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MIX

PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

IN THE STUDIO WITH THE BEASTIE BOYS

What's New in Digital Multitrack Recorders

Recording Acoustic Groups

Hot R&B Producers Foster & McElroy

Making The Most Of Your Masters

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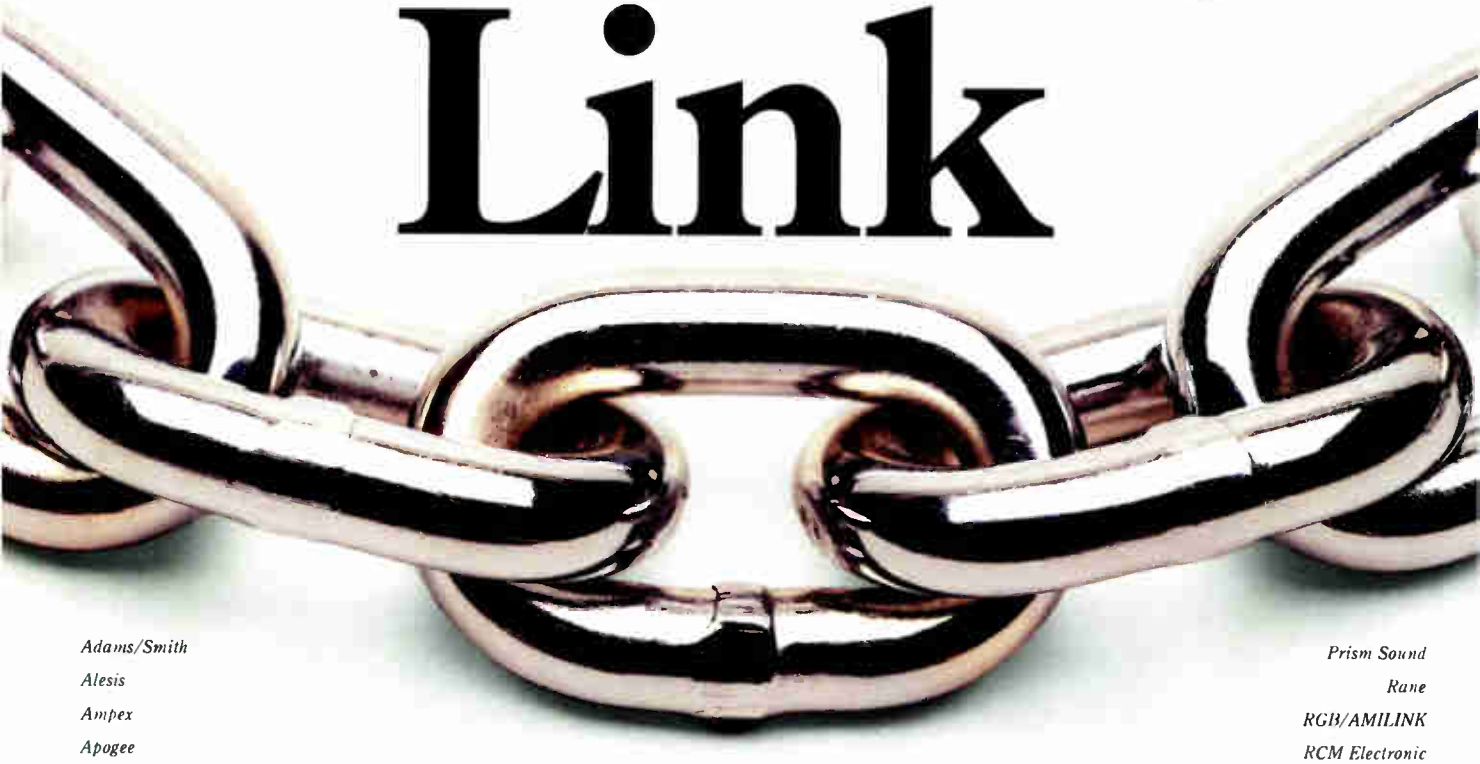

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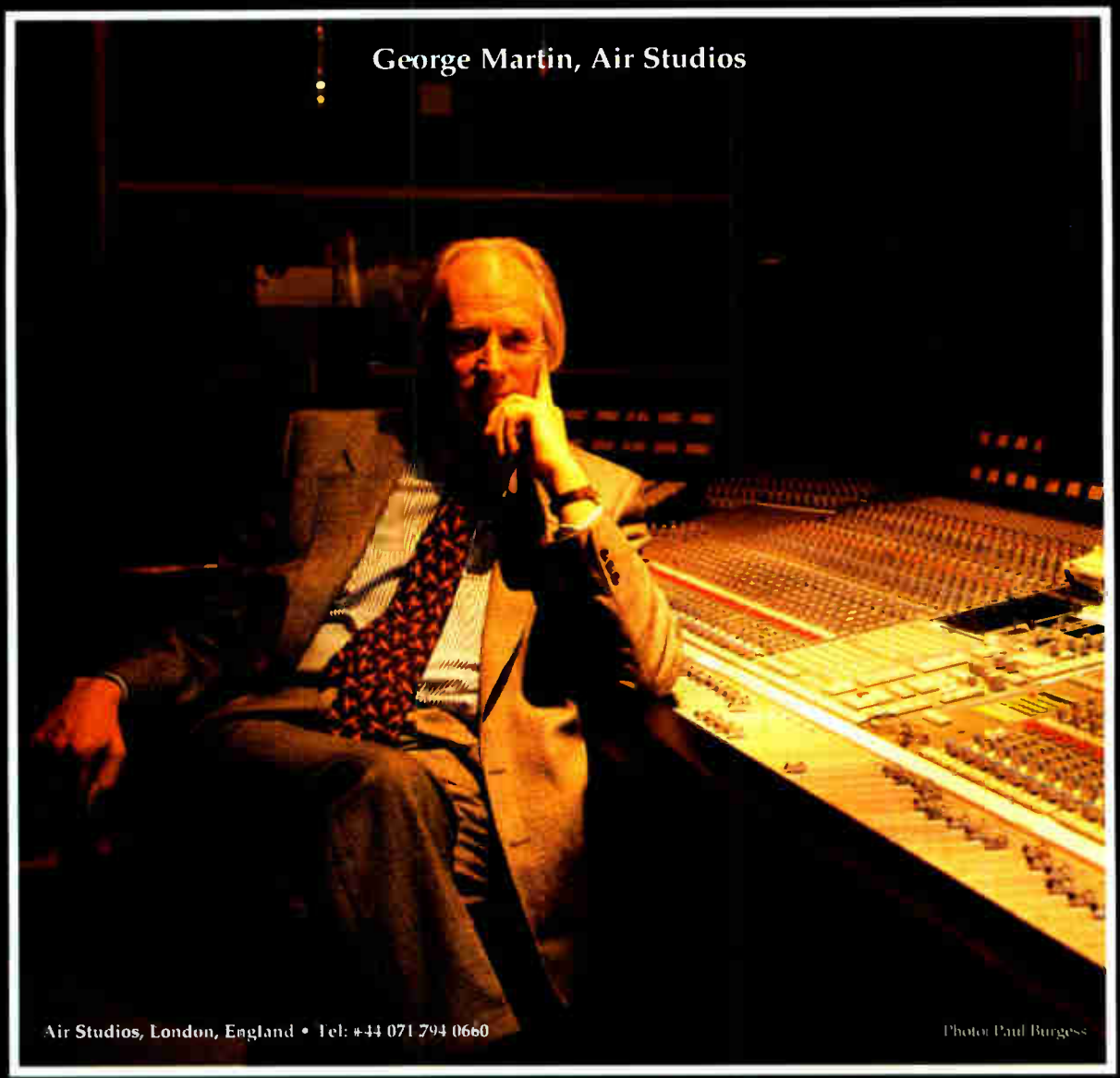

"I have always admired the ergonomics and automation of SSL consoles. Now, having compared the sound quality of our new SL 8000 console at Air Lyndhurst with the older SSLs that were in use at our former studio at Oxford Circus, I find that the sound quality of the new console is marvellous.

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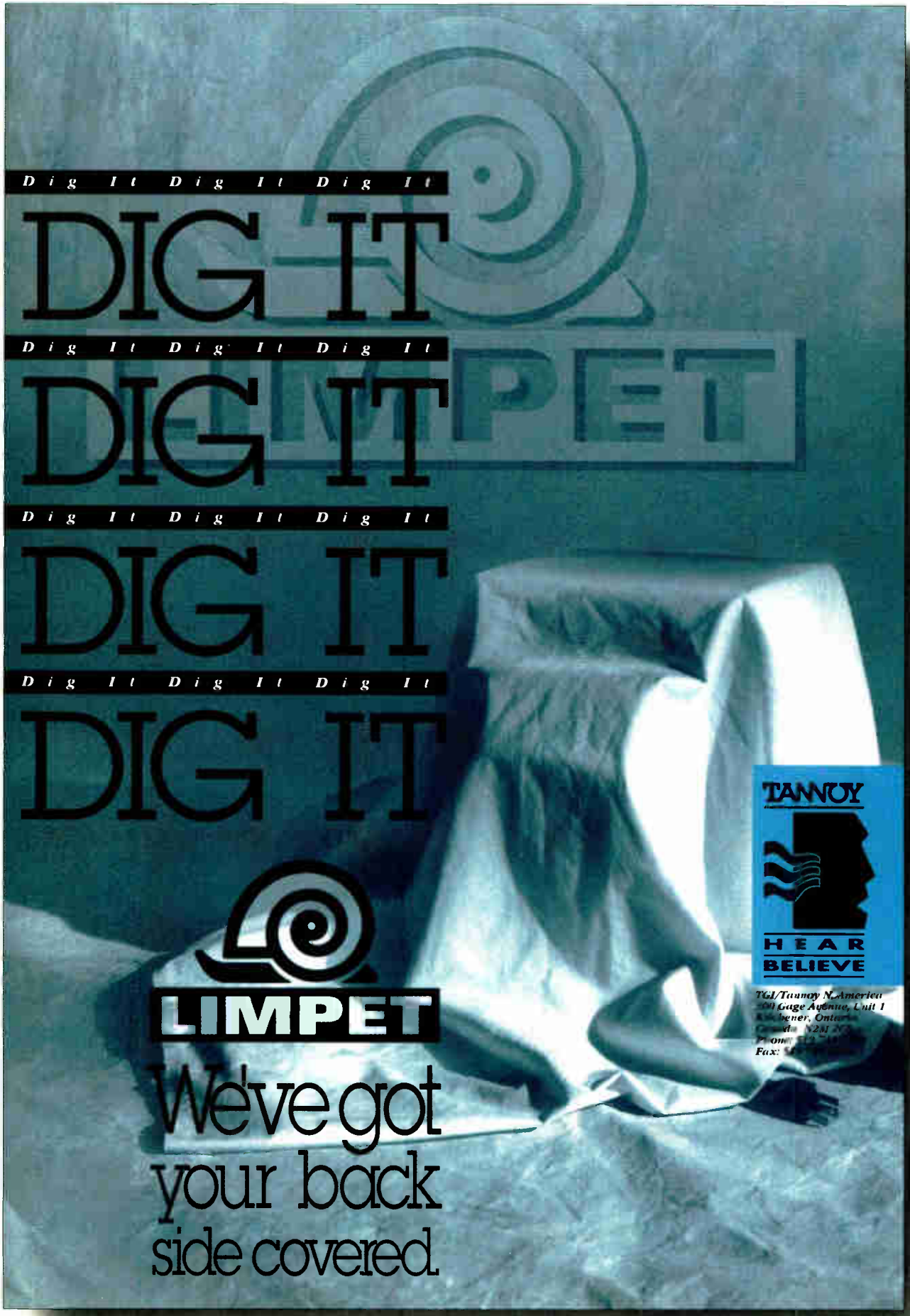
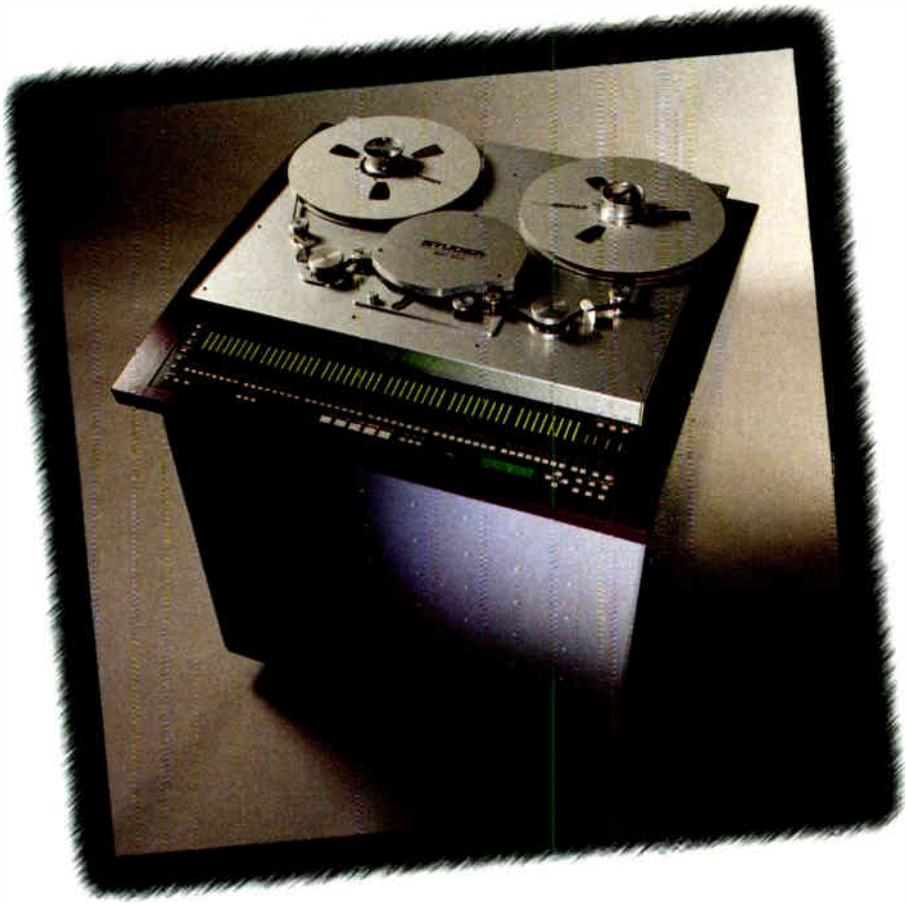


the new art of sound



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JUNE 1994, VOLUME 18, NUMBER 6

10TH ANNUAL TEC AWARDS

AUDIO

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POST-PRODUCTION

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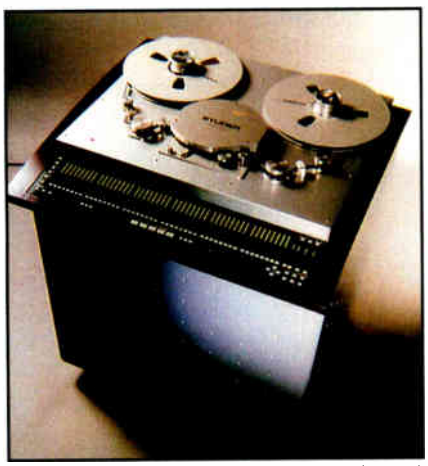
AUDIO & MULTIMEDIA

LIVE SOUND



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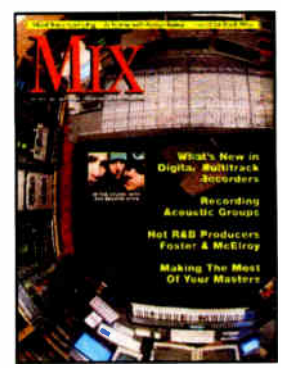
TAPE & DISC

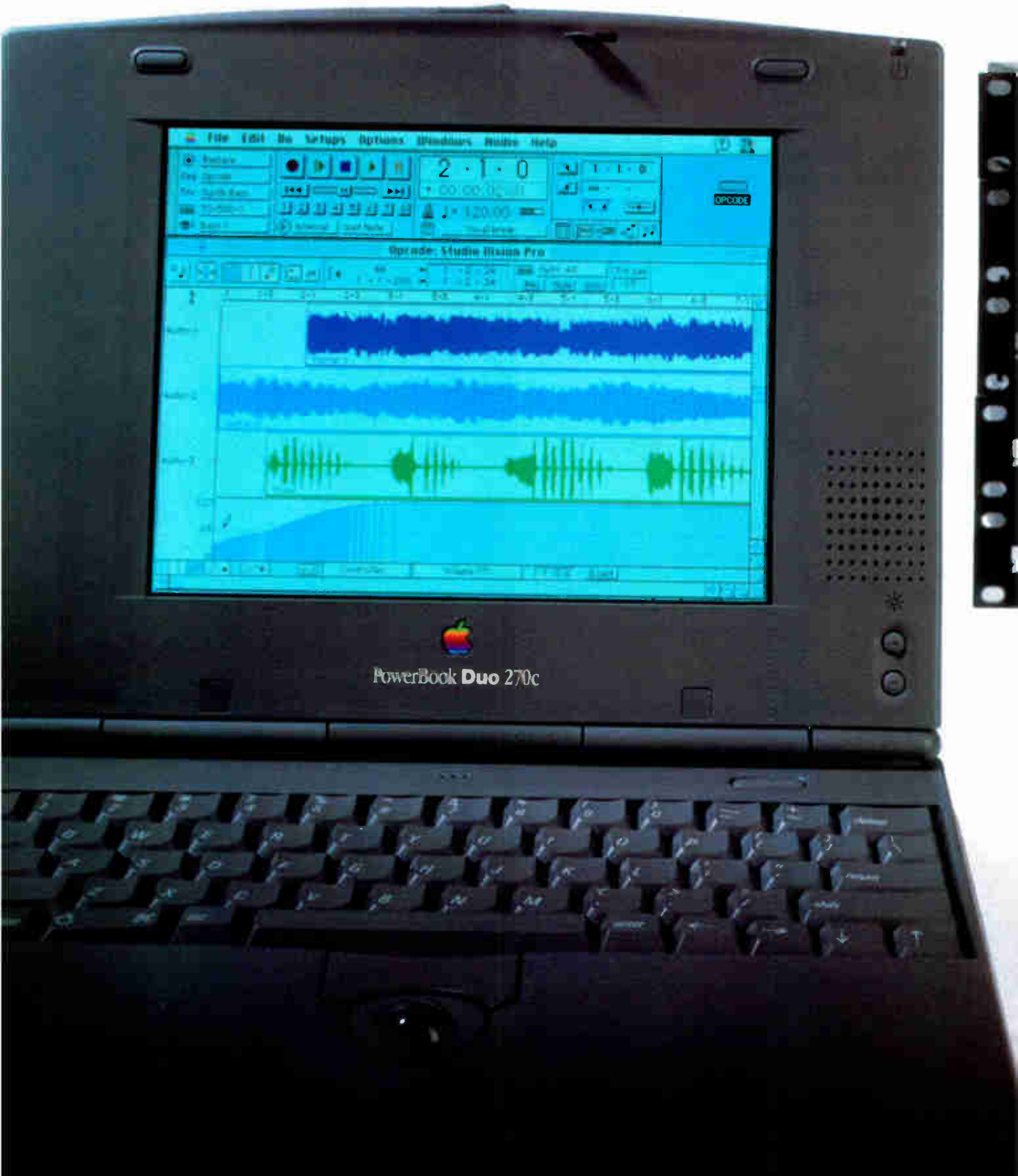
MUSIC

DEPARTMENTS

Cover: Film-scorer Hans Zimmer's main writing room at his new five-room facility, Cyberia, in Santa Monica, Calif. Featuring a Euphonix CS2000 console, the room boasts an impressive array of synthesizers including the Yamaha VL1 Virtual Synth, over 25 Akai and Roland samplers and one of the largest collections of vintage Moog and Roland modular analog synths. Designed by Bret Thoeny of BOTO Designs, the facility is owned by Zimmer and producer/engineer Jay Rifkin. **Photo:** Ed Colver. **Inset Photo:** Ari Marcopoulos.



Dynamic Duo.



