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DIGITAL RECORDING

- *Making the Analog/Digital Choice*
- *ADAT Modifications*
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MIX

PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

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DEPARTMENTS

Cover: East Side Audio and Video, a six-room facility specializing in audio post, has New York's first SSL Omni-Mix system with VisionTrack. Pictured is the recently refurbished Studio D, which was designed by East Side's own Jim Sorensen, with acoustical design by Bill Morrison. Studio D is wired for surround sound and features UREI 813 main monitors, Westlake BBSM6 alternate mains and video monitoring from Sony. **Photo:** Julian Jaime. **Inset Photo:** Steve Jennings.

FROM THE EDITOR

What If...Digital Had Come First?

Hindsight is 20/20. We all know how audio history has played out since the early days of digital. Admittedly, it was a rough start, especially in terms of low-bit resolution designs, crude converter technology and the (then) high cost of memory/processing power. But what if digital manipulation and recording had been the mature, century-old process, and we were now faced with a new technology known as analog? Here are a few user comments overheard at the "Analog World" exhibits during a recent trade show in that alternate universe...

Analog Recorder Booth: "Sure, that upper frequency response is nice, but it won't matter on a CD anyway. Now, what about analog's wow and flutter, or nonlinear LF response due to head bump. It's impossible to clone tracks. And that tape hiss..."

2-Track Editing Workshop: "Let me see...You take the original master tape, chop it up with razor blades and use *adhesive tape* to put it back together?"

Synchronizer Booth: "These two analog decks can lock up to frame accuracy. Frame accuracy? That's 33 milliseconds...Don't you realize what that will do to phase?"

Plate Reverb Booth: "You're simulating reverb by shaking a seven-foot metal sheet with a couple of contact mics mounted on it? How do I tweak parameters or store different spatial programs?"

Copper Wire Booth: "You expect me to replace my 20-pound, 500-foot, 400-channel fiber-optic snake with eight 56-channel copper cables that weigh 1,500 pounds each? You gotta be kidding..."

Vinyl Record Demo: "The sound is reproduced by a vibrating needle in a groove, and the media is subject to scratches! The record companies are going to love this: Users replacing entire collections every couple of years!"

Technical Papers Section: "Just how are we supposed to make music *without* CD-ROM drum loops, sampled vocal performances, cut-and-paste assembly editing, quantized tempo correction, virtual tracking and pre-packaged sequences? Analog? Forget it!"

I woke up, realizing that it was just a dream. Clearly, the examples quoted above are exaggerated views, but the reality is that when a new technology appears, we're often too involved in attacking its flaws rather than examining its virtues. And whether you're recording to ½-inch analog 2-track or directly to a 20-bit system, it's apparent that there's room for both analog and digital technology in this industry.

This month, in our annual salute to The Digital Studio, James D'Angelo examines the basics of buying a workstation, Gary Woods conducts listening tests of ADAT mods, Mel Lambert chats with digital pioneer Andy Moorer, and Rick Clark talks to top producers and engineers about making the analog/digital choice. Digital keeps getting better, but it's comforting to know that analog remains a viable option.

I like that.

George Pe

George Petersen
Editor

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24

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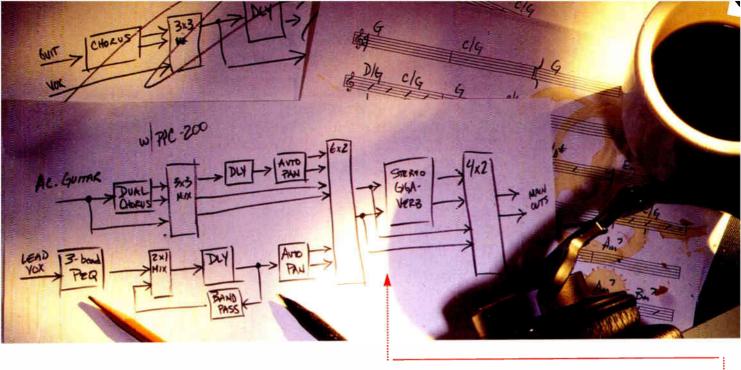
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CURRENT

TEC AWARDS TO HONOR SPECTOR, PARSONS

Phil Spector will be inducted into the TEC Hall of Fame, and Alan Parsons will be given the Les Paul Award at the Eleventh Annual Technical Excellence & Creativity Awards, to be held at the New York Marriott Marquis on Friday, October 6.

The TEC Hall of Fame recognizes those individuals whose careers have best exemplified the spirit of creative and technical excellence in professional audio. This year, the TEC nominating panel voted to honor Spector, architect of the Wall of Sound. Spector has worked with many top artists of the rock 'n' roll era, ranging from The Crystals, The Ronettes and the Righteous Brothers to John Lennon and George Harrison.

The Les Paul Award was created in 1991 to honor those individuals or institutions that have set the highest standards in the creative application of technology. The board of the Mix Foundation for Excellence in Audio and the editors of *Mix* chose to recognize Grammy-winning engineer, producer and musician Parsons, who has worked as an engineer and producer on such classics as The Beatles' *Abbey Road* and Pink Floyd's *Dark Side of the Moon*. Since 1976, he has also been the leader of progressive art-rock band the Alan Parsons Project.

For a list of the 1995 TEC Awards nominees, please see page 38. For tickets or for more information about the TEC Awards, call Karen Dunn, executive director, at (510) 939-6149.

AMPEX MEDIA SALE PENDING

Redwood City, Calif.-based Ampex Corporation signed a letter of intent to sell Ampex Media Corp. (manufacturers of Ampex recording media) and its subsidiaries to a group of international financial institutions that are AMC's existing creditors.

Once the deal is closed, AMC will be renamed, but the change should prove transparent to consumers: The new company will retain the same management and will continue to manufacture and distribute the Ampex line of tapes and other media through its current subsidiaries in the U.S. and elsewhere.

KORG USA CREATES MULTIMEDIA DIVISION

Korg USA, headquartered in Westbury, N.Y., has formed a new division, Korg Media Technologies. The Silicon Valley-based KMT was created to address the sound-source needs of the computer and consumer OEM markets. Korg USA president Michael Kovins said that creating quality sounds has been integral to Korg's success in pro PCM workstations. "For the first time, we are able to offer this sound-generation technology directly to OEMs for inclusion in the computer, karaoke, consumer electronics and the expanding multimedia markets," Kovins said. KMT is now the exclusive distributor of Korg sound chips.

Dave Smith, the founder of MIDI-pioneer company Sequential Circuits, was named president of KMT. "According to Dataquest," Smith said, "3.2 million sound boards were sold in the USA last year; in 1994, it is projected to be 6 million. With figures like these, this is an opportune time for Korg to enter this very lucrative market."

REV GETS FUNDING, CD-PLUS ON THE RISE

New York City-based interactive entertainment company REV Entertainment secured $1.3 million in first-stage financing from investment company Effex America Inc. for the development and production of numerous CD-Plus titles for Warner Bros., Elektra and Atlantic.

REV is a pioneer in the development of the CD-Plus format, which seems to be emerging as an industry standard. The format features traditional audio combined on one disc with multimedia content (such as video liner notes, music videos, lyrics, artist biographies and photos). The discs can play like standard audio CDs in a CD player and can also run on Windows-based or Macintosh computers equipped with a CD-ROM drive, for access to the multimedia content.

TIMELINE FORMS NEW DIVISION, SUPPORTS SGI PLATFORM

TimeLine Vista Inc. (Vista, Calif.) formed a separate business unit, TimeLine Mediasound Division, to serve the expanding Silicon Graphics-based digital audio marketplace. The new division, directed by Kris Jackson, will focus on developing and marketing Mediasound product for the SGI platform.

Mediasound is the first pro digital audio recording and editing software package specifically designed for SGI workstations. The SGI platform is known for its powerful effects and animation capabilities, and by adding pro audio functionality, Mediasound hopes to make the platform into a complete production environment.

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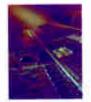
You've been using digital tape for years. Now digital mastering makes your final CD sound even better. But often it doesn't sound like your studio mix — the one you love, the one the artist approved.

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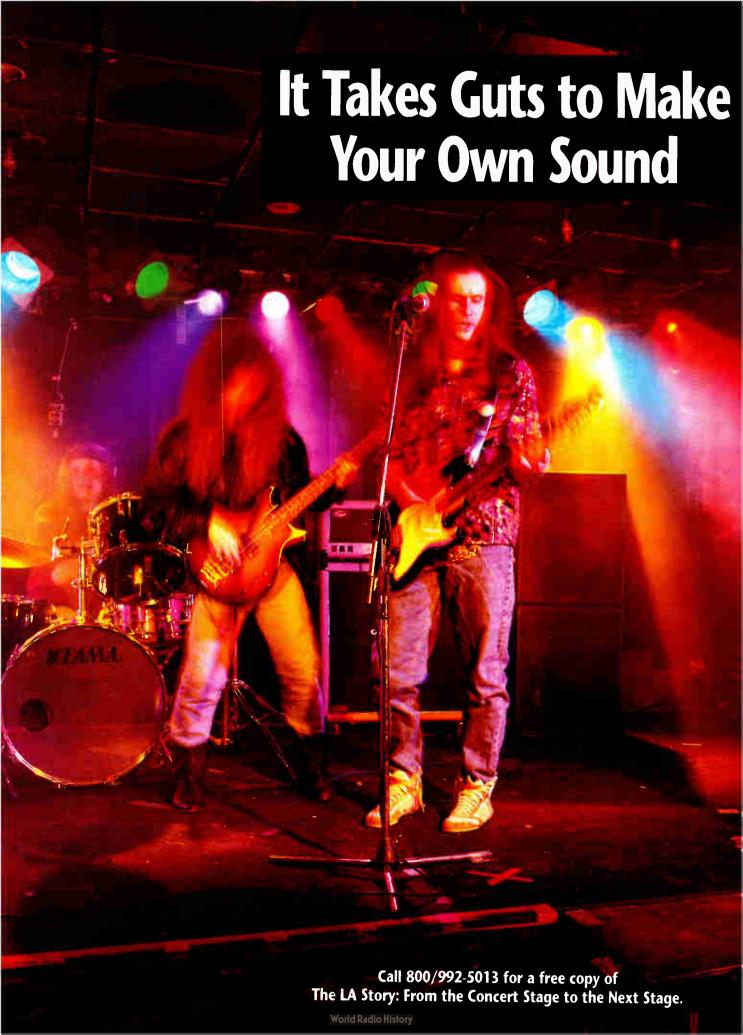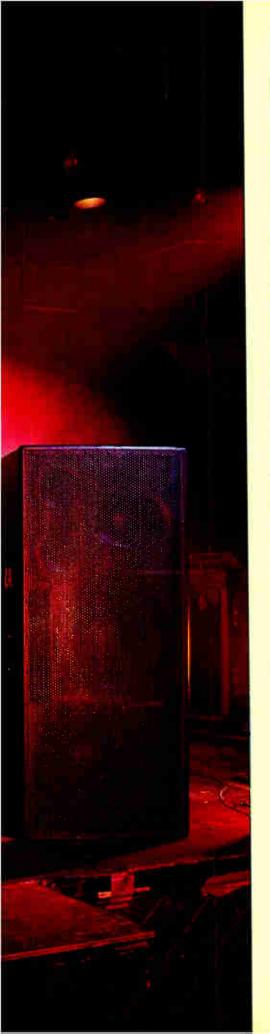
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World Radio History

INDUSTRY NOTES

TimeLine Vista Inc. (Vista, CA) appointed David B. Hartley as vice president of sales...**Ampex Media Corp.** (Redwood City, CA) promoted Fred C. Layn to marketing manager, Audio Tape Products, and Frank Foster to marketing manager, Videotape Products...Northridge, CA-based **JBL Professional** appointed Shannon T. Celia as public relations manager...**Constance E. English** joined the management team at **Neotek Corp.** (Chicago) as director of sales and marketing...**Jim Pace**, co-owner of Audio Intervisual Design, was appointed to the board of directors of **Spatializer Audio Laboratories Inc.** (Los Angeles)...**Steinberg/Jones** changed its name to **Steinberg North America** and moved to new, larger facilities at 9312 Deering Ave., Chatsworth, CA 91311. Phone and fax remain the same...**Brad Carr** was appointed as the new Western regional sales manager for **Ramsa Panasonic**'s (Cypress, CA) pro audio division...**Burlington Audio/Video Tapes Inc.** (Oceanside, NY) changed its name to **Burlington A/V Recording Media** to better reflect the services and products it offers. Address and phone remain the same...New York dealer **Dale Electronics** is expanding its sales and showroom facilities and recently added industry veterans Bill Dexter and Joe Prout to its pro audio sales staff...**Sascom Marketing Group** (Pickering, ON) added **Arnie Toshner** to its marketing team...**Symetrix Inc.** (Lynnwood, WA) appointed World Marketing Associates as its new representative for Europe and the Middle East. The company also named Dutch distributor **Iemke Roos Audio** as its international distributor of the year ...Farmingdale, NY-based **beyerdynamic** appointed **The Music People! Inc.** as its new U.S. distributor... **Meyer Sound** (Berkeley, CA) can now be reached via the Internet. The two self-explanatory addresses are techsupport@meyersound.com and service@meyersound.com... **Mark L. Fitch** joined **Renkus-Heinz**

(Irvine, CA) as national sales manager...Mukilteo, WA-based **Rane Corporation** appointed Jerry Spriggs to the newly created position of commercial products marketing manager...**Pinnacle Micro Inc.** (Irvine, CA) signed a national retail agreement with computer superstore Comp-USA, where the company's optical storage products are now available ...**Tektronix** (Beaverton, OR) appointed Kevin Dauphinee as product marketing director. He is in charge of new product development and strategic planning for the Profile Pro Disk Recorder line... **LightSpeed Technologies Inc.** (Lake Oswego, OR) appointed Paul Baughman as national sales manager for wireless microphone systems and products...**Julie Nathanson** was appointed vice president, entertainment, at **Rogers & Cowan Inc**... Sunnyvale, CA-based **Pinnacle Systems** hired Kevin B. McDonald as vice president of marketing. The company also formed a new, wholly owned subsidiary, Pinnacle Systems Ltd., based in the UK, to provide sales, marketing and customer service to Europe, Africa and the Middle East. Brian Conner was named general manager of the UK subsidiary...**Kordex Inc.** (Floral Park, NY) formed an alliance with a group of five Italian manufacturers of audio cable and connectors and will be distributing their products in the U.S. and Latin America under the brand name of **Audible Purity Cable** ...**Hi-Tech Audio Systems Inc.** (South San Francisco, CA) was recently reorganized: Louis Adamo, formerly vice president, is the company's new president; Spencer Jackson was promoted to vice president and remains rental department manager; Ralph Tolson is the new vice president and chief financial officer... **Showscan Entertainment** selected **Westrex** to design and manufacture its next generation of special venue electronic projectors...**Henninger Video** hired Jack Norman as vice president and general manager of its Arlington, VA, facility. ∎

TRACER TECHNOLOGIES BEGINS OPERATIONS

Three former Turtle Beach Systems sales and marketing executives have started Tracer Technologies, a Dallastown, Pa., firm designed to provide marketing services, sales representation and an international distribution network to companies without their own sales/marketing departments.

"Over the years, we've run across many small companies...two or three engineers with great products, excellent ideas, but without access to sales channels worldwide, and with limited marketing knowledge," said Denise Moyer, partner. "We formed Tracer to help give these products the same chance on a retail shelf and in the public's eye that any large company's products have."

CONFERENCE NEWS

REPLItech International is slated for June 13-15 at the Santa Clara Convention Center in Santa Clara, Calif. For more information, call (800) 800-5474.

The United Kingdom's Association of Professional Recording Services will hold its Audio Technology '95/The APRS Show on June 21-23 at the National Hall at Olympia in London. Featuring a new name and location, the show also boasts many new companies exhibiting this year. A Briefings and Workshops program rounds out the event. For registration information, call 011-44-0-1734-312211.

The Summer NAMM show in Nashville (July 14-16) will be bigger than ever this year. After the success of last year's event, exhibitor interest has been so high this year that the event is threatening to outgrow the Nashville Convention Center. NAMM is working with exhibitors to limit the amount of booth space in order to accommodate everyone. Fortunately, the city of Nashville is building an additional space that will be available for future shows. Call (619) 438-8001 for information. ∎

by **Stephen St.Croix**

"Elsie, Dee Projector Ees Here..."

"Okay, Ricky, I'll sign for it." "Tanks, huhney." Doorbell rings again. "Oh, Elsie, can you get dee door again? I am workin' on a new conga solo." "Okay, Ricky...Oh, Riiicky; it's *another* projector!" "What? Oh, NO!" "I didn't order it, Ricky, honest. Waaah!"

Has this ever happened to you? Okay, okay. Has it ever happened to you without the politically incorrect but still acceptable (because it refers to a television classic) stereotype dialect? Well, it happened to me, and I don't even speak Spanish. And all because I had a movie to score, and I didn't want to do it on a wimpy little 35-inch tube. I didn't think that I would get that big-screen feel if I did it on a little glass monitor. I also didn't want months more of all that killer ELF right in my face. I didn't want the induced flyback hum in channels 30 to 40. I didn't want the soundfield disrupted anymore...What I *did* want was a new and better way. I wanted, well, I wanted a new toy.

I wanted a *screen*! I wanted it to drop down from the ceiling when I was using it and to be gone when I wasn't. I wanted all my floor space available for walking, and all of my rack, table and console surfaces to remain unsacrificed. I wanted video projected on that screen, but I didn't want heat, noise, huge boxes in the middle of the control room, convergence problems or 1.85:1 phosphor burn in ghosts when I was using other aspect ratios. I didn't want to be locked into some manufacturer's idea of exactly how far from the screen the projector had to be, what angle, what image size, what...oh, you know; I want what I always want: all the cool, good stuff, with none of the stupid garbage that usually comes with it. Guess what? I found it, and now Fred and Ethyl come over a couple of times a week just to watch

Oh
Ricky!
Waaah!

videodiscs.

And then there is the fact that many of you have asked if I knew of a good, economical way to get a picture on a screen for film and post work in smaller facilities, and I have always wondered if there were a better way than the 150 pounds of Sony glass over your console bridge or 115 pounds of three-lens phosphor sitting right where you want to be. So, over the past several years, I have kept checking LCD projection systems and have walked away disappointed...until now.

HOW IT WAS IN THE GOOD OLD DAYS
Phosphor. Mirrors. Compound combination glass and plastic liquid-cooled lens assemblies, mirrors. *Convergence*! Ten hours of it on initial setup! These are some of my least favorite things. So least, in fact, that they have kept front-projection television out of my place since it first claimed to have arrived. And those rear-projection boxes? They stayed out because—aw, come on—because they deserve to stay out. Who ever

thought of selling people that? The only thing they are good for is watching football and causing divorces.

LCDs? Dim, slow, silly, unrealistic colors, huge visible pixels. If that's what you saw the last time that you looked for a projection system for your studio, you must have gone with me. But technology has marched ever on, and I thought it might be time to look at and into them again. So this time, I decided they must meet the following criteria to be considered: They have to be 10,000 bucks or less, and they have to work. When I say work, I don't mean sort-of-working so that you can say the technology has arrived but you would not really want to own one. I mean work as in really realistic as a video viewing system. I checked around and, as of this writing, there seemed to be two main games in town that fit my (albeit arbitrary) parameters: Sharp and Vidikron. Well, actually, neither one of these companies is in town, and neither one of them was particularly fast in its response to my inquiries. I tried getting through to one, and after some effort, gave up and tried the other. Try two said that

they would get me one when they could, so I sat back to practice my newest skill, patience. While waiting for company two to ship, a surprise package showed from company one. Ten days after I opened that, company two shipped. So, without planning it, my interest in trying out one of the new generations of LCD projectors turned into a real live shoot-out between the Sharp 850 and the Vidikron Crystal One. These two machines couldn't be any more different; what one was, the other wasn't. What I liked in one was not-so-good to terrible, or even totally nonexistent, in the other. Really, if one had a feature or performance highlight, the other might not have it at all. I went crazy. I spent weeks comparing these units and learning amazing stuff. It was a *very* educational time.

So, I am going to do something that I never had any intention of doing, and that I have never done before: directly compare two competitive pieces of gear. And just to make it interesting, I will compare two machines that are different enough that they really should not be compared. Both machines are excellent, in fact

stunning, yet I will no doubt piss off both companies by what my comparisons reveal. Okay, so that part is pretty normal for me. Here we go.

First of all, let me tell you why these things are so attractive. They actually work now, will not burn like phosphor systems, have no convergence procedure, can instantly zoom and focus to almost any size, and set up in ten minutes, not ten hours. You can hang them anywhere you want in the control room and zoom their single lenses to your heart's desire. I mean really. You can choose the placement by deciding where they cause you the least physical inconvenience, then hang the screen wherever you want it, and just zoom, focus and you are done. As most of you know, the three-lens phosphor systems require you to measure the precise distance from the front lens element to the screen, and that distance is a hard ratio of the screen size. If you happen to have something else where you are required to mount the projector, or if you just don't like the idea of the thing hanging directly over your head while you work, too bad. The phosphor

systems generally require a very short distance to the screen: It is likely that you would be looking at the rear of

I wanted a *screen*! I wanted it to drop down from the ceiling when I was using it and to be gone when I wasn't. I wanted all my floor space available for walking, and all of my rack, table and console surfaces to remain unsacrificed.

it while mixing. The LCD machines can be quite far from the screen, well behind you, out of the way (in fact,

the Vidikron requires almost twice the distance as the Sharp, but the Sharp does offer a similar long lens as an option). LCD projectors are not affected by magnetic fields leaking from power amps, subwoofers or small nuclear devices, although the same magnetic field can make the phosphor systems instantly transform any image into a backdrop for a '69 Jefferson Airplane concert at the Fillmore.

Other similarities between the Sharp 850 and the Vidikron Crystal One follow. Both use very, very clever (and simple) tricks to eliminate the first thing that you would be skeptical about: visible scan lines. They ain't no Faroudjas, but they are amazing. You don't see any scan lines, even with image sizes that only little kids (and I) would want: really big. Considering that line doublers cost up to $25k, this free-cheating approach is quite a nice surprise. Just to keep the picture confused, Vidikron does in fact also offer six phosphor projectors, along with three real digital line doublers that cost as little as $8.5k. In fact, Vidikron has the most impressive selection of projec-

by Mel Lambert

DIGITAL PIONEER ANDY MOORER

SCIENTIST, TECHNOLOGIST, COMPOSER AND SENIOR VP OF R&D AT SONIC SOLUTIONS

We all need our heroes. That those in our industry tend to look more like Clark Kent than Superman might result from audio engineers and technologists spending time in the library and not the gym. But there's no escaping the fact that, in the world of digital audio, James Anderson Moorer, Ph.D, comes closer to a caped crusader than just about anyone. With degrees from MIT and Stanford

Leader of R&D at Lucasfilm, where he designed and led the SoundDroid project. For the past eight years, he's been with Sonic Solutions—a company he co-founded—where he currently holds the post of senior VP of R&D. In addition to designing the original DSP platform and most of the software for the firm's Sonic System workstation, he developed the advanced DSP algorithms implement-

University, during the past 20 years Moorer has demonstrated a unique combination of both theoretical and practical expertise.

From his early days as co-director and co-founder of Stanford's Center for Computer Research in Music and Acoustics (CCRMA) and scientific adviser to IRCAM in Paris, Moorer went on to serve as Digital Audio Project

ed within NoNoise. He has published extensively in a wide variety of academic and conference proceedings. He also composed the "THX Logo Theme," which precedes each feature film shown in the hundreds of THX-certified theaters around the world.

With such a background, Moorer is ideally suited to reflect on the important pro audio landmarks of the

past decade and to put a shine on the *Mix* crystal ball.

Mix: Cast your mind back ten years. What technology choices were available back then, compared to today?
Andy Moorer: If you don't mind, I'll start 20 years ago. Twenty years ago there were two key problems. One was the lack of economical conversion. What converters did exist were for instrumentation; there's a world of difference between a device that delivers audio and one that delivers a certain voltage. We built what we considered to be a state-of-the-art, 14-bit A-to-D and 16-bit D-to-A system at Stanford back in the early '70s, running at a 25kHz sampling rate. Which leads me to the next problem: the spectacular amounts of data involved with digital audio at any reasonable precision.

Back then, the computers were limited. At Stanford we were using the [Digital Equipment Corp.] PDP-10, which was about the size of a van and had roughly the same horsepower as my PowerBook. If you

now move ahead to ten years ago, most of those problems had been dealt with. High-quality audio converters were still not economical—back then, a set of converters from

Multimedia is driving the computer industry to produce more and more powerful computers. Because who needs a Pentium to do word processing?

Digital Sound Corporation cost about $25,000—but at least they were commercially available. You could connect them to a large computer and actually process audio.

It was interesting because what

we had set up might be considered as a studio environment. We had mixers, editors, filtering, special effects—pitch shift—and backward play. It was all offline—you did your mix by typing in numbers of dB on which channel at what time.
Mix: How long would it take to perform those calculations?
Moorer: Gosh, anywhere from ten-times to thousands of times real time. There was a piece I did that was two-and-a-half minutes long, called "Lions Are Growing." It took something like ten hours of computer time to handle the final mix and reverberation. Needless to say, you couldn't afford to make very many mistakes; it had to be extremely well planned out. There was no room for feel or improvisation in the process.
Mix: When did you start moving toward developing equipment for recording and production, rather than electronic music?
Moorer: Probably in 1975, when at Stanford we developed a prototype digital station [that] recorded up to five tracks of digital audio, again at a low sampling rate. It wasn't until my work

ANALOG & DIGITAL

BY RICK CLARK

The debate over the virtues of analog and digital have been long and furious. *Mix* decided to talk to a handful of top producer/engineers about their experiences with mixing up the two formats during tracking. Among the questions we posed: If you have equal access to both analog and digital multitracks at a session, how would you go about using the strengths of each in the recording process? Would you prefer cutting electric guitars analog or using digital for synths? Would you even bother with mixing it up at all? What resulted was an interesting dialog that covered a range of opinions. And as expected, the questions provoked strong feelings that increasingly focused on the virtues of one format over the other.

JAY GRAYDON

Producer, engineer, guitarist and songwriter are all titles that apply to Jay Graydon. Between the late '60s and the late '70s, Graydon played on practically every "A" list session in Los Angeles, including with artists like Barbra Streisand, Dolly Parton, Steely Dan and a load of classic Motown releases. As a songwriter, Graydon has won two Grammys for R&B Song of the Year for Earth, Wind & Fire's "After the Love Is Gone" (co-written with David Foster and Bill Champlin) and George Benson's "Turn Your Love Around," which he co-wrote with Steve Lukather and Bill Champlin. Besides winning those two Grammys, Graydon has been nominated 12 times in various categories.

Graydon's production credits include Al Jarreau, Manhattan Transfer, George Benson, El DeBarge, Kenny Rogers, Sheena Easton, Art Garfunkel, Patti LaBelle and many others. As an artist, Graydon has achieved considerable success, primarily outside the States, with albums like Planet 3, Airplay for the Planet *and* Airplay, *a collaborative effort with David Foster.*

A lot of times, engineers choose to cut tracks—live drums, etc.—in the analog domain and then immediately bounce to digital. Engineers do this to retain the top end, which dissipates in time in the analog domain, and to get the tape compression that analog offers, but in the digital domain. Another good reason is to have a back-up of an analog master. Even if an engineer doesn't like the digital format, he can't deny the fact that a digital back-up is way better than an analog back-up. This is reason enough to have both formats at hand.

For rock 'n' roll, I like analog, particularly for guitars and drums. If you want the guitars

to sound thick, they are going to sound thicker and bigger with analog; it's the nature of the medium. It is going to sound grainier in digital-land. It's not that you can't get it to sound good in digital; it's just more "organic"-sounding on analog. When I'm doing vocals, if I have a choice, I prefer to stay in the digital domain. I usually bounce—or combine—lead vocals, and analog bouncing adds more noise than digital bouncing.

Synthesizers and drum machines like digital. Most samplers like digital, but it depends on what the sample is. A real harsh sample is more friendly to analog. Thick synthesizer pads can take up too much room in a track, and this is where digital becomes friendly, since analog tends to thicken things more.

Real drums—other than hard rock—can go either way, format-wise. If you're doing rock 'n' roll, analog with tape compression seems to give it that nice bigness. Recording drums on digital is better for definition and seems to take up less space in the final mix. Brass and saxes are more analog-friendly. I've recorded most instruments and vocals in both

"THE BOTTOM LINE IS ANALOG AND DIGITAL ARE BOTH GOOD MEDIUMS, AND ARE BOTH VERY USEFUL." —JAY GRAYDON

domains, and the bottom line is, a good engineer can make anything work in either domain.
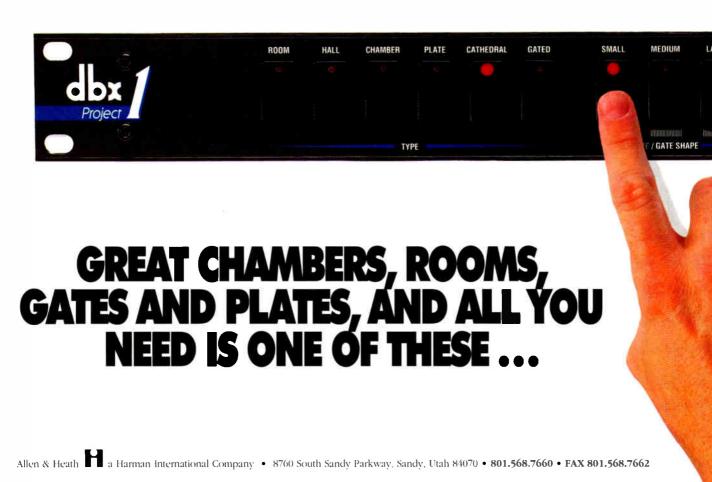
I will over-EQ the top end on analog. When I'm cutting analog, I always add a little bit more at 12 kHz or so, because in the long run, the first thing that changes in analog is the top end. Running analog tape across the heads, in time, is going to suck a little of that top end off, and you've just got to get used to that fact.

When you EQ going to digital, remember that it's not like going to analog. Once you record EQ the first time on digital, it's going to sound that way as long as the tape holds up.

As far as locking up or slaving tape machines, dig this: SMPTE lock-up is an archaic medium that was probably designed around the same

time that electricity was. [Laughs] When you are locking up two analog machines, the chasing machine is just swimming all over the place. Try this experiment with two locked-up analog machines: Simultaneously record a 1k tone—or whatever—on track "X" of both machines. Play back both tracks and throw one of them "out-of-phase." You'll hear flanging that is all over the place. One way to help this problem is to have only one song on a reel of tape. This helps the motor tensions respond quicker. SMPTE design is not the main problem. It is the physics and time slop of the tape travel and swimming voltages to the motors.

I was a beta tester for the Alesis ADATs, and that's the digital recorder I mainly use. I use six to eight ma-

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chines, and their internal lock-up is not SMPTE. They may take a little time to get locked, but when they do, it's flawless.

Microphone selection for digital and analog may be different. A mic that sounds good on your favorite singer or whatever in analog-land, might be too sizzley in digital-land. Just play around with different mics to see what works for you. With digital, in general, the top end is going to be a little "tizzy," so when I mix off the ADAT system, I always mix to half-inch analog—Ampex ATR half-inch, running 3M 996 tape—just to get a little more air in it. It takes everything and makes it a little bit more delicious and warm.

I'm sure I'll get some heat for this, but I don't like to mix to digital 2-tracks. The overall sound picture is not as wide and doesn't have the depth that half-inch analog has.

Whatever format I'm working with, I always listen through the machine, on input. I do this for a number of reasons. I'll eventually hear the playback from the machine, so I want to hear the wire/electronics of the machine now, so I can EQ more effi-

ciently. If there is an electronic problem with any of the input cards, or something like that, I'll hear it before I record to tape. If I'm in digital-land, I monitor through the A-to-D and D-to-A filters, so if the filters are bad, I'll hear it before I go to tape. Also, I want to EQ through the electronics and filters so the input signal going through the filters sounds exactly the same on playback.

The bottom line is analog and digital are both good mediums, and are both very useful. No matter which format you use to make records, Joe Public couldn't care less! You and I could record a great song on a mono tape machine, and if the record company promotes it, we might have a hit. Joe Public probably wouldn't even notice it was mono.
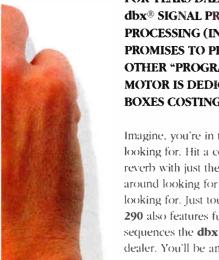
ED CHERNEY
Producer/engineer Ed Cherney's discography reads like a who's who of

legendary and critically aclaimed artists: Bob Dylan, Elton John, Bonnie Raitt, Bob Seger, Eric Clapton, Ry Cooder, Ringo Starr, Lyle Lovett, George Harrison, Jackson Browne and the B-52's are but a few of his lengthy credits. Most recently, Cherney won a Grammy for Album of the Year for Bonnie Raitt's Longing In Their Hearts. *Cherney has been involved in two other Grammy nominations, as well. His production work on Canadian Jann Arden's* Living Under the Sun *album resulted in a sweep of that country's Juno Awards this spring. Cherney recently co-produced and engineered Little Feat's latest effort,* Ain't Had Enough Fun, *and worked with the Rolling Stones in Japan.*

I have quite a bit of experience in recording in each and every way. But typically on rock or pop music, with acoustic drums, I like to cut analog. With the new tape formulations, I use 996, but [Ampex] 499 is good, too. At 30 ips, I'll hit the tape pretty hard and get good signal-to-noise. You can get fine articulation but still get the punch. If I had my choice, I would use 16-track. Typically, though, I am recording so many musicians that I

can fill 22 or 23 tracks recording, so I would probably prefer not to get into locking up machines while tracking, because that opens up a whole other slew of problems. They sort of have got it down, but it still is a pain. When you're tracking, you want to worry about getting the music down and not worry about whether your machines are locking up or not.

If money isn't a factor—because obviously when you run digital, you have to run a digital machine, and that is another $500 dollars a day that you spend—but if money is no object, 98 percent of the time, I would certainly do vocals on digital. Sony 48-track is so great, with the D-to-D stuff, that you are able to fly stuff like vocals and choruses around very conveniently and really make it seamless. Digital is great mostly for the comping capabilities. Synthesizers and drum machines work with digital, because they aren't analog anyway. You can come digital out of those things, if you need to. Editing on digital is really a treat, but there still is also quite a trade-off.

I was in Japan with the Rolling Stones, doing a live "unplugged" album. I found myself using Sony 3348 48-track digital. All those tracks and the space and convenience can't be beat, but comparing one format against the other, analog just stands up a little better to my ears. It is more musical.
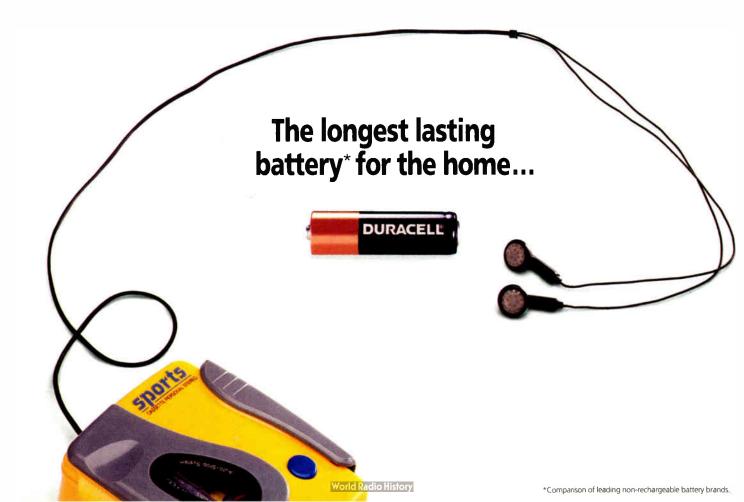
My objection to all of the digital machines that I have heard—all of them—and it's just the nature of them, are black magic things like clocking errors and sampling rates that are ridiculously too low. If I am doing a digital project, my ears can get shredded, and I can get fatigued after five or six hours. I'm talking about listening at moderate listening levels. The first couple of playbacks are astounding. It's like "Listen to that! It's incredible!" After sitting in front of the music for a while, my ears start to go to the "holes," in particular. That is all I start hearing, and I stop hearing the music. I can't work as long a day, or at the end of the day, I feel like

something bad has happened to me. I have spoken to other reputable engineers about that, and they say, "Yeah! I have the same thing happen." I think it's your brain doing something to try and rectify what's missing.

IAN CAPLE

British producer/engineer Ian Caple has worked with a wide range of artists, including Shriekback, Kate Bush, Simple Minds, King Swamp, Chapterhouse, Echo & The Bunnymen, The Fixx, Adam Ant, and more recently, Compulsion, Psyclone Rangers and Tindersticks.

Recently, I cut an album for the Sky Cries Mary at Robert Lang Studios in Seattle. We recorded the basic album at 15 ips with Dolby SR on a good-sounding, old API board, and then did the overdubs and mixed it at Apache Tracks in Phoenix, on a Neve Flying Faders board. We transferred the 15 ips, analog, Dolby SR tape to an Otari digital 32-track. That combination was really good. We had already filled up most of the 24-track with backing tracks and overdubs. By transferring to 32 tracks, we had all

"I DON'T THINK THERE ARE ANY SOUND ADVANTAGES TO DIGITAL. I THINK THE ADVANTAGES ARE FROM PUNCHING—THEY SEEM TO BE A LITTLE MORE FORGIVING." —DANIEL LANOIS

the extra tracks for vocals, plus the convenience of punching in and out easily. It was much nicer. We could do lots of takes of vocals and compile them digitally. We mixed the album from the digital multitrack to a Panasonic 3700 DAT. That's a good combination, and I was really pleased with it.

I had previously recorded an album for a band called the Elastic Purejoy straight onto a 32-track digital machine, and there was always a lack of bottom-end punch—no matter how hard I tried, it was just never there. Kick drum and bass were difficult to get right. I was eventually very pleased with the way it sounded, but it took a lot of work to get it there. Ninety-nine percent of the multitrack recording I do is analog. When you record the bass and the kick with 15 ips Dolby SR, it is perfect and instantly there. The bottom end comes back how you would like it to sound.
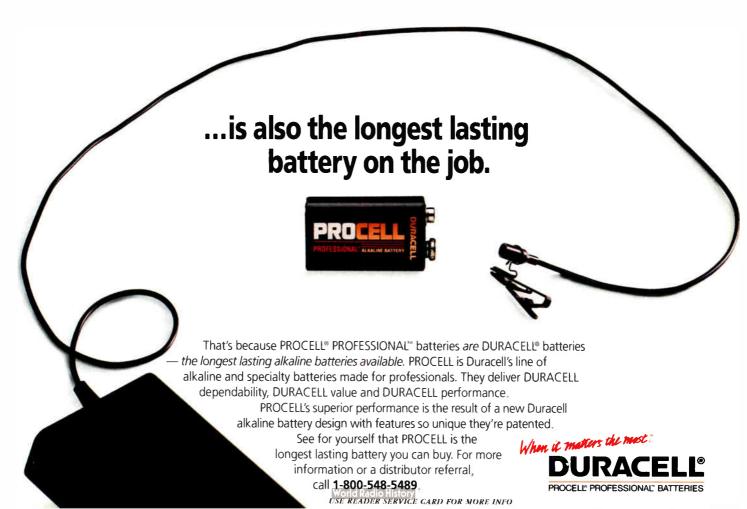
DANIEL LANOIS

Daniel Lanois is one of the most distinctive producer/engineers in the history of popular music. His richly ambient sonic treatments have been a distinctive touch on great albums by artists like Bob Dylan, Peter Gabriel, U2, the Neville Brothers, his own excellent solo work and, most recently, Emmylou Harris. Lanois' New Orleans recording studio, Kingsway, has also attracted many artists, including recent projects by the Tragically Hip and From Good Homes.

I generally use an analog multitrack machine, simply because I think they sound great, and they happen to be the tape recorders I have. Now and again, we do nice recordings on ADATs in smaller home settings. I have an ADAT that we've been carrying on the road for a while, just for convenience. I'm not a diehard analog recording person, but my favorite tape recorder is still my old Studer A-80 24-track. I just like the sound of it, and I've done some nice recordings on it. It doesn't punch as well as digital machines, but it has served me well.

I don't think there are any sound advantages to digital. I think the advantages are from punching—they seem to be a little more forgiving. You can make an error on level with digital, and it can be corrected, whereas if you were recording analog without noise reduction, and you

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recorded too quiet, you would get noise. That is an immediate advantage of digital.

We mixed up the formats during tracking on the last Peter Gabriel record that I did with him. We cut the tracks on analog and then we locked up the Mitsubishi 32 for a bunch of other things. It worked out: The digital was real good for vocals, because you don't lose a generation when you're doing comps.

I get better bass on analog. I suppose that when you saturate tape, you get a musical result. When you hit it hard, you get a "loudness" effect. You're really working with an organic form, whereas with digital, no matter how quiet or hard you hit it, you still get the same results. I think when you hit analog tape hard, the midrange collapses, therefore there is the impression of more top and bottom, so you get the "loudness" curve effect, which is a musical curve. That is why it exists on blasters and hi-fi systems. Press the "loudness" button and things sound more

exciting, and I think you get that from analog.

TONY VISCONTI

Tony Visconti is a native New Yorker who has been associated with some of the finest records and artists to come out of England. In 1967, Visconti traveled to work with British producer Denny Cordell—a six-month trip that somehow stretched to 23 years. Under Cordell (who died this past February), Tony arranged the orchestral parts for Procol Harum, The Move, Joe Cocker and Denny Laine. David Bowie and Marc Bolan of Tyrannosaurus Rex (later T-Rex) came into Visconti's life in 1968. Between 1969 and 1982, Visconti recorded ten albums with Bowie (including Young Americans, Heroes, The Man Who Sold the World *and* Scary Monsters). *With Marc Bolan, Visconti was an essential production/engineering ingredient that helped land ten Top Five UK hits and the worldwide hit "Bang A Gong (Get It On)."*

Visconti's production credits also include Badfinger, Iggy Pop, John Hiatt, Gentle Giant, Sparks, Moody Blues, The Alarm, U2, Strawbs, Thin Lizzy, Bert Jansch, Boomtown Rats and many others. From 1972 to 1989, Visconti owned Good Earth Recording, a popular London facility that generated hits for artists such as Duran Duran, George Michael, The Cult and Tina Turner. He currently lives in New York and has a private 24-track studio.

In 1967, when I started my career as a producer in London, I had a lot of ideas about engineering, mainly inspired by what The Beatles had accomplished in the way of shaping a specific sound for a specific song. *Revolver* just about blew my mind when I heard those sounds for the first time. Almost 30 years later, I'm hearing arguments about analog being warm and fat and digital being cold and clinical, and I have to laugh.

Once I cracked the code—with the tutelage of many a great British engineer—of equalization, compression, gating, flanging, phasing and ADT [automatic double tracking], I considered myself lucky to get a reasonable facsimile of what I heard in the control room *before* it was committed to tape. The tape in the late '60s and early '70s was pretty bad. The multitracks were laughable by today's standards. The end of a tape was often slower in pitch than the

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beginning of the tape, and lining it up was a haphazard affair—sure, the 1kHz, the 10kHz and the 100Hz read zero VU, but if you dared to measure 30Hz or 14kHz, you'd see something on the VU meter that would make you lose your appetite. Analog was so bad then, we were always craving for what is now digital to appear. A producer and engineer would work very hard "getting sounds" on the microphones and equalization. After that magical take was rendered by the group, I would enthusiastically ask them to come into the control room to listen. Why was the snare duller on playback? Why was the kick drum playing back 6 dB quieter?

What so few engineers and producers of my generation are willing to admit is that they settled for second best and made the most of it in those golden days of rock. Ironically, the very same records from that period make up the bulk of rock music played on radio today and are examined under a microscope by today's musicians, producers and engineers. After hearing Beatles, Zep and Stones for so long, there is a mental "fix" on the sound of that era as being the "ultimate" sound in rock. The sound of that period went through so many "correctional" phases before it hit the public that you can't pinpoint it to any one device that made that era so "warm and analog." My T-Rex mixes were very punchy because I did everything in my power to make them leap out of the speakers—compressors and equalizers were my "friends," the tape was my enemy. Then we had to master those bombastic sounds to vinyl and watch the mastering engineer reaching for the highpass filter, the low-end centering button and dropping the level for a drum fill. I came to accept that the public would never hear what we chosen few heard in the studio—until digital came along.

Now it may not be perfect, but the most accurate means of reproducing music we have, now available to the public, are digital products—disc and tape. My Bowie productions have been "cleaned up" by Sonic Solutions and zapped to CD. I can now hear reverbs that were [originally] lost in the scratches and the surface noise. But I can also hear all the channels of stuff that I put the sounds through to restore the sonic integrity in the first place; not counting the "re-mastering" added in the best interests of repackaging.

Rock music isn't, and never was, hi-fi. It was always a highly contrived sound coming out of domestic speakers posturing as a very loud performance. The very same signal processors that were used to maintain some form of an exciting sound after it has been committed to analog tape, is now the sound *itself*! What I'm saying is that even though analog was crap in the good old days, we knew how to make it behave by a ton of sonic tricks. However, even after the great sounds were sorted out, analog tape used to and still does to some extent, "eat them up."

Tape compression, although it is a reality that has become a romantic

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notion, is not an accurate means of equalization and is unpredictable. If I am compressing and equalizing a kick and a snare and I take a considerable time doing that, I *don't* want the "storage system" to change that hard work. Nevertheless, before digital came along, it *did* change my hard work, so I compensated for this in the mix or the submixes (in the time before locking machines together, we *had* to submix the drum kit to make track room available). The actual "warm" and nostalgic analog sound sought after today is not actually the tape itself. It was an engineer, like myself, fighting down the long chain of production events, trying to restore the original punch of the instruments before they were committed to tape.

I want to add that I can still make a recording with that "classic" sound using modern equipment and modern digital tape—it doesn't depend on analog tape or equipment more than 30 years old. Our filter tools from Neve, Focusrite, Massenburg are superb tone-shapers, and there are plenty of modern manufacturers making "classic" tube equipment, like Tube-Tech and Manley. If you put fat, warm sounds onto digital tape, you will get fat, warm sounds on playback! With digital, what goes in comes out.

Sonic tricks: The major tricks that make a great rock record are compression (the *sound* of rock), over-the-top EQ (the *color* of rock), and the many contrived echoes/reverbs, the phasing, the flanging and the automatic double tracking (the *flavors* of rock). And let's not forget that invaluable tool that compiles a mind-boggling guitar solo from seven so-so tracks and lets a singer sing a duet with himself—the multitrack tape recorder! Rock sound is, and has been, extremely manipulated since it began—remember Elvis' slapback?—regardless of what medium it is recorded on—analog, digital tape or hard disk! ∎

Rick Clark, a Memphis-based writer and musician, would like to thank Jay Graydon, Tony Visconti, Ed Cherney, Ian Caple and Daniel Lanois for their gracious input to this article.

