Waveguide™. Its trapezoidal shape reduces standing waves in the enclosure, and the crossover network is computer-optimized with asymmetrically sloped fourth-order filters, parametric equalization and driver protection. It can be run full-range passive or bi-amped. The MX100 Close Coupled Electronic Processor™ is recommended for optimum performance. LA stands for "Linear Activation" and refers to the way the human ear responds to the way the system's total acoustic output activates the entire listening area. The enclosure is equipped with two NL-4 connectors and measures 47 inches tall by 21 inches wide, with a curved front grille. Like



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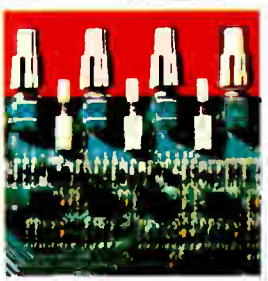

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its predecessor, the FR 253, its wide-band, flat response lends itself to a range of live applications that includes drum monitor, small P.A., keyboard rigs, as well as portable and permanent playback systems. Other products planned for the series include the LA215, a two-way multipurpose speaker incorporating a 15- and a 2-inch, and the LA118 single 18-inch subwoofer.

Sabine (Gainesville, Fla.) introduced the FBX™ SOLO, a miniature version of the FBX-901. By re-engineering and refining the guts of a 901, its size has been reduced to 2.78x1.65x5.5 inches, and it fits six across in a single-rackspace frame. Like previous FBX products, it automatically places one of six narrow notch filters in line when it senses feedback at the exact frequency and only to the necessary depth. It comes in two versions: The SL-610 is designed for line-level insert points on a mixing console and lists for $299; for mixers that don't have insert points, the SM-610 has a mic-level input, phantom power and a line-level out. Front-panel controls include Bypass, Reset and Lock, and there are LEDs for signal, status of the six filters, Bypass and Lock. By using 1/10-octave FBX filters to control feedback, the unit automatically and accurately places a notch filter at the offending frequency, instead of manually having to pull down the right graphic EQ slider that can take out 1/3 of an octave or more, removing ten times as much acoustical power in the process and usually not at the exact frequency center. The applications for this little gem range from karaoke systems to secret-weapon-when-you-can't-carry-much-else-into-a-club to a whole rack of six for every live mic in front of a monitor mix.

JBL (Northridge, Calif.) has upped the ante for portable plastic speaker enclosures with the introduction of the EON Series. The line includes two-way, 10- and 15-inch powered and unpowered speaker enclosures, a powered 15-inch sub and 10-channel mono and stereo mixers with matching polypropylene packaging. Two mics, two speakers, a mixer and cables can be bought as a system for under $2,200 list. The EON Power 15 is a bi-amplified speaker incorporating 130-watt and 50-watt amps for the lows and highs, respectively. Unique to this series is a differential voice-coil drive scheme that reduces the weight of a 15-pound magnet to 1.8 pounds. The patent on this technology is being applied for, and everyone I spoke with at JBL was reluctant to discuss it. The entire weight is less than 40 pounds. Designed for multipurpose use, the speaker can be driven from a mixer or by a single microphone by throwing a mic/line switch. The enclosure has angles on the back, allowing it to be used as a floor monitor also, and it has a flange to go onto an Ultimate Support stand.

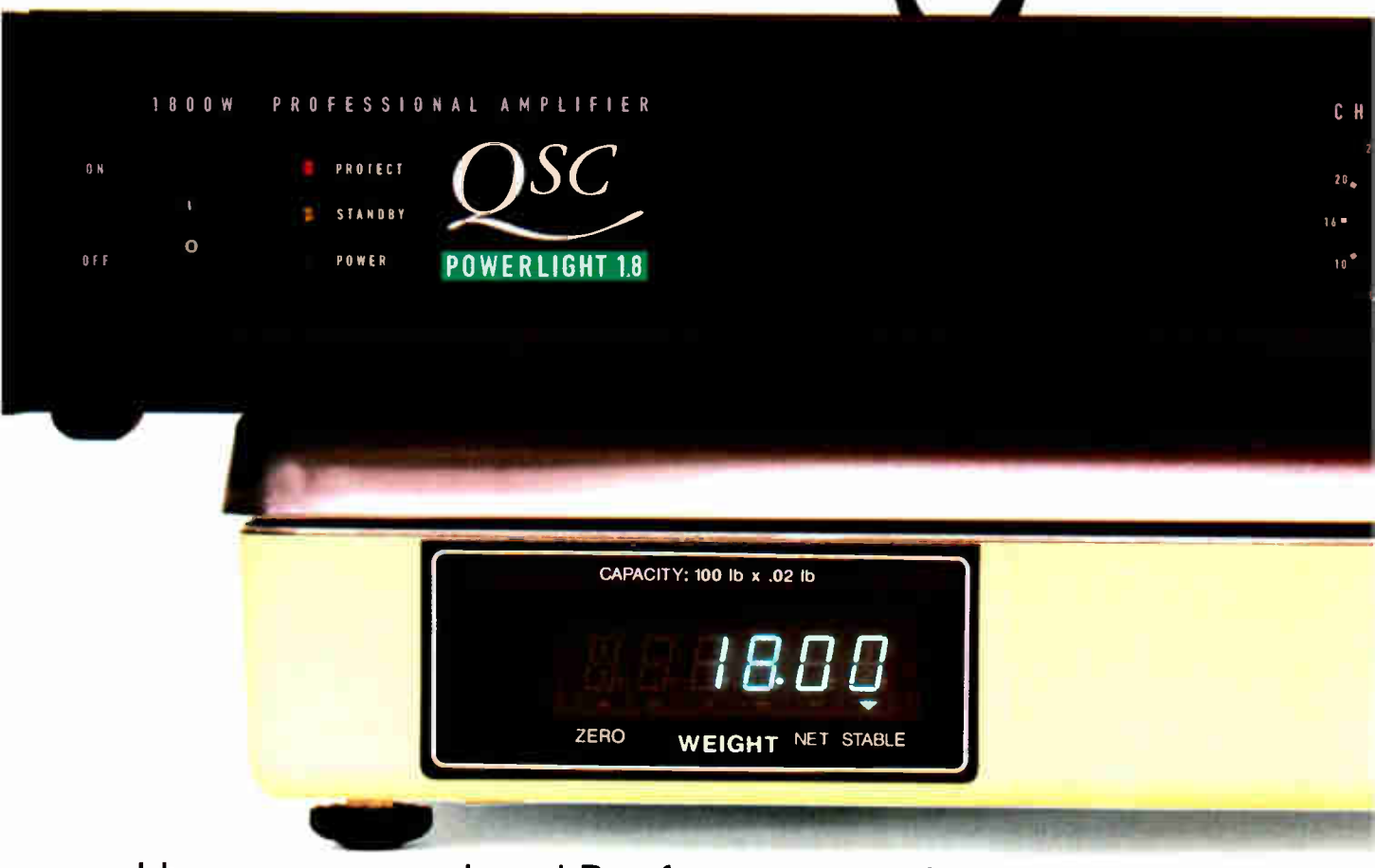
AKG (San Leandro, Calif.) announced a reduction of the list prices of its Tri-power Series of

dynamic vocal microphones to as low as $129 for the D3700. Newly introduced at the show was the C-680 BL boundary-type directional mic, listing for only $229. Originally intended for teleconferencing applications, it has already seen successful use as a "foot-mic" for theatrical applications. While in Detroit earlier in January, I ran into engineer Jim Van Bergen, who was opening on a new Neil Simon comedy, using six of the first ones in this country as area mics for the play. The frequency response is smooth throughout the vocal range, and the mic has a cardioid pattern at a 45° angle. In other mic news, **Beyer** (Farmingdale, N.Y.) slashed pricing on its entire line of products by up to 40%, lowering the list price of an M-88 TG to $399.

Crest (Paramus, N.J.) introduced the new V Series of affordably priced amps, which come in somewhere below the CA Series. The three models are rated at 225 watts, 450 watts and 750 watts per channel at 4 ohms and can also be run at 2 ohms. The models are numbered by their 8-ohm bridged power spec, i.e., 450, 900 and 1500, and they weigh 25, 35 and 42 pounds, respectively. There are two different front panels in this series, with the V having attenuators on the front panel and 20-segment LED signal meters with peak hold, while the "Vs" models lack the meters, having only clip, signal and protect LEDs, and have the pots on the back. The Tour-Class™ protection features found in their more expensive models are incorporated. The chassis is made of 14-gauge steel, and they have two-speed fans. Input connectors are ¼-inch TRS and barrier strip. They are all three spaces high and 11.5 inches deep. The loudest amp is class H, while the other two are AB. The three-year warranty is automatically extended two additional years if the registration card is sent in. In other Crest news, models 2 and 4 have been added to the "CA" Series, rated at 250 and 450 watts per channel into 4 ohms, and only the CA 4 has a 2-ohm rating, at 550 watts.

Crown (Elkhart, Ind.) introduced the next step in the evolution of IQ technology: the advent of distributed signal processing. Crown's new DP "digital processing" module plugs into any Macrotech, Com-Tech, or Macro-Reference amplifier, just like all other PIP modules. The module provides signal processing at the amplifier that was previously only available from either custom proprietary devices or an assortment of individual auxiliary signal processors such as EQ, crossover, gating, compression, delay, loudspeaker control and protection. The module makes it practical to furnish individual signal processing for optimization of every driver in a sound system. Using the IQ Turbo Version 1.3 software, adjustment can be made either manually or via presets. Time alignment changes can be made

PowerLight.



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instantaneously, on-the-fly. By employing signal delays, speaker enclosures, as well as their individual components, can be "moved" in relation to other components in the system. ■

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

LIVE SOUND WORKSHOP REPORT
by Rudy Trubitt

The sixth annual SYN-AUD-CON/*Pro Sound News* live sound workshop was recently held at Chapman College in Orange, Calif. Nearly 90 people from the U.S. and abroad were present. The event preceded this year's winter NAMM show, underscoring the trade show's relevance to touring sound.

The usual suspects were on staff, including workshop chairman Will Parry (Signal Perfection Ltd.), Mick Whelan (JBL, formerly with Electrotec), Albert Leccese (Audio Analysts) and David Scheirman (Concert Sound Consultants/Lone Wolf). Also returning was one of last year's guest speakers, David Robb (Jaffe Holden Scarbrough Acoustics Inc.), who was on the regular staff this time. This year's new staffer was Showco's Howard Page, who captivated the group with his off-the-cuff humor and extensive experience. As in previous years, Sound Image provided the main P.A., which was ably manned by Dave Revel.

As always, the event covered a lot of ground in three nonstop days (at various points in the program, attendees had a choice between a basic or advanced track). Starting with an overview of the tour and sound contracting business, Parry gave up-and-coming entrepreneurs some insights into keeping one's business sound; Leccese gave advice to those looking for their first gig with the majors. Scheirman offered an extensive computer

control overview and a basic console tutorial for student track members.

Listening experiments included Whelan's rotating array-on-a-turntable, which showed the effects of array configuration and driver interaction, while Robb presented a live demo of the Haas effect using multiple speakers and different delay times.

Each year, special guests present materials to the class. Craig Janssen (Acoustic Dimensions) gave an advanced talk covering contemporary DSP applications, both from a touring and install perspective, as well as a basic DSP introduction to the entire group. Veteran tour rigger Harry Donovan (Donovan Rigging) spent a full afternoon offering an advanced look into the math behind safe rigging.

In keeping with this year's theme, "The Human Interface in a Digital World," former *Mix* sound reinforcement editor Rudy Trubitt presented a segment on the use of MIDI for FOH effects control, with a focus on quick changeovers to avoid the distraction of endless button-pushing.

During the live mixing finale of day three, technical coordinator John Murray (TOA) held an optional session. Away from the main hall, he used a TEF and real-time analysis to show an instrumentation-based technique for setting crossover points and system tuning.

All in all, it was an event well worth attending. And though admission was not inexpensive, rest assured that the $650 paid by attendees isn't making anyone rich. The event is made possible by the donation of time by staff (including the outstanding help by members of Jim Paul's California's Institute of Concert Sound), the loan of an incredible pile of gear from countless manufacturers and continuing underwriting by *PSV*. ■

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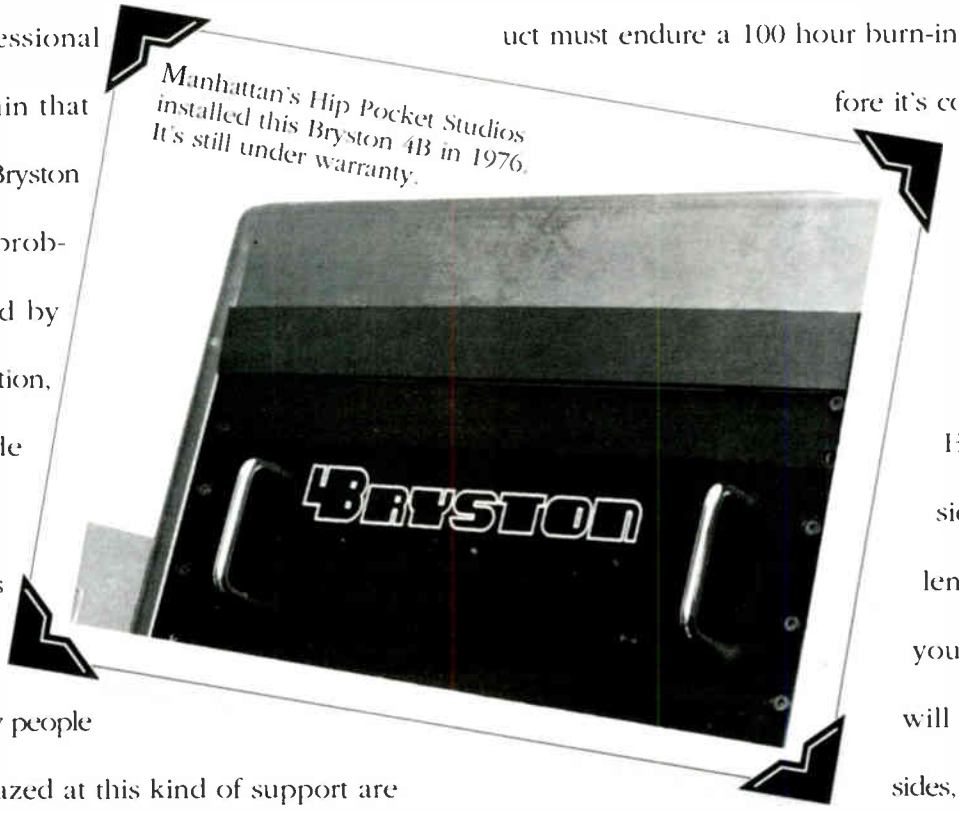

That means paying strict attention to every component, then spending an entire day building each Bryston power amplifier, crossover or preamplifier. After assembly, every Bryston product must endure a 100 hour burn-in period before it's complete.

Is all this attention excessive? Hardly, considering the length of time your Bryston will last. Besides, we don't think an amplifier's performance and reliability should be compromised because its manufacturer was willing to make compromises. Even if they were made 20 years ago.

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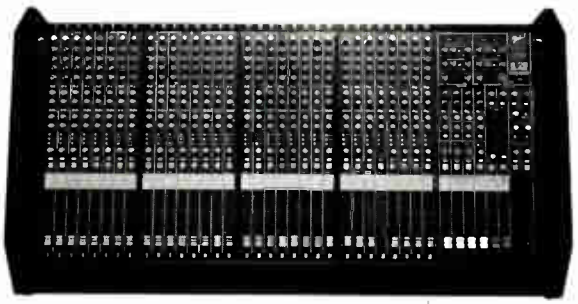

FENDER MX SERIES CONSOLES

Fender Pro Audio (Scottsdale, AZ) offers the MX-5200 Series mixing consoles. The units are available with 16, 24 or 32 input channels; four submasters, stereo main masters and mono sum outputs; and six sends (two stage monitor and four auxiliary). The series was designed to offer high sound quality at a low price. A 2-band, fully parametric EQ may be inserted into any input channel, submaster or master by using the rear-panel equalizer access patching. Suggested retail ranges from $1,879.99 to $3,159.99.