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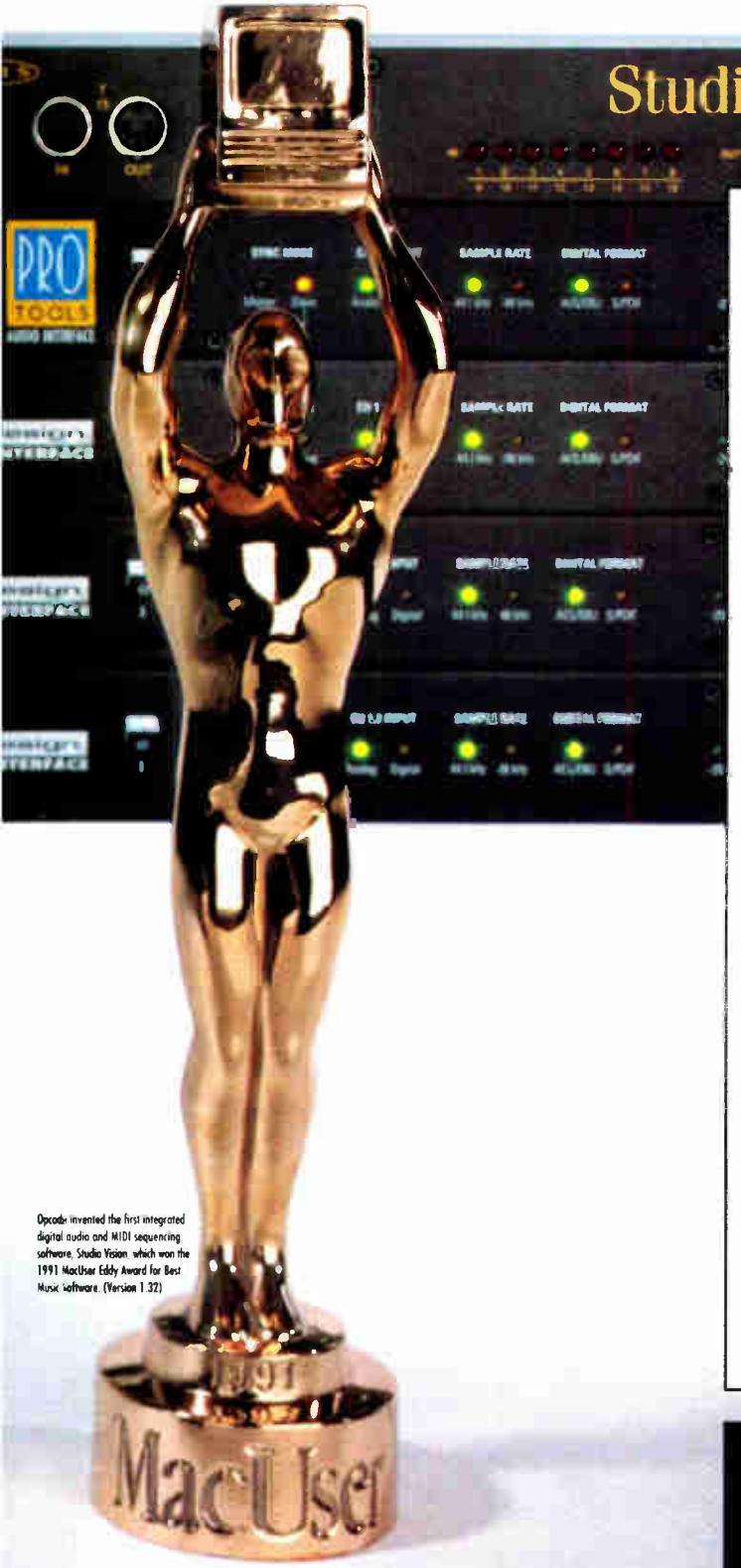

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FROM THE EDITOR

In thinking about our record producer theme in this month's issue, I couldn't help but wonder about the role of the producer as more and more artists take the multimedia plunge. Until now, it has been most common for a recording artist to connect with an interactive developer to realize a CD-ROM concept. Many of these relationships have been initiated by developers who seek out artists.

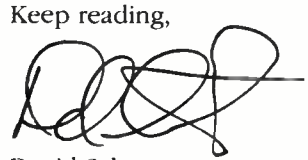
Interactive multimedia is certainly a team sport at this stage of development, so new that it seems no one has yet mastered all of the skills required to assemble a truly successful multimedia production. Even more apparent is that no real "hits" have emerged among music-oriented CD-ROMs. It is inevitable that hits will happen as the proliferation of CD-ROM drives leads to rapid growth of software sales, which are predicted to nearly triple over last year's sales, according to quite a few industry observers.

In most recording projects, the producer is the team coach, creating an environment for team members to work in harmony and synergy. With all of the elements of a modern-day music CD-ROM, there are tremendous opportunities for record producers to provide much-needed perspective.

Who will become the next George Martin or Quincy Jones or Phil Spector or Phil Ramone of the CD-ROM world? Is he or she in school, or working near you at some workstation? Is it you? We'd sure like to know. If this sounds like what you are aiming toward, please drop us a note. We'd like to stay up on your progress.

We are on the cusp of a new Golden Age of media production, with tremendous creative possibilities, a rapidly growing consumer base and nearly no rules in place. Any record producer with an eye toward the future would be wise to learn the production requirements and possibilities of interactive music and the mind-set of working with new kinds of multidisciplined teams. It may be that when real "hits" start to emerge in this genre, it will be because of the hit perspectives that forward-thinking producers have brought to the medium. The time is right, and the opportunity is here. Make your mark.

Keep reading,



David Schwartz
Editor-in-Chief

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CURRENT

NSCA 1994: CHANGING TIMES
by George Petersen

Several thousand sound system and contracting professionals gathered in Las Vegas April 7-9 for the annual NSCA Contractors Conference and Expo. Formerly the National Sound and Communications Association, NSCA is now the National Systems Contractors Association, a name that "better represents the expanding role and capabilities of our members," explains NSCA president Jack Toerner. According to a recent survey, an increasing number of NSCA members now include services such as CCTV, access control, LAN/data cabling, master antenna TV and alarm installations.

This change was echoed on the show floor, where a record 403 exhibitors showed technology ranging from cutting-edge sound reinforcement components to ceiling speakers and nurse call intercoms. The *buzz word du show* was "systems integration," as manufacturers emphasized intercomponent communication protocols and computer control of audio systems. One of the most popular events, Lone Wolf's MediaLink Expo, combined intensive four-hour workshops on the basics and possibilities of system networking with hands-on applications of MediaLinked products controlled over various computer platforms.

TOA's DACsys II digital audio control products take the technology developed for its Saori system to the next step. Controllable over a PC or Macintosh (or via MediaLink) with 16 memory presets, and available as 2-in, 4-out and 2-in, 2-out versions, the DACsys II units provide ⅓-octave EQ, alignment delay (up to 1.3 seconds), 16-band parametric EQ, noise gates, crossovers, notch and shelving filters, and more. Both 20-bit digital and analog I/O are standard; a programmable 8x8 matrix/mixer is also available.

Having purchased the pro audio division of Intersonics, those mysterious guys at the show in lab coats from Quantum Sound (Northbrook, Ill.) debuted the latest in speakerless technology. TorqueDrive™ converts rotary motion to direct air displacement. A single 9x14-inch, 30-pound, TorqueDrive subwoofer offers an LF cutoff extending down to 16 Hz; full-range (100 to 18k Hz) systems are also planned. Quantum will also market the voice coil-less ServoDrive and ContraBass subwoofer systems.

Renkus-Heinz (Irvine, Calif.) showed its CoEntrant Waveguide Technology, combining multiple HF compression drivers with cone MF speakers, all mounted along the apex of a compound throat, which feeds a common horn flare to create a point-source effect. The top-of-the-line CE-3 M/H high-pack uses six 1-inch HF drivers and six 6.5-inch carbon fiber cone mids, for 142dB peaks and 250 to 20k Hz response.

More conventional—but also very cool—is the R-4 Series III from Clair Brothers (Lititz, Pa.). This 260-pound, three-way system has an 18-inch woofer, 12-inch cone mid (mounted on a conical horn) and 2-inch HF compression driver on a CD horn. The 60°x40° horns are rotatable for horizontal use, and response is said to be 32 to 20k Hz. Optional casters attach to the cabinet's extruded aluminum corners, enabling the R-4 III to be moved easily.

For a list of the 1994 TEC Awards nominees, please see page 69.

New Developments: Martin Audio is on strong footing as part of TGI North America (U.S./Canadian distributors of Tannoy and B&K). Martin operations continue as usual at its Chicago HQ. And the French line of Nexo SR products, renowned in Europe, are now available through (Genelec and Drawmer distributors) QMI of Hopkinton, Mass.

GP's Product Pick: Available through TC Electronic, Denmark's Odeon Sound software uses a PC to specify the precise 3-D size, shape, materials used and acoustical treatment(s) of a listening environment, along with the positions of the sound source and listener. It then calculates the room's aural characteristics, sends the data to a TC Electronic M5000 reverb and simulates the room acoustics over headphones.

Best Rumor Award: You didn't hear it from me, but a well-known Southern California-based manufacturer of reverbs and modular digital multitrack recorders is about to launch a sound reinforcement division. First products will be two-rackspace power amps, the A4 (200 watts/channel) and A8 (400 W/ch). I can't say more, but other surprises are on the way—and keep it a secret, huh?

Best Elevator Conversation: The most persistent topic at NSCA was Harman Intl.'s "realignment" of the AKG Group (see related item below). Harman's announcement, made the day before the show, seemed a total surprise to the AKG Group staff, and no clear answers were forthcoming, leaving employees, reps and end-users in the dark about the implications of the change.

—CONTINUED ON PAGE 12

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INDUSTRY NOTES

UK-based **Trident Audio** recently opened a new U.S. national sales office at 3200 West End Ave., Ste. 500, Nashville, TN 37203. Phone (615) 783-1625; fax (615) 783-1606...**Euphonix** opened an Eastern regional sales office in New York, headed by regional manager **Steve Zaretsky**. The address is 630 9th Ave., Ste. 418, New York, NY 10036. Phone (212) 581-6242; fax (212) 315-9552...**Sabine Inc.** (Gainesville, FL) hired **Michael Rennie** in sales and marketing...**Jane Scobie** was appointed marketing manager at **Apogee Electronics Corp.** (Santa Monica, CA)...**beyerdynamic USA** (Farmingdale, NY) is now distributing **Sound Performance Laboratory's** (SPL) line of EQs...Oklahoma City-based **Altec Lansing** promoted **John Sexton** to manager, sales and marketing...**Otari Corp.** (Foster City, CA) appointed **Robert La Violette** as its new sales manager for industrial products...As of July 1, **University Sound Inc.** will have consolidated all operations and relocated from its Sylmar, CA, headquarters to larger facilities at 10500 W. Reno, Oklahoma City, OK 73126. Phone (800) 444-9516...**Andy Somers** joined **Fairlight DSG's** Los Angeles office as product manager for North America...**Digidesign** (Menlo Park, CA) announced an agreement with the **School of Audio Engineering**, designating SAE as the exclusive provider of Digidesign Pro Schools worldwide (excluding the U.S., Canada and Austria)...**Sonic Solutions** (San Rafael, CA) announced a number of new MediaNet alliances for the company's networking system for multimedia applications. New MediaNet partners include **Cisco Systems, Sun Microsystems, Radius Inc., Silicon Graphics, ImMix** and **Data Translation**...**IDB Communications Group Inc.** recently acquired all the assets of **Entertainment Digital Network Inc.** (EDnet)...**Quantum Sound Inc.** (Northbrook, IL) appointed **Northmar Inc.** as its sales representative in Alaska, Idaho, Montana, Oregon and Washington. Quantum also appointed **Jesse Walsh Communications** as its advertising and public relations agency...New sales reps for Petaluma, CA-based **Apogee Sound**: **Pacific Star Marketing** is handling Hawaii; **Quadtech Marketing** covers Minnesota, Iowa, Nebraska, North Dakota, South Dakota and western Wisconsin; **On the Hudson Marketing** was assigned the metropolitan New York area, including Long Island; **Rome Bailey** is the company's rep in California, Nevada and Arizona; **Main Line Marketing** covers Florida; and **Evans Sales and Marketing** handles Mississippi, Tennessee, Alabama, Georgia and North and South Carolina...**AudioTechniques** named **David Schecterson** and **Ed Knieriem** as co-managers of its parts department...**FAST Electronic** moved to new headquarters. The new address is 1 Twin Dolphin Dr., Redwood City, CA 94065. Phone (415) 802-0772; fax (415) 802-0746...New alliances for **Lone Wolf Corp.** (Seattle): **Crestron Electronics** (Cresskill, NJ) and Lone Wolf entered into a joint cooperative and technical relationship, while **Innovative Electronic Designs** is the newest licensee for Lone Wolf's MediaLink technology...The **Lighting Dimensions International** convention will be held November 18-20 at the Sparks Convention Center in Reno, NV. For more information, call (212) 229-2965...The 18th **Tonmeistertagung** international convention on sound design will be held in Germany November 15-18. For more information, call (49) 2204-23-595...Finally, longtime Michael MacDonald keyboard player **Chuck Sabatino** suffered a severe stroke early this year and is now in rehabilitation. Medical bills are piling up, and donations would be appreciated. Please send them to Mercy Retirement & Care Center, 3431 Foothill Blvd. Oakland, CA 94061, Attn: Sister Patrick. ■

—FROM PAGE 10, CURRENT

Best Demo Award: Roy Bowling of Labor $aving Devices hawked his line of specialized installation tools with an enthusiasm exceeding any TV evangelist. You could learn more about snaking cables from this guy in ten minutes than in ten years of working on the job. A tool catalog is available by calling (303) 232-6341, but better yet, find out when he's giving one of his free seminars in your area.

Our NSCA news continues with expanded coverage next month. The next expo is slated for April 30-May 2, 1995, in Indianapolis. Call (708) 598-7070 for details.

HARMAN REALIGNS, MOVES AKG GROUP

In a move designed to strengthen manufacturing, distribution and service, Harman International recently combined operations that share common activities, scaling down the San Leandro, Calif., office of the AKG Group and relocating most of the companies that were headquartered there.

AKG and BSS are moving in with JBL in Northridge, Calif.; the dbx division of AKG will move its manufacturing and marketing operations to Salt Lake City and will report to John Johnson, president of DOD Electronics. The low-end Soundcraft products—such as the Spirit line—also will be marketed through DOD/DigiTech.

Lexicon assumed management oversight for the activities of Orban (which will remain in the San Leandro office) and Studer Editech (Menlo Park, Calif.). Lexicon also is handling all U.S. Studer distribution.

There will be some personnel reduction at the companies that have relocated, but Harman is not planning on making any big shifts in distribution, so the marketplace won't see any dramatic changes. The company is chiefly moving responsibility for some of the products around. ■

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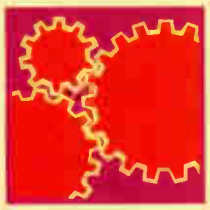

"EDLs are loaded into the DAWN, then sorted by reel. We either record the reels manually or automatically by having the DAWN control the source machine, as deemed necessary. Edits are then generated by the DAWN and placed to match the original imported EDL."

—ROB (RADAR) HEGEDUS
FOR
SOUND INTERCHANGE
TORONTO, CANADA

Dialogue—

"Because most of the dialog work I get is cut on film, there's no EDL to auto load from, so I re-sync from the dailies one cue at a time. The DAWN streamlines this process so effectively that I have more time to be an editor—which helps everybody right through the mix."

—DAVID A. COHEN
FOR
TEKNIFILM LABS
PORTLAND, OREGON

Music—

"The live orchestral score is recorded directly into the DAWN with a time code reference. I edit and lay multi-track music stems, then playback locked to the dubbing stage for the final mix. I achieve all of this sometimes within an hour."

—LORI ESCHLER,
MUSIC EDITOR FOR
SEAQUEST DSV
STUDIO CITY,
CALIFORNIA

Sound Effects—

"We get an EDL from the editing house and import it into the DAWN. Software 4 creates empty edits, automatically, with Ins and Outs for each sound effect that has been spotted. Then we 'fill in' the blanks with SFX from our library.

—CHARLIE
RYCHWALSKI
FOR
SILHOUETTE SOUND
BURBANK, CALIFORNIA

Mixing—

"ADR is spotted, then recorded and cut on the DAWN. Other DAWN stations record and edit dialog, music, foley and production effects. All the elements from different stations are then combined at the dubbing stage and mixed off a 48 track DAWN installation."

—JOHN ROSS
FOR
DIGITAL SOUND AND
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by Stephen St.Croix

HEAR TODAY, GROAN TOMORROW

I recently managed to slice my left ear canal down to the bone. Actually, this is not a very difficult feat once you decide you are going to slice it up at all, as there is no muscle tissue there, just skin directly over bone. Anyway, the result of this accidental exploratory surgery was a trip to the medicine man. He told me, in classic medicine man tradition, that I had sliced my left ear canal down to the bone, and that I should try to avoid such activity in the future. He finally told me that whatever happened had totally missed the eardrum. Okay, good. Operating on the basic assumption that punching holes in my eardrums might have some obscure negative impact on my career, I was very glad to hear that.

But as long as I was there, I thought I would do the old hearing test deal again and talk to this new doctor about ears (if you remember in my November '93 column, different doctors told me different stories on how the human hearing hardware works). The doctor was not all that helpful, which I have become pretty used to. My father is a doctor, and most doctors I go to in Maryland know of him, so I get the official son-of-a-doctor treatment: short, fast, to the point, no detail, assumptions that I actually know what all that Latin means, and out the door to live out my life or to die in half an hour, as the case may be.

But the lab technician who ran my tests was a different story. She was actually quite interested in ears and hearing, was very current on the new theories and procedures, and had a great deal of amassed data in her little cubical that I had never seen before. She showed me electron microscope photographs of the inner ear and the little cilia, explained the Current Cool Concepts on how hearing works, and basically spent so much time with me that I think she might have caught some flak as a result. Another case of the high cost of educating the masses. She was great. And here is what she said, in her...well, in *my* own words.

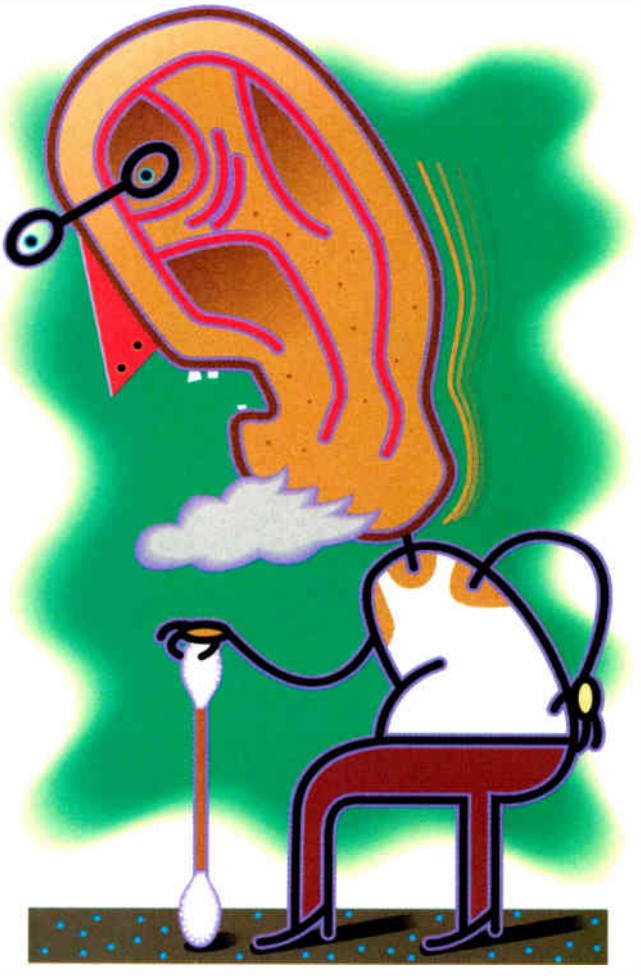

ILLUSTRATION: DAVE EMBER

Hearing is pretty silly, and really doesn't work at all like we used to

think. There *are* in fact multiple rows of audio sensitive hairlets (not to be confused with the audio sensitive harlots that used to come backstage in the good old days), but it seems that their assigned tasks aren't what we originally thought they were. To simplify this to the point of realistic inclusion in my column, the New Deal is as follows.

Replacing the last decade's belief that the little hairs in the inner ear are tuned like mini tuning forks is the new theory that the shape and material composition of the organ of corti itself plays a great part in determining which cells are excited by any given frequency. Von Bekesy's traveling wave theory is very popular again these days. Simplified to the edge of danger, it's a *place* theory, as opposed to the resonant theory that I referred to in my last column on hearing.

Instead of all the hairs living in an identical environment, with each one choosing to dance only when excited by the frequency for which it was born to dance to, it seems that they are all basically the same, and the *environment* itself is tuned, by shape and material damping. High frequencies first, where the SPL is the loudest (this is why exposure-related loss is up there), with lower frequencies as the sound travels deeper into the cochlea.

Wait...Late-Breaking News: As I sat here writing this column, my March issue of *Mix* arrived, and I found Bob Ghent's piece "Healthy Hearing and Sound Reinforcement." This is a *must read* article! It covers in very clear terms what I was about to go into here, so I won't repeat—read it.

AND NOW WE RETURN TO OUR REGULAR PROGRAMMING

Lets leave all the bull behind, where it belongs, on the floor of used car dealerships: The human ear simply was *not* designed for modern life. Society is loud, and modern technical society is even louder. Induced hearing damage is basically inescapable in the big city, and unlike the bulging muscles of the bronzed juicers in Santa Monica, overuse does *not* make your ears better, stronger or more impressive—it just kills them. *Age*, on the other hand, often does make your ears bigger, so hang on; good times, they are a comin'.

Obviously, age is an important factor in hearing loss, too, but here is a thought: Not only are we exposed to daily SPL levels far exceeding what we are actually designed to take, but we live much longer now than even a few short generations ago, and certainly multiples longer than the original ear design was warranted for. This plays twice: It keeps you around on the noisy streets longer, so that you can amass more exposure-related hearing damage, and it causes non-damage-related HF roll-off to become much more pronounced. I mean, how many engineers in the cave days worried about age-related HF loss, when life expectancy was twenty years? As far as I know, it was only the British ones.