1995 TEC Awards Nominees

Listed below are the nominees chosen by the 1995 Nominating Panel of the Eleventh Annual Technical Excellence & Creativity Awards • The TEC Awards will be held Friday, October 6, 1995, at the Marriot Marquis in New York City.

OUTSTANDING INSTITUTIONAL ACHIEVEMENT

ACOUSTICS/FACILITY DESIGN COMPANY
- Russ Berger Design Group, Inc., Dallas, TX
- Salter Associates, San Francisco, CA
- studio bau:ton, Los Angeles, CA
- Walters-Storyk Design Group, Highland, NY
- Waterland Group, Los Angeles, CA

SOUND REINFORCEMENT COMPANY
- A-1 Audio, Inc., Hollywood, CA
- Britannia Row Productions, London, England
- Clair Brothers Audio, Inc., Lititz, PA
- Showco, Inc., Dallas, TX
- Sound Image, San Marcos, CA

MASTERING FACILITY
- Bernie Grundman Mastering, Hollywood, CA
- Bob Ludwig's Gateway Mastering, Portland, ME
- Georgetown Masters, Nashville, TN
- Precision Mastering, Los Angeles, CA
- The Mastering Lab, Los Angeles, CA

AUDIO POST-PRODUCTION FACILITY
- Buena Vista Sound, Burbank, CA
- EFX, Los Angeles, CA
- Howard Schwartz Recording Inc., New York City
- Pacific Ocean Post, Santa Monica, CA
- Sync Sound, New York City

REMOTE RECORDING FACILITY
- Effanel Music Inc., New York City
- Le Mobile, Los Angeles, CA
- Record Plant Remote, Inc., New York City
- Remote Recording Services, Lahaska, PA
- Westwood One Mobile Recording Division, Culver City, CA

RECORDING STUDIO
- Emerald Sound Studios, Nashville, TN
- Masterfonics, Nashville, TN
- Ocean Way Recording, Los Angeles, CA
- Record Plant, Los Angeles, CA
- Sony Music Studios, New York City

OUTSTANDING CREATIVE ACHIEVEMENT

AUDIO POST-PRODUCTION ENGINEER
- John Alberts
- Lee Dichter
- Ken Hahn
- Steve Maslow/Gregg Landaker/Bob Beemer
- George Meyer

REMOTE/BROADCAST RECORDING ENGINEER
- Biff Dawes
- Randy Ezratty
- Ed Greene
- John Harris
- Kooster McAllister

SOUND REINFORCEMENT ENGINEER
- Robert Colby
- Dave Kob
- Andy Jackson
- Bruce Jackson
- Benji Lefevre

MASTERING ENGINEER
- Greg Calbi
- Bernie Grundman
- Bob Ludwig
- Stephen Marcussen
- Doug Sax

RECORD PRODUCER
- Garth Fundis
- Tony Brown
- Jerry Harrison
- Scott Litt
- Brendan O'Brien

RECORDING ENGINEER
- Ed Cherney
- Joe Ferla
- Pat McCarthy
- Hugh Padgham
- Elliot Scheiner

OUTSTANDING TECHNICAL ACHIEVEMENT

ANCILLARY EQUIPMENT
- Aphex Model Tubessence 107 Mic Preamp
- Dolby Labs DolbyFAX
- JL Cooper CuePoint Controller
- Lightwave Fibox
- Peavey VMP-2 Tube Mic Preamp
- Tektronix AM700 Audio Measurement Set

AMPLIFIER TECHNOLOGY
- Apogee Sound DA-800
- Bryston 8B NPB
- CyberLogic NC-812
- Hafler Trans-Nova P-3000
- Manley Reference 440
- QSC PowerLight 1.8

COMPUTER SOFTWARE & PERIPHERALS
- Jupiter Systems MDT-Multiband Dynamics Tool
- Opcode StudioVision 2.0
- Sonic Foundry Sonic Forge 3.0
- Steinberg Recycle
- Twelve Tone Systems Cakewalk Pro. for Windows 3.0
- Waves L1-Ultramaximizer

MICROPHONE TECHNOLOGY
- AKG C12VR Vintage Reissue
- Audio-Technica AT-4050/CM5
- Audix OM-5
- Bruel & Kjaer 4040 Tube Mic
- Electro-Voice RE2000
- Neumann KM184

SOUND REINFORCEMENT LOUDSPEAKER TECHNOLOGY
- Bag End ELF-M2 Controller
- Community Professional VHF100 Driver
- Eastern Acoustic Works KF853 High-Q Stadium Array
- JBL 4890/4891 Monitors
- Turbosound TCS-612 Speakers
- Wordworx MAX 1.5M Monitors

STUDIO MONITOR TECHNOLOGY
- Genelec 1030A
- Hot House SD312 High Output Monitor
- KRK K-RoK
- Meyer Sound Labs HD-2
- JBL DMS-1
- Tannoy Limpet

MUSICAL INSTRUMENT TECHNOLOGY
- E-mu ES-32 Sampler
- Kurzweil PC88 Keyboard
- Korg WaveDrum
- Oberheim OB-MX Synth
- Roland JV-1080 Synth
- Yamaha VL-1-m Synth

SIGNAL PROCESSING TECHNOLOGY
- Alesis QuadraVerb 2 Multieffects
- BSS Audio OmniDrive
- Drawmer 1961 Tube Equalizer
- Focusrite Red3 Compressor
- Lexicon PCM80 Multieffects
- Night Technologies Inc. EQ^3 Equalizer

RECORDING DEVICES/STORAGE TECHNOLOGY
- Fostex D-25 DAT
- HHB Portadat
- Kodak 600DT CD Recorder/Transporter System
- Panasonic SV-4100 DAT
- Studer D827-EDR 24-bit Recording Option
- Tascam DA-30 MK II DAT

WORKSTATION TECHNOLOGY
- Avid Technology AudioVision 3.01
- Fairlight MFX3
- Otari Corporation RADAR
- Roland DM-800
- Spectral Audio Prisma/Prismatica
- Studer Editech PostTrio

SOUND REINFORCEMENT CONSOLE TECHNOLOGY
- Allen & Heath GL-4
- Cadac Concert
- Crest Century GTx
- Midas XL-4
- Soundcraft SM24
- Yamaha PM3500
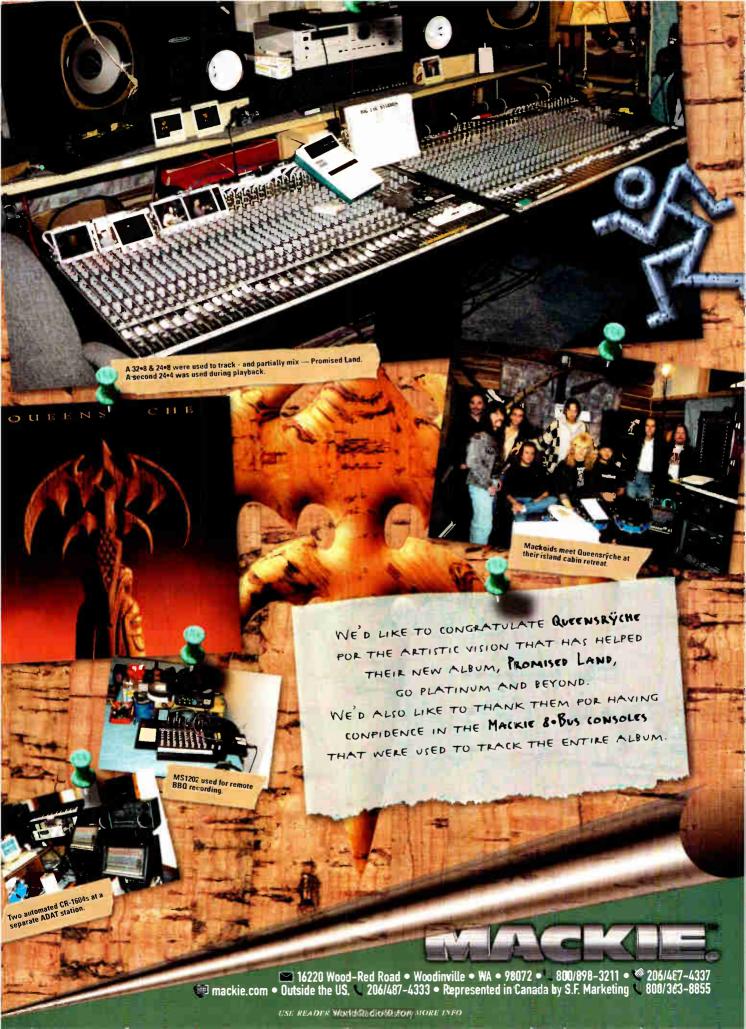
SMALL FORMAT CONSOLE TECHNOLOGY
- Mackie Designs LM3204 Line Mixer
- Soundtracs Automated Topaz
- Studiomaster Classic 8
- Tascam M2600
- TL Audio 8:2 Tube Mixer
- Yamaha ProMix 01

LARGE FORMAT CONSOLE TECHNOLOGY
- Amek 9098 by Rupert Neve
- Harrison Series Twelve
- Soundcraft DC2000
- Solid State Logic SL9000J
- Tactile Technology M4000
- Trident Ventura 85

FOR MORE INFORMATION CONTACT KAREN DUNN AT (510) 939-6149.

A SPECIAL TEC AWARDS NOMINEES SUPPLEMENT AND VOTING BALLOT WILL APPEAR IN THE AUGUST ISSUE OF MIX.

A 32•8 & 24•8 were used to track - and partially mix — Promised Land.
A second 24•4 was used during playback.

Mackoids meet Queensrÿche at
their island cabin retreat.

MS1202 used for remote
BBQ recording.

Two automated CR-1604s at a
separate ADAT station.

WE'D LIKE TO CONGRATULATE QUEENSRÿCHE
FOR THE ARTISTIC VISION THAT HAS HELPED
THEIR NEW ALBUM, PROMISED LAND,
GO PLATINUM AND BEYOND.
WE'D ALSO LIKE TO THANK THEM FOR HAVING
CONFIDENCE IN THE MACKIE 8•BUS CONSOLES
THAT WERE USED TO TRACK THE ENTIRE ALBUM.

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Illustration: Ad McCauley

Digital Audio Workstations

PRE-PURCHASE

Considerations

magine going into a restaurant where the menu has hundreds of entrees, thousands of appetizers and side dishes, and a selection of desserts that could fill a phone book. This scenario is not dissimilar to the current range of choices available in digital audio workstations. A recent survey of complete digital audio workstations topped 200 products with prices ranging from $4,000 to more than $100,000, and the majority of them have merit. Suffice it to say, they will not all be covered here. Instead, we'll examine a few factors to consider before making the DAW purchase.

Since the early days of computing, people have been recording sound into a computer and storing it on disk, RAM and ROM. Early computers even stored their programs on plain old audio cassettes in lieu of a floppy. It wasn't pretty audio, but it was computer-generated and, therefore, digital audio. Pro audio companies such as Studer/Editech and Digidesign then began providing affordable random-access audio editing systems, but, unlike the cola wars, the market hasn't thinned out much. As a result, studios today have dozens of workstation systems to choose from, with each having its own approach to disk-based audio.

There are some who would say that DAWs are pushing analog recording into obsolescence, but that will be a long time coming. There are traditionalists and young upstarts who aren't yet sold on the benefits of digital audio. There are even some who claim that having the ability to do instantaneous edits distorts the process of making music.

Still, no one is questioning the power that a workstation can provide in the studio. High-speed access to phrases and sections of songs, software patchbays designed to eliminate wiring nightmares, automated mixdown, and the ability to copy and paste settings and effects from one track instantly to another track or song are all welcome features for a busy engineer or producer.

THE COMPUTER QUESTION

No matter how you slice it, a DAW is a computer. Whether it is a stand-alone product or one that uses a host computer, the DAW does not exist without a microprocessor, a keyboard, RAM, a monitor and at least one monster hard drive. That is a computer. So, generally, the better the computer, the better the DAW. But the similarities stop there. Toss in a digital signal processor, high-quality A/D and D/A converters, flexible audio interfacing (AES/EBU, S/PDIF and balanced analog XLRs), and a slew of software

BY JAMES D'ANGELO

ANGELO

to tie everything together, and now you have a computer that's been hot-rodded for audio. Unfortunately for the consumer, none of these pieces is trivial, and skimping in any one area could compromise the final product.

Lately, Macintosh and PC manufacturers have been incorporating more and more features into their standard models. The push from multimedia and audio production has inspired computer manufacturers to stock their products with DSP chips, stereo I/O and high-capacity/high-performance hard drives. Meanwhile, some software companies have been taking advantage of this by making DAWs that involve only the purchase of software. These software DAWs are often able to take advantage of additional hardware boards (such as Digidesign's AudioMedia series), but they do not require them. Programs like OSC's Deck II can record up to 24 tracks of CD-quality audio on a Macintosh (the 8100 PowerPC model) without extra hardware (truly a feat!). And these software DAWs represent a growing trend in audio manipulation: It is not absurd to think that

everybody will one day be able to record and sync dozens of CD-quality audio tracks to their own video editing suite, and everything will take place inside a personal computer.

But, in the here and now, the personal computer, as shipped, is still far from being the perfect audio studio. Digital audio is still an enormous amount of information for a computer to handle in real time. In the situation above, the 24 tracks of audio use up all available processing power of the computer, leaving no processor headroom to provide EQ or effects or much of anything else. For engineers looking to do true multitracking, the stereo, analog I/Os of the high-end computers leave much to be desired. Without extra hardware, state-of-the-art computers soon become maxed out.

To get around the limitations of the stock computer, another type of DAW uses a computer as a host. These systems provide their own DSP, I/Os, and, in some instances,

even extra processor slots and disk drive ports. They use the computer as an interface and to handle file management. The intention of this is to add higher-quality sound to a well-known user interface while avoiding a bottleneck at the host's microprocessor. The SoundBlaster Series of audio cards for PC-compatibles has been around for years to upgrade the sound capabilities for games and audio. But as technology improves, these game sound cards have pushed into the pro audio DAW arena and have confused the boundaries between project and pro. Many such cards now offer CD-quality recording, onboard effects and often some editing software. On the high end, systems have come down in price and are offering many more features. As they meet somewhere in the middle, consumers see a buyer's market of highly competitive systems.
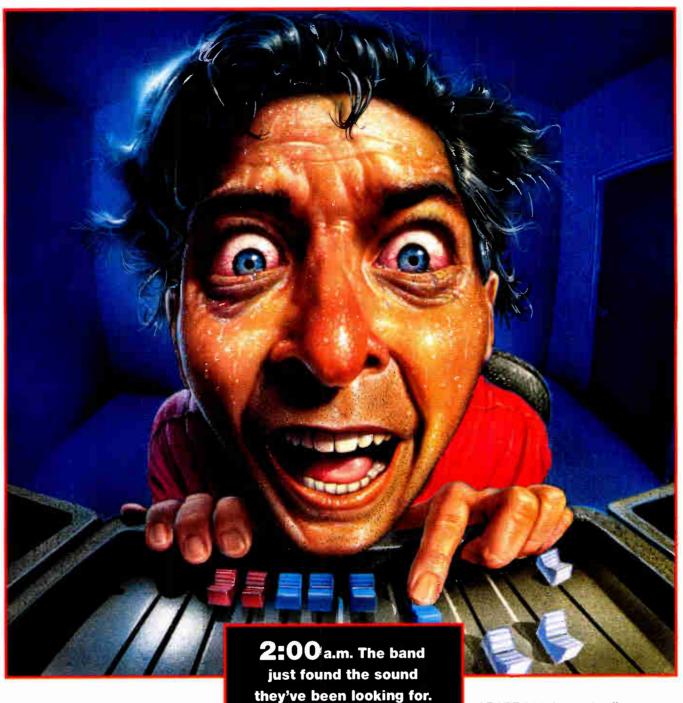
As they provide their own hardware interfaces, computer-hosted

2:00 a.m. The band just found the sound they've been looking for. Everyone's rockin'. Except you. You're figuring out how to tell them the HIGH OUTPUT master you were using just "crapped out."

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DEMAND IT.

BASF

DAWs can offer high-end inputs and outputs to accommodate more tracks. While the best software DAWs only allow stereo I/O, computer host systems typically allow for 4 to 16 tracks of I/O, with the potential to add more. They also offer a choice between digital and analog I/O, and often both. For those looking at multitracking, this is a major advantage over the strictly software approaches.

While there are many DAWs to choose from, the computer question often comes down to choosing between a high-end Macintosh or IBM-compatible system. Currently, the Macintosh dominates pro audio, but many DAW companies have announced support for PCs. And there are many thriving companies providing products exclusively for PCs. The Macintosh is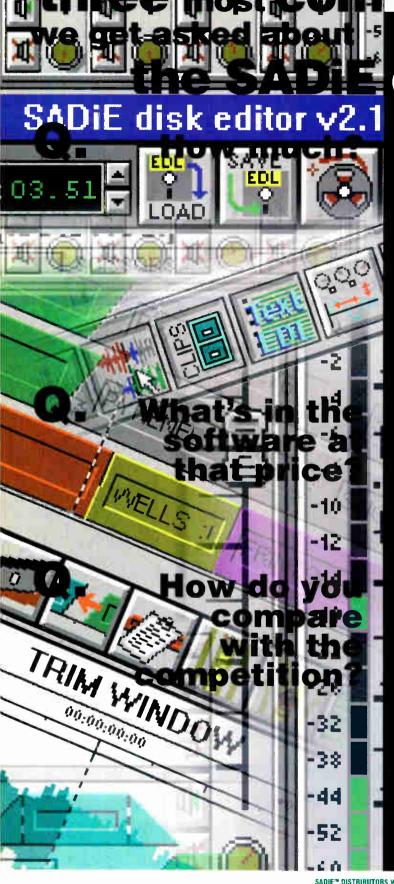 often the system where original pro audio applications are developed, and they are then ported over to the PC. Still, there are plenty of high-end workstations for both platforms on the market, so if you are considering building a workstation around a computer you already have, there is probably something to fit your needs.

Each computer-based DAW, even on the same platform, tends to have a radically different user interface. Though most of them attempt to base their look and feel on traditional mixing consoles, things such as menus, dialog boxes and control windows can be entirely different. Being skilled with one DAW does not necessarily mean you'll be able to use another without enduring a painful learning curve. As a solution, some programs like Prisma Music by Spectral Synthesis attempt to get rid of any computer-type interface; all the screen images are based on actual studio devices like mixing consoles and patchbays, in an attempt to eliminate the need for menus, layered windows or dialog boxes. This may be

DAW Designs At a Glance

SOFTWARE DAWs
Pros: Inexpensive; standard user interface; no hardware install; upgrades are inexpensive; benefits of having a computer included.
Cons: No multichannel interfacing; lack digital I/O; limited by onboard processing.

COMPUTERS AS HOST MACHINES
Pros: Standard user interface; high-quality audio interfaces; multitrack I/O; digital and analog I/O; benefits of having a computer included.
Cons: Bulky; hardware installation necessary; more expensive.

STAND-ALONE SYSTEMS
Pros: Hardware designed for recording audio (faders and knobs), portability (sometimes); generally much simpler than learning a computer and an audio program; high-quality audio interfaces; multitrack I/O; digital and analog I/O; simple plug-and-use setup.
Cons: Can't use DAW as a word processor or spreadsheet; often more expensive; monitor support sometimes limited or absent; not as many backup options.

an approach to consider for those not initiated to Windows or Mac environments.

The bottom line on computer choice is this: If you know IBM, buy IBM; if you know Mac, then buy Mac. If you are well-versed in both, the Mac may be the choice due to its still broader acceptance in the music production community. Apple's Power-Macs are now beginning to see support from the pro audio industry, but until Apple releases a faster version of their NuBus architecture (most likely the PCI bus), most of the hardware designs that rely on high data transfer will remain stagnant (including video boards). Designs such as Pro Tools or Dyaxis II do not use much more of the Macintosh than its handy-dandy user interface, monitor and keyboard, so a more inexpensive Quadra still makes an excellent host.

THE STAND-ALONE

A third, and very common, form of DAW is the stand-alone. Units such as the Akai DR8, Korg SoundLink or Otari RADAR come complete and are not intended to be hooked up to an external computer. The advantages of these systems are obvious. They usually come in one box, they don't require the user to install boards or software, and the operator doesn't have to deal with the host computer's operating system (i.e., DOS, Windows or Macintosh OS). In the case of the Roland DM-800, the user can put the entire system (12 pounds) under an arm and run off to the next gig.

As all DAWs need some form of computer inside, these stand-alone DAWs may not offer a price break over computer-based systems, and in the cases where you already own a powerful computer, you may feel funny investing in a second one. But, they do offer specialized recording hardware such as real faders and knobs that almost anyone who mixes prefers over software-based controls.

THE KEY IS THE HARD DRIVE

In essence, a DAW is nothing more than a beefed-up sampler. But while samplers push audio into RAM, DAWs have been taking advantage of the dramatic speed increases in hard drives to store sound directly to disk. So, instead of being limited to just a few minutes of sampling, DAWs offer virtually unlimited recording capability.

The replacement of tape with hard drives brings a whole bevy of advantages. Even at high recording levels, the digital medium provides almost zero wow and flutter, minimal distortion, over 96dB dynamic range and a very flat frequency response. While tape costs can add up when virgin stock is required, hard drives can be re-used indefinitely. And not having tape means no adjusting or cleaning heads, no tape hiss (if the tape is analog), no wait for rewind and fast forward—access to any part of a series of recordings can be provided nearly instantly by locator points in the software. Besides, how often is tape warrantied for five years like the latest onslaught of drives?

In DAWs, the recording chain is as follows: The analog audio is filtered to prevent aliasing, converted to a digital signal, stored in a RAM buffer,

flagged and organized by the DAW's archival scheme and dumped in bursts onto the hard drive. If the hard drive is too slow, the RAM buffer eventually overflows, and data is lost. But if the drive is fast enough, this burst process can continue until the drive is full or the session is done. For years, a slow crop of hard drives was the weak link in digital audio. Today's drives are bigger, faster, stronger and becoming more affordable.

Still, when buying a hard drive for any of the above systems, there are three factors that need to be considered: size, access time and throughput.

When tracking 16-bit, 44.1kHz audio, a DAW consumes about 5 megabytes of drive space per track per minute. So a 1-gigabyte drive (about $650 dollars these days) can provide up to 200 track-minutes of recording capacity. This may sound like a lot until you realize that an 8-track recording would fill the entire drive in 25 minutes! And hard disks are still fairly expensive.

The good news is that drives can be daisy-chained together. If the drive you bought is not big enough, you merely add another one and you're back at work as if your drive was the combined size of the two. The nice part of this is that you don't have to worry about buying a drive now that needs to be able to store everything for future use. But each system has a limit on how many drives can be daisy-chained (usually a maximum of seven) to the DAW; if you buy large enough drives, this shouldn't be an issue.

The final two main features of drive performance are related. Access time is the amount of time it takes for the drive to find the information and put it onto the data bus for access by the processors. Throughput is the amount of data throughput the drive can sustain without requiring a RAM buffer. For access times, low numbers are better; for throughput, higher numbers are better. They are not directly related, so make sure to get the specs on both before purchasing.

For four tracks of CD-quality audio, the hard drive should have an access time of 25 ms or less, and a throughput of 250 kbytes or greater. Drives of this caliber have been around for

years. For eight tracks of audio, you need a hard drive with 15ms access and 2-meg throughput. A drive of this caliber is on the order of the generic 1GB hard drives available for around $600 a gig. For 16 tracks of audio, you'll probably need a hard drive with 7ms access and 4-meg throughput.

THE INS AND OUTS, DIGITALLY SPEAKING

A weak link in many DAWs is the analog-to-digital and digital-to-analog converters. Transferring the analog signal into and out of the digital domain requires the best in conversion technology. No converter is perfect, and higher bit numbers don't automatically ensure better audio reproduction. Few people maintain that 16 bits of conversion (96 dB) is sufficient. The human ear can often detect the difference between 16- and 20-bit (120dB) converters, especially with low-level signals where converters are more apt to show problems of quantization error and self-noise. State-of-the-art converters are advertising 22-bit resolution (an ideal dynamic range of 132 dB), but they are extremely pricey and too new to be time-tested. Fortunately, if your DAW has digital I/O, your DAW's internal converters can be bypassed by adding higher-end third-party products or even using the converters in your DAT machine. DAT machines typically have better converters than DAWs (though this is not always true) and can be enabled to provide A/D and D/A conversion.

BACKING UP

The slew of backup options and formats available to the world of digital audio are the same as those used by corporate America for their mammoth databases. When a hard drive crashes (and they do), it is often impossible to retrieve anything off of the disk, so you need a system for backing up your digital audio data. Hopefully, the backup system will satisfy these criteria: cheap data cartridges, quick backup and simple software for backing up and reloading lost information. There are many different systems out there, and it is beyond the scope of this article to break them all down. To make backups to

dataDAT (not the audio type), optical drives, Syquest or CD-ROM, the DAW chosen must have the ability to send entire files through a SCSI, Ethernet or other standard data channel. Also, if you have a modular digital multitrack, check and see if your DAW will be able to back up to that. Some systems now offer backup options for ADATs and Tascam DA-88s.

Investigate and budget for a backup system when you purchase a DAW. Beware of proprietary systems. If the DAW uses only proprietary hard drives, RAM or backup systems, find yourself another DAW. Proprietary technology could leave you on a very expensive island, and certainly alone if the company goes out of business.

OTHER THINGS TO CONSIDER

Video support can be very important in a DAW. Will it sync up to external video and/or film? A DAW may be virtually useless in post-production unless it offers synchronization capabilities. Also, look into dealer support and manuals. Some companies bend over backward to continue serving the customer long after the purchase; others treat you like an orphan.

Because these products are so complex (operating systems, backups, recording, automation, video support, etc.), make sure that the manual is thick, well-illustrated and well-written. Look at that index to make sure it is thorough. You need to find information fast. How big a monitor does it support? Does it support two? Some Windows-based applications can bring up a large number of windows, which can result in a cluttered interface. Can you do a good amount of work without opening a thousand windows or subpages? Monitors are your interface for a DAW; don't let anyone tell you that small is okay.

THE BOTTOM LINE

The main thing to be aware of when purchasing a DAW, or anything that is based on a computer, is that in a few months, your top-of-the-line, state-of-the-art product will be slowly inching toward obsolescence. However, the up side is that all of today's state-of-the-art DAWs have enough power to produce excellent recordings for years to come.

Thanks to Cathy Curtiss for her assistance with this article—Ed. ∎

by Dan Daley

WHAT'S IT GONNA BE?

LINEAR OR RANDOM?

The hoopla surrounding the advent of the modular digital multitrack might give some the impression that it has become the de facto standard for the project studio. That's certainly the view of many of those project users who have gone out and bought one or more of the estimated 60,000-plus units in the field from a growing number of manufacturers.

Linear media brings with it a certain level of comfort and familiarity, particularly to a generation of users who moved to project studios from the conventional professional audio world. Linear media is relatively inexpensive, and tape is a proven format. It's also tangible, and there is an implicit sense of security that having a project on tape offers.

On the other hand, it's becoming a much less linear world out there. Despite technical raves, consumers refused to embrace a digital linear format in Digital Compact Cassette because it didn't give them the random access they had become used to in their CDs. Similarly, those pro audio users who interface with hard disk editors and recorders would be hard pressed to give up the ability to slip tracks and manipulate audio data in a way tape never could. But the recording time of hard disk systems is relatively limited compared to tape, and the removable media is considerably more expensive. It's also more prone to corruption.

Often, and increasingly, both types of systems co-exist in the same workplaces, with users drawing the advantages of both formats and, in doing so, creating a work methodology that's more than the sum of its parts. But there are drawbacks to that kind of interaction in the project studio environment: Multiple datastreams—only one of which is actually audio information—create a quiet sort of havoc on the creative process. The management of multiple, incompatible systems becomes an end in and of itself, making the already-complex world of the engineer/artist exponentially more difficult.

In covering project studios for

> The debate between linear and random access is ongoing, and its discourse is played out in psychological, practical and economic terms every day.

some years, I've seen technology compete with creativity in what is often a zero-sum game: One wins at the expense of the other. And I've also detected a palpable desire on the part of many project users to avoid technological eclecticism. On the other hand, there are those who take the idea of every piece of gear having its own sound and apply it to functionality: Every computer or tape deck has its own feel. The debate between linear and random access is ongoing, and its discourse is played out in psychological, practical and

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economic terms every day.

The project studio seems to be, in many instances now, in the middle, with both types of systems in use for very specific applications. Those users have, perhaps, the best vantage point from which to view the future.

"I can imagine random-access systems getting better and better," says Sheldon Steiger, whose Noise Productions in Manhattan covers music recording, audio post and multimedia with both Tascam DA-88s and Digidesign Pro Tools. "But I can't imagine one without the other. Random access is the serious environment for editing, but it's more volatile—systems crash and hard disks go down. Linear doesn't offer the same kind of functionality, but it does give you a more robust format and a certain inherent sound. I mean, if you're going to work on a one-time event, like a concert, you're going to choose linear because it's more stable. But I can see where the studio environment will increasingly move to random access, to the point where tape might get wiped out in the stu-

dio altogether."

Another mixed-media user is Steve Horelick, whose Oasis Productions in Westchester, N.Y., also does

No one seems to think that tape is going away any time soon.

music and post and uses Sound Tools and ADATs for the productions. The real irony of random access, says Horelick, is that the speed it offers up front is counterbalanced by the slowness of backing up the media. "When someone comes up with a 2GB drive that's fast, cheap, removable and dependable, then I could see myself going all the way with random access," he says. "But those are the key words, and I don't see that happening tomorrow." And, he adds, storage is just one issue fac-

ing random access; the computer environments in which it lives are rapidly becoming overloaded. "I've gotten to the point where I don't like to run sequencers and samplers on the same machine," Horelick says, noting that he currently uses a Mac for the former and a Fairlight for the latter. "When you run a lot of different, complicated applications simultaneously on any computer, they tend to crash. That's one thing that you can say about linear: I don't need my computer to access it."
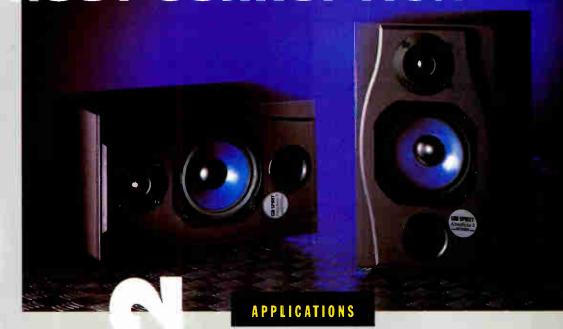
These comments seem to sum up a general consensus within the project niche: Users are comfortable with both formats, and, to differing degrees, they're awaiting the development of storage and backup approaches that will put random access on an operational and functional par with linear. Those developments will be coming from the manufacturers of both types of systems, and their observations are also worth noting.

Otari's introduction last year of their co-developed RADAR 24-track hard drive-based system has the company strategically positioning that product to be the synergistic

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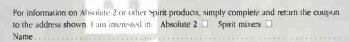
The advanced vented cabinet design complements the 6.5"/165mm low-frequency driver to give smooth, extended bass response. The soft dome tweeter and high quality crossover keep the frequency response smooth right up to a crisp high end that's free of unnatural colouration - unlike the harsh sound of some low-cost monitors.

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THE INSIDE STORY

- As with Spirit mixers, the electronic design of Absolute 2 uses **high quality components**, including film capacitors and an air-cored inductor, in a circuit that embodies classically simple design principles. Terminals allow **bi-wired** as well as standard connections.

- Rather than compromise with off-the-shelf components, we use **custom hardware** built to our specifications - both drivers are exclusive to Absolute 2.

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- The vented cabinet employs a **special port design** that does more than simply deliver extended bass response. With its carefully chosen dimensions, air turbulence is reduced, contributing to Absolute 2's smooth, uncoloured low frequency characteristics.

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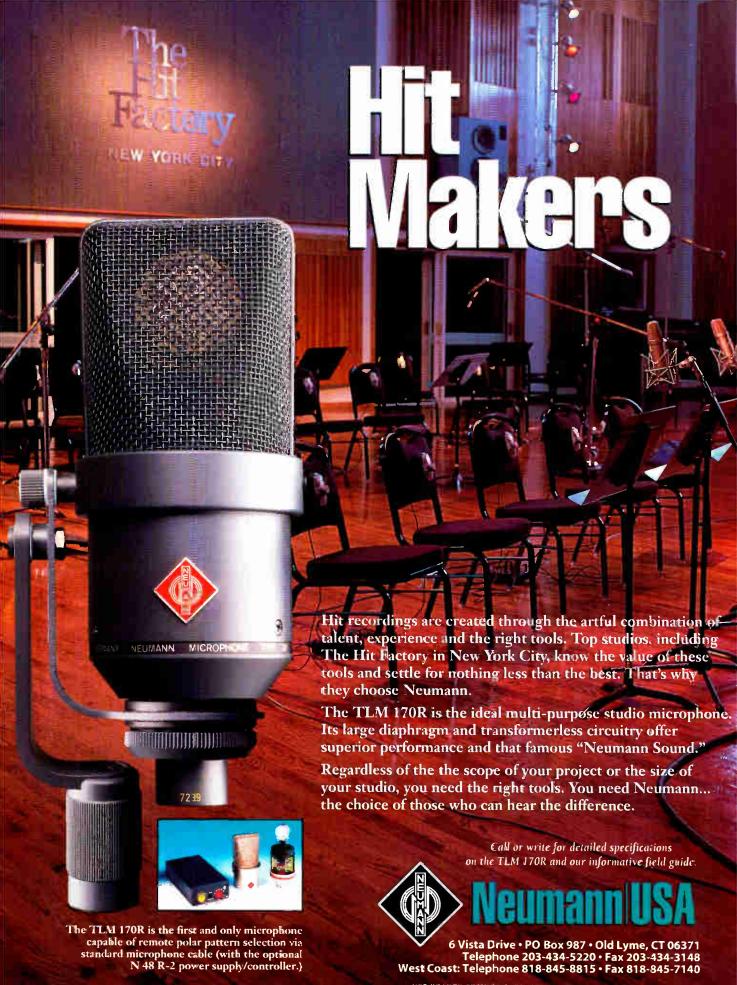World Radio History

combination of linear functionality and random-access operation. James Goodman, the company's marketing manager and a former New York studio owner (where I met him years ago as a client), agrees that storage and backup are the major issues that face random access as it moves through the project studio ranks, rather than the compatibility and price concerns that were at issue for commercial for-hire facilities. RADAR backs up to 8mm Exabyte tape, and a full 22-minute, 24-track project takes about 90 minutes to completely load or download from the recorder, although a recent software upgrade allows for incremental ongoing backup that takes less time. However, Goodman acknowledges that the abilities of hard drives are limited, and that magneto-optical drives will figure largely in the future of random access systems.

"That's a reality of hard disk systems," he says. "The answer is to get away from hard disk-based systems [for storage], to make them robust and to make them inexpensive. And
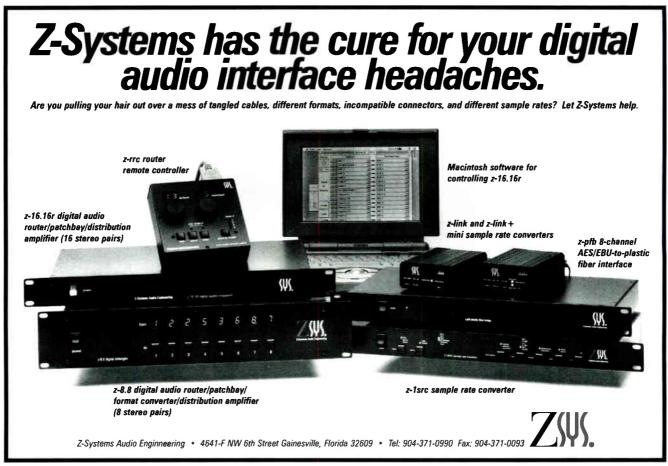
I think that answer is going to come from the computer industry, and we'll likely see something within about five years. In the meantime, you'll still need multiple hard drives, running at about six tracks per drive —although we think that can be pushed to eight—to mimic the ability of linear tape to store [information]. The project studio is becoming the mass market in professional audio, and they're driving the development of the recording systems. The computer industry is the other mass market that's going to come up with the solutions to the issues of storage and backup. The pressure is there."

But even as the main issues facing random access are addressed, no one seems to think that tape is going away any time soon, least of all Otari, whose MTR Series of multitrack recorders have become to analog recording what Ford was to the automotive industry in the 1920s: reliable, no-frills, inexpensive transport. And not the makers of the MDMs, Alesis and Tascam, who have staked much of their futures on equally inexpensive digital linear

media. Tascam's Roger Maycock takes the attitude that random access and linear complement each other, a feeling currently reflected in project studios. And, he adds, linear as a concept offers a distinct advantage that random access can't: far fewer competing production and mix/transfer formats. But on the subject of the future, Maycock concedes that linear formats have a finite existence. "What I believe, though, is that that time will not come for a long, long time," he says. "It's still easier to hand off a tape on a project, whether it's still in production or finished, than it is to try to find common file formats between random-access systems."

So it's not as simple as saying that linear formats will eventually give way to random access. But Goodman's observation that the ultimate solutions to random-access issues will come from the computer industry reminds us that project studios are tied to the larger pro audio world by the fact that our collective fates are being decided by another industry entirely. ∎
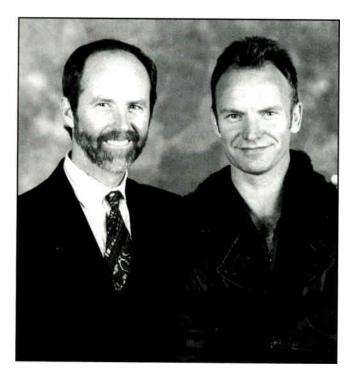
Dan Daley is Mix's *East Coast Editor.*

by Mr. Bonzai

MICHAEL GREENE
REBEL WITH A CAUSE

During this year's Grammy Awards broadcast, 1.6 billion people around the world learned some sad news about America. Recording Academy President Michael Greene announced, "We are here tonight on the brink of becoming the only industrialized nation in the world with no federal support for the arts." Ordered by the network not to display an 800 number for supporters, Greene pulled a note out of his pocket and read the number anyway. He added, "When Winston Churchill was asked during World War II to cut the British Arts Council Budget, he didn't waste words. 'Hell no,' said Churchill, 'what

Michael Greene and Sting

have we been fighting for?' "

Formerly an artist and producer for Warner Bros., GRC and Mercury Records, Georgia-born Greene was spotted by Frank Zappa and signed to the Discreet label right out of college. With degrees in business and marketing, he has headed up record-

ing studios and TV stations, founded one of the first video music networks, helped build Atlanta's Crawford Post Productions as its executive VP and was involved with interactive projects before they were very active. In 1988, he became the first full-time president and CEO of NARAS.
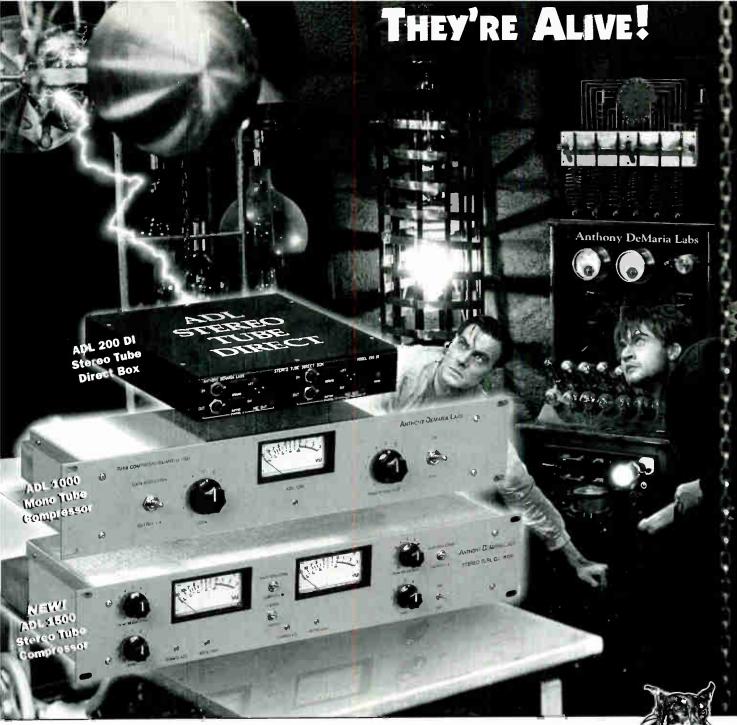
Greene sits across from me at the Academy. He's wearing jeans and one of those dress shirts minus the collar that remind you of a Confederate soldier.

Bonzai: How come everybody's always bitching about the Grammys?

Greene: With 87 categories of music and a membership made up of polka people, gangsta rappers, contemporary Christian artists, jazz, classical and Latinos, these people don't agree on anything—except that what they do is important and that music is important.

I think people get upset by the big categories. Record of the Year and Album of the Year are two categories that all the membership votes on. When you have that many different kinds of people in that many different genres of music voting in a category, you typically find very homogenized—very safe—nominees. We're trying to do something about that. I think the other categories, where you have specialized nominations coming from people who have more acumen in the specific field that they are voting in, it generally ends up being a lot better. But Grammy-bashing is a God-given right in this country, and that will always be the case.

Bonzai: Who votes?

Greene: The Academy has about 10,000 members, and 8,000 are voting members. To be a voting member, you have to have had six commercially released recordings that you have contributed to, either creatively or technically. You can be a

musician, a songwriter, an arranger, composer, spoken-word artist, album-notes writer, album-packaging artist, an engineer or a producer. All of those people make up the voting constituency, and that's what makes the Grammy awards a peer award. It really is creative and technical people awarding Grammys for creative and technical excellence.

Bonzai: How does winning affect commercial success?

Greene: I got a couple of calls shortly after the show—Tony Bennett had fallen off the charts, but he reappeared the week afterward in the Top 50, just from the Grammy performance and winning Album of the Year. Sheryl Crow sold twice as many records the week after. Bruce Springsteen sold 250,000 records.

And the effect is not only seen in the big categories. [Cuban jazz pianist] Gonzala Rubalcaba was selling in the single digits the week before and all of a sudden found he was selling a ton more the week after. Plus notoriety. You take an Allison Krause, a Shawn Colvin, people who appear in the folk categories —it all of a sudden elevates the consciousness about who these people are. A lot more mainstream people start listening and finding out, "Maybe I'm not only a pop music fan. Maybe there's other stuff going on that is musically interesting."

Bonzai: How have the Grammy shows changed in recent years?

Greene: I think the awards process generally dictates the composition of the show. Five years ago, we didn't have a Rap category, or Hard Rock, Metal, Alternative, World Music or New Age. The Academy, as far as I can tell, was relatively catatonic during the '70s and most of the '80s.

During that period, I was a touring musician, ran recording studios and worked as a producer, so I wasn't in the middle of what they did. When I look back, I see some very squirrely omissions. The addition of new categories and fields of music in the last five years has really led us to the point where the show introduced a bald-headed Irish alternative singer named Sinead O'Conner when nobody had ever heard of her. We had Seal four years ago. We

aim to open people's hearts and minds to new, exciting artists before they break.

Obviously, we have a prerequisite to put on talent that is popular, but we also feel a real obligation to be a window of accessibility to the American public and the world, so that you can tune in and know that you are not going to see the same people you hear on the radio. Gonzala Rubalcaba probably hadn't sold 2,500 records. I saw him in Cuba three years ago, and we got him over here. He's not on there for ratings; he's there to showcase to the world the most phenomenal new keyboard talent on the planet. We didn't put on a

Bono, Frank Sinatra and Michael Greene

Tony Childs, a Melissa Etheridge five years ago to try to garner ratings. We put them on because I think it's important that we act as that window of accessibility to great music for people who have all the buttons on their car radios tuned to all the same crappy stuff. It's important that they hear new things.

Bonzai: As the first president and CEO, don't you find it strange that they didn't have that position before?

Greene: They had an executive director. The Academy was run as an "association," but not in the technical sense. It was here to do its little association matters and didn't take stands on freedom of expression, intellectual property or education issues. They were doing their thing, having their TV show.

I became Chairman in 1985 and ran on this platform: You people suck. Being a musician and walking into this group, I asked how many agreed that they sucked. In time, the heat had been turned up by the industry and anyone looking at the organization. I said that they should change the name and become the

Grammy Awards Association, Incorporated or, if you are going to pose as an Academy, you need to go back into the dictionary and see what that means. The Academy in ancient Greece was where Plato took his students and taught them.

We are in the business of providing continuing education for professionals, dealing with technical displacement, training, health insurance, issues, seminars. We are the organization that is the advocate of the music person. Who else is going to take on the National Association of Broadcasters and say, "Excuse me, less talk and more music does not mean you don't identify artists by front- and back-announcing them on the radio." One of our jobs is busting the record labels' chops. Bonnie Raitt and I went on *Nightline* chastising the record industry for not making penance to the great rhythm and blues artists that have been screwed for years. If we don't do that, nobody else will.

Also, we were a founding organization of the National Coalition of Music Education, which enlightens people about how to get music back in the schools. At this past Grammy Awards, we brought to the attention of the world that we have a bunch of jerks in Washington who are still trying to pull the plug on funding for the arts and privatize it, commercialize it.

Bonzai: How bad is the musical education situation?

Greene: In California, we have one music teacher for every 1,500 students. We have half the number of kids playing in high school orchestras than we did just eight years ago.

Bonzai: How is Grammy in the Schools working?

Greene: It's out now to 15 different metropolitan areas. Basically, it's more of a career day, though. We find students who desire to pursue a career in music, bring them to a centralized location and put them in touch with someone like David Foster, Terry Lewis and Jimmy Jam, and talk about careers in music. For the most part, we try to talk them out of getting into this business. The ones who remain, who absolutely want it, we give them the roadmap. We give them things that none of us had. My father was a big band leader, and I watched

him learn the hard way.

We also have the National Concert Series for Children, 12 Grammy All American Bands, 14 All American High School Choruses, and the National Coalition for Music Education with 50 state headquarters. We present programs to over 700,000 kids a year through Grammy-related educational activities. We got the arts included in America 2000 and helped establish the first national standards for arts in this country [instituted and funded by the federal government] now going out to communities and school systems. We've made a lot of progress, and it has come by us being the meanest sons of bitches on the block. Nothing changes in this industry, or in the political sector, unless you do something like what I did on the Grammy Awards. You stand up and publicly embarrass people, because otherwise, they will not care enough to change.