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SENNHEISER MD735/736 PROFORCE MICROPHONES

Sennheiser (Old Lyme, CT) has expanded its ProForce line with the MD735 and MD736 dynamic microphones. Designed to provide maximum feedback rejection for live vocals, the units are equipped with NdFeB magnets, featherweight membranes and voice coils to withstand very high sound pressure levels without distortion. The MD736 is identical to the MD735 but includes a switch. Both have a supercardioid pattern for improved feedback control onstage.

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CROWN DISTRIBUTED INTELLIGENCE

The new DP module from Crown (Elkhart, IN) plugs into the rear of any Crown Macro-Tech, Com-Tech or Macro Reference amplifier to provide all of the signal processing—such as equalization, crossover, gating, compression, delay, loudspeaker control and protection and more—directly at the amplifier. Operating entirely in the digital domain, DP module makes it possible to provide different signal processing for each loudspeaker in a system, and all system parameters can be controlled remotely using Crown's IQ Turbo 1.3 software.

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SOUNDTECH POWER SOURCE AMPLIFIERS

SoundTech (Vernon Hills, IL) introduces a new range of power amplifiers, called the Power Source Series, that are based on digital switching power supply technology. The first model, the PS1300 amplifier, is a stereo amp capable of 650 watts RMS (into 4 Ω), in a two-rackspace package weighing only 21 pounds. Featuring dual extruded-aluminum cooling tunnels with twin variable-speed fans, an array of status LEDs and rear-panel controls, the unit has a signal-to-noise ratio of 100 dB. Retail is $1,299.90.

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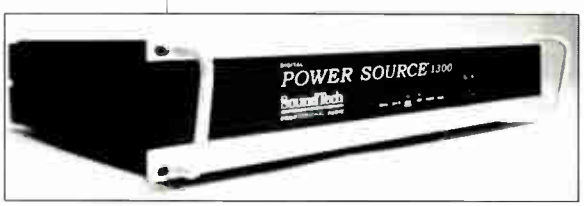

YORKVILLE ELITE EX-601 SPEAKER SYSTEM

Yorkville Sound (Niagara Falls, NY) has introduced the EX-601 full-range cabinet speaker system. Optimized for use with the élite SW-1000 or SW-800 subwoofer systems, the EX-601 can also be used as a stand-alone full-range unit. The arrayable 600-watt system has a maximum SPL of 129 dB, which makes it appropriate for large and small mains or stage-monitoring applications. It is constructed of ¾-inch Canadian poplar plywood and comes with a two-year warranty.

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LONE WOLF VNOS SOFTWARE

From Lone Wolf (Seattle) comes VNOS, its Visual Networking Operating System, which is designed specifically for controlling and monitoring amplifiers, crossovers, equalizers and other sound system components. Version 1.5.2 of the software is available in both Mac and Windows formats and controls equipment by QSC, Rane, TOA, Vega, LAB. Gruppen, Carver and other MediaLink licensees. An intuitive graphical interface facilitates the creation, operation, diagnosis and reconfiguration of integrated MediaLink networks via fiber-optic or twisted-pair cabling.

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BY BLAIR JACKSON

RECORDING NOTES

Buddy Guy

CHICAGO'S GREAT BLUES SURVIVOR

by Bruce Pilato

Eric Clapton considers him the greatest living guitarist. Stevie Ray Vaughan once called him his biggest influence. Jeff Beck, Carlos Santana and B.B. King view him as a true guitar hero, and Jimi Hendrix once canceled a show just to go hear him play. Though he's been playing the blues for 35 years, it appears as though 1995 may finally be *The Year of Buddy Guy*.

"I try to give 120 percent every time I put on a guitar," Guy says. The soft-spoken, Chicago-based blues virtuoso who, until 1991, had gone almost a decade without a domestically released album, has returned to the forefront of the music world with two critically acclaimed, Grammy Award-winning LPs, and a new blues collection, *Slippin' In*, released late last fall. Also, a live album recorded with G.E. Smith and the Saturday Night Live Band is set for release this coming fall.

Guy recently published his autobiography, titled *Damn Right, I've Got the Blues* and played a series of high-profile live shows that included opening slots for the Rolling Stones' *Voodoo Lounge* tour and headline gigs at The National Association of Broadcasters convention and on the CBS radio-syndicated *Live at the House of Blues* show. His touring schedules for 1995 *and* 1996 are already booked solid. The headline tour for *Slippin' In* kicked off with a blistering, ten-night stand at Guy's own *Legends* club in Chicago.

Released on the BMG-distributed Silvertone Records, *Slippin' In* presents Buddy Guy in his best light—without gimmicks or celebrity guests. "Everybody's been saying that this is my best album, but I don't really know why," he says. "My previous two albums had all kinds of names on it, like Bonnie Raitt, Travis Tritt, Jeff Beck and Eric Clapton. I always felt like I could stand on my own two feet, but you know, nowadays, the famous people seem to be a big thing for the record companies. They love it when they all come in and help you out."

This time around, Guy decided to keep the support team to a minimum. Onboard were his longtime backing band—guitarist Scott Holt, bassist Greg Rzab and drummer Ray Allison—the reunited former backing band for Stevie Ray Vaughan (Double Trouble), and legendary Chess Records/Chuck Berry pianist, Johnnie Johnson.

Both *Slippin' In* and the forthcoming live album were produced by Eddie Kramer, best known for his work with Jimi Hendrix, Led Zeppelin, Kiss and the Rolling Stones. Kramer's relationship with Guy began when the producer solicited Guy to perform a searing version of the song "Red House" for the album *Stone Free: A Tribute to Jimi Hendrix*. Many critics and fans considered the Guy/Kramer collaboration to be one of the album's musical high points, so they decided to make an entire record together.

"Eddie knew about my relationship with Jimi Hendrix," Guy says. "I finally made it through New York in late 1967, and Jimi

—CONTINUED ON PAGE 191

Walter Becker's "Whacked" Solo Debut

by George Petersen

Born in 1950, Walter Becker made fruitless childhood attempts at playing musical instruments (tenor sax and melodica). Years later, after hearing Bob Dylan on the radio, Becker was inspired to take up guitar. In college, he met Donald Fagen, and the duo went from musical sidemen (backing up Jay & The Americans) to staff songwriters at ABC Records, writing material for John Kay and Barbra Streisand. In 1972, Becker and Fagen formed Steely Dan, a group whose decade of success proved that there was, indeed, a market for well-crafted rock with intelligent lyrics and interesting chord changes. Unfortunately, years on the road had taken their toll on the Steely Dan founders, and the group disbanded in 1981, with Becker and Fagen going separate ways.

Fagen concentrated on a solo career with his landmark 1982 *The Nightfly* LP, and later formed The New York Rock & Soul Revue. Meanwhile, Becker was carving out a niche as a producer, working with both pop (Rickie Lee Jones, Michael Franks, China Crisis, Lost Tribe) and jazz artists, such as John Beasley, Bob Sheppard and Andy LaVerne. Eventually, Becker and Fagen reunited in the early '90s, first with Becker arriving to produce *Kamakiriad* (Fagen's second solo album), followed by a surprise announcement in 1993 of a Steely Dan reunion tour, which they reprised in 1994.

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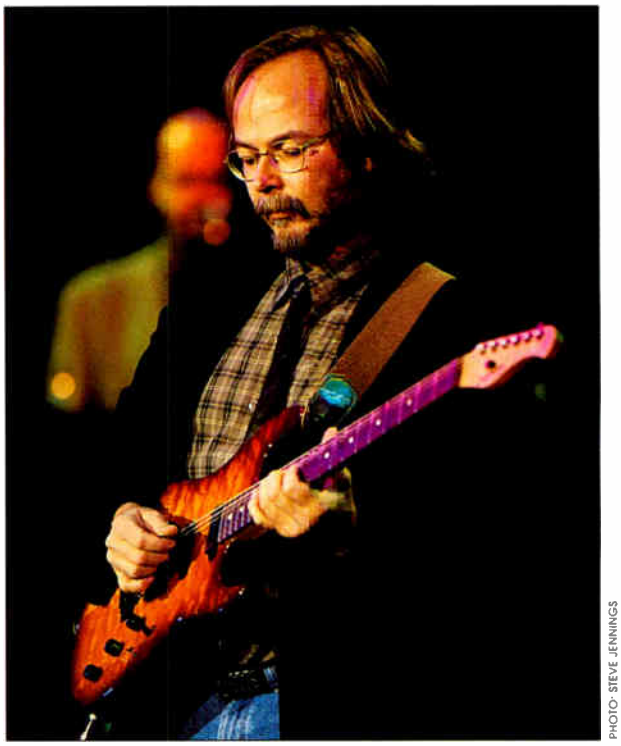

PHOTO: STEVE JENNINGS

CLASSIC TRACKS

The Temptations' "Papa Was a Rolling Stone"

by Blair Jackson

By 1972, the classic songwriting formulas that had made Motown Records into an unstoppable commercial giant were tired and no longer guaranteed to rocket songs to the top of the charts. Some of the bands that had dominated what became known as Motown's "Golden Decade" were beginning to fray around the edges, as well. The Supremes were in disarray following the departure of Diana Ross. The Four Tops, in a skid since the departure of the Holland-Dozier-Holland songwriting team from Motown, left the label themselves in '72. Smokey Robinson broke away from The Miracles. The Marvellettes were on a downward spiral.

The Temptations, 1972

Younger Motown acts like the Jackson 5 and Stevie Wonder took up a lot of the slack, and then there were two acts from the first wave that continued to light up the charts: Marvin Gaye struck gold with a series of politically conscious songs like "What's Going On" and "Mercy Mercy Me (The Ecology)." Meanwhile, The Temptations, propelled by a spate of great Norman Whitfield-Barrett Strong songs like "Can't Get Next to You," "Just My Imagination" and the topical "Ball of Confusion," managed to weather stylistic shifts by embracing the changes. The Temptations forged a psychedelic soul sound in the late '60s, and in the early '70s recorded songs that—like Gaye's—tapped into the still-burgeoning black pride movement.

In the grand scheme of things, it could be argued that The Temptations' salad days were behind them in 1972. The group had been together for ten years and put 31 songs on the pop charts (13 in the Top 10), but three of its five voices—David Ruffin, Eddie Kendricks and Paul Williams—had left to pursue solo careers. A little more than a year after "Just My Imagination" hit Number One, The Temps went back into the studio with two new singers, Damon Harris and Richard Street, joining original members Melvin Franklin and Otis Williams, and four-year vet Dennis Edwards. If the old blend of voices was not what it once was, there was still one very

—CONTINUED ON PAGE 196

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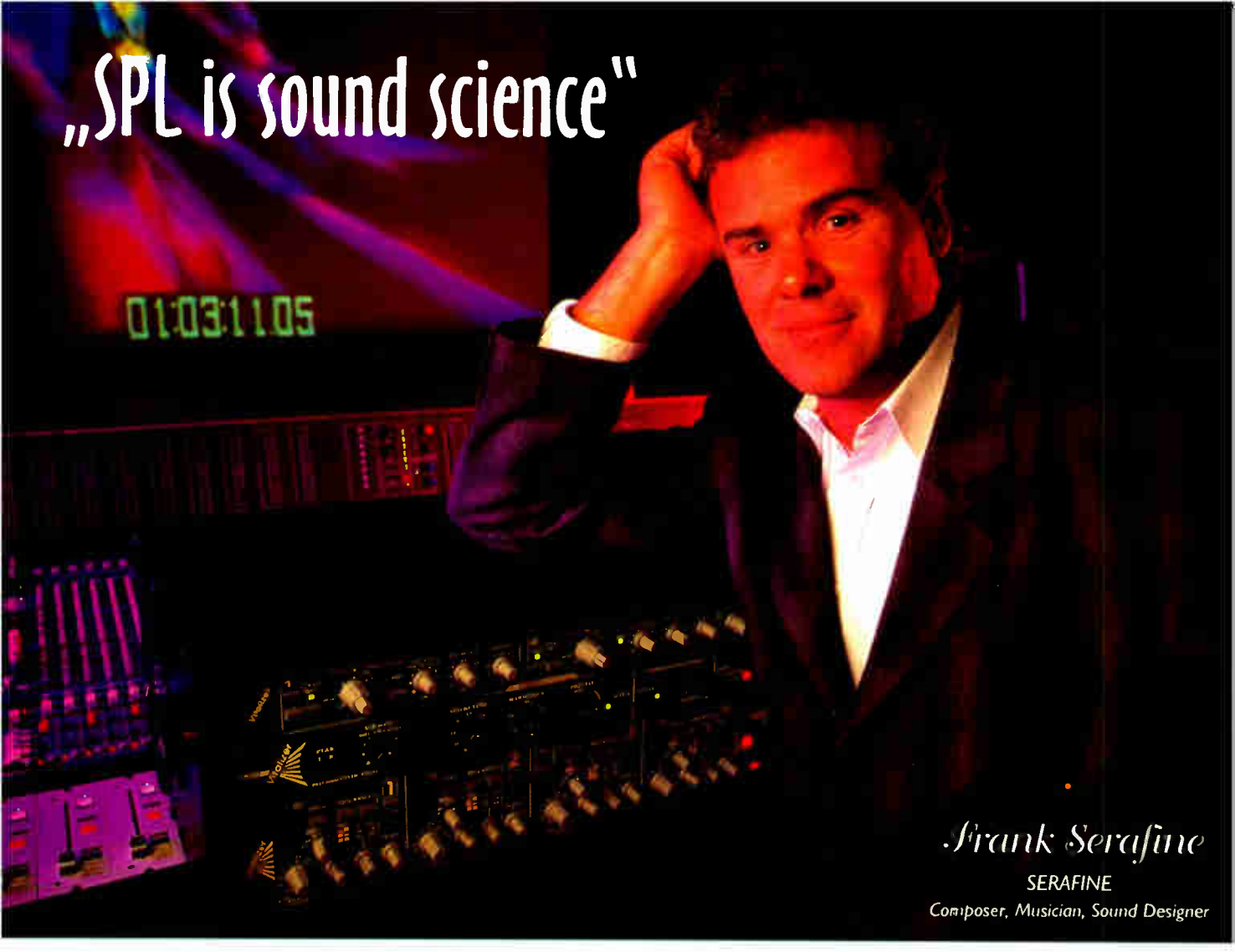

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—FROM PAGE 188, BUDDY GUY

came out to see me play. I met him at that time. We jammed and became friends, and we stayed friends until he died. Every time I would go through New York, he'd show up with a guitar and an amplifier. We use to jam at Steve Paul's club, The Scene. We'd tear the place up, man."

Slippin' In was recorded at Chicago Recording Company and Arlyn Studios in Austin, Texas, and mixed at New York's RPM Studios, and the former house of Hendrix, Electric Lady Studios.

"It was an honor and a great pleasure to work with Buddy Guy," says Kramer, from his home in rural upstate New York. "He is one of the last great blues men around. He is totally free, and able to put all of his feelings into his guitar playing and singing. Plus, Buddy is a sweetheart in the studio. He is very focused in the studio. And he puts so much passion into the way he sings. His singing and his playing are integrated. He rarely goes past the second take to get a keeper."

Kramer says he used his standard guitar setup, which consists of two amplifiers placed in two isolated rooms. "For miking," says Kramer, "I had my usual combination of dynamic, ribbons and condensers. The mix of all the mics goes into stereo tube compression and stereo equalizers." Alas, Kramer refuses to get more specific about his equipment choices. "I've spent years developing this setup," he says with a laugh. "Do you think I want to give it away now?" Like all of Kramer's recording projects, *Slippin' In* was recorded 15 ips with Dolby SR on Ampex 499 tape.