So here are my 1994 Rules for Hearing Survival:

1) Never forget that the cleaner your studio monitor chain is, the louder you might mix: We, at Marshall and Lightning Studio, have found that when you switch from a large wall-mounted system to a

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super-clean near-field, you may tend to mix louder because the distortion artifacts are less. After years of the old way, we apparently associate distortion with volume to the point where we tend to turn up a clean system if the distortion is missing—in a subconscious search for those IM and HD levels that we all know and love. So when you finally get those great new high-buck near-fields you have been coveting, break out that dusty old SPL meter and calibrate your life for the first week. You may be surprised.

2) If your parents "cuffed" you on your ears when you were a child, have them killed and choose a new line of work.

3) Two short three-minute, loud playbacks will produce enough short-term damage so that subsequent playbacks actually have to be louder in order to hear what we are all looking for—those little drum squeaks, reverb-return tail-mud, and the thousand other unwanted artifacts that we fear in a modern complex multitrack session. Save the loud "buried-in-the-background-garbage" hunts for the end of each day, then go home.

4) When shooting .44 magnum or larger-caliber handguns inside, try to keep at least a window or door open. This is even more important if you are in a small, tiled bathroom or shower.

5) Really clean, super-low- and super-high-frequency audio is very difficult to judge for volume. Yes, I know that you already know this, but knowing that you know it is actually kind of dangerous, since you *think* you know how much you can misjudge, while the truth is that you would be very surprised if you ran controlled tests: You *can't* judge. This stuff can sneak up on you really easily and slam your hearing before you have a clue. So watch out.

6) When doing very high-altitude free falls, stuff a bit of cotton in your ears to cut the LF wind artifacts. I know that real men don't do this, but on the other hand, real men can't hear shit, either. This also applies to motorcycle riding (note that Harleys sound even better this way) and riding in your car with the window down (really)!

7) Be sixteen again and start over and do it right this time, now that we all know that hearing loss is real.

8) If you happen to be sexually involved with a screamer, be sure to use protection; stuff a shooter's earplug in your ear. You know which ear, it's almost always the same one, isn't it?

9) If you have lint in your ear from using cheap cotton or tissues for the above suggestions, don't vacuum it out.

10) Don't put beans in your nose.

11) Buy a little portable SPL meter and find out for yourself how deadly many daily activities can be for your hearing. Then do something about it. I guess a time comes in everyone's life when they grow up and realize that though you may joke about some things, some of these things themselves are not jokes. Hearing loss is so easy to accomplish that it takes a very real level of awareness to minimize it. You can't avoid it, but for your own sake, take this seriously! ■

Stephen St.Croix was lucky: His first live gig hurt, so he figured out that it might not be good for him. He has used hearing protection ever since, be it wax, Kleenex, cotton or .38 shells. The shells look the coolest.

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by Barry Diament

MAKING THE MOST OF YOUR MASTERS

Over the years, many articles in music and recording journals have explained the preparation of master tapes for the mastering studio. Though some useful information is offered, most of these pieces seem biased toward the convenience of the mastering engineers, so that artists and producers may be unaware of all their options: choices to be made before booking time in the mastering room.

Before even thinking about the mastering—indeed, before considering the mix—the most important decision is the 2-track format, and within the general categories of analog and digital there are a host of other categories. Analog offers ¼- and ½-inch tape widths, and tape speed is usually 15 or 30 ips. (Slower speeds are not recommended.) For any combination of tape width and speed, other options include noise reduction (Dolby A, Dolby SR or dbx). These choices of tape type, width, speed and noise reduction (or no), offer dozens of possible formats. And that's only in analog!

Digital 2-track formats include the open-reel DASH or PD, the older videocassette-based PCM-F1, the ¾-inch U-Matic 1630 (or 1610) and the ubiquitous DAT. Many digital recorders offer different sampling rates. Even within each of the digital formats, there is a further choice: that of using the internal A/D converter built into the record machine or using an external, dedicated ADC. Using an external converter opens another set of options. Ladder-type? Single-bit (or bitstream)? What about the new re-dithering and noise-shaping devices promising 20-bit resolution?

With at least 16 different analog combinations and the number of digital formats increasing faster than I can type, and with the knowledge

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that each of these will sound at least a little different from any of the others, how do you choose?

ANALOG

Within the analog domain, ½-inch tape sounds better than ¼-inch because having twice the space in which to store the music increases the signal-to-noise ratio, resulting in less tape hiss for a given recorded level. For the same reason, the 30 ips speed offers better sound than 15 ips; twice the "real estate" is used for a given amount of information storage. Faster tape speed also offers improved high-frequency response, yielding better definition of transients and, hence, clearer definition among the separate parts in a complex mix.

The negatives with ½-inch or with recording at 30 ips are increased tape cost and the need for more tape storage space. Some engineers and producers who decide to record in analog stay with the 15 ips speed because they feel the bass frequency response at 30 ips is compromised. In fact, the greater apparent bass at 15 ips is the result of a "bass bump" (a rise in the upper bass), caused by a combination of the head geometry of the machine and the tape speed. Below the bump, low frequencies roll off quickly. At 30 ips, on the other hand, the bottom rolls off smoothly, without a bump, albeit at a slightly higher frequency; the added transient capability of 30 ips makes for a tighter, snappier, truer picture of the low frequencies. Also, the smoothness of the inherent bass roll-off makes it easier to restore the low bottom with EQ if desired. This is not to say that you can't have a great recording using ¼-inch tape going at 15 ips; many great albums I've had the good fortune to work on, especially remasters of some of the classics of various musical genres, were done this way.

What about noise reduction? We rarely see it used on 30 ips tapes, probably because of the higher speed's lower inherent noise. Many seem to like the effect that noise reduction adds to their program material. Effect is the operative word here because, in addition to reducing tape hiss, many listeners find that the various noise reduction schemes "reduce" some of the music as well, slowing down transients and robbing the music of "air" and detail.

Most of the best-sounding albums (on vinyl or CD) have their origins in ½-inch (wider on some older records), 30 ips analog tape, with no noise reduction.

DIGITAL OPTIONS

The once-popular PCM-F1 format has given way to the increased convenience and superior quality of DAT. The DASH, PD and 1630 machines are not as commonly available for mixing, although some projects do occasionally arrive in these formats. Obviously, DAT is the most common format for digital mastering.

If you choose DAT (or one of the other digital media) as a master format, you have to decide how the signal will be encoded. You can use the A/D converter built into the record machine, or you can use a separate ADC, in effect using the tape machine as a transport only. Some of the best-sounding ADCs available today come as outboard units.

The advertisements for A/D converters abound with terms like oversampling, 20-bit, 16-bit, 1-bit, low-bit, high-bit, bitstream and the current buzz word, "jitter." What do these

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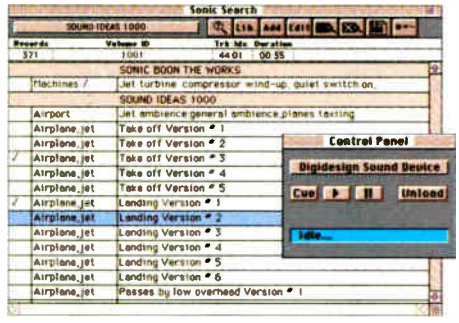

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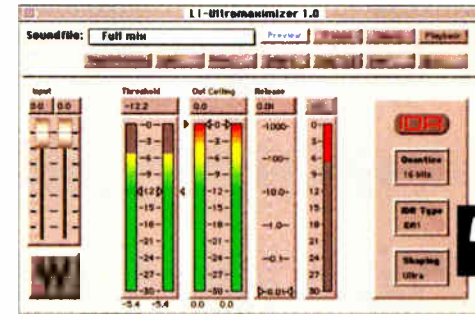

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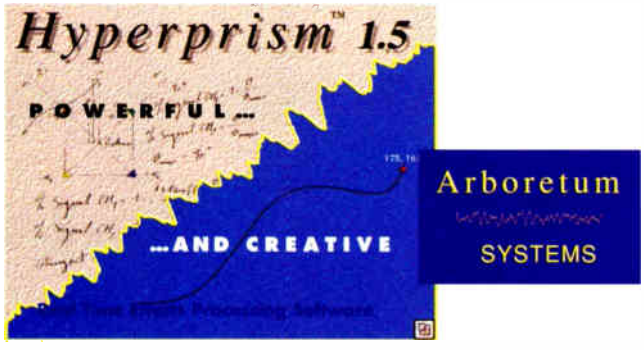

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mean as far as sound quality is concerned? Generally speaking, not much. The term 64-times oversampling doesn't mean it will sound better than 8x oversampling; it's just a number for folks who want numbers. "Twenty-bit" ain't necessarily so; sometimes even 16-bit isn't! A poorly designed ladder-type ("16-bit") converter won't sound as smooth as many of the "1-bit" ADCs, but none of the latter (non-ladder) will display the degree of dynamic slam and harmonic detail of the best ladder-types.

A problem that can result from using an outboard ADC involves jitter and the transfer of the digital data. The sonic drawbacks associated with jitter originate in the entire digital chain (all the way to final CD or DAT playback). A low jitter spec (the lower the better) for an ADC (or a DAC on playback) does not guarantee low jitter. Jitter can be introduced by the cable used to transfer the digital data from the converter to the transport mechanism or from the transport to the converter on playback. (Did you believe that "it's just numbers; digital cable doesn't matter"? Of course not.)

The bottom line here is that if you're going to use an outboard A/D converter, pay attention to the cables carrying the data. BNC, XLR and RCA coaxial connections, in addition to the AT&T optical method, offer the best method of signal transfer. Avoid the so-called TOSlink (consumer) optical connections, which are notorious for loss of information and coarsening of sound. If you're using a co-ax cable, pay attention to correct characteristic impedance, or signal-degrading reflections will occur within the cable itself.

Assuming you've chosen your encoding method (outboard converter with proper cabling or built-in converter for convenience or economy), at what sampling rate should you encode your signal? The commonly available choice is between 44.1k and 48k. Depending on how you choose to master, each has its advantages.

If your recording is going to receive any sort of analog processing in the mastering stage, sampling at 48 kHz offers slightly more treble bandwidth and, consequently, a more accurate tape to work with. Many of our clients and colleagues prefer using analog equalizers (and limiters, etc.). They feel the additional conversion stages (to analog for processing, and back to digital for the final CD or DAT) do less damage to the sound than using the currently available digital processing gear.

On the other hand, if your DAT master won't require any processing or if you choose to process in the digital domain, 44.1 kHz is the sampling rate of choice. You can save the additional conversion steps and, more importantly, you won't have to do a digital sampling rate conversion (which always seems to harden the sound and obscure low-level information by adding quantizing noise).

WHAT ABOUT 20-BIT?

"Twenty-bit encoding" is becoming a popular phrase this year. Though there are some 20-bit encoders on the market, there is no widespread use of 20-bit storage media. CD, DAT and the other common digital formats are 16-bit media. Until the day 20- (or more) bit digital media becomes available, you can only store 16-bit "words" on your CD or DAT.

In an effort to squeeze another four bits' worth of information (or

more accurately, a facsimile of such) from a 20-bit source onto the CD, several companies now offer redithering and noise-shaping devices. These attempt to alleviate some of the losses in low-level resolution as they exist in the current standard.

Of course, there are 20-bit storage media available today in the form of hard disk drives, as well as magneto-optical discs, and their associated computer-based controllers. As many professional mastering facilities use these desktop systems, it is possible to take an analog source tape and, using a 20-bit analog-to-digital encoder, redither and noise-shape the signal with one of the previously mentioned devices, ending up with a "20-bit" CD. This cannot be done from digital source tapes encoded using the current 16-bit standard.

How audible is the result of using one of the "20 into 16" devices? There does appear to be some improvement in low-level information retrieval, primarily in the midrange frequencies. It should be kept in mind, however, that the subtractive distortions being addressed by these devices are not the ones most experienced listeners agree upon as being the weak link in the current digital standard.

The High Definition Compatible Digital system from Pacific Microsonics (Berkeley, Calif.) promises to address some of the additive distortions plaguing the current digital standards, as well as the issue of resolution of low-level detail. At press time, the system was not available for general use; it is being used only by co-inventor Keith Johnson on the CDs he records for the Reference Recordings label. HDCD-encoded CDs can be played on any standard CD player with a resulting increase in low-level information and some diminution of digital hardness. The full benefits of HDCD encoding, however, will be realized when HDCD decoder chips are built into CD players (the way Dolby chips are found in almost every cassette player).

Whether HDCD (and its chips) and/or any of the various "20 into 16" devices becomes commonly available or not, remember that these are only intermediate steps toward a higher-resolution storage device than the 16-bit CD. But by far, the factor that determines the quality of the finished CD more than any other is the quality of the 2-track original that the mastering engineer will use.

MAXIMIZING THE MIX

During the mix, the most important tool at your disposal is your monitoring system. (See "Mastering Monitoring: Some Thoughts on Stereo" by Barry Diament, *Mix*, June 1990.) Because all of the decisions you make regarding the sound of your recording and your mix will be based on what your monitors tell you, it's a good idea to make sure they're going to tell you the truth.

The placement of your monitors in the listening environment will largely determine how well they can do their job. Because speakers and the room work together to produce the sound you hear, careful attention must be paid to minimizing the room's influence. This way, the sound to be heard by the end listener can be determined and auditioned with assurance.

The factor that determines the quality of the finished CD more than any other is the quality of the 2-track original that the mastering engineer will use.

As far back as the 1950s, Peter Walker wrote about placing loudspeakers for stereo reproduction. Now, keep in mind that by "stereo," Walker was referring to the re-creation of a three-dimensional sound field (an audio "hologram") and not the traditional left-to-right spread many people are used to. To minimize the effects of room modes (i.e., to get the truest reproduction of low frequencies) and to maximize the re-creation of the stereo soundstage, Walker talked about placing speakers well away from room boundaries. He suggested a starting point one third of the way along the room diagonals. In other words, the fronts of the speakers will be about one third of the room's length from the wall behind them and about one third of the room width apart.

The rise of near-field monitoring in the past several years indicates that producers and engineers have been reacting intuitively to the boxy sound that results from monitors placed near (or in) walls and corners. They've been relying on small speakers that fit on stands kept relatively near the listening position. Why hasn't anybody moved the good speakers to the choice listening position?

Are your own speakers near a wall, floor or any large surface? Sometimes moving them only a few inches can greatly improve the sound; moving them several feet might prove to be magical. Credit should be given to Harry Pearson, editor of *The Absolute Sound* (an audiophile journal), for popularizing "The Rule of Thirds." As with many aspects of audio, the discoveries and observations of the audiophile community lead to progress in the pro audio world. Correctly placing your loudspeakers (assuming they're reasonably accurate) enables you to hear what your program really sounds like. Compared to the monitor implementation in most studios, that's a giant step.

A few other details will ensure getting the best final results. First, if the program might require EQ or some other form of signal processing in the mastering stage, it's a good idea to leave a couple of dB extra headroom.

If you're not absolutely confident in your monitors, leave most or all of the final EQ, etc. for the mastering room. This is often a good idea anyway, because it is easier to add EQ (or processing) in the mastering room than it is to "un-EQ" (or "unprocess") what was done at an earlier stage of production.

Understanding the available options will make you better prepared for all the choices you'll have to make before you get to the mastering stage of record production. With the optimum 2-track format chosen for mixing, and careful placement of well-chosen monitors, you're well on your way to mastering the best record possible. ■

Barry Diament is an independent audio engineer and consultant whose company, Barry Diament Audio, specializes in mastering.

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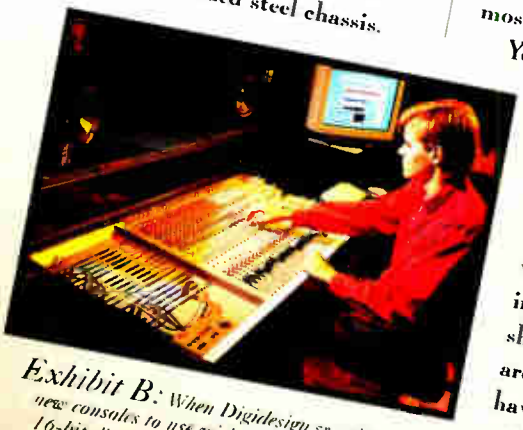

Exhibit B: When Digidesign was judging new consoles to use with their own 20- and 16-bit digital recording & editing systems, they knew the board would have to be good. Very good. And quiet. Very quiet. Their verdict? The D&R Orion.

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RECORDING THE ACOUSTIC COMBO

BY JOHN LA GROU

Our series on recording techniques has so far explored electric and acoustic guitars, symphony orchestras and vocals. We'll now combine a diversity of formats and instruments under the topic of the acoustic combo, encompassing jazz ensembles, small classical groups, acoustic duos, percussion sections, instrumentalists with vocals and much more. For this article, we further stretch the definition to include the occasional amplified instrument, such as a jazz guitar with a small, clean amp...no stacks of speakers need apply.

Many of the engineering techniques used for small acoustic ensembles cross over from orchestral and pop recording. Maintaining a sense of live presence with occasional focus on highlight instruments is a key to most successful combo work. Indeed, capturing realism—a sense of "being there"—is a top priority with this month's panel of engineers.

Common to some acoustic combo recordings is the quest for isolated intimacy—an ideal recording environment in which musicians work together naturally while the engineer maintains separation. This is especially important on multitrack sessions, but many engineers today strive to capture the entire acoustic ensemble direct to stereo with out regard to isolation.

Let's now explore the acoustic ensemble techniques of today's top recordists. This month's panel includes engineers working with acoustic music in classical, pop, jazz, country, bluegrass and other genres.

"Small jazz ensembles are usually at their best in an intimate club setting. For this reason, we ask the players to arrange themselves in the room or studio as they would in performance." —*Michael Bishop*

MICHAEL BISHOP

Specializing in acoustic music, Cleveland's Telarc International is one of the most successful independent labels for classical and jazz recordings. Having developed a reputation for high sonic standards,

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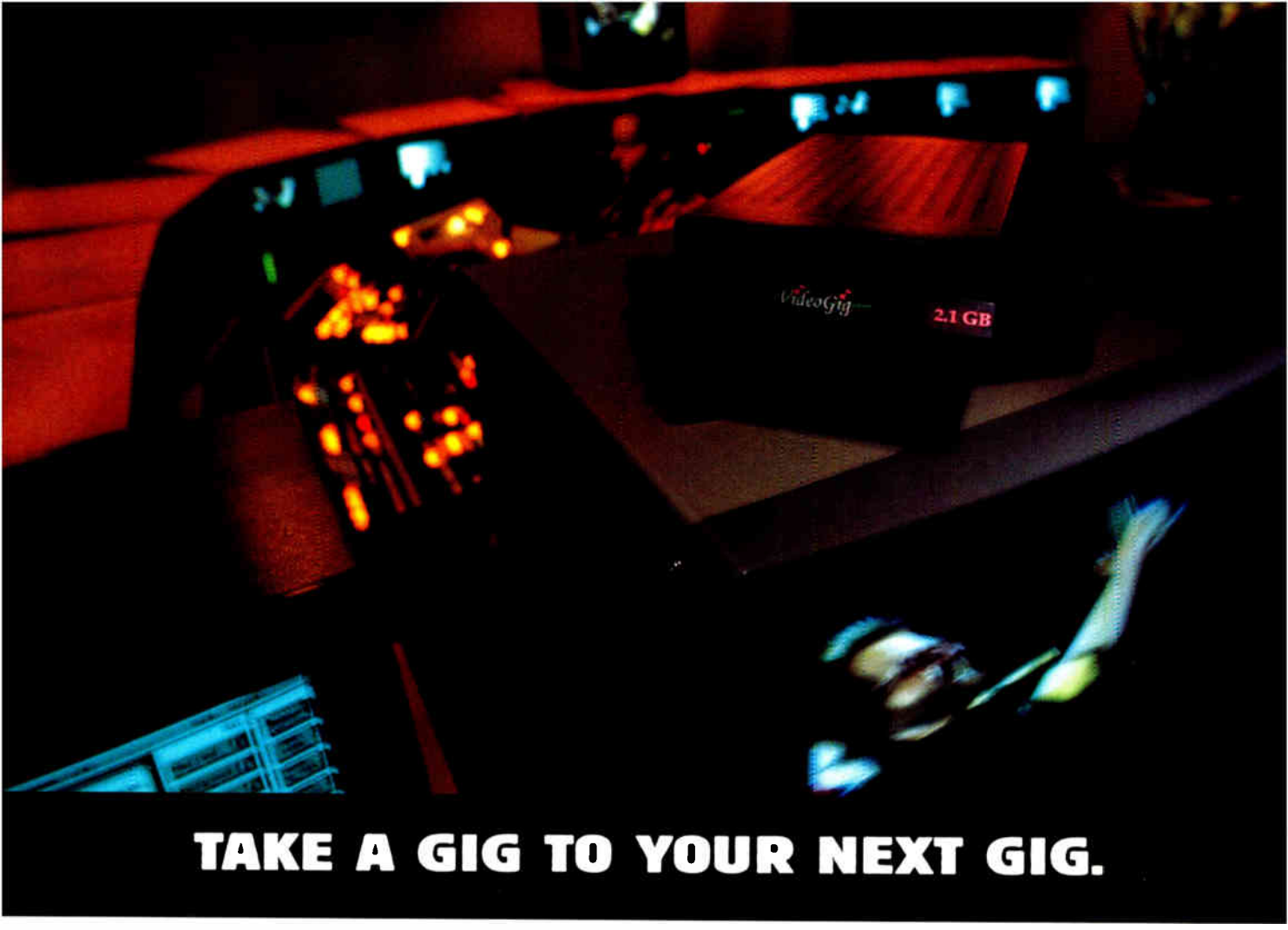

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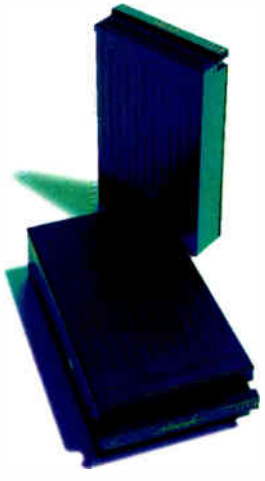

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Telarc's Michael Bishop shares some of their methods for maintaining realism on acoustic combo recordings.