Bonzai: As the child of a professional musician, and a working musician in your own right, did you sniff a lot of BS early on?

Greene: Yes, I watched my father, leader of the Charlie Greene Orchestra, during the demise of the big band venues. I watched him go from being a popular band leader on the East Coast, and in just a matter of five years, having to take other jobs. He tried to keep me out of the business, and I've done the same with my kids. We all do, but it just makes them want to get into it more—I buy them drums, guitars and everything else because I know there is no hope.

One of the first things we did when I came into NARAS was to start MusicCares, our foundation that helps indigent musicians, provides money for them to move out of their cars and into apartments. If a guitar player has had a car wreck and can't play, we attempt to figure out bridge-financing. That wasn't the result of me waking up one day and having an emotional imperative for doing this. When I was a child, on Christmas Eve, old musicians he'd worked with would come up to my dad's door and beg for money because they had no money to get their kids presents.

Bonzai: Didn't you run a recording studio?

Greene: Several. I ran a 48-track and a 24-track room back in the late '70s

in Atlanta called Apogee Studios. We did a lot of the early hard rock 'n' roll in the South—Molly Hatchett, Ted Nugent, Nantucket, Kansas. I went on to start the Music Video Channel, which came out about the same time as MTV. We had four million subscribers nationally, with more of a diversified format than MTV. I ran a couple of television stations while still producing records. Eventually, I helped form a company in Atlanta with Jesse Crawford. Crawford Post Production has 16 online suites, nine recording studios, with Steve Davis the head of the audio department there. I first knew Steve when I was a jingle singer and he
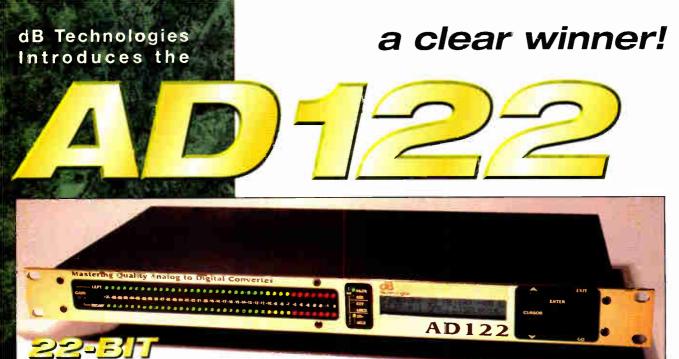
> **W**e've made a lot of progress, and it has come by us being the meanest sons of bitches on the block. Nothing changes in this industry, unless you do something like what I did on the Grammy Awards.

was an engineer at Doppler Studios, run by Pete Caldwell, a past president of SPARS.

Bonzai: What's your advice for people in the recording studio business?

Greene: Whether you are an entrepreneur or a fader-slider, you have to anticipate the evolution, the dialog and the collaboration that exist among different parts of our industry. It usually ends up confounding you in terms of tactics for technical acquisitions. You have to get a vision in place, so that you are a tall quarterback and can look way down the field for the next opportunity or "techastrophe."

Here's multimedia. I have a couple of digital workstations, got a big Neve over here, we still do record projects, I'm getting into the commercial end of the business a little— my business is all over the place, in

by Dan Daley

JACK DOUGLAS
LONG VOYAGES

Jack Douglas is back home. Sort of. He's lounging on a shredded couch in a cavernous, cosmetically incorrect recording studio as the band packs up and ashtrays fill. It's kind of like 1969, except that now his hair is graying, falling just over his ears. His feet, encased in a pair of black Fila running shoes, are propped up on a coffee table. He is drawing on a lit cigarette and three decades of illuminated memories as one of the producers who defined both how rock is recorded and how it sounds on the radio: Six records with Aerosmith; three with Cheap Trick; both engineer and producer for John Lennon, including the multi-Platinum *Double Fantasy* record, which also garnered him a Grammy Award; Alice Cooper's classic "School's Out"; stops along the way with The Knack, Rick Derringer, Montrose, Joe Perry and Graham Parker.

Douglas hung up his guns in 1987, looking to recover another, more familial aspect of his life after years in the studio and inside a dangerous rock 'n' roll milieu that nearly consumed him, emotionally, mentally and physically. The studio he's sitting in now, in Weehawken, New Jersey, is called IIWII—the acronymic version of the John Lennon epigram, "It is what it is." The studio is co-owned by Roy Cicala, who gave Douglas his first job in a recording studio at the New York Record Plant, in 1969. Douglas is behind the board once more as a producer. It feels good. You can see that in his face and body language. He is proving that you *can* go home again.

What have you been up to for the last few years? We haven't heard much from you.
I retired. My last major production was Cheap Trick in 1985. Since then, I've been doing some administrative

sort of work. I was a partner in a small label in Paris and commuting between there and Miami. It was a good excuse to spend some time in Europe; especially Paris.

I was like a madman from 1965 to 1985. I was going nonstop. I gave the Grammy to my mom and decided to start thinking about other things, like three kids to raise. I barely knew my kids. Now all three are in college. I got back together with [former Aerosmith and Ted Nugent manager] David Krebs, and now he's managing me. He's started a label, called Rock World, distributed by Sony, and

I'm looking for acts.

Paris...Quite a ways from East Tremont Avenue in the Bronx where you were born, right? What was your first tape recorder?

It was a wire recorder. My father worked as a brakeman for the railroad, and stuff tended to fall off loading docks. It inspired me to learn an instrument. Other kids were recording records onto them. I got more of a kick out of recording the guitar on it. I ended up learning to play that way.

When did you go to work at Record Plant? Was that your first assisting gig?

1969. I had just done an album for the Isley Brothers as part of a band. I was in a lot of bands, signed to many labels. Back then, we would actually sign to three different labels under three different names. I remember being signed to Bell, Epic and Columbia at the same time with the same band under different names. Whatever one stuck, that's who we'd be.

This band was called Privilege, signed to the Isleys' label, called Teaneck Records, distributed by Buddah. We were kind of heavy metal, and they wanted to move away from R&B. We were playing at Palisades amusement park [in New York], and they saw us and signed us. We recorded the whole album in five days on eight tracks. After they mixed it, I heard that they had added conga players and black female singers, and it had turned into an R&B record. I asked the engineer at A&R Recording if I could mix it. I didn't know my ass from my elbow. I found I dug the other side of the glass, and I was getting frustrated with the band scene. The engineer, Tony May, told me about this new studio where everyone was going—Roy Cicala, Shelley Yakus, Jay Messina—it was Record Plant. I got a job [there] as janitor, cleaning out johns and lugging Hendrix tapes around, and they were doing Woodstock at the time. I worked up from that to tape librarian and then to assistant.

How did you make the transition to engineer there?

There was an engineer there, Jack Adams. He was doing The Who sessions for what would be *Who's Next.*

He did the R&B that came into the place and didn't like rock, no matter who the artist was. So we get the room set up and he says to me, 'I hate this rock shit. I don't care about any of it.' Now Jack lived on a houseboat in the 79th Street boat basin. So he tells me to go into the other room and tells me to call him on the phone and tell him his houseboat is on fire. He was like a method actor —he needed motivation to lie. So I'm twelve feet away and telling him

Douglas (L) in the studio with Aerosmith

his houseboat's on fire, and I can hear him screaming, telling [Who producer] Kit Lambert and Pete Townshend that his boat's on fire. It's sinking in the boat basin. He tells them that I'm not the assistant but the other engineer on the session and that I'll be doing the sessions. Up till then, I had only done some jingle dates and one record session with Patty LaBelle during which I had set the old Datamix console on fire by knocking someone's beer into the transformers. So I was a little nervous.

So you became the engineer for Who's Next?

Everything was all set up. The first song was "Won't Get Fooled Again." Studio C, 16 tracks.

The Who's producer, Kit Lambert, was a bit flamboyant.

His father was a famous London orchestra conductor, and Kit had that same flair. Kit conducted the band, either by jumping around the control room or by playing with the lights. He insisted that he be able to get to the light dimmers and see the band at the same time. He'd make color changes during songs. We were in Studio A and doing a vocal overdub on "Won't Get Fooled Again," and Roger [Daltrey] was watching Kit

conduct his vocal. When it came time for the infamous scream on that song, Kit had wandered away from the lights and he literally dove across the board to reach them. It was a large Spectrasonic board. He made it, but he wound up with little indentations in his face from the knobs in the jukebox section. That's how I learned to produce—I took a little bit of Kit's flair, some of [Bill] Symczyk's laid-backness.

How did you record The Who, particularly Keith Moon?

They loved the sound of these old Sony D130 [mics]. We had those all over Keith Moon's toms and a D12 in the bass drum. Studio C was hard to get any ambience in. There was like 90 dB of separation—the old Hidley philosophy. There wasn't much room-miking until we got into Studio A. Keith would knock over all the mics while playing and hit them with his sticks. It took a lot of editing and erasing to get rid of that. On Roger Daltrey, we used a tube 47, 77 and a 67 for different vocals. Pete used a Hi Watt stack and a little Fender Princeton. We used a Sony on the Princeton, and a 57 in tight, and a Sennheiser in tight, and an 87 about six feet away on the Hi Watt.

Bob Ezrin [Alice Cooper, Flo & Eddie producer] got you into production?

There were a few famous producers I was working with who had a habit of not showing up and calling to see how things were going. Bob made me aware that I was already producing because of that. He got me to do some Canadian records, like Crowbar, to get me to, in a sense, open out of town, so I wouldn't fall on my butt in New York. He was priming me for the next Alice Cooper album, *Muscle of Love.*

Were you learning to mix for radio?

I always mixed for the radio. In fact, Shelly Yakus and I and the maintenance department at Record Plant set up our own AM radio station, WRPS. We had a transmitter and all the right radio limiting and would broadcast our mix from one room to another to see what it would sound like.

Shelly still does that, but now he uses a '57 Chevy for the band to drive around the parking lot to listen.

[Laughs] You drove by Record Plant listening to WQXR and suddenly you

were hearing mixes coming from Record Plant that weren't out yet.

Before we talk about John Lennon, let's talk about how you first got famous for your own appearance in Liverpool when you were about 19.
Right after I got out of high school, The Beatles were huge. Me and my buddy, Eddie, whom I played in bands with, decided to leave our shitty jobs—I was working at a blast furnace and as a ramp man at a drive-in theater making people sit up in their seats. We saved our money and took a tramp steamer to Europe. It was $112. The only problem was there was no fixed time you arrived at your destination. It was like a pirate ship. It had come up from South America with a load of bananas and rum and a lot of tarantulas on the bananas. So me and Eddie took off for Liverpool with stops in Newfoundland and Scotland and Ireland. On the crossing in the North Atlantic, that ship got real small. And the only passengers on the ship were me and Eddie and this weird hermit who only said, "Whooo" all the time.

We finally got to Liverpool, and being the naive kids we were, we had clothes and our guitars to join bands and become Mersey Beat stars. The customs officer asked for our work permits and return tickets, and we didn't have them. He said, "You're not going anywhere," and he told us to stay on the ship. I decided to jump ship. I borrowed some clothes from the crew and drew a mustache under my nose and walked right past the customs guy who was guarding us. I went to a phone booth and changed back to my clothes and wiped the mustache off and went walking through Liverpool.

[The Beatles'] *Rubber Soul* had just come out, and I saw in a newspaper that The Beatles were about to do a home-coming concert. There was absolute magic in the air. I went to the office of the Liverpool News and told a reporter about how two American musicians were being held prisoner in the harbor and they said, "this is perfect." They told me to sneak back onto the ship and they would have every paper in the north of England cover the story. They took me out for dinner and then that night I went back to the phone booth, changed back and walked right back past the

customs guard again. He never knew I was gone. The next morning, every newspaper from Glasgow to Birmingham had a story about us on the same front page as The Beatles' homecoming. A few years later, I was working on the [John Lennon] *Imagine* album. I told John the story, and he said, "I remember those two crazy Americans and it turns out it was you? Geez!" We became very good friends after that.

What was your production relationship with Lennon and Yoko Ono?
I was sort of the line producer.

Did he want to distance himself sonically from The Beatles?
He did and he didn't. Not from his own sound within The Beatles. Certainly that was the case on *Imagine*. By *Double Fantasy*, he was more mature, adult contemporary. We stayed close throughout the period. I was with him in Los Angeles during his craziness. I was also doing a lot of work for him with Yoko.

Was she difficult to interpret artistically for you, considering you were doing so much hard rock?
I was very into a lot of experimental things. I was a big John Cale fan, and

I listened a lot to Stravinsky. I had done some spoken-word stuff with [poet] Allen Ginsberg. I love music. I'll hang on any note of anything and find something I like about it. I would find something in Yoko that was valid and work on pulling that out, even if it was totally abstract. I worked on three records with her before John's death—like *Approximately Infinite Universe*, and some other real weird, experimental stuff; whole bands of instruments that were driven by steam engines, solos by dead rats...

Solos by dead rats? How do you mike a dead rat?

It would take too long to explain. It really prepared me to work on Patti Smith's *Radio Ethiopia*.

For Double Fantasy, *did John do his vocals at the piano?*

We did live vocals with every song; a lot of them were keepers. Everything on *Milk & Honey* was live vocals. I rehearsed the band for *Double Fantasy*. They didn't know who the artist was. When John spoke to me about doing the record, he was very insecure about going into the studio so he swore me to secrecy. He sent me tapes of songs with him on guitar or piano recorded in Bermuda on a little Panasonic machine. He told me to hire musicians and book a studio and if I told anyone it was him, it was off. I arranged the tunes and wrote them out.

Whom did you call?

It really was John's contemporaries—Tony Levin, Andy Newmark, Earl Slick, Hugh McCracken, George Small. John was about to turn 40, and they were around his age. I sang the parts at rehearsals at SIR. I booked the old Hit Factory. They didn't find out it was John until I took them to The Dakota the night before the first session. But a couple of them had figured it out from the music.

One thing that seemed to remain very consistent through a few records you did with him was John's piano sound. And that piano is right here at IIWII.

There was a philosophy of how pianos should sound. The way Roy and Shelly and Dave Thorner and I thought of pianos was the way John liked it.

The Beatles pianos were very bright, percussive pianos. And Lennon's was very mid-rangy. Was that the piano or you?

That was my ears and John's preferences. I used a couple of 87s and a Sennheiser in there, and I partially closed the hood and then had a 57 stuck between the hood and the piano body.

Aerosmith—you were refining and defining hard rock sounds at that point, and Aerosmith was probably the apex of that.

I had done an album for the New York Dolls as an engineer, but it was another one of those gigs where the producer didn't show up a lot, and I did a lot of the production work. The management company appreciated that, and the same management company had just signed Aerosmith. They

Douglas made the transition from assistant to engineer on this 1971 album.

had first approached Ezrin, and he thought it was too hard-sounding for him. And he suggested me. I was a huge Yardbirds fan, and that's where Aerosmith was coming from.

What was the miking approach on those records?

Both tight and open. We were very into in-time limiting, the room mics' compression being cued by the bass drum. It's ambient, but that ambience was always sucked up by the beat. It worked great for radio. Those were all 16-track records, and there's a lot of low end in there. If you look at a meter, you'd see them stand still.

How did you get Steven Tyler's guttural vocal sound?

I used an 87 or a 57 in front of him. But that was just for him to work off. I was really miking him with a Sennheiser shotgun from about ten feet away. All those vocals were done with a shotgun mic.

Cheap Trick—you were moving it back toward the center, taking hard rock and making it glossier.

I was going for a Beatles record, a modern Beatles record with a Mid-

western twang. They were intentionally glossy records. I would go for a little more realism on the instruments and clean, clear tracks and then process it with less limiting. It was just a poppier sound. For every tune, I would have precalculated approaches. For every song at this point, there would be a change in miking, different drums, different amps. Every song had to have its character. I did it with Aerosmith and did it more with Cheap Trick.

It sounds like you're starting to put more emphasis on the song rather than the artist. Graham Parker was one of the strongest writers you worked with, and it sounded like the sonic context of each of his tracks was more tailored to the song.

That's very true.

Were you transforming from sound producer to a song producer?

As an engineer it's hard to stop thinking about sound ever. But I was concentrating more on working with the character of the song. I probably started relying more on my engineers than ever before at that point. I was becoming more secure.

Was it hard to let go of the engineer inside you?

It was at first. But then it became more of a joy. You can't be listening to the performance and every sound nuance at the same time.

Was there anyone you wanted to produce but it didn't work out?

There was a David Bowie live album that Tony Visconti ended up producing. [Bowie and I] got along great together. We were both big James Dean fans. We'd talk about him for hours. Then after John's death, I got a call from his former manager, and he asked me if I'd be interested in doing a record with David. Then Bowie changed managers, and his new manager told me everything was off, and it never got back on again. It would have been a very big change in direction for me.

As you get back into the producer's chair again, what do you see has changed?

It's come back around for me. I can identify more with what's going on now than in the beginning of the '90s.

Hard rock is back.

Absolutely. I'm going to do what I want to do. I'm not lacking in funds. What I was lacking in was fun. ■
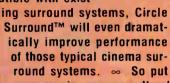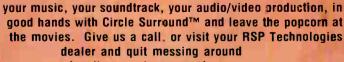
Dan Daley is Mix's *east coast editor.*

by Philip De Lancie

SHOWROM

INTERACTIVE MUSIC PROMOTION FROM 21st CENTURY MEDIA

S o far, most interactive multimedia CDs that focus on music have been oriented toward the interests of music consumers. But what about the professionals who make the music? Does interactive multimedia have something to offer them, as well? A new CD from 21st Century Media, entitled *The Studio Directory*, takes that question on directly, and the answer is a resounding "yes."

In a CD-Audio player, *The Studio Directory* allows you to hear tracks—including selections from Tom Waits, Huey Lewis & The News, Narada Michael Walden and Teja Bell—recorded at ten studios located in the North Bay region of the San Francisco Bay Area. The studios, all commercial multitrack facilities, include Studio D, Muthers, Prairie Sun and Walden's Tarpan. In a CD-ROM drive, the disc becomes an attractive multimedia promotional piece offering access to information about each of the studios, including equipment lists and narrated QuickTime video tours. There is also an "interactive interview" with Walden. 21st Century refers to the multiplatform (CD-Audio, PC and Macintosh) promotional disc as a "ShowROM."
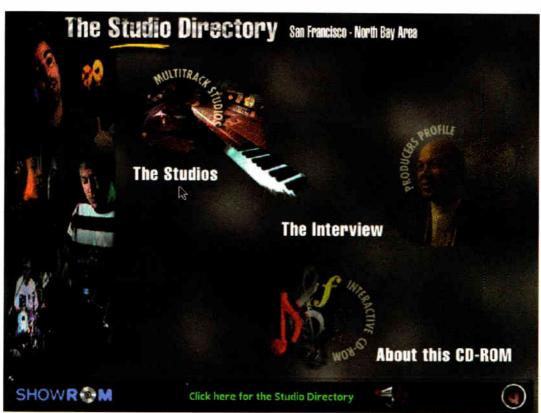
The ShowROM concept seems to offer an effective way to showcase

The main menu from 21st Century Media's ShowROM **The Studio Directory**

Top left: The Studio menu; Top right: section on Studio D; Bottom: Interactive interview with Narada Michael Walden

recording studios or any of a variety of other services or products where stand-alone CD-Audio tracks can complement interactive multimedia content. To combine the data and CD-Audio material on the same disc, 21st Century chose the TrackZero technology championed by ActiveAudio Labs. TrackZero avoids the infamous "track 1 problem" inherent in traditional mixed-mode (audio + data) CD-ROMs, but it has some problems of its own: Only two of the four computers (two Macintosh, two Windows) on which I tried the disc were

able to recognize that there was anything on it other than CD-Audio tracks. According to ActiveAudio, this limitation is well on its way toward resolution (see sidebar, "TrackZero vs. Stamped Multisession").

Although The Studio Directory demonstrates a professional application of the ShowROM concept, 21st Century is pushing the idea, in concert with companion kiosk and online products, primarily as a way for record companies to promote their artists to music consumers. To explain more about ShowROMs and how he

hopes they might be used by the music industry, 21st Century Media's founder and president, Jim Baker, spoke with me from the company's office in San Rafael, Calif.
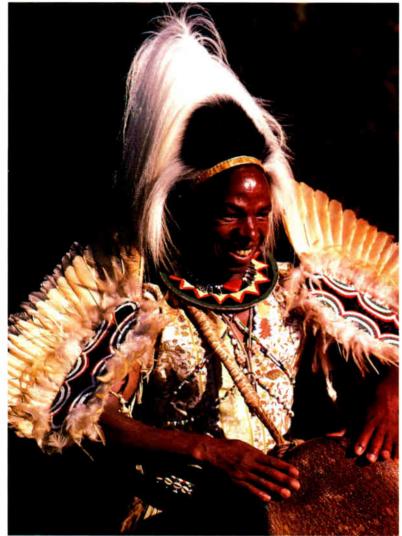
How do you define a ShowROM?
A ShowROM is designed to be a promotional showcase for a particular product, whether it be an interactive music product or anything else. It is being actively marketed to record companies worldwide. We are approaching those companies, saying: "Here is a free CD, The Studio Directory. See how it is an audio CD, but if you put it in a computer, you also get this interactive stuff. We can do a similar thing for your artists." So we are definitely promoting ShowROM as a saleable product and selling ourselves as a production company that can make it for them.

The ShowROM engine is designed to deliver any kind of interactive video animation or graphics. It is essentially a set of code for navigational tools: back, forward, the volume thing, the way it calls video up, the way you can play the Red Book audio tracks from within the interactive interface. All of that is quite intensive, custom code that we spent a long time putting together that was not available previously. We are using off-the-shelf authoring tools, but we put it together. For instance, we used Macromedia Director, but we wrote seven different X-Objects that were quite lengthy pieces of code to vastly improve the playback of the video, to control the audio on the Mac and the PC, to control the playback of the Red Book audio part. We built our own audio controller. All that took us quite a bit of time, and we are refining it all the time.

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What does ShowROM have to offer as a promotional tool over existing promotional devices such as music videos?

It is not just a question of a pop video on a CD. If it was, you could just go out and buy the videotape at the video store. The point is to add a personal angle to any video you shoot. If you look at the Narada Michael Walden interview on the *Studio Directory* ShowROM, you definitely get the impression that this is a very one-to-one conversation. It is very warmly lit, and he is talking in a really rich, quiet voice. And he is being very intimate with the viewer. He reveals some very interesting things about some of the artists he has worked with, like Whitney Houston and Aretha Franklin, and you are just drawn in.

We would want to do the same thing with a recording artist, so we would go to Band X's lead singer's house, interview them, get to view where they live, what their hobbies are and their sports. This gives the fan a much closer relationship with the artist than you can get on a pop video or a concert. There is very little material like that out there. Even on MTV, it is something that is played once and then it's gone. On the CD, you can capture so much. We are definitely trying to approach it from that angle, and it is working well with many of the record companies.

How do the kiosk and online elements fit together with ShowROM?

TrackZero vs. Stamped Multisession

In the game of setting standards for new formats, big players like Sony, Philips and Microsoft usually hold all the cards, and it is generally not easy for small companies with different ideas to make their voices heard. In the case of a combined audio and multimedia CD, however, the giants are moving too slowly and uncertainly for many who want to begin releasing product as soon as possible. That creates a window of opportunity for those offering alternatives to the "stamped multisession" idea put forth by Sony and Philips and referred to by Microsoft as "Enhanced CD."

The stamped multisession format is based on the Orange Book standard, which allows the playback of CD-Rs (including Photo CDs) recorded in multiple sessions rather than all in one pass. Instead of being recorded, however, enhanced CDs will be replicated (stamped). Music tracks will appear first on these discs, followed by a separate "session" of multimedia data. CD-Audio players can only recognize the first session on a CD, which means that consumers with older CD players (those that do not automatically mute in the absence of audio data) will be protected from the potential trauma of accidentally playing the data through hi-fi speakers.

The leading alternative to stamped multisession is variously referred to as the "pregap" or "track 0" solution, a single-session approach in which the data is stored in the pregap that precedes the start of the first track on an audio CD. The use of the pregap for data was envisioned several years ago in the "CD-I Ready" format promoted by Philips, but the idea (like CD-I itself) never really caught on.

Now that the installed base of desktop CD-ROM drives has hit critical mass, several independent labels have leapt into the interactive music market with variations on the pregap approach, including Circle Interactive, Ardent Records and AIX Entertainment. Most major labels, however, are leery of the pregap idea because it is possible (though not particularly likely) that consumers will scan backward from the start of track 1 into the data track. So far, the only major to transcend these consumer-liability fears is BMG/Ariola Australia, which released a CD single last fall from the group gf4.

The gf4 single used TrackZero technology developed by ActiveAudio Labs, a division of Pacific Advanced Media in Australia. Among the advantages of Track Zero discs, PAMS points to the fact that the data is written first—at the inside of the CD—rather than after the audio as in the proposed enhanced CD. PAMS claims that it makes accessing data from disc 1.5 to 2.5 times faster, as well as more reliable because molding anomalies tend to be worse (creating higher read errors) toward the outside of the disc.

Despite these advantages, pregap solutions share a major obstacle with multisession CDs: The discs are not currently readable on all CD-ROM drives. Microsoft has announced that it is working with all PC-drive vendors to ensure the upgrading and distribution of software drivers enabling the reading of enhanced CDs. But the company acknowledges that 40% of the installed base of drives have hardware limitations precluding an upgrade to multisession.

For its part, PAMS acknowledges that not all drives can find data when it is stored in the pregap, which means that TrackZero discs may mount as regular audio CDs rather than interactive CDs in those drives. But the company claims that the problem is strictly a matter of updating software drivers, and that the drive vendors have been very receptive to incorporating the CD-I Ready specifications into updated drivers.

On the Macintosh, PAMS claims that 95% of drives can already play the discs, based on the fact that Apple's drivers are already compliant (some third-party drivers are not). Compliance on the PC side is lower, perhaps 60%. But PAMS says Creative Labs has already updated its drivers, while NEC has "announced their commitment to support ActiveAudio...and expects new drivers to be available shortly." According to PAMS's Brett Crossley, "The fact that Creative and NEC—the two big names—have announced TrackZero compatibility has guaranteed that the other manufacturers will comply." Updated drivers are being posted on the Internet (ftp.interconnect.com.av indirectory\pub\ibm-pc) as they become available, and are being distributed on floppy. ■

ShowROM is part of a collection of marketing tools called ShowSeries that we are promoting right now. We are rolling out this set of tools at the Music & Multimedia Conference in San Francisco at the end of May. ShowPoint is an interactive point-of-sale kiosk, and ShowNet is our integrated online service. That is a World Wide Web home page. We will ship software on the ShowROMs that will allow the user—Mac or Windows—to double-click on an icon and connect to the ShowNet page that is relevant to that particular ShowROM product. So if it is a ShowROM for Band X, they just double-click on the icon to log on and go to the page for Band X, which gives all the latest information: tour dates, reviews, etc.

Basically, the idea is to "perk up" audio CDs with ShowROM, and then perk up the ShowROM idea with ShowNet. I got pretty tired of the fact that you spend two, three or six months developing a CD-ROM, and it rolls out the door already out of date. By having this real-time live loop into the Internet, the ShowROM doesn't go out of date. It can be continually updated. And we will design the home page for that specific ShowROM to be reminiscent of the interface on the CD-ROM itself, given the limitations of graphical throughput on the Internet.

How much does it cost to create a ShowROM title, and how much might it add to the price of a music CD?

The cost of doing a ShowROM is considerably less than doing a fully blown CD-ROM title, because we have this set of tools, a shell into which we drop audio and video and graphics. So we are trying to convince the record companies that they should add this interactivity at no extra cost to the consumer. There is, of course, an initial resistance to the idea of not increasing the price of the disc. So the response is mixed. Many understand our point, because the cost of development is only between $30,000 and $50,000. And that can easily be factored into the promotional budget of an average audio CD. It's a great way to launch a new act, and a great way to gain some press.

What kind of response have your efforts to promote the ShowROM idea received so far?

We are having a lot more interest from the independent labels than we are from the majors, because the majors say they are already exploring these avenues themselves, which they are. But the independents are often trying to find someone to work with on this kind of thing.

How does the Studio Directory *ShowROM fit into the overall ShowROM picture?*

The Studio Directory was really made to demo the ShowROM's capability. 21st Century Media basically paid all the costs of development. The studios only paid $250 to $500 to be on there, really just a token payment, and they got 25 free discs each.

Many of the studios could not afford to pay more than they did to be on the CD. So you won't be able to do a series of discs funding it from the studios themselves. You would need to have a backer who is doing it for his own promotional purpose. If somebody came to me and said, "I'll sponsor you doing a New York version," then we would ultimately do it. But I'm not going to fork out of my own pocket to do more. Also, you can only really fit 10 studios on a CD, so you would have to do an awful lot of discs to cover California or anyplace else. And I don't think there are that many studios that can afford to promote themselves this way. So to me, the *Studio Directory* thing is not commercially viable without a sponsor.

What is the difference between ActiveAudio and other techniques that store data in the pregap before track 1?

Essentially, there is no difference. ActiveAudio is a convenient solution for the developer who has neither the time nor the interest in custom developing the technology to hide the data in the pregap. ActiveAudio is offering the solution off-the-shelf. It's not something done during the premastering on your desktop, but in the glass mastering stage at the replication facility.

What fees and costs are involved in using the ActiveAudio approach?

They charge for it in two ways. The developer pays a fee to ActiveAudio Labs for the mastering, less than $2,000 including the glass master. And there is a royalty, which is very small: a couple of cents per disc. Currently, you have to have your project mastered in Australia, but ActiveAudio Labs is licensing a number of replicators worldwide, which will then take

the hassle away from the developer or publisher. The replicator will then just charge a small fee on top per disc. Instead of $1.00 per disc, you might be charged $1.05.

Many CD-ROM drives apparently are not able to find the data on data-in-pregap discs. Doesn't that limit the usefulness of the ActiveAudio technology?

There are issues surrounding the track 0 technology. Some drivers—software, not hardware—still do not support the data-in-pregap technique, either because they are old drivers or because the companies that wrote the drivers did not feel that it was a requirement, because it is not a commonly used feature of the CD-ROM format. So it is just a question of manufacturers bringing their drivers up to the CD-I Ready spec. It is a software issue.

As a licensee, it is obviously important if I am going to produce titles using the technology that it is supported across-the-board by driver manufacturers. But I have to rely on the inventor to lobby the manufacturers to ensure that they follow this standard, which has already been defined and which major manufacturers like Apple already incorporate into their drivers.

This whole issue is exactly why we made the *Studio Directory* a giveaway, using the ActiveAudio technology. Originally, we were planning to make a commercial product. It was going to be sold for $9.95 or something. But I looked very closely at the technology and decided at that point that I would rather make it a free CD that would serve two purposes: firstly, to promote the North Bay studios, and secondly to promote the technology. I did not want to get involved in the issue of technical support for customers who have paid and thus totally deserve to have a product which functions. The decision was made back in November, when ActiveAudio Labs was not quite as certain about the success they were going to have with the manufacturers over the driver issue. Titles that we produce in the future will be supported well enough to make them chargeable products.

Why did you decide to use the ActiveAudio system over a multisession CD-Plus approach?
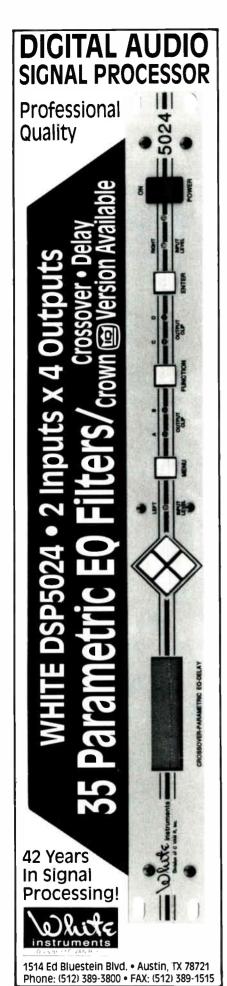
We were launching the ShowROM concept, which is a marketing tool. It doesn't matter what technique

AUDIO & MULTIMEDIA

ShowROM uses; it could be using ActiveAudio or CD-Plus—any technique which effectively separates the interactive partition from the audio partition. We have a CD-Plus version, which we showed at MIDEM. However, CD-Plus/Enhanced CD is not shipping yet and does not function in the majority of computers. It certainly doesn't play back yet on the Mac using the standard Apple drivers. With Toast (a CD-R recording software package distributed by 21st Century Media), you can burn a CD-Plus that runs on an Apple, but only because the package includes a driver that lets you mount CD-Plus discs on your Mac. The Apple drivers themselves do not support CD-Plus out-of-the-box. I am assured by Apple that they will have drivers very soon that support CD-Plus.

It's important to remember that CD-Plus is a big political issue, not just a question of technology. Originally, you had Sony, Warner and Microsoft all sitting down with Apple to come up with an agreed format for enhanced-music CDs. They agreed on the stamped multisession approach, but then Microsoft went around the corner and trademarked the name "Enhanced CD," and they have been touting it as their own solution for the music business. The conversations between Apple and Microsoft fell apart, and Sony, who have been sitting on their Mariah Carey CD-Plus title for months, is wondering what to do now. Meanwhile, the RIAA was incensed by a Microsoft press release which said that the RIAA had endorsed Microsoft's Enhanced CD, which was not true. What the RIAA endorsed was CD-Plus as a concept.

Anyway, as a developer, I need a product now which answers the problem for mixed-mode discs. Even given its initial problems with certain drivers, ActiveAudio is delivering a solution which is pretty neat, and I would rather pursue that solution than wait for the political furor over CD-Plus to calm down.

Describe the typical production process you envision for ShowROMs. The more material we are provided with, the quicker and easier the production process. Our typical client in the record industry would already have their CD-Audio tracks together. We are given that material, and we figure out how much there is, and we find out how much space we have left on the disc. So then we know the parameters for developing our interactive content.

The next big question is video. Has it already been shot, or are we going to have to go out and shoot video of the band performing, or in rehearsal, or at their homes relaxing—all the different kinds of video that the typical fan is going to want to see? In *The Studio Directory*, there was no existing video at all, so we had to go out and shoot 10 different studios on 10 different days, on location with a crew. That obviously adds considerably to the finished budget. At least 50 percent of the total production cost can very quickly be taken up by on-location video shoots. And that is going to be a consideration for the label.
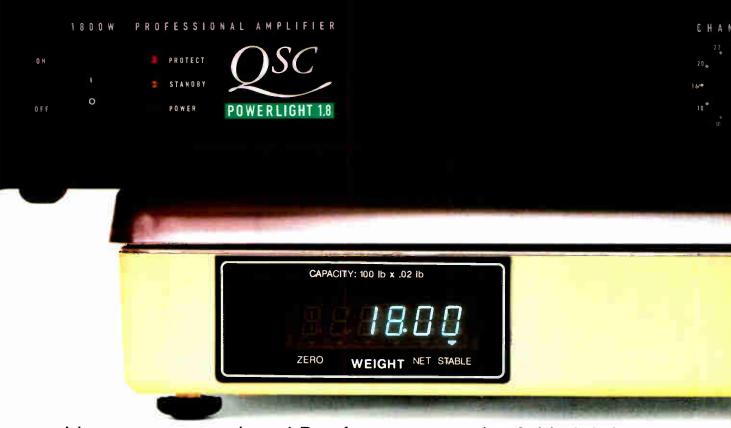
So we would go out and shoot video if we need to, then bring it back into our multimedia production system and edit it and compress it. Then we combine it with the material already provided by the label or artist. Then we go about the basic process of designing the screens, which we can knock out really quite quickly. The graphics just drop in behind our existing interactive interface, and we then piece it all together based on the storyboard.

The ShowROM functionality is maintained throughout each project, but the look and feel can be completely customized for each artist. The programming part is always the most time-consuming part of any interactive project, and that has already been done. We paid for that in our development time. What the client is paying for is the time of collecting all the custom graphics, designing them in Photoshop, knocking it all together and the general assembly of the material for a cross-platform CD-ROM.

Once we have that all together, we burn a number of one-off CDs for testing between the Mac and the PC, and we then prepare the project to be "ActiveAudio-ized." When we are building a one-off CD, the audio tracks start at track 2, because the data is in track 1. But when it is ready to be converted to ActiveAudio, the data goes in track 0, and the audio tracks start at track 1. ∎

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

PowerLight.

Some Spears,
Some Ghosts,
Some Gorillas...

SOUND

FOR THREE SUMMER BLOCKBUSTERS

BY TOM KENNY

TREKKING THROUGH THE "CONGO"

Few shooting locations on the planet can be more challenging for a production sound mixer than a tropical rain forest. It's wet, even in the dry season. It's hot. And the insects are big and loud, making it difficult to pull clean dialog tracks out of the back grounds.

Nearly half of Paramount Pictures' action-adventure thriller *Congo* involves a trek through the Congolese rain forest (actually shot over 30 days in Costa Rica), with a corporate-sponsored expedition in search of legendary diamonds from the Lost City of Zinj. The trek brings them ultimately to the top of a volcano and a confrontation with fierce, man-killing gorillas that have been bred for centuries to protect the precious stones.

"I must say, this was the most strenuous working situation I've ever been in as far as carrying things in," says production sound mixer Ron Judkins, who last year received two Academy Award nominations for *Jurassic Park* and *Schindler's List*, winning for *Jurassic*. "A lot of the locations were over lava and pumice stone. One location—the Irazu volcano—was over 10,000 feet, and several people got sick. The trucks got within about a 10-minute hike, and we set up right on the edge of this extinct, but still hissing crater. The cloud floor was below us, and we had these red tents set up against a blue sky—really beautiful for the first part of the day. Just after lunch, the clouds started rising right through us, like the fog rolling in. The temperature dropped 20 degrees, and within 30

"BRAVEHEART": BATTLES OF THE 13TH CENTURY

They just don't make films like *Braveheart* anymore. Not with 1,200 men riding over a hill on horses, ready for battle. Not without digital doubling and tripling post-production techniques, which can make 50 people appear to be 500. Because of its sheer size (the 1,200 extras were all reservists in the Irish army) and dramatic look, *Braveheart* hearkens back to the glory days of *El Cid, Lawrence of Arabia* and *Spartacus*.

The word is that this picture, which tells the tale of a Scottish knight who rallies the peasants to repel the English invasion of the late 1290s, wouldn't have been made in today's Hollywood without the perseverance of director-star Mel Gibson. It was a costly and lengthy undertaking, shot over five months on locations in Scotland and Ireland. To re-create the feel of the 13th century, director of photography John Toll, who won an Academy Award this year for *Legends of the Fall*, has said, "I was determined to make a gritty, realistic picture as far as possible. This is no Pollyanna story. The weather and mud in Scotland made life difficult...but the grim, dark overcast and dripping environment up there added a lot to the picture."

Not surprisingly, co-supervising sound editor Per Hallberg (he shares the title with Soundelux's Lon Bender, as he did on *Legends of the Fall*) attempted to achieve the same feel in the audio tracks. "The 13th century is way before anything mechanical," Hallberg says. "There are obviously no motors, no gunshots, no explosions—nothing like that that would help us fill the backgrounds in that way. So we had to go all organic, with a lot of wood, leather and that kind of feel. The picture was shot to look wet, dirty and gritty, and we're trying to match that in a sense—not too

PHOTO MERRICK MORTON

PHOTO COURTESY OF INDUSTRIAL LIGHT & MAGIC/UCS & AMBLIN 1995

Gary Rydstrom at Skywalker Sound

PHOTO: KERRY MORDOQUIST

Ghost Swishes For "Casper"

He's a friendly ghost, this *Casper*. Boyish and innocent. Clever and rascally. A regular, albeit transparent, kid who lives alone in a 19th-century haunted house. His parents are dead, which leaves him somewhat at the mercy of his three evil uncles. Together, they are the most talked-about computer-generated creations since, well, since dinosaurs walked, ran and leaped through movie theaters two summers ago.

But where *Jurassic Park* had about eight minutes of actual computer-generated dinosaurs on screen (the rest being models and robots), Amblin Entertainment and Industrial Light & Magic have crafted more than 45 minutes of ghosts for this summer's blockbuster cartoon-cum-movie. Much of the crew that worked on *Jurassic* is intact for *Casper*, including associate producer Colin Wilson, visual effects supervisor Michael Lantieri and the audio post-production team at Skywalker Sound, led by *Jurassic*'s Academy Award-winning sound designer Gary

Rydstrom.

"*Casper* is certainly not real life," Rydstrom says, "but it's not meant to be cartoony, so it's not going to have too many traditional twangs and boings and those sorts of sounds. But Casper can transform himself into things; he can twist around and pass through walls, so it's always finding that point in between that's a little outrageous and fun, but not Hanna-Barbera tracks. We have four main characters created out of the computer—the kind of stuff Hollywood's been talking about for a long time. From my point of view, when the visuals are so high-tech and so different than anything we've ever seen—and so knowingly unreal—I think it's even more important that the sound effects are as grounded in reality as you can make them. This is

not meant to be a live-action cartoon. It's meant to be the real world with Casper in it."

To place Casper in the real world, Rydstrom incorporated recognizable sounds into the countless segments of ghost swishes and movements. Wind, of course, was a starting point, but wind alone would cause problems because it's so prevalent in many of the backgrounds, including those in the haunted house, where it whips through cracks and doors and windows. "If the ghosts just sounded like wind," Rydstrom says, "they would be indistinguishable. What I found to be most effective was isolating those moments when wind really buffets against the microphone. We got a lot of the source material by sticking a microphone out of a car sunroof while driving, and iso-

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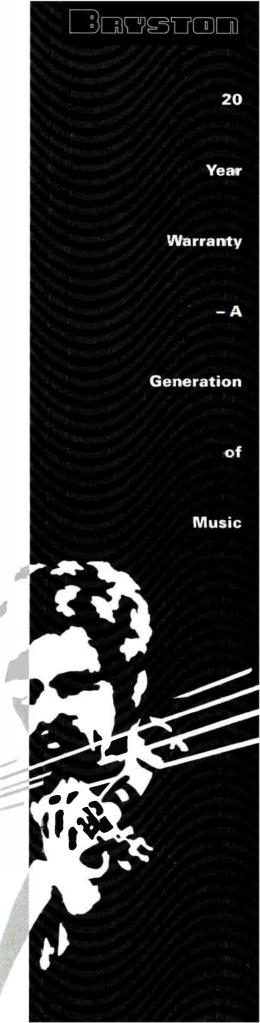
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lating the buffeting sounds from the steady wisps. We used that for quick or deep movements.

"A lot of the Casper sound turned out to be from a tympani," he adds. "We started playing around and getting all the sort of comic, traditional vibrating sounds. Then by accident, I played around with blowing air through a tube and sticking it on top of the drum, and it made this whistling, airy sound that was just wonderful in the way it resonated within the cavity of the tympani. Those are the choral-type, what I consider vocal-ish, wisp sounds that work well for Casper. It was something I didn't expect at all, but that always happens when you do these things.

"Then for the bad ghosts," Rydstrom continues, "instead of sounding light, wispy, happy and weightless, the bad ghosts have to sound deep and menacing while still seeming to have audio transparency. So I've done a lot of microphone distortion and feedback—all the ugly stuff that we try to avoid. I set up a feedback loop in my studio and played sounds through a live mic back over the speakers and did a whole bunch of things, like slapping my hand, or hitting the mic, or blowing into the mic. That looping feedback sound had a very nasty, ghost-ly quality.

"We also recorded one of those revolving doors in a bank, and out of curiosity we pushed it backward. This squeaking glass sound was really horrific. The people in the bank would tell us to stop because it sounded like we were breaking it, and of course, we said we would stop. They would go back to work, and we would push it back again, getting as many small snippets as we could. Played down an octave with echo added, it's a very scary ghost sound."

These ghosts tend to move around a lot, transforming themselves, passing through walls and flying up in your face in a split-second. From an audio point of view, some of that will be manufactured in the mix with the use of a joystick and by taking full advantage of the 6-channel discrete digital formats. And some of it was taken care of in sound design, some of it with plungers. "An amazingly useful prop," Rydstrom says. "I hate to be so low-tech about it, but they're very airy, and you can get a great variety of sounds from pushing down on plungers, spinning your hand in plungers, pushing two plungers together—not just the traditional sucking sound. It works well for Casper passing through walls. If anyone wants to try it at home, there are sounds you can get that don't sound like the comic plunger."

Perhaps the biggest challenge Rydstrom faced was creating enough variety in the ghost movements so that the effects didn't get tiresome. A library of source material resided in Rydstrom's Synclavier, and he could perform layered effects musically to imply motion and emotion.

"Ideally, Casper's sounds will shift as his mood shifts," Rydstrom says. "The simple trick is to pitch-wheel the sounds—a slower pitch tends to be sadder. But I have so many basic sounds for Casper that eventually I start saying in the back of my mind, 'Well, that's sort of a happy, quick takeoff sound, and this is sort of a forlorn, lovelorn Casper sound.' Even though they may be made from the same source materially, they have almost a vocal quality to them, almost like singing, that can be very emotional. [On the Synclavier] you can make use of it like you would music and choose the sections and play them. And that's a great way to think of effects. If you think of them strictly as sound effects, then you usually end up trying to do something that's a literal representation of what you see on the screen. But it's more fun to think of it as doing something a little more emotional for the movie." ∎

minutes, it was pouring rain. It was dreadful."

Rain, Judkins says, was the most problematic aspect of the shoot, right up there with the 95-degree temperatures that often created sauna-like conditions. The crew had towels, umbrellas, tarps, hair dryers and compressed air, but it never seemed enough. "There would be no place outside the truck to set up, and you would have ten people working out of one truck—camera people, video people, stills and sound, all with muddy boots and wet clothing. The truck was so humid inside that we actually had mold growing in our cases. When I put the equipment away at night, we would blow it out with compressed air and towel everything off, then we'd open the case in the morning, and the top cover of the StellaDat and the Sonosax mixer would be fogged. Your heart sinks, because this gear can't live through these conditions forever. But I was amazed at how well the equipment stood up, especially the StellaDat."

To be honest, Judkins admits, he twice encountered audio dropouts of about two seconds on the StellaDat, both times in a full rainstorm, with 90-degree temperatures. After bringing the tapes to Manfred Klemme at Sonosax USA, which now makes and markets the StellaDat, it was determined that the tape itself was so moist

Production sound mixer Ron Judkins on location in Costa Rica, with his Sonosax mixer and StellaDat and Nagra recorders.

PHOTO MERRICK MORTON

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that it was sticking to the drum at the beginning of a take. "The interesting thing," Judkins says, "is that both times it happened, the Panavision camera died before the StellaDat."