After working his way up through the Chicago club scene in the late '50s and early '60s, Buddy Guy became a house session musician at the famed Chess Recording Studios. While there, he backed such legends as Howlin' Wolf and Muddy Waters. In 1969, he teamed up with Junior Wells for a series of albums and tours that brought them to rock audiences. In the '70s, they toured with The Stones, but by the '80s, Guy and Wells had gone their separate ways professionally. The two remain good friends to this day and often appear on each other's albums.

"Every time I made records with Howlin' Wolf and Junior Wells, I was playing what I was told to play, in order to make sure the song had what it needed," Guy explains. "Thanks to Eric Clapton and Jeff Beck, when I worked in the studio with them in the 1960s and '70s, they encouraged me to play what *I* wanted to play. Prior to that, I had always been trying to fit in the mold of whoever I was backing in the studio. Then, when I started making my own records, I realized I didn't really have any distinct style, so I started working on that, and eventually it came together. Now, it's funny, because I'll hear a blues record and I'll realize that someone else is playing Buddy Guy licks. Now, when I go in the studio, I just try to go in and do what I do best: play the hottest blues I know."

Part of the charm of a Buddy Guy album is its purity. Guy has made every album a live recording experience, something, he says, that has kept the music fresh. "I don't think I've overdubbed anything yet on my records," he says. "Okay, maybe once or twice. My fire comes from my band when we're playing in the stu-

dio. I look around and I see them, and it just happens. It's the same when I'm playing a live show. I need to see the reaction of the people. I need to see how they're affected by my playing. When I stop feeling that way, then I will know it's time for me to get out of the business."

Guy says he usually records a song four or five times in the studio, even if he is certain he has already nailed a killer take. "You never know what's going to happen when you play a song," he adds. "It's the same when you release a record and then go out on a tour. Those songs never sound the same on the stage as they did when you recorded them."

The forthcoming live album with G.E. Smith & the Saturday Night Live Band was recorded at New York's Irving Plaza and Guy's Legends club during breaks in the making of *Slippin' In*. The last show was also shot for a soon-to-be-released film documentary. "The idea was to record me live with a really big band," Guy says. "I'm looking forward to hearing the finished product, because I haven't heard anything yet. I never listen to Buddy Guy when I'm home."

With the success of Eric Clapton's *From The Cradle* album, and Guy's recent albums, the blues are starting to reach huge mainstream audiences and gain the industry recognition the genre truly deserves. Guy's success at the Grammys has given his career an unexpected boost, as well: "I feel I owe those Grammys to all the blues players who never even thought about winning a Grammy—Howlin' Wolf, T-Bone Walker and those guys. When I accepted it for myself, I also accepted it for them.

"You know, in the old days, we were all just blues musicians," Guy continues. "Then, in the '60s, we all got separated by the record companies. They had to put everyone in a category. Now there is Chicago blues, New Orleans blues, West Side blues, East Side blues. To me, it's all just the blues. But whatever it takes to keep the real blues alive is all I care about. There is only a handful of us left now. So I will do whatever it takes to keep this music going." ■

—FROM PAGE 189, WALTER BECKER

These days, Becker resides far from the major recording markets, spending much of his time at his secluded home/studio complex in Hawaii. More recently, Becker completed *11 Tracks of Whack*, his first solo album, which he co-produced with Fagen. Becker graciously took a couple moments from his *pa'ahana* island lifestyle to comment on the new album and his approach to producing.

Becker: So what's new?
Mix: Well, I was hoping to ask *you* some of that.
Becker: Oh that's right, you're supposed to be interviewing me.
Mix: Let's start with the boring questions everybody's asked you a thousand times. What is *11 Tracks of Whack?*
Becker: There are damn near 11 tracks on the album. I locked onto the word "whack" back when John Gotti was convicted. *The New York Times* sent a reporter down to Little Italy to gather opinions, to find out what the Italian-American man on the street thought of the conviction. One of the guys said, "I think what went wrong up there was that the jurors heard all these wiretaps, and sometimes they didn't understand what they were hearing. When they heard John Gotti say, 'I want to whack that guy,' they'd think that meant he wanted to kill him. But that might have meant that he was going to slap somebody."

This event coincided—had the temporal coincidence—with my awareness that a lot of the songs I had written were lashing out at various people, real and imagined. And the ones that weren't lashing out at other people were lashing out at myself. I also wanted my album to capture the songs in the spirit as it was first written, rather than being worked over into a polished gem, kind of like having a first whack at it. I was also attracted by the notion that "whack" in rap jargon refers to something that's jive, bogus or inauthentic. There's an element of parody to these songs, and to some extent, they aren't really what they appear to be.
Mix: How unusual for you...
Becker: Isn't that a change?
Mix: You've *never* been ironic or self-parodying...
Becker: Certainly not! [Laughs] It seems like the rest of society has finally begun to approach Donald [Fagen's] and my standards of irony.

Now we're just doing what everybody else is doing.

Mix: The album has 12 cuts. Which is the *non*-whack track?

Becker: The last one ["Little Kawai"] is the least whack of them all, as it has an unaccustomed high level of sincerity. It was a real challenge for me to actually express sincere affection in a musical form.

Mix: Did you feel this was a personal album, a la *Nightfly*?

Becker: When I started writing the stuff, I tried not to superimpose any framework or limitations on the songs, such as a set of songs about a single subject. I think I came up with a set of songs without any single overriding theme, other than something you could bring a psychiatrist in to work on. Although, if you're writing something that has any truth to it on any level, it has to be personal, although not frankly autobiographical.

Mix: So you were looking for a raw, minimalist sound?

Becker: I got to the point where I wanted to write simple, strong ideas, and I wanted them to go out into the world in a raw condition. I didn't think that adding a lot of layers of overdubs was appropriate to the overall thrust of what I was writing and to my singing. I thought that this setting would work out better with my vocals, which—no matter what you do to it—can never be that polished.

Mix: When I first listened to the album, I heard a couple tunes where you could have easily taken it to that next step—such as having a sax line follow the vocal or doubling the vocal—essentially making it into a Steely Dan-style production.

Becker: I just wanted to put things down in a simple form. I spent so many years doing this with Donald, and I certainly could have done that, but I think the musical context of the times has shifted, and my own taste has shifted to things that are a little more raw-sounding.

Mix: Did your production experience working with Rickie Lee Jones, China Crisis and the jazz stuff you did with people such as Andy LaVerne change your attitude about being an artist?

Becker: Definitely. In fact, I would go so far as to say that the experiences I had working with those people, particularly the pop people—Rickie Lee, China Crisis and Michael Franks—made me want to do this.

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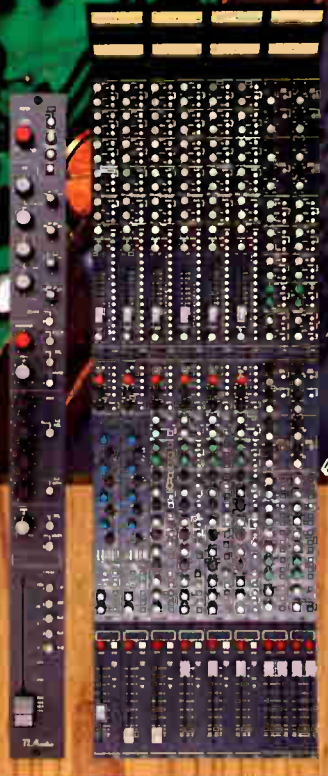

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The writing determines whether a record's going to be any good, and working with Rickie Lee got me thinking about songwriting again.

Mix: What was the recording system you used?

Becker: Most of the songs were sequenced using a Macintosh computer with [Opcode] Vision software and samples were triggered through [Digidesign's] SampleCell. The actual recorders were two Sony PCM-3324S digital multitracks. Usually we'd start with the sequences and then dump them to multitrack, and in some cases, replacing some of the sequenced parts, or just adding to them.

Mix: Were the drum sounds on the sequenced parts from Roger Nichols' Wendel Jr. system?

Becker: Some of them were Wendel sounds, and a lot of them were from a Korg T3 synthesizer I've been using for a couple of years. I did a lot of writing on the T3, and I never found other samples that worked as well as those, so there are a lot of Korg samples on the album. I also used samples that Roger, Dave—the engineer here at my studio—and I made at various times.

Mix: You're mainly known as a guitar player. Did you work out these tunes on keys?

Becker: Most of the tunes were written on keyboards.

Mix: Does that change your approach to songwriting?

Becker: Definitely. And because of the sequencing program, I was able to do things that I was never able to do before. The sequencer allows you to take a track and do your arranging at the same time that you're writing. You can create parts that interlock and really form a groove, without having to use a multitrack and switch from instrument to instrument, as people used to do.

Mix: Did you start off with the tracks that had the whole rhythm section and then get into the sequenced stuff?

Becker: My original intention was to do a live album. I started off with a band and only got a couple cuts that I liked. I thought that maybe this was a powerful suggestion that having written these songs as sequences, maybe I should use a few of those. Also, being in Hawaii, I'm somewhat isolated from the musical community at large, and I ended up continuing to work that way.

Mix: Wasn't working from sequences one of the techniques you used in producing Fagen's *Kamakiriad*?

Becker: That was exactly the way we did *Kamakiriad*, except on that album, we tried to incorporate a lot of live stuff into the sequences, such as live drum overdubs, with drummers playing along with sequences. On *11 Tracks of Whack*, I didn't do much of that.

Mix: And the album was mixed to 20-bit?

Becker: The mixes were all 20-bit, and processed with the Sony Super Bit Mapping system for the final CD release.

Mix: What did you mix to?

Becker: We mixed to a couple of things. One was a big hard disk recorder that Sony designed to handle 20-bit audio, and we were also mixing to a SADiE computer that Roger had, and the usual array of standard 16-bit DAT decks, and an Akai hard disk system that Roger brought. We had a bewildering array of backup devices.

Mix: How long did the mix take?

Becker: Three weeks. It could have gone faster, but I didn't have a console automation system. If I would have had that, I could have been saving rough mixes as I went along. As it was, I ended up trying to imi-

tate those cool-sounding mixes that we cut at earlier stages.

Mix: So what's next for Walter Becker?

Becker: An extended vacation, as I sit here and ponder the progress of the *11 Tracks of Whack* through the American cultural wasteland. I'll also be looking through the classifieds of *Mix* magazine, looking for that rare—and perhaps useless—piece of audio equipment I've been looking for all those years, but when you get it, it isn't what you expected anyway.

Mix: I think I have a couple of those in my studio...

Becker: [Laughs] They are great things to have.

Mix: Do you prefer pop or jazz production projects?

Becker: I like doing instrumental music and like doing the fast production over a couple days. I'd like to do more of that, but I'm not sure what I'll be doing next. Maybe I'll get a band and do an instrumental album with them and write songs for them...

Mix: ...and then...*tour?*

Becker: Did you say *tour?* [Laughs] It's possible. Maybe a few club dates up at Makawao [Maui], but that's about as far as I think I'd want to take it. ■

—FROM PAGE 189, THE TEMPTATIONS

important constant for the group: producer/songwriter Norman Whitfield. And in the spring of '72, Whitfield (with his frequent collaborator Barrett Strong) came through for The Temptations one more time, providing the group with what was to be the group's last Number One song (at least on the pop charts; they continued to score R&B hits through the '80s). That song was the monumental classic "Papa Was a Rolling Stone."

Actually, "Papa Was a Rolling Stone" was already something of a known quantity in the R&B community: Whitfield had cut a much different version of the song with the group the Undisputed Truth ("Smiling Faces Sometimes") earlier in the year, but it didn't catch on the way Whitfield hoped it would. So when Whitfield brought it to The Temptations, he had an entirely new vision for the song. And although 1972 was to be the year that Motown made its big move to Los Angeles (where the label had already had a large presence for several years), "Papa" was still a Detroit product through and through, recorded at Motown's studios with a group of both young and veteran session cats and house engineers led by Orson Lewis.

Clocking in at nearly 12 minutes, the song is one of the most ambitious productions to ever come out of Motown. At its heart is a pulse laid down by the late, great bassist James Jamerson, drummer Andrew Smith (who was only 21 at the time), percussionist Jack Ashford, and the ultra-funky and rhythmic guitar duo of Paul Warren (who was just 18) and Melvin Ragin (who more than lives up to his nickname "Wah-Wah"). The late Earl Van Dyke lays down a soft and spacy Fender Rhodes line, and John Trudell, sounding like some weird cross between Miles Davis and Sly & the Family Stone's Cynthia Robinson, plays piercing Echoplexed trumpet lines that rise and fall in short bursts all through the song. A small string section, masterfully arranged by Paul Riser, makes quick runs around, through and on top of the beat, then slows down here and there to sound almost sweet. Drifting in and out of the ever-shifting arrangement is a lone harp—an angelic voice in what is otherwise a rather dark and ominous track.

After a nearly four-minute instrumental introduction, the verses

begin, with each of the singers handling different parts of the narrative, which paints a sad and disturbing portrait of a problem-plagued absentee father in the ghetto. The chorus, with all the Temps singing, accompanied by cracking, percussive handclaps, is among the best known in contemporary music: "Papa was a rolling stone/Wherever he laid his hat was his home/And when he died, all he left us was alone." For its time, it was quite a statement about one kind of urban black family, and its power has not been diminished by time.

Whereas tracking in Motown's early days was almost always done live, by the late '60s and early '70s, the standard m.o.—at least for sessions produced by Norman Whitfield—was to stack instruments, building from the rhythm track, and adding vocals and any sweetening later. Most of "Papa Was a Rolling Stone" was recorded at Hitsville Studio A on West Grand Blvd. in Detroit. According to Mike McLean, who was the head tech for Motown's studios from the early '60s until April of '72, "Hitsville is where all the rhythm tracks were done. It was equipped with an Ampex MM1000 16-track tape machine, no Dolby, and it was supported by an assortment of little mixers. It didn't even have a console. It was mainly just a tracking room. It had very good acoustics because years earlier we had installed some sophisticated sound treatment that was based on the old RCA [Studios] design.

"Then we had another facility," McLean adds, "that was known as the Davidson Avenue facility—or Dav—which is where string parts and some other things were usually done. This is the facility that was originally developed as Golden World Records. It was a big, big room with acoustics that weren't nearly as sophisticated [as Hitsville]. We had these huge baffles—giant panels that are usually used to make soundproof rooms for audiometry testing. They were four-inch thick, steel-covered things with custom-built wheel bases. They were massive panels, but very helpful in that room. They gave the engineers a lot more control. Davidson Avenue also had an MM1000 16-track and a homebrew console with some Neumann EQs and Op-amp Labs stuff."