"Small jazz ensembles are usually at their best in an intimate club setting," Bishop notes. "For this reason, we ask the players to arrange themselves in the room or studio as they would in performance. When the group is satisfied with their position and sound, we'll try to adapt our recording techniques to them.

"Wherever possible, we always start with a single stereo pair of mics providing a solid image of the entire acoustic ensemble," he adds. "We'll use either the Mid/Side technique or spaced omnis, depending on the room and music. Microphone choices will vary for similar reasons. Using this single-pair technique, the room, for better or worse, really becomes part of the sound. Some of our favorite rooms for acoustic recording are Clinton Recording Studio A, Power Station Studio A and Master Sound Astoria.

"I really like the Sennheiser MKH microphones for their natural open sound and dynamic range," Bishop says. "For M/S, we'll often use the MKH-30 figure-eight with the MKH-50 supercardioid. If the room is really nice, we'll put up MKH-20s in a spaced array, spread in ratio to the overall width of the players. This main pair will be prominent in the mix."

Because Telarc also is known for its live work, I asked Bishop how he would approach the real deal. He says that "P.A. bleed and general leakage become problems in a live club recording. Unless conditions are near perfect, we augment the main stereo mics by adding a number of close mics, mixed on-site to 2-track.

"I like to use stereo pairs for each spot-mic position," he says. "For instance, the piano often gets a modified ORTF pair of B&K cardioids. Specifically, I'll start with a spread of about one foot at an angle of around 130 degrees and place the pair just inside the perimeter, near the center of the sound board. We carry our own 'medium stick' to sessions, as short stick can cause ugly lid reflections and full stick in live performance can overexpose the piano to other instruments.

"However, for sheer sonics," he confides, "we really prefer to record acoustic music in a controlled environment. Even in the best studios, we'll sometimes use individual spot mics. A good example might be a full drum set. We don't stick a cardioid mic on everything, but we've found conservative methods that offer a very realistic image while maintaining the live group sound.

"Many drummers are now using kick skins with a tuning hole on the front," Bishop adds. "A B&K omni does nicely, perhaps a 4004 with a severe windscreen directly on axis to the hole, about one to three feet removed. A spaced pair of cardioids go over the drummer's head, pointed toward the right floor tom and left rack tom, respectively. And, if necessary, we might place an omni, such as the MKH-20, near the snare and hi-hat and fine-tune the position for balance.

"Acoustic basses can be difficult," he continues. "A couple years ago, we discovered a microphone made by Audio-Technica, the ATM-35, which is now our first choice for spotting a bass. It's lightweight, takes high SPL with interchangeable patterns and comes with a tiny gooseneck, which snaps on the F-hole. Mixing a bit of DI signal adds that crucial bit of presence without clogging the image. We've found the 35 works well on close-miked trumpet and sax." [Author's Note: Listen to Telarc CD-83361, a 20-bit recording employing a pair of ATM-35s on Jerry Mulligan's baritone sax, and Telarc CD-83307 and 83316, where Dizzy Gillespie's trumpet is miked with an ATM-35.]

"We'll often have to isolate the vocalist when one accompanies the group," Bishop explains. "Depending on the room and style of music, I'll use a slightly spaced pair of omnis anywhere from two to six feet away. A matched pair of Neumann vacuum tube M-50s work especially well on female vocalists.

"I also like to use an 8-foot-high semicircle gobo of RPG Diffusors behind acoustic groups," he says. "This really helps focus the group within a larger room without losing the resonance of the large room itself. If a bassist or guitarist is using an amplifier, I might use RPG Abfussors as gobos between instruments.

"All microphones are sent on short cables to a rack of outboard preamplifiers," Bishop adds, "including Millennia HV-3s and FM Acoustics M-1s, and mixed with the shortest signal path possible in the board. Unless there's some requirement for multitrack, we'll record direct to a 2-track Mitsubishi X-86 using our custom 20-bit converters and an Apogee UV-22 for conversion to 16 bits if DAT is used. We're also looking forward to trying the Sony 9000 MO recorder on sessions and in editing."

BILL VORNDICK

One of today's busiest acoustic country engineers is Bil VornDick. With a list of credits including Bela Fleck & the Flecktones, Doc Watson, Jerry Douglas, Allison Kraus, Mark O'Conner, III Tyme Out and the Nashville Bluegrass Band (1993 Grammy winner for Bluegrass Album of the Year), VornDick shares his methods for defining today's acoustic country ensemble sound.

"I think the most important aspect of recording an ensemble is preparation and organization," VornDick says. "It helps to know in advance who's coming to the session. There are many great players in Nashville, and I know the sound of their instruments. If I know who's coming, I can be tested and ready with the proper microphones, preamps, cue feeds and isolation techniques for the session.

"I record most of the acoustic groups with a stereo pair of mics on each instrument. We rarely do multiple dubs of individual instruments. There's more life and spontaneity when all the musicians are playing together; and you can feel it on the recording."

—Bill VornDick

"I record most of the acoustic groups with a stereo pair of mics on

each instrument," he continues. "We rarely do multiple dubs of individual instruments. There's more life and spontaneity when all the musicians are playing together; and you can feel it on the recording. It's always a question of how much isolation is required for any session, but I prefer to have all the players in the same space. Unfortunately, mixing a session recorded without proper isolation can translate into poor instrumental tone and definition. So I usually take advantage of the various rooms and isolation methods here at Music Row Audio [in Nashville]."

"We have a large collection of microphones, preamps and compressors, which we try to match up to the individual instrument," VornDick says. "Every instrument is different, and every mic and preamp highlights particular colors."

Recently, VornDick recorded an acoustic quartet session. "The upright acoustic bass was placed in our larger isolation room, about 12 by 15," he says. "On bass, I'll typically experiment with a KM-84 or 86, paired with a C-12 or U47. I'll move the mics around until we hit some sweet spots; one mic in the upper body, one in the lower.

"Many acoustic basses are dynamically inconsistent from note to note," VornDick continues, "so I often use a pair of UREI LN1176 compressors to smooth the peaks and valleys. The upper mids of a bass also have a tendency to get lost in the mix, so I may add some outboard EQ to tape. The Sontec or Rane SP15 are good choices for this.

"The violin was placed in our smaller room, which measures about 10 by 11," he explains. "We've tried lots of techniques on the violin and usually end up with a U67 or KM-64 through a Drawmer 1960 preamp/compressor. We place the mics above and focused toward the sweet spot. Some other nice combinations we've found on violin include C-24s and KM-84s.

"The other two instruments, guitar and mandolin, were recorded in the 25-by-30 main room," VornDick notes. "There's something very sweet about recording wooden acoustic instruments in rooms with hardwood flooring. Here at Music Row Audio, the floor is ¾-inch oak tongue and groove, which is floating. The walls are trapped and finished with strips of Western cedar.

"The acoustic guitar, a Martin D-28, was recorded using two Sankens," he says. "On guitar, in general, I'll try pairs of Sanken CU-31s or 32s, Schoeps cardioids or Audio-Technica 4033s—or some combination of these. One mic sits between the end of the neck and hole along the lower body pointing up, about six inches away. Of course, this changes with every player.

"The second guitar mic is placed right, about chest high, again around six inches away, pointed down between hole and body," VornDick explains. "Getting the proper phase between two mics like this can be tricky. I'll monitor alternately in mono and stereo while placing the mics until the sound is solid. A phase meter can also be handy when adjusting widely spaced stereo mics. I approach the mandolin like a guitar; two mics carefully adjusted for image and depth. Getting the mandolin player to stay in place is another story! The Milab DC-96B sounds particularly sweet on the old

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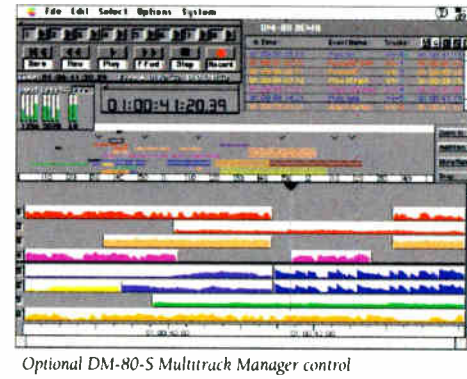

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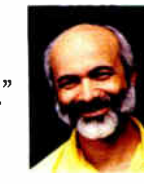

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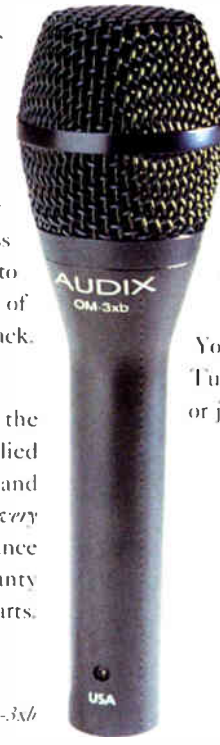

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F-hole Gibsons, as do the KM-84s and 64s. For this session, we liked the 96B-84 combination.

"When I'm recording more than one instrument in the main room, I use a closed-cell foam baffling," he adds. "It's about 12 inches thick and is cut so the musicians can see over the top. This foam is just right and doesn't muddy everything up. It has a nicely neutral effect, a free ambience so to speak, and is perfect for isolating acoustic instruments without isolating the players too much.

"All the instrument mics were fed directly to mic pre's," VornDick notes. "Some were then patched to compressors, and others went straight to our MTR-100A multitrack using Ampex 499 tape, monitored through the console. Recording each instrument in stereo allows unique identities without conflicts in the mix. For instance, one instrument might be panned hard left and 10 o'clock, while another might be set at 11 and 2, and so forth."

In summarizing his experience with acoustic ensemble recording, VornDick says, "Don't get caught up with using the same audio path all the time. I've offered some opinions that work for me, but I'm always doing something different. What do your ears tell you? That's the bottom line."

PRESTON SMITH

As engineer for National Programming Group at Minnesota Public Radio and technical director for the

"I'm convinced that the best direct 2-track recordings sound more realistic than a remix. A direct stereo recording is especially appropriate on acoustic ensembles in good rooms. Room acoustics are difficult to maintain on a multitrack remix."

—Preston Smith

Minnesota Symphony Orchestra, Preston Smith is no stranger to the art of recording acoustic combos. Smith spoke with *Mix* from the MPR studios in St. Paul.

"Aside from broadcast responsibilities," Smith says, "most of my recording work is with pure classical and classical pops, such as semi-classical remakes of hit tunes and popular music. I recently finished a project for Virgin called *Love Songs and Lullabies*. We had Sharon Isbin on guitar, with vocals by Benita Valente and Thomas Allen, and Brazilian percussion. It was entirely acoustic and very enjoyable.

"On Sharon's record," Smith continues, "it was important to capture the sound of all players and vocalists in a single space without sounding electrically panned and mixed. On some songs, the only way to achieve this was to forsake the multitrack and record directly to 2-track.

"Though it's tempting to do everything in multitrack, I'm convinced that the best direct 2-track recordings sound more realistic than a remix. When you record direct, you avoid the additional trip through the console and the unavoidable new generation. A direct stereo recording is especially appropriate on acoustic ensembles in good rooms. Room acoustics are difficult to maintain on a multitrack remix.

"For instance," Smith says, "there's nothing like a beautifully reverberant room for recording a classical chamber group. No reverb in the world can duplicate the detail and complexity of a fine room. However, when the natural acoustic sound is good, a reverb such as the Lexicon 480XL can nicely complement the recording.

"Most producers prefer an acoustic recording to be fairly immediate and clear. Yet, the closer to the ensemble we place mics, the less room sound we get. This is why I find it difficult to avoid using a mixer. A good balance of direct ensemble and room is often attainable only through a minimum of four mics—two or three on the ensemble and two for ambience."

When asked to elaborate on a typical ensemble recording setup, Smith responds, "It really varies depending on the project and room. We did the Isbin project in the MPR studio [a 40x60x15-foot room with Neve V Series console], and each song was quite different. The guitar was recorded with a pair of B&K 4006s, the vocal ensemble was recorded somewhat distantly with a pair of B&K 4011s, and the Brazilian percussion array was generally miked with a pair of Neumann KM-84s, often spread fairly wide. We sometimes overdubbed percussion using the B&K omnis for a larger image. Some songs were recorded as an ensemble direct, and others were overdubbed instrument by instrument.

"On a typical string quartet or small chamber group," Smith elaborates, "I'll often select two or three Neumann KM-131s or B&K 4006s, spread and mixed to strike a balance between spaciousness and good stereo image. An additional set of stereo omnis often go up in the room or hall for ambience.

"When we go remote," he notes, "I like to use the Ampria 8x2 line mixer, which has remote mic preamps or my DDA Model S for acoustic ensemble mixing. As I set up a mix, I tend to go with my first impressions. I find that the more I try to tweak the image, the easier it is to mess things up. I'll always bring along some trusty reference CDs and listen carefully while I'm setting up a

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mix. If it takes longer than ten minutes or so to develop a good balance, I go back and listen to the ensemble for a while and start fresh.

"I prefer to monitor on speakers, but that's difficult in certain remote rooms; especially churches. If possible, I bring B&W 801s and PSE mono power amps for reference monitoring. The Wadia A/D provides the majority of my conversion to digital."

A few parting Smith truisms: "Don't overlook the obvious. So often, we'll scratch our heads and wonder why the sound isn't right. It might just be that the ensemble isn't in perfect tune, or one player is a little too soft. When things aren't going well, one thing I've done is rearrange the players in a different way—maybe facing each other, or setting different instruments closer to each other. It's amazing what a difference little things like this can make in a recording."

BRUCE SWEDIEN

Although his recent credits focus on pop and rock recordings, Bruce Swedien is no stranger to the acoustic combo. With an engineering legacy spanning nearly 40 years, Swedien brings a master's insight to the defining years of stereo combo recording.

"I think the most important ensemble recordings I made were the late-'50s sessions with Oscar Peterson," Swedien says. "The sessions were officially recorded in mono, but I privately multed a stereo machine down the hall! I still have those stereo tapes today, and they sound marvelous. There's even talk of making a CD from some of the unreleased stereo masters.

"Those sessions were all recorded at Universal's Studio A in Chicago," he explains. "It's a very large room, about 75 by 50 with a 25-foot ceiling. Acoustic ensemble recordings usually do better in a large, well-tuned room, and the Peterson sessions were no exception. Studio A has a sound like you wouldn't believe. It's magic! I recorded a lot of acoustic groups in that room.

"I learned early on that jazz combo players need to play together physically or they lose the groove," Swedien says. "Wherever the musicians feel comfortable playing is where I try to work from, though certain modifications are inevitable. For instance, the acoustic bass couples easily into the piano. But Oscar and Ray (Brown) liked to play real close together. So I placed the bass on an iso-riser, about ten feet off the floor. This cleaned up the piano low end.

"I learned early on that jazz combo players need to play together physically or they lose the groove. Wherever the musicians feel comfortable playing is where I try to work from, though certain modifications are inevitable."

—Bruce Swedien

"On Ray's bass," Swedien continues, "I devised a technique of wrapping the microphone in foam rubber and placing the mic in the hole of the bridge so that the capsule is under the fingerboard. Ray didn't seem to mind, and the Altec 21B mics I used worked wonderfully. They're shaped like small Coke bottles and fit perfectly. I've got a number of these 21Bs, which I still use today.

"My first choice for piano miking at that time was a pair of KM-56s," he says. "Occasionally, I use the same pair today that I used on Oscar's piano back in 1958. They sound so good! I like to place them in coincident X-Y nearer to the high strings, with the lid open full. Depending on production requirements, I may go in as close as eight feet off the high piano strings. Another X-Y pair I'm using on piano is the AKG 414-EB.

"Ed Thigpen was Oscar's drummer," Swedien notes. "I wish the drum overheads were stereo for those sessions, but I used only a single Telefunken CM-51 short body—the one with interchangeable capsules. An RCA 77DX ribbon mic picked up the hat and snare.

"These days," he says, "assuming we're isolating the drums from the ensemble, I'll start with a true coincident pair of B&K omnis over the set and adjust for overall sound. I've got a little 12-inch square mini-gobo made of particle board and plywood, with Mu-metal sandwiched inside. This panel goes between the snare and hat to provide extra isolation. I have a particular AKG-451, which works wonderfully on many snares.

"Now for kick," Swedien explains, "I've got a furniture blanket sewn in the shape of a drum. After we get a good fit, I'll place an appropriate mic in a special zipper slot. Kick mics can range from U47s to MD-421s, depending on the player. And on toms, I still like a robust mic, such as a U87."

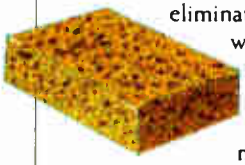
BOB KATZ

As product manufacturer and 20-year recording veteran, Bob Katz has gained a deserved reputation in professional audio. Presiding over the New York AES chapter, Katz divides his time between recording dates, mastering sessions and management of his company, Digital Domain, in

Why you should buy an FBX to do nothing to your sound.

By Doran Oster, President, Sabine Musical Mfg. Co.

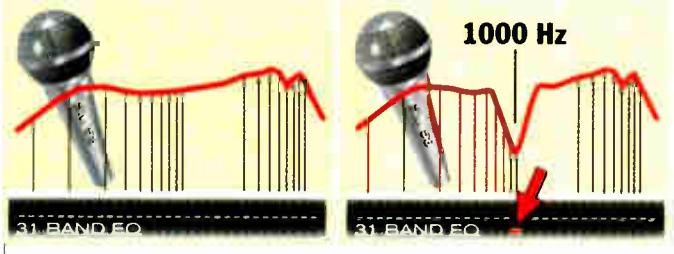
Until the invention of the Sabine FBX Feedback Exterminator, engineers had no practical alternative for controlling feedback other than the 1/3-octave graphic EQ — **a 35-year-old technology**. **"What's wrong with EQs?"** Nothing — if you need to "shape your sound". On the other hand, if you're using an EQ to eliminate feedback, you may as well think of it as a **"sound sponge"**. In fact, EQs "soak up" a lot more sound than you might realize. Practical experience proves that EQ filters are much too wide for chasing feedback and end up muting the program.



Here's why: 1/3-octave EQ filters are actually one full octave wide! Think about this: If the filters were only 1/3 octave wide, there would be no filtering between the fixed sliders. I'm not just talking about cheap EQs — even the best EQs share this problem. **In fact, if you pull your 1000 Hz slider down 12 dB, it actually removes 46% of the power going to your speakers between 500 and 2,000 Hz!** Pull two or three sliders, and you wipe out the overtones of your voice, causing you to sound nasal and your monitors to sound muddy.

Wouldn't it be great if your EQ filters could be ten times narrower? Then they could eliminate feedback without a perceptible change in the sound. What if you could get more gain before feedback? Well, the Sabine FBX does all that — and the FBX's fully digital **adaptive filters** do it automatically!

Now, you may say, **"If the room is set up properly with an EQ, I don't have a problem."** But maybe you do, and don't realize it. Try this test, and prove it to yourself. After you finish your next installation, patch in a CD player and play your favorite CD. Now punch the EQ in and out of line. **We think you'll agree it sounds like there's a blanket on the speakers when the EQ is in.** That's your EQ soaking up the sound.



Moving even a single EQ slider ruins your frequency response!

Are all sound professionals crazy to use EQs to control feedback? No — up until Sabine invented the FBX, there was no practical alternative. Parametric EQs have narrow filters but are too slow and cumbersome for live sound. They cause phase shifting, and drift with temperature. Pitch and phase shifters ruin the sound and can't be seriously considered.

Which brings us back to the new **Sabine FBX Feedback Exterminator**, the only option that really works. Put it just before the power amp in the audio chain, and it automatically senses feedback. Then it automatically calculates the frequency of the feedback and, in less than a second, places a very narrow digital filter

The Sabine FBX-900

(ten times narrower than a 1/3 octave EQ and up to 20 dB deep) directly on the resonating frequency. **The FBX automatically eliminates feedback without muting the sound. And you get more gain before feedback.** Think of the FBX as an EQ with 20,000 sliders run by 1,000 top-notch engineers. It's just that simple.