There are no sound carts in the jungle, so Judkins, boom operator Bob Jackson, and cable operator Tove Blue carried everything in three modified backpacks. The first held the 6-input Sonosax mixer and a Nagra 4.2. The second normally contained the StellaDat and a Lectrosonics radio mic receiver pack. The third held the transmitter, all the headsets and all the D cells and battery power. One of the main knocks against portable DAT machines is that they draw a lot of power, but Judkins says that in the redesigned StellaDat, the power needs have dropped considerably. Even on a set, Judkins prefers to use his own power.

"Most days, we would also carry in two 26-amp-hour, lead-acid batteries in cases," Judkins says. "They sound big, but they're not. One of them would power the StellaDat for about 12 continuous hours, and the other would power the mixer for about 15 hours. There's also a back you can get for the StellaDat that takes the NP-13 batteries that Sony developed to power those camcorders. The machine will run about an hour on one of those, and I had four of them. When we got into places where we really had to hike far, I would just bring those. Then I would power the machine up for the shot and turn it off for the waiting time. It was a little nerve-wracking; generally, you just let the machine cook all day."

Despite the logistics of the trek, Judkins was able to use conventional booms more than might be expected. For wider tracking scenes where the actors talked, they were pretty much forced to go with radio mics. And though he prefers to record completely flat, the radio mics forced him to use some "gentle" EQ. "Depending on how acoustically transparent an actor's clothing is and what you have to do to bury and hide the microphones," Judkins explains, "I'll use a little mid- and high-frequency boost to restore sibilance that's lost through the clothing. Basically, I find that it's sibilance that makes the human voice intelligible. I try to do as little EQ as possible, but there are times you have to do some to make the radio mics sound natural."
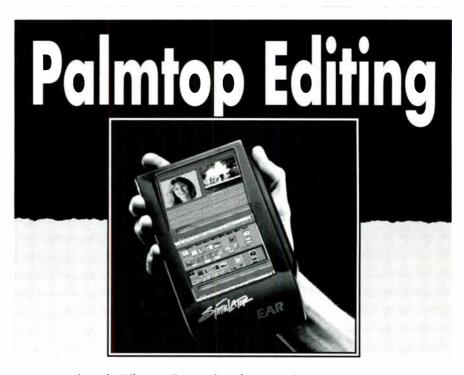
Before heading to the jungle, Judkins had been invited to a post-pro-

duction meeting, one of the first times that had happened in his 15 years in the business. Besides the chance to meet the audio team involved in post, Judkins learned that supervising sound editor Wylie Stateman prefers M-S stereo effects recordings over X-Y, and got an idea of what direction the sound design would take so he could record some effects on location.

After the Costa Rica portion of the shoot was wrapped, Judkins and boom man Jackson stayed three extra days to capture additional ambiences and the sound of howler monkeys, which make a low, throaty growl—

likened by producer Kathleen Kennedy to the dinosaurs in *Jurassic* —which Stateman wanted to augment the gorilla vocals.

"We almost didn't get them," Judkins says, "because when it's raining they don't make any sound. At the end of three days in Tortuguero National Park, the sun finally broke out at dawn. And the monkeys were so happy that we found about a dozen of them sunning themselves in the tops of the trees—just relaxing and picking at themselves, but not making a whole lot of noise. But then our boat guide took his paddle and slapped the surface of the water, which annoyed

them, so they started howling and growling." (Despite Stateman's wishes, he was forced to use a matched pair of Sennheiser MKH-60s in an X-Y pattern after the Neumann M-S failed in the high humidity.)

"We also got some really great ambiences in these jungles—several hours at different times of the day, with parrots calling and all kinds of bird life," he adds. "And there are different kinds of jungles. The jungle at Arinol is a higher-altitude rain forest, and there wasn't much insect life. When we went down to Tortuguero and the lower-altitude jungles, the birds and insects got louder and became this great din, this whine that after a few hours got on your nerves. But the characters in the film trek through different parts of the jungle, and the different sounds create very different moods in the film. This is an action-adventure movie, so I can imagine that when they want to create a real feeling of anxiety, these insects are going to be played *loud*." ∎

Lon Bender and Per Hallberg, co-supervising sound editors on Braveheart

clean, yet very tasty. For example, we're not trying to overwork the production dialog in editing, and we've discussed with head re-recording mixer Andy Nelson the idea of not overprocessing any of the tracks. Even Mel Gibson is dirty, and his hair's not washed, and he's sleeping outside. It's not meant to be pretty and slick and glorified in any way."

There are quiet moments in *Braveheart*, mostly within castles or the village huts, but undoubtedly, the biggest challenge for the sound crew was the huge battle scenes, one of which lasts nearly 15 minutes on screen. Portions of the battles were shot MOS (without sound), although the production benefited from having effects recordist Nigel Holland on the set to gather the sound of 1,200 men marching, screaming and fighting. That became the bed upon which more specific Foley and effects were added. And there was a lot of Foley and effects.

"We started with basically nothing from production," Hallberg explains. "But we still have to pay attention to what's happening without overdoing it. So the basic, in-the-bottom putty, if you will, was recorded by Nigel and the production mixer, Brian Simmons, on the set—the sounds of 1,200 men marching. That's good for depth and width, but it's too indistinct to cut through with a lot of definition. On top, then, we added Foley marching and group marching—we did a lot of wild recordings outside with smaller groups of people. And then we layered it together in such a way that it played without becoming mush. It has to have the

World Radio History

detail and stay exciting.

"Then, when the battle starts, we have no guns and explosions, so it's all hand-to-hand combat, which brings you in very close to the action," he continues. "We have quick cuts on a battle scene that's maybe 15 minutes long, and to keep people interested we had to be very careful to have it not sound monotonous. So we spent a lot of time on exterior recordings. We had this big group that we called 'Impacts and Weapons,' where we did exterior recordings of sword hits, metal shings, metal impacts, impacts into different body types and flesh. Then we spent another day on the Foley stage doing more wild recordings of all these sounds, and we built a big library of all of it, with a lot of variety."

The interior Foley work was done at Warner Hollywood by walkers John Roesch and Hilda Hodges, mixed by Mary Jo Lang and recorded by Carolyn Tapp. Foley and ADR were edited on mag. Peter Sullivan, the main effects editor, cuts on a StudioFrame, though many Pro Tools, Synclaviers and other setups were also employed. It was Sullivan who came up with some of the unique arrow-bys, by setting up a mic and recording the whiz-by of bent arrows, arrows with holes in them and arrows with objects tied to them. "Each show has to have some new good things, and I think Peter's been coming up with some...what the bullet-bys were in *True Lies*, the arrow-bys are in *Braveheart*."

Group ADR sessions were also recorded outside—small groups and single people running by the mic giving a war-whoop battle cry. It was the same idea: to add definition and detail to enormous scenes that run the danger of turning into audio mush. "When you get outdoors, the feel is very different from what you get on an ADR stage," Hallberg says. "You get a whole different character to the sound. We have to then make it sound real and build it into the scope of the entire movie. The music is coming from James Horner, so we know it will be good; we know it will be big, and we know they'll want to hear it. So our material has to be done in a way that it plays within the score. We have to be specific, and we have to be minimalistic—a less-is-more concept within this grand scope. And I think we've done that." ■

Tom Kenny is associate editor of Mix.

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ABSOLUTE AUDIO

ABSOLUTE AUDIO

BY TOM KENNY

POST · SCRIPT

Monitoring Systems

by Larry Blake

In the past four columns, I tried to show how it's possible to mix stereo films using inexpensive technology originally designed for project studios. Though I don't think that Hollywood will be scrapping its $500,000-plus consoles and banks of mag machines in favor of Eight-Bus Wonders and modular digital multitracks, my Big Toe tells me that any day now, some kids working out of their parents' den will rock our socks with the next Great American Sound Job. (Which will probably be for the next *Citizen Kane*, directed by a youngster in the Midwest armed with a Hi-8 camera, as Francis Coppola has predicted.)

There's a pretty good chance that said *wunderkinden* will probably be monitoring on dad's hot-rodded home theater system. And though I think that the explosive growth of home theater is a happy thing, you definitely need to proceed with caution. I am *not* recommending that home theaters are the place to mix movies; I'm only saying that if that's all you have, then go for it! You won't be breaking any laws, and you will not impede the cure for cancer.

But first, I strongly recommend that your system have three matched main LCR speakers—the larger the better. As good as small satellite speakers can sound, I don't think that's the way to go. If you already have high-quality main stereo speakers and only need to add a center channel, make sure that it is as good as you can afford, keeping in mind a basic match to LR. But before I go much further, it's important that we recap some of the basics that apply to re-recording stages and theaters alike.

The monitoring part of a film sound system— whether a mixing stage or a theater—is known as the B Chain and includes everything from the main fader to the room EQ, power amps, crossover networks, speakers, screen, and last but not least, auditorium acoustics. (The A Chain, as you might imagine, is the transducer—optical or mag preamps or D/A converters—plus noise reduction and matrix decoding, if applicable). The international standard for the electroacoustic response of theatrical films is known as the "X" (for extended, not rated) curve, which measures flat from approximately 40 Hz to 2 kHz, where a 3dB-per-octave roll-off commences. For small dubbing stages and screening rooms, a modified curve is used, with a gentler (1.5dB-per-octave) roll-off above 2 kHz. Though this may seem severe, please note that the X curve was designed to allow the very far-field situation of film sound to match near-field flat monitors. The hows and whys of this are quite complicated, and I can only say that my experience proves that the theory translates to the real world.

Alignment is accomplished by generating pink noise into the system on a per-channel basis, feeding into a real-time analyzer the output of a calibration microphone located approximately two thirds of the way back in the auditorium (or at the console). It is recommended that you use *four* microphones, averaging their outputs with a "multiplexer." A ⅓-octave equalizer is adjusted until you achieve the desired curve, although this is a gross oversimplification and adjusting room EQ is nowhere near as prosaic and tangible as reproducer EQ on an analog recorder. "Voicing" a room is a real black art, and I strongly emphasize that you need to check test mixes in a range of screening rooms and theaters before you give your imprimatur to a B Chain. This is doubly true if you're trying to make a go of a home theater situation; don't be calling me if your mixes don't translate!

Before you even start thinking about what kind of cool speakers to get, you should devote some amount of brainpower to the decidedly uncool but very important area of acoustics. There are many books out there to fill you

ILLUSTRATION TIM GLEASON

The "X-Files" Files

by Tim Moshansky

Humankind has always had a fascination with the paranormal—UFO abductions, unexplained phenomena, alien contact. The universe we live in is filled with mystery and the unknown. Where did we come from? Is there life beyond our world? Where are we heading? These are questions that have remained unanswered for centuries. *The X-Files*, now in its second season on Fox Television, delves into the supernatural world and attempts to answer some of these questions in a format indebted to *The Twilight Zone*, *The FBI* and *In Search Of...*

Top: David Duchovny and Gillian Anderson; left: clockwise from bottom left: Michael Hawley, cable puller; Marty La Croix, boom operator; and Michael Williamson, sound mixer

Every week. FBI special agents Fox Mulder (David Duchovny) and Dana Scully (Gillian Anderson) investigate strange occurrences and events from the so-called "X-Files," often becoming involved with forces beyond their control or understanding.

Here on earth, the show has become a bona fide hit, with high ratings in the U.S. and Canada, and a huge following in Europe and Australia. It is currently being broadcast in surround sound in certain areas of the UK and Europe.

The success of the first season meant a bigger budget and has helped from a sound point of view, according to production mixer Michael Williamson. Changes from last season included adding a cable puller. which helps the sound team manipulate the

---

And the Oscar Goes to...

When the Academy of Motion Picture Arts & Sciences handed out Oscars on March 27, *Speed* won Best Sound Effects Editing and Best Sound. And though supervising sound editor Stephen Hunter Flick of Weddington Productions bounded to the stage to accept the former, and re-recording mixers Gregg Landaker. Steve Maslow and Bob Beemer, along with production sound mixer David MacMillian. graciously accepted the latter, a larger audio crew toiled away on a tight schedule to deliver a superb soundtrack to the Skywalker Sound South mix stage. They were, listed alphabetically:

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EFFECTS

Sound Effects Editors: David Bartlett, Paul Berolzheimer, Dean Beville, John Dunn, Donald Flick, Judee Flick, Avram D. Gold, Warren Hamilton Jr., Gregory Hedgepath, Patricio Libenson, Dean Manley. Kirk Schuler, Dave Stone and Bruce Stubblefield
Assistant Sound Editors: Dana Gustafson, Michael Mirkovich, Sonny Pettijohn, Jeena M. Phelps

Sound Effects Recordist: Eric Potter
Foley Artists: John Cucci, Ken Dufva, David Lee Fein, Dan O'Connell, Joan Rowe, Catherine Rowe
Foley Mixers: David Alstadter, Bruce Bell, Eric Gotthelf
Additional Re-Recording Mixers: Ezra Dweck, Sergio Reyes, B. Tennyson Sebastian III

DIALOG

Supervising Dialog Editor: Gary S. Gerlich
Dialog Editors: Greg Gerlich, Pieter S. Hubbard, Elliott Koretz, Hal Sanders, Marvin Walowitz
Assistant Dialog Editors: Jerry Pirozzi, Samuel Webb
Supervising ADR Editor: Victoria Rose Sampson
ADR Editors: Beth Bergeron, Linda Folk, Kay Rose, David Spence
Assistant ADR Editors: Nancy Barker, Phillip Norden
ADR Mixers: Robert Deschaine, Darcey Kite

MUSIC

Composed by: Mark Mancina
Music Score Consultant: Curt Sobel
Conducting/Orchestrations: Don Harper
Orchestrated by: Bruce Fowler, Ladd McIntosh, Yvonne S. Moriarity
Soloists: Mike Fisher, Alan Holdsworth
Technical Assistants: Chris Ward, Bob Daspit
Additional Music: John Van Tongeren
Music Contractor: Sandy DeCrescent
Voice Casting: Barbara Harris
Music Recorded and Mixed at Media Ventures by: Jay Rifkin, Alan Meyerson
Additional Recording: Sony Studios ∎

in on the basics of studio design, and you would do well to bone up on the subject. Better yet, hire someone who knows what they're doing. I know some acousticians get all itchy about the subject of monitor equalization, stating that they prefer to solve the fundamental problems acoustically. Although this reasoning is every bit as sound as making the most of microphone placement or selection before grabbing the EQ on the console, please take note that there is no serious film re-recording stage on the planet that doesn't use ⅓-octave equalization. The X curve (along with the 85dB monitoring level) is your friend, and adhering to it will help your mixes translate to venues as disparate as your local Hell Sixplex, my beloved Samuel Goldwyn Theater in Beverly Hills or a living room festooned (God, I love that word) with a frou-frou home theater system. You don't need an expensive system, although if you have the money and wherewithal and are building a humble mixing stage, I would heartily recommend mounting speakers in a wall behind a perforated screen. This, plus careful ⅓-octave room EQ and some distance to the screen (15 feet will do), will get you most of the way to the real world. At this point, it's all up to you and your skills as a sound editor and mixer; *no* monitoring system perforce can be "heard" because it does not encode anything onto the track.

The act of choosing a speaker system has always been a tug-of-war between wanting to hear everything that is on the track and wanting to hear it as the consumer will. This dilemma is virtually personified in rock music mixdowns, which frequently take place on two ends of the speaker spectrum: mixing on a cheesy "real world" speaker and mastering on a monolith straight out of a high-end magazine centerfold. A re-recording mixer's work, on the other hand, isn't handed off to someone at another facility for a final dose of sonic secret sauce because films are mixed *and* mastered in the same re-recording studio. The idea of making decisions based on what my mix will sound like at the Hell Sixplex seems counterproductive at best, suicidal at worst.

I just don't get the record approach. When I'm mixing a film, I want to know what is on the track, and I want the monitoring system to

be as revealing and as free of distortion as possible. This is even more important today with the proliferation of digital release formats: If you hear distortion, you can't worry if the source of the distortion is the B Chain. To put it another way, a mix can sound no better than it sounds at the mix. You will be restricted in your ability to finely tune a sound job if either your speakers or acoustics are keeping anything from you. And, indeed, the film sound post-production community is looking hard at a number of schemes to improve existing monitoring systems.

One of the more recent trends has been lowering the frequency response of the full-range main screen channels below the standard 40 Hz down at least one octave to 20 Hz, or even further. (Legend has it that loud sounds at a specific frequency in this sub-audible region can induce involuntary sphincter openings, so *caveat mixer*.) This would seem to obviate the need for a separate subwoofer channel, except for the simple fact that the B Chains of 99% of first-run theaters today need subs if they want to go below 40.

Therefore I think that any dubbing stage going for this extended low end should be able to switch the main screen channels to a real-world 40Hz limit. Because a speaker system that goes to 10 Hz has no need for subwoofers, it goes without saying that you would have to compromise your sphincter-rattling napalm strike for both sub-less 10Hz-plus venues and for standard sub-enhanced 40Hz-plus theaters.

In addition to this extension below 40, another trend has been the division of everything above that point to a tri-amplified system, with two crossover points instead of the standard, single 500 Hz. I regret to say that I haven't heard any of the handful of so-equipped dubbing stages and screening rooms, but the word I've heard on the street from Johnny Two-Fingers is good. This is the first real change in film monitoring since the almost overnight adoption of bi-amped, direct-radiator speakers in the mid-'80s. For the last change before that, you have to go back 35 years to the adoption of the Altec-Lansing Voice of the Theater system. Before you record folks cackle with condescension about how film folks are slow to change, please realize that the B Chains of dubbing stages use fun-

damentally the same components as a first-rate, first-run theater. There's no equivalent in film re-recording of "switching to the cheesy near-fields." (Yes, I'm aware that not all near-fields are cheesy.)

Recently, I have been receiving a large number of letters from students asking for advice on breaking into "the biz." Next month, I'll attempt to answer these queries, unless you first send them to me at P.O. Box 24609, New Orleans, LA 70184; fax (504) 488-5139; or via the Internet: swelltone@aol.com. ∎

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although seeing his nephew's team win the Carrollton Boosters 10/11-year-old basketball championship would be a good start.

scenes more easily. "We can have longer walking shots and have the cable being pulled by our cable puller, as opposed to trying to get someone from the set," explains Williamson. "It also allows us to do dual-booming a lot more, which prevents us from going to plant microphones, which are subject to having the actor talking directly at the microphone. I prefer to use the two booms, because you never really know what an actor is going to do."

The luxury of a bigger budget has also allowed Williamson and his team (which includes boom operator Marty Lacroix and cable puller Michael Hawley) to buy some new equipment. One of the biggest changes for Williamson was changing from a Sonosax mixer to a Cooper board. "I loved my Sonosax," he says. "I had it since I started mixing nine years ago, but I was finding I need a little more versatility, especially in the output sections. [On the Cooper] there's six or seven headphone outputs and several auxiliary outputs. I can monitor off the mixer and switch between the play and record heads, which I couldn't do with the Sonosax. It has a built-in microphone system and a nice 3-band oscillator [1k, 10k and 100k] for laying down tones. The metering section is also very good because it follows whatever I'm listening to, so if I'm listening to the tape head, the meters will actually read what the

tape head is doing. So even if it looks like the Nagra is going down to +5, the Nagra's limiter is kicking it in and it's coming back off of there at maybe only +2, for whatever reason, and it's not distorting. I'll crush it, I'll let it go, and it won't bother me as much. Sometimes I think it's quieter, and sometimes I think my Sonosax was quieter, but for versatility, this Cooper board was definitely one of my better investments."

Williamson also purchased four new UHF Lectrosonics wireless microphones and receivers for his rack.

"We don't like to use wireless," he admits, "but when we do, we want to make sure we have the range. We were using VHF units before, and the range was okay but not great. The overall dynamic range was fine, but we were using technology that was six or seven years old, and this new Lectrosonics stuff is great; twice the range and better quality. It sounds to me almost like it's right off the boom. We did almost an entire episode on a wireless boom with this because of a cabling problem. We were shooting on a Navy destroyer, and the wireless

still worked through two-inch plate steel. Most people have never been inside a boat, and they don't realize it's only five-foot-ten in there. Trying to swing a boom over an actor who's six feet doesn't work."

He also has changed from Scotch 808 tape, which is pretty much the industry standard in Vancouver, B.C., to Scotch 966, which is a lower noise stock (6 dB more signal-to-noise ratio) with the same headroom. "Since our actors have a tendency to get whispery and get down in volume," he says, "I chose that stock be-

Digital Hollywood '95

by Guy DeFazio

The fifth annual Digital Hollywood convention, held February 20-23 at the Beverly Hills Hilton, brought together major players from the worlds of traditional digital media production, digital hardware manufacturing, computer software development/publishing, and the rapidly expanding industries of multimedia production/publishing. The multimedia companies in attendance represented the fields of CD-ROM development/publishing, online delivery services, digital broadcast/transmission services and location-based multimedia production. Four days of panel discussions and workshops focused on how both new and established digital media companies are effectively embracing many of the emerging multimedia business opportunities of the '90s.

In a showing of digital muscle, the Hollywood production community demonstrated the latest wide-screen (film) applications of existing digital audio/video technologies. The most impressive presentation was given by the *Stargate* production team. With a step-by-step discussion of the digital tricks used to create swirling cyber-gates and royal morphing-warriors, the concise demonstration had this attendee captivated. As a follow-up to their demonstrations, the panelists elaborated on how most of these technologies are continuing to surface in a variety of new multimedia location-based venues, as well as in other CD-based and digitally transmitted multimedia products.

Additionally, the Hollywood re-

cord community played an integral role in many of the conference workshops and panel discussions. A particularly popular topic was CD(+) and its various technical forms. Microsoft's new "stamped multisession" technique for encoding Red Book Audio and multimedia data on the same disc seems to be leading the pack. But a variety of other proprietary mixed-mode encoding methods are also beginning to make their way through the halls of the Federal Patent Office and into the so-called "enhanced-audio" arena. Why should the multimedia industry be any different from the professional audio industry when it comes to standardization?

The bottom line with CD(+) is not which flavor of encoding scheme it uses but the fact that CD(+) technology (in any form) will be introducing multimedia content into the mainstream record bins. Firmly established record-distribution channels will be opened to multimedia content developers, while also offering record labels added product value through the use of normally unused data space on their traditional music-only CDs.

Digital Hollywood also played host to two days of new product exhibits. The most notable audio-related product introduced was the new Mediasound editing software from TimeLine Vista Inc. This 6-track, audio-editing package is designed specifically for the Silicon Graphics Indy, Indigo and Indigo2 workstations. Drawing on the design of TimeLine's DAW-80 digital audio workstation, Mediasound has successfully combined the high performance of the powerful SGI platform with traditional digital audio editing functionality, along with OMF and AIFF-C compatibility.

Also on hand was Micropolis Cor-

poration, one of the leading suppliers of hard disk storage systems. Micropolis introduced its new line of Super-Capacity disk drives, including models designed specifically for high-speed A/V applications. Their new drives can be configured into easily expandable disk subsystems or into larger multidrive arrays. The multidrive arrays can be configured for up to 280 gigabytes of online storage, and multiple arrays can be attached to the same system for even more massive storage access.

Of course, what would a Digital Hollywood gathering be without a Digital Hollywood Awards event? Staying true to Tinseltown tradition, the star-studded gala brought together a group of awards presenters including popular recording artists such as Herbie Hancock and Dweezil Zappa, as well as legendary actors such as James Coburn and Robert Culp. Two of the big winners, among the 29 categories covering every possible form of digital entertainment-related product, were Peter Gabriel's *Xplora 1* for Best Rock 'n' Roll CD-ROM and Robert Zemeckis' *Forrest Gump* for Best Digital Hollywood Movie.

For a digital transcript of the entire Digital Hollywood conference, Multimedia Marketing ([800] 301-2341) has assembled a complete CD-ROM database of the events. In fact, all of the titles in their "Virtual Conference" CD-ROM catalog offer instant access to verbatim transcripts, panelist biographies, and industry contacts from many of the major multimedia-related conferences of the past year. ∎

Guy DeFazio is an audio producer, engineer, designer and freelance writer based out of Los Angeles.

cause I need every bit of help I can get. The lower the noise, the softer they can whisper and the more I can hear it without having to literally hear the tape stock hiss come at me. We don't have a lot of loud activity happening on this show, so we don't need the higher headroom."

One of the greatest challenges for the sound team is the conditions that they often have to shoot in while on location in Vancouver. "The biggest difference between this show and other shows," says Williamson half-jokingly, "is that UFOs never land in the middle of the city during the daytime. They always land in the middle of mountains or out in the water, and it has to be raining, and it has to be muddy, and it has to be windy, so those are the problems we have. If we're out in the bush and they decide they want to have wind blowing through the trees, we have to try and isolate the dialog to a point where you don't hear the wind machine. And the wind machines that they have are these huge Ritter fans, which I'm sure are a big Cessna engine with a big prop on it—if you stand in front of it, you get blown

over. The noise you can never really get rid of, so you have to find that fine line where you get the actors loud enough and the background soft enough."

In a recent episode, "Fearful Symmetry," the crew had to deal with live exotic animals such as bears, tigers, cougars, monkeys and an elephant. "Animals aren't like people," points out Williamson. "They don't ignore things that move around that fast, and they have a tendency to follow the boom. I've had to deal with not getting a boom in too close because it would spook one of the tigers.

"Another thing is that it never fails that our lead actor gets beaten up, and with that brings a whole host of new problems. If you're in a very wild environment and there's lightning machines going off and rain towers spreading rain all over the place and wind machines going nuts, and the only way you can really get good, solid, clean sound is by putting a wireless on a guy, and he's got to go into a fight, then all of a sudden, the wireless isn't going to be any good. Everything is a challenge."

Williamson is quick to give credit

to the crew he works with on the set, as well as the post-production crew at West Productions in Los Angeles. "I'm really happy with the guys I've got working with me—Lacroix and Hawley. They're both a heck of a lot more experienced at some of these things than I am, and they come up with great solutions to a lot of the problems. I think the biggest lesson of this show for me comes from our post-production mixer Dave West and our music guy Mark Snow. They hide most of the problems that we run into by having a good mix and great music. This show, unlike a lot of other shows, is wall-to-wall music. It's fabulous; it sets the mood. A lot of our show isn't dialog because they want to show a story or tell a story, without telling you the story. They want you to become involved in the pictures and figure it out yourself." Williamson also credits the show's creator and executive producer Chris Carter for taking a chance with him when he could have chosen a half-dozen guys with more credentials.

The *X-Files* sound team has streamlined the location recording

New Products For Film/Video Sound

NVISION DAPS II

NVision (Nevada City, CA) now offers an enhanced version of its Digital Audio Processing Suite. DAPS II is a modular system designed to eliminate many of the digital domain interface, conversion and synchronization problems in audio, video and post facilities. A DAPS II system consists of two digital audio routers (for sending any eight inputs to any eight digital outputs); a 4-channel sample rate converter; 4-channel digital delay compensator; 4-channel digital audio mixer/mixminus/routing module; and remote controller panels. All digital I/O is via AES/EBU signals.
Circle 191 on Reader Service Card

RANE AUDIO/VIDEO DELAY

Now available from Rane (Mukilteo, WA) is the AVA audio/video alignment delay, designed as a cost-effective ($799) solution to synchronization problems. The unit includes two independent channels of Dolby TimeLink circuitry, with delay times adjustable in field (half-frame) increments, up to 9.5 NTSC frames. Two nonvolatile user memories store frequently used settings, which are recallable from the front panel or a remote switch.
Circle 192 on Reader Service Card

DYNAUDIOACOUSTICS SURROUND SOUND

DynaudioAcoustics (dist. by AXI of Rockland, MA) now offers stereo surround speaker systems (LCR and LCRS), designed for the post-production mixing environment. By combining satellite MF/HF speakers with any number of Active Bass Extension Systems (subwoofers), a modular monitoring environment can be created where the satellites can be upgraded or more ABES units added to improve performance. Also, the separate sub-bass channel feeding the ABES provides compatibility with both 5.1 film surround and 4-channel television formats.
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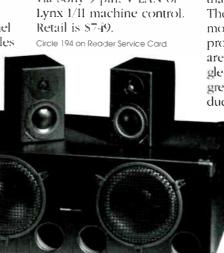
VIRTUAL PRO TOOLS POSTCONFORM

PostConform™, from Digidesign (Menlo Park, CA) is an EDL import/autoconform application that automatically and seamlessly simplifies the process of loading and conforming field audio and post-production elements into Pro Tools. Features include CMX-format EDL support, onscreen spotting of EDL elements, and automatic recording and spotting to Pro Tools via Sony 9-pin, V-LAN or Lynx I/II machine control. Retail is $749.
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RECORDER V2.0

ASC Audio Video Corp. (Burbank, CA) unveiled software enhancements for its Virtual Recorder, a disk-based video recorder that offers random-access picture playback for post and broadcast applications. New features include "Control Track" (which simplifies interfacing with digital audio workstation operators and others who record multiple segments with duplicate timecode) and "Auto Mode." The latter allows users to specify punch-in/out points for replacing video segments and adds playback looping.
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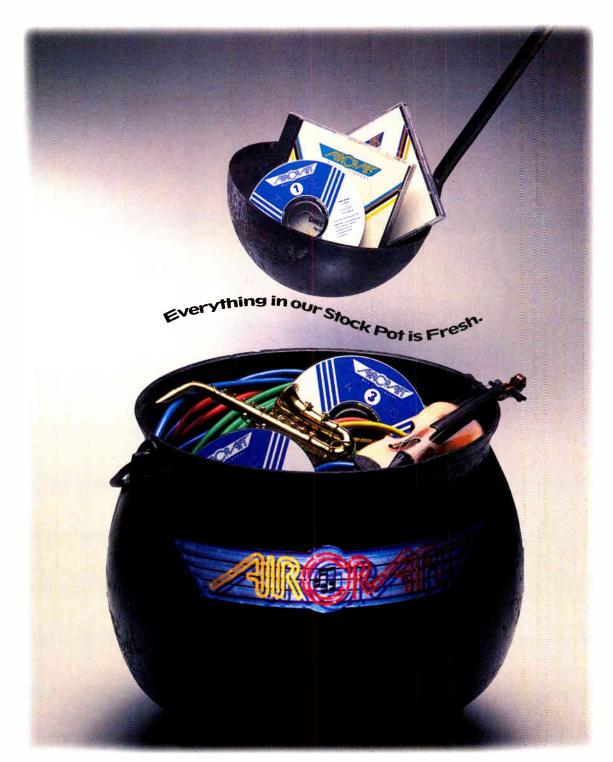
AKG C577 MIC

AKG (Northridge, CA) unveils the C577 omnidirectional condenser microphone, a miniature lavalier mic with an on-camera profile smaller than a pencil-end eraser. The mic's dual side-mounted diaphragms provide twice the surface area of similar-sized, single-diaphragm designs, for greater sensitivity and reduced self noise. The side-mount design is also said to reduce clothing rustle. The mic cable terminates with a phantom power adapter with integral XLR connector; an unterminated version is available for use with wireless transmitters.

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ADAT MOD

LISTENING TESTS

THE QUEST FOR ULTIMATE PERFORMANCE

BY GARY WOODS

Modular digital multitracks have changed the way a lot of us make music. Today, there are more than 50,000 ADAT (Alesis and Fostex) and DTRS-format decks (Tascam and Sony) worldwide, used in every facet of music, motion picture and television production. In the recording industry, six Number One songs on *Billboard's* 1994 charts were tracked on ADATs. Songs like Culture Beat's "Got to Get It," Method Man's "Bring the Pain," and Brandy's "I Wanna Be Down" were all produced on stock ADATs.

One studio operator told me that he felt the ADATs sounded every bit as good as—if not better than—Mitsubishi digital 32-track machines. ADATs use the latest sigma-delta converters and sound fairly respectable right out of the box, so I was surprised to hear that people were making modifications, trying to make them sound even better.

Jim Williams of Audio Upgrades and Eddie King of Angel City have taken apart these little jewels, sucked out their innards and repacked them with amazing and wonderful components. But the modifications aren't cheap. The Williams mod costs $800, and the King mod costs $500. For a unit that is street priced at around $2,200, this is a serious investment.

So the question is, is it worth it? How do these modified units sound? To find out, I knew I had to get beyond the specs. (Even if you are adept at reading those numbers published by manufacturers, what do they *really* mean? Few of us spend time recording pure sine waves, so what do those specs have in common with the real world?) To get a user's perspective, I staged a listening test, using a group of musicians, composers, producers and engineers.

The participants in the listening tests included Ashley Irwin (composer), Richard Zimmerman (product specialist from Project

PHOTO·ILLUSTRATION BY ERIC DINYER

overall. Compressed dynamics."

(Jim Williams mod)

Irwin: "Similar sound to machine 1 (Eddie King)."

Rando: "Best of all, good clarity, high end rounder, less harsh. Very real."

Wiedemann: "Mushy, better than number 2 (unmodified machine) but not as good as number 1 (Eddie King)."

LOW CELLO
(Stock ADAT)

Frichtel: "Somewhat strident sounding."

Halpern: "Sounds okay."

(Eddie King mod)

Frichtel: "More open, sweeter top end."

Halpern: "Much warmer sounding."

(Jim Williams mod)

Frichtel: "Similar to machine 1 (Eddie King), possibly a bit more low end than either machine."

Halpern: "Better on lower bows, warmest and fullest of all."

CHINESE GONG
(Stock ADAT)

Irwin: "Unable to hear the gong harmonics decay evenly."

Halpern: "Nice on last hit, hard attack."

Frichtel: "Sounds great until compared to machine 1 (Eddie King) and 3 (Jim Williams)."

(Eddie King mod)

Irwin: "Seems to have the most presence."

Rando: "Better definition, but upper end is still rolled off. Needs to have more air in the sound."

(Jim Williams mod)

Irwin: "Similar to machine 1 (Eddie King)."

Rando: "Best one, breathes, I can hear all of the sound, all frequencies are clear. It sounds like what was played."

BELL TREE
(Stock ADAT)

Halpern: "Not too crazy about the sound."

Fox: "Consistent—no frequency jumps out."

(Eddie King mod)

Halpern: "Really nice decay."

Fox: "Perhaps more going than number 2 (unmodified unit)."

(Jim Williams mod)

Halpern: "Warmest and fullest, nice decay."

Fox: "High mids stand out a bit."

ACOUSTIC GUITAR
(Stock ADAT)

Zimmerman: "Not warm, but not bright either."

Frichtel: "Sounds wonderful, slightly darker than other machines."

(Eddie King mod)

Rando: "Better sound, clear, lacks some definition in upper mid. Highs are not well-articulated. Definition is not great. Needs help but better than machine 2 (unmodified unit)."

Frichtel: "Greater depth, cleaner sound, better transients than machine 2 (unmodified machine). Consistently my favorite machine."
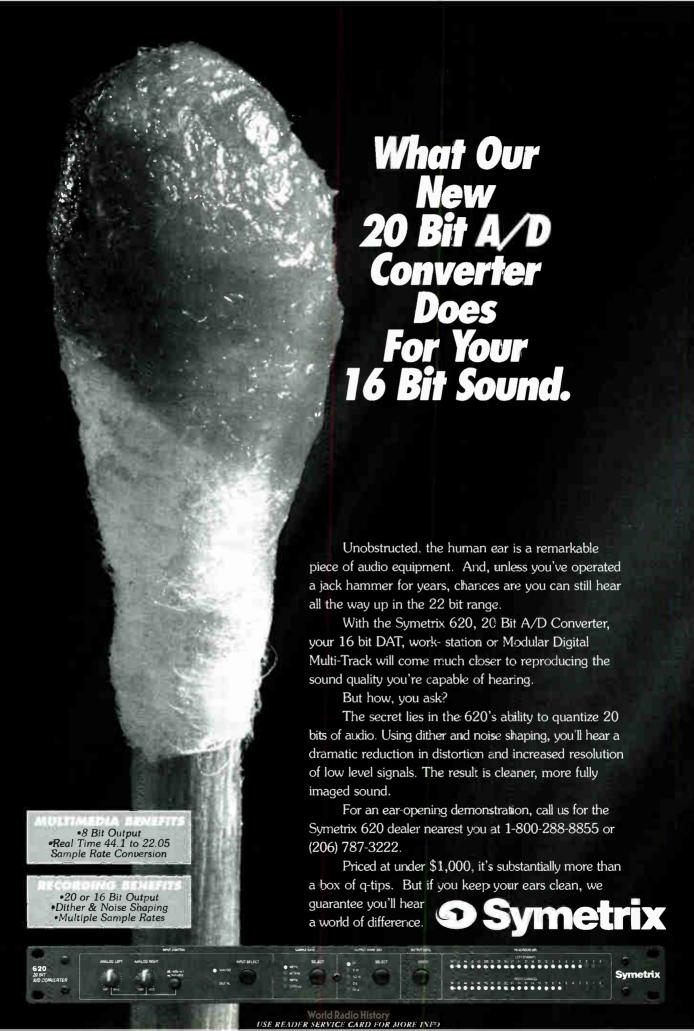
(Jim Williams mod)

Rando: "Sounds like the actual source, i.e., exactly how it sounded

Another Contender

As we went to press, we learned about another ADAT upgrade, this one from Digital Lab Studios of Cape Girardeau, Mo. The DLS ADAT upgrade replaces the analog input/output section of the Alesis ADATs with balanced ¼-inch I/O and includes potentiometer-based gain-control mic preamps (with phantom power) for each channel. This allows for mic- or line-level inputs to be inserted into the ADAT directly. The upgrade also provides adjustable input gain control for each channel on the ¼-inch/Elco inputs for precise level matching. The plug-in installation is said to take only ten minutes, and as a board-swap upgrade, the original ADAT electronics can be kept in the case of warranty servicing, etc. The boards are priced at $250 for the analog output section or $500 for the analog input section; a high-performance replacement A/D and D/A board is also available at $500. For more information, call Digital Lab Studios at (314) 335-0141.

—George Petersen

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in the room."

Frichtel: "Similar to machine 1 (Eddie King), perhaps more low end than 1 or 2. (Eddie King and unmodified unit)"

FEMALE VOCAL
(Stock ADAT)
Irwin: "Best presence/clarity."
Zimmerman: "Very in-your-face, kind of harsh."
(Eddie King mod)
Rando: "Real harsh on high end, like distorted edges to vocal. Makes vocal too harsh."
Zimmerman: "Also in-your-face but not as much. Sounds the most realistic, but I like 3 (Jim Williams) better."
(Jim Williams mod)
Rando: "More realistic, showed what was there. It is once again exactly what I heard in the room."
Zimmerman: "I like this machine best; it seems warmer with a nice smooth character."

MALE VOCAL
(Stock ADAT)
Frichtel: "Slightly closed sound."
Halpern: "Just nice."
(Eddie King mod)
Irwin: "Lumpy midrange—top end seems smoother than machine number 2 (unmodified unit)."
Halpern: "Very nice, much more vocal depth, but not warm enough."
(Jim Williams mod)
Irwin: "Seems the most transparent."
Halpern: "Really nice, has the depth, much warmer and fuller."

AFTER THE TEST
After the test, I asked the evaluators for overall ratings of each of the machines. On the unmodified unit, Stephanie Fife wrote, "Flattest sound, least definition." Richard Halpern noted, "Sounds like the stock unit." Charles Frichtel wrote, "Least favorite sonically." Jim Fox wrote, "Least dynamic."

On the Eddie King modified machine, Fife wrote, "Warm sound

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overall, better definition, too." Halpern said, "Nice mod, but doesn't have it all." Frichtel wrote, "Consistently my favorite machine. Always seemed to be more open, with greater depth and clarity." Jim Fox wrote, "Most consistent through frequency range, more open than number 2 (unmodified machine)." Richard Zimmerman wrote, "This was the most natural overall, very good high-end resolution, accurate." Jay Rando wrote, "Has some clock noise, it is harsh in the high end. It gives an 'edge' to all sounds, bordering on a distortion or Aural Exciter. Not my favorite but usable if I had to." Jun Murakawa wrote, "Less harmonics," and Claus Wiedemann wrote, "on the 100 percent scale, this machine is 60 percent hi-fi."

On the Jim Williams mod, Fife wrote, "The machine had the widest range of overtones, cleanest—most definition—I like it the best." Halpern wrote, "Sold. I want this mod." Frichtel wrote, "Closest to machine 1 (Eddie King)." Fox wrote, "Most dynamic, most open up top.

Maybe not most consistent throughout frequency range, but closest to analog sound." Richard Zimmerman wrote, "This is my favorite. Warm and rich, excellent bottom-end resolution. Very pleasant and comfortable sounding." Rando wrote, "The most realistic. Had breath and air in it. The one I would prefer to use." Murakawa wrote, "Sound like this got a ramp on high mid," and Claus Wiedemann wrote, "On the 100 percent scale, this machine is 45 percent not acceptable."

It's important to consider that the tests were conducted in a very good room with high-quality monitoring, yet even in this room, the differences were subtle, requiring multiple listenings to ascertain the characteristics.

Because neither modification is inexpensive, it's a tough call on whether to opt for modification or not. These MODs may void your warranty—if in doubt, check with Alesis. Am I going to modify my ADATs? Well, I haven't quite made up my mind. To really hear the differences requires a very good playback system, and I'm not sure my TEAC Model 3, Bogen amp and AR4s are quite up to the task. The ADATs sound very good out of the box, but for a reasonable investment, they can sound better. Is it worth it? Stick your head in a speaker and decide for yourself.

For information on listening to these modifications in person or having them performed on your machine, call Eddie King at Angel City, (818) 764-9042, or Jim Williams at Audio Upgrades, (818) 780-1222. ■

Gary Woods, a composer, arranger and orchestrator who has worked on The Mod Squad, The Love Boat, *and with artists ranging from Whitney Houston to Jim Nabors, serves on the board of directors of the Society of Composers and Lyricists.*

Report From Las Vegas

From April 9 to 13, nearly 85,000 broadcasting and production professionals from 85 countries came to Las Vegas for the National Association of Broadcasters convention. Having attended NAB last year, I couldn't imagine how even one more person could be crammed into this gambler's paradise. Every hotel in town was booked solid, and taxi lines at the convention stretched far into the desert. But attendance for NAB95 was 15% higher than last year's show. This is one popular event.

Almost 1,000 booths (packed into 550,000 square feet of exhibit space) featured the newest technological marvels for the broadcast and post-production industries. And many of those exhibiting hoped to grab a slice of the pie stemming from NBC's lucrative 1996 Olympic contracts, which were being nailed down

so that system setup can begin for the venues.

Unlike past years', this NAB show didn't have that one mega-product that everybody was talking about. Instead, the big news stemmed from strategic partnerships, as companies combine divergent specialties to create new technologies. One example was the dockable, disk-based video camera from Avid/Ikegami, which takes a giant step toward the reality of tapeless ENG.

An alliance announced by Alcatel, Dolby Labs and Pacific Bell demonstrated methods of transmitting six channels of digital audio, along with machine control data and picture—HDTV and com-

Studer D19 MicAD

ponent digital video— over fiber-optic (Vyvx, Sprint and Pacific Bell local) telco lines. The demo at the show involved file-sharing between NAB booths in Las Vegas, Universal Studios in Hollywood and Skywalker Sound in Northern California. In addition to providing the ability to transfer dailies, rough cuts and production material between facilities, the system also proposes "Cinema of the Future"," an advanced platform for distributing HDTV programming to exhibition sites or directly to end-users. Pass the popcorn!

Need a new remote unit? You may want to look into Sony's Shooting Star Series, with models ranging from the showpiece 51-foot, air-ride trailer to 19-foot vans, each of which includes a selection of component digital (or composite analog) video and analog or digital audio gear. All

models are ready to roll, and all-Sony equipped, of course.

From the recording and audio post-production side, new consoles took center stage. Amek's "DSP Mixer" system is an all-digital console based around a hardware controller that feeds a host PC, which controls the rackmount DSP core, audio I/O section and optional matrix routing. Designed to interface with workstations (24 inputs max), the system features moving fader automation, 4-band EQ, dynamics control and 20-bit DSP. The mixer is currently in the early prototype stage— production models are at least a year away.

Available now is the D/ESAM 820 digital edit suite mixer from Graham-Patten Systems. The rackmount 820 has 4-channel outputs, 16 inputs (analog or 20-bit digital), 600-snapshot memory and integral sample-rate conversion. A modular design offers expandability (up to 56 in-

HHB PortaDAT PDR1000

Graham-Patten Systems D/ESAM 820

puts) and optional parametric EQ and delay. An upgrade path for D/ESAM 800s is offered.

Euphonix launched new versions of its successful CS2000 digitally controlled analog console. Already installed into WFLD in Chicago, the CS2000B is tailored for the broadcast market and offers 12 mix-minus feeds, SnapShot Recall of all console parameters for instant show changeover and a redundant power supply option. Designed for video post, the CS2000P has eight stereo mix buses, six stereo mix stems and SnapShot Recall. The CS2000F is a film-dubbing console providing multi-operator options (up to 48 faders per position), eight stereo mix buses, multisurround mix busing and 64x4 monitor matrixing.

Speaking of film, Sascom Marketing debuted Lafont Audio's The Chroma, an in-line film/video post console in 44- or 68-channel frame sizes. Standard amenities include onboard dynamics, 4-channel, discrete LCRS panning, 6-channel surround monitoring, three floating film-bus groups and Optifile VCA automation (moving faders optional). Also

very cool is the Lafont Telephone Box, a $1,495, single-rackspace package that simulates the sound of a telephone conversation. It not only includes filtering/EQ functions but also has controls for adding distortion and phone-line noise to the signal, for that authentic touch.

Noteworthy gear and news were abundant at the show: At the Siemens booth, AMS demo'd a 16-fader version of its Logic 3 digital mixer, now available with a dual-joystick "podule" for surround sound applications.

D&R North America showed an optional LCRS module for its Orion consoles. When active, the LCRS panpot feeds the aux 4 bus to the center channel, while surround can be fed from any post-fader aux send.

Fairlight celebrated its 20th anniversary by announcing the development of a disk-based film dubber system. The targeted price is $1,500 per track, and users have the choice of tradi-

tional hard disks or removable MO media. Features include forward or reverse lock to film chains and the ability to slave up to 300 tracks.

New DAT machines keep on coming. Otari's DTR-8 is an under-$2,000 studio deck with balanced XLR analog and AES/EBU and S/PDIF digital I/O. Another low-cost DAT, the Sony DTC-A8, incorporates Super Bit Mapping in the A/D circuitry to preserve the quality of high-resolution source material during conversion to 16-bit storage. Retail is $1,349. Designed for the project studio market is Tascam's DA-20 ($999), a rackmount model with S/P DIF digital, RCA analog jacks and a wireless remote control. And HHB announced a $3,995 SMPTE timecode retrofit that upgrades its Porta-DAT PDR1000 location recorders to the full PDR1000TC spec. HHB is also shipping a 4-bay fast charger for PortaDAT batteries.