Mixes typically occurred at a third

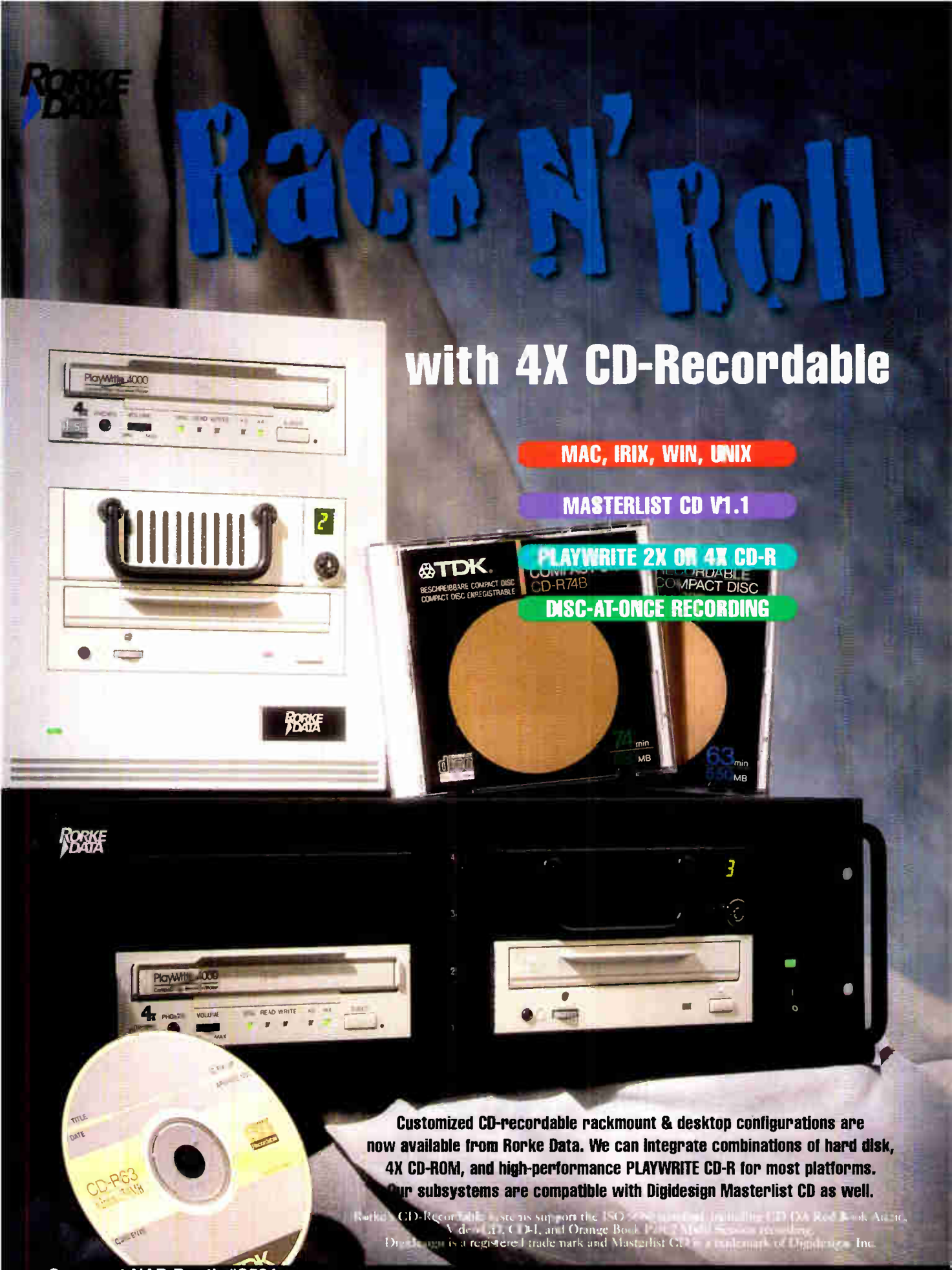
site, the Motown Center, which housed two mix rooms, each equipped with $50,000, custom-built Electrodyne consoles and a mastering room. "The Electrodynes were considered quite revolutionary for the time," McLean says, "because of the VCA design. We had eight subgroups and we could switch the faders for the 16-track mixdown." Each mix room also contained four Altec 604-E loudspeakers in a quad arrangement. According to McLean, "It sounded pretty impressive when it was panned around those big speakers."

Drummer Andrew Smith remembers that "working for Norman Whitfield was extremely demanding, to say the least. He always had a very strong idea of what he wanted to hear, and he was always able to get great performances out of us."

"The way all his sessions started out was he'd have breakfast there for us," percussionist Jack Ashford recalls. "Then what he'd do was pass out the chord charts, and we'd start running it down. He took total charge of his sessions. If there was an arranger, he'd usually be sitting off in a corner, because Norman might have one idea when he gave the tune to the arranger, but by the time he got to the studio and heard it all hit him at once, it usually altered his original plan. On that particular song, I remember at one point he said, 'Let's just leave the two guitars going and the rest of you take a break.' He sent us all out and then he worked with them for a while. He'd do that sometimes—work on the drums and the bass, let everyone else go. He would lock down the parts that he viewed as the nucleus of the song first. Then, after he got that together, he'd bring everyone else in, he'd kick it off, and it would melt right together. It was tremendous. His personality would make you want to play. He was the dominating force, but at the same time, he didn't get in the way of what you did."

"Papa" represents the apex of Norman Whitfield's studio genius. It's an airy, atmospheric track loaded with interesting touches that never overwhelm any other element.

About the "Papa" tracking sessions, Smith adds, "Norman started conducting us one by one, as far as what he wanted. It turned out to be like an ESP situation. It was one of those sessions where if you were a creative player, you had to really tune in with your antennas to his body language, and his humming once in a while, to feel where he was coming from. Basically, he hummed the beat he was after to me, and I got on top of that. What he wanted me to do was establish a heartbeat for the song, so he could



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work around it. Once we had that heartbeat pumpin', then he started creepin' around the room like he was a Svengali or something. It's true, he would point, one by one sometimes, to the different musicians to give them their cue, and they had to tune in on their ESP levels to make sure they were locked into exactly what he wanted. Little by little, this is how he mixed his potion."

I ask Smith if it was hard to sustain the same beat for 12 minutes. "Man, 12 minutes is an understatement, because we did a lot of different takes of it," he answers. "I remember that day when I left the studio, my head was throbbing; my *brains* were throbbing. That song required all the concentration I had, to keep that beat steady. It sounds simple from the outside, but those are sometimes the hardest ones to play. I couldn't skip a beat or slide—I had to keep that heartbeat goin' every second." The musicians had no vocal guide track to work with: "Norman kept it all in his head, and sometimes you'd hear him hum a line or sing a little to himself. He always knew exactly where he was," Smith says.

The singers usually added their parts to the finished rhythm track in a separate session. In the case of "Papa," there was also a major overdub session at Davidson Avenue to add guitarist Paul Warren's colorful, snaky leads. The string session also took place at Davidson Avenue, closer to the mix. In all, there were four cutting sessions: May 15 and June 14, 22 and 28, 1972.

Motown engineers in that era used Neumann mics almost exclusively—head tech McLean says he was particularly fond of the KM86 and once ordered 50 for the studios. "I thought it would be great to have one all-purpose mic," he says, "but of course the engineers complained that it wasn't giving them enough flexibility, and I suppose they were right. I was being a little idealistic." Instruments and amps were generally miked quite close, with plate reverbs and the occasional overhead mic providing track ambience.

Whitfield, who has always eschewed talking to the press and remains a very private person to this day, is best known as a brilliant songwriter, but his later Temptations work—from "Ball of Confusion" to "Papa Was a Rolling Stone"—offers vivid testimony to his production genius as well. These are highly complex arrangements that required serious mixing chops. At Whitfield's direction, Motown's engineers managed to make these often-dense songs into colorfully coherent works of art. "Papa," mixed by Whitfield and Orson Lewis, represents the apex of his studio genius. It's an airy, atmospheric track loaded with interesting touches that never overwhelm any other element.

When The Temptations' "Papa Was a Rolling Stone" was released in the fall of 1972, it was an instant smash, hitting Number One in a shortened (seven-minute) mono version, and propelling the album on which it appeared—*All Directions*—all the way to Number Two on the pop charts, their highest-charting album of new material ever.

"We knew it was special at the time we made it," Jack Ashford says today. "Even without the vocals, you could tell something was goin' on. It had a certain vibe to it. But you know, we didn't really know we were making history because we were too busy living it. It was that way with all the songs. We were just playing music, man." ■

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Brian Heywood. ***MIDI Monitor Issue 11***

"I wanted to really check out the vari sync mode. I slowed the video down to a crawl, Cubase locked in and the sequenced music was playing slowly ... a bit faster ... and ... yes the Soundscape synced up and was recording. The SSHDR1 has lots of features, creative usage of available power, sounds great, syncs great, straightforward, easy to use and expandable."
John Zulaikha. ***Connections Feb '95***

"The next stage of the Digital Revolution starts here."
Bob Walder. ***Home and Studio Recording Jul '93***

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by Philip De Lancie

TAPE & DISC NEWS

TWO SIDES TO DIGITAL VIDEODISC STORY

Momentum is building in the home video industry behind a new optical disc format for video rentals and sales. As reported in *Billboard*, the DVD format would be a two-sided, 5-inch disc storing up to 270 minutes of video. Using MPEG 2 compression, the discs are said to offer picture quality even better than LaserDisc, along with multiple audio tracks and adjustable screen ratios. Given a capacity of more than 15-times current CD-ROMs, the format could have significant impact on other applications, as well.

The major drawback of the two-sided approach is manufacturing cost. *Billboard* quotes estimates in the range of $1.75 to $1.80 per disc, compared to around $1.10 for a rival single-sided MPEG 2 format that has been promoted by Sony and Philips. But apparently, cost is less important than capacity; the magazine reports that the bulk of industry support from both hardware manufacturers and movie studios has lined up behind Toshiba and Time Warner, developers of the two-sided DVD. Sony and Philips are not expected to stand in the way of a developing consensus by releasing the competing system. The DVD players, which would also play audio CDs, are expected to launch in 1996 at just under $500.

The rapid emergence of a new optical video format confirms what many were already saying about the current White Book-based Video CD, which is a single-sided disc using MPEG 1 compression to deliver 74 minutes of near-VHS-quality video.

Limited in capacity and offering no quality improvement over VHS, Video CD is increasingly relegated to the status of an interim solution, obsolete before it has really gotten off the ground. That could spell trouble for companies such as Philips and 3DO, who use Video-CD-compatibility as a selling point for their set-top interactive multimedia players.

INFOTECH'S 1994 CD-ROM ESTIMATES

Sales data collected by InfoTech show a 137% increase in the worldwide installed base of CD-ROM drives in 1994 over 1993. The company's preliminary estimates, subject to revision, show 26.9 million units in the field, 89% desktop drives and 11% in set-top boxes. According to InfoTech's Julie Schwerin, drives built into computing systems outsold multimedia-upgrade kits for the first time, by a margin of two to one.

In announcing InfoTech's $500 Optical Publishing Industry Assessment, 7th Edition, Schwerin said that "an increased number of titles are vying for position in still relatively narrow distribution channels," driving the weighted-average consumer title price down to just over $50. Schwerin expects channels to continue to widen this year, with increasing availablity in outlets such as book stores, video stores and supermarkets. Worldwide title sales were up an estimated 161% in 1994 to 91.8 million units. Total titles in print increased 45% to 11,837, led by a near doubling in the consumer sector. Schwerin expects the number of consumer titles to double again this year.

KALIEDA SHIPS SCRIPTX

The long-touted ScriptX cross-platform multimedia authoring environment from Apple/IBM joint venture Kalieda Labs is finally shipping to application developers. ScriptX allows developers to create a single interactive multimedia program that will play back under multiple operating systems such as Windows and Mac OS using the companion Kalieda Media Player. Kalieda describes KMP as a layer of dynamic, object-oriented software that sits above any operating system and interprets a ScriptX application at run-time to provide synchronized compositing of audio, video and graphical elements.

Because of Kalieda's parents, ScriptX has been keenly anticipated as a solution to the problems facing cross-platform multimedia developers—problems the music industry will soon be staring in the face as it gears up for "enhanced-CD" title production. But Kalieda's initial product, the ScriptX Language Kit, is targeted only toward "experienced and technically sophisticated designers and programmers." So the wait is not over for off-the-shelf tools offering non-programmers user-friendly access to ScriptX capabilities. Both Apple and IBM, however, have stated that they intend to provide such tools, and that they encourage third parties to do so as well. Meanwhile, it is too early to tell whether the KMP layer takes a noticeable toll on playback performance compared to native-optimized code.

SPLICES

Saki Magnetics (Calabasas, CA) reports that **National Tape & Disc** (no relation to this department of *Mix*) or-

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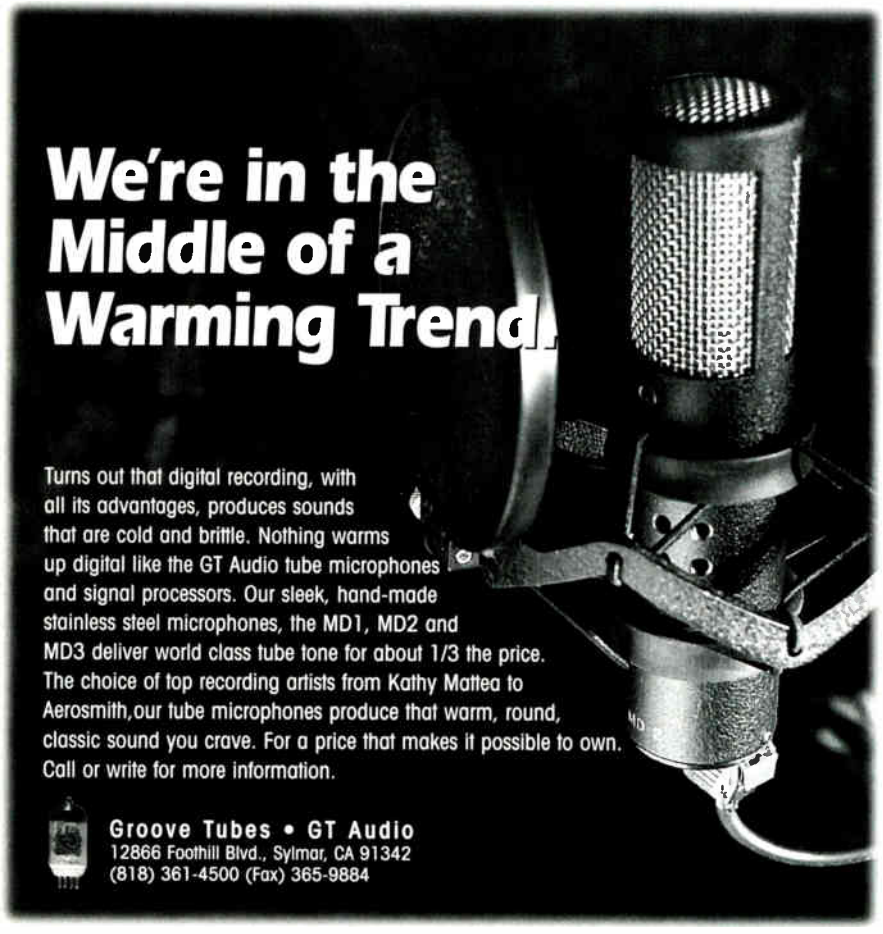

dered Saki heads for 20 new slaves slated for installation at its expanding Nashville facility. Eight duplicators recently purchased Saki replacement heads for their in-cassette dupe systems. Saki is strengthening its sales network overseas, where four of the eight orders originated...Santa Ana, CA-based **Embassy Cassette** has taken delivery of a new 1000 Series high-speed audio cassette duplication system from **Versadyne** (Campbell, CA)... **Magnetic Products** (Valencia, CA) expanded its videocassette production capacity with the addition of two 14-machine lines of VL-352 loaders from **Otari** (Foster City, CA). The two lines, linked with an "integrated conveyor highway," boost the company's VHS-loading output by up to 109,000 per day...**HMG Digital Technologies** and **Allied Film Laboratories** announced the finalization of their merger into the new publicly traded entity **Allied Digital Technologies**. HMG was a significant independent duplicator...New York City's **Digital Force** mastered and manufactured a "Backstage Preview Special" CD for radio stations to promote the annual MTV Music Video Awards...In San Francisco, **Rocket Lab**'s Paul Stubblebine has been busy remastering a series of reissues from '60s blues label Testament Records, including titles from Otis Spann and Fred McDowell. Stubblebine also worked with Henry Kaiser on his new *Siamese Step Brother* release. Engineer Ken Lee worked with blues singer Jimmy Dillon on an album featuring Etta James, Eric Clapton and Clarence Clemons...**Truetone**'s Phil Austin mastered releases for rapper Matlock and dixieland group Squirrel Nut Zippers. Also at the Hackensack, NJ, facility were prank-callers the Jerky Boys working with engineer David Radin...Burbank, CA, studio stalwart **The Enterprise** jumped into the multimedia game with the addition of audio and video file conversion, Mac and MPC authoring and CD-ROM premastering...**CD-ROM Strategies** (Irvine, CA) announced that its CD-Gen is the only CD-recording software package currently able to master multisession enhanced CDs for the DOS/Windows environment. ■

Send Tape & Disc News to Philip De Lancie at Mix, 6400 Hollis St., #12, Emeryville, CA 94608; Fax (510) 653-5142.