Who's using the FBX? Thousands are now installed throughout the world. Here are just a few of our customers: The Ricky Van Shelton Band. Dr. John. Vienna State Opera House. The Vatican. NASA. Full Sail Center for Recording Arts. CBS Studios. Merle Haggard. McCormick Place Convention Center in Chicago. Hyatt Regency, San Francisco. Jefferson County, Colorado, Court System. Boeing. Ohio University. **And the list goes on and on.**

Make us prove it— call Sabine to arrange a demonstration of the FBX Feedback Exterminator.

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FBX9P071593

New York City.

Specializing in acoustic recording, Katz has engineered more than 100 CDs for the audiophile Chesky label and many others. Among these fine-sounding recordings can be found a number of acoustic ensembles. I asked Katz to comment on his techniques and opinions on recording the small, mostly unplugged combo.

"Owning a mastering studio, I have the opportunity to really scrutinize the quality of my recordings," Katz explains. "In fact, no matter how familiar I am with the speakers I bring to the recording sessions, I always come back to the mastering room to double-check my work. This is why the first day of any session is considered 'our day' for getting the right sound; that is, for the musicians and me. After the first day of recording, it's all theirs.

"In my acoustic recordings," he adds, "I have a priority of importance. Most important is the room. Any engineer can multimike a combo and get an acceptable sound. It's my objective to match the room and musicians in such a way to allow for minimum microphone usage—often just a stereo pair. If the room is just right, and the musicians can play with sensitivity, two microphones are sometimes sufficient to capture a beautiful soundstage."

"Any engineer can multimike a combo and get an acceptable sound. It's my objective to match the room and musicians in such a way to allow for minimum microphone usage—often just a stereo pair."

—Bob Katz

Katz's next priority is the "necessity of the producer and engineer to coax an exceptional performance from the musicians. Great players need no help in concert, but recording is unique and, especially when attempting a minimal mic technique, the engineer and producer must work closely with the musicians to get a balanced, natural sound.

"My third priority is, of course, the selection of microphones and signal path," Katz explains. "In my work for Chesky, we almost always use a custom AKG C-24 stereo microphone with electronics entirely modified by George Kaye at Audiolabs. The transformer has been removed, and the all-tube electronics have been modernized for lower noise and better sound. The preamp is actually built into the mic so it operates at line level. On occasion, we'll also use stock microphones, but as highlights only and almost never for main pickup.

"Now, I always begin an acoustic ensemble project with a clear mental picture of how the combo should sound on record," he continues. "I believe it's an aesthetic sensibility that every recording engineer should develop. Without an audio vision,

there's no real direction, and the end result is left largely to random chance.

"I think the best combo recording I've made was with Kenny Rankin. To begin with, we used the old RCA Studio A in New York—perhaps the finest room in New York City. The ceiling was entirely adjustable, and the room was perfect for acoustic work. They were just crazy for closing it.

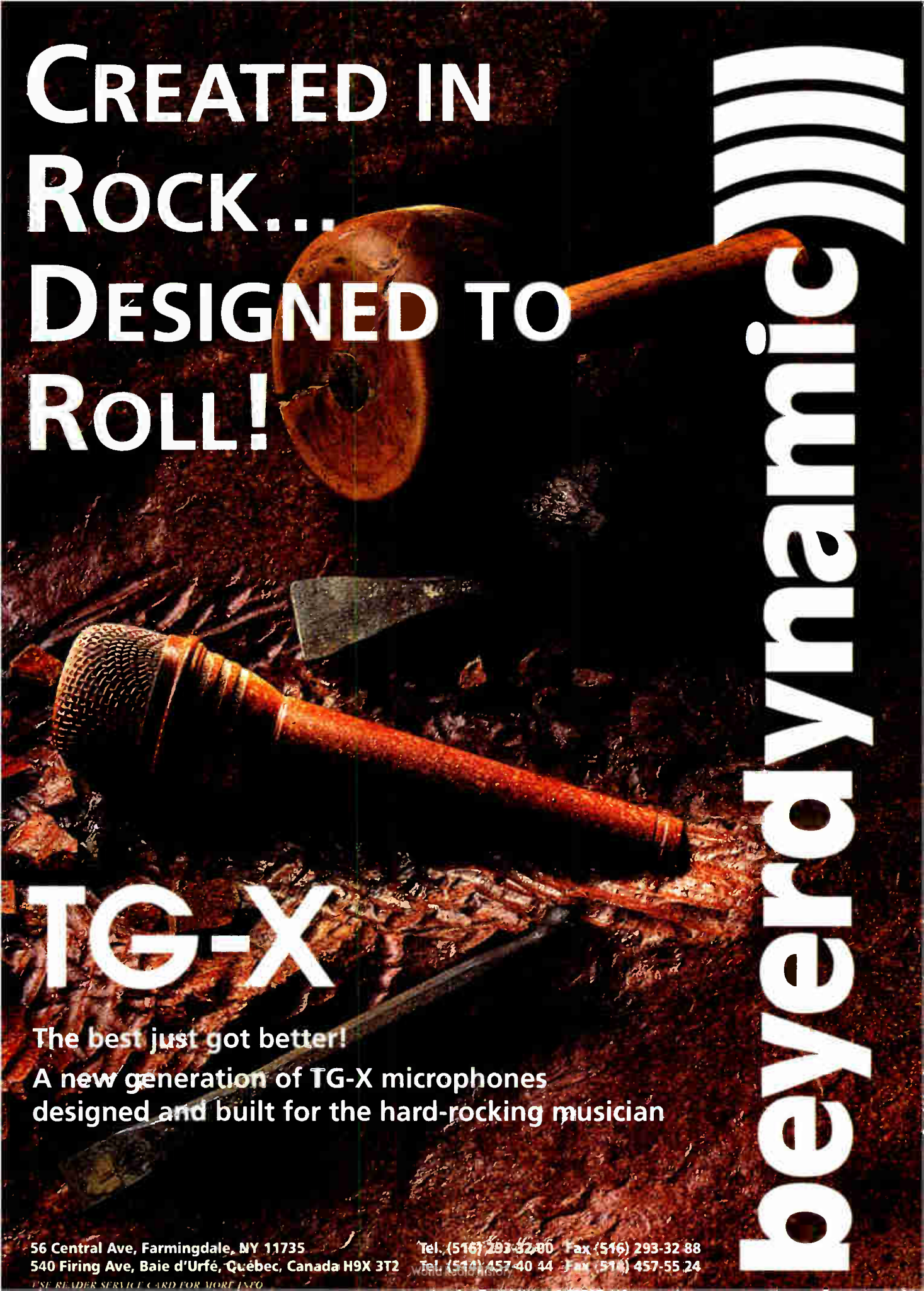
"Kenny was backed by a bunch of great players: Dave Ratajczak on drums, Danilo Perez on piano, Dave Finck on upright bass and George Young on woodwinds. We recorded the ensemble with a Blumlein crossed figure-eight pattern, and Kenny sang on the back side of the microphone, facing the ensemble, using the equally sensitive rear Blumlein pattern. I think we needed a little extra presence on the piano, but better than 90 percent of the record was recorded with a single stereo pair.

"One thing that made this session work is a drummer who played with great sensitivity," he explains. "On a single-point mic arrangement, if the drummer gets even a little too loud, it can spoil the entire group. The entire group, in fact, understood the concept of self-mixing their levels. We took hours to find the right positions for everybody. And because Kenny faced the group, it was easier for the players to sense and interact with the singer's subtleties, and vice versa.

"Another important aspect of two-mic ensemble recording is having a consistent bass player. Dave Finck's instrument, and his ability to play it uniformly, made this recording very special. No compression or EQ was necessary. We also had our pick of pianos from Yamaha's Concert Art Department in New York. Finding the right piano for the room and combo blend was another key.

"The entire recording was sent directly to 2-track via my custom 128-times oversampling 20-bit A/D converter, dithered for 16-bit format," Katz says. "Newer Chesky recordings use an A-to-D adapted from my solid-state design but built with tubes by George Kaye. The very latest recordings are 20-bit and re-dithered to 16-bit using a new algorithm at the last stage only." ■

John La Grou is an engineer, musician and inventor.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IN DIGITAL MULTITRACK TAPE RECORDERS

"The more things change, the more they stay the same." At least that old adage still applies in professional audio. Remember, if you will, back to that Orwellian year of 1984. A decade ago, everybody predicted that in ten years we'd all be encrypting thought processes on biocubes, and recording tape would be...well, history. So here we are in 1994, and good ol' recording tape is still with us. High-end digital multitracks continue their steady sales. Meanwhile, thanks to the revolution in modular digital multitracks (MDMs), the reality of digital recording has become affordable to just about anyone with a MasterCard and a yen to be creative.

Here are the latest offerings in the world of digital multitrack tape recorders—what's available, along with retail pricing. Regarding the latter, bear in mind that these are *suggested* retail prices; your pricing may vary. Addresses are provided so you can contact the manufacturers directly for more information.

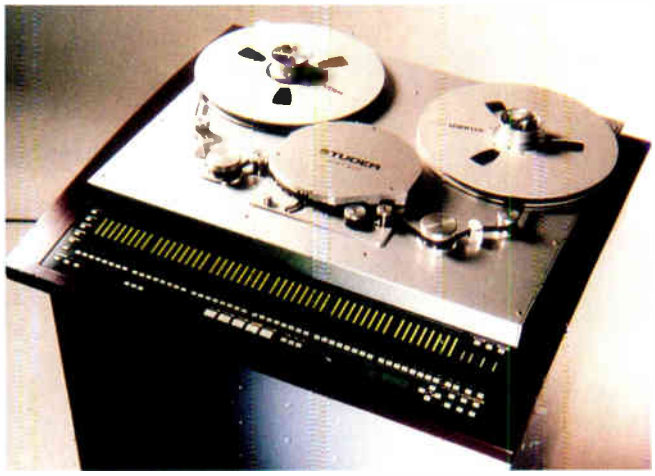
REEL-TO-REEL SYSTEMS

It's no secret that the PD- (Professional Digital) and DASH- (Digital Audio Stationary Head) format machines represent the elite corps of digital multitracks, with a sizable user base among high-end studios. DASH systems are available from Sony, Studer and Tascam. Otari is currently alone in the PD camp, although its machines are also compatible with hundreds of the (now-discontinued) Mitsubishi decks worldwide.

OTARI DTR-900II

The DTR-900II is Otari's third-generation digital 32-track, offering expanded use of VLSIs for

BY GEORGE PETERSEN

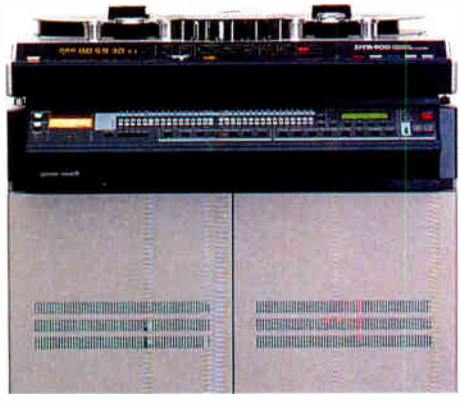


STUDER D827 MCH

TASCAM DA-800/24

ALESIS ADAT

FOSTEX RD-8



OTARI DTR-900II

SONY PCM-3324S

greater reliability and less power consumption, and improved ±15-volt power supplies to accommodate optional Apogee lowpass filters in the A/D and D/A sections. This PD-format machine records 32 tracks on 1-inch tape and is compatible with Otari DTR-900 models, as well as the Mitsubishi X-850 and X-880 decks. Maximum recording time is one hour, using a 14-inch, 9,700-foot reel of tape. Two analog cue tracks and a dedicated SMPTE time code track are provided.

Converters are eight-times oversampled, 18-bit DACs, and four AES/EBU digital inputs and outputs can be selected to any of the 32 tracks, for use with digital VTRs or other AES/EBU-compatible devices. Error correction is Reed-Solomon Code with CRC recovery/correction circuitry. Analog inputs and outputs are active-balanced, operating at +4dBu.

Among the DTR-900II's standard features are switchable 44.056/44.1/48kHz sampling rates, ±12.5% varispeed (adjustable in 0.1% increments and displayed in percent or halftones), parallel and serial control ports, built-in SMPTE time code reader/generator, digital overdubbing and ping-pong capabilities, simultaneous recording from digital and analog inputs (if desired) and a transport that resolves to any common time-base reference, such as composite video or line frequency.

The remote provides full transport controls, along with 30-segment LED meters with selectable peak-reading or peak-hold characteristics. Additionally, users can select from seven different rates at which the bar graph meters decay. Crossfade times can be adjusted from 1.3 milliseconds to 1.3 seconds, in 1,024 steps, and standard autolocator features include 100 cue point memory, ten direct store/search points, return-to-zero, repeat and autopunch functions, the latter definable in 0.1-frame or millisecond resolutions. All session data—such as cue point and event time data, autolocator information, channel setup memories—can be stored on the tape and loaded into the remote before the next session.

A digital matrix feature allows the user to select analog or digital inputs—or a combination of both—for simultaneous, multisource recording. Routing of signals within this digital matrix can be addressed from the re-

mote or the machine itself, for assigning any input to any track. This allows internal track bouncing and seamless assembly editing, even on a single-transport system.

The basic DTR-900II has a pro user net pricing of $140,000; the version with Apogee filters is $150,000. Standard accessories include the remote locator with meter display, a 10-meter cable for the remote and a 10-meter digital dubbing cable for cloning tracks between two DTR-900IIs.

Options include a plug-in chase synchronizer module (EC-105) that simplifies locking the DTR-900II as a slave to a master time code source, additional meter bridges for console-top or recorder mounting, and a CB-503 PD-to-DASH-to-PD format converter, enabling bidirectional transfers between the DTR-900II and any DASH multitrack recorder—entirely in the digital domain.

A dual-transport system with 64-track autolocator is also available, providing sample-accurate lockup between the two machines.

Otari Corporation, 378 Vintage Park Drive, Foster City, CA 94404; (415) 341-5900.

SONY PCM-3348

Since introducing the PCM-3348 48-track digital recorder at the 1988 AES Convention in Los Angeles, Sony has delivered over 100 such machines in the U.S.

The PCM-3348 uses the double-density DASH format. Therefore, basic tracks can be recorded on any standard 24-track DASH deck, and production can continue by using the (upwardly and downwardly) compatible PCM-3348, providing 24 extra tracks for overdubbing and mixing. Two analog cue tracks and one time code track also are provided. Other amenities include recording time of up to 65 minutes (at 44.1 kHz), two-times oversampling A/D and D/A converters and a power consumption of 1,200 watts.

Features include a multiple ping-pong mode for bouncing up to 48 tracks simultaneously within the machine; built-in SMPTE time code reader generator; switchable 44.1/48kHz sampling rates (44.056kHz sampling for video applications is also available); ±12.5% pitch shift; and expanded sampling memory. The latter provides 20 seconds of full-resolution, 16-bit stereo audio (or 40 seconds in mono), with

manual or external source triggering and reverse sample playback. Precise editing of sample start and end points is possible, as is the ability to delay the output of any track (in single-sample increments) to compensate for signal processing delays, miking techniques, etc.

The PCM-3348's time code chase synchronization and control functions are extensive, with free-run or rechase modes, variable resync capability and the ability to insert frame- or subframe-accurate offsets. SMPTE drop-frame, nondrop-frame, EBU and film time codes are supported; an internal synchronizer handles sample-accurate lockup of multiple PCM-3348s. Also standard is a dedicated electronic edit mode for machine-to-machine assembly editing in the digital domain. Analog inputs and outputs are electronically balanced, and available digital I/O ports are AES/EBU and (unbalanced and balanced) SDIF-2.

The RM-3348 remote controller/autolocator, which comes with the recorder, provides control over all PCM-3348 functions, including variable speed control, digital ping-pong and three days of memory backup. Up to three PCM-3348 or PCM-3324 transports can be controlled.

The PCM-3348 is priced at $252,350 including the RM-3348 remote control/autolocator and stand. Options include a console interface board (for controlling the PCM-3348's record-ready functions from a mixing console) and a MADI interface board, providing access to all tracks using the Multichannel Audio Digital Interface protocol, for connection to other MADI-equipped equipment (recorders, digital consoles, etc.) over a single coaxial cable. Another option is a remote 48-track meter unit, with switchable peak hold (two seconds or permanent), clipping indicators, record status LEDs for each track, and error status indicators.

SONY PCM-3324S

Priced at $62,830—about the same range as an analog 24-track with noise reduction—is the Sony PCM-3324S, a digital 24-track recording system that can be custom-configured with numerous options. The machine is compatible with all DASH-format 24- and 48-track recorders, has a maximum recording time of 65 minutes on a 14-inch reel of ½-inch tape (at 44.1 kHz) and offers selectable 48/44.1/44.056kHz sampling frequencies.

The PCM-3324S uses a high-speed, pinch roller-less transport, and due to its extensive use of VLSI technology, consumes a mere 800 watts of power. Prestriping and/or erasing operations (including control track and time code) can occur at four-times real speed, and ±12.5% varispeed is standard. Other standard amenities include 1-bit A/D converters (64-times oversampled), 18-bit D/A converters (eight-times oversampled), a multiformat time code generator, V-clock and varisync facilities, and automatic microprocessor-controlled alignment. Analog inputs and outputs are electronically balanced XLRs.

The PCM-3324S becomes quite a different machine with the addition of various options. The RM-3324S ($3,090) is a simple remote control that provides basic transport/record controls, along with crossfade time select, autopunch, varispeed and autolocate functions, with 100 cue point memory. The larger RM-3324 remote ($11,330) adds advanced features such as machine-to-machine synchronization for electronic editing and multiple digital ping-pong for copying tracks within the digital domain.

Other options include serial and parallel transport control interfaces, a confidence monitoring head, time code reader/generator/chase synchronizer and 2-channel SDIF-2 or AES/EBU digital I/O boards (channels can be routed or assigned via the RM-3324S or RM-3324 remotes, and up to four I/O boards can be installed in the PCM-3324S). Multichannel digital I/O options include MADI or SDIF-2, with 24 channels on either. As with the PCM-3348, a remote meter display is available and has two-second peak hold, infinite peak hold and normal meter modes. The RAM playback option is similar to that of the PCM-3348, with 20 seconds of full-resolution, 16-bit stereo audio (or 40 seconds in mono), with manual or external source triggering and reverse sample playback.

Sony Pro Audio, 3 Paragon Drive, Montvale, NJ 07645; (201) 930-1000.

STUDER D827 MCH

No newcomer to the digital multitrack arena, Studer showed its first

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Bryston's BMP-2 is a balanced two channel single rack-space microphone and instrument preamplifier providing audio performance exceeding that achieved in recording studio consoles. Designed for high level "close mic" applications, headroom is maintained without using input attenuation (pads). A 1/4" unbalanced (1 meg.) instrument input jack is provided to utilize low and medium signal levels from magnetic pickups in guitars, contact microphones, keyboards etc.

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Switches and connectors are gold plated to provide freedom from corrosion and distortion. Electronic components are hand selected and tested both before and after installation in the circuit. Each and every preamplifier is "burned-in" on our test bench for a full 100 hours prior to final checkout.

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digital 8-track design at the 71st AES Convention in March 1982. Unveiled at the 1993 AES in New York City, the D827 MCH, Studer's newest digital recorder, is fully compatible with all 24- and 48-track DASH-format machines.

Getting past the recorder's streamlined look and radical purple color scheme, the D827 MCH offers much more than is visible to the eye. The recorder can be ordered as a basic 24-track machine, and can be later field-retrofitted to full 48-track operation as budgets or production needs increase.

The basic machine (24- or 48-track) in the standard configuration is sold without converters (presumably for use with external converters and/or a digital console) and includes onboard SMPTE synchronization (with full editing capabilities), as well as 56-channel MADI and 2-channel AES/EBU interfaces. Time code is always available at the TC output—even in stop or during winding operations; and ±12.5% varispeed is standard, as are 44.1/48/44.056/47.952kHz sampling frequencies.

More than 14 available options allow users to "custom" configure the machine. First is the A/D converter package, which uses advanced noise shaping techniques to impart many of the benefits of 18-bit conversion for storage on the 16-bit DASH format. The A/D converters are available in groups of eight channels, with and without noise shaping. The D/A converters are also available in 8-channel blocks but do not require noise shaping circuitry, as the noise shaping is a single-ended process (encode-only), with no decoding necessary.

This fall, Studer will begin delivering its 24-bit expansion system for the D827-48. This retrofitable $30,000 option transforms the 48-track recorder into a 24-track machine, where the first 24 tracks will be DASH-compatible for 16-bit playback, and the additional bit information for the first 24 tracks is stored on tracks 25 to 48. The option provides digital I/O only and does not include the 24-bit converters, so users can select their own converters, or connect the deck to a digital console.

Other options include an SDIF-2 interface, 24- or 48-track confidence playback heads, remote meter bridge, parallel audio interface, two autolocators (with and without sound memory) and "Setup Handler." The latter is a Macintosh application that takes full advantage of the D827's software configurability, allowing screen-based manipulation/storage of user parameters, user text memos, input/output configurations and internal ping-ponging or track-bounce setups/routings. Sound memory is an onboard RAM option providing sampling capability to simplify the editing of recorded material for reinsertion into any new location. With either 45 or 180 seconds of mono audio available (split among any four tracks), the editing of sizable sound files is possible.