Modular digital multi-tracks are more popular than ever, and NAB showcased the growing market for third-party accessories. The Otari UFC-24 is a universal format converter in a two-rackspace box that converts up to 24 channels of ProDigi, SDIF-2, ADAT lightpipe, Tascam TDIF-1 and (optionally) AES/EBU I/O. Retail is $1,995. Studer presented its D19 MicAD, a high-quality mic and line pre-amplifier with eight balanced analog inputs and built-in A/D converters, with digital outputs to AES/EBU, SDIF, ADAT and Tascam TDIF-1 digital gear. The unit features manual (or MIDI!) control of levels, 20-bit A/D converters, and switchable DSP dithering with noise shaping for use with 16-bit decks or workstations.

There were plenty of other product hits from the show, and we'll present these in our regular product columns in the months to come. Meanwhile, NAB returns to Las Vegas next year (April 15-18, 1996), so mark your calendars and lock in those hotel reservations before it's too late. And...Have a lucky day! ■

Euphonix CS2000B installation at Chicago's WFLD

by James D'Angelo

ROLAND DM-800
MULTITRACK DISK RECORDER

Roland has been a leader in musical instruments and digital audio for years, and the company's efforts in hard-disk random-access recording have been significant. First shown in 1992, the DM-80 digital multitrack was a three-piece unit (fader box, remote control and main processing unit). It sounded excellent but was a bit awkward, and it checked in at over $10,000 for the 8-track version. The model never reached mass acceptance, but Roland never gave up on the idea of a portable digital recording unit. The company's response is the DM-800, which addresses some of the problems of the earlier model and takes advantage of the dropping costs of technology to produce a remarkably simple all-in-one hard disk recorder for $6,295.
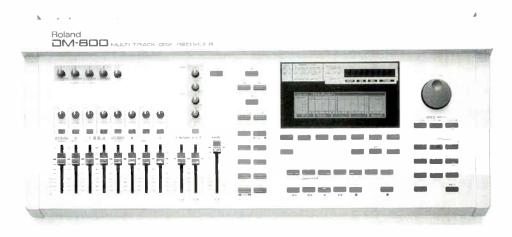
At first look, the DM-800 appears a little too simple. Its footprint is about twice the size of a computer keyboard and much smaller than a musical keyboard. But it has a host of powerful features. Weighing in around 12 pounds (depending on the internal hard drives), the unit can be wielded relatively easily with one hand and stashed under an arm for travel. The only question would be what to carry in the other hand, because the basic DM-800 unit has virtually everything required to do some serious recording.

THE CONNECTIONS

The front panel has 11 faders (master, left/right and eight tracks), bunches of knobs (panning, gain control, EQ), status LEDs (record/play/mute) for each channel, indicators for sample rate and hard-disk access, an LED timecode display, cursor keys, a parameter-adjust dial, a small multiline LCD that shows menus and command information, and graphic representation of the mixer including levels and waveforms. Below the cursor arrows in the middle of the panel are 12 buttons dealing with markers and locate functions, and beneath the LCD are a series of menu-select function keys for navigation through the operating system.

Balanced ¼-inch TRS analog inputs and outputs (these also accept unbalanced signals) are on the rear panel. For each input, there is a corresponding 20dB variable gain control. Unfortunately, as with most DAWs, there is no preamp option for microphones. I know we're trying to keep costs down, but because of the unit's portability, it would be great to have at least one decent mic pre for

Roland
DM-800 MULTI TRACK DISK RECORDER

World Radio History

location sound. The digital I/O is S/PDIF coaxial on RCA jacks and can be used in conjunction with the analog inputs so that you could use four analog and two tracks of digital simultaneously.

Other connections include MIDI in/out, two SCSI ports, headphone jack, footswitch input, SMPTE LTC in/out jacks, a proprietary RMDB 8-channel digital audio interface (used to connect the DM-800 to other digital audio devices), and an input for a PC-type ASCII keyboard for simplified alphanumeric entry, as well as simplified commands.

Video display of a typical DM-800 screen

The DM-800 also has a bevy of video output options (standard RCA composite, S-video and digital RGB), all switchable between NTSC and PAL. I've seen professional video boards that don't support this many formats.

Obviously, with all-in-one units, setup is trivial. Connect the power cord, power up, and you are ready to begin. Still, there is that little matter of the operating system (this is not trivial), but the DM-800 doesn't disappoint. Despite Roland's advertisements stating that no computer is required, there is a rather powerful computer tucked away somewhere inside this little 12-pound wonder. The operating system is very clean and simple.

Within minutes of unpacking the unit, I was recording and mixing. For those considering a DAW purchase, this is an important feature. No matter how simple installing boards may be—and sometimes is—it's nerve-wracking to consider that everything you touch inside a computer seems

to say, "touch me and void your warranty." The Roland DM-800 is ready to go, right out of the box.

TAKES, PHRASES AND PROJECTS

Roland has developed its own lingo for dealing with different aspects of digital audio. The three main words to watch for are Projects, Takes and Phrases. By trimming Takes into Phrases, the user creates Projects, which could be a song, radio spot, film soundtrack, whatever.

Turn on the DM-800 and it glows and purrs, finally opening the last project that you were working on (this can be annoying if you wanted to go to a different Project, because opening projects can take some time). A Project is the basic song/project building block of the DM-800, and up to 150 projects can be ongoing at once. Inside the Projects, the digital audio is broken up into Takes and Phrases. For you programming-types, the Project contains all the pointers to the data files that make up the song. The data files are the Takes, and once the Takes are edited, they become Phrases.

When tracks are armed for recording—a process that can, at times, take four steps—they can be monitored by pressing the Level Meter menu button, then recorded by activating the two "record" buttons and then pressing "play." Whenever you start recording, the DM-800 creates a new record file direct to the hard disk, calling it a Take. Takes are raw, unprocessed digital audio that could contain extraneous material. Phrases are the parts of Takes that are used to construct the song or production. Roland doesn't name the pieces of Takes that aren't used in a production.

Up to eight tracks can be recorded simultaneously, with a limit of four to each disk. Any new takes are recorded to the hard drive, replacing the previous ones only on the screen. All takes are actually stored on the hard drive and can be brought back and used. Takes only disappear if you explicitly delete them. This nondestructive recording is useful in that you

never need to throw away any moments, but it also requires valuable hard drive space.

EXTERNAL EQUIPMENT

Hooking up a monitor and an ASCII keyboard is a breeze. But, while the support for an external keyboard is excellent and intuitive, the monitor support is a tad reminiscent of the early days of computing. Although it contains a lot of information, there is nothing slick about the presentation. The external monitor does have the benefit of showing all eight tracks in a preview fashion, but besides that, it doesn't offer any added functionality, and only 16 colors are available. Compared to the splashy imagery of state-of-the-art computer-based DAWs, these views are grungy and a bit disappointing. Despite all this, you probably won't want to be spending much time with this unit without an external keyboard and monitor. Entering names of takes by using the data wheel is not exactly my working mode of choice.

MIXING AND EDITING

Onboard the DM-800 is a powerful automated mixing board. The DM-800 remembers fades, EQ changes, level moves, panning etc. It is also easy to process a track as each Take is being created, which makes it easy to get an early idea for the final mix. A nice feature of the DM-800 is that it has real faders and pan controls! Sliding faders with a mouse is still far from intuitive. With the DM-800, just push the individual faders and rotate the pan knobs.

Taking full advantage of the random-access, digital domain, the DM-800 has incorporated many of the nicer features found on computer sequencers. Each Project can have 40 markers for quick location access, and the unit can import and export tempo maps with up to 960 ticks/beat accuracy. The automation features are lush (snapshot, dynamic and grouping), but the faders do not move.

Because audio comes straight from the hard drive, the idea of virtual tracks gets a little hazy. Indeed, everything recorded into the DM-800 can be brought up almost instantaneously. There is even a footstep feature, ideal for Foley, that links ten sequential sounds to one key/trigger. As the character on screen goes about his

business, these ten sounds can be synched on the fly. The unit features up to 100 layers per track, and they can be shuffled in and out instantly like a deck of playing cards.

Despite all the work Roland has put into making the DM-800 a full-featured editor, there is still much to be desired. Anyone who has worked on full-screen, mouse-controlled DAWs—and who hasn't hooked up an external monitor and keyboard to the DM-800—will cringe at the display window that shows one wave at a time and only four tracks. This is about four too few for a dedicated 8-track recorder. Due to the lack of mouse support, moving Phrases around can involve selecting the track (using cursor buttons), setting up the move with menus, sliding the data wheel and hitting the execute button. These operations get easier as you become used to them, but they lack the immediacy and intuitiveness of grabbing a track with a mouse and stretching the audio. Still, the DM-800 has some nice features to bypass this bottleneck: jump to marker, nudge, and butt to previous/next phrase come in handy as long as the phrases work well together.

Most editing operations take place using the three buttons dedicated to previewing and editing. Combined with the scrub feature (a big improvement over the DM-80), these hasten and simplify the positioning of edit points without fiddling with too many controls. Taking advantage of a digital system with RAM, the system loops frame-sized chunks of audio until the correct edit point is found. The frame size can be controlled in 1-millisecond increments both before and after the edit points, and the view of the wave can be zoomed.

The RMDB bus is a nice touch. Although it requires optional accessories, it would be a shame if it were missing. Roland plans to offer optional interfaces for connecting the DM-800 directly to ADAT lightpipe and Tascam's TDIF-1 connectors. The RMDB is designed for 8-track backups to be made to ADATs and DA-88s. Given the time it takes to back up the megabytes of information required for even a simple song to DAT, it's nice to know that dumps to MDMs can be made in real time and can be played back from the backup or original format. There is also a Sony emulation 422 master/slave interface in the works.

THE SOUND

The unit sounds great. It has a very flat response throughout the entire range, and there wasn't one situation where I felt the sound was distorted or colored. Given the modern 18-bit converters and 128-times oversampling, this can't always be assumed, but it is a good start. Even the EQs are musical and intuitive (try to find comparable EQs on any DAW—it's tough). An appreciated touch: The unit is much quieter than most computers; the hard drives purr a little, but nowhere near the noise of many of the fans and drives that come with computers today. The noise produced by such systems can become annoying when trying to record sensitive instruments; over time, fan noise can lead to increased fatigue and affect mixdowns.

MISSING ITEMS

Where are the batteries? Granted, laptop computers are designed almost entirely for low power consumption, and the DM-800 sure ain't a laptop, but it would be nice to know that the unit could be hooked up to some form of alternative power (even a car battery). How handy would it be to have this unit in the field? Very! Eight digital tracks with mixdown capabilities, SMPTE generation and external sync in a 12-pound box would be almost revolutionary. Roland could really push this unit into post-production and field recording if they could add a battery pack or external DC input.

How can I add tracks? Most DAWs these days are designed with expandability in mind. The "I can afford eight tracks today, but hopefully I can beef up to 48 in the future" is a common sentiment. The DM-800 has no support for expansion. Of course, using SMPTE and slaving other machines to the DM-800 is a viable possibility, but who wants to use SMPTE if you don't have to? Not me. There is no mention in the manual concerning the possibility of using the RMDB interface to cascade two DM-800s for additional tracks; unfortunately, with only one DM-800 available, I couldn't test this theory.

Concerning hard drive diagnostics/optimization tools, the all-in-one DAWs are limited in low-level system access. It may seem like a petty problem, but if a hard drive gets buggy or starts to fragment, what are

the options? PC-based DAWs have a wealth of third-party systems support; proprietary operating systems don't. The DM-800 is a hard drive-based system, but the diagnosis of the hard drives is limited, and defragmenting and optimizing routines are sadly nonexistent. Hopefully, everything works fine, but in a situation where there are many edits and the disk is filling up, a fragmented hard drive can dramatically reduce hard disk performance, and the user is forced to reformat. On the flip side, though, the DM-800 has two SCSI ports, which can speed up data acquisition by nearly a factor of two. I like that.

THE MANUAL

Given the complexity of this all-one-unit and its inherent operating system and modus operandi, the manual itself can be a selling point. At first glance, the manual seems way too thin to cover all these details, but after playing around with the DM-800, it becomes obvious that many of the concerns of a computer-based hard disk recorder needn't apply. Because it isn't a computer, there are many things that remain transparent to the user, and that is good. I don't want to be bogged down with hard drive allocation files; I don't want to figure out which format to save the digital audio in; I don't want to hear that my system extensions for my graphics programs are interfering with my digital audio applications; I don't want to know I'm running out of usable RAM and I need to quit and reboot. Please! I just want to record. So, on this level, the manual can afford to remain thin. And at only 176 pages and soft-bound, it is as portable as the unit itself. Still, it's a tad thin for a system with no help menus.

My one gripe is the index. Even on much simpler systems, an index can run six pages with hundreds of entries, but for the DM-800 there are just two pages and only one entry after "T". What ever happened to "Zero Crossing" and "Virtual Tracks" and hundreds of other things? Please, Roland, beef this up.

CONCLUSION

Simple is not a word I would normally apply to a package that contains an operating system, an automated mixer (no moving faders), 8-track hard disk recorder, as well as other features. But the Roland
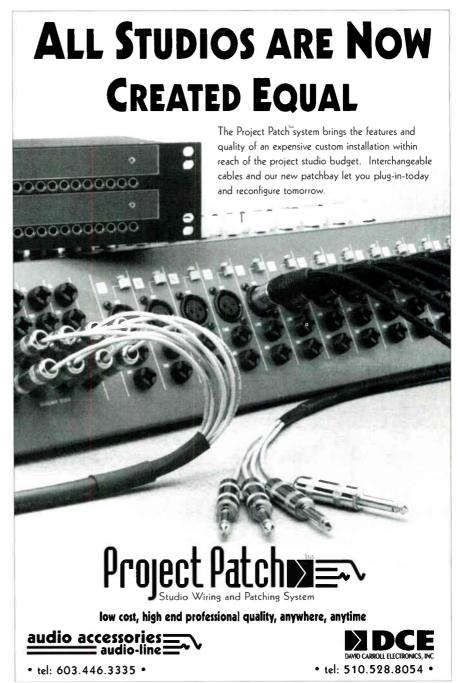
DM-800 does a lot of things very easily. This is a great recorder, mixer and playback unit. It sounds great, it looks great and is extremely portable. But it cannot compete with computer-based DAWs for graphic editing, plug-in capabilities and file management. Even with high-resolution graphics of a computer-based DAW, a 20-inch screen can become confining. The DM-800 has far from high-resolution graphics, and it has no mouse and limited views.

With $6,295 to spend on a digital audio workstation, the question often is, can you do this for cheaper? In terms of portability, desk space,

faders and eight high-quality I/Os, the DM-800 is certainly sitting in its own world. And the DM-800 proved to be very stable, as I used the system for three weeks without experiencing any crashes or glitches. For anyone seeking a complete digital studio with plug-and-go simplicity in an affordable, compact package, the Roland DM-800 may be the answer you're looking for.

Roland Pro Audio, 7200 Dominion Circle, Los Angeles, CA 90040; (213) 685-5141; fax: (213) 722-0911. ■

James D'Angelo is the technical editor of Mix.

New Products

DYNATEK CD-ROM MASTERING SYSTEM

DynaTek (Bedford, Nova Scotia) announces the CDM-4000 CD-ROM mastering system, featuring a 1.2GB SCSI hard drive, a quad-speed CD-ROM reader and a quad-speed CD-ROM recorder all in one unit. This stand-alone system features system-independent operation, 1x, 2x and 4x recording capability, drag-and-drop graphical interface and an onboard, 4x CD-ROM reader and recorder, enabling fast, one-button CD-ROM duplication.

Circle 226 on Reader Service Card

PRESONUS DCP-8

PreSonus (Baton Rouge, LA) releases its DCP-8 8-channel audio dynamics processor. Housed in a single rackspace, the DCP-8 features eight discrete analog compressor/limiters, noise gates, independent mutes and automated level channels, all under digital control. With a full-featured MIDI interface and storage for 100 audio scenes, the unit's software features four linked stereo channels, master/slave linking and software switching of input levels.

Circle 227 on Reader Service Card

ORBAN DSE 7000 SOFTWARE UPGRADE

Orban (San Leandro, CA) has announced Version 5.0 software for its DSE 7000 digital audio workstation. New features include Time-Fit time compression and expansion, pitch shifting, two-octave varispeed copy, two-octave varispeed play, reverse audio and expanded help.

Circle 228 on Reader Service Card

DIGIDESIGN PRO TOOLS III V.3.1

Digidesign (Menlo Park, CA) debuts Pro Tools software Version 3.1. The new version adds support for Pro Tools III expansion kits, upping the record/play capability to 48 tracks in 16-track increments and I/O in 8-channel increments. Also new in 3.1 is Quick-Punch (punch-on-the-fly) capability, the availability of a new version of PostView, ADAT interface, performance improvements including external synchronization and the inclusion of OMF Utility (which allows OMF compatibility), and conversion between Pro Tools and Media Composer sessions without re-copying.

Circle 229 on Reader Service Card

REVELATION CD SOFTWARE

New from Revelation (Valley Forge, PA) are three software products designed to write data to CD. Easy-CD Pro is PC-based software for archival storage, backup, data distribution, prototype one-offs, etc. It supports all disc formats and CD recorders with a drag-and-drop interface and multisession capabilities. The Toast CD-Write series for the Macintosh has both the Toast CD-DA 1.6 Red Book audio CD software and the Toast CD-ROM Pro 2.5 CD-ROM write software. Toast CD-DA supports write speeds of 1x, 2x, 4x and 6x, AIFF or SoundDesigner II formats, etc. Toast CD-ROM supports most major formats, recorders and write speeds.

Circle 230 on Reader Service Card

E-MU 8-TRACK DISK RECORDER

E-mu Systems (Scotts Valley, CA) has announced an 8-track hard disk recorder, slated for late 1995 release. Featuring a 240x64 high-resolution, graphic user interface, S/PDIF digital I/O, dedicated tape machine-style control and data wheel, the system is projected to cost between $3,000 and $4,000.

ENSONIQ DP/4+

Ensoniq (Malvern, PA) is shipping the DP/4+ Parallel Effects Processor, the successor to its DP/4. The two-rackspace device incorporates the same four-processor approach as the DP/4 but features 54 different effects algorithms, four balanced TRS inputs and outputs, a combination XLR/¼-inch input on the front panel, four independent 24-bit processors and numerous signal routing possibilities between the processors. Each processor is a completely programmable, custom DSP chip. There are also two new algorithms designed to emulate the dynamic "crunch" of a Class A tube amp.

Circle 231 on Reader Service Card

LIGHTHOUSE DIGITAL MATRIX SWITCHER

New from Lighthouse Digital (Grass Valley, CA) is the Lighthouse SMX Series AES/EBU Matrix Switcher. Providing matrix sizes from 8x8 through 128x128, with flexible I/O configurations including fiber optic, two-wire and MIDI, the unit responds to local, remote and MIDI control. The SMX Matrix Switcher can be used to configure or reconfigure effects loops during MIDI sequencing or by using the Lighthouse Easy-Patch software, which allows the user to add or subtract effects in an effects loop by using the effect name and a mouse.

Circle 232 on Reader Service Card

Z-SYSTEMS Z-16.16 DIGITAL AUDIO CROSSPOINT

The z-16.16 digital audio crosspoint from Z-Systems (Gainesville, FL) is an AES/EBU router, channel switcher and distribution amplifier—in one package. It features 16 input and output AES/EBU lines (110-ohm terminated, transformer-isolated) and allows single inputs to drive multiple outputs, channel-switching between multiple inputs to a single output, and arbitrary routing patterns. The single-rackspace unit features I/O connections using DB25-to-XLR breakout cables, the same cables used by the Fostex and Tascam digital 8-tracks.
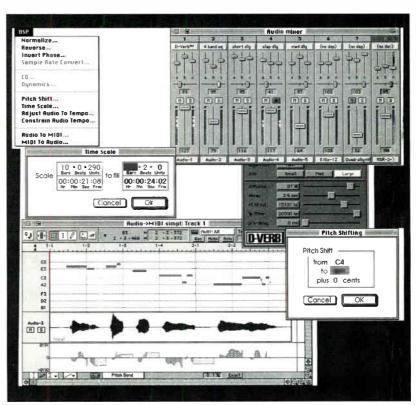
Circle 233 on Reader Service Card
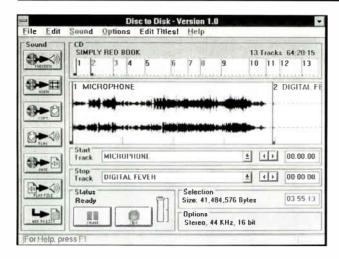
OPCODE STUDIO VISION 3.0

Opcode Systems (Palo Alto, CA) debuts Studio Vision Version 3.0, an upgrade to Studio Vision Pro, its Macintosh MIDI sequencing software with integrated digital audio recording and editing. New features include customizable mixer consoles (to 256 channels), "Audio to MIDI" conversion (and vice versa), Opcode DSP plug-ins (time compression/expansion, pitch shift, etc.) and Digidesign Pro Tools III and TDM compatibility.

Circle 234 on Reader Service Card

Disc to Disk - Version 1.0
File Edit Sound Options Edit Titles! Help

SONY LOW-COST DAT

Designed for project studios and other budget-conscious users, Sony's (Montvale, NJ) new low-cost DAT recorder, the DTC-A8, incorporates Super Bit Mapping in the A/D circuitry and a four-motor tape-drive transport. Sony's SBM process is said to preserve the quality of high-resolution source material during conversion to 16-bit storage. Retail is $1,349.
Circle 235 on Reader Service Card

SYMETRIX 620 20-BIT A/D CONVERTER

Symetrix (Seattle, WA) introduces the latest product in the company's 600 Series of digital productivity tools: the 620 20-bit A/D converter. An alternative to the onboard converters found in pro DAT recorders and workstations, the 620 has true 20-bit quantization, selectable output word size, dither and noise shaping. The unit outputs digital data in either AES/EBU or S/PDIF digital formats at sample rates of 48, 44.1, 32 or 22.05 kHz. The 620 downsamples from 44.1 kHz to 22.05 kHz, as well as performing 16-to-8-bit rate conversions.
Circle 236 on Reader Service Card

SONIC FOUNDRY SOUND FORGE 3.0

Sonic Foundry (Madison, WI) offers Sound Forge 3.0, a full-featured sound editor for musicians, sound designers and multimedia developers on the Windows platform. The program features sound file editing, audio processing effects, creation of loops and regions, and generation of playlists. External samplers and synchronization to MIDI and SMPTE timecode are fully supported. Retail is $495.
Circle 237 on Reader Service Card

RORKE DATA 4X RECORDABLE CD

Rorke Data (Eden Prairie, MN) is now shipping both rackmount and desktop Yamaha 4x and Playwrite 4000 4x-speed recordable CD subsystems for Windows, Macintosh, Masterlist and Unix. Typical systems include 4xCDR, 4xCD-ROM, and 2GB non-thermal-cal hard drive integrated in a four-rackspace enclosure with SCSI address access on the front. CD-R Mastering Software bundled for Mac, Windows and Unix is available.
Circle 238 on Reader Service Card

OMI DISC-TO-DISK FOR WINDOWS

Optical Media International (Los Gatos, CA) now offers its Disc-to-Disk sound capture utility for PC CD-ROM drives. Previously only available for the Macintosh, the software does not need a sound board because it converts the digital representation of audio found on a CD directly into the most popular PC and Mac computer file formats, including Macintosh AIFF/AIFC, QuickTime, Creative Labs VOC, Raw PCM and Windows WAV. Retail is $199.
Circle 239 on Reader Service Card

HOT OFF THE SHELF

Now shipping is S/Link 2.0, a batch audio file transfer and conversion utility for the Macintosh, from The Synclavier Company; (603) 448-8887... HHB announces new recordable CD media at $11.99 for a 74-minute disc; (207) 773-2424... River City Sound released Volume 5 of its Broadcast Series production music library. Retail is $59; (901) 274-7277...Voice Crystal has released "Funky Rhythms You Can't Live Without," a license-free collection of hip hop loops and sounds; (707) 766-9548...Tektronix is offering a new online information service, the Tektronix Television Division Bulletin Board. Call (503) 627-4697...Sili Tape, a self-bonding silicone rubber tape for electronic field repairs, is available from Equipment Emporium; (818) 894-4034...Digidesign announces the DPP-1 Pitch Processor software plug-in for the

TECHNO LAB DIGITAL REPORTER

Techno Lab's (Omaha, NE) Digital Reporter is a single-rackspace tool for counting errors produced by the digital audio device that is plugged in (i.e., DAT machines or CD players). Interpolation, parity and COD errors are counted in relation to the time they occur, then printed via RS-232 on any printer that is plugged in or displayed on a PC or Mac. S/PDIF (coaxial and optical) and AES/EBU digital I/O ports are supported. Retail is $2,562.
Circle 240 on Reader Service Card

Pro Tools environment: (415) 688-0600...TM Century debuts the addition of the Signature Music Library to its production library of The Winning Score and Water Music services. (800) 375-1050... East-West/Soundwarehouse has a free CD-ROM catalog covering a broad selection of sampled sounds on CD and CD-ROM. (310) 858-8797...Ampex is now shipping Ampex 489 Extended Play S-VHS cassettes for Alesis/Fostex ADAT recorders and Hi8 audio cassettes for Tascam/Sony DTRS machines: At your dealer now...Analog Devices' new 16-bit AD1893 SamplePort asynchronous sample-rate converter solves consumer/computer audio interconnect problems: (617) 937-1428...Available in kit form, the Pavo MIDItools Custom Instrument Kit allows you to create a MIDI controller/instrument in one night: (215) 413-2355. ∎
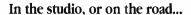
ARE YOU PROTECTED?

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

Yorkville's SR-300 studio reference amplifier incorporates our proprietary Speaker Protection Circuitry (SPC) to give your speakers 3-way insurance. The high pass filter protects against deadly sub-sonic oscillations while a limiter monitors both peak and average output. This protects against spikes and dangerously high sustained output signals. Of course, we can't guarantee you'll never blow your speakers, but the SR-300 will give them a fighting chance.

Yorkville SR-300 Studio Reference Amplifier

In the studio, or on the road...

- Silent, convection cooling with side-mounted heatsinks to keep heat away from the rear of the rack
- Heavy gauge steel chassis with reinforced rack mount ears
- Toroidal power supply for low induced hum
- Balanced 1/4" phone inputs

- Both 1/4" and push-terminal speaker outputs
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- 150 watts/ch. @ 4 ohms continuous avg. power (stable down to 2.7 ohms)
- Yorkville's unbeatable 2 year (EVEN IF YOU BREAK IT!) transferable warranty

Get protected with the Yorkville SR-300 studio reference amplifier.

POWER FOR THE 90's

by Dave Tosti-Lane

Spectral AudioPrisma

PRISMATICA DIGITAL AUDIO WORKSTATION

The last time I worked with a Spectral (then Spectral Synthesis) workstation, I was impressed with the feature set, ease of use and reasonable cost of such a capable system. With the new AudioPrisma, Spectral improves on the features and capabilities of the earlier system at nearly a third of the cost. The Prismatica software bears a striking resemblance to the Studio-Tracks software I reviewed (*Mix*, January, 1993), but AudioPrisma's new
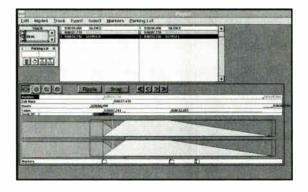
front end, Prisma Music, is something completely different. (See sidebar for more on Prisma Music.)

A basic AudioPrisma/Prismatica system is priced at $4,495 and includes the AudioPrisma SCSI/DSP board, the Prismatica recording/editing/mixing software, Prisma Music and all cabling for installation into your Windows-based PC (25 MHz 386 minimum). Digital I/O and synchronization features are standard and built into the card. Up to 96 virtual tracks are supported with 12 tracks active at any one time, patchable through a 12-channel digital mixer operating in real time. It's available as a turnkey system (with

computer) or as components for installation into your PC.

The AudioPrisma board has internal and external SCSI connectors and two digital audio ports: One is an 8-channel SMDAI (Spectral Multichannel Digital Audio Interface); the other is stereo and switchable from AES/EBU to S/PDIF. Optional interfaces provide a variety of analog I/O configurations. The 16-bit ISA card has 4 MB of onboard RAM (expandable to 64 MB). A pair of ribbon cables lead to a second slot-cover bracket bearing two additional connectors. One of these is used for either the supplied SMPTE/MIDI fanout cable or the $205 optional AB-1 Aux Box, which provides MIDI, SMPTE, black burst, VITC and RS-422 machine control.

Although you could simply buy a minimum system (AudioPrisma card and Prismatica software) and use a DAT deck for the A/D and D/A conversions, Spectral offers a range of optional audio interfaces: Priced at $3,195, the ADAX-8818 connects eight channels of balanced +4dB analog in and out (16-bit, 64x oversampling in-

puts; 18-bit, 64x oversampling outputs) on ¼-inch TRS jacks with front-panel meter display, along with AES/EBU and S/PDIF digital in and out.

Typical screens: Multitrack display, above; Playlist view, at right

The Truth Is Out

Alesis Monitor One™ 1994 TEC Award Winner Studio Monitor Technology

Every time you mix,
you've got to hear the truth.
Trust the speakers the pros trust.
The Alesis Monitor One
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TECHNICAL EXCELLENCE & CREATIVITY
OUTSTANDING TECHNICAL ACHIEVEMENT
STUDIO MONITOR TECHNOLOGY
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The AX-88 is similar, but lacks the metering and retails at $2,695. For those with simpler needs, Spectral offers the AX-S, a high-quality, stereo A/D-D/A box with +4 analog XLRs and AES/EBU digital ports for $1,115. Spectral's recently released Translator is a $995 single-rackspace box that converts to/from SMDAI to ADAT lightpipe, Tascam TDIF-1 or Yamaha Y2 digital formats. The Translator can also be used as a stand-alone unit for converting DA-88 signals to ADAT and vice versa, as well as connecting modular digital multitracks (or a SMDAI-equipped system) to Yamaha's DMC1000 digital console.

GETTING STARTED
I did this evaluation as a component install, rather than a turnkey, putting the system into an Intel Pentium 90MHz machine, with 16MB RAM and a very fast Windows graphic card. I also observed the system running on a 486/66MHz/4MB machine, and was assured it would run on lesser computers (25 MHz, 386 minimum).

Installing AudioPrisma is simple, especially if you have two adjacent open slots in your computer. The full-length card is installed in one, with a connector bracket installed next to it. Once the card and connectors are installed, you can power the computer up, unless you are installing an internal SCSI drive. I chose an external chain for use with a Rorke Data removable SCSI disk system, with two Seagate Hawk 1.2GB drives, which made it easy to transport projects started on one machine to another Spectral system. Given the difficulty and time needed to do this any other way, I'm afraid I've been spoiled by having these drives.

The Prisma system uses an identical disk format to Spectral's Audio-Engine/StudioTracks Version 2.0, allowing projects to be shared back and forth between systems. It is also possible to convert media from earlier versions of StudioTracks to the Prisma/Prismatica format. Additionally, both Prismatica and current StudioTracks versions allow easy user-formatting of audio drives: Merely click on an unformatted drive icon in the "Directory" display to initiate an automatic-format procedure. Up to four SCSI devices (type 1 or 2) may be designated as "real-time" media, and these devices may be either hard drives or removable magneto-optical drives. In addition, up to three back-up-drive devices may be connected, including MO or tape drives.

SOFTWARE AND OPERATION
Prismatica software provides many ways to accomplish any task. You can get to a function via the graphical button interface, through a drop-down menu system or through a very flexible system of shortcut keys. New shortcut keys can be defined on-the-fly, and Prismatica includes a full set of defined shortcut and function keys. All can be modified. On another level, you can manipulate audio from almost any display in the program, even doing DSP functions on audio called up from the directory display.

The multitrack display (see Fig. 1) offers easy manipulation of audio "segments" via click-and-drag mouse operation, text changes in an Edit Segment dialog box or using "nudge buttons" in the information display at the top of the screen. The operator

can scroll through the 96 available virtual tracks, though, at best, 12 tracks can be active at one time for a mix (e.g., six playing and six recording, eight recording and four playing, etc.). The display is set either for a "block" or waveform view, and individual tracks can be set to either type. In addition, the wave may be displayed as either a "bi-polar" view (full waveform) or an "envelope" view (top half of the waveform view). It is also possible to have either pan or volume automation data graphically displayed over the waveform.

The Playlist view provides a "close-up" look at a single track or pair of stereo tracks. It includes both a text display of track contents and a graphical block display of selected segments. This view makes it easier to work on individual segments and

Sample mixer and operating screens from Prisma Music

Prisma Music

Current owners of Audio-Prisma, and those who purchase a system in the near future, will get a very nice surprise package from Spectral with the introduction of Prisma Music, the new software front end to the system. With an interface designed by [*Mix* contributor] Stephen St.Croix, Prisma Music is a completely new and most surprising development for a Windows-based DAW. In fact, most people who see Prisma Music for the first time may have a hard time believing they are looking at a Windows program, at least until they manage to bring up a dialog box, or ALT-Tab out to the program manager.

St.Croix takes the position, which I wholeheartedly support, that the user should not have to spend time accessing menus, remembering what the cryptic little icons are for, or trying to recall how to get from one screen to another. To that end, Prisma Music puts all the controls you need right in front of you, appropriately labeled and looking much like the controls on our hardware components. The Mixer looks like a mixer and, moreover, works like one.

I don't have any mixers in my studio with the ability to expand the EQ and Sends sections when you click on them like Prisma Music, but you get the idea. Automation works with essentially all the functions on the mixer, including mutes, EQ changes, pan, fades and sends. Everything is labeled clearly, and the look of the basic screen is very pleasing: businesslike without being cluttered or glitzy. In the Editor view, you can select segments by simply dragging a window across them; fades are calculated only once and retained from session to session, and you can display the names of segments over their waveshapes easily. Markers (up to 199 of them!) can display text labels on the marker line so that they can be used to easily identify positions without having to call up dialogs or remember letter and number combinations.

As the name implies, Prisma Music is designed for the engineer working on recording and editing music, and it appears to be a successful design. Prisma Music is the first of what is intended to be a series of application-specific "front ends" for the Prisma hardware, and Spectral is looking at developing specialized front ends for other markets. Prisma Music will be shipped free to all current Prisma system owners, and will be included with all systems sold during the system's introductory period. —*Dave Tosti-Lane*
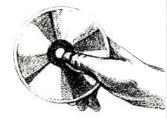
on transitions between segments using the adjustable edit points, fades, insets (beginning and end points of the edits) and position information for each. Buttons facilitate looping of the beginning and end of a segment for adjusting various parameters and for the addition or removal of segments to a track.

From either view, the recording process is straightforward: You click on the button labeled "REC" in the tools section at the upper left of the screen. At this point, select a specific "slot" for recording by setting a begin point and end point for the new segment. Or, alternatively, simply click on the track label, and Prismatica will define an empty segment beginning at the "Now" cursor position and extending for a user-adjustable default length. It takes only two clicks to prepare for recording any length segment: once on the "REC" button, and then once on the track (or stereo pair of tracks). A remote MIDI controller—such as the JLCooper CS-10—can be used to operate the tape-deck controls. Once the recording is complete, the user has the option of either freeing up the remaining space, which was pre-allocated for recording, or redoing the recording session without saving the previous take.

Once audio is in the editor, you can manipulate it in all the familiar ways, including scrubbing (multiple modes), moving, duplicating, adjusting start and end points, splitting a segment into smaller segments, and performing nondestructive fades and crossfades. All of this is done by selecting the appropriate tool button, menu choice or using the defined shortcut key, or simply dragging the part of the segment you want to manipulate. You can also play up to six tracks with varispeed playback ranging from -200% to +200% of normal speed, and you can play up to six tracks in reverse, also nondestructively.

The only nondestructive operation that has any processing time requirements is the initial calculation for fades and crossfades, which occurs the first time you play the segment after establishing the fade. At that time, all fades you have performed since the last play operation are calculated as well. Fades include logarithmic, basic linear and "equal power" curves, and may be chosen from 200 possible

variations. Fades can also be performed destructively, in which case no calculations are necessary after the one-time DSP operation.

Prismatica offers "destructive" editing, as well. Options include Time Compression and Expansion (with pitch correction), Pitch Shifting (with time correction), Gain Adjustment, Normalization, Reverse (backward play) and Fade In/Out—all fully functional. The time compression/expansion is very good, even on vocal work and musical selections. As with any system, the most difficult signals for time alteration are complex musical passages with lots of reverberant energy. Prismatica does a great job with such signals as long as the processing is not taken to extremes. Another feature hidden in the destructive DSP menu is an option to perform a peak scan without subsequently normalizing the sound file. This reports how close the peak data in the file comes to full digital level—a thoughtful addition, but this would be more helpful if it also identified the location of the peaks.

This system has one of the most responsive and workable Punch modes I've used. It's easy to set up for punch-in and -out on-the-fly—something that some more expensive editors seem to have great difficulty pulling off. The punch is instantaneous and, of course, nondestructive, allowing multiple retakes. It can be operated by simply clicking the mouse at the points for punch-in/out on each track, such as a "punch between predefined markers," or a freeform punch on command. Prismatica also handles the monitor switching, so you hear the punch source only during the actual punch. Punch options can be used on up to six tracks simultaneously. It is also possible to punch during sync with external timecode sources.

Speaking of external sync, Prismatica and the AudioPrisma hardware make this a relatively simple operation. I used Prismatica to post a 25-minute tape and found it quite workable. I connected one VCR's output to the AB-1 Aux Box, the video-out from the AB-1 to a second deck, and routed the audio from the first deck to the inputs on the ADAX-8818. With the various software choices set for outputting VITC on lines 10 to 12—or any set of lines up to 38 to 40, which is well within the visible picture—it is possible to place

all the power of the DP/4 ... plus

introducing the new DP/4+

The DP/4. You've heard about it from the many rave reviews it received around the world. Or any number of top studios and engineers who have used it on hit records, soundtracks, and commercials.

It offered an unheard-of 4 inputs and 4 outputs, with 4 independent high quality effect processors. Able to process from 1 to 4 different signals with true stereo output. All with a rich sound, and effects covering everything from mixdown, to live sound, to your guitar.

How could we hope to top that? Simple. We listened. To reviewers, top artists, studios, and your comments. The result? The new DP/4+.

Along with the great sound and features of the original, the new DP/4+ will integrate into your studio (home or pro) with better signal matching and ease-of-use. If you're a guitar player you'll appreciate our improved effects switching and new amp simulations. As well as the built-in tuner and headphone jack.

Introduce yourself to the power of the DP/4+. And thanks for the input!

For more information or the dealer nearest you, call 1-800-553-5151. Or, try our automated fax retrieval system at 1-800-257-1439.

Prismatica into "record," start the video dub, and the Aux Box will stripe VITC to the receiving video deck, while audio from the sending deck is recorded onto the hard drive with sync information.

After completing the striping operation, it is possible to activate a "burn in" window to display timecode on the video screen, and you can move this timecode display around on the screen to get the easiest reading position. The burn-in display really simplifies defining edit points in post applications: Place Prismatica into "Slave to Timecode" mode, control your video deck and the audio locks to timecode within about a second or so of starting the video deck. You can disengage the sync so that you can do much of the basic work of loading music and effects to the system as you normally would, then go into sync to move them about for final placement. Or, as mentioned above, for Foley-type work, you can place the system into Record or Punch mode with the transport controlled by the external sync to do live effects to the action on the screen.

THE BOTTOM LINE

The AudioPrisma hardware and peripherals are of high quality and thoughtful design. And they are reasonably priced, considering their extensive capabilities, especially with regard to timecode functions, DSP power and I/O options. The Prismatica software is robust and capable. I didn't have any problems with the system—other than my occasional pilot errors—and I moved a lot of audio through the system over a period of weeks. The system is priced at less than $6k—including high-quality converters. Add to this AudioPrisma's 12-channel digital mixing, real-time EQ, varispeed operation, velocity scrubbing, removeable drive support and fast edit interface, and this becomes quite an attractive choice for the production professional.

Spectral, 18800 142nd Ave. NE, Woodinville, WA 98072; (206) 487-2931. ∎

Dave Tosti-Lane is a theatrical sound designer currently serving as chairman of the Performance Production Department at Cornish College of the Arts in Seattle.

by Paul Potyen

MacWaveMaker

MORNING STAR SOLUTIONS' MIDI NUBUS CARD FOR THE MACINTOSH

T hanks to the rising popularity of multimedia, sound cards are found under the hood of many a Windows PC these days. However, since the Macintosh operating system has always incorporated the use of sound, there has been no similar proliferation of sound cards for the Mac. Most of the audio cards developed for the Mac are intended for pro audio recording and playback applications.
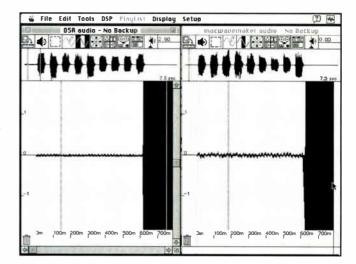
On the MIDI side, the Yamaha FB01 was one of the first widely accepted MIDI synthesizers to be put on a PC card. And though the majority of today's MPC sound cards incorporate some form of General MIDI playback as well as digital audio, Mac NuBus card-based MIDI solutions were nonexistent until recently. Macintosh-based MIDI composers typically use any number of external MIDI devices. Typical Mac audio playback systems either require external MIDI boxes, or they simply play back digitized versions of MIDI performances using native digital audio capabilities.

MacWaveMaker, from Morning Star Solutions (Westford, Mass.), is a high-performance MIDI synthesis card for the Macintosh. It incorporates Kurzweil's Multimedia Audio Sample-playback System (MASS) technology on a NuBus card, and includes a set of General MIDI instruments, a bank of MT32 sounds and a bank of SuperOrchestral sounds. Unlike the family of Windows sound cards, MacWaveMaker does not incorporate digital audio recording and playback. However, the card uses excellent digitized audio samples for its MIDI instruments.

The card can be installed easily in any Macintosh with NuBus slots, and requires System 6.08 or later. RCA jacks on the edge of the card provide line-level audio, left and right.

An adapter cable provides MIDI Out and MIDI In auxiliary ports. On the software side, the MWM Software disk includes drivers for OMS FreeMIDI and MIDI Manager. An MWM Quick-Time Extension is also included, allowing Standard MIDI Files that have been converted into QuickTime 2.0 movies to be played back directly through the card instead of using the sounds included in QuickTime 2.0.

Installation on a IIci equipped

Figure 1: Noise floor for a digitized MIDI sequence using an organ patch played through a Korg 05R (left) and a MacWaveMaker (right). Vertical axis shows percent of full scale.

with Opcode StudioVision 1.44 and OMS was simple, and the MacWaveMaker icon appeared automatically in the OMS setup window. On power-up, MWM's default program map is set to General MIDI, with 16 channels available. According to the user's manual, "For the sounds that bear an acknowledged known instrument or sound effect name, every attempt has been made to provide the highest quality and most accurate rendition possible." For GM sounds with ambiguous names, the Roland Sound Canvas was used as the reference in creating MWM sounds. In general, the sounds were as good as, or better than, the Korg 05R/W MIDI

module that was used as a comparison in this evaluation. Volumes were also generally equivalent. And the signal-to-noise level was noteworthy for a NuBus card, given the proximity of all kinds of electrical signals inside the computer (see Fig. 1).

Changing banks from within StudioVision was accomplished by changing controller #0. Select 0 for GM, 1 for MT32, 2 for SuperOrchestral, 3 or above for percussion/drum sounds. When you select bank 3 (or above), you can then use a program change to select one of eight drum sets. Each of MWM's MIDI channels is independently controllable, so you can have an electronic drum set on MIDI 1, for example, with a SuperOrchestral palette on MIDI 3 at the same time.

The GM spec calls for control of reverb amount on Controller 91. MWM ignores this controller, instead using Controller 83 to select from a variety of effects, including chorus, delay and "symphonic" reverb in three different environments: room, stage and hall. Unfortunately, you have no control over the amount of the effect you choose, and the effect is global; that is, it affects all MIDI channels. If you care to dig deeper into the MIDI control of the MWM card, there is much more to keep you busy.

At a list price of $579, the MacWaveMaker card is a good choice for multimedia kiosks (or any semiportable, Macintosh-based MIDI playback system) requiring high-quality MIDI playback. It eliminates the need for an external box, MIDI cables and MIDI interfaces, and it sounds great. And, in fact, for composers who want a quality General MIDI device (and more), have an extra NuBus slot and are cramped for space for their outboard gear, MWM is well worth considering. As of April 1, end-users can purchase a $499 MacWaveMaker bundle directly from Morning Star Solutions, which includes Passport Designs' Master Tracks Pro, Version 6.0.

Morning Star Solutions Inc., 7 King's Pine Road, Westford, MA 01886; (508) 692-0373. ∎

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

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Kodak

by George Petersen

PRODUCT
CRITIQUES AND COMMENTS

LIGHTWAVE FIBOX

If you work with audio, you work with wire. Most of us rarely think about wire, except in a negative sense: When it breaks, we're angry. When we're coiling a 250-foot snake that's spent a week at a festival in a muddy stadium, we're disgusted. And when we have to deal with long cable runs, we spend a lot of time worrying about EMI, RFI and signal loss, particularly when mic-level signals are traveling more than 150 feet.

Fiber-optic systems have long been available for sending audio over long lines. But, in the past, these were expensive, complex systems that often suffered in terms of audio performance, due to low resolution (typically 16-bit) and primitive converter/digital filter designs.

However, such drawbacks may soon be a thing of the past with the availability

of systems such as the Lightwave Fibox. Priced at under $750/channel ($1,499 for a stereo send/receive pair), Fibox is the first in a series of modular, expandable fiber-optic transmission systems designed for moving analog or digital audio over distances of up to 2.5 miles.

The Fibox system is based on a high-quality, 20-bit, Burr-Brown A/D (#PCM1760) and D/A (#PCM1702) converter chipset, providing a dynamic range of 108 dB. The convert-

ers in the analog input/output versions operate at 48 kHz to optimize frequency response (0.1 to 21.5k Hz, -3dB). Digital I/O versions are also available; these offer switchable sampling rate operation and AES/EBU digital interfacing.

Housed in a ⅓-rackspace chassis, the send unit (Model FBAI-M) has two balanced XLR inputs, switchable for line/mic-level signals, with mic gain adjustable from 4 to 70 dB. Other features include individually switchable, 48VDC phantom power on each channel and a rear-panel phase-reverse switch that inverts the polarity of channel 1 relative to channel 2. Also on the rear panel is an ST-style, 1310nm-wavelength fiber output (for 62.5 or 125µm fiber-optic cable) and a DB-15 connector that links several units for synchronized, multichannel operation. The units are rackmountable, and a complete 12-channel system could fit into three rackspaces.