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COAST TO

L.A. GRAPEVINE

by Maureen Droney

CD-I...CD-ROM—The "M" Word—Whatever you call it, everybody's talking about it. But who's really in the trenches doing it? Well, over at **Soundcastle** in Silverlake, engineer Charlie Watts, (no, not *that* Charlie Watts!) has completed a CD-Interactive version of *Peter and the Wolf* for Warner Bros. It was a first-time interactive effort for everyone involved: Watts, who edited and mixed; cartoon-animation legend Chuck Jones (creator of Road Runner, Wil-E-Coyote, Elmer Fudd, etc.); and director George Daugherty.

The project was a natural for Soundcastle, because the studio has been heading in a

—CONTINUED ON PAGE 210

Engineer Charlie Watts and studio manager Candace Corn at Silverlake's Soundcastle Studios

PHOTO MAUREEN DRONEY

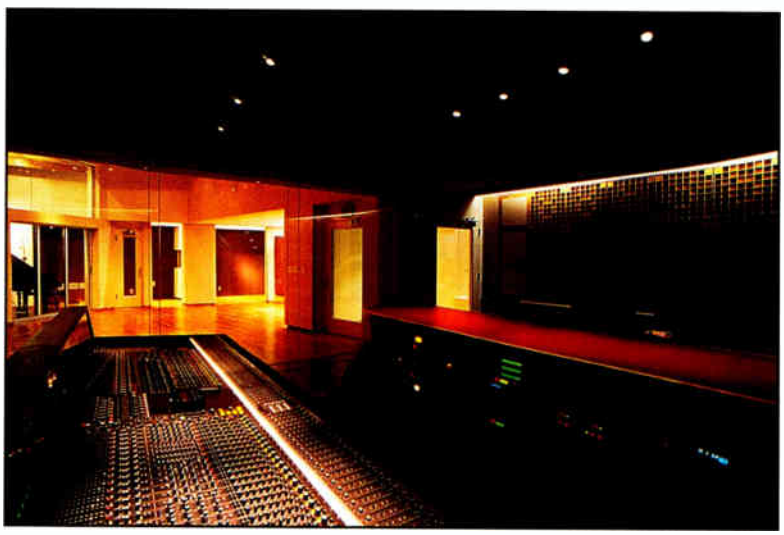
NASHVILLE SKYLINE

by Dan Daley

Reba vs. The Row: In a show of solidarity, an estimated 30 Nashville recording studios and owners signed petitions asking the city zoning commission to block the construction of a helipad atop the new recording and office complex being built on Music Row by country superstar Reba McEntire's Starstruck Entertainment Co.

On January 4, the evening before a zoning commission hearing on the matter was to be held, studio owners and managers gathered at Georgetown Masters, located directly across the street from the Starstruck construction site, to vent their concerns. The group, which was organized by Georgetown owner Denny Purcell and other Row residents and business owners, retained the services of studio designer Russ Berger and acoustical expert Tom Rose, both of whom have written studies on the impact of regular helicopter operations on Row studios.

"If anyone has any doubts about it, let me say now that the impact



Nashville's Sony/Tree music publishers moved into new headquarters on Music Row. The Russ Berger Design Group designed a new recording studio as part of the $3.5-million renovation, which nearly doubled the size of the previous Sony/Tree facility.

would be significant," said Berger, who has worked on more than 20 Nashville studios and offered his services pro bono. "The noise will destroy session work. I don't think [Starstruck] really understands the magnitude of this." Todd Culross, chief engineer at Music Mill Studios, told *Mix*, "Our studio is in a log cabin-type of structure. It's completely ludicrous to propose such a thing.

—CONTINUED ON PAGE 214

COAST

PHOTO: SANDY SAGER

Control room A (with refurbished API console) and live recording space at Chicago's Warzone Recorders

NORTH CENTRAL NEWS

by Jeff Forlenza

In a large warehouse on the outskirts of downtown Chicago is **Warzone Recorders**, owned by Van Christie and Jim Marcus, of the industrial band Die Warzau, and studio managers Doug Woodbury and Yvonne Goerndt. Warzone features a cavernous live room with a 35-foot vaulted ceiling, two control rooms and a decidedly music-for-music's-sake ethic. Fletcher of Boston's Mercenary Audio designed Warzone's control room A, while the studio owners designed their B room themselves. Well-stocked with vintage analog gear, Warzone has refurbished API consoles from the '70s in both control rooms, and MCI JH-24 and Otari MTR-90 multitracks, to go along with a Spectral Synthesis hard disk editing system.

Christie and Marcus learned engineering in the early days of their band's history, when Chicago was pumping out techno dance grooves—which came to be known as house—as well as hard-edged industrial music. "In the mid-'80s, there were a lot of similarities between house and industrial," Christie explains. "We were tracking our own band as well as an increasing number of outside projects as the demand for house music grew. After seeing our recording costs skyrocket, we decided to start our own studio."

Christie and Marcus found a large warehouse in 1993 and set about finding vintage gear to fill it. The console in control room A is a 32-input API (retrofitted with MegaMix automation) from the old Capricorn Studios in Macon, Ga., where the Allman Brothers band used to work. The B room, which is mainly for programming and dance projects, has a 32-in API, which came along with a slew of mics and analog gear from New York's Radio City Music Hall. Other featured War-

—CONTINUED ON PAGE 212

NY METRO REPORT

by Dan Daley

We're All Connected: The recording industry's first New York City BBS is up and running. **The Allied Pool Corp.**, a communal sort of audio engineer referral service that has been operating in New York since February 1992, began its NYC BBS last November. The service began free to anyone interested in using it and was expected to begin charging a nominal fee—around $10 per month—when its Internet access is established later this year, according to Pool founder and engineer Tony Maserati. "The key to this thing is that we want to keep

—CONTINUED ON PAGE 219

Battery Studios (New York City) redesigned its Control Room K2 with the help of Harris Grant Associates. The room includes RPG acoustic treatments and a Boxer T5 monitor system by Coastal Acoustics Ltd.

—FROM PAGE 208, L.A. GRAPEVINE

multimedia direction for the last few years. Along with its usual music clientele, Soundcastle has played host to a lot of advertising post-production business and is equipped with an SSL ScreenSound system, which was used for editing on *Peter and the Wolf*. Engineer Watts, who is known for his computer savvy (he built his own CD-ROM computer from scratch just for fun), describes the interactive project: "It was George Daugherty who came up with the idea of doing an orchestra CD-ROM with fairly decent fidelity," Watts explains. "Because what they previously did was, if you had a Soundblaster card in your computer, it used that card for all of its sounds. No real audio information was stored on the disk—it was just a command set of instructions that told the Soundblaster to play this little chord here. So George figured, 'Lets put it all on the CD-ROM and see what we can get away with!' The symphony orchestra had been recorded to DAT, along with separate musical instrument lines recorded after the full session, and we loaded that into the ScreenSound along with the other elements, including voice-overs by Kirstie Alley, Lloyd Bridges and [child actor] Ross Beringer. Then we used the ScreenSound to edit them all together to make the 28-minute piece, which was mixed through the Neve VR, back to DAT. The DAT was digitized at George's company, IFX, where they made the actual CD-ROM.

"Of course, we came up against a few hurdles while mixing," Watts continues. "When the format leaves the recording studio, it's in pretty good shape with a large amount of dynamic range and fidelity. But then you go from the studio DAT to 8-bit mono, the norm for sound on CD-ROMs now. Although a few do use 16-bit, with animation, it's always a trade-off—how fast you can drag the data out. A CD-ROM has to run at full speed to crank out audio data continuously, so if you impress upon it video demands as well, you have a huge datastream that has to pour out of there. So you make trade-offs—picture compression and 8-bit audio. When you're monitoring in the studio, you are hearing everything fairly hi-fi, but once it gets to a two-inch speaker on top of someone's computer, things change dramatically. Without having a method of monitoring that 8-bit mono sound, you mix a bit, then you digitize it. Then you bring it back and you go, 'Well the oboe is really overbearing right here.' And then you have to go back in and mix those down and go digitize it again, and of course, then there is something else! We actually mixed it once, and then we remixed it four times till we got it right."

Watts sees CD-ROM business as a possible saving grace for studios right now: "It makes a lot of sense for a studio set up for music recording," he says. "It's a gradual step, rather than having to go out and buy $500,000 worth of posting equipment. And as time goes on, my guess is that most of the major labels will go this route. Some people think the home studio thing, which is fairly prevalent right now, is where it's going to stay. Where the person digitizes a bunch of pictures and generates MIDI music for it at home. But the next step, and what

Warners and IFX did, is to say, 'Let's make something that's really hi-fi, that looks really good, and let's try to market it as a cut above the rest.' And for that kind of work, obviously, you need professional recording facilities. Warners wanted to get their feet wet with *Peter*, and the feedback is that everybody likes it. And I guess it did okay because we're going to do another one!"

Cirque du Jerque: They're baaack...The Circle Jerks, those pioneers of L.A. punk, were in recording for Mercury/PolyGram at Hollywood's Sunset Sound Factory with producer/engineer Niko Bolas. The four-piece group recorded live, of course, with everyone, including singer Keith Morris, in the same room. They ended up buying themselves a brand-new stage monitor setup when, not wanting to use headphones, they were horrified by the price of a few days' rental for a system. Morris explains, "Since I'm using a hand-held and I'm jumping around and on the ground, I sometimes get my monitor creating feedback, which can't be removed from the vocal." The project was in the mix stage when we talked to them—with Bolas doing several quick mixes of each song before moving on to the next. Morris describes their process: "We're on the third day of mixing, and we're mixing probably seven songs a day—quick mixes. I mean, this is not Journey or Phil Collins!"

The other Keith in the band, drummer (and well-known music business tax accountant) Keith Clark, describes the band's music as "rhythmic, energetic and intense—musical without being melodically pop." About their re-entry into the recording fray after a long hiatus Clark comments, "The Circle Jerks laid on the barbed wire so that a lot of the bands today could cross over on our backs and have some success. But we're still the ringleaders, the daddy-o's!"

NARAS continued its GRAMMY professional forum series in Southern California with two panels held during January in Anaheim. At the first one, prominent jazz personalities—producer/songwriter/musician Patrice Rushen, bassist John Clayton, composer Patrick Williams and former Take 6 member Mervyn Warren—got serious about "The Reality of Life for Studio Musicians With a Jazz Background." Moderated by pianist Michael Melvoin, the forum intended to take a "cold shower" approach that discussed the shrinking pie of gigs, in both clubs and the studio, for jazz artists. However, what developed was more positive, as the participants shared their wit and wisdom about creating what Clayton called a "casserole of a life," including teaching, playing, producing and composing. As always, one of the treats of these forums is getting to hear pieces from the panelists' repertoires—in this case, examples of what Rushen called "the only true American art form."

The second panel, held in conjunction with the NAMM show, discussed challenges of record production and was led by Phil Ramone. (He's showing real talent for this job—maybe someone should offer him his own talk show!) The diverse panel of producers included rocker Andy Johns, Nashville's Tony Brown, Grammy-winner of "Classical Producer of the Year," Joanna Nickrenz, and the unclassifiable Bill Bottrell. Nickrenz, whose projects are usually recorded direct to stereo, was a particular hit. NARAS' David Sears commented, "Since the participants were all from such different areas of music, it was great to see

them interact. A lot of them didn't know each other to start, but they really mixed it up. By the end, they were asking each other, 'How do you do that?' and exchanging phone numbers."

Fax your L.A. news to Maureen Droney at (818) 346-3062. ■

—FROM PAGE 209, NORTH CENTRAL NEWS

zone gear includes analog Moog and Roland synths, EMT plate reverb and even a Farfisa organ. Warzone also has their own production company and record label, which in-house producer Matt Warren helps run: Warzone Productions and Warzone Records. Bands tracking at Warzone recently included Mindfunk, Pigface, Sister Machine Gun and, of course, Die Warzau, whose new album, *Engine*, was just released on Wax Trax/TVT Records.

Radio Spirits in Buffalo Grove, IL, is one of the nation's largest producers of old-time radio programs. The nationally syndicated *When Radio Was*, which airs on about 150 stations nationwide, begins at the two-room production facility in a suburb of Chicago. Founded in 1978 by Carl Amari, an old-time radio and nostalgia expert, the company relocated to its current 5,000-square-foot facility in 1993. Radio Spirits senior producer Craig Harding reports they recently added a second Sonic Solutions workstation linked by a Media Net system to help them edit, assemble and master their vintage radio shows for release on CD and cassette. Other gear at Radio Spirits includes a Tascam 3700 console with JL Cooper automation and Studer 807 2-tracks.

Harding says they do a lot of clean-up work with the Sonic NoNoise capabilities for outside clients, and that they do live rock 'n' roll on the weekends. One such band Harding worked with was The Chronics. Since there is no designated tracking room at Radio Spirits, Harding captured drums and guitars in the warehouse and vocals in the office space and plans to take the project to Chicago Trax to mix. The Chronics CD will be used by the group to shop for a distribution deal.

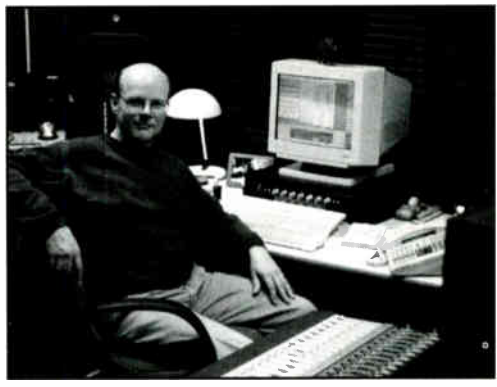
Quite a few popular recordings have come out of **Idful Music**, Brad Wood's definitively analog facility in Chicago: Liz Phair, Veruca Salt and Sunnyday Real Estate all worked

The Fez: Engineer Sam Fishkin and his assistant-in-training, Emily Fishkin, work on mixes at Steve Ford's Cheerful Little Earful Studios in Chicago.

with Wood, who built Idful in 1988. Idful gear includes a Neotek Elan console, Studer A80 MkIII 24-track, Telefunken ½-inch 2-track and a collection of more than 60 microphones. Idful engineer Casey Rice says that, unlike other Chicago facilities, they only do music-recording projects. One recent Idful session was Geffen Recording artists Loud Lucy working with engineers John McEntire and Wood.

"If you build it..." Brian McCormack built his **Galt Studios** in the middle of a cornfield in Culver, Ind., to cater to advertising clients in Indianapolis and Chicago. Recently the audio/video production facility underwent a major renovation with the help of the Walters-Storyk Design Group. John Storyk helped design a multifunctional tracking space suitable for big drum kits, small orchestras and live video. Galt gear includes a Neotek Elite console, a pair of Otari MTR-90 2-inch 24-tracks, Panasonic SV-3700 and Roland DM-80 digital workstations.