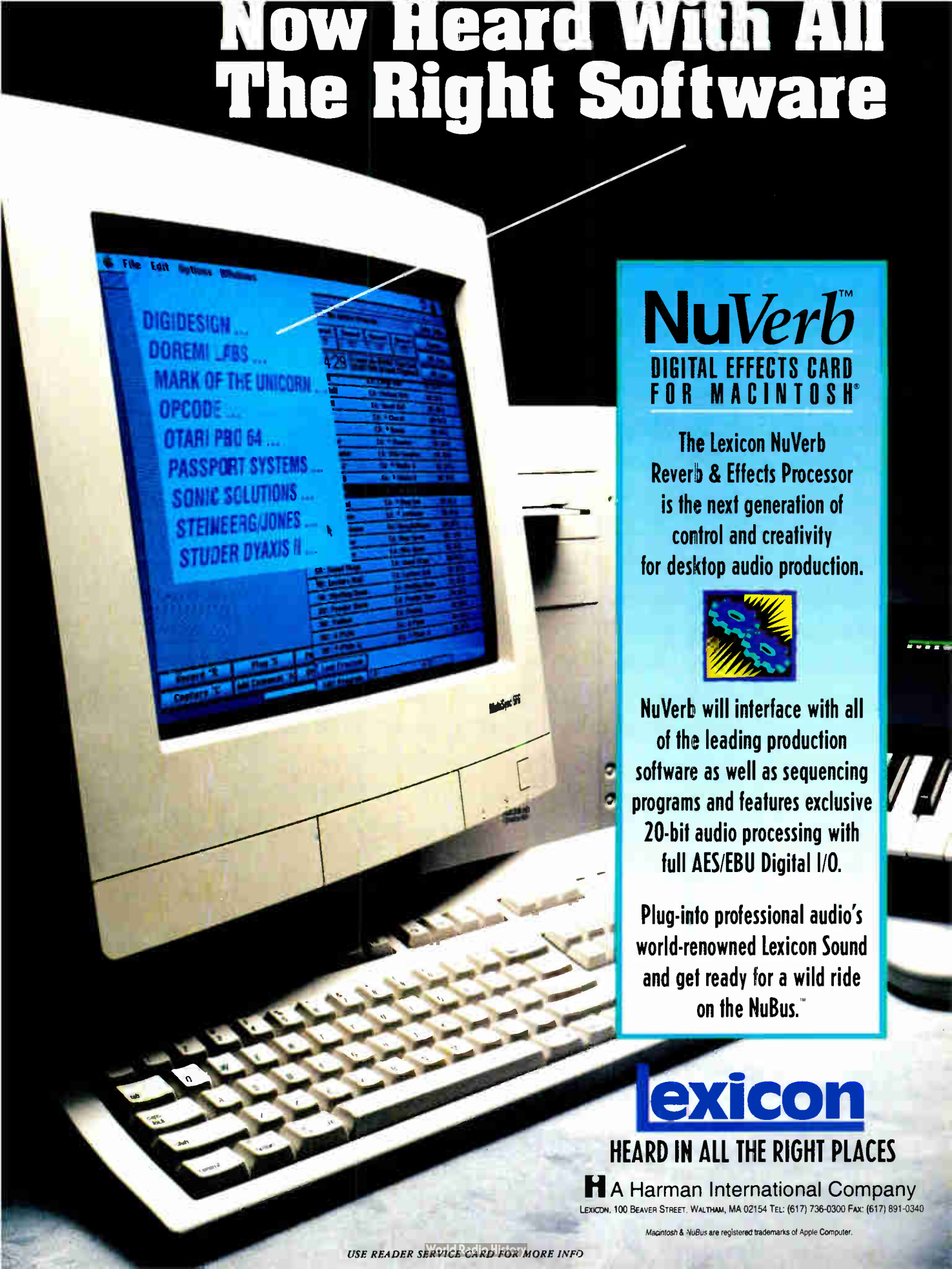
Pricing for a standard 24-track D-827-24 is $80,000 (less converters); 48-track models begin at $125,000 (less converters) or $148,400 with A/D and D/A converters.

Studer Editech Corp., 1865 Air Lane Drive, Nashville, TN 37210; (615) 391-3399.

TASCAM DA-800/24

Tascam's DA-800/24 is a 24-track DASH-format digital recorder featuring proprietary ZD circuits in the D/A converters, two-times oversampling in record and playback, analog and digital cue tracks, 30-point au-

Now Heard With All The Right Software



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tolocator, 40-character alphanumeric display, and AES/EBU and SDIF digital I/O ports.

Among the standard amenities on this $100,000 machine are a full-function remote controller and on-board synchronization, which can operate either as a slave or master code source. Some of the recorder's convenience features are emphasis and control logic switching at the remote control (under a hidden panel), an hours/minutes/seconds calculator, and an optional second meter bridge for remote use. Due to the DA-800/24's extensive use of LSI circuitry, power consumption is only 850 watts.

Tascam Professional, 7733 Telegraph Road, Montebello, CA 90640; (213) 726-0303.

MODULAR DIGITAL MULTITRACK SYSTEMS

High tape costs may be a thing of the past, when you can record digital audio tracks on an MDM system using readily available videocassettes. Offering expandability and a price/performance ratio that's unbeatable, it's no surprise that more than 30,000 MDM recorders have been sold over the past couple of years. And this huge user base has also attracted third-party companies (and the manufacturers themselves) to develop accessories and add-ons for specialized applications.

ALESIS ADAT

Over the past two years, Alesis has sold more than 25,000 of its S-VHS-based digital recorders, a number that exceeds the combined output of all other manufacturers of digital multitrack recorders. Eighteen months ago, Fostex agreed to develop ADAT-format recorders under its own name and began delivering its RD-8 decks this year.

Priced at $3,995, ADAT is a modular, expandable system based on each unit having eight tracks and occupying three rackspaces. At suggested retail, a complete 24-track digital system (three ADATs and a BRC remote controller) costs less than $14,000; a 32-track system is less than $18,000.

ADAT features 16-bit linear resolution, variable sampling rates of 40.4 to 50.8 kHz, two location memories (plus return-to-zero), looping/rehearse function and a choice of four digital crossfade times.

Mike Pinder likes to keep his Mellotron mellow.

"Part of my bliss is having The CardD at my fingertips. The CardD has become an integral part of my studio, being permanently connected to the output of my mixing console. I am very impressed with this product. It's a pleasure to use, and I am equally impressed the the people who stand behind it."

Songwriter, vocalist, and keyboardist Michael Pinder, formerly with the Moody Blues, is famous for his pioneering use of the Mellotron. The hauntingly beautiful sounds of this instrument became the trademark of the group's early works.

Mike is back in the studio, and has just released a new CD called *"Off the Shelf."*[1] Mike's new CD *"has a jazzier, more sophisticated flavor than his music with the Moodies, while retaining...'that heavenly atmosphere.'"*[2]

When it came time to digitize his recordings for final mastering, Mike trusted only one system. *"...at the end of the chain I mix directly to an IBM clone computer running The CardD™, by Digital Audio Labs... It's fabulous, for a thousand dollars, and it has incredible editing and the A-to-D and D-to-A converters are the best I ever heard. I do all of my mastering there."*[2]

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[1] Mike's CD is available exclusively through Higher & Higher, P.O. Box 829, Geneva, FL 32732. Send SASE for information.

[2] From Higher & Higher, an independent fan magazine focusing on the Moody Blues, Winter/Spring 1994

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SnapShot Recall™

Hans Zimmer's film scoring projects include: True Romance, Cool Running, I'll do Anything, The Lion King, and House of the Spirits.

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National Sound's All-Digital Studio 2. Recent Projects: NBC's Today Show campaign, Fox-WNYW News theme, A Current Affair theme, and PBS Network theme.

AUDIO POST/MUSIC

National Sound (a division of National Video Center/NY)

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Recent Shows Include: 1993 MTV Video Music Awards, 1993 Billboard Music Awards, Aerosmith, Rod Stewart, Midnight Oil, Counting Crows, and Smashing Pumpkins.

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During complex productions complete console setup may be instantly reconfigured on-air. During rehearsal the mix can be fine tuned to be recalled instantly during the show. Each segment in a show may have its own SnapShot. The Euphonix can handle the work of several consoles, making life a lot easier for the engineer and resulting in better mixes.

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In a music environment SnapShot Recall allows the engineer to setup for complex mix and overdub sessions in seconds rather than hours. For Audio Post Production studios, SnapShot Recall lets the client compare different versions of a cue or a scene, making the decision process easier.

Great care has been taken in the analog circuit design to ensure that SnapShots may be fired on-air. In fact Euphonix systems are installed in facilities such as Broadcast Studios and Opera Houses where it is essential to have instant, silent resettability during the performance.

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Euphonix

Any number of ADATs—up to a maximum of 16 transports—can be synched to sample-accuracy (±1/48,000 second) by connecting one sync cable between each ADAT.

With ADAT's higher operating speed, a 120-minute S-VHS cassette yields 40 minutes, 44 seconds of record time, going up to 53 minutes on a 160-minute tape. Included with every ADAT is the LRC, a palm-sized remote controller that duplicates all the transport controls. Analog input/output connections include both ¼-inch jacks (-10dBV, unbalanced) and +4dBu balanced I/O on a 56-pin Elco connector. Also on the rear panel is a ¼-inch jack for a punch-in/out footswitch.

The rear panel has fiber-optic in/out ports, allowing the cloning of safety copies—each ADAT includes the necessary glass-fiber cable—and providing access to the digital audio datastream for connecting peripheral devices, such as the optional Alesis AI-1 S/PDIF- or AES/EBU-to-ADAT interface. Recently, Alesis added ADAT-compatible, fiber-optic ports on its Quadrasynth synthesizer and Quadraverb II digital effects processor.

Priced at $1,995, the BRC controller adds essential functions—such as multichannel editing, video and/or MIDI synchronization, programmable pre/post-roll, multipoint autolocation, track delays (up to 170 ms), track bouncing, etc.—that are lacking in the basic ADAT recorder. Standard BRC features include SMPTE time code read/write/generate, chase lock to any external SMPTE source, MIDI synchronization, transport control of up to 16 ADAT decks, 400 locate points, digital-domain track bouncing, automated assembly editing, independent delay of any (or all) tracks, record group assignments, auto punch-in/out, multimachine offset and more.

The BRC also allows for a few tricks of its own, including the ability to name and display individual song titles, take numbers or regions. A user also can store such data (along with setup information, autolocator points and customized user defaults) on the head of each tape. Continuous play allows multiple ADATs to operate in relay fashion, providing a virtually unlimited amount of record/play time—as one deck stops recording, another seamlessly begins recording from that point.

The BRC slaves an ADAT system to incoming SMPTE time code at +4 or -10dB levels; video sync (composite or black burst) and word clock in/out ports are provided. The BRC syncs to MIDI sequencers using MIDI Time Code or MIDI Clock/Song Position Pointer; MIDI Machine Control is also supported.

The optional AI-1 ($895) is an Alesis fiber optic-to-AES/EBU and S/PDIF digital interface and sample rate converter. Also in a single rackspace chassis is the AI-2 ($995) synchronizer. Developed jointly with TimeLine, the AI-2 offers SMPTE chase, Sony 9-pin interface, word clock in/out, video reference input and an interface for controlling ADATs from a TimeLine Lynx, Lynx-2 or MicroLynx system. Used with an ADAT system (with or without BRC), the AI-2 can act as a stand-alone synchronizer for chase-locking to incoming SMPTE time code from any source.

ADAT ACCESSORIES

DataSync from JL Cooper Electronics (Los Angeles) derives a MIDI Time Code output from ADAT's control track, providing MTC or MIDI Machine Control for driving sequencers or other MIDI-controllable devices

without having to waste an audio track for recording time code. Cooper's dataMaster is a rack-mount synchronizer with SMPTE chase, MIDI sync, MIDI Machine Control and optional ($149) Sony 9-pin/ESbus sync. CuePoint, Cooper's newest product, adds many of the BRC functions in a mid-sized, mid-priced ($799) locator/controller.

The Steinberg ACI from Steinberg/Jones (Northridge, Calif.) adds MIDI sync and MIDI Machine Control to any ADAT system. Designed for use with Steinberg's Cubase program, ACI works with any sequencer or computer platform that supports MMC. Sound Trax Studios' (Burbank, Calif.) PC-Connection is a hardware/software system for controlling ADATs via an IBM-compatible computer.

On the workstation front, Digidesign offers interfaces for transferring eight tracks of audio directly to/from ADAT into Session-8 and Pro Tools disk-based workstations. Meanwhile, Fostex has included ADAT-format, fiber-optic, digital I/O on its Foundation 2000 workstation.

Alesis Corporation, 3630 Holdredge Avenue, Los Angeles, CA 90016; (310) 558-4530.

FOSTEX RD-8

Now available, the Fostex RD-8 uses the same S-VHS transport and record electronics as the Alesis ADAT but adds sophisticated synchronization and control features. The RD-8 is compatible with the Alesis system and can be used as a master or slave deck; tapes recorded on the two machines are completely interchangeable. With any ADAT system—Alesis or Fostex—a 120-minute S-VHS cassette yields 40 minutes, 44 seconds of record time. The RD-8 also has a T-160 mode, where it is possible to use 160-minute videotapes.

The RD-8 offers 16-bit linear digital resolution, variable sampling rates (44.1 or 48 kHz) and a choice of four digital crossfade times. Other features include an onboard SMPTE chase-lock synchronizer/reader/generator, RS-422 (Sony P2 9-pin) control for interfacing to video editors, video sync input, word sync in/out, pull-up/pull-down (44.056 and 47.952kHz sampling for 29.97 fps resync), MIDI Machine Control, onboard 170ms track delay, multimachine offset and ±6% pitch shift capability.

Among the RD-8's autolocation-specific functions is a 100-locator-point memory and programmable pre/post-roll times. Up to 16 ADATs and/or Fostex RD-8s can be synchronized with sample accuracy (±1/48,000 second), and this transport sync scheme does not require dedicating an audio track to recording SMPTE signals. One important function that the RD-8 offers (which is lacking in the Alesis ADAT) is the ability to punch-in/out of the recording process while recording on other track(s).

The RD-8 has a two-line-by-18-character LCD window to display multiple pages of software access for operational data (SMPTE rates, sync status, sampling and/or clock rates, etc.), as well as autodiagnostics and locator info. Any information displayed in the LCD window, along with the machine's 100 locator memories and user-default settings for sync and operational parameters, can be stored in a table of contents section on the head of any ADAT tape.

The RD-8's rear panel has -10dBV analog audio inputs/outputs (on RCA phono jacks); +4dBu inputs/outputs on D25-sub multipin connectors; fiber-optic digital I/O (ADAT-format); MIDI in and out; BNC video input; time code input and output on balanced XLR jacks; output to the Alesis RMB meter bridge; ¼-inch jack for optional punch-in/out footswitch; sync jacks for interlocking other RD-8s or ADATs; and a 9-pin RS-422 interface. The latter uses the Sony P2 serial communications protocol for controlling RD-8 functions from a video editor.

Fiber-optic in/out ports allow the cloning of safety copies between two RD-8s, two ADATs or one RD-8 and one ADAT, and each RD-8 includes the necessary glass-fiber cable. The optical transfer ports also provide access to the digital audio datastream for connecting peripheral devices. Included with the RD-8 is the Model 8312, a compact remote that duplicates the transport controls.

The RD-8 also includes features catering specifically to the film/video post market. The unit slaves to incoming SMPTE time code. Word clock in/out ports are also provided, and the RD-8's SMPTE in and out ports can be varied to operate at levels ranging from -10 to +4 dB.

Additionally, the RD-8's sample

rate can be adjusted by ±0.1% to compensate for the timing differences between film shot intentionally for video release at 30 fps (or 24 fps film transferred to video at 30 fps via telecine), when the NTSC frame rate is 29.97 fps. This "pull-up/pull-down" feature makes the 0.1% change in the speed of the tape, while leaving the time code format/frame rate unchanged.

MIDI in and out ports on the RD-8's rear panel can output MIDI Time Code for synching the recorder to a MIDI sequencer. MIDI Machine Control is supported, which allows the RD-8's transport and record functions to be controlled from an MMC-equipped sequencer.

The RD-8 offers extensive control of the Alesis Digital Bus, a proprietary fiber-optic chain that allows making clone copies, track bouncing and assembly editing. Fostex has included an ADAT-format, fiber-optic digital input and output on its Foundation 2000 workstation, an expandable 8- to 48-track disk-based system that combines recording, editing, mixing and signal processing functions. Digidesign markets an 8-channel ADAT fiber optic-to-Digidesign Session-8 or Pro Tools interface.

The Fostex RD-8 retails at $4,795, including Model 4312 remote control.

Fostex Corporation, 15431 Blackburn Avenue, Norwalk, CA 90650; (310) 921-1112.

TASCAM DA-88

The Tascam DA-88 debuted at the Audio Engineering Society Convention in San Francisco on October 1, 1992. Tascam, however, was no newcomer into the professional digital marketplace, having unveiled its DA-800 digital 24-track four years earlier.

The DA-88 is an 8-track deck that can record 108 minutes of digital audio on a standard Hi-8mm videotape. Like other MDM designs, DA-88s do not require using audio tracks or external synchronizers for multimachine lockup: A single cable between DA-88s provides sample-accurate sync, and up to 16 of these $4,499 machines can be interlocked for up to 128 tracks (in 8-track increments) of recording capability. A 120-minute tape provides an actual recording time of 108 minutes.

Besides the usual transport functions, the DA-88's four-rackspace front panel includes controls for tape shuttle, sample rate select, two locator points, rehearse and auto-punch modes, clock source select, time code generate/record switches (these function only with the optional SY-88 SMPTE synchronization card) and keys for setting pre/post-roll times, crossfade times, sync offset, ±6% pitch change and playback delays on any individual tracks, to a maximum of 7,200 samples. A 24-track meter bridge, model MU8824 ($899, plus the PW-88M meter bridge connector cable, an additional $90) is optional.

The DA-88 defaults to a crossfade time of 10 milliseconds, which users can increase to a maximum of 90 ms. The line-level analog inputs and outputs are unbalanced RCA phono jacks (-10dBV) and balanced +4dB on two 25-pin, D-sub multipin connectors. A ¼-inch jack permits remote punch-in/out operations with an optional footswitch.

Digital access is via the TDIF-1 (Tascam Digital InterFace), a 25-pin, D-sub port that connects to a second DA-88 for cloning tapes or to Tascam's optional AES/EBU and S/PDIF interface (the $1,099 model IF-88AE) or the $1,299 SDIF-2 (IF-88SD) interface. Combined with the DA-88's sync offset feature and a PW88D

dubbing cable ($100), the TDIF-1 port also allows multitrack assembly editing between two machines, entirely in the digital domain.

BNC word sync in and out ports are included on the DA-88's rear panel, but there are few practical applications where these would be of any use without the optional AES/EBU or SDIF-2 interfaces. More useful is the optional SY-88 synchronization board ($799), a plug-in SMPTE card for MIDI Machine Control and chase-lock to time code sources. A single SY-88 card provides SMPTE functions for the master recorder and up to 15 interlocked DA-88 units operating as slaves.

In addition to SMPTE chase, the SY-88 provides a connection for external RS-422 video editor control and video in/out sync on standard BNC jacks, for locking to/from a standard video sync signal. Other features of the SY-88 include changing the master DA-88's display to show any incoming time code source, absolute time to SMPTE time code conversion and pull-up/pull-down.

Priced at $200, the RC-808 is a compact 5.5x6-inch unit that duplicates all of the DA-88's transport controls except the shuttle wheel. While the RC-808 is designed as a single-machine controller, additional DA-88s connected to the master DA-88 will chase to follow the commands issued by the RC-808.

The RC-848 ($1,499) is a large multimachine autolocator with record select buttons for up to 48 tracks (six DA-88s). Beyond the standard transport commands, the RC-848 also provides programmable pre/post-roll, along with 9-pin RS-422 output for interfacing to video systems, ports for controlling Tascam analog decks, 99-point autolocation, shuttle wheel, LCD status screen and two time displays.

THIRD-PARTY DEVELOPMENTS

Soundmaster of Etobicoke, Ontario (near Toronto), a manufacturer of transport synchronizers for the film and video industries, unveiled a DA-88 interface for its Integrated Operations Nucleus (ION) system. The ION interface puts the DA-88 under the serial control of the Soundmaster SYNCRO synchronizer, allowing DA-88 operations to be controlled from a PC host computer. The system provides synchronization control of the DA-88 and any number of other audio, video or film transports.

At the recent NAB show, British manufacturer PrismSound (dist. by Sprocket Digital of Burbank, Calif.) unveiled the MR-2024T, an interface that allows recording six 20-bit channels or four 24-bit channels on the Tascam DA-88. Designed for connection with outboard, high-bit-rate A/D and D/A converters, this single-rackspace unit has four pairs of AES/EBU digital I/O, an S/PDIF I/O pair and four word sync outs. Two TDIF-1 (Tascam format) digital ports provide connection to the main DA-88 and a backup deck. Applications include 20/24-bit music recording (or as a high-res mixdown deck), layback to 20-bit digital VTRs and multichannel surround sound mixing.