Also built in a ⅓-rackspace box, the 2-channel Model FBAO-M receive unit features balanced XLR outputs (with ground lift switch) and a front-panel headphone output, for easy signal monitoring. And a DB-25 link connector allows slaving several FBAO-M units for expanding the system.

Operation requires little more than making the connections and powering the system. Both units have rear jacks for external 12VDC powering (the units draw a hefty 500MA). The 12VDC part is ideal for remote applications, powered via auto or motorcycle batteries. Lightwave says that a marine battery will power a 12-channel Fibox system for 12 to 14 hours, and I have no reason to doubt it. Unfortunately, I was less than enamored with the non-robust sleeve plugs on the end of the DC wall wart. The plugs can pull out easily, which necessitates

slapping gaffer's tape over the connector to ensure a noninterruptible connection. Aware of the problem, Lightwave now ships Fibox with locking power connectors. A rackmount supply capable of powering six units is also available.

Otherwise, I have few complaints about Fibox. The controls are recessed —a nice touch—and the construction quality and overall "feel" of the units are very good. My measurements confirmed the unit's claimed THD+Noise spec of 0.006% (1 kHz). I also ran the signal through a half-kilometer (1,640 feet) of fiber cable to check frequency response over long distances. It tested out to be a ruler-flat ±0.2 dB from 20 to 20 k Hz and -3 dB at 22 kHz. I shudder even to consider what would happen to a signal sent through copper wire over such a distance, but I'd be willing to bet that linear frequency response wouldn't be the result.

But specs are only half the story. The Fibox system provided clear audio transfers under all conditions, and I never had to concern myself with EMI, RFI, ground loops or whether someone's CB radio transmission would become part of my next recording. The mic preamps in the send unit are excellent, providing sonic transparency in addition to being handy in a variety of applications. Of course, if you're doing location broadcasts or sound reinforcement, the weight (and size) of the cabling becomes an important factor, whether it's having to schlep a 1,500-pound copper snake through a hockey arena, install wiring over flimsy suspended ceiling panels or run a feed out to a satellite uplink. And fiber offers multipurpose flexibility in studio installs, such as cabling to machine rooms, interconnecting post rooms or as tielines between adjacent (or not-too-adjacent) facilties. In such instances, fiber wins every time.

At $1,499, the Fibox system is a formidable problem solver at an attractive price. The system readily expands for future growth, and in addition to the audio modules mentioned (add-on boxes are priced from $575), Lightwave also markets data interfaces for sending data (SMPTE, MIDI, PA485 or RS-422) over the fiber, along with the audio signals.

Lightwave, 900 Jackson Street, Suite 700, Dallas, TX 75202; (214) 741-5142 or (800) 525-3443.

GOLD LINE MULTI-SEND PERSONAL MIX SYSTEM

I don't know about you, but I hate doing cue mixes for performers. Whether in the studio or onstage, the most important thing to many of these *artistes* is their cue mix. In fact, I've witnessed (and engineered) countless sessions where a band—supposedly on a budget—spent two thirds of their studio time working on the ultimate headphone mix, thus reducing the amount of time available for tracking and overdubs.

Enter the Gold Line MS3 Multi-Send personal mix and headphone system. Designed for studio or live use, the MS3 has three inputs (two line-level only, one line/mic-switch-

Gold Line Multi-Send

able), all with XLR and ¼-inch connections, each with pass-through outputs. The latter pass any incoming signals unaffected, for daisy-chaining to any other units in the chain. The MS3 also features input-level mix knobs for creating a customized mix from the three sources, headphone outputs and a line-level mix output for driving an external amp (for stage slants or really LOUD phones).

The MS3 is powered via an external DC from a wall wart supply. The 5-foot cable coming out of the adapter seems too short: Ten or 15 feet would be better, especially given the fact that performers rarely position themselves near the walls where the warts live. Other than these cord quibbles, someone really put some time into the MS3's design. Recessed controls protect the front panel knobs from damage caused by those inevitable drops and clunks that seem to accompany any gig, and the rugged aluminum chassis has threaded holes for custom mic stand, music stand or wall mounting.

Setup is straightforward. The unit can be used with ¼-inch or XLR connectors: balanced or unbalanced, -10 or +4dB levels. The three pass-through

connectors (one is switchable from mic- to line-level outputs, ¼-inch or XLR; the other two are ¼-inch line-level only) add virtually no coloration to the signals. The mic-level pass-through measured with a frequency response that was ±0.1 dB from 100 to 40k Hz; and below 100 Hz, the roll-off was an almost insignificant -0.25 dB. THD+N spec'd out to be 0.003% at 1 kHz—more than respectable for a $349 unit designed for road work and studio cueing.

An appreciated addition is the two headphone outputs on the front panel: One is set for 600-ohm and the other for 8-ohm headphones. The headphone outputs seemed loud enough—probably inadequate for the typical smash-and-thrash drummer—but in such cases, merely take the line output and feed it into a 1,500-watt amp, which should drive anyone's headphones sufficiently to the threshold of pain.

But the best thing about the MS3 is that it works, and it speeds things along onstage and in the studio. The three mix controls (source one/source two/and mic) have a mushy feel, but as long as the box keeps the performers off my back (and out of my talkback), I'm willing to forgo a few frills. At $349 each, the Gold Line MS3 takes a step toward making audio engineering into a pleasant experience.

Gold Line, Box 500 West Redding, CT 06896; (203) 938-2588.

TROISI DIGITAL COMPANION CONVERTERS

Obsolescence is not a word that audio engineers like to hear. Typically, when you buy a piece of gear, you hope to get years of use from the product. Unfortunately, with the dizzying pace of improvements in digital technology, what you buy today may be worthless tomorrow. As an example, I bought a $3,000 outboard D/A converter a couple of years ago. Once, it provided wonderful performance; today, even the converters built into my portable CD player can run circles around it. Yuk.

In an effort to reduce this nightmare of obsolescence, Troisi offers a series of analog/digital and digital/analog converters that feature plug-in modules that increase the performance of the units from 16 to 18 or 20 bits. If you're currently work-

ing strictly with 16-bit systems, you can later upgrade to 20-bit with a simple plug-in module, rather than placing the entire unit on a shelf and kissing off your entire investment.

The Troisi Digital Companions are housed in half-rack enclosures, and their price is equally compact: $1,495 for the A/D converter or $1,295 for the DAC. The price is the same whether you choose a 16-, 18- or 20-bit model, and the modules are $395 each.

The back panels of all of the Troisi converters feature AES, RCA S/PDIF and Toslink optical digital ports, +4dB analog connections on XLR jacks, and a DIN jack for the external wall wart supply. The A/D converter also includes a BNC word clock input, which has become a necessity these days.

The front panel of the A/D box has recessed screws for adjusting input level and switches with LED indicators for selecting internal/external word clock and 44.1/48kHz sampling rate output. Those six people who really need it will appreciate the emphasis in/out switching, but these days, I don't know too many engineers who record using digital em-

phasis. The D/A box has switches for selecting from its three digital inputs, along with recessed output level pots and status LEDs to indicate sampling rate (32/44.1/48 kHz), emphasis or digital errors.

Inside, the units are laid out cleanly, with high-quality construction, and removing and reinstalling the upgrade daughterboards is simple. The components are also very good: The 20-bit DACs are Analog Devices AD1862NJs, while the 20-bit ADC is a Crystal Semiconductor CS5390KP. Good stuff.

In repeated listening tests, using the Troisi converters over a period of months, I was impressed with their performance. The 16-bit ADC easily surpassed the performance of the stock converters on any DAT deck on the market and provided a measureable, obvious difference to all who heard them, with a marked improvement in clarity. The DAC unit's performance proved similar, outclassing stock DAT converters by a considerable margin, reproducing sound with rich textures, and improving imaging, depth and soundstage. Engineers who've never heard

their product played back through external converters will be in for a treat when they try this box.

Of course, when you're ready to move up to full 20-bit performance, install the 20-bit module and you're on your way to the next generation. The 20-bit ADC combines transparency and detail with a level of sonic accuracy that's excellent for a unit costing only $1,495. With an increasing number of affordable 20-bit recording systems on the market (such as Rane's PaqRat) and the increase of noise-shaped 20-bit CD releases (using Apogee UV22 or Sony Super Bit Mapping), 20-bit is going to be part of your future.

The only caveat I have to offer is that 20-bit converters create noticeable truncation artifacts when used with a 16-bit system, so if you're working in 16- *and* 20-bit media, you'll need to invest in another module for your converter. But at least you won't be throwing away your investment when you upgrade.

Troisi, distributed by Northeastern Digital Recording, 2 Hidden Meadow Lane, Southborough, MA 01772; (508) 481-9322. ∎

by Jeff Forlenza

SOUNDCHECK

The Gyuto Tantric Choir onstage at San Francisco's Palace of Fine Arts. The monks wore AKG C-410 headset mics, and a stereo pair of Neumann U89s was placed centerstage for ambience. Meyer Sound's new MTS-4 loudspeaker system was used to reproduce the three-note chord, which these monks are famous for.

GYUTO MONKS TOUR WITH MEYER SOUND'S NEW LOUDSPEAKER

The third U.S. tour by the Gyuto Tantric Choir—presented by world-music champion, Grateful Dead drummer and executive producer Mickey Hart—carried a new sound reinforcement system by Meyer Sound Labs of Berkeley, Calif. The MTS-4 loudspeaker system was designed to reproduce the full spectrum of audible sound with great power and clarity, especially in the lower frequencies. When Hart was planning the most recent Monks tour, he called upon Meyer Sound to supply sound reinforcement. The triple-tuned MTS-4 enclosures were the perfect choice to reproduce the three-note chord, which these monks are famous for, with deep bass and subtle harmonics.

According to company president John Meyer, "Tibetan religious chant covers a very wide range, from extremely low bass

notes to high, delicate harmonics. In order for the audience to perceive the full impact of this profound, meditative music, all those notes must be reproduced with highest fidelity." The new boxes are self-powered, four-way (18-, 15-, 12- and 4-inch drivers), actively crossed boxes with ultralow distortion. With its three independent cone woofers, the MTS-4 has excellent low-frequency output. Not surprisingly, a beta MTS-4 system is already in place at a disco in Mexico City. Official release of the new Meyer system is planned for the fall AES convention in New York, with production units available beforehand.

Dave Dennison mixed front-of-house for the monks. Before each performance, Dennison (who also mixes FOH for David Grisman and the Jerry Garcia

Band) used the Meyer SIM system to tune the room. The monks themselves wore AKG C-410 headset mics, and a stereo pair of Neumann U89s were placed centerstage for ambience. Other mics included Ramsa SW-

TOUR PROFILE
Laurie Anderson
THE "NERVE BIBLE" TOUR

by Robin Danar

F.O.H. engineer Robin Danar

PHOTOS: STEVE JENNINGS

[Before "multimedia" became a buzz word, Laurie Anderson was putting together incredibly complex shows that blended live and taped music, film and video projections, spoken-word pieces with songs, and generally trying to shake up people's preconceptions about everything she could. There's always a certain amount of legerdemain involved in her performances, and at least part of the power of what she does comes from the fact that she doesn't discriminate against any media.

One piece might be accompanied by a crude line animation, another by something that involves sophisticated computer-generated graphics. She plays with light and shadows, color and texture. Her writing is similarly diverse, moving from short, abstract dream fragments to highly developed dialogs involving a multiplicity of characters and voices. She doesn't really "sing" in a traditional sense, yet her performances are unquestionably musical. She's toured with big groups (like the one captured in her fine film, Home of the Brave), small ensembles, and now, on her Nerve Bible Tour, alone with just mounds of technology to keep her company onstage. To say she is "one of a kind" is an understatement.

To give Mix readers some insight into this remarkable tour, we asked Robin Danar, who is Anderson's live sound engineer (and sonic collaborator), to write about his experiences. Danar is an independent producer/engineer based out

—FROM PAGE 138, GYUTO MONKS TOUR
5s and Sennheiser 409s for drums and horns, respectively, and a stereo pair of AKG 452s for the damaru, or Tibetan skull drum.

Based on a 500-year-old tradition, the monks chant in sanskrit. Loyal to the Dalai Lama, the monks were touring to raise funds for their monastery and to keep Tibetan traditions alive. ■

DOUGLAS SMALLEY (1947-1995)

The Los Angeles sound reinforcement community recently lost one of its best when Doug Smalley passed away. Smalley worked with Studio Instrument

Douglas Smalley was an integral part of the L.A. sound reinforcement community.

Rentals for 22 years. In that capacity, he helped many musicians take their acts to the stage;

QUICKTIPS

"Sound du jour." Planning on going on the road this summer with your group? If you'll be using local production, no investment will pay bigger dividends than a carefully crafted technical description of your show. Try to keep things simple by fitting all the sound specs onto one page. Include all your relevant phone numbers at the bottom (beeper, cellular, fax, home, management co., etc.), in the order you would like them called. You can be sure someone will need to speak with you about substitutions.

Even more important than your rider is a one-page document with a stage plan on the top half and an input list with microphone and stand choices on the bottom. This will allow the system technician to get the stage together even when you're running late and can't get there until the doors open. This can be either drawn by hand or by using a computer but should be clear enough so that it will fax well; Neatness counts. One good, cheap computer program is KeyCAD by Softkey International (about $30). Carry several hard copies of this sheet at all times and always back yourself up by faxing this to the actual sound vendor a week ahead of time.

Show the locations on the stage plan of the band gear and wedges with mix numbers clearly marked. Don't forget the location of AC drops for backline power. Indicate if there is a preference for the location of the monitor console. Show the locations of all inputs on the plan with channel numbers in circles, which refer to the inputs on your list below. After each channel number, leave a space for your in-house tech to write the snake number and the sub-box assigns. In addition to stand and microphone type (plus alternates), each line of the input list should indicate inserts by type and order of importance (i.e., Comp 1 for lead vocal, Gate 1 for kick drum).

Finally, if there is any piece of equipment remotely important to your show, bring it with you (including board-tape. Sharpie and headphones). No matter how common you may think a certain item is, you'll be surprised how often it can't be found.

Send QuickTips to Mark Frink at 4050 Admiral Way #305, West Seattle 98116; BBS: (206) 933-8478. —*Mark Frink*

he worked with virtually all the great musicians in L.A. From renting gear to arranging rehearsal space to helping Yamaha put on their Soundcheck (a competition for local, unsigned bands), Smalley was integral to the L.A. music community as a whole.

Born in Shenandoah, Va., in 1947, Smalley moved to California in 1971. He started work with Dolph Rempp and Ken Berry at Stages at their 6247 Santa Monica and Vine location in 1972. Studio Instrument Rentals started in 1973 as part of the Stages family, providing music instrument rentals and rehearsal space. The company later moved to its present location.

S.I.R. piano department manager Warren Huff said, "Let there be no mistake about it: S.I.R. is the house Doug built. 6001 Santa Monica was more than just a place to work. More 'new' rock bands broke into the record business on Stage 6 at S.I.R. than can be counted by memory alone. Standards in the business like Natalie Cole, Smokey Robinson, George Benson, George Duke, Chick Corea, Neil Young and many, many more returned repeatedly not only for the privacy afforded by the location but for the professional care, and often wild service, given by Doug. For those who knew him, Doug was the consummate professional his whole career. Doug was a professor in his craft, with his finger on the pulse of the L.A. music industry for over 20 years. I learned volumes from the man. He was colorful to say the least. He pulled no punches. He spoke his mind and loved you more if you spoke yours. Doug will be sorely missed and impossible to replace…We can only try to follow in his footsteps."

Don Adey, stage manager at S.I.R., said, "Doug was loved by many. He was a gentle, caring man to all that met him. I had the good fortune to be his friend and partner. I will miss him dearly."

Douglas Smalley is survived by his brother, Dallas. ■

of Manhattan with more than 15 years of international live mixing experience for bands including Suzanne Vega, the B-52's, The Church and Blue Nile. Recently, he has devoted most of his energy to studio production and artist development. Recent projects include a live CD by Mercury recording artists Rusted Root, and independent releases by Mr. Henry, RCA recording artists From Good Homes, and New York acts Big Mouth and Mommy. He is currently setting up a music-related site on the World Wide Web (for now, contact rdsquid@aol.com). On nights off, he can be found mixing at the Mercury Lounge in New York City.—Eds.]

The Nerve Bible Tour began with a phone call, early in September. "You know how people go into the studio and make these elaborately produced albums with lots of overdubs and then go on the road and do these simple solo shows and leave everything out? Well, my new album is really sparse," Laurie Anderson explained. "I've got lots of great stuff that we recorded and left out of the final mixes, but I'm thinking about going on the road solo and throwing it all in," she continued. "And we're going to take it online, as well." I have done several world tours with her since 1988, so I knew what to expect: Each tour has been more challenging than the previous one, and this would be no exception.

Our initial meeting was at Anderson's Manhattan studio in mid-December. The production had started months before, as set designers, lighting designers, photographers, video editors and other technical experts developed the visual and logistical aspects of the show. Concurrently, she was working on a soon-to-be-released CD-ROM with Voyager and exploring ideas on how to take the tour online. Beginning with an audio core and a walk-through, the show is heavily scripted for all departments. The score details the microphones, instruments and associated effects that will be used for each piece, as well as any backing tapes.

The "Nerve Bible" has three microphone groups. At the keyboard position, stage-right, there is a wireless RF mic and a hard-wire, both Shure products using Beta 87 capsules. Center-stage there is another RF and a hard-wire, and there's a third, floating RF microphone. There are also extra mic stands in various spots around the stage, some hidden. The wireless mics "travel" throughout the show, depending on the physical positioning, the vocal continuity of each piece, and the needs of an artist who is moving around, playing a variety of instruments while speaking or singing. Anderson's vision of the show must be handled with a minimal amount of audio "stuff" onstage, so the focus can be on her and all the spectacular projection and lighting effects. The idea is to make something very big seem simple.

There are only two low-profile monitor wedges onstage, also at the keyboard and the center-stage positions. Two more in the wings are used for side-fills, and a fifth is hidden upstage for rear fill. The first two aux sends on the FOH Yamaha PM4000 are used for these, one for onstage and the second for offstage. Anderson takes mostly tape in her monitors, post-fader, so that she can hear relative levels and crossfades properly. She gets a little dry vocal and instruments but likes to hear them mostly in the house, and her dynamic is best when she hears it well. Audio feeds are also supplied to the projectionist backstage, as all cues are manual and interrelated.

During the first days of run-through at Anderson's apartment/studio, the initial input list began to take shape. Things were constantly changing as she viewed the production materializing and modified the show. We then moved up to Purchase, N.Y., for a week of rehearsals and our first show, and some of the extra possibilities had already been prepared for.

First of all, each microphone is "multed" or split into two channels in the console. All three RF mics have a "clean" channel (a "small space" program for dialog and a longer plate for singing and effects), as well as a second channel set up as an effects send only, which involves varying degrees of Harmonizer and other effects. In the show, a common situation is for Anderson to be walking around and speaking on a "clean" RF mic, which suddenly has to turn into a Harmonized-down "voice of authority." After this switch (as fast as a studio punch), only the Harmonizer return and its effects are heard, and it then switches back to her normal speaking voice just as quickly.

The hard-wired mics are used in tandem with the RF mics. For example, the RF mic might be "clean" with a singing ambience, and the hard-wire heavily affected, with or without direct vocal, depending on the situation. Anderson keeps the two mics about a foot apart and will use either, or both at once. Each mic channel is used in many different ways during the course of the show. Prior to each scene, the next microphone(s) she will use, with the proper effect(s), must be quickly set up. This goes for her instruments as well, all taken with Countryman Type 85 D.I.s.

Initially, there were backups of everything, but these found their way into the show, as Anderson wanted to do more, and also as the special needs for certain performances dictated. H-3000 #3, originally a backup, is now used for three cues that were too rapidly paced to hit consistently. The third RF mic, also originally a backup, is now used regularly throughout the show. Recently we used the backup keyboard in a downstage position, in front of the P.A., for the first time. On *The Tonight Show*, the backup DAT tapes had to be used because a change of sequence required a

crossfade between two pieces of music on the same tape.

Anderson's BBE 862 Sonic Maximizer is inserted across subgroups 1 and 2 for the Panasonic SV-3700 playback machines. The Nerve Bible is Anderson's toughest solo venture yet, with more than 50 DAT tape cues, almost all of which crossfade. On my first outing, there were 12 tape cues, with only two on the second machine. There are now many short pieces with multiple crossfades. A typical move is to hit tape B, fade tape A, cue tape A, set the levels, and then set up for the next piece. The VCA masters are used for the crossfades, referencing the "flash" point as unity gain and for riding tape levels relative to Anderson's live performance. The first six VCAs cover most of the audio mix: DAT A, DAT B, Instrument, Clean Vocal, Effect Vocal and General Ambience. Once the actual faders are in place, a lot of quick touch-ups can occur,

while still keeping track of the original basic blend. This setup mix must be maintained, letting her feel a "dynamic," because Anderson listens to the house so much. Level changes, on her vocals in particular, need to be subtle and slow; otherwise, she'll simply compensate in the opposite direction.

For the effects switches, there is a MIDI foot pedal connected to Anderson's personal rack of three Eventide H-3000 Harmonizers and two Lexicon PCM-70s. It only affects the devices that need to change for each scene, so that the other effects can change while Anderson is talking on one of the Harmonizers.

The structure of the show is one of constant contrast: very quiet to very loud, very dry to very wet, very bright to very deep, creating movement. One difficulty is the extensive use of effects with large amounts of regeneration and long decays, making a great deal of muting necessary. Vocals and instru-

ments are gated, as well as effects returns. Six dbx 166 stereo compressor/gates are used on vocals and violin, and a Drawmer DL-241 stereo compressor/gate is inserted on the guitar channels. Aphex 612 stereo gates are inserted on the three Harmonizer returns, as bleed and re-Harmonization are primary concerns. No matter how exciting the sonic picture is, a primary concern is to make sure every word is understood. The dialog is what ties everything together, so it's got to be clear. That includes Harmonized and reverb-washed vocals. Having multiple channels with specific equalization helps this, along with the gating of vocals and effects returns. The compression also aids in smoothing out the sends to the Harmonizers.

Lastly, there is the "self-defense" factor. There is a lot of gain on these mics and instruments. It's annoying enough to hear a violin being put down

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with an infinite delay loop on it. By the time you hear it, it's too late. The handling noise on mics has the same problem. At the very first show, Anderson accidentally knocked over a stand with two microphones on it. One of the mics not only had an infinite loop on it, but that effects return was actually being sent to another Harmonizer with a similar effect on it. Had that mic not been muted, it would have been disastrous. Individual and group muting are also invaluable in getting the noise level down and keeping the effects under control.

This show is based on quality of acoustic tone, requiring that the sound system reproduce a wide dynamic range with no noise. System technician Andy Meyer, a mixer in his own right, understands the importance of quiet to achieving our dynamic goals, so I never have to think about the rig. The Maryland Sound system consists of eight HC-12 high/mid speakers, six HC-15 lows, four HC-18 subs and four Meyer UPA speakers used for front fill. There are two one-ton motors, each capable of flying a pair of two-cabinet columns per side. We haven't had a buzz or an RF problem yet, a tribute to his talents, as well as the Shure wireless system. Meyer is doubling up on this tour, also handling Anderson's axes onstage, which are Korg M1 keyboards, Steinberger and Zeta violins, Steinberger guitars and the Drumsuit, a custom "suit" with strategically placed trigger pads built by Bob Bielecki.

There is a very industrial nature to mixing this show that is, unfortunately, inseparable from the sensitivity required to mix a show covering a full spectrum of dynamics and emotions. Since there is no sequencing, there are a lot of timing cues going on between Anderson and me that are very musical. I rarely get a chance to look at the stage during the show, and I can't wear a Clear-Com headset. I am, in effect, "the

band," so the cues have to be done musically. Even though scripted, the cues are often quite different from night to night, and each show has a unique vibe to it.

As the tour progresses, not only does the timing get better, but we can deal with a lot of subtleties. We've been doing some effects crossfades, for example, that are related to the dialog and the mood of the transitions. Anderson has been very open to suggestions, not just sonically but musically, and that has been particularly rewarding. At times, it's just like mixing records.

As far as the Internet connection, it has been fascinating. The Voyager Company has a very hip line of CD-ROM titles (including Anderson's), and has been a trend-setter in that field for quite a while. They have sent out a rotating crew on tour with us to upload information. Besides the usual stuff such as concert dates and reviews, they've been trying some new things.

First of all, there's the Green Room. We've had a wide assortment of uploads from each stop on the tour. There was a chat session from backstage, there are QuickTime movies of Anderson at the Aquarium, snippets from rehearsals, local-flavor-type stuff. You can click on a city on the U.S. map, and, if we've been there, there's a surprise. You can also check out some samples of the CD-ROM, which looks remarkable.

Currently, we are preparing a little sample of each sector of the live production. It will probably look like a 3-D stage plot, with Sound on one page, Lights on another, and Video on another. There will be icons on the set related to each department of the production. You will be able to click on an effects microphone and hear it, a video projector to see a film, a laser, etc. If you're on the Web, check it out at http://www.voyagerco.com and follow the signs to Laurie's stuff. New things are being added every day. ∎

New Sound Reinforcement Products

EV EXPANDS MT LINE
Electro-Voice (Buchanan, MI) has added five new High-Q models to its MT-B line of Manifold Technology speakers. The MTH-4B mid-bass/MF/HF (150-20k Hz) system is available in 40°x20° or 60°x40° coverage versions. The MTH-2B mid-bass/MF/HF system is available in 90°x40° or 60°x40° versions. The four have improved mid-bass horn manifolding for increased sound quality and output. The MTL-2B bass system has two 18-inch woofers facing into a manifold chamber, for a 37Hz to 200Hz response and a max SPL of 130.5 dB (1,200 watts). All are available in carpeted or painted versions; flying hardware is optional.
Circle 212 on Reader Service Card

KLIPSCH KP-3002-C
Klipsch Professional (Hope, AR) debuts the KP-3000-C, a two-way vented loudspeaker in a trapezoidal enclosure. The KP-3002-C features a 2-inch, titanium-dome compression driver coupled to a Tractrix Wave 40°x60° horn and a 15-inch, 300-watt woofer. Other features include proprietary KLiP HF driver protection, locking Neutrik ¼-inch inputs, bi-amp capability, metal grilles, tripod socket and a five-year warranty.
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MARTIN WAVEFRONT 8
Distributed by TGI (Kitchener, Ontario) is the Martin Wavefront 8, a three-way speaker offering performance down to 80 Hz, 55° horizontal dispersion and load-certified MAN flying points. Each trapezoidal cabinet houses two horn-loaded, 12-inch woofers, a 6.5-inch cone mid driver with toroidal phase plug and horn, and a 1-inch compression driver on a constant-Q HF horn. Wavefront 8S, a matching sub box with 15- and 18-inch woofers, is optional.
Circle 214 on Reader Service Card

RAMSA
WR-S4400 CONSOLES
The WR-S4400 Series of 4-bus mixing consoles from Ramsa/Panasonic (Cypress, CA) offer pro features such as long-throw 100mm faders, individually switchable phantom power and 3-band EQ with swept mids. Available with 12, 16 and 24 inputs, the WR-S4400 also provides direct output switching for each channel, which can increase the number of available sends (up to 27 on the 24-channel model) without affecting other channel operations.
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AKG SR800 WIRELESS
AKG Acoustics (Northridge, CA) expands its WMS900 UHF wireless line with a low-cost, rack-mount receiver. The SR800 is a true-diversity receiver for users who need the high performance of the WMS900 system, yet have more modest channel capability requirements. Features include dbx noise reduction for extended dynamic range, front or rear antenna mounts, balanced XLR audio outs, headphone monitoring and an 11-segment LED meter for audio or RF strength.

They say electrolytics, we say garbage

XXCREST CONSOLES

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XXCREST CONSOLES **Breaking sound barriers**

by Ron Streicher

The Shanghai
Symphony
Orchestra during
rehearsal

ON LOCATION IN CHINA

RECORDING THE SHANGHAI SYMPHONY ORCHESTRA

Streicher's custom
stereo array—a
variant on the
"Decca Tree." In
the center is an
AKG C-426 stereo
mic set to the M-S
configuration.
Flanking it is a pair
of Neumann TLM-
50 omnidirectional
mics.

"Don't leave home without it!" This all-too-familiar admonition rang in my ears as I prepared for another recording project in a foreign, distant land. Because I had previously traveled to Karachi and Moscow to make orchestral recordings, this was not an unfamiliar situation. However, because this project was the Shanghai Symphony Orchestra, I also found myself thinking of the Chinese saying: May you live in interesting times.

It has been said that any project lives or dies in its planning. In relating my experiences on this project, I intend to explain many of the factors that go into coordinating a recording session on-location in a foreign country. If this article makes you aware of some of the potential pitfalls, then this recording project will have fulfilled a dual purpose.

PREPARATIONS

Last September, I received a call from record producer Jane Welton asking me to go with her to Shanghai in December. The project was to record two concert performances of the Shanghai Symphony Orchestra led by American guest conductor/composer Victoria Bond, whose new

The Beijing Experience
Sound for Warner Bros.' "The Little Panda"

by Mark P. Stoeckinger

Warner Bros.' *The Little Panda* is a family action-adventure film about Ryan Tyler, a 10-year-old boy who travels to China to visit his father, a researcher on a panda preserve. Early on, Ryan gets caught up in panda intrigue: He must save the life of a cub, upon whose existence the future of the preserve depends. The film is filled with precarious suspension bridges, wild river rapids and runaway horse carts, not to mention the bumbling yet dangerous poachers who are after Ryan and the panda cub. The movie (directed by Chris Cain) was filmed on-location in Jiuzhiagou, a panda preserve in western Sichuan. The topography of this part of the Himalayas is lush and beautiful—laced with ponds, rivers, waterfalls and waterfalls and more waterfalls.

Production sound mixer Andy Whiskas used a wide array of mics to record some great tracks under challenging and changing circumstances. Whiskas' selections included a Neumann KMR82 and 84, a Sanken VP88 and a Schoeps CMS 5, along with Tram radio mics when the situation dictated. Recordings were made simultaneously to a Nagra IV-S and Sony D7 DAT machine. Dan Gleich, working with Whiskas, also used a Sony D7 DAT machine with Sanken VP88, Schoeps CMS 5 and Neumann KMR82 and 84 microphones to record a vast array of production ambience tracks for use in postproduction. Because of the obtrusiveness of water sounds in some of the locations and because some of the Chinese actors' English wasn't always clear, a great deal of dialog had to be added after the shoot, so ADR became a very important part of the post-production process.
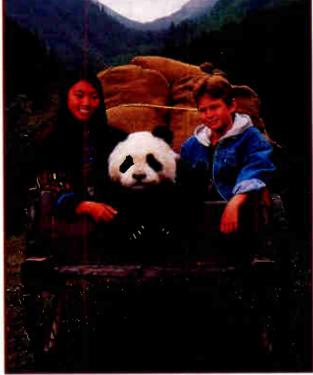
The ADR work was done at Beijing Film Studio, one of 16 major film studios in mainland China. The facility was chosen not only because of its successful 40-year history in feature-film work, but because any foreign film made in China must be produced in cooperation with China Film Co-Production, which manages China's participation in foreign productions, and that organization is based in Beijing. We had chosen the studio before leaving for Beijing and phoned ahead to make sure the equipment we required for the ADR sessions would be available: a synchronized 24-track Dolby SR rack, DAT machine and a 35mm playback machine, all hardlocked to a 35mm film projector.

In all, we spent seven days in China, three of them dedicated to recording ADR for six principal actors and two groups. The first was a Chinese walla group brought in on February 15, recorded mostly to picture, although some cues were

Ling (actress Yi Ding) and Ryan (Ryan Slater) with their furry friend

recorded wild for the actors' convenience. The second group consisted of Tibetan children to record walla cues and overlay a song from production; none of the children had ever been in a studio.

The kids were recorded mostly wild as well. We provided playback (on 3-track sprocketed mag, transferred from the 8-track ADAT tape supplied by music editor Jim Harrison), and after figuring out that

they couldn't understand the lyrics, which were in Chinese, we provided a click track on one of the three channels. The kids wore headphones, and they had junction boxes that looked just like American lunch boxes, except for all the ½-inch outputs and the one audio in. It was quite a sight. After 24 takes, I figured that I had four takes that we could use

The **Panda ADR** mixing staff, headed by Mr. Lee (left)

with the music provided by Bill Ross.
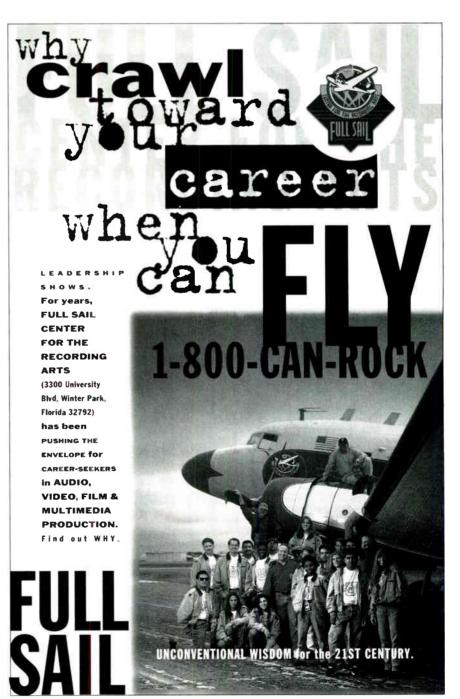
Inside Beijing Film Studio's large, two-story brick post-production building are two mixing stages, a scoring stage, a Foley stage and an ADR room. A tour of the ADR facilities made it quite clear that it could not accommodate the type of work I had intended. I learned that the replacement dialog process in China is equipped to operate off the 35mm loop method, where each line of dialog to be replaced is removed from the work print and work track and cut into corresponding loops to be played over and over again, with the actor reciting the line on each pass of the film loop through the playback machine. Although that system was industry-standard the world over for more than 50 years, it is slow and inflexible, because each loop needs to be threaded up in the film projector and the guide-track playback machine. No deviations are immediately accessible because the process would have to come to a stop while new loops are created from scratch.

Fortunately, a tour of the remaining studios in the sound building showed us a mixing stage where the acoustics were dead enough to record ADR, and a Westrex 4-track film recorder was available to handle the multitrack requirements. The Otari

MTR-80 we had requested in advance was hard-wired into the scoring stage, and even then it was set up to run wild. The studio was not equipped with any of the automation needed to cue the actors for frame-accurate placement of lines.

When recording ADR in the States or in Europe, an actor hears three sequential beeps inside a headset. Where the fourth beep would be, the actor begins performing the line. Without this technology, near-perfect sync is virtually impossible to achieve. We found, in fact, that the concept of replacing a line with performance

and sync equal to the original production recording was quite contrary to the way in which the actors were used to working.

Shooting films either silent or with only rudimentary guide tracks allows the director and actors the ability to re-perform part or all of the production. Perfect lip sync does not seem to be a priority to Chinese filmmakers. This obstacle was compounded by the fact that some of the actors needed to clarify their English for intelligibility. We also wanted to match the record quality of these new lines into the existing production track,

which requires recording the new lines of dialog as on- or off-axis as the original recordings were. Although Mr. Lee, our mixer, was initially quite surprised that I would change the mic position between virtually every line, he eventually embraced the concept and began helping me fine-tune the mic positions.

More troublesome was providing

Actor Cheu Chang works on ADR for Warner Bros.' The Little Panda.
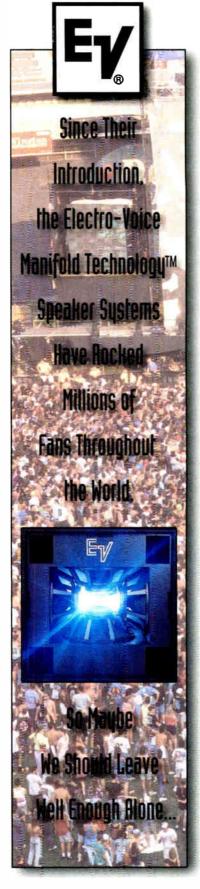
each actor with a cue to begin delivering replacement dialog. The solution turned out to be a little nudge on the shoulder at the precise moment the line should begin. Getting the lines to sound right was another challenge; there are sounds in English that are just not made in the Chinese language, and through the process of coaching English pronunciation, I came away with a new appreciation of phonics. Fortunately, everyone involved was a consummate professional and learned the process quite rapidly.

Stateside studios would be envious of the staffing provided for the ADR sessions: a mixer, a recordist, two assistant recordists, machine room operator, projectionist, a translator to keep notes and logs and two personal translators. It was an impressive staff, one that was willing to contribute and learn at the same time. We had to adapt to their culture and needs, and they made it easy. The key to recording in any foreign culture, I've found, is to always make demands within reason, learn to listen, and, above all, be flexible. ■

Mark P. Stoeckinger of Soundelux, Hollywood, was supervising sound editor on The Little Panda, *which will be released late-summer.*

composition *Thinking Like a Mountain* was the featured work on the program. Soon to be released on compact disc (*Live From Shanghai* on Protone Records), the evening also included the world premiere of the *Susan Suite* by the orchestra's resident composer, Liu Tingyu, and Tchaikovsky's "Symphony No. 6."

Following our conversation, I began corresponding via fax with the Shanghai Symphony's manager, Cao Yiji, to ascertain specific details of the orchestra, the hall and many other practical bits of information needed to plan the technical aspects of the project. As with all recording projects, the first thing I needed to determine was just what equipment would be required. In this instance, it was also necessary to find out what might be obtained locally and what needed to be brought from home. Obviously, the less I needed to bring, the easier the project would be and the lower the costs to the producer—always an important consideration.

After a lengthy exchange of faxes, it seemed unlikely that I would be able to borrow or rent the microphones and digital recording equipment I wanted from Shanghai sources. Although some equipment was available locally, it was not of the quality I wanted for the project. (It also would have been prohibitively expensive, because the sole source for the equipment was the China Record Company, and they wanted us not only to pay rental for the equipment itself, but also to compensate them for their "loss of use" of the equipment while we were using it, including the salaries of the engineers who would be idle during that time.) Consequently, I determined that the only practical course—both technically and fiscally—would be for me to provide all the primary recording gear; the only equipment I would rely on from local sources would be microphone stands and the monitor amplifier and loudspeakers. (As it turned out, through the courtesy of Lars-Olof Janflod of Genelec OY, I was able to secure the loan of a pair of Genelec 1031A monitors, which were delivered by the Shanghai dealer to the concert hall.) I still had to pare down the roster of equipment to the barest minimum, keeping in mind that backups and alternates should be taken just in case.

WHAT TO BRING?

I have been a longtime advocate of the mid-side stereo technique, so my principal microphone pickup consisted of a custom "stereo tree" I devised as a variant of the Decca Tree. An AKG 426 stereo microphone, set in the M-S mode, serves as the center pickup, using an MS-380TX (from Audio Engineering Associates, Pasadena, Calif.) as both the microphone preamplifiers and matrix decoder. A second MS-380TX provided the preamps for a closely flanking pair of Neumann TLM-50 omnidirectional microphones. The three microphones are configured on a custom fixture I fabricated for this purpose, as shown on page 150. (To protect this somewhat bulky system against mechanical noise, each microphone was individually shock-mounted, and the entire fixture was set on a Floater Acoustic Suspension from Ambient Systems.)

This primary microphone system reliably achieves the sonic perspective I always strive for: an articulate and stable stereo image from the mid-side pickup, yet with just enough phasing information from the flanking mics to introduce some "spaciousness" to the overall sound. The soundstage is full and rich in stereo and also provides ample ambience when played back on a surround sound system.
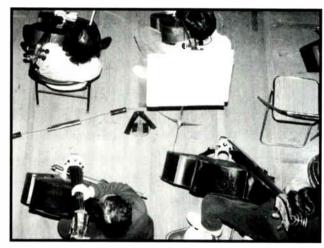
Placement of this microphone array was, in this instance, relatively close to the orchestra; this was dictated as much by the proximity of the audience seating to the stage as by the reality that traffic and audience noise were uncontrollable factors in this live concert situation.

I chose the MS-380TX because of its superb mic pre's. The fact that this unit also provides a built-in mid-side decoder makes the system even cleaner; this is an important consideration when doing a remote session —especially one so far from home. The second MS-380TX not only gave me two more high-quality mic pre-

amps for the flank mics but also was a "backup" for the other unit. These four channels were fed at line level to a modified Soundcraft Spirit-IV mixing console.

A prominent feature of Bond's *Thinking Like a Mountain* is a spoken narration; my pickup for this was a Schoeps MK-41/CM-3 hypercardioid. The signal from this microphone was also split to the house

Overhead view showing placement of the bass "spot mic"

The control room

P.A. As this piece opens with an extended solo for the Chinese flute, a crossed pair of Schoeps hypercardioid microphones was used to highlight this, as well as the other wind section solos. The only other supporting microphone was a Schoeps BLM-03 boundary microphone to add a little articulation from the principal contrabass. (I place a protecting grille—a conventional headlight guard, purchased at an auto supply shop— over the mic to prevent people from stepping on it or jabbing it with an end-peg.)

The recording was mixed directly

to stereo DAT via a Lexicon 20/20 AD 20-bit digital converter, using the company's proprietary PONS (Psychoacoustically Optimized Noise Shaping) algorithm to convert the 20-bit signal to the conventional 16-bit format. This signal was fed via its AES/EBU outputs directly to two Panasonic SV-3700 DAT decks, used as the master recorders.

A Sony consumer DAT recorder, borrowed from the Shanghai Music Conservatory, ran a third copy for the producer's editing reference, and a dual-well cassette deck provided tapes for the orchestra's management. These two machines were provided analog inputs from a self-built audio distribution amplifier/monitor interface system.

In addition to listening on the Genelec monitors, I frequently referred to my standard Sony MDR-V6 headphones as a cross-check. Critical recording levels were monitored on a Dorrough Model 1200 stereo test set and a DK Audio MSD-550 Stereo Phase (X-Y) display monitor. (This latter device was taken because of its size; it is considerably smaller and lighter than the oscilloscope I normally use as a phase monitor. It was kindly loaned to me by Ed Sommers of Audio Services Corporation in Hollywood.)

Because the mains voltage in China, like much of the rest of the world, is 220 VAC/50 Hz, an important part of my equipment package was a custom power conversion/stabilization system consisting of a 220:110-volt stepdown/isolation transformer and a Furman AR-117 line voltage regulator. This system provides a clean, stable supply of 117 volts, whatever the local mains voltage. Because all of the recording equipment is capable of operating just as well at 50 Hz as at 60 Hz, line frequency was not a concern. Also a part of this AC power system are a Variac (variable transformer) and meters to monitor the incoming and outgoing mains voltages, as well as current consumption.

Rounding out the equipment complement were additional and

MT "B" Series Manifold Technology™ Speaker Systems from Electro-Voice.

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New Wave Entertainment, Burbank
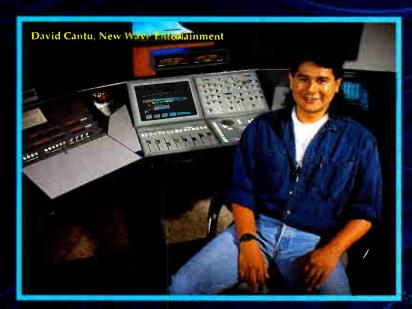
"Scenaria lets us stay totally within the digital domain to final mix, which maintains sound quality. It's definitely a fast system to use, and the film-style user interface lets us assemble the sound elements to picture in a very intuitive way - our clients understand what we're doing and are more involved."

Tom Goldblatt, Audio Mixer at East Side Audio and Video

East Side Audio & Video, a 6-room facility specialising in audio post-production, recently took delivery of New York's first OmniMix digital surround sound audio/video system. Projects include: Commercial spots for American Express, AT&T, IBM, MCI, Miller, Pepsi, Revlon, Volvo.

David Cantu, New Wave Entertainment

New Wave Entertainment handles audio and video production for theatrical trailers and TV commercials for Buena Vista Marketing, the promotional arm of the Disney Group. New Wave recently opened a new facility, with two Scenaria systems and SoundNet, designed to provide full editorial and mix-to-picture capabilities.

Projects include: trailers & commercials for Walt Disney, Touchstone, Hollywood, Caravan and Miramax Pictures

SSL DIGITAL

Solid State Logic

backup microphones, cables and snakes, four tall (15-foot portable), lightweight microphone stands, a talkback system, and a kit of essential tools. In all, the equipment fit in nine large cases and weighed just under 1,000 pounds. Admittedly, this is quite a lot of freight, but this included all of the equipment necessary to make the recording, plus backups and alternatives. There is no room for failure on a project of this scope.

A SLOW BOAT TO CHINA

Going through Customs in any foreign country can be quite an experience—especially if there is no one there who speaks English. It is crucial, therefore, to have an interpreter who will represent your interests. (I stress *your*, because even if an interpreter is provided by the Customs office, it is highly unlikely that time or any disputes will go in your favor.) It is also very important to have several copies of all your documentation —translated into the local language if possible—for the equipment you are bringing in and/or taking out.

In Shanghai, I was accompanied by a representative from the orchestra who was familiar with Customs matters, as he was the person who makes arrangements for their tours outside China. Even with this significant advantage, clearance into China took nearly a full day, going from one office to another (in three separate buildings) to obtain the several signatures and permits required. Despite all the arrangements made in advance, which included securing a letter from the Chinese Cultural Ministry stating the nature and purpose of the project, we hit a snag when the Customs officers demanded that a bond (equivalent to $30,000) be posted to guarantee that the equipment would leave on the appointed date. After considerable negotiations, the amount was reduced to something more reasonable, and the orchestra posted this on the assurance that I wished my equipment returned even more than they did!

THE RECORDING SESSIONS

Although it had been our intention to record a cover session following the two concerts, after we arrived in Shanghai, we were informed by the orchestra's manager that this would

not be possible, due to a scheduling conflict with the concert hall. This meant that we had only the dress rehearsal and two concert performances available to us. Given this tight schedule, it was my responsibility to get the equipment set up and tested prior to the downbeat of the rehearsal. The rehearsal was scheduled for 9:00 a.m., and the hall was occupied the day before, so I had only the night before to set up the equipment and run cables to the stage.

The orchestra manager had offered the option of setting up my equipment inside the hall itself, and

he somehow couldn't understand why I didn't want to do this. He kept insisting: "That's where Shanghai Radio always sets up"—a statement later reinforced by their arrival on the evening of the second concert. The only other space available for use as a "control room" was a small, nearly round reception room, with a domed ceiling, just off the main seating area. This I reluctantly made do. It did prove beneficial on one count: Between the rehearsal and the two evening concerts, the hall was to be used for two other public events, so I had to pull everything back into

this room for safekeeping. Luckily, the concert hall had good security for the building: a live-in guard.