Formerly co-owner of Chicago's Seagrape Recording, Mike Konopka has gone independent under the name of **Thundertone Audio**, specializing in engineering, sound design and audio production services. After ten years at The Grape, Konopka wanted a break from management tasks and wanted to get his hands back on the faders. Some of



Senior producer Craig Harding at the Sonic Solutions Quattro system in Studio B at Radio Spirits in Buffalo Grove, IL

Konopka's recent sessions included a live broadcast of the Freddy Jones Band using ISDN phone lines. Another live gig Konopka engineered was A.C. Reed & The Sparkplugs. Konopka also keeps busy as co-writer (with Tim Powell of Chicago's Metro Mobile) of *The Eardrum*, an amusing, informative newsletter that started as a chronicle of the Chicago chapter meetings of E.A.R.S.—Engineering and Recording Society—an outreach committee of the Chicago chapter of NARAS. Recently, *The Eardrum* went independent. If you

want to recieve *The Eardrum* write to 2097 Johns Drive, Glenview, IL 60025; or fax (708) 998-6421. E.A.R.S. meetings are held at various studios and recording locales throughout the Chicago metropolitan area on the last Tuesday of each month. For more info contact E.A.R.S. chairman Harry Brotman at (708) 799-7711.

Another independent engineer in Chicago is Sam Fishkin, whose business handle is **Samsonics**. Fishkin fills his days tracking and mixing jingles for Reebok, McDonald's and Hallmark at Chicago's commercial house Steve Ford Music. Fishkin also tracks music from the likes of C.J. Chenier (son of zydeco king Clifton) and female blues band Saffire for Chicago's own Alligator Records. Fishkin mixed the Chenier project at the Chicago Recording Company, and he recorded and mixed Saffire at Streeterville Studios. Alligator owner Bruce Igluaer produced both projects, which Fishkin engineered. ■

—FROM PAGE 208, NASHVILLE SKYLINE

You know this business: Sometimes you only get one chance to get a great take. The noise will drive smaller studios out of business."

Starstruck withdrew the request for variance the next day, just before the scheduled zoning commission meeting. Several days later, however, the request was resubmitted and then almost as quickly withdrawn again. Narvel Blackstock, Starstruck executive VP and husband of McEntire, issued the following statement: "We have decided to withdraw our request for a helistop on Music Row because of continued opposition. It's not worth damaging our long-term friendship with all our neighbors on Music Row. We're putting in a music/entertainment complex, which is the main focus of what we're doing. The helistop was an afterthought."

Despite Blackstock's conciliatory-sounding comment, it appears that there will be considerable acrimony around the issue for some time to come, since it also appears that the heliport is being built as part of the complex, leaving the door open for future requests to the zoning board for helicopter operations.

On Thursday evening, Jan. 19, **Masterfonics** unveiled the raw space that will become its tracking room sometime in August, if all goes according to schedule. Studio owner Glenn Meadows provided sledgehammers and spray paint for guests to express themselves and help prepare the warehouse-type structure for a complete renovation. The most striking alteration will be that the roof will be raised approximately eight feet to increase the tracking room's acoustical capacity.

As with Masterfonics' other facility, the design is by the reclusive Tom Hidley, via fax and DHL. The main recording room is approximately 2,300 square feet with a 32x30 control room and Hidley/Kenoshita monitoring. Chief of technical services for Masterfonics, Frank Wells, says he expects to implement $30,000 worth of Mogami wiring on the installation and that Masterfonics is budgeting six figures for microphones and micpre's alone. ■

Fax Nashville news to Dan Daley at (615) 646-0102.

New York Engineers Share Miking Tips

Recording engineers Frank Filipetti and David Smith enlightened more than 70 audio engineers with an "Everything You Wanted to Know About Miking Technique" seminar at a recent meeting of the New York AES chapter.

During the two-hour session, which was hosted by Audio Techniques, Filipetti discussed his approach to recording drums (overheads pick up 70% of his sound), acoustic guitar (omnidirectionals are great for picking up the ambience behind a guitar) and vocalists (don't use a windscreen unless you have to), while Sony Classical's Smith shared his insight into miking pianos in a solo or chamber mode (parallel-spaced omnis placed 18 to 20 inches apart, just over the top of the piano), orchestras (he usually uses three to five omni-

—CONTINUED ON PAGE 218

SESSIONS & STUDIO NEWS

by Jeff Forlenza

PHOTO: THOMAS SKOVSENDE

Producer Bill Milkowski (left) and slide guitarist David Tronzo take a break from recording a track for NYC Records' Come Together: Guitar Tribute to the Beatles, Volume 2 at The Pad Studio in New York City. Engineer Stuart Lerman recorded the tune.

NORTH CENTRAL

Producers Butch Vig, Steve Marker and Doug Erikson were working with Scottish singer Shirley Manson on an album project called *Garbage* at Smart Studios in Madison, WI...The Sounds of Blackness recorded a song for a Marvin Gaye tribute with producer Gary Hines and engineer Steve Hodges at Flyte Tyme Productions in Minneapolis...Brazilian guitarist/vocalist Paulinho Garcia tracked his debut for Southport Records, *Jazzmineiro*, at Chicago's Sparrow Sound Design with the engineer/production team of Joanie Pallatto and Bradley Parker-Sparrow...Chicago's own Dinner Thieves recorded their latest CD at Studio X (Chicago) with producer Maestro and engineer Randy Wilson...Alternative act Albino Violet tracked an upcoming release with producer/engineer Greg D. Feezel and assistant engineer Bill Hartzell at Electro-Sound Recording in Kent, OH...

SOUTHEAST

At the historic Muscle Shoals Sound Studios (Sheffield, AL), producer Wolf Stephenson was in tracking Bobby "Blue" Bland for Malaco Records with engineer Steve Melton and assistant Kent Bruce...At New Orleans' Ultrasonic Studios Capitol recording artists Blind Melon overdubbed their latest album with engineers Andy Wallace and Ken Lomas...At Tree Sound Studios (Norcross, GA) famed producer Mitch Easter worked with studio owner/engineer Paul Diaz on an EP for North Carolina band Drag to be released on Bing Records...Blues-rockers Jimmy Thackery and The Drivers recorded their new Blind Pig Records release at New River Studios (Ft. Lauderdale, FL) with producer Jim Gaines and engineer John Hanlon...

NORTHEAST

Studio 4 reports plenty of activity in its new Neve/SSL/Euphonix-equipped facility in Conshohocken, PA: The Butcher Brothers, Joe and Phil Nicolo were working with Urge Overkill on their second album for Geffen; and Dave Johnson was busy co-producing the RuffHouse Records debut from Keith Martin...Contemporary jazz

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Comfort is very important to an artist's creativity. Rockingchair Recording offers a relaxing environment and personalized service that set us apart. Special attention was given to the aesthetics and location of our studio in order to establish the perfect atmosphere for our clientele. We are located in the heart of midtown Memphis, just minutes away from historical Beale Street, clubs, restaurants, and hotels. Together, Rockingchair and Memphis make a perfect retreat for today's recording artist.

Mobile Audio Recording Services Inc.

2610 Freewood Dr., Ste. 16
Dallas, TX 75220
(214) 352-2446; Fax (214) 352-6001

Mobile Audio Recording Services Inc. is a full-service facility providing 24/48-track remote audio to the music, video and film industries. The truck and crew, formerly with Omega Productions of Dallas, has been involved in numerous projects for video and film as well as individual album projects. Our facility and crew are tailored to provide quality service and customer satisfaction.

The ClubHouse

Box 373
Germantown, NY 12526
(518) 537-6305; Fax (518) 537-5829

The ClubHouse recently installed a Neve 8058 MkII mixing desk. Vintage Neumann tube microphones and Telefunken preamplifiers have been added to the collection. Our large studio is 50'x25'x20', and the smaller room is a more intimate 19'x16'x8'. Located on the scenic Hudson River only two hours north of New York City, The ClubHouse provides a large selection of fine equipment in a relaxed country setting.

Half & Half Productions

1810 S. Minnesota Ave.
Sioux Falls, SD 57105
(605) 330-0809; Fax (605) 330-0801

South Dakota's first fully automated digital studio offers a staff, and composer/producer Jaee Logan, that is willing to go that extra mile for clients. Equipment ranges from a Euphonix CS2000 digitally controlled studio system to a Pro Tools 16-track digital recorder, a Tascam 48 8-track, a Yamaha C6F conservatory grand piano and more. Come join us in an environment that is quiet and peaceful, but at the heartbeat of the world! For information, call (605) 330-0809.

▪ STUDIO SHOWCASE ▪

Sony Classical Production Inc.

1370 Ave. of the Americas, Ste. 2301
New York, NY 10019
(212) 445-1800; Fax (212) 262-0228

Sony Classical Productions, one of the most advanced US digital location recording, remastering and production facilities, serves both Sony Classical and outside clients. With 2- to 48-track operation, it is the only facility in this country with 24-bit multitrack capability and 24-bit audio post-production for video in both NTSC and PAL. Recent recordings include Marsalis on Music, Wagner's Flying Dutchman, and much of the remastering of the 35mm Ultra Analog Everest/Vanguard reissue series.

Quad Recording Studios

723 7th Ave.; New York, NY 10019
(212) 730-1035; Fax (212) 730-1083

Quad Recording's four world-class Solid State Logic studios (up to 72 channels), two digital editing suites and two complete MIDI rooms are available for all your music recording needs, from preproduction to post-production. Artists who use our state-of-the-art facility include Aerosmith, Prince, David Sanborn, Janet Jackson, Elton John, Rolling Stones, Daryl Hall, Frankie Knuckles, David Byrne, Mariah Carey, B.B. King, Rosanne Cash, U2, Marc Cohn, SWV, Whitney Houston, Yoko Ono and David Morales.

Acme Recording Studios Inc.

112 West Boston Post Road
Mamaroneck, NY 10543
(914) 381-4141; Fax (914) 381-4543

Acme Studios offers an environment that is far enough from the pressures and distractions of Manhattan to foster productivity, yet is convenient—35 minutes by car or train. Acme's Studio A offers 24- to 48-track recording and mixing. A 56-input discrete console is featured. Studio B is a 24-track room with an extensive MIDI and mix-to-picture setup. Credits include Spin Doctors, Mick Ronson, Nice & Smooth, Atlantic Starr, Geri Allen and *RFK* (HBO).

group Steps Ahead recorded and mixed their latest NYC Records release, *Vibe*, at New York's RPM Studios with engineer Mike Krowiak. Vibraphonist/bandleader/label president Mike Mainieri co-produced the album with Adam Holzman...Juliana Hatfield mixed her latest Atlantic Records project with the Fort Apache production/engineering team of Sean Slade and Paul Kolderie at Manhattan's Magic Shop Recording Studio...Savoy Brown tracked and mixed their latest release for Viceroy Music at Showplace Studios (Dover, NJ) with engineer Ben Elliott and assistants Rick Deardorff and Joe Kunis. Legendary blues guitarist Hubert Sumlin made a special guest appearance on Savoy's song "Shake for Me"...

SOUTHERN CALIFORNIA

R&B producers Foster & McElroy were mixing tracks with the group Asante and engineer Ken Kessie at L.A.'s Skip Saylor Recording...Michael Nesmith recorded his latest release for his label Rio Records, *The Garden*, at Footprint Studios and Trax in Los Angeles with engineers Brian Friedman and Michael McDonald. Nesmith co-produced the album with John Hobbs...Co-producer/engineer Ed Cherney mixed the new Little Feat album for Zoo Entertainment at Hollywood's Brooklyn Recording with fellow producers Bill Payne and Bill Wray...Producer Dennis Walker was at Ocean Studios (Burbank) working on the upcoming Buddah Heads project for Edoya/RCA Records with engineer Chris Minto...

NORTHWEST

At Fantasy Studios in Berkeley, CA: Guitarman Joe Satriani tracked and overdubbed a project for Relativity Records with engineer John Cuniberti, and the Mother Hips mixed their American Records' debut with engineer Neil King...Producer Jerry Harrison (Pure, Crash Test Dummies) and engineer Karl Derfler were at Studio D (Sausalito, CA) working with New York City band The Bogmen on their debut for Arista Records...

SOUTHWEST

Rapper Scarface tracked, mixed and mastered his album, *The Diary*, at Houston's Digital Services with engineers Mike Dean and John Moran...Mike Edwards (of the band Jesus Jones) remixed three tracks from Austin-based band Happy Face at Planet Dallas with producer Rick Rooney for the new Happy Face CD...

STUDIO NEWS

Denver's Rocky Mountain Recorders installed two Amek Mozart RN Series mixing consoles recently. The Mozart consoles will work in conjunction with RMR's Digidesign Pro Tools system and 32- and 24-track tape machines...PM Productions (Crompond, NY) recently installed a customized Harrison console with Optifile 3D automation, Tascam DA-88 digital multitracks and a vintage Ampex 612 recorder...Dallas-based studio The

Listening Chair opened a new facility in the city's Deep Ellum section to cater to its post-production and multimedia clients. Designed by Bob Suffolk, the new studio features a Mackie mixer and a Pro Tools hard disk recording system...**Blue Room Studios** recently opened in San Francisco with 600 square feet of recording space, two isolation booths, a full kitchen and lounge. Blue Room gear includes a Yamaha MR1642 console, Tascam TSR 8-track recorder and an assortment of mics and outboard gear. ■

Send nationwide sessions and studio news to Jeff Forlenza c/o Mix, *6400 Hollis St. #12, Emeryville, CA 94608.*

—FROM PAGE 214, MIKING TIPS

directionals if the group is not being recorded sectionally) and opera singers (he stations the mics at least four feet away).

Both engineers also displayed their passion for outboard mic preamps. Despite some older boards like the Neve 8078 having some great preamps, Filipetti said he likes to use preamps (such as Tube Techs) for recording piano so that the signal doesn't become noisy after going through the console. "We are victims of 'preamp du jour syndrome,'" Filipetti explained, "For example, we might use the Millenia if we want a neutral sound, the FM Acoustics for a very bright sound, or the Jensen M1 for a darker sound."

Filipetti and Smith even entertained the crowd with selections from Carly Simon's release *Letters Never Sent* (which Filipetti produced, engineered and mixed) and a 1960s Vladimir Horovitz recording that was made by CBS Masterworks' patriarch, Buddy Graham. Of course, no chapter meeting would be complete without some kernel of aural revelation. According to Filipetti, Linda Ronstadt is a very reliable microphone test signal. "She comes close to being a sine wave," he claims. You heard it here first, folks.

—Evan Ambinder

—FROM PAGE 209, NY METRO

it having a local feel," he says. "The Internet is so huge, and you don't always want to chat with someone from Sweden. This way, you get to connect with people in your home town and hear about things like upgrades to consoles and other kinds of locally useful information."

The Pool presently has 12 members, whose commissions paid into the Pool are supporting the BBS until it becomes profitable, which Maserati expects to occur later this year. More than 120 users have logged on since it commenced operations, including a lot of familiar names thinly veiled through online handles. (I'm DANMIX, incidentally.) Allied Pool will provide user software on request. The log-on number is (212) 674-7375.

Yes, Master: In a truncated version of the New York theme approach this column takes, I talked to a few mastering folks about what's particular to New York in this regard. Murat Aktar, partner in the two-suite/one-edit-room mastering house **Absolute Audio**, says it's the variety and redundancy of gear required in New York, thanks to the diverse kinds of music and technical levels that come in. "You have to have a choice for everything that's in the room—tape machines, converters, EQs—everything except the monitoring. That's the one thing that stays consistent." So does the incoming format situation, he adds; Absolute is seeing about 70% DAT as the source format at this point.

Doug Levine, president of **Masterdisk**, agrees with most of the foregoing. He also provides both mains and near-field options for monitoring, although some genres, like rap and hip-hop, completely disregard the bookshelf-size speakers. "And you've got to have at least three different kinds of converters, depending upon the music," he adds.