Tascam Professional, 7733 Telegraph Road, Montebello, CA 90640; (213) 726-0303. ■

Mix senior editor George Petersen is the author of Modular Digital Multitracks: The Power User's Guide, *available through Mix Bookshelf.*

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by Dan Daley

FOLLOW THE BOUNCING TRACK

"Gee, wasn't the future wonderful?" That's the likely sentiment of many project studio owners when, despite all the revolutionary benefits of the latest technology, they must get back to basics. As dazzling as high tech gets, the fundamentals always remain with us. As well they should.

One of those fundamentals is track bouncing, which has become less an issue in the 48-track environment of large facilities but remains a ubiquitous necessity in project studios where 8- and 16-track configurations still rule. Affordable digital systems such as the ADAT make track bounces less onerous from a noise standpoint, but bounces in the digital domain still have their pitfalls. So do those in analog, still the dominant format in project studios. Good bounce etiquette in either domain helps ensure a good finished product; let's look at a few rules of the road.

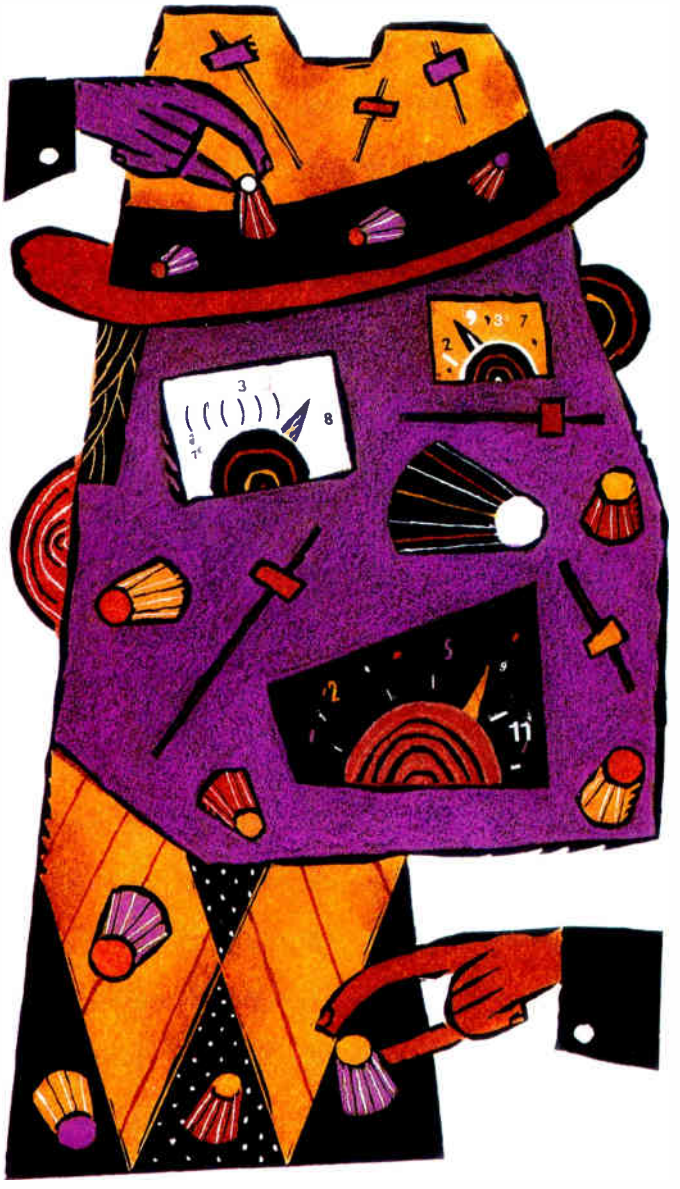

ILLUSTRATION: AD McCAULEY

THE ANALOG TRADE-OFF

Engineer Richard Dodd is a UK native who relocated to Nashville two years ago. With credits ranging from the Traveling Wilburys and George Harrison to the quintessential hillbilly of Marty Brown, he's only now considering jumping into personal recording. However, as he points out, "It really doesn't matter what type of studio you're working in, personal or professional. There are issues surrounding track-jumping [British for 'bouncing'] that are common to both."

Among them is noise reduction. "When working with Dolby SR or any other type of noise reduction, it's essentially a trade-off," he explains. "You have to deal with certain sonic anomalies in exchange for the reduction in tape hiss." When bouncing tracks down using NR, Dodd suggests that you first decode, then re-encode the tracks, rather than sending encoded tracks to another track and compounding the encoding. "Because they're being read off the sync head, Dolby isn't seeing everything it needs to make a perfect reproduction," he says. "I also suggest

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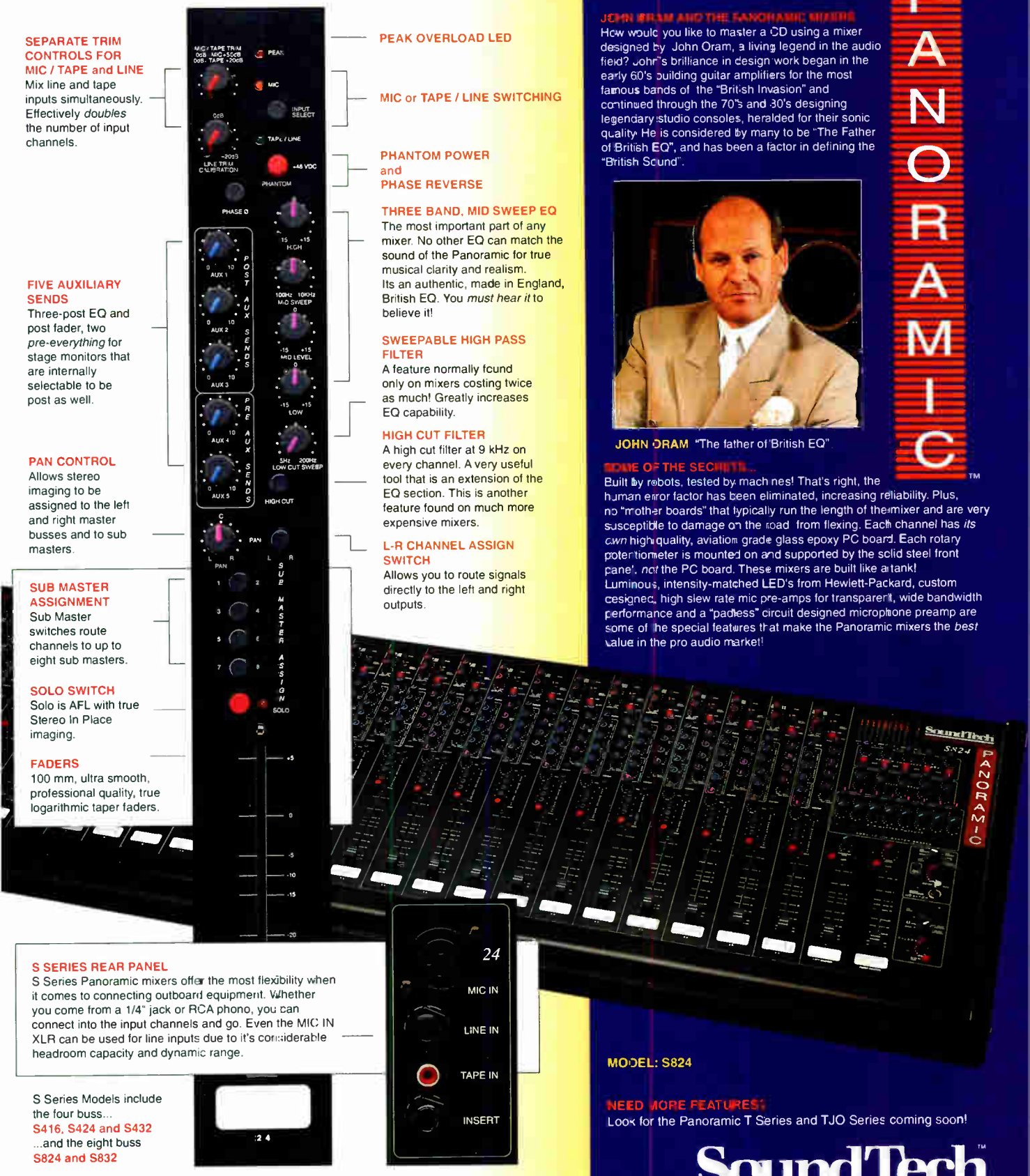

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that you reduce the low frequencies on the sync amp, feeding the Dolbys less low end, essentially tricking the Dolby and getting a better low-frequency reproduction."

Be careful where you're bouncing to. Placing a sparse pianissimo track combination next to a dynamic one is asking for crosstalk trouble on analog tape. Though that might seem obvious, it highlights the need to plan bounces as far ahead as possible, especially when working on limited track configurations. Crosstalk problems can be rectified to a degree by using the phase switch, placing the elements of the adjacent track out-of-phase, thus canceling them out. This works best when the information that's been bounced has little frequency and dynamic relation to the offending track. For instance, if vocals land next to drums, any percussion crosstalk can be effectively canceled using the phase trick. The remedy is less effective when two percussive tracks—which include synthesizers—land next to each other. This solution also works better on low frequencies than on higher ones. (It's also an old trick used by engineers looking to eliminate headphone leakage onto tracks.)

Digital bounces also have potential problems, the most egregious being converter delays, which can lag bounced tracks between 0.5 and 1 millisecond behind the rest of the tape. "That's enough to be annoying," says Dodd. "If you're going to bounce portions of instruments, like a drum kit, you're better off bouncing the whole kit, even if it means using more tracks." For instance, instead of bouncing the overheads and rack-tom microphones to a stereo track and leaving the kick and snare on their original tracks, bouncing the snare and kick to one or two other tracks will keep them in perfect sync with the rest of the kit. The alternative is to use a high-quality delay line to sync back the kick and snare during the mix.

MDM BOUNCING

Track bouncing on the new MDM decks, the Alesis ADAT and Tascam DA-88, seems relatively straightforward. Although internal bounces can be done, most users prefer to route signal through the console for this procedure, citing better control over

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level and access to EQ and effects for the combined tracks.

Frank Piazza, co-owner of an ADAT-equipped project studio in New York and producer of music for TV cartoons through Livingston/Piazza Productions, cautions MDM bouncers to be aware of enhanced high end in combined tracks. "You get dazzled by the crisp, clear high end of digital," he says. "That can lead to a problem: When you combine tracks in a bounce, that high end becomes cumulative on the bounced track, and the end result is too bright. I'd rather add high end to the track in the final mix." Piazza rolls off some top end above 5 kHz in his bounces and prefers not to print any effects on bounced tracks.

Piazza adds that microphone choice is also critical on MDMs, again because of the enhanced high end, and that also affects bounced tracks. "If you're using inexpensive microphones, their imperfections will get picked up on the ADAT," he explains. "Once you combine a six-part vocal section using microphones like that, the cumulative effect really shows up."

David Peacock, of Cutting Edge Productions (Riverdale, NY), likes to bounce internally, and thus digitally, on the ADAT. The limitation is that process requires two or more units, linked by fiber-optic cable, and you can't bounce multiple tracks down to a single track. However, the benefit Peacock has found is the ability to create vocal and other types of comp tracks from multiple tracks, then send those to a single new track, all digitally. "There's also no level control when you're bouncing digitally," he says. "But that's more convenient in some ways. It makes the process simpler."

Robert Agnello, whose Manhattan-based On the Lamb Music produces alternative music scoring for the cable-TV kids' show *Pete & Pete*, says that going through the console for bounces on his Tascam DA-88 doesn't add noticeable noise or artifacts to the bounce mix and allows additional control over the result. "I prefer to come back through my two Mackie consoles for EQ and better level control," he says. "It's harder to control the level bouncing internally." Agnello also prints effects most of the time during bounces. "It locks

THE 10TH ANNUAL TEC AWARDS

NOMINEES

Listed below are the nominees chosen by the Nominating Panel of the Tenth Annual Technical Excellence & Creativity Awards. The TEC Awards will be held Friday, November 11, at the Westin St. Francis in San Francisco. For more information, contact Karen Dunn (510) 939-6149.

OUTSTANDING INSTITUTIONAL ACHIEVEMENT

ACOUSTICS/FACILITY DESIGN COMPANY
ARcoustics, Inc., New York, NY
BOTO Design Architects Inc., Venice, CA
Russ Berger Design Group, Inc., Dallas, TX
studio bau:ton, Los Angeles, CA
Walters-Storyk Design Group, Highland, NY

SOUND REINFORCEMENT COMPANY
Audio Analysts, Colorado Springs, CO
Clair Brothers Audio Inc., Lititz, PA
Electrotec Productions, Inc., Canoga Park, CA
MD Systems, Nashville, TN
Sound Image, San Marcos, CA

MASTERING FACILITY
Bernie Grundman Mastering, Hollywood, CA
Gateway Mastering, Portland, ME
Masterdisk Corp., New York, NY
Masterfonics, Nashville, TN
Sterling Sound, New York, NY

AUDIO POST-PRODUCTION FACILITY
Howard Schwartz Recording Inc., New York, NY
Pacific Ocean Post, Santa Monica, CA
Skywalker Sound North, San Rafael, CA
Sync Sound, New York, NY
Todd-AO/Glen Glenn Sound Studios, Hollywood, CA

REMOTE RECORDING FACILITY
Effanel Music Inc., New York, NY
Le Mobile, Los Angeles, CA
Record Plant Remote Inc., New York, NY
Reelsound Recording Co., Austin, TX
Remote Recording Services, Lahaska, PA

RECORDING STUDIO
A&M Studios, Los Angeles, CA
Conway Studios, Los Angeles, CA
The Hit Factory, New York, NY
Record Plant, Hollywood, CA
Sony Music Studios, New York, NY

OUTSTANDING CREATIVE ACHIEVEMENT

AUDIO POST-PRODUCTION ENGINEER
Ken Hahn
Lee Murphy
George Meyer
Gary Rydstrom
Wylie Stateman

REMOTE/BROADCAST RECORDING ENGINEER
Guy Charbonneau
Biff Dawes
Randy Ezratty
David Hewitt
Kooster McAllister

SOUND REINFORCEMENT ENGINEER
Robert Colby
Dave Kob
Ricky Moeller
Greg Price
Robert Scovill

MASTERING ENGINEER
Greg Calbi
Ted Jensen
Bob Ludwig
Glenn Meadows
Doug Sax

RECORD PRODUCER
Walter Becker
Tony Brown
David Foster
Brendan O'Brien
Don Was

RECORDING ENGINEER
Ed Cherney
Bob Clearmountain
Steve Hodge, Dave Rideau
George Massenburg
Roger Nichols

OUTSTANDING TECHNICAL ACHIEVEMENT

SIGNAL PROCESSING TECHNOLOGY
Analog Devices AD1890/AD1891 ASRC Chips
DigiTech TSR-24 Digital Multieffects
Eventide DSP4000 UltraHarmonizer
Lexicon Alex Digital Reverb
Roland SRV-330 Digital Multieffects
Yamaha SPX990 Digital Multieffects

RECORDING DEVICES/STORAGE TECHNOLOGY
Akai DR4d Digital 4-Track Recorder/Editor
Digidesign Pro Tools 2.0
Fostex RD-8 Digital 8-Track
Sonic Solutions Quattro Workstation
Sony PCM-9000 Disk Recorder/Editor
Tascam DA-88 Digital 8-Track

LARGE FORMAT CONSOLE TECHNOLOGY
AMS Logic 3
AT&T DISQ System
Euphonix CS2000
Otari Concept 1
Solid State Logic G-Plus
Sony DMX-6000

SMALL FORMAT CONSOLE TECHNOLOGY
D&R Vision
Mackie 8-Bus Series
Soundcraft Spirit Studio LC
SoundTech Panoramic
Soundtracs Topaz
Studiomaster P7

SOUND REINFORCEMENT CONSOLE TECHNOLOGY
Allen & Heath GL-2
Crest Century LM Monitor Console
DDA QII
Midas XL3-48
Soundcraft Vienna II
Yamaha PM4000M Monitor Console

MUSICAL INSTRUMENT TECHNOLOGY
Akai CD3000
Alesis Quadrasynth
E-mu Morpheus
Kurzweil MicroPiano
Roland S-760 Sampler
Yamaha VL1

MICROPHONE TECHNOLOGY
AKG C414B/TL II
Beyer MC834
Manley Reference Gold Series
Neumann TLM193
Sennheiser MKH80
Shure Beta 87

STUDIO MONITOR TECHNOLOGY
Alesis Monitor One
Apogee Sound MPTS-1
Bag End ELF System
KRK 7000B
Quested Q208
Tannoy PBM 6.5 MkII

SOUND REINFORCEMENT LOUDSPEAKER TECHNOLOGY
Apogee Sound AE-9
Clair Brothers R-2DP
Eastern Acoustic Works KF852/BH852
JBL SR Series II
Meyer Sound Labs MSL-5
Turbosound Floodlight

COMPUTER SOFTWARE & PERIPHERALS TECHNOLOGY
Digidesign SampleCell II
Emagic Logic Audio
Innovative Quality Software Software Audio Workshop
Opcode Vision 2.0
OSC Deck II
Passport Producer Pro

AMPLIFIER TECHNOLOGY
Crest 7301
Crown MA-36X12
Demeter VT275HF
Hafler Trans-Nova 9505
Hot House M500 HV
Stewart PA-1400

ANCILLARY EQUIPMENT
Apogee Electronics UV1000 CD
Audio Precision ATS-1 Test System
Brainstorm Electronics SR-15+
Millennia Media HV-3 Preamp
Roland SRC-2 Sample Rate Converter
Tech-21 SansAmp PSA-1

HALL OF FAME
Frank Zappa

LES PAUL AWARD
Herbie Hancock

WATCH FOR YOUR VOTING BALLOT IN THE AUGUST ISSUE OF MIX MAGAZINE.

me into making a decision. Otherwise, I could go on doing hundreds of mixes, and that's not something you want to do when working with the deadlines of television."

In Nashville, Profile Audio partners Mark Lambert and Alan Shipston use their DA-88 system in conjunction with a Digidesign Pro Tools hard drive system, synched with a Digidesign Slave Driver. The bounces tend to go one way, sending edited tracks from the Pro Tools to the DA-88, a premix approach that provides flexibility. They haven't purchased the digital interface for the Tascam deck, so their two-way bouncing is limited. "You don't want to go through the converters more than you have to," Lambert explains. "You lose both dynamic range and some top-end brilliance when you send the signal through four sets of converters in a two-way bounce. The best bet is to get edits you're happy with, then bounce those four tracks off the hard drive down to the tape system."

It's ironic that the premix, one of the most functional tools of the early multitracking days, is once again such an important component of recording. The fact that digital recording is less noisy doesn't take away from the basics of the operation. A good mix still boils down to good planning and careful level and effects control. ■

Dan Daley is a Mix *contributing editor.*

MEGATAKING, DIGITAL STYLE

There are many ways to get more tracks in a Modular Digital Multitrack system, such as borrowing more transports, synching to MIDI or bouncing tracks. Here are a couple of slick tricks that can turn your ADAT or DA-88 setup into a real production powerhouse.

According to George's Second Law of Studio Reality, if you need "X" number of tracks, then the number available will always be exactly X minus one. Yet, with a multitransport MDM system, you can easily avoid such limitations, without resorting to the obvious solutions, such as renting or borrowing machines.

I call this method "megataking." No, it's not a typo for megatracking. This technique allows you to do as many *takes* of a track as you want, limited only by your tape budget. Best of all, it works on any MDM system with 16 or more tracks.

Let's assume you have a 24-track system, and you've filled all the tracks. Then on playback, you wonder if the sax solo on track 22 could be a little better. It's the classic producer's dilemma: "Should we erase a perfectly good take on the chance that we could do a better one?" You're out of tracks, so this is no easy decision to make. Fortunately, you're using an MDM system, so let's do a little megataking.

Grab a new, preformatted tape and make a clone copy of Tape 3, which contains tracks 17-24. Now replace Tape 3 with the clone, and you can record over the old solo on the clone tape *without* jeopardizing the original performance. Once you get a performance you like, you can either keep it or stick with the original solo. If you're really undecided, you can continue this megataking process with as many clone tapes as you wish.

A further variation on megataking involves making a clone of Tape 3 and then filling all of the tracks *except* #22 with up to seven different sax solos. Later, the producer can pick from these seven and copy the selected track onto track 22 of the original session tape. As another alternative, the engineer could do an assembly edit, copying the best sections from three solos into one seamless composite performance (created on clone track 22) and then copying the composite back onto track 22 of the original session tape.

I have found the latter techniques especially useful for lead vocals, where I can choose, say, the first verse and chorus from take one (recorded on track one), the bridge from take 2/track 2, and the second/third verse and choruses from take 3/track 3. With a little cut and paste, just about any vocalist can sound like Pavarotti—well, sort of like Pavarotti...

Reprinted from Modular Digital Multitracks: A Power User's Guide, *available through Mix Bookshelf.*

—George Petersen

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by Paul Potyen

THE RESIDENTS' "FREAK SHOW"

MULTIMEDIA EYE-CONOCLASTS

Anyone who is familiar with the work of The Residents knows that this group of enigmatic and creative individuals probably possesses the best imaginable set of credentials for producing an interactive multimedia entertainment piece. And *The Freak Show* is just that: a successful blend of quirky music, amazing graphics and animation, and a story that could only come from the minds of the mysterious amalgamation known as The Cryptic Corporation, the Residents' production company, considered by many to be "freaks" themselves, and suspected by many to comprise the bandmembers.

The San Francisco-based Residents have been creating their own off-beat brand of music, music videos and performance art since 1972. *The Residents Freak Show*, a Macintosh CD-ROM disc published by The Voyager Company, is a logical incarnation of their creative energies, which have resulted in more than 20 LPs, numerous music videos, TV and film scores, and experimental live performance art tours such as *Mole Show*, *The 13th Anniversary Show* and *CUBE E: The History of American Music in 3 E-Z Pieces*. Within the Freak Show circus tent, you discover the bizarre stories and fantasies of Wanda the Worm Woman, Harry the Head, Jelly Jack and others, through animation, photos, comics, music and music videos.

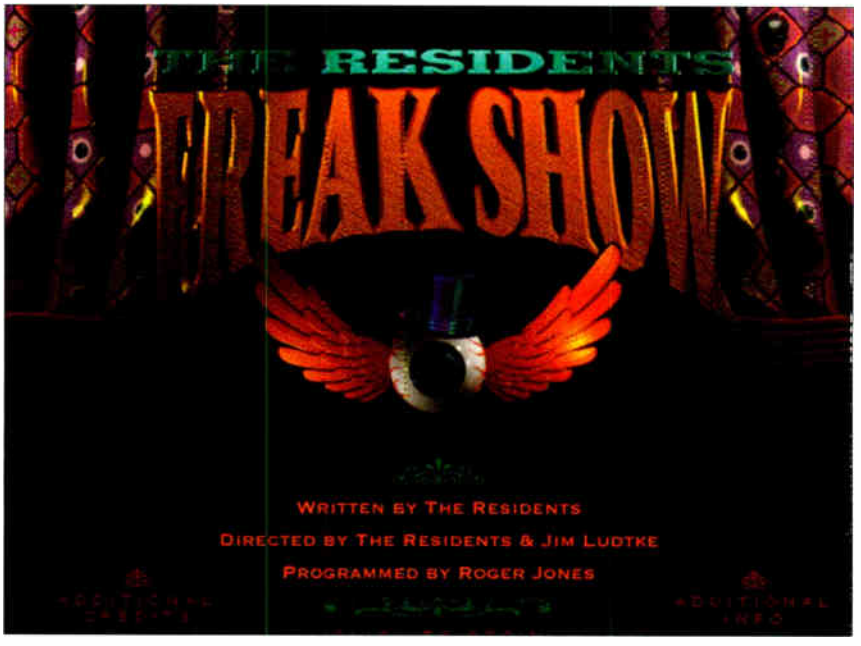
The group's members usually eschew publicity—refreshing in today's hype-fueled world—having decided at the outset that the personal details of the individuals were irrelevant to the group's work. However, this interview with Hardy Fox, president of the Cryptic Corporation, provided a rare opportunity to get an insider's perspective on the work of this unique group of artists.

You dedicated* The Residents Freak Show *to P.T. Barnum, "whose legacy of 'suckers' and 'freaks' defined the yin and yang of outcast culture." Would you elaborate on that?

Barnum took it from a slimy aspect of show business to a kind of "high art" in New York in the mid-19th century. He really created the concept of the freak show. The public saw freaks, but the freaks saw suckers. One was no better than the other, except from their own perspectives. The freaks really considered themselves as having special talents and proved it by getting suckers to give them money.

Do The Residents consider themselves freaks?

They do. That's basically how the whole thing started. They had finished the lengthy CUBE E tour. Touring sort of wears you down and affects your mind. The album grew out of this feeling that people were paying to watch other people who have eyeballs for heads. [For years, The Residents have appeared in public wearing giant eyeballs over their heads to conceal their true identities.—Ed.] From that came the *Freak Show* album. The album was translated into *Freak Show*, the graphic novel. It was published by Dark Horse about a year after the album



Top: Opening credit screen. Bottom, from left to right: Wanda the Worm Woman makes her living by letting people watch her suck worms; behind the circus tent with Tex the Barker; if you pour the ex-lion tamer a few drinks in the privacy of his trailer, he'll reminisce.

came out. Then those two things became *Freak Show*, the CD-ROM.

At what point did the idea occur for an interactive treatment of this subject matter?

Pretty much as soon as people started talking about CD-ROM. The Residents are computer-literate, and they have samplers with CD-ROM drives for their sounds. So they understood the potential that the medium offered them at a very early stage in its development. They also get a certain amount of support and encouragement from the computer world. They were very fortunate to have met Jim Ludtke [the project's co-director, animator and designer] several years ago when they were in New York, trying to transfer visual material from the Mac to videotape at a time when that was not easy. He helped make that transfer. That was the beginning of the relationship. Then a couple of years ago, Jim moved to San Francisco so the CD-ROM could really go.

It took about a year to record the *Freak Show* audio CD, and then it took two more years to become a CD-ROM. Remarkably enough, the audio CD has been repackaged and is being released in April as the soundtrack to the CD-ROM. Sometimes the tail wags the dog.

Did you re-create the music for the CD-ROM, or did you modify existing audio content?

The audio CD was produced using the computer, and every step of the process was backed up. It was possible to go back and find any version we wanted—without vocals, or vocals only, for example. So we could rebuild tracks from the original elements. Obviously, there was additional dialog recording for the CD-ROM.

We used a Pinnacle Micro PMO magneto-optical recorder in connection with four channels of Digidesign Pro Tools in producing the audio CD. The PMO 650 uses 650MB cartridges (325 per side) and was really critical to our ability to do all this work. We also used an ADAT, which was locked to Pro Tools via SMPTE. This was all recorded three years ago, so not much of the sampling equipment that we used then is still around.

How do you know when to hand off a portion of your project (for ex-

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ample, letting Jim Ludtke handle the graphics), as opposed to doing it yourself? How do you find the right people to hand off to?

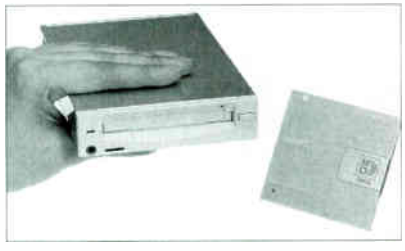
Basically, all of us were astounded by Jim's work. And even more so, he was interested in doing it. He was so excited about doing it that he was willing to do it within the constraints of the CD-ROM budget. He was at a

*inter*media '94: Long on Titles, Short on Breakthroughs

According to the Optical Publishing Industry, as of March 1, 1994, more than 8,000 CD-ROM titles are in print (an increase of 54% over 1992), and the total worldwide commercial installed base of CD-ROM drives is 11.4 million (up 155% from 12 months ago). As one might expect, the 1994 *inter*media conference, held in San Jose, Calif., in March, provided ample evidence of these statistics. More than 300 exhibitors were on hand at the sold-out event, an increase of 33% over last year's show.

Of particular note to interactive music buffs was the announcement from Compton's NewMedia of a joint venture with Warner Bros. Consumer Products to produce a John Lennon CD-ROM. The interactive tribute to the famous Beatles songwriter will provide photos, video, CD-quality audio of unreleased music and text from Lennon's writings, including many unpublished works. It will be offered in Windows and Macintosh formats this fall.

Despite the abundance of new CD-ROM titles on parade, only a few important announcements ensued from this year's *inter*media event. Among them was Sony's introduction of its MD DATA drive, a rewritable storage device based on its MiniDisc audio technology.



Sony MDM 111 MD Data Drive

Scheduled to be available for OEM customers in April as an internal unit that fits into desktop computers, the MDM 111 uses 2.5-inch-diameter, magneto-optical discs with a storage capacity of 140 MB. The device will accept rewritable, read-only and hybrid (read-only and rewritable sections) media.

Commodore announced plans to introduce its Amiga CD32 CD-ROM player in the U.S. this spring. (As of March, more than 100,000 units have been sold in Europe.) Priced at $399, the 32-bit system will also be able to run MPEG full-motion video with an optional $249 card. More than 100 titles were expected to be available for the player by ship date. Oddly enough, Commodore's only presence at the show was for the industry announcements.

Other news included the release of Yamaha's new CDR100 CD Recorder, capable of reading and recording data at 1x, 2x and 4x-speed. The unit, which is used in

Yamaha CDR100 CD Recorder

connection with PCs, Macs and workstations via SCSI, handles all standard formats, including Yellow Book, Red Book, CD-ROM XA and CD-I. Also of note was an April release of Director 4.0 from Macro-Media. The new version of that company's multimedia authoring software for the Macintosh offers faster script execution, which translates into decreased load times and smoother playback of animation and video.

Due to the anticipated increase in demand for exhibitor space, next year's *inter*media conference will be held within the larger confines of San Francisco's Moscone Center. ■

point in his life where he wanted to do something else besides what advertising agency art directors had been hiring him to do.

What about the programming?

Well we couldn't have been much luckier. It runs under the [MacroMedia's] Director [authoring system] shell. Our programmer is Roger Jones, who is one of the people who wrote Director. It turns out he was a Residents fan, and when the opportunity came up, he took it. There's a lot of code in there that you won't find in Director. A CD-ROM of the complexity of *Freak Show* will not run as fast as this does. He programmed a lot of interesting things into the CD-ROM, including a certain amount of intelligence. The program will make assumptions about what you're going to do next and prepare for it in advance in order to speed it up.

Also, I noticed that the first time you come to a sideshow, the barker shows up, and if you don't want to listen to him, you click on the screen. He says something insulting and leaves. But if you come back to that same sideshow, he won't show up again because he knows you've already been there.

That's one of the areas that we found most interesting. We'll probably be exercising it more in our next title.

Can you describe the sequence of steps you took to get from vision to completed title?

Since it was spinning off of two existing projects—an audio project and a graphic novel—we had a basic idea for using that material to tell the stories of these freaks. There were no board meetings or anything like that. It was very organically grown, and constantly changed. It just kept getting bigger and bigger until it finally filled the disc. Some things never got on there because there wasn't room.

What Jim brought into it was a dual emphasis: There were the tent performances, and then there was a backstage area where these people lived in their trailers. So the characters were presented in their professional life, as well as their private life. It was a brilliant idea.

At what point did The Voyager Company get involved?

Pretty early. We had done a laserdisc for them called *Twenty Twisted Questions*, which was a 20-year retrospective of video, live performance and recordings. They were very pleased with that, and when we presented them with this idea for a CD-ROM, it took about five minutes of explaining to get them to say, "Let's do it." They went with a verbal description; we didn't have a demo. They're probably the only company that would have done that. It also helped that [Voyager president] Bob Stein had seen one of our performances and liked it.

And from a financial standpoint, it's absolutely a success. It is literally flying out the doors. Voyager is saying it's far and away their biggest hit ever.

How do you feel about the end result?

I think the general attitude is that we're right up around 95 percent on it, which is about as high as you can go. We feel it's a success, particularly since we didn't really know what we were doing in the process. We all agreed at the outset that it should have emotional impact. We wanted something that would at some point make you feel a little strange. We didn't want something that you merely watch and then click here or there. Most of the CD-ROM titles out there are quite removed from the human, emotional side.

How did you try to accomplish that emotional grab?

We tried to give character to the freaks that are in it. And to some degree, we wanted to imbue a sense of caring about the characters, even though they're just cartoons. Part of it is done by giving them history and personalities, and letting them have pain. Ultimately, everyone is a freak in some way. We may not have massive deformities, but despite our similarities, we are all different from each other. We wanted to call on our empathy with our sameness, as well as our empathy with our uniqueness. While we worked on the project, we were too close to it to know if we really accomplished that.

We wanted the section on the real human freaks to be separate from the rest of it. We felt there was something to teach there—something interesting about humanity in that section about real people who really did interesting things. Some of them were in pathetic situations, and some of them were simply fascinating characters. We felt that the inclusion of that last section made it a more broad, multilayered project.

Where did you find the content for the last section, and how did you get the rights to it?

Finding it is just a matter of research, a lot of which had already gone into the album. When The Residents work on a project, they get interested in it. We discovered that the pictures are publicity photos. The thing about the real-life freaks is that a freak is not a deformed person: It's a person who markets themselves. So they all had promotional photos because they were all selling their deformities to the "suckers."

The Residents have never been afraid to embrace technology in pursuit of their creative vision. And yet you never become "seduced" by it. Has this always been true for you, and do you consider this approach to be a key to your creative success?

The Residents use technology as a means to an end. They don't always know how to use the tools very well. They could not possibly have programmed this CD-ROM, but they have ideas about how it should be done.

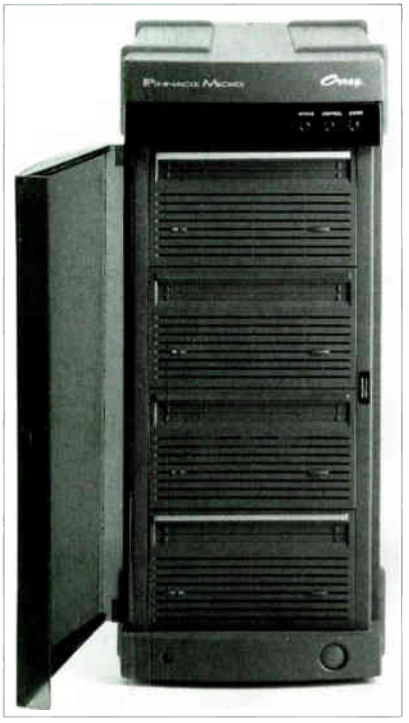
They are quite fascinated by technology, but one difference between *Freak Show* and other CD-ROMs is its total lack of "techyness." There are no buttons on the screen, and no "instrument panels." It was important that the technology be invisible. The cursors turn into icons that give ideas about what to do and where to go. The interface does not have a steep learning curve. Even a child can quickly figure out what's interesting on the screen. The technology is invisible.

* * *

The Residents Freak Show CD-ROM is available from Voyager's distributors, including the Residents' own mail-order branch, Ralph America ([800] 795-3933). Voyager is currently porting *The Residents Freak Show* over to the PC platform, and it is expected to be available in the fall. And The Residents have a new CD-ROM in the works. In addition, the Freak Show Live Show is currently scheduled to run for about three weeks in April, '95 in Prague, Czechoslovakia. And *Freak Show, the Movie* is currently in the talking stages. "Who knows," says Fox, "maybe there'll soon be a Freak Show Amusement Park." ■

Mix associate editor Paul Potyen is part freak, part sucker.

MULTIMEDIA CHIP SHOTS



Pinnacle Micro Orray

PINNACLE MICRO ORRAY

Pinnacle Micro Inc. (Irvine, CA) introduced its new Orray 5.2GB optical disc drive, combining the multihead, multiplatter approach of magnetic drives with the removability and reliability of MO systems. The Orray offers data transfer at up to 8 MB per second in streaming or transaction-based modes, with an intelligent, high-speed Intel RISC processor. Standard operation provides management of media defects by the ANSI X3B11 and ECMA 1.3GB 130mm specifications for interchangeability, and Orray operation features even stricter standards for handling defects.

Circle #201 on Reader Service Card

CREATIVE LABS SOUND BLASTER AWE32

At *inter*media in San Jose, CA, Creative Labs Inc. (Milpitas, CA) unveiled the most advanced Sound Blaster card to date, incorporating the digital sample playback synthesis capabilities of E-mu's EMU8000 integrated audio DSP. The card supports 32-voice MIDI polyphony, as well as independent control of special effects (reverb, chorus or QSound), and vibrato and tremolo for each voice. Sound Blaster AWE32 also offers 16-bit stereo recording and playback up to 44.1 kHz, with real-time compression and decompression of audio files. Retail price is $399.95.

Circle #202 on Reader Service Card

MICROBOARDS VIDEOVIEW 1000

This new multifunction multimedia player from Microboards Inc. (Carver, MN) supports video production viewing, as well as other multimedia applications for industrial and commercial use. The board-level player forms the basis for various custom-configured multimedia systems and supports playback from CD-I, CD-Audio, CD-ROM/XA, CD-DA, CD-Video, data communication devices, hard disks and SCSI devices such as DAT, MO and IC cards.

Circle #203 on Reader Service Card

SYQUEST SQ5200C HARD DRIVE

SyQuest released its first 200MB, 5.25-inch removable hard cartridge drive, providing a SCSI II interface that reads and writes to 44, 88 or 200MB SyQuest cartridges. The new drive offers near-line storage, system sharing and fast backup. An average access time of 18 ms, sustained data transfer rate of 1.9 MB/second and a Mean Time Between Failure rating of 1,000 hours complete the package, expected to retail for about $599. Additional cartridges will run about $99-$109.

Circle #204 on Reader Service Card

MARK OF THE UNICORN PERFORMER 5.0

Mark of the Unicorn (Cambridge, MA) upgraded its popular Performer sequencer for the Macintosh. New features include support for color monitors; MIDI Machine Control for working with any MMC-compatible device, including the Alesis ADAT and BRC, and Tascam DA-88; a Groove Quantize feature with a unique graphic slider interface to control timing, velocity and duration in any of ten beat divisions; enhanced QuickScribe score notation; and drum machine-style cycle recording with a full graphic interface. Also included are 50 free DNA Grooves from WC Music Research and the Drumtrax library of drum patterns. List price is $495.

Circle #205 on Reader Service Card

VIDEOFUSION QUICKFLIX! 1.1

The new version of QuickFLIX! software from VideoFusion Inc. (Maumee, OH) has been optimized for use with the new PowerPC Macintoshes, providing dramatic improvements in QuickTime movie rendering and processing speed. It also takes advantage of the speech-recognition capabilities of the Macintosh AV series, giving users the ability to create, edit, layer and add effects to QuickTime clips entirely by voice command. Suggested retail is $149.

Also new from VideoFusion Inc. is version 1.6 of its VideoFusion professional editing and effects software, also with optimized support for the Macintosh PowerPCs. In addition, it offers enhanced special effects and support for Avid Technology Open Media Framework standard.

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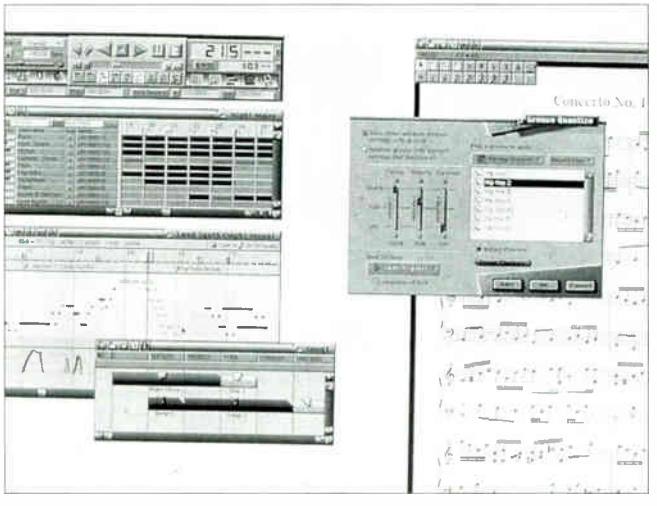

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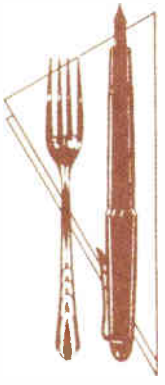
by Mr. Bonzai

RICHARD THOMPSON

BURNING BRIGHT



There's a devilish grin on Richard Thompson's face as he steps away from the microphone and lets the audience take the chorus on one of his much-loved songs. "Cry, cry/If it makes you feel better/Set it all down in a tear-stained letter." A rowdy crowd is joined to form an impromptu glee club of righteous rudeness. His new *Mirror Blue* is jammed tight with songs of grit and poetry that a haiku master might admire for its crystal clarity and brevity of expression. And you pickers are gonna head for the woodshed when you hear the commanding touch of this 30-year top rankster and prankster.

Thompson first gained recognition as a trailblazing guitarist, then singer/songwriter with Fairport Convention in the late '60s. In his crucible of American folk forms, blues and Appalachian balladry, Celtic classics and basic rock 'n' roll, he cooked up the best of British folk-rock. He followed with a memorable long-term stint with his talented (ex-)wife Linda. Thompson's been solo now for a long time, but he always works with a select group of top cats.

Produced by studio-maestro Mitchell Froom and engineered by Tchad Blake, he's created an exquisite collection of rockers and ballads. Guitars are ablaze and smoldering, laced with a mighty odd assortment of booming percussion and exotic instrumentation. His singing is at a height of powerful resonance, phrasing and freedom. After the 27-song concert featuring his Banshee electric wails and the most meticulous of

PHOTO: PETER SANDERS

acoustic picking, *L.A. Times*' critic Chris Willman called him the "Jekyll and Hyde of guitar heroes."

We met for an early lunch—bagels and mineral water—in Mr. Thompson's gargantuan office in the Capitol Records Tower. No, it's just an empty boardroom, and he's hanging up the phone as I enter...

Bonzai: What's that I overheard about your guitar—did you lose it?
Thompson: No, it's just in the shop for a lot of electronic work to be done.
Bonzai: What kind is it?
Thompson: It's a Loudin acoustic guitar, made in Northern Ireland—a really great guitar, but it's had a hard life. It needs work, and I'm upgrading the electronics.
Bonzai: How many guitars do you have?
Thompson: Probably no more than eight—a modest total. I've got two Loudin acoustics, two Ferrington acoustics, a