The morning of the dress rehearsal, I arrived early to set up the microphones and confirm that everything was working properly. As is my custom on such occasions, I also took advantage of the orchestra's tuning to preset my balances and levels. The rehearsal went as all rehearsals go, with frequent stops for fine-tuning of the performances. The bulk of the rehearsal was devoted to the two featured pieces. Nothing was played all the way through, and, in fact, not all of the Tchaikovsky symphony was covered, as this had been rehearsed off-site prior to moving into the hall. Even so, because we knew we would not have a "cover session," everything was recorded onto tape.

The two concert performances were recorded without undue incident...other than the arrival of a video company to tape the second concert for a documentary. When they asked for a feed of our stereo mix, I was prepared to accommodate them with transformer-isolated splits from the analog outputs of my distribution amplifier. Shanghai Radio also came to do a live broadcast of this concert; they set up their own microphones, however.

Immediately following the second concert, we quickly began striking our equipment, so that the hall would be available for the next morning's booking. Some help was available, so I was able to complete repacking all my cases in about two hours. My equipment was picked up the next morning and taken to Customs to await clearance out of China.

CUSTOMS REVISITED

Obtaining clearance to leave Shanghai proved a bit less complicated than entering. The paperwork took only a couple of hours and was accomplished at one location. And, of course, the surety bond was returned to the orchestra's much-relieved representative.

I went along for all of the Customs visits because I wanted to retain the keys to the equipment cases. This was for two reasons: First, I did not intend to release my control of the equipment. Second, and a bit more pragmatic, the equipment was

very carefully packed, and for fear of damage, I did not want them even to attempt to open and repack the cases. As it turned out, the only time I was asked to open anything for inspection was upon leaving. Just one case, which I had secured with padlock and chain, had aroused the curiosity of the Customs agent. This was no problem: I opened the case, he looked and was satisfied. Afterward, when I asked the translator why that particular case had been selected for inspection, he said the agent had asked him why this case was chained, and he replied that it was because the equipment (the mixing console) was so valuable. The translator was rather amused when I explained that the real reason was much more mundane: Unlike the other equipment trunks, the console case had no locks of its own!

Our return into the U.S. was an enlightening experience in itself. When I went to reclaim my shipment, I was told by the U.S. Customs agent that I would have to pay re-entry duty on my equipment before it would be released to me. Apparently, the shipping agent who handled the freight had not secured one particular form to register my inventory with U.S. Customs before it left the country. Luckily, the shipping agent put me in contact with his Customs broker, and all was resolved in short order. Much to my ultimate relief, the equipment was delivered back to me the next day. As I said at the outset, it's all in the preparation.

After returning to the States, conductor Victoria Bond and producer Jane Welton reviewed the recordings. Because the two performances went so well, it was decided that what little editing was necessary would be done as the tapes were transferred to the final master, thus saving a digital generation—as well as additional editing and transfer time. So, the compact disc will be only two digital generations removed from the original DAT recordings. It is expected to be released this spring. ■

Ron Streicher, owner of Pacific Audio-Visual Enterprises in Monrovia, Calif., is an engineer specializing in live, on-location music recording. His experience includes work with the Los Angeles Philharmonic and the Aspen Music Festival, where he is co-director of the Recording Institute.

World Radio History

BY BLAIR JACKSON

RECORDING · NOTES

broun fellinis

aphrokubist improvisations vol.9

Broun Fellinis: Something Old, Something New

The San Francisco Bay Area has always been a top market for jazz of every stripe, but the region has actually nurtured relatively few of its own jazz players since the '70s, when Bobby Hutcherson, Denny Zeitlin, Art Lande, Eddie Henderson and a few others were drawing big crowds in a number of different live jazz spaces. In the past couple of years, however, a hip new jazz scene that incorporates straight-ahead jazz, funk, acid jazz and hip hop has developed in clubs like the Elbo Room, Deco and the Sound Factory, and allowed groups like the much-lauded Charlie Hunter Trio, Alphabet Soup, Slide 5 and the Broun Fellinis to build serious local followings.
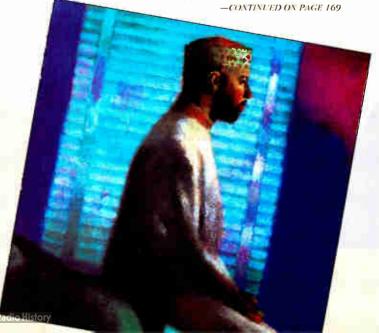
The buzz surrounding the Broun Fellinis has been strong for more than a year now, and with the recent release of their first album, *AphroKubist Improvisations Vol. 9* (on the Moonshine Music label), the group is poised to bust out of Northern California and make some waves nationwide. This is a trio that delivers the goods: Their 14-cut CD blasts through with a fistful of boppin', Coltrane-ish instrumentals and a bunch of groove-heavy, but always jazzy, rap/poetry tracks that sound like they were inspired more by Gil Scott-Heron and the Beat poets than by Snoop Doggy Dog and street gangstas. Musically, these guys turn on a dime, effortlessly shifting tempos and dynamics like

Leon Parker: A Different Drummer

You may not find Leon Parker's fine Epicure debut album, *Above and Below*, on the current *Billboard* jazz charts. But Parker's been there recently...sort of. The exceptional young New York drummer has received considerable acclaim for his skins work on the eponymous Blue Note album by the hot French pianist Jacky Terrasson, and he also recently toured in a trio with Terrasson and bassist Ugonna Okegwo. Terrasson and Okegwo are featured prominently on Parker's album, too, along with sax players David Sanchez, Mark Turner and Joshua Redman (on one cut), percussionists Adam Cruz and Natalie Cushman, vocalist Jay McGovern, and Parker's wife, Lisa, on ethereal flute. It's a wonderful album, with a nice mix of new interpretations of jazz classics like Monk's "Bemsha Swing," Ellington's "Caravan" and Monk's "Epistro-

Joe Lovano and Gunther Schuller: A Classic Pairing

Rush Hour, tenor sax great Joe Lovano's fifth album for the resurgent Blue Note label, pairs him with noted composer/arranger Gunther Schuller (perhaps best known in the jazz world for his '60s work with Ornette Coleman, Eric Dolphy, the Modern Jazz Quartet and Dizzy Gillespie) on a wide-ranging set of large-band and small-orchestra pieces recorded live in the studio. (The disc also features a few more intimate tracks featuring Lovano overdubbing himself in smaller settings.) Compositions by giants like Ellington, Mingus, Coleman, Strayhorn and Monk are joined by three sometimes dense but still lyrical Schuller tunes and three simpler sketches by Lovano.

As a whole, the disc moves from intricate, highly arranged ensemble work to nearly unaccompanied free blowing by Lovano; indeed, there are dollops of many of the prevailing jazz styles of the past 50 years scattered across the 64-minute disc. It's an always-challenging set that rewards the serious listener with plenty of unexpected twists and turns. "I invited Gunther to be musical director, and this is really his world," Lovano told one writer. But it is Lovano's alternately warm and insistent tenor (and on three tracks soprano) that gives this ambitious undertaking its clear focus.

Not surprisingly, producing this disc was no stroll in the park. James Farber, whose engineering credits include two previous Lovano discs for Blue Note, as well as albums by Joshua Redman, Wallace Roney, Peter Erskine, Dave Holland and pop/rock artists like Talking Heads, James Taylor and Mick Jagger, says, "That this record was done on a Blue Note budget, no matter what the

"Birdland" by Weather Report

In the beginning, there was Miles Davis. *In a Silent Way*, recorded and released in 1969, and *Bitches Brew*, recorded in '69, released in '70, were widely considered the first jazz-rock "fusion" records (a term *everyone* seemed to hate, then and now), turning the jazz world on its collective ear. *Bitches Brew*, in particular, seemed to really open the doors to a flood of musicians who created a bold and exciting new kind of instrumental music. Check out the players on these two records, and you'll find nearly all the significant leaders of the first wave of fusion bands: Chick Corea, who formed Return to Forever;

Wayne Shorter and Josef Zawinul of Weather Report

PHOTO: BILL WEINER

Herbie Hancock and Benny Maupin, who created The Headhunters; John McLaughlin, founder of the incredible Mahavishnu Orchestra; Tony Williams, whose Lifetime band (originally featuring McLaughlin) won a large rock following; and Josef Zawinul and Wayne Shorter, who started the longest-lasting of all the Miles alumni bands, Weather Report. These are truly some of the greatest musicians and composers of our time, players who have transcended genre over and over, and who remain vital artists to this day.

Of Miles' turn to electricity at the end of the '60s, Zawinul told an interviewer last year, "That was my sound! I brought that sound to Miles in the first place! Through me, he got turned onto electronics. That's what good musicians do: Good people turn each other on to good things. It was a give-and-take. It was not a master-pupil situation. It was a friendship and an exchange of thoughts and philosophy. I was always influenced by Miles because of his beautiful playing, but not influenced to the point that we were trying to copy anything. We always were different."

Weather Report, which keyboardist Zawinul and tenor/soprano sax player Shorter carried through myriad incarnations between 1970 and 1986, probably achieved the greatest worldwide success of all the fusion outfits. It's easy to see why: Both leaders were extremely versatile composers who successfully bridged jazz, R&B, Afro-Latin and (in Zawinul's case) classical traditions in their writing; as

bands that have been around *a lot* longer than they have. All three members—tenor sax player David Boyce, bassist Ayman Mobarak and drummer Kevin Carnes (formerly of The Beatnigs)—are outstanding players who make old styles sound new and new styles sound warmly familiar.

"I've always been a huge jazz fan," says producer/engineer Michael Ahearn, who signed the group after being knocked out by a Fellinis gig at the Elbo Room, "but I'm one of

Broun Fellinis (L-R): Ayman Mobarak, David Boyce, Kevin Carnes

those people who has been sorry to see jazz relegated to the silk-suit crowd or museum status. I love the notion that right now there is classic jazz—this sort of late '40s, '50s and early '60s type of jazz—being played in the clubs again by and for young people, and even becoming dance music again."

Ahearn, a staff engineer at San Francisco's Russian Hill Recording who also produces independent projects (his '90s credits include producing the first two Consolidated records and the first Disposable Heroes of Hiphoprosy release on Rough Trade), says, "For the trio songs, there was a jazz aesthetic we wanted to address. We were definitely going for a Blue Note/Prestige type of sound. I kept it very dry, like all those great Rudy Van Gelder [-engineered] records. It was the living room vibe—cutting live and trying to get something that sounded comfortable. Basically, we were using 2-inch like it was 2-track. The multitrack

kept rolling until we had the take we wanted. Each of the [straight jazz] pieces is a complete take without edits. I think it's really important to keep each performance whole and separate, because each one has its own unique story to tell."

Russian Hill Studio A is equipped with an SSL 4000 console and an Otari MTR-100 recorder with SR. "Analog was intentionally chosen for the project because of my own prejudices," Ahearn says. "Ninety percent of recording is knowing what

mic to choose, where to put it and then taking the direct output of the microphone preamp straight to a tape machine. That's how all of this record was recorded. I didn't have the budget to bypass the console, but I bypassed the channel strips, so basically the way it went was microphone into the preamps, which were SSL Series E preamps, and then straight to the tape machine. There was EQ on the mix, but I used outboard EQ—the Amek DeMedici [Rupert Neve-designed]—on vocals, sax and fretless bass. Given a budget, I'd do everything with classic tube microphones and V72 mic pre's or Massenburg mic pre's. To me, the old gear definitely sounds better. Once I was exposed to the old gear, there was no goin' back.

"The room at Russian Hill sounds really good," Ahearn adds, "and I intentionally put the sax player in the room so we could do omnimicrophone techniques with it, so it didn't sound like it was recorded in some

tiny, 1970s room. On David [Boyce, sax], I used either a Telefunken 251 or a modified U47 tube that I got from Steve Jarvis' rental company. It was important to me to use vintage mics on the important solo instruments. For the drums, I used mainly dynamic mics all around—421s, a 57—but I didn't do a lot of up-down miking. For overheads, I used B&K 4011s because I like the way stereo drum miking sounds with those mics. I also added a cymbal to Kevin's kit because I like the sound of stereo cymbal in a recording." Mobarak's bass went through a tube direct box and his Hartke cabinet, which was in another room. (After making the record, Mobarak decided he did not want to tour with the group, so he has been replaced by Kirk Petersen.)

While the instrumental pieces are intact performances, there are a few overdubs, mainly additional horn lines by Boyce: "David always has very specific ideas of what he wants to do," Ahearn says, "and he wanted to add some counterpoint and harmony lines. He writes out charts, but of course, he also improvises within that [framework]. David is a veritable walking jazz encyclopedia. A lot of their jazz pieces start out as themes or hooks that they then develop. He comes from a very traditional jazz writing style, where musical riffs blossom into full tunes. The approach we took in mixing the trio was that all three instruments are of equal importance—traditionally on jazz records, the lead instrument or soloist dominates the mix. The Fellinis wanted a more unified sound."

The songs with lyrics were done after the trio pieces. "They had some tunes and improvisations that were either very funky or seemed to cry out for lyrical input," Ahearn explains, "and David writes a lot of poetry—he has notebooks and notebooks full of poetry. So they had a lot of jams that maybe couldn't stand up as songs or jazz tunes, but given a lyric, it was a whole 'nother animal. It's very much like Beat poetry, but there's also a lot of humor in it. It's mystical, yet it addresses a lot of everyday things in very creative ways. To me, it's almost like African-American Dr. Seuss. There's also a lot of George Clinton influence in there. When we went down to L.A. to master the record at Bernie Grundman's, basically we listened to

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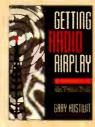
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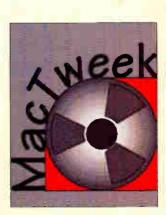
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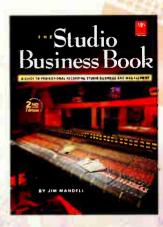
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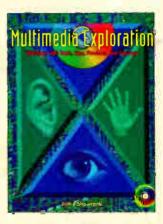
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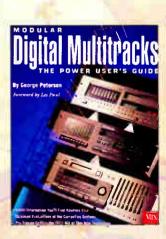
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Parliament for eight hours down [to L.A.] and eight hours back up," Ahearn laughs.

Some of the rap/poetry songs have a more contemporary vibe to them, in large part because of the sequenced parts written by drummer Kevin Carnes, aided by local composer Malcolm Payne, who provided some sampled sounds. Carnes then played live drums over the sequenced parts, giving the tracks a nice textural depth. Comments Ahearn, "A lot of the problem I have with synth-generated rhythm and drum tracks is that unless the guy is really a hot, hot programmer, it's identifiable as a synthesized rhythm part. The nice thing about using a combination on the track is that the acoustic element automatically makes it less identifiable as something unnatural." In addition to doing all the vocals except for two tracks (one each by Carnes and The Crack MC), Boyce also added some Wurlitzer piano and Fender Rhodes overdubs.

Ahearn admits that more "studio trickery was employed" on these tracks, but he declines to tell what pieces of gear he used. "Let's just say they're not real expensive pieces of gear that I used to do any of the effects. It's all within the realm of 90 percent of all studios. I wanted to keep the production fairly simple for sanity reasons and for aesthetic reasons." Ahearn does note, however, that he used a PCM70 on Carnes' drum sound: "I have a custom program I call 'Broun Drums,' which is basically a small-room program. Huge drum sounds would've been completely inappropriate for this record."

Though *AfroKubist Improvisations Vol. 9* was made on what Ahearn describes as "an absolute shoestring," you can't put a price on either heart or soul, and this record is loaded with both. Most of all, though, it's a cool spin. ∎

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phy," pop chestnuts like "It's Only a Paper Moon," and Parker originals that show him to be a composer with a keen ear for melody and an imaginative sense of dynamics. The album opens and closes with Parker drumming on his body with his hands— *tres* cool.

Parker is a remarkably fluid drummer, with a light touch and a very distinctive approach to cymbal work.

He plays a very small kit—just a snare, bass and one cymbal, though he added a floor tom for the recording sessions. Engineer Joe Ferla, last profiled in these pages for his work on the fine *Mingus Nightmares* LP two years ago, worked on *Above and Below* with producer Joel Dorn, whose long resume includes jazzers like Yusef Lateef, Les McCann, Mose Allison and Rahsaan Roland Kirk (as well as Roberta Flack's "Killing Me Softly" and many other pop records). For the sessions, Ferla chose The Hit Factory in NYC, where he was once chief engineer.

"It's the old Bell Sound Studio with a Neve VR," Ferla notes. "It's a great-sounding, medium-sized room with plaster walls that aren't parallel, a wood floor and a scalloped ceiling— perfect for Leon's kit." Ferla says that Parker was set up in the studio alongside percussionist Cruz "so they were one big percussion section. They didn't want to be separated, didn't even want a baffle between them. So I put them right next to each other, 15 inches apart." He enclosed the drum section with nine-by-four-foot Plexiglas baffles. "I always try to set up a studio with the musicians in mind. If I can make them comfortable, I'll get great performances out of them."

In recording Parker, "the biggest challenge was capturing the cymbal," Ferla adds. "The sound is very big and spread, not the small, pinpointed cymbal sound you hear on a lot of jazz records. I placed a U67 in the room about 12 feet away, eight or nine feet high, and a U47 tight on the cymbal. Equal amounts of these mics were used in the mix. For the rest of the kit, I had a pair of Beyer M-88s

PHOTO: NINA D ALLESANDRO

Leon Parker

on the bass drum, front and back, an M-88 on the floor tom, and two mics on the top of the snare—one was an AKG 451 for weight; the other a Beyer 422, which picks up the ring." For the two body-drumming pieces, Ferla used four mics: two RCA 77s close and a pair of 414s far away.

A lot of the sound of the record is the room itself, but Ferla also used small amounts of reverb—mainly Lexicon 480—here and there, particularly on the songs featuring Lisa Parker's flute. "I used a longer, prettier reverb on the flute pieces, with a predelay," Ferla says. "You can really fine-tune a 480, finding the frequency of decay, setting the crossover point, pre-delay, reverb time, room size; it goes on and on. For the flute tune ["Evy"], it was a matter of choosing a pretty program and putting about a 128-millisecond pre-delay on it, which is like a 15 ips tape delay—an old sound really. It's a familiar sound that I'm fond of, and I use it often. It's not appropriate for every record, but it was for this one."

Ferla concludes, "At the beginning of the project, Joel [Dorn] said to Leon, 'I'm gonna tell you what the rules are here: There *are* no rules.' That really struck me, and that's really the sense of how these sessions

went. Leon knew he didn't have to worry. He was going to get his music on this record the way he wanted. It was going to be a creative process, and there wasn't going to be someone there telling him what to do and how to do it. It was more like, 'What do you have to say here? Let's hear you say it, and let's see what we can make of that. Let's see if we can capture who you are.' Which I think we really did." ■

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amount, is amazing because the whole thing was recorded in two six-hour sessions, aside from Joe's solo pieces, which were done separately. The first day was all string section with Joe and a rhythm section, with the addition of voice and flute, and the next day was woodwinds and brass with rhythm section and Joe; that one also included vibes. I'm amazed that it got done because it involved two complete setups on consecutive days."

Farber chose Manhattan's Power Station for the project—a good fit because Farber was on staff there for a few years before becoming an independent. "It's a great place for this kind of project," he comments. "Power Station Studio A lends itself to a certain kind of setup. I discussed with Gunther how he liked to see the orchestra in front of him, and it turns out it was the way I had also anticipated it. So the large room was for the [17-piece] orchestra, and Joe had what's often considered the piano room, which has a very high ceiling. The rhythm section was in what's called the Rhythm Room, which is also fairly sizable. The rooms are all separated by sliding glass doors—not completely soundproof, but close. The small booth at the side, the first day, housed the acoustic guitar, and the second day it was going to house the percussionist, but when he showed up with half-a-dozen tympani, we moved that out to the rhythm section room and put the bass players in the small room."

Studio A is equipped with a Neve 8068: "Forty inputs," Farber says about the console, "and we used every one of them. In fact, if one of them had broken, we would have been in trouble. We recorded to Mitsubishi 32-track digital."

Farber outlines part of his miking scheme for the sessions: "For the

string section, we used a stereo room mic, which was also the same one used on the horn section the next day, an AKG C-24. Then, for the violins and violas, there was one Neumann U86 for every two strings, and the cellos had one per instrument. The horn section [the next day] was all 87s, one per instrument and the C-24. Joe recorded into a Telefunken

Gunther Schuller and Joe Lovano

PHOTO: JIMMY KATZ, GIANT STEPS

251. For the singer [Judi Silvano], I'm pretty sure we used an 87." Farber also used 87s on the two bassists, "and there was one little section where we used a direct on Ed." [Edwin Schuller, Gunther's son. Another son, George, played drums on the sessions.]

"After Gunther would get a few takes all the way through," Farber continues, "he would go back and do a take, and every time he would hear a mistake, he'd go back and say, 'Okay, let's do letter C again with the pickup to make an easier edit.' There were sections of pieces that were recorded. Sometimes he would have a complex section, and he would record that one little section alone, knowing that if he got it perfect, he would edit it in later. His tempos are always together, so that wasn't an issue in the editing session.

"Had we been going for a live 2-track, we would've spent more time balancing all this in the control room," Farber explains. "As it was, though, the string section live mix was pretty close to perfect. The horn date was so intricate and had so many different players doing completely different dynamics, it was a harder date and we needed to do more in the mix."

Farber used only minimal processing on the sessions. "I try to pick a

good room to record in so I don't have to use a lot of reverb," he notes. "Joe always had an EMT plate, and I think the basic reverb we used on the rest was a hall program on the [Lexicon] 480. We used quite a bit of the C-24 [room mic] in the mix, particularly on the string date, because they had a more natural balance in the room than the horns did."

As for Lovano's more intimate pieces, "Those all went very quickly," Farber says. "Joe knew what he was going for, so it was quite straightforward. I might've changed the mic position a little for the different instruments, but that's about all."
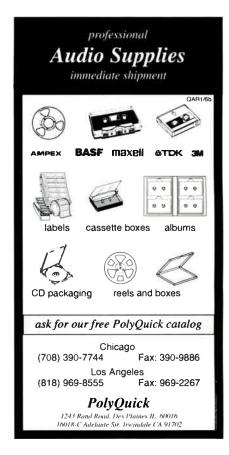
With so many different elements to pull together, the mixing sessions at NYC's River Sound (on a Neve 8078 with Flying Faders) were occasionally quite demanding. "That we mixed it in just two days is amazing to me," Farber says. "We had our live mixes to refer to, of course. The string mixes were relatively easier to balance. Gunther and Joe had really studied the tapes—the live mixes—and Joe had thought about a couple of edits where his solo was the best here and melody was best on this take, so we would edit takes together, more than anyone would know by listening.

"Gunther listened measure by measure for the ideal performance for everything he wrote or arranged. So in the mix session, if we had had a lot of money, what we would have done is recorded on Sony 48 to begin with, but at least had transferred to Sony 48, had two multitrack digitals, and done all our editing on digital multitrack without destroying anything, and being able to do our crossfades or edit track by track. Well, considering we didn't have that kind of time or money, the only way we could mix this—and there are probably 60 edits, more so on the horn date than on the string date—Gunther would have me mix four bars here, then go to another take and mix the next two bars, then go to the next take and mix one bar and then to another take for Joe's solo, et cetera, et cetera. Joe was a little nervous about working this way, and I had hoped that we would have time that I could mix to analog and splice it together to make sure we liked the way it flowed and that the dynamics were right, but we didn't have time for any of that. So we just mixed all the pieces, and Gunther took them to a Sonic Solutions editing

place in Massachusetts [it was edited by Joel Gordon] and edited it together and sent it to Joe and me. And I can say honestly I really can't hear where the edits are. That was Gunther's genius—that he knew exactly which pieces to use, and everybody trusted him, and then we went and put it together." ■
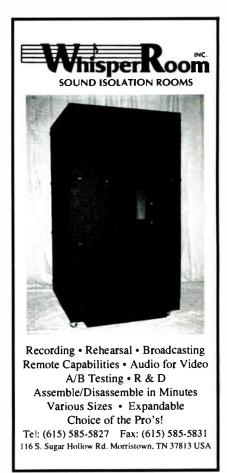
—FROM PAGE 163, WEATHER REPORT

players, each could make his instrument sing in the most beautiful, lyrical, *human* way imaginable; and like Miles before them, they always surrounded themselves with amazing musicians—Weather Report drummers through the years included Alphonse Mouzon, Airto Moreira, Chester Thompson, Alex Acuna and Peter Erskine. Among the bassists were Miroslav Vitous, Alphonso Johnson and the inimitable Jaco Pastorius.

The peak of Weather Report's career came after they put out their seventh album, called *Heavy Weather*, recorded at Devonshire Studios in Los Angeles in the fall of 1976 and released in late winter 1977. By then, the ever-shifting lineup in the band included Zawinul, Shorter, Pastorius, Acuna and percussionist Manolo Badrena. As always, Zawinul was the main composer, producer and orchestrator, though on this album Pastorius also took a co-producer credit. "Jaco was in the studio with me all the time in those days," Zawinul told me recently. "In those days, Wayne was more or less the great 'painter' in the band, not so much involved with the recording. Jaco knew a lot about technology, and he always had a lot of good ideas. He was a very creative guy and fun to work with; lots of energy. He had a couple of nice tunes on that record ["Teen Town" and "Havona"], too."

Though filled from top to bottom with superb tunes, it was the album's lead-off track, a Zawinul tune called "Birdland," that really put Weather Report on the map commercially and led to the album selling more than a million copies worldwide. With its instantly hummable melody, Jaco Pastorius' bold, sliding bass figure, an insistent, hand-clappin' rhythm, and keyboard and horn textures that sounded part big band, part Rio *Carnaval*, "Birdland" was a joyous romp from beginning to end. Like most of Zawinul's songs, it began as an im-

provisation at home and blossomed into a structured composition.

"I played on the acoustic piano one morning, and I had a little Walkman with me, and I came up with this line [he sings the melody]—*bood-em-bop, bood-em-bop-baaaa*—but I played a left-handed boogie-woogie line to it," Zawinul says. "For some reason, I was all day thinking about Dinah Washington, who I used to work with a long time ago. I remember the second time I met her. I walked in to Birdland [the famous New York club] around three o'clock in the morning, and right when I opened the door, she was standing on the steps, and there was a band playing in there. I don't even know who it was playing, but when I opened the door, it had that sound [he sings the distinctive lower-register opening riff of "Birdland"]—*bwonnng, bwonnng, bwonnng!* So that was the atmosphere I was trying to create."

As was his custom, Zawinul continued working on the tune at his keyboard-filled music room in Pasadena, Calif. (these days he lives in Manhattan), spending untold hours developing his own synthesizer voicings for his arsenal of keyboards and working out parts for the rest of the band to play. When Weather Report went into Devonshire—where they'd recorded their previous album, *Black Market*, as well—they played the tune live, adding just a few overdubs later. "My last solo on there is an overdub," Zawinul says, "but it was all written exactly the way you hear it on the record." Alas, the engineer on the session, Devonshire staffer Ron Malo, died a couple of years ago, so specific information about technical aspects of the session are scant.

"Devonshire was a great studio," Zawinul says. "David Mancini [Devonshire studio owner] always treated us real good, and it was a comfortable place to work. I think at the time we made that record, it was still 16-track, and they had this nice, small, very clean [MCI] board. We'd be in there, and we'd all have our hands on it—Jaco and me and Ron Malo—doing all the fades by hand. Obviously, there was no memory [automation] or anything like that."

Zawinul remembers using "whatever mics they had there" on the sessions—at the time, these included a number of Neumann U87s, EV RE20s,

AKG 452s and 414s, Sennheiser 421s and RCA 77s. "Of course, all my synthesizer stuff was direct," Zawinul says, "and I think Jaco was, too." Zawinul's keyboards on the track were an Oberheim Polyphonic synth, an Arp 2600, a melodica and acoustic piano. Pastorius added dimension to the track with a mandocello line in addition to his bass part. The studio had three live echo chambers for ambience.

All in all, it's a big, beautifully arranged, supremely *swinging* tune that sounded even bigger when the band tackled the song in concert. When drummer Acuna was replaced by Erskine during the making of the follow-up to *Heavy Weather*, called *Mr. Gone* (also recorded at Devonshire), Weather Report had its most potent lineup ever—it truly had the power of the best arena rock bands of the era, but, of course, the music was so much more interesting. "Jaco, Peter, Wayne and me—pretty amazing," Zawinul reflected in an interview last year. "We knew how to space, and we knew how to play off on one another. We still had that jazz thing. We had a couple of R&B-oriented things, but in general, we played some serious, forward jazz grooves with a stronger beat. We were able, with that band, to get an incredible power, and we turned on so many people through this music. It was unbelievable."

That fearsome foursome (with occasional support from Zawinul's son Erich on percussion) is documented best on the recently remastered live album *8:30*, recorded during a world tour in the winter of '79. A seven-minute version of "Birdland" is one of the album's stand-outs—but only one of many inspired cuts on the disc. The synergy of that band is something to behold. For my money, Weather Report never quite recaptured the magic of its late '70s glory, though Zawinul, Shorter and Erskine have all had brilliant careers since. Years of self-destructive behavior eventually caught up with and killed Jaco Pastorius in 1987, robbing the music world of one of its most colorful and original players.

Finally, an interesting footnote about "Birdland": It is the only song to have won Grammy Awards in three different decades—for Weather Report in the '70s, Manhattan Transfer's vocal version in the '80s, and Quincy Jones' take on the tune in the '90s. ∎

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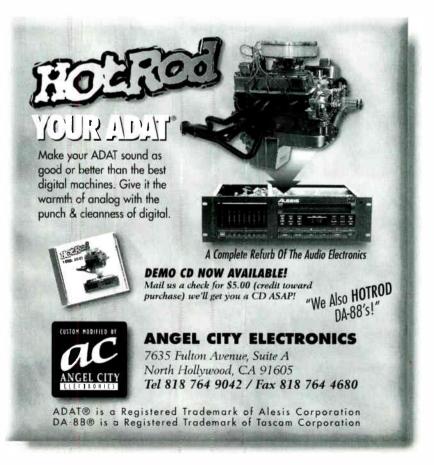
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by Philip De Lancie

TAPE & DISC NEWS

APPLE SETS INTERACTIVE MUSIC AGENDA

With an eye toward defending its dominance in the creative community against encroachment by Microsoft, Apple Computer has begun a campaign to establish QuickTime as the de facto standard for cross-platform media delivery in enhanced CD/CD-Plus (audio + multimedia) titles. The company hopes to see 50 to 100 enhanced CD titles by Christmas and expects to overcome technical obstacles by distributing software drivers to end-users online, in record stores (in conjunction with the Recording Industry Association of America) and bundled with new Macs and CD-ROM drives.

Apple's efforts were announced at a Music Industry Day hosted by the company at its Cupertino, Calif., campus on March 27. (Microsoft hosted a similar event last November.) Taking more of an overview approach than an in-depth exploration, Apple showed off new software tools and hardware technologies, as well as generally reaffirmed its commitment to the music community (aren't we still waiting for built-in MIDI ports on Macs?).

Among the initiatives spotlighted were the introduction of new software tools tailored to the needs of interactive music developers. The Quick-Time Music toolkit includes tools for implementing an enhanced CD extension to the CD-Audio controller, which will allow users to see graphics and lyrics in conjunction with Red Book audio—without having to launch into a full-scale/full-screen multimedia environment. Unspecified additional tools were said to be forthcoming.

The toolkit will be made available free to members of the Apple Multimedia Program, a company-sponsored developer's group ($300/year) that will be adding a dedicated Interactive Music Track. Members also receive market analysis, equipment discounts and co-marketing opportunities.

Among the new hardware demonstrated was a prototype of the Pippin set-top machine manufactured under license from Apple by Japanese game-maker Bandai (the Morphin' Power Rangers people). The box, which sports a Power PC CPU and 6 MB of RAM, is supposed to extend to the playability of CD-ROM titles authored for Macintosh into the TV-based market. It's a great idea, but unfortunately, the box is designed to download its operating system from the titles when they are inserted, meaning that the user has to wait a

Screens from Squeeze's forthcoming CD-Plus release

couple of minutes for the title to boot (sounds user-friendly to me!) and that publishers will have to remaster existing titles to include the Mac OS on disc before they will be playable on the Pippin. The machines are set for release in Japan later this year.

QuickTime On-Line main menu

In other gizmo news, Apple showed a prototype incorporating flat-screen technology normally reserved for portables into a sleek black "designer" Mac with built-in speakers and CD drive, intended to be at home on high-tech dining room tables everywhere. And the company's new QuickTime VR (a navigable 360-degree continuum of stitched-together still images) was shown with an impressive demonstration allowing the user to take a self-directed tour of the House of Blues nightclub. Also in the tools department, Apple announced that it will license Opcode's Open Music System for inclusion in a version of QuickTime due out later in the year.

Apple also announced QuickTime On-Line, a World Wide Web server (http://quicktime@apple.com) for information, development tools and demonstrations, and an advertising campaign promoting QuickTime as a brand to interactive music professionals and enthusiasts. The company is also offering Apple Support as a tech-support option for record labels, but the price tag of up to $1 per unit may dampen music industry enthusiasm
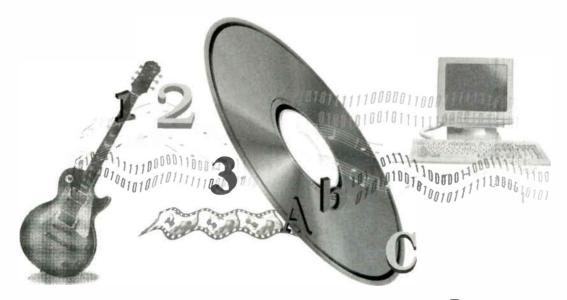
for the concept. Finally, it was intimated that built-in 16-bit, 44.1kHz audio would soon be standard across the full Mac product line.

A representative of the RIAA was also on hand to talk about that organization's CD-Plus plans, which include a six-artist (one from each major label) industry sampler disc and a diagnostic disc to help users track down playback problems. He also said it was "safe to assume" that CD-Plus products will follow the Sony/Philips "stamped multisession" standard, dampening the hopes of advocates of "track zero" (data in pregap) alternatives.

DMI BOWS IMAGEDISC PROCESS

Disc Manufacturing Inc. announced a new program to combat piracy with ImageDiscs, a patented process for digitally mastering artwork onto a CD. The process internally embeds artwork provided by the client, such as a logo or label, onto the disc, which can then be further printed in the normal external manner. Unfortunately, the process only works on available non-data areas of a disc, which limits its utility for full or nearly full CDs. The

World Radio History

DMI's ImageDisc

process is available to DMI customers and for licensing by other replicators.

SPLICES

As part of an expansion plan that calls for a 50% growth in facility space, Future Disc Systems has acquired the 8,000-square-foot building in Hollywood, CA, in which it has been a tenant. The plans include construction of a sixth, larger mastering room featuring "leading edge" equipment...After 13 years as a tracking/mixing studio, Time Capsule Recording in La Habra, CA, has been reborn as a mastering house. The new facility features a Sonic System with CD Printer, Apogee 20-bit converters and the TC Electronic M5000 Digital Audio Mainframe... Bernie Grundman Mastering installed three additional Studer-Editech Dyaxis II systems into its Hollywood facility...The Rocket Lab (San Francisco) announced that it is "now fully equipped to offer start-to-finish mastering for both the audio and multimedia aspects of CD-Plus." Rocket's Ken Lee has also been working on projects for 4 Non Blondes and Red House Painters...New York City's Digital Force manufactured *The Broadway Kids* CD, a collection, hosted by Petula Clark, of the best-known songs originally performed on Broadway by children. The project was produced by I DOC Productions...Automatic Inspection Devices (Toledo, OH) announced that its parent, Medar Inc., has acquired Integral Vision of Bedford, England, a maker of in-line, visual inspection systems for CD replication. The two companies will cooperate on forthcoming inspection products. AID also announced that it is representing the CD analyzer line of Aerosonic Limited in the Americas, Asia and the Indian subcontinent...Allied Digital Technologies is closing its North Bergen, NJ, video duplication facility and consolidating its operations into existing plants in Knoxville, TN; Happauge, NY; Landover, MD; and Detroit, MI. ∎

C O A S To

PHILLY TRACKING

by Jeff Forlenza

From the Schuylkill to the Delaware; from South Street to the Liberty Bell; from the 'burbs of Camden to Conshohocken, there seems to be a music renaissance in Philadelphia. And Philly studios are recording it.

The Studio 4/RuffHouse Records crew recently moved out of their Center City location to the suburb of Conshohocken, Penn. RuffHouse, which was started by Joe Nicolo and Chris Schwartz, is the hot label in town these days. Joe and Phil Nicolo, a.k.a. "The Butcher Brothers," have mixed and remixed for the likes of Bruce Springsteen, Billy Joel, Sting, The Police and the Rolling

Philadelphia's Sonic Recording's renovated B Room, featuring an SSL E/G Series console

Stones. Co-owner Dave Johnson just scored a hit with G. Love and Special Sauce, a Philadelphia/Boston band that Johnson developed and produced for Okeh/Epic. With nearly 20,000 square feet, a Neve 8048, an SSL E/G Series and a Euphonix CS2000, a full-scale mastering facility (MasterVoice) and independent engineers subletting space, Studio 4 definitely is more than just rap, which orignally helped put the RuffHouse label on the map.

The Nicolo brothers say that their move to the 'burbs means more reasonable rent and no Philadelphia city wage tax. "With RuffHouse Records and the records we were

Jazz guitar legend Pat Martino (left) and executive producer Mike Forte listen to tracks from Martino's new album **The Maker** *on King/Evidence Records at Forte's Creation Station studio in Philadelphia.*

doing, people were coming from 3,000 miles away to work with us," Joe observes, "so [we believed] they would come another 18 miles. We didn't necessarily have to be in Center City."

"We've spent over a million dollars in just the renovation portion of the building," Phil says, "and we still have four or five months' work to do. We bought [the building] last

COAST

PHOTOS: CHRIS BENTLEY

BOSTON CHATTER

Eric Bradford

The fortunes of Boston's recording industry have long been linked to the depth of the local talent pool. The '80s saw bands ranging from Aerosmith to the Pixies garnering international attention for the area, and studios such as Newbury Sound and the Cars' now-defunct Syncro Sound hosting major local and national acts. This synergy soon proved to cut both ways, however. The '90s brought a crop of talent who seemed unable to duplicate the success and musical innovation of their predecessors, and many local producers agree that this slump directly affected business for the city's studios. Bookings from non-Boston acts dropped off, and newly signed locals headed to L.A. and elsewhere for major projects.

But recently, it seems that the drought may have ended. Last year saw a wave of new signings from the Boston area, and several long-time local favorites such as The Breeders, Juliana Hatfield and The Lemonheads finally began to collect their due. This

The recently remodeled Zippah Recording in Brookline, Mass., features a 36-channel custom Neve console with Tascam MS-16 analog and Alesis ADAT digital recorders.

revitalization of the Boston scene, along with the increasing willingness of these acts to record locally, has resulted in what several of the larger studios report as a decided upswing in bookings.

"There's a lot of

The control room at Blue Jay Recording (Carlisle, Mass.) features a 56-channel SSL console.

things happening musically in Boston, a lot of money has been coming from outside," explains John Lupfer, studio manager at Q Division. "We're getting a lot of stuff that might have left. There was a real noticeable downturn a couple of years ago, it seemed like everybody was out of work, and bigger projects were put on hold. But right

March, and it's only now that we have four of our rooms up and running. Our live room is approximately 35x40 feet. And there are three iso rooms off the main room that are approximately 15 feet square. The main room is similar to our old facility—it's the design where you have slotted pine with Soundsoak behind it. There's a huge skylight in the center of the room—like a 12-foot-square bell tower that goes up an additional 17 feet."

Joe has his own room equipped with a digitally controlled Euphonix CS2000 console. "I just rented the room out to this band Colors on Relativity," he says. "They just used the room for mixing. But for the most part, it's my treehouse—I do all my mixing in there."

"Jim Salamone will be moving in along with some of the principals of another studio, called Morningstar [in Spring Hill, Pa.]. And they will be putting in a Euphonix downstairs, which will give us five rooms," Phil says. "There's another room that we've sublet to Jay Davidson and Ted Greenberg. It's the same design
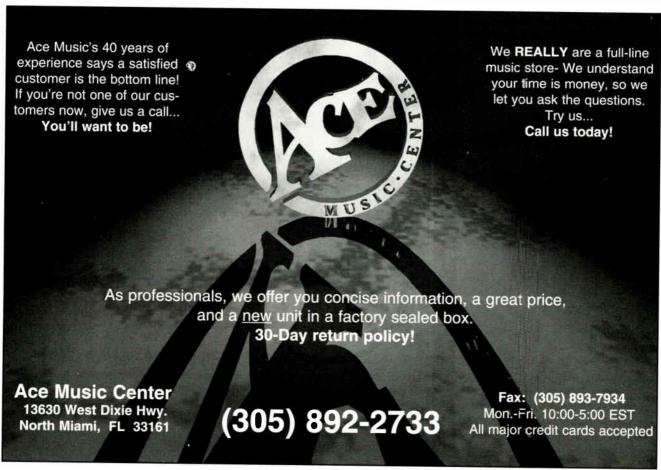
as our rooms, and they put in a vintage API with a Studer 800 and a battery of vintage tube gear. It's nice because we can use [their studio] for overflow and yet we don't have to worry about the upkeep and the cost of that room."

Joe also stresses, "A good facility or producer or mixer is only as good as the people you surround yourself with. Some of the people we have here are incredible: Andy 'Funky Drummer' Kravitz—as far as drum playing, programming, editing—is amazing. My engineer Taj Walton, who does most of the R&B stuff that I do, is excellent." Phil adds, "Ian Cross is another guy—my guitar tech—he's producing Ben Arnold, an alternative folk guy for Ruff-House. And our two other partners—Chris Schwartz, CEO of Ruff-House, and Dave Johnson, our third partner at Studio 4. And my engineer Dirk Grobelny, who does most of the engineering of the stuff I do. These are all creative people."

Also in the Conshohocken facility are the A&R, publicity and day-to-day operations for RuffHouse Records, which is an independent

label exclusively distributed by Columbia Records. "We have a competent A&R staff," Joe Nicolo says. "Rose Mann, Glenn Manko and Jeff Wells—we listen to every tape. And we're looking to expand our horizons. We have the second Dandelion album coming, *Dyslexicon*, which is classic garage rock 'n' roll, which Phil just finished producing."

Upcoming Studio 4 sessions include Joe Nicolo mixing the third Cypress Hill record, tentatively titled *Temple of Boom*, with Cypress producer DJ Muggs; Phil producing James Hall, a New Orleans-based singer/songwriter for Geffen; and then, when they're both ready, Anthrax will be coming to Conshohocken to record their latest for Elektra.

The space vacated by Studio 4 in Center City was purchased by Michael Block and is now called Tongue & Groove. Block also runs The Production Block, a service for renting and buying vintage gear. Not surprisingly, he installed a custom API console from L.A.'s Sunset Sound (the same board used to track *Led Zeppelin IV*) and an impressive

array of vintage mics and processing. Studio 4 co-owner Dave "Stiff" Johnson signed on as co-partner of Tongue & Groove. Sessions already completed at the studio include Philly-based band Wanderlust tracking for RCA with engineer Michael Musmanno, and G. Love and Special Sauce doing pre-production for their second album for Okeh/Epic with producer Johnson. Also, former Record Plant NYC engineer Mike Klein recently joined the staff.

The Philly studio with the most history is Sigma Sound. Over its 27 years, Sigma has earned more than 150 Gold and Platinum records; among the most recent are Barry White's *The Icon Is Love*, Gerald Levert's *Groove On*, Bel Biv DeVoe's *Hootie Mack* and Patti LaBelle's *Gems*. Joe Tarsia founded Sigma Sound in 1968. Today it is run by Joe's son Michael. Sigma's 10,000-square-foot facility houses three multitrack studios, one DAW production studio with A/V capability, one video post-production suite, two MIDI production suites and one duplication room.

Mike Tarsia reports a resurgence of live music tracking: "Things are heading back out into the studio rather than the control room. People are really tired of sampled drums. In fact, the Roots on Geffen did some work here [with engineer David Ivory in Studio 3], and the drummer played live grooves. When Gerald Levert did his album here, we suggested that he do strings and horns on the song 'Answering Service.' And for a couple of other songs, we pulled out our stereo Fender Rhodes; we had it in the control room, and most of the Rhodes sounds were real rather than synth. While we continue to support two active MIDI production suites, we want to revitalize the kind of recording that put Sigma on the map in the first place—capturing on tape the excitement of real-time acoustical performances."
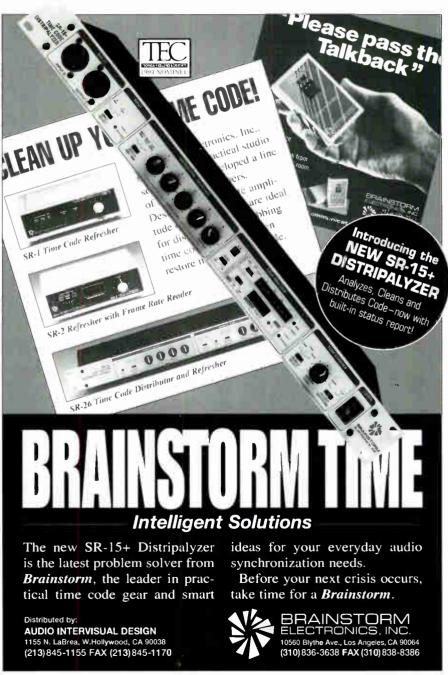
Tarsia is especially proud of their Neve console, which was purchased from Utopia Studios in London and meticulously rebuilt with Neve components: "The 8078 is like having 52 inputs of outboard gear. We have the 4-band equalizers. Neve only made three 8078 mainframes in the world that are 52-input. It's a true classic. We have Massenburg automation, which is great."

Tarsia says of the main tracking room: "It holds about 30 musicians comfortably. We're known for our live recording. That's what really held us through this time of home studios—there's only a certain number of places where you're gonna get a good live room sound. George Augspurger did our room with my father ten years ago, and the room sounds incredible.

"We do the full gamut," Tarsia says. "We have a full media production room with full video capabilities—with video lock, Betacam, 1-inch VTR, ¾-inch, sync-to-picture—the whole nine yards. A number of feature films have been shot in Philly recently, and Sigma has done work for most of them. [Director] Terry Gilliam was just here doing post work with our media director, John Anthony." Sigma is now part of the IDB Communications direct-dial digital audio network for long-distance transmission over ISDN lines.

David Ivory of Ivory Productions—an independent facility within Sigma Sound—also reports an increase in live music. Ivory is a producer/engineer/songwriter who started his career by recording his own bands. Ivory owned and operated Iris Sound (in Royersford,

Penn.) successfully for over ten years, where he hired Vince Kershner to manage the studio. Ivory moved his facility into Sigma Sound, where he had mixed many albums, in 1992. Ivory is also producer and A&R-man for his own label, Rage'N Records, which is co-owned by Chuck Woodward, Kershner and Ivory. Specializing in singer/songwriter rock 'n' roll, Rage'N Records looks for new talent to record and shop. Ivory equipment includes a Trident 32x24 console, a Soundcraft 24-track and a Fostex RD-8 recorder.

Maja Music is another tenant of Sigma's 212 North 12th St. facility. A full-service music production company, Maja serves both the music and media communities with its high-end audio and MIDI suite. Maja's partners, composer/producer Michael Aharon and engineer/producer John Anthony, recently completed Irish composer Seamus Egan's upcoming Shenachie Records release, *When Juniper Sleeps*. Five tracks from the CD will be featured in the soundtrack to the film *The Brothers McMullen*, which just took grand prize at the Sundance film festival. Maja's work

has also been featured in the film *Philadelphia* and the forthcoming Al Pacino film, *Two Bits*.

In November of last year, Michael Thatcher, Guy Lutze and David Saia opened Sonic Recording Studio. Formerly known as The Warehouse, where Cinderella and DJ Jazzy Jeff worked, the space was completely renovated, and it now houses three recording studios, with two more scheduled to open. Sonic's A room features a custom 44-input API console; the B room houses a 32-channel E Series SSL console, and the C room is a complete MIDI production suite with three Alesis ADATs and a 24-channel Mackie mixer.

Sonic co-owner Thatcher says, "We had to gut the place and totally rewire it. The original studio design was done by Obie O'Brien. So the place was here, but we had to add a lot of new gear and fix up a lot of stuff that was in disrepair. We got our SSL board [in the B room] from Ambience Recording in Detroit. The way we designed it was to use the API to cut tracks and then the SSL to mix. It's a real nice combination. And we got a Mackie in the MIDI

room. And we're thinking of buying a rack of DA-88s. We've got a rack of ADATs, and everybody is fighting over them."

Sonic sessions started in December 1994 with Boyz II Men working on a project called *Lately* for Warner Bros. Producer Brendan O'Brien returned to the studio to work with PolyGram artist Billy Falcon, and he brought in drummer Kenny Aronoff. Aronoff commented that Sonic had a great-sounding live room. Sonic's tracking room is big enough to fit Philadelphia's orchestra, and Thatcher says they also do a lot of gospel choirs and large ensembles.

Victory Recording Studios is located in the Society Hill section of Philadelphia. Originally owned by Kajem, the facility was purchased by Eric Asadoorian in May 1992. Asadoorian kept all the staff and did a major renovation of the facility, putting in a free-floating iso booth, working on acoustics and generally repairing and upgrading the equipment. Victory has four studios: V is the primary tracking room with its 34x16x14-foot live studio; the An-

BERKLEE COLLEGE OF MUSIC CELEBRATES ITS 50TH ANNIVERSARY

by Jeff Forlenza

Berklee College of Music in Boston's Back Bay turns 50 this year, and they have a lot to celebrate. Berklee was founded in 1945 by Lawrence Berk, when the pianist/arranger and MIT-trained engineer used to teach jazz theory to about 50 students under the name of Schillinger House of Music. In 1953, Berk changed the name to Berklee (a play on the name of his son, Lee Berk), and since then Berklee has kept changing with the times, both musically and technologically.

Today, Berklee College of Music has ten professionally equipped recording facilities; more than 100 MIDI-equipped workstations; six fully equipped film/video scoring labs, a 1,200-seat performance center and a worldwide reputation of excellence in music education. With nearly 3,000 students and 300 faculty members representing 75 different countries, Berklee is the world's largest independent, nonprofit music college. Incidentally, Berklee won four TEC Awards for outstanding educational institution.

Lee Eliot Berk has been president of Berklee since 1979, and he is committed to keeping pace with new recording technology. Since 1990, the college has invested $10 million in computers, sound studios, audio equipment and a multimedia lab. Last year, Berklee opened its tenth recording studio—a 24-track teaching studio, featuring an SSL 4000 G Series automated console.

Don Puluse, Music Technology Division chair at Berklee, stresses that students get to use all that state-of-the-art equipment. Puluse, who has 12 Gold and Platinum records from his days as a recording engineer for CBS Records, reports their Music Production and Engineering program is a project-oriented curriculum. In the Music Production for Records course, for example, student producers are entirely in charge of a musical project and must oversee all aspects of producing the recording. And every year, Berklee puts out a CD of select studio production projects from that course. Student producers can use all the Berklee equipment on hand, including the SSL, Sony and Amek consoles and processors by Lexicon, Summit and Sontec.

Unlike other music production and engineering courses, Berklee requires its engineering students to be musicians before entering the MP&E major. On the MIDI side, Berklee's Music Synthesis Program focuses on multimedia performance, production and sound design. The music synthesis department features Apple, Digidesign and Opcode equipment, as well as synthesizers from Kurzweil, Korg, Roland and Yamaha.

Events celebrating Berklee's 50th anniversary will be held throughout the year: The Boston Globe Jazz Festival's Salute to Berklee will be held on June 24; Founder's Day Convocation, with guest speakers including NARAS president/CEO Michael Greene, will be held October 12-14 at the Boston campus; and the Smithsonian Institution's traveling library exhibit titled "Beyond Category: The Musical Genius of Duke Ellington" will be co-hosted by Berklee and the Boston Public Library, from November 25, 1995, through January 21, 1996. ■

World Radio History

dromedia Suite is a production studio with an abundance of MIDI gear; the Synclavier Suite is occupied by commercial composer and record producer Larry Gold; and the Copy Suite is for editing, assembly and real-time duplication in multiple formats. Studio V has a Sony MXP-3036 console with automation; the Andromedia Suite has an Amek Einstein console with automation and an Akai A-DAM 24-track digital multitrack; the Andromedia and Synclavier Suites feature various keyboard and MIDI equipment.

Victory administrator Gene Leone, who engineered Frankie Smith's platinum "Double Dutch Bus" and hits from Evelyn Champagne King, says, "For quite a while, we saw a great deal of MIDI and sequenced projects being recorded in our studios. Now there seems to be a shift back to acoustic instruments." Recent projects at Victory include engineer Jon Smeltz working with producers Larry Gold and Kenny Whitehead on a Whitehead Brothers album for Motown; and Teddy Pendergrass recording vocals for his next Elektra release.

It was big news around Philly when the internationally known Kajem Studios closed and auctioned off its gear after co-owner Sam Moses passed away. Boyz II Men purchased the facility and renamed it Stone Creek Studios. The studio is housed in an 18th-century mill in Gladwyne, about 20 minutes from downtown. George Hajioannou of Studio Logic completely renovated and rewired the facility, and A room equipment will include an SSL 4048 E/G Series console and Quested HQ410U monitors. Plans include individual writing and MIDI rooms for each of the group's four members, along with a new digital mixing and mastering suite.

Joe DeLuca runs Why Me? Recording, a 24-track analog/digital facility across the Delaware River from Philly in Gibbsboro, N.J. DeLuca, who is also a mastering engineer at MasterWorks/Frankford-Wayne in Philly, tracks a lot of hardcore and underground rock music. Why Me? gear includes a Mackie 32x8 console, a Tascam MS-16 analog 16-track and a Tascam DA-88 digital recorder—which can be locked for 24 tracks. Bands who have tracked at Why Me? include Starkweather, Philly Dust Crew

and Dare to Defy—all for the Too Damn Hype/Dutch East record label.

Another studio across the Delaware River is RPL Studios in Camden, N.J. Owned by Ron Oliano, RPL is a recording, duplicating and manufacturing facility. With a large (20x30x12) tracking room, two Mackie 24x8 consoles, one Mackie 16x8 console, three Tascam DA-88 digital recorders and Pro Tools software, projects can remain at RPL all the way to mastering, duplicating and packaging. ∎

now, there's a lot of attention on Boston." Q Division has hosted several local artists that are attracting this attention in the past year, including Aimee Mann, Morphine, Jennifer Trynin and Letters To Cleo. Recent Q Division purchases include a Neve 8068 console, which was refurbished by Fred Hill.

One of the biggest stories locally in the past year has been Fort Apache's groundbreaking deal with MCA Records (see January '95 *Mix*). Since signing Boston's Cold Water Flat to their imprint and recording their major-label debut, the studio has played host to Juliana Hatfield and Belly, who are representing the area with critically acclaimed albums and extensive world tours. February's release of the *This is Fort Apache* compilation, coupled with a heavy promotional campaign, has thrust the studio and its producers into the national spotlight.

The MCA deal included funds for an upgrade that included the purchase of a Neve 8078 console, Studer A820 and A827 tape machines, and a redesign of the physical layout of the studio. As if all this weren't enough, the Fort's staff decided to build a smaller, as-yet-unnamed studio a few blocks away to accommodate acts that can't afford the increased rates, which came along with the upgrade to the main studio. "That way," explains studio manager Brian Dunton, "we felt that we were giving back to the community that gave so much to us."

Among the area's smaller studios is Brookline's 16-track Zippah. Co-owner Ken Thomas believes that the fraternal nature of the local music scene works in his facility's favor. "We have a real family here, and that adds to the feel of the place, but

it's by no means exclusionary," he says. "Bands from New York have been coming up more and more, recently, and I think that the vibe is part of the reason for that." Thomas and studio co-founder Peter Weiss took on a new partner, Brian Charles, last year, and recently completed a major upgrade that included a 36-channel Neve 3114 console, as well as an old 2-channel module from an EMI console used by The Beatles at London's Abbey Road.

Sound Techniques is slowly moving beyond its image as a high-end post-production and commercial house by bringing in more album projects. Work was recently done for Duran Duran's latest, *Thank You*, with local engineer Bob St. John and producer Anthony Resta. Studio rep Gina Romani said that the combination of the Neve V Series board in Studio A and the SSL 4056 G Series in Studio B seem to be a draw for artists such as bluesman Otis Grand, who traveled from London to complete an album project at the facility.

About 35 minutes outside of Boston in Carlisle, Mass., is Blue Jay Studios. Blue Jay continues to host a steady stream of major acts. Originally opened in 1979, Blue Jay was the first studio in New England to buy an SSL console, and their dedication to analog recording is borne out by their selection of tape machines—currently a Studer A800 with Dolby SR. The combination of a somewhat remote location, their top-of-the-line equipment, and a completely underground room that provides artists with "absolutely no ambient noise at all" keep a steady stream of out-of-town clients coming in.

"Blue Jay is set up to deal with anybody," says Bob Lawson, who co-owns the studio with his wife Janet. "We try to keep in touch with the local music scene, but we're open to anything. For example, this week we've got the Boston Symphony, a zydeco band, and They Might Be Giants." Earlier in the year, On Site Entertainment provided the studio with a web site on the internet, which provides visitors with equipment lists, photos of the studio's interior and exterior, and other information. Next time you're roaming the World Wide Web, you can visit them at http://www.ose.com/ose/blue-jay/. ∎

L.A. GRAPEVINE

by Maureen Droney

The Village cleans house—literally—as on the second and third floors of the historic facility rooms full of vintage equipment, parts and dusty ledgers are being sorted and counted. Those upper regions have always been a bit of a mystery—various music-related businesses have had offices there, but with many more unused spaces, it evoked the feeling of a ghost-inhabited attic. Now, The Village, where Fleetwood Mac recorded *Tusk* and more recently, the Eagles mixed their *Hell Freezes Over* album, is in transition.

Since the beginning of the year, the studios have been under the direction of president Julie Hormel (daughter of owner Geordie Hormel) and CEO Jeff Greenberg (former booking agent, manager and concert promoter) with the help of their studio consultant, multiple-Grammy-winning engineer Al Schmitt and studio manager Robin Bulla. Says Hormel, "I practically grew up at the Village—it's like a second home to me. And in the past few years, I've felt that a great, historic studio was falling behind—not living up to its potential. It needed leadership, change and direction."

One of the first changes, at consultant Al Schmitt's recommendation, was to bring in Jay Antista as chief engineer. Antista, formerly with Sunset Sound, and before that a co-owner of Lion's Share, has been more than busy since he arrived. The Neve VR consoles in Studio B and D and the SSL in A have been refurbished and recapped, and speakers in all the studios have been re-coned and tuned. Studio F, the small upstairs room fitted with a Trident Series 80 board, has also been revoiced and is seeing a lot of action with well-known actors stopping in to add their voices to books on tape.

Another change is a new parking arrangement that allows for much more parking when needed for orchestra or other large sessions. As for the the rest of the complex, well, there's a lot of potential still to be sorted out. Currently both Robbie Robertson and Jeff Baxter maintain offices there, and plans for the future include a possible soundstage on the

NY METRO REPORT
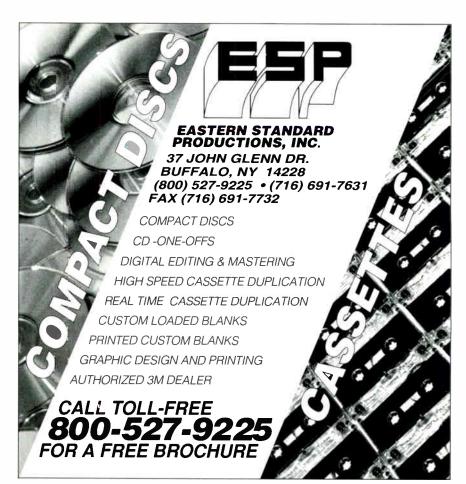
by Dan Daley

Major upgrades at major facilities: **Right Track Recording** has ordered a 96-input SSL 9000J, upgraded its SSL G-Plus to 100 inputs, bought an 80-input Neve Capricorn and took delivery of a Studer D827 48-track digital recorder with 20-bit converters so far. **Clinton Recording** added a D827 and a Dyaxis IIi system, as well as a new Lexicon 480L and more high-end microphones. And **Quad Recording**'s Lou Gonzales told me that he was about to announce the acquisition of a new SSL console. **Electric Lady Studios** has put in an AT&T DISQ digital core system, to be used in conjunction with its 64-input SSL 4000 console. (As a premium incentive, AT&T has also arranged to provide Lisa Roy's Nashville-based Studio A booking and referral services for one year to purchasers of their DISQ digital core mixer system.) On the post side, **Sound One** is now up to three Sony 3348 decks, and they added four 60-input Neve VSP consoles and more than 20 Tascam DA-88 decks.

Is it just spring fever, or is there something else going on? The reactions are mixed, but they seem to reflect a guarded optimism that's coinciding with the first few buds of an early spring in New York. Kieran Connelly, booking manager at **Clinton Recording**, says he's somewhat ambivalent. Clinton's upgrades were based on a slight but noticeable increase in film audio work at the studio that's been demanding 48-track digital media. "We're still in the transition from jingle house to music recording facility," Connelly explains, noting recent projects there for Spin Doctors and David Byrne. "So it's hard to get a real reading as to what's going on out there. But I truly believe that it's better than a year or so ago when we were seeing a lot of studio closings like Skyline and others. You could say I'm cautiously optimistic for the future of large facilities here."

On the other hand, Simon Andrews, owner of Right Track Recording, says his upgrades coincide with a general ebullience that he says permeates the overall industry right now, not just New York, and attributes locally based optimism to more

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.

Omega Recording Studios

5609 Fishers Lane
Rockville, MD 20852
(301) 230-9100; Fax (301) 230-9103

Located just outside the nation's capitol. Omega offers four state-of-the-art studios featuring Neve, SSL and API consoles. Choose from 32-track digital, three 24-track analog rooms or our MIDI/Digital Editing studio featuring our Sonic Solutions DAW. Past clients have included: Prince, Michael Bolton, Barbra Streisand, the Allman Brothers Band, Luther Vandross, Elton John, 2 Live Crew, Heavy D and the Boyz and Richard Smallwood, as well as numerous film and video scores.

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).

Quad Recording Studios

723 7th Ave.; New York, NY 10019
(212) 730-1035; Fax (212) 730-1083
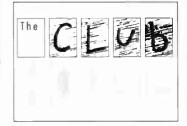
Quad Recording's four world-class Solid State Logic studios (up to 72 channels), two digital editing suites and two complete MIDI rooms are available for all your music recording needs, from pre-production to post-production. Artists who use our state-of-the-art facility include Aerosmith, Prince, David 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.

Rockingchair Recording Studios

1711 Poplar Ave.
Memphis, TN 38104
(901) 276-8542; Fax (901) 276-8546

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.

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.

—FROM PAGE 60, MICHAEL GREENE

a highly competitive marketplace. What is my role in the evolution and the collaboration which exists between telephone companies, cable companies, hardware manufacturers, the computer industry, the record industry, multimedia distribution? How do I factor in? What are the margins?

As an entrepreneur, your job is to create a grid, and that grid has to have vertical and horizontal variables that come into play. Near-term, mid-term, long-term. If you are going to make a major equipment acquisition, what peripheral kinds of products might be necessary to enable you to use it for other things? You can't afford to get so locked into one particular part of the business that you are no longer elastic enough to take advantage of something else.

The digital workstation is one of the best examples. You have to keep training your engineers. What is digital compression all about? What do datastreams mean? How do the pieces of gear talk to each other, and not just through routers? What kinds of black boxes are necessary to be able to stay ahead of the questions from the client? Let's say he wants to walk out of your studio with a 12-inch video check disk that he can use for educational purposes, with music, and graphics, full-motion video, still-frame video, etc. You must get smart on the language, and then you've got to become visionary in terms of how you spend your money.

Having been a facilities person for as long as I was, I would never get back into it—because of the margins. The margins are impossible. If you make eight percent in a major market post-production facility, you're lucky. You've got to have a computer graphics division, an audio division that is flexible enough to do tedious industrial work, commercials, and still satisfy the music client. You've got to have a very flexible environment. What are the entryways? How do people access your business? Telecine, absolutely, if you are in the commercial field. If they're working on 35mm or 16mm, once you get them in, you can talk to

them about audio, computer graphics. That's your handshake. People come in looking for voice-over, audio work, "Oh, by the way, for your next remote location work, we also have a division that can do field recording for you."

From a technician's standpoint, we are in an era now when you have to know more than your clients. You have to be the authority. Because of access to information, the clients walk in, and they are very smart. They know the buzz words and just enough to make you look stupid. And they are dangerous in that regard. If you want to be absolutely impenetrable, as someone who can

Michael Greene and Frank Zappa

keep his job for as long as you want, your client skills and your information base are just as important as how you make those electrical impulses hit the oxide and at what density. That's the key now—and it's exciting. It's making our people have to become much smarter.

Bonzai: Regarding NARAS, we used to think in terms of vinyl, then cassettes, CDs, all in a linear audio evolution. Now we have new elements coming into the package of the future. How will NARAS reflect those changes in what we think of as the recording industry?

Greene: We give out awards for recordings. I don't care if they're on a chip that goes in the back of your eyeglasses, or in your watch. The recording is judged not on the medium but on the sound and the performances.

We've got Grammy online, and we were on the Internet with the Grammy awards this year, backstage. We had over 100,000 log on this Grammy season. I'm a total wingnut, and I may not be brilliant with all of the latest developments, but it's fas-

cinating, it's exciting to push the envelope in terms of the connectivity between engineers and musicians, producers, videographers and all the other people in our business.

Bonzai: For the kid who loves music, what's your advice for survival in the music business?

Greene: I think the first thing you have to do is get your education. If you are a high school kid, you don't yet have all the intellectual tools to make the decisions you need to direct your life. I can't tell you how many kids drop out of school because they are sure they want to do music. They wake up one day, they're 24 years old, they are not going to make it as a music person, and they find themselves totally unprepared to be competitive in any other part of the work force.

And if you are a musician, don't predicate what you create by listening to the radio. Best-case scenario: You are influenced by a particular genre that is happening on July the 15th. By the time you acclimate yourself to your way of reinventing it, get that recorded, get it on a CD, get it placed and marketed, that phase of our musical history is over. And you will find yourself sitting there like the Bee Gees in 1995. Not much gonna happen.

If you are a technical person, a young person who wants to get into that side of the industry, go to every single place you can and volunteer. Get a mixer, some sound reinforcement gear, go to every club, find every little band in every ashtray and say, "I want to be your sound reinforcement person." Follow them around. Do whatever you can to get in a position to push faders and get your hands on wires.

At any moment, you must be prepared to take the challenge. As a teenager, I was a young musician on Columbia with a group called the Hampton Grease Band. Frank Zappa heard us play—we were alternative, kind of the East Coast answer to the Mothers of Invention. He said to me, "I want you to fly out to Los Angeles and see me." I said okay. Just a kid from Atlanta, I had never been to L.A., but I flew out, they picked me up at the airport and took me to Frank's house. We ate dinner, and af-

terwards, he sat down at the piano and messed around for a minute, got his guitar and started playing this incredibly intricate chord structure and said, "Sing me a melody line to this." And I got right into it. It was that moment in time when I had to prove, more to myself than to him, that I could listen to an atonal variation moving from a Lydian to an Ionian mode, as only Frank could do, and within a few passes, come up with something that was interpretive, consistent with what he was doing and that had some expression to it. The next day, I was signed to their label

Whether you are an entrepreneur or a fader-slider, you have to anticipate the evolution, the dialog and the collaboration that exist among different parts of our industry.

as a solo artist. You never know when the moment will come when all of your bullshit, all of your planning and all of your pontification will be like clothing that is stripped off of you. You either put up or shut up.

For musicians, never go anywhere without a cassette. If you are in a public situation, maybe a panel discussion, never be afraid to walk up with that cassette and say, "I know you probably don't have time to listen to this, but I think this is perfect for what you are doing with so-and-so. Thank you very much for your time." I get a hundred cassettes a week. If a kid walks up to me and says that, you better believe I will listen and respond.

You have to be aggressive, and believe in yourself. ∎

In ceremonies earlier this evening, roving editor Mr. Bonzai received the 1995 Grammy Award in the Alternative Metal Mambo category.

—FROM PAGE 24, ANDY MOORER

at Lucasfilm [during the mid-'80s] with the SoundDroid audio signal processor that we actually achieved the online, real-time performance that you expect from modern consoles. Unfortunately, there was only the one prototype SoundDroid built, and it was never commercialized as such, although it was used on a number of Lucasfilm's internal productions.

Mix: When developing SoundDroid, how much off-the-shelf hardware could you use and how much was handmade?

Moorer: It was all handmade from scratch, from top to bottom. The problem then was the lack of high-speed DSP chips. There was the TMS 320, but it was a relatively slow 16-bit device and not suitable for professional-quality audio. That gap had to be filled with custom-built hardware, which was large and fast and expensive.

A number of devices that are now commonplace became available in the late '80s, including the AT&T parts. Also, the CD revolution drove down the price of converters—for $25 you can get a DAC that's every bit as good as the $25,000 ones we used in the late '70s.

Mix: And low-cost hard drives of sufficiently high capacity?

Moorer: Yes. As recently as six years ago, the hard drive was the bottleneck. We had the audio processing and conversion equipment, but drives were still frightfully expensive. To produce a 74-minute CD, you'd have several times that much information in storage at any one time. Until fairly recently, that would be like six hard drives. Nowadays, the drives are getting up to reasonable capacity, and I see no reason why this trend shouldn't continue.

Mix: Disc-access speeds are also important, to ensure multichannel audio onto a disc?

Moorer: These are refinements of techniques we've always known about. There are algorithms we've known for many years; there's probably 200 doctoral dissertations on disc scheduling and data routing to and from discs. Now it's economical to apply those on much smaller scales. In fact, our low-end Sonic System uses some relatively sophisticated disc scheduling to attain ten and 12 channels [of data] from relatively economical discs.

Data access and transfer efficien-

cy is very important. A drive manufacturer will quote you a throughput or bandwidth parameter; generally, this is not an attainable maximum. An interesting question is, "What fraction of that maximum advertised bandwidth does the system actually hit?" If digital audio [represents] 100 kilobytes per second, and you take a manufacturer's value of a three megabytes-per-second transfer rate, then you'd think that you'd be able to get 30 channels of audio off that disk drive. Most systems can't do that. It's interesting to ask, "Gee, if my disk transfers three megabytes per second, how come I can only read eight channels off it?"

The reason is that to attain that [data rate] requires building in high-speed data handling through the bus, into the device, through your processing cards, and out again. For instance, modern computers, even workstations, generally only hit ten percent to 15 percent of the disc's maximum bandwidth.

Mix: And for the same reasons, real-world networking might not offer the advertised efficiencies?

Moorer: Right, you can apply this same discussion to a network. Many people take what should be a very fast network board, plug it into a Macintosh, and notice that their networking performance didn't change, even though they're using a wire that's ten- or 100-times faster. The reason is that, once again, to achieve real-time network performance, every step of the pathway has to be re-designed and tailored for high-speed transfer. For instance, in our Media-Net solution, we've put the entire file system and data-handling into the card itself, so that every aspect of the disc-to-network performance has been optimized.

Mix: Might I suggest that a third parameter is the notion of tracks vs. voices vs. channels—that certain systems have to re-record the edited sections, simply because they cannot provide simultaneous, real-time access to the overlap segments?

Moorer: When we started down this path seven or eight years ago, we came to the conclusion that editors and mixers really didn't want to have to worry about how a system handled edits. So we designed a system from the beginning to perform these functions transparently. Now there's some confusion about how cross-fades are done; on certain systems that are, let's say, "disc-transfer poor,"

you don't have a lot of bandwidth to the disc, so consequently, overlap splices have to be computed out of real time and then stored back on the disc. That [strategy] saves you disc bandwidth, but if you have a 100-second crossfade, it might take 100 seconds to compute it and put it back—which makes it relatively difficult to try out ten different versions.

On the Sonic System, we went for a real-time, synthesized edit: We actually read the sound that's being faded down, the sound that's being faded up, and re-synthesize the crossfade. Our new Ultra Sonic Processor is what you might term 32-voice and 16-channel; you can have 16 simultaneously sounding channels and perform relatively brief 100- to 200-millisecond crossfades into 16 more channels. For that short amount of time, you're actually transferring 32 channels of audio.

Mix: Is it also your philosophy to perform data-intensive computations, such as might be required for a 4-band parametric equalizer, or dy-namics control, on a dedicated DSP board, rather than try to let a general-purpose microprocessor handle it?

Moorer: There's always a question about whether a certain process should be done inside the host computer vs. inside a board. Granted, host computers get faster every year, but then so do boards, and what we want to do with them gets more and more complicated. For the professional, it's unlikely that at any time in our lifetime the host computer will be fast enough to do everything we need it to do.

In the future, the amount of processing power we will be able to put on these boards will far exceed what is being done in even the largest of studios today. We're going to see a board that may handle hundreds of channels of audio in real time, with dozens and dozens of filter sections in each channel, and the appropriate network and disc bandwidth to handle all of that.

Mix: So the Macintosh front end you use is just a graphical user interface? It simply provides visual cues and extracts from the user mouse-clicks and keystrokes?
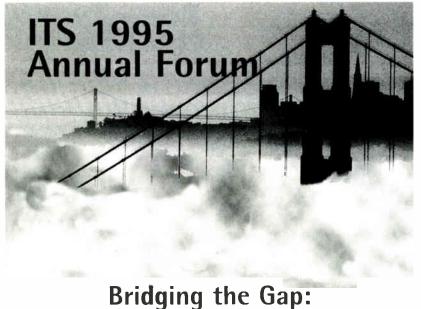
Moorer: That's right. In the Sonic System, the host computer is entirely the user interface; once audio is running, the Mac does virtually nothing except draw pretty pictures. No audio goes across the NuBus at all; we have backstrap connectors between our DSP cards. We don't use time-domain multiplexing because it's too rigid a form; instead, we use a kind of message-passing system.

Pointing to the future, my operating assumption is that the DSP hardware will far outpace what we do with it. Real developments in the future will revolve around the user interface. If, let's say, you have in a one-foot cube 200 channels of audio, how do you control it? Obviously, it's impractical for a single person to control a 200-channel fader. The challenge for our industry is going to be how to control the spectacular amount of power we're going to have in these relatively small boxes.

Mix: How are you responding to that challenge? Do you gather information regularly from focus groups (along with feedback from your dealers), gain a consensus and then turn that into a product?

Moorer: All of those things and more. We're floating ideas past people all the time and coming up with a cluster of concepts that will take us into the new millennium. The key idea is overview vs. focus. Human beings are visual creatures; they take in an enormous amount of data through their eyes. The idea would be to have overviews that give the user a small amount of information about all of the processes they're controlling and then the ability to focus or zoom into that function and put it onto physical faders or controls.

Mix: This isn't a segment of the market that Sonic is known for—the "Studio in a Box," with integrated recording, mixing, editing and DSP, such as might be provided by, for example, the SSL OmniMix or Scenaria. Is that a market you're moving toward?

Moorer: Obviously we don't build mixing desks as such, but all manufacturers, not just Sonic, will have to face the facts. Number one is that it's not going to be that many years before your "studio" is a two-foot cube sitting on your desk, with all the audio processing power of a 200-channel mixer. For control, some people will obviously build large reconfigurable platforms. Sonic hasn't done that in the past; what we've

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done is use general-purpose computers to control devices of increasing complexity, up to 24 channels. Our advances in hardware make it relatively easy to go beyond that, if that's what we decide to do.

Mix: So we're moving toward a situation where distinctions between the stages of production and the hardware we use—the mixer and the recorder and then the editor—become blurred?

Moorer: It gets even more blurred if you talk about a network situation, because now when you're controlling something on a screen, you don't even know where the processing is happening.

Mix: What about storage media? The cost of hard drives is dropping, and they're getting faster. What about removable media, beyond Exabytes and other tape-based media to magneto-optical systems of sufficient speed and bandwidth?

Moorer: Users are asking for interchange media. A scenario is described to me: "We've laid down a few tracks here in San Francisco, and now we'd like to take the tape to England and record the London Philharmonic on a few tracks. How do we do that?" So, yes indeed, some kind of medium of exchange is going to be important in the future. As for removable drives, they're still something like ten-times or more higher in price/performance [compared to] magnetic medium.

Mix: Beyond the exchange of information from studio to studio, and project to project, what about off-loading material in background?

Moorer: Some of our clients actually do that today with removable disk drives. But it's my personal feeling that the ideal exchange or removable recording medium has not yet been developed. And there are reasons why users might bypass that stage entirely and become used to working on high-speed networks within a building or between facilities. Then you don't care about the transfer rate, flying to England to dub in the Philharmonic.

Archival storage [vs. online access via high-speed networking] is a different animal. Archiving can be done on high-density CDs—that's a different item. As far as medium of exchange goes, the availability of high-speed networking is increasing faster than the speed of computation and the performance of disk drives.

At some point in the not-too-dis-

tant future, rather than fly to London, it will be more economical to simply pipe 100 channels of 16/20/24-bit audio from London. Consequently, one use for the medium of exchange then goes away.

Mix: One final observation. Most of these technologies seem to be coming from outside our industry. The reason that we can enjoy major networking developments is that organizations are linking computers for data exchange.

Moorer: Actually, it is exactly the reverse—the audio and video markets are currently driving the computer industry. DataDAT and CD-ROM were developed for the audio industry. Multimedia is driving the computer industry to produce more and more powerful computers. Because who needs a Pentium to do word processing?

Mix: And what about Asynchronous Transfer Mode, which offers gigabytes of data transfer? ATM wasn't developed for the pro audio industry.

Moorer: Actually, I would submit the contrary: ATM was designed explicitly to carry audio and video. But you are correct about moving ATM up to a professional level. The point is that, because consumers are now interested in high-quality audio, suddenly we're starting to see wide-area networks with enormous amounts of bandwidth. And ATM is the key.

Don't forget that it's the existence of the ten million CD players that also dropped the cost of conversion for professionals. Set-top boxes bringing music and entertainment [into the home via] an ATM fiber-optic network are also going to drive down the prices for professionals.

Mix: A final question: What single piece of technology will have a major impact on the studio of ten to 15 years in the future?

Moorer: To tell you the truth, my personal feeling is that the technologies we now see on the horizon are enough, that we have enough technology to do what artists, musicians, studio engineers want to do. Any deficit is more in our imagination of how we might design the user interface to take advantage of all that potential processing power. ∎

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

—FROM PAGE 21, ELSIE, DEE PROJECTOR EES HERE
tors and line doublers of any single manufacturer I know.

Both the Sharp and the Vidikron eat S video, both have IR remotes that you can aim at the screen, and the units will read the bounce. The Crystal One weighs nothing, and the Sharp, half that. Both will make you rethink LCD projection technology.

And now for the main act, the *differences*. The Vidikron has a very good RF tuner and closed-caption decoding (as you may know, closed-caption data is carried on the video feed, so this thing can decode it from other video sources, as well). The Sharp has no tuner at all but is a true 640x480 direct-mapped computer display, and a very intelligent one at that. You can feed it VGA, EGA, CGA or Mac, and it figures it out and displays it—rather stunningly, in fact. It comes with the proper adapter cables and even has a "phase" control to slip those little computer pixels until they really do line up exactly with the Sharp's pixels. The result of one or two pushes of the button is, well…sharp; razor-sharp.

WHAT IS HE DOING HERE?

Let's get down to it. This month's column isn't for everybody, but I'm gambling that there are many of you out there who have been dragging your feet on installing a real projection system in your control room because of inconvenience, down time, expense or available quality. Well, the time may have come for you. It finally did for me. So with that, I dive ever deeper into the hell of showing you the differences of two systems that I liked a lot, so that you may better decide which fits your needs. Remember, I had these things for *months*, and I spent that time testing, comparing, superimposing images (very revealing) and watching *Jurassic Park* (very subwoofery). So, onward—randomly, I'm afraid.

The Sharp has features that are so good that you can't believe there were ever systems without them. It can move the picture vertically over a huge distance without keystoning. I have no idea how they do that. It stays in perfect focus when you zoom, no matter how much you zoom. I have no idea how they do that, either. When you do zoom, it zooms up from the bottom of the

image. Very convenient when changing sizes on-the-fly (try *that* with a three-lens phosphor system). All this makes the Sharp truly the most portable high-end system I have found. It even has a carrying handle built on. You just walk in, set it on any table or stick it to the ceiling, turn it on, zoom, focus and then vertically slip the entire image to the desired height, all with the back-lighted IR remote. In fact, it seems to work quite well out by the pool, projecting on a stucco house wall. Quite well.

The Sharp has "masking": digital shutters that you can close in to keep the top and bottom edges of the image black as you switch to different aspect ratios. They are totally adjustable by remote, and there are several memories to keep your adjustments in, along with memories for brightness, contrast, white balance and lots of other stuff. This means that when you feed it Mac screens, it knows what kind of contrast and color balance you like, and when you feed it laserdisc feeds, it can change to your preferred settings for those. Pretty nice.

Strangely, the Sharp overscans horizontally, and the Vidikron does not; so you actually see noticeably more of the picture on the Vidikron.

Pixels. Well, pixel count, size, shape and visibility are all important factors, but we start to get into that "what's that mic sound like?" domain here; specs and numbers don't always tell the whole story. In fact, when comparing the Sharp and the Vidikron, this turns out to be exactly the case. The Sharp has more pixels, and so is decidedly higher-resolution then the Vidikron. Its linearity and geometry are clearly superior. Its keystoning control is perfect. The Sharp's 309,120-pixel-per-color display is the highest in this price range, and it does show. Because Sharp has chosen to make this a "data" display device, the company has abandoned its older "delta" pixel array technology and has replaced it with new "striped" technology. This marketspeak means that they used to offset every alternate row of pixels by half a pixel, like bricks in a wall, so that you would not see a "window screen" grid effect of pixel edges (which are black) lining up. This delta alignment is considered a good trick for movies, but stacking the pixels in aligned columns is considered better for data, since text will have sharp vertical

edges that way. And so it is done. The Sharp looks great with a 640x480 Mac screen, but you can clearly see the pixels in Tia Carrere's face. The Vidikron, on the other hand, *does* use the delta pattern, and it does work. Even though there are significantly fewer pixels (217,945, or 479x455), you really don't see them. Nice trick. As far as high-density computer data on the Crystal One? There is an RGB plus sync input for CGA, if that will meet your needs.

The Sharp has every feature and convenience in the galaxy, weighs nothing and can truly be taken over to a friend's house to watch a movie on. It is accurate as hell, and even more precise than many glass tubes, though the res is still a bit lower. In fact, here lies the rub. It is so precise that it is a bit cool; no, cold. Though stunning for Mac and VGA, EGA or CGA displays, it has two Fatal Downfalls. Fatal Downfall Number 1: How many MIDI or DAW programs do you actually run that are happy with a little 13-inch (640x480) screen? Even if that screen is 10 feet across and very cool-looking, it's not really enough pixels for today's monster programs. The DAW that I currently use wants 1,024x768, for example. So, though all this impressive direct-mapped computer input stuff is great, would you actually use it in your studio?

And now, Fatal Downfall Number 2: The Sharp simply cannot make flesh tones. With all its background white level-trimming features and all its surgical precision, faces have a pink *and* green tinge at the same time. You just can't fix it! In fact, color in general is where most of the problems lie. Although it has very impressive blacks and black detail, it can't really make white. Everything looks a little milky, like you want to turn up the contrast, but that doesn't do it. Colors simply aren't convincing, though intensity and saturation are very impressive. You know what it looks like? Hand-tinted black-and-white photos from the distant past. The colors are right, I guess, but they look translucent, as if they were *added* to a black-and-white film. Free Turnerization. All the numbers, but no soul.

HERE IT COMES, THE UNAVOIDABLE REFERENCE TO MOTOR VEHICLES

It's the old Harley vs. the Crotch rocket all over again. The rice burner undeniably has all the numbers;

AD INDEX & READER SERVICE PAGE

it's faster, corners better, uses less fuel, has 2,000 times the features, can run under water, never leaks oil, has technology from beyond known dimensions, has a direct computer interface, and on and on. But something's a little off; it's just not quite right; it sort of misses the mark. The Harley, on the other hand (which now uses two-year-old Japanese electronics; a radical improvement), is not as tight, not as precise, not as slick, maybe even still leaks a little oil, but it's got *soul*. It's right. It exists for only one reason: to give you a ride in that original tradition, in the way it used to be when little bikes first crawled out of the primordial 90-weight hypoid ooze and evolved into the first big V twins—80-cubic-inch machines that understood the oil in their crankcases came from the dinosaurs, and so respectfully deposited a little bit back into the earth with every ride, and a little more every night…That's the bike to ride if you are riding a bike, and the 12-cylinder, 17,000 rpm, water-cooled, kevlar-bodied rocket is the bike to use for simply going faster than anybody in the world has the right to go.

The Sharp is that rocket—stacked with precision power, features, versatility and cool lights, but lacking soul. The Vidikron is the Harley: simple, more basic, warm, organic, pleasing and, well, let's be honest here, *fun*. And like the Harley, it uses last year's Japanese electronics; the Crystal One actually uses last year's Sharp delta panels but with very different color decoding.

Now, this LCD projector comparison differs from the bike comparison in that while the organic iron of the Harley costs three times what the rocket costs, the Crystal one comes in at $8k, and the Sharp tips the economic scales at $10k. Personally, I couldn't resist the Harley that costs $2k less than the rocket; I bought a Crystal One.

BEACH, BEACH, BEACH

Here's a nasty little list of random points to consider: The Sharp makes lush, saturated green plants, and the Vidikron does not. The Sharp is very precise—geometrically impressive—while the Vidikron is looser and less linear. The Sharp is cold, has a blue tinge, makes gray-blue whites and truly dismal skin tones. The Vidikron

is warm, and Earthlings look like they are, in fact, Earthlings. The Sharp has a not-too-convincing sort of "artificial" feel to the colors. The Vidikron is very natural and pleasing. The Sharp has more pixels and tighter control of the image (absolutely NO color fringing on the right side of transitions). The Vidikron is much brighter, which can be very important, as you can imagine. The Sharp has that keystone feature; the Vidikron does not. The Sharp is much lighter than the Vidikron. Now this next one is interesting, and I have no idea what it would be, but it is. Dalite sent me chunks of several different screen surfaces to try out, and I made an amazing discovery. Though the Sharp is completely tolerant of high-gain glass bead screens, the Vidikron is very intolerant. The Vidikron will turn brown dirt purple and humans pink if you try to boost the image with anything having a gain of more than 1.7. Go figure.

And although the Sharp simply won't bloom or blow out bright colors, the Vidikron will happily blow out yellows and burn the details right out of near whites.

But the Sharp looks like science, and the Vidikron looks like *movies*.

YEAH, YEAH. I KNOW…

Like I said at the top, neither of these manufacturers is going to be calling up for reprints of this column, but I hope that you understand what I am saying here. If you need to display 640x480, get the Sharp; it is the sharpest thing I have seen for less than $10k. But if you want to work on film or video, or if you just want to sit back and abuse the facility by simply watching a movie, get the Crystal One. Five minutes into the movie, you forget it's an LCD.

And just to keep the momentum of the confusion going, Vidikron has future plans for a high-res Sharp-killer (called the Crystal Two), using a new secret LCD technology that promises to scare all of us. It doesn't replace the One, and it costs quite a bit more, but I (for one) am certainly watching for it (for two). What's a boy with a few bucks in the bank and a darkened room to do? ∎

If you remember from a previous bio that Stephen St.Croix got radial keratotomy, you can understand that now he needs something to try his new eyes on.

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process to the point where looping is down considerably from the first season. They may do an hour each episode to add or replace a line here or there, or for voice-over. They very rarely loop an entire scene. "We do very minimal in the way of ADR," says Williamson, "especially considering our two actors are in nearly every scene. The producers are happy about this, because if they have to go and do ADR, it's more time added and becomes a scheduling problem. And at that point, it's a really big consideration. It is so important to have a good relationship between the post-production mixer and the sound mixer on set. I try to talk to Paul Radwin, our supervising post-production producer, as much as I can. I try to warn him if I think there's a problem coming up so they can immediately flag it."

Given the current popularity of *The X-Files*, which is currently aired in countries as diverse as Germany, Czechoslovakia, Spain, England and Australia, it seems likely that the show will be around for a few years to come, satisfying the public's fixation on things paranormal. And, of course, the sound is going to continue to get better.

"I heard a recording from an AES seminar that a friend of mine brought back about ten years ago," concludes Williamson, "and there was a production sound mixer talking about timecode, and he said that the mixer was very important in the past, always got head credits and everything else. Then technology continued on, and mixing got a little bit easier, sound got a little bit better, and now he truly believes that the sound mixers are placed somewhere between craft services and the honeywagon drivers. We have a lot of responsibility here; we have to do a lot of things. There's a lot of people on film sets that are truly ignorant of what we do, so that's exactly what they feel. This show is good, we have some very, very experienced people in the lighting department, in the grip department and the set dec department. And they know exactly what a good mixer can do, and they will help us in any way they possibly can." ∎

Tim Moshansky is a freelance writer and musician based in Vancouver, B.C. He has just completed his first book, The A to Z Guide to Film Production Terms.

second floor where there already exists a large screening room.

The Hook Music Recording Studio in North Hollywood offers no-frills quality at a great rate. Owner Mike Frenchik developed his extensive tube mic collection (proudly displayed in portraits hanging in the lobby) at the Hook's original facility on Ventura Blvd. Although the business at Hook #1 was built on voice-over and ADR work, a few in-the-know vocalists also took advantage of the room, including Huey Lewis, Offspring's Dexter Holland and Denise Williams.

According to Frenchik, it was those sessions with Denise Williams that inspired him to expand his studio business. He recalls, "Denise just impressed me as such a true artist—it made me realize that I wanted to go further in the direction of music recording." Frenchik has actually been in music all his life—he is classically trained with a masters degree in saxophone and music theory. He got into the engineering side of the business, he says, "by default," working with live bands. Now his studio's credits include over 40 albums, focusing on those with tight budgets.

When, in early 1994, producer Michael Omartian left town for Nashville, his studio on Sherman Way near Coldwater became available, and Frenchik saw an opportunity. He acquired the space to create a second studio that would focus on music production. Toward that goal he installed a 32-in Neve 8068, a Studer 827, Tannoy 15 SRM and Genelec S-30 monitors, along with Avalon and Tube Tech gear, and opened for business in December of 1994.

Studio coordinator Amy Onishi gave me the tour—the complex is spacious and comfortable, with an easy-access loading dock and plenty of parking. Says Frenchik, "I believe that there's a niche in the L.A. market for a quality recording room that can book out for under $1,000 per day, including engineer. And people have told me they like having a facility that serves just one client at a time where they can really focus and get work done." Projects that have been in since Hook #2 opened include MCA's Dime Store Hoods produced by Matt Wallace, with engineer Joe Barresi.

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than just more music recording. "Look, record companies sold $12 billion worth of records last year," Andrews states. "There had been a bit of doldrums here for the last few years, but with a new government administration in place in New York, the streets are cleaner and the general quality of life is up. I mean, all you can do is do your best and hope for the best. But I do feel that there's a bit of a renaissance going on here. I feel quite positive about it."

In the middle is Lou Gonzales, owner of Quad Recording, whose new SSL will replace one of the E Series/G computer boards he now has in his four rooms later this year. "Things are chugging along," he says. "I'm considering the new console as a matter of a technical upgrade, but also because I have a few clients who are requiring it. So it's a bit of both."

Bob Toeller, manager of technical services at Sound One, says that post has experienced a significant renaissance in the wake of the producers' strike nearly four years ago that devastated much of the audio post industry in town. "The after-effects of that strike lasted a good year after the strike ended," he says. "But it's been cranking ever since then. What's happening is that more of the film-editing community is switching to the modular decks like the Tascam; they're not rolling in big 35-millimeter reels anymore. That's been the case in Los Angeles for some time, but it's happening here faster than we expected. So those kinds of changes are driving the upgrades in post."

Sound On Sound's Dave Amlen, who added a second room a year ago with an SSL G-Plus to complement his existing Neve VR, was slightly ahead of the the current ongoing expansions. But he cautions against defining it as a trend. "I've been looking for trends in New York ever since I opened and haven't found one yet," he observes. "Every room creates its own client base. There's an ebb and flow in New York that doesn't always have a reason behind it. We saw Skyline and Sigma—combined five 48-track rooms—go out of business shortly after Media did. But Hit Factory expanded and Sony opened up shortly after that. So I think there just happens to be a certain number of rooms that New York can safely support." ∎