Sterling's Larry Lachmann notes that, "Right now anything and everything goes in mastering in New York." Analog and digital EQ are melded together as an increasing base of urban/contemporary seeks to make radio but maintain its hipness. "What you got is people living in the projects and having record deals," Lachmann says. "For them, too slick is not cool. It has to be competent but lo-fi at the same time." That should be easy for New Yorkers. ■

LUNCHING WITH BONZAI

—FROM PAGE 102, AL KOOPER

Bonzai: What do you record to?
Kooper: Three Fostex ADATs. They were rough at first, but as the software changed, they got better.
Bonzai: Who is this Roosevelt Gook character who plays on your records?
Kooper: Me.
Bonzai: Your press release reads, "Kooper Kaps Kareer With Kool Kakewalk." Is that all there is?
Kooper: No, this just summarizes everything I've done up 'til now. Next is the record I have wanted to make for many years, with my new material.
Bonzai: Is it going to shock people?
Kooper: I don't think it's going to shock anybody. I'm not a shocking type of guy. I'm just a crusader of music for music's sake. It's even more important to do that now than ever before.
Bonzai: Are you surprised that you've survived so long?
Kooper: I don't know if I have in the big sense. I don't know if you call this surviving. I didn't have a record deal for 12 years, and might not have one today if it wasn't for Music Masters. I consider myself fortunate to still be recording in the face of what the music business has become.
Bonzai: Is there a conspiracy?
Kooper: No, it's just that everything has become incredibly corporate. It's difficult to express yourself unless you fit into the "korrect kompartmentalized kategories." Every now and then, a Bonnie Raitt will pop through, but it's very rare.
Bonzai: Do you think this new album will fare well?
Kooper: You mean, make the top twenty? I think not. Right now, I just try to put out a record that's exactly what I want it to be. To me, that's what successful means. This record is the most for the fans of any record I've ever made. From the people I've met, this is what they want, and here it is. And being able to reproduce the original bands is a nice touch, instead of playing it with your band of the moment. I'm glad for that, and I also love playing with these people: John Sebastian, Harvey Brooks—a wizard, a true star—John Simon, Randy Brecker, Will Lee, Anton Fig, Jim Fielder.
Bonzai: Is there an unspoken communication with guys you've known so long?
Kooper: Yes, and it's also wonderful to play with them because it's so uncomplicated by the vagaries of our youth.
Bonzai: Are you better players now?
Kooper: You know what, every time we got together as the Blues Project I thought, "Now I can do this so much better." But there is only one way to play that music, and you have to continue to play it that way. In some ways, you can bring your expertise to it and make it a little better, but you take a song like "Two Trains Running"—we play it exactly like we did when we were little kids. Of all the things on the record, it rings the truest of '60s music. If you had to tell someone what music was really like in the '60s, what it sounded like and what it was all about, I would put that track on. Plus, it's out of tune; it's out of time, while other tracks on the album are so precise and on the money. It's refreshing, and Danny Kalb is no different than John Lee Hooker, except that he's white. He doesn't get the respect that he should get, but he is the blues. He has lived a tough life, and he gets up there and does his thing the way he's always done it. I'm a big fan, and it's my pleasure to showcase him for those 11 minutes.
Bonzai: He's the only lead vocal on the album other than you?
Kooper: Correct, and I don't mind stepping aside for him.
Bonzai: You also mixed this album?
Kooper: I mix all my stuff. I wish I could find someone else to do it, but I have not found anyone who hears things quite the same way that I do. I did have quite a lot of help on this, though, because it was the hardest record I ever mixed in my life. Live records are tough. I was helped by the "amazing snare drum trick from the '60s." Somehow, live snare drum tracks are usually quite unremarkable-sounding. I don't know what it is, but it always happens.
Bonzai: So what is the amazing snare drum trick from the '60s?
Kooper: I called my friend, Evil Wilhelm, in Southern California, who has a collection of the finest snare drums that money can buy. I asked him to send me his best snare drum, which he did. I took that and the plastic ring that goes around a 24-track tape and put that on top of the snare drum. Then I put an Auratone speaker face down on the snare drum, held up by a plastic ring, and fed a semi-gated version of the snare drum track to that Auratone. I miked the snare

drum like I would mike any snare drum, and I incorporated that with the snare drum sound from the original track. You get the exact same dynamics as the drummer played, which you can't do with samples. This is old-time logic vs. new-time technology, and yet it's still better. The sound waves from the Auratone play the snare drum, with the same dynamics as the original drummer.

Bonzai: People speak of your incredible influence on performers today...

Kooper: Name one. [laughs] It's funny. As an artist, I never had a hit single. When you have a hit single, you know you have reached everyone at a certain period of time. Paul Simon and Art Garfunkel know that all the people from 1966 knew who they were. I don't have that sort of barometer. I'm always amazed that anyone knows who I am, or recognizes me when they meet me. You just never know who bought those albums that weren't in the Top Ten. And when I meet famous people who know who I am, then I'm incredulous. I've met some well-known "fans," and I didn't especially hear it in their music.

Bonzai: Who are these people?

Kooper: Eddie Van Halen, who kissed my boot at an art opening, embarassing me beyond belief. Phil Collins told me that *The Child Is Father to the Man* album was the reason he did music. When he told me he loved "I Can't Quit Her," I said, "Hey, do it. Come up with a great arrangement, because I'm sick of this one." I hope that my candid liner notes are not a bad thing, but I have this compulsion to tell the truth. People have to understand that when you have played the same song, over and over again for 20 years, that you might get sick of that song. It's great when you can come up with a new arrangement, because it's like doing a new song. But, for me, some songs defy that.

Bonzai: Any current, new music that you like?

Kooper: My favorite band is King's X: They are the most musical of the new bands, for me. It's a crime that they're not bigger. They are fantastic, and really good live.

Bonzai: Well, that's it—oh, there is one more thing...

Kooper: What, did I borrow money from you a long time ago? ■

Roving editor Mr. Bonzai has the soul of a poet, and he's not giving it back.

—FROM PAGE 164, BITS AND PIECES

DDA QMR console with patchbay to its new recording suite, which was designed for standard and Dolby Surround mixing. Airwaves is now a three-room facility (two digital mixing rooms plus the new studio) that focuses on audio post work for radio and TV commercials, CD-ROM production, corporate audio-visual work and scoring for feature films...**Lydian** Sound (Ontario) took delivery of Canada's first DDA Profile console with Optifile automation. Lydian Sound is a 3,000-square-foot music-recording facility...The fourth annual **Music West** conference will be held in Vancouver from May 11-14. This year's show will offer a series of panels and discussion groups about the state of indie labels and music, as well as workshops for aspiring producers, musicians and composers... TV Global (Rio de Janeiro, Brazil) added 18 Vega 600 Series Pro Plus UHF wireless microphone systems. The new systems will be used primarily for soap opera production...

EUROPE

The **International Teleproduction Society** has three new German chapters. The ITS provides its members with industrywide financial and engineering reports and a forum for the exchange of information and equipment...The 19th annual **International Television Symposium and Technical Exhibition** will be held in Montreux, Switzerland, June 8-13. The event will feature papers on new production and post-production developments, production and transmission workshops and a Future Technology Forum...

ASIA

The 14th edition of the **Australasian Music Industry Directory** was released earlier this year. This latest version offers more than 8,000 industry contacts, some of them in territories not previously included, such as New Zealand, Papua New Guinea, Tahiti, Fiji, Tonga, Vanuatu, Guam and Hawaii...**Midem Asia**, a music-industry and entertainment market conference organized by the Reed Midem Organization (Paris) will be held May 23-25 in Hong Kong. One of the first companies to reserve exhibition space was Warner Music International. ■

—FROM PAGE 46, DIGITAL MULTITRACK FORMATS

Standard BRC features include SMPTE timecode read/write/generate, chase lock to any external SMPTE source, MIDI sync, transport control of up to 16 ADAT decks, 400 locate points, automated assembly editing, independent delay of any (or all) tracks, record group assignments, auto punch-in/out, multimachine offset and more.

The Fostex RD-8 ($4,295) uses the same S-VHS transport and record electronics as the Alesis ADAT but adds sophisticated synchronization and control features. The RD-8 is compatible with the Alesis system and can be used as a master or slave deck; tapes recorded on the two machines are completely interchangeable. Standard features include an onboard SMPTE chase-lock synchronizer/reader/generator, RS-422 (Sony P2 9-pin) control, pull-up/pull-down (44.056 and 47.952kHz sampling for 29.97 fps resync) and MIDI Machine Control. One important function that the RD-8 offers (which is lacking in the Alesis ADAT) is the ability to punch-in/out of the recording process while recording on another track(s).

The Tascam DA-88 ($4,499) can record 108 minutes of digital audio on a standard Hi-8mm videotape (slightly longer with extended-length formulations). Besides the usual transport functions, the DA-88's four-rack-space front panel includes controls for tape shuttle, sample-rate select, two locator points, rehearse and auto-punch modes, and clock source select. The optional SY-88 synchronization board ($799) is a plug-in SMPTE card for MIDI Machine Control, chase-lock to timecode sources and RS-422 video editor control. The RC-848 ($1,499) is a large multimachine autolocator with record-select buttons for up to 48 tracks (six DA-88s). Beyond the standard transport commands, the RC-848 also provides programmable pre/post-roll, along with 9-pin RS-422 output for interfacing to video systems, ports for controlling Tascam analog decks, 99-point autolocation, shuttle wheel, LCD status screen and two time displays.

Unveiled last November, Sony's PCM-800 ($5,995) MDM is compatible with the Tascam DA-88, offering eight tracks of digital audio on Hi-8mm. Standard features include up to 108 minutes of recordin.g time on an NTSC-120 tape; two 25-pin D-sub connectors, which carry eight channels of AES/EBU digital information (on stereo pairs); and breakout cables with XLR connectors for interfacing with other digital devices. The RM-D800 ($1,500) is an autolocator/remote unit that can control up to eight PCM-800s. Another option, the DABK-801 sync board ($800), is similar to Tascam's SY-88 card, in that it adds SMPTE timecode chase, 9-pin RS-422 control, MIDI Machine Control, timecode generation and MIDI sync capabilities.

THE BOTTOM LINE

Much has been said about all of these machines in the ADAT (S-VHS) vs. DTRS (Hi-8mm) format wars that are waged in dealer showrooms and studios—as well as a constant flow of "my format can beat up your format" griping on the Internet. But a few facts are clear:

1. By using readily available videocassettes as a recording medium, MDM systems can slash tape budgets to a bare minimum—as low as a few cents per track-minute. Compared to analog 24-track tape, which may cost $40 for a six-minute tune, MDMs clearly have the edge.

2. MDM systems are upwardly (and downwardly) compatible. A 32-track MDM system would have no

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SFP = SOUND FOR PICTURE SUPLEMENT

trouble playing back an 8- or 16-track session—something that's considerably harder to pull off with reel-to-reel decks. Equally important is the fact that a modular system can be easily expanded as budgets or needs grow, whether it's buying another deck or merely borrowing or renting a machine for a complex session.

3. All the MDM systems on the market have advanced features, such as multimachine assembly editing, SMPTE or MIDI sync, and MIDI Machine Control. The latter permits recording and tracking operations to be controlled from a sequencer or other MIDI devices, with a precision that can be up to 20 times more accurate than a SMPTE frame.

4. Price. The least expensive 24-track MDM system retails at just under $9,000, while the entry-level ticket in reel-to-reel systems is more than $60,000.

5. The huge user base of MDM machines also has attracted third-party companies (and the manufacturers themselves) to develop accessories and add-ons for specialized applications. For example, at last year's AES show in San Francisco, Rane unveiled its PAQRAT Series, a line of under-$1,000, 20/24-bit recording adapters for the ADAT and DA-88. Additionally, several companies unveiled longer-length tapes (S-VHS and Hi-8mm), which extend the recording capacity of the machines.

6. MDM recorders share a natural synergy with disk-based workstation systems, and DA-88 and ADAT support peripherals have been announced by Digidesign, Spectral and others. In fact, the $995 Spectral Translator not only provides access for transferring ADAT or DA-88 tracks into Spectral workstations, but the unit also functions as a DA-88/ADAT converter for transferring tracks or cloning tapes between these two incompatible formats.

7. As with any precision device, MDM systems need regular maintenance and care, whether it's occasional head cleanings (and possibly head replacement after 3,000 hours) or a servicing tuneup every six months or so. No one would possibly expect a pro 2-inch analog machine to run for half a year without a maintenance schedule, so why should MDMs be any different? Such attention could considerably reduce the number of service gripes among MDM users and is worth including in your studio budget.

WHAT'S NEXT?

Whether you decide on a modular or reel-to-reel system, or you're spending $15,000 or $150,000 on a digital multitrack, the playing field in 1995 is a whole lot different than it was a decade ago. And as for where it'll be in 2005—log on to your *Mix Ultranet* comm-unit in ten years, and we'll keep you posted. ■

Mix *editor George Petersen is the author of* Modular Digital Multitracks: A Power User's Guide, *available through Mix Bookshelf.*

—*FROM PAGE 46, TAPE VS. DISK*

memory considerations alone would dictate a tape-based system. Any 16-bit digital recorder requires approximately 5 MB per track-minute of storage at 44.1 kHz. Using this formula, a 65-minute reel of double-density, 48-track DASH tape would consume the equivalent of: 5 MB/min x 65 minutes x 48 tracks = 15,600 MB. That's over 15 gigabytes, and so far you've only recorded the first set on opening night!

What's becoming more prevalent is not an either/or situation in the tape-disk wars, but rather a hybrid system where users pick and choose either approach, or a combination of the two, depending on project needs. A film-scoring date may use tape for orchestral recording and go to disk for music editing; a country album may start with tape, "fly" tracks from the multitrack to the workstation for editing and then transfer the edited tracks back onto the recorder before mixing; and conversely, a video soundtrack created using workstations may use multitrack tape to store production submixes.

—*George Petersen*

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—FROM PAGE 33, DATA DENSITY

shores. About the huge job of replacing all the copper-cable TV feeds with the glass needed for the next step. All this stuff. It will *all* appear, but I want it to appear intact, whole, complete, uncompromised.

But all that still defines only the challenge. The underlying problem is complex and political. The legislation process for wider transmission channels takes years and years of futzing around with almost anybody's viable proposed data format schemes. When the organizations that evaluate and decide on which proposed systems or combination of systems will become the new standard, so much is at stake that it is almost hopeless. On the one hand, they want to provide the best, most thought-out, most efficient, most expandable format possible, while on the other hand they must freeze and implement as soon as possible, or the economic impact can be devastating. What a dilemma! If you were on that committee, and you were just about to freeze on a system or spec definition that seemed pretty good, and right in the middle a new guy shows up with something that is so much better that no one can deny it but it would require stopping everything, throwing away a year's work, and then starting over, what would *you* do? Quite a problem, isn't it?

So what's the deal? What is going to come along and pop us out of this trap? What one thing can reshape both the challenge and the underlying problem in one pass? Could it be...data compression? You know: "I love you so much I could squeeze you till you squeak"? I think that it could.

I do not mean today's batch of hokey DIGO (data in, garbage out) lossies, but the real deal. Not the stupid (and easily visible) MPEG that the RCA DirectTV MD (mini dish) home satellite digital TV system uses. Though it *is* noiseless and it *is* ghostless, it is also kinda dataless. Huge blocky compression artifact superpixels dancing wildly around on my screen while I am trying to watch a sunset is not my vision of the Digital Promise, I assure you. But that is *exactly* what the current vision is, and that scares the hell out of me.

Some of you may remember that I recently wrote about the Sony Mini Disc and other what I consider totally unacceptable products that use clearly audible data-destruction techniques in order to squeeze MD (more data) onto a tiny little disk. Well, it's *baaack*. If you haven't yet heard one, you should go out and do it. Wait, I have used "MD" twice already with two different meanings. Let's run with that so I can get it out of my system. Here we go. See if you don't agree that it would take more than an MD (medical doctor) to repair the MD (massive damage) to the MD (Mini Disc)'s MD (mangled data) due to lossy compression used to meet MD (modern demands) for program time. Truly an MD (market-driven) MD (media disaster). Okay, I'm done.

Our current condition is like that of supercars in the '60s. Come on, you knew I would get there in this column, too, didn't you? Back then, the state of the art in muscle cars was *speed*. They went very, very fast, but advances in what were obviously secondary areas of concern lagged far behind. Everybody knew that they were fast, and everybody knew that they could not corner or stop or handle any bumps. They were just fast. Then the public decided that they wanted a little control, a bit of finesse, maybe even some sophistication. No problem. We started to get it, and cars went from the fastest they have ever been to 110 HP creepers overnight. Then in the 30 years that followed, cornering and braking became realities, and then and only then did technology return to replace the speed that we had traded away for comfort, control and a bit more safety. Only in the last couple of years are we beginning to see the car we asked for in 1970, combining the sophistication we wanted with the long-lost speed we loved. Not that huge 1965 bottom-heavy V8 torque, but a new techno-power that is almost as good but a hundred times cleaner and three times more efficient. A compromise even I can live with for the betterment of Earth.

So here we are *once again*, with all that V8 power (huge, high-resolution datastreams) and no control. Without sophisticated management of all that power, all we can do now is throw data out the window until what remains is little enough to be managed by our puny Earth technology. Sad.

The way I see it, there are three ways to go from here:

1) Build a bigger, faster world where all this raw data can actually be handled directly, in its natural uncompressed form.

2) Develop intelligent, *lossless* hardware compression that squeezes this data into little black-hole-dense streamlets so that our current puny Earth science can manage it without trashing it.

3) Seal the gaps between the tiles in our aqueducts with lead and all die of lead poisoning like the Romans. In other words, continue down this insane, uninformed, suicidal road upon which we have already embarked; halting *and even reversing* the trend toward improving the resolution and quality of our digital audio and video data. Yes, choice #3 is to use permanently destructive lossy data compression that sounds like it was designed as a special high school science project for troubled children to keep them and their guns off the street.

Now, which of these choices are we going with? Either 1 or 2 is fine with me, but as you look at the list to make your own decision, keep the following in mind: One day, we as a race will leave this planet and take our place among the stars. We will rocket our way to freedom for a few millennia (no doubt getting lost from time to time because we can't understand our own navigation beacons due to poor data quality from cheesy, lossy compression), and then we will invent "beaming"—teletransportation. Now when we do this, do you want our place in the universe to be that of the dunce, the lowly court jesters of our galaxy; the race that once had an average IQ of 100 but now has one of 67 because of lossy compression techniques used on the teletransportation data beams? Personally, I love to use every single point of IQ that I still possess after serving a decade in the '60s, and I don't want to end up a purring pet on the lap of some Alpha-Centurion just because I thought it would be clever to reduce myself to a nonlinear 8- or 12-bit approximation of what I was before I beamed over. No sir, not me. I'll be that last guy on Earth, the one with the glow-in-the-dark T-shirt that says, "I'll let you leave me before I'll let you squeeze me." ■

Stephen St.Croix is 6'2" and has been known to drive a Miata from time to time. He knows *about compression.*

FEEDBACK

GOTHAM CANADA RESPONDS

I am writing in reply to the letter from Howard Redikopp published in the February "Feedback" section. His letter completely misrepresents the sales policy of Gotham Audio Canada.

First, he alleges that we are trading obsolete microphones and dumping them into other countries. The microphones we accept as trade-ins from our dealers and their customers are mostly AKG C-414, Neumann U47, Neumann U67, Neumann U87, Beyer MC-740 and similar products. With hundreds of these models still in regular use throughout Canada and the USA, they can hardly be described as "obsolete."

Second, every used microphone we resell is completely reconditioned to original specs and sold with a three-month, money-back warranty. We have never received a microphone back from a dissatisfied customer.

Third, the reason we sell used microphones to countries outside Canada and the USA has nothing to do with the supply of parts. It is to protect our dealers' markets. They obviously do not want traded-in microphones sold back into their own market. Are these really unethical trading practices as Mr. Redikopp alleges? Mr. Redikopp was probably misled by a Microtech sales promotion letter of a few months ago, which was sent out unedited and unsigned and may have given a false impression of our policies.

Bernard E. Berry
Gotham Audio Canada
Downsview, Ontario

HOORAY FOR COMPLAINTS

As I read Stephen Anderson's article "Top Ten Complaints" (February 1994), I found myself saying, "Yes! Yes!" A high proportion of our technical support and sales are to end-users trying to make their audio *systems* work. Apparently, growing numbers of equipment manufacturers are either ignorant of analog interconnection issues (maybe engineering schools are so enamored with digital "gee-whiz" that they've forgotten about analog circuit design) or they simply choose to let their customers solve these problems. It seems ironic that this is happening at a time when both consumer performance expectations and the dynamic range capabilities of digital equipment are rising.

Equipment with unbalanced or "single-ended" inputs may work acceptably well in a *very* small system but doesn't deserve to be called even *semi*professional. A high-performance, transformer-balanced input can accept signals from either balanced or unbalanced outputs and achieve very high rejection of common-mode hum and buzz as well as RFI/EMI from broadcast signals or local computer equipment. Widely used "electronically balanced" inputs *rarely* achieve advertised common-mode rejection in the real world and often make great AM radio receivers, but they are cheap and generally better than an unbalanced input.

I wholeheartedly endorse all of Mr. Anderson's complaints, but I find poorly designed interfaces and their over-promotion particularly irritating. I have been a panelist in a number of AES workshops on grounding and shielding and also presented a paper at the November '94 AES convention on the subject of balanced lines in audio systems. I will gladly send a copy of the preprint to any interested reader.

Bill Whitlock
Jensen Transformers
Van Nuys, CA

PIN 2, PLEASE!

I am an independent audio tech in the New York City area, and this morning one of my clients phoned to relate a problem regarding a rental. It seems that the ½-inch, 2-track machine he rented for a mixdown was pin 2 hot, while the mixdown decks installed in his control room were manufactured (and wired) with pin 3 hot. So after the rental arrived, he had to mentally shift gears from "mixdown" mode to "now I'll have to make some cables" mode. Definitely a waste of time and no fun at all.

Several hours later, the February '95 issue of *Mix* arrived in my mailbox with Stephen Anderson's "Top Ten Technical Complaints." Mr. Anderson hit the nail on the head when it comes to the things that aggravate techs most. But I'll go out on a limb and say not only is the pin 2/pin 3 hot issue annoying, *it is an insult.* Manufacturers take note: Techs are tired of this nonsense. Design gear with pin 2 hot. There is no excuse for doing it any other way.

Steve La Cerra
Brooklyn, NY

TO SHELLY, MY MENTOR

I smiled through your profile on Shelly Yakus ("Lunching with Bonzai," February '95). Not only are Shelly's ears golden but so is his heart! As a staff engineer at A&M, I benefited from Shelly's engineering "forums" but even more so from his understanding of human nature. Shelly is part of a vanishing and important breed; he is a natural mentor, someone who's brought *generations* of engineers up through the ranks.

The studio and music business community needs more people with the dedication, intelligence and good humor of Shelly Yakus.

Mark McKenna
Bearsville Studios
Bearsville, NY

Send Feedback to Blair Jackson at Mix, *6400 Hollis St. #12, Emeryville, CA 94608; fax (510) 653-5142; or 74673.3672 @ Compuserve.com*

REASONS TO CHOOSE THE MACKIE 8•BUS–PT 2

Lately, several big pro audio companies have gone out of their way to "mention" us in their own 8-bus console ads. Okay, we'll admit it, several consoles have at least one more thingamajig, dooflanger or whozamabob than ours does.

If your sole criteria for buying an 8-bus console is the sheer amount of STUFF on it, there's always gonna be contenders.

But the Mackie 8•Bus console is founded on sound *quality* — ultra low noise, high headroom, premium mic preamps — rather than sheer quantity of knobs and buttons.

Not surprisingly, seasoned professionals share the same priorities. In competition with several of the very consoles that keep "mentioning" us in their ads, we recently won *MIX* magazine's highly coveted TEC Award for Small Consoles. As well as *LIVE! Sound* magazine's Best Front of House Mixer Award.

Call us toll-free for our 24-page 8•Bus brochure. It details more of the reasons that our 8•Bus Console Series is the best recording or PA console values available today for under $20,000.

C An expandable console system.

If you can successfully foretell the future, you might as well play the stock market, make a zillion bucks and buy a 128-channel SSL console.

However, because most of us are less clairvoyant and a lot poorer, we've designed a system that can grow with your needs and budget. Start with our 24•8 or 32•8 console[1]. Then, when your tax refund comes back, add an optional meter bridge[2]. When you land that Really Big Project That Pays Actual Money, add more input channels (and tape returns) in groups of twenty-four with our 24•E Expander console[3].

You can keep right on growing your Mackie 8•Bus console system up to 128 channels or more.

And, beginning this spring, you can automate the whole shebang with our OTTO-34/ Ultramix™ Pro/OTTOpilot Universal

MIDI Automation system. It's receiving rave reviews from seasoned pros who are used to working with "big console" automation systems.

1 $3,995 (24•8) and $4,995 (32•8) suggested retail. Slightly higher in Canada.
2 $795 (MB•24) and $895 (MB•32) suggested retail. Definitely higher in Canada.
3 $2,995 suggested retail. MB•E meter bridge $695 suggested retail. Positively higher in Canada.

D +4dBu operation throughout.

This is a biggie in terms of overall noise and headroom. There are two current standards for console operating levels: –10dBV and +4dBu. Without knocking our competition, let's just say that +4dBu is the only truly professional standard, used with all serious recording, SR and video production components.

This higher operating level effectively lowers the noise floor and increases dynamic range.

Naturally, our 8•Bus consoles operate exclusively at internal levels of +4dBu. (It's one of the many reasons that Mackie 24•8s and 32•8s have already been used to track top-charted albums such as Queensryche's new *Promised Land*, edit dialog for TV shows like *The Untouchables*[4]).

And, for those of you who still own –10dBV gear, our 8•Bus console tape outputs and returns can be switched to accept this semi-pro/hobbyist standard.

4 Mention in this ad denotes usage only, not official endorsement by the artists or production companies listed.

E Built like tanks.

Our 8•Bus Series consoles have been in the field long enough to gain an almost legendary reputation for durability. For example, several absorbed the impact of toppling monitor speakers during last year's Los Angeles earthquake with little more than a few broken knobs.

Others have survived drops off loading docks, power surges that wiped out whole racks of outboard gear, and beer baths, not to mention gazillions of air and semi trailer miles with major tours.

Read our 8•Bus tabloid/ brochure to learn about the impact-absorbing knob/stand-off design, fiberglass circuit boards and steel monocoque chassis that make our consoles so rugged. And why we ship our consoles with a massive 220-watt power supply that can withstand high ambient temperatures and low line voltages.

Bottom line: You simply can't buy a more dependable console. Maybe that's why *LIVE! Sound* magazine readers voted us 1994 "Best Front of House Console."

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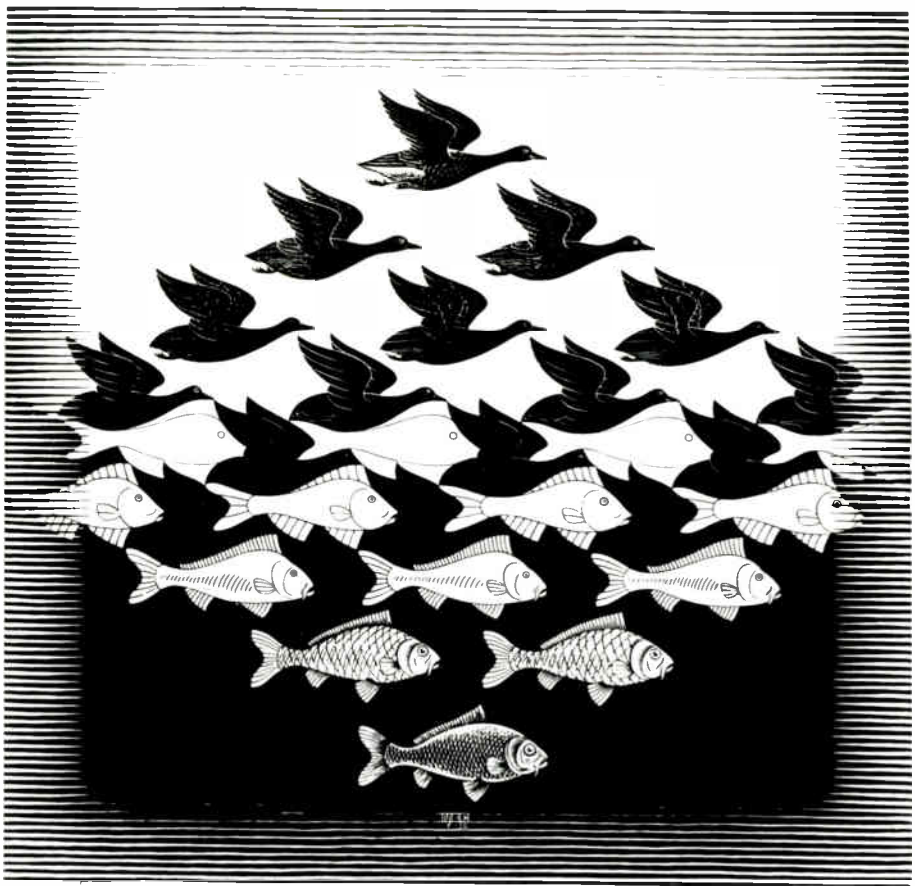
If you think only your eyes can play tricks on you...



Study the illustration. Are the geese becoming fish, the fish becoming geese, or perhaps both? Seasoned recording engineers will agree that your eyes *and* your ears can play tricks on you. In the studio, sometimes what you think you hear isn't there. Other times, things you don't hear at all end up on tape. And the longer you spend listening, the more likely these aural illusions will occur.

The most critical listening devices in your studio are your own ears. They evaluate the sounds that are the basis of your work, your art. If your ears are deceived, your work may fall short of its full potential. You must hear everything, and often must listen for hours on end. If your studio monitors alter sound, even slightly, you won't get an accurate representation of your work and the potential for listener fatigue is greatly increased.

This is exactly why our engineers strive to produce studio monitors that deliver sound with unfailing accuracy. And, why they create components designed to work in perfect harmony with each other. In the laboratory, they work with quantifiable parameters that do have a definite impact on what you may or may not hear. *Distortion*, which effects clarity, articulation, imaging and, most importantly, listener fatigue. *Frequency Response*, which measures a loudspeaker's ability to uniformly reproduce sound. *Power Handling*, the ability of a loudspeaker system to handle the wide dynamic range typical of the digital domain. And, finally, *Dispersion*, which determines how the system's energy balance changes as your listening position moves off axis.

Models pictured (L-R)
3-Way 10" 4410A, 2-Way 8" 4408A and 3-Way 12" 4412A

The original 4400 Series monitors have played a major role in recording and broadcast studios for years. Today, 4400 Series "A" models rely on low frequency transducers with Symmetrical Field Geometry (SFG™) magnet structures and large diameter edgewound ribbon voice coils. They incorporate new titanium dome tweeters, oriented to create "Left" and "Right" mirror-imaged pairs. Refined crossover networks use conjugate circuit topology and tight tolerance components to give 4400A Series monitors absolutely smooth transition between transducers for perfect imaging and unparalleled power response.

If you're looking for a new pair of studio monitors, look into the 4400A Series. We think you'll find them to be a sight for sore ears.

JBL

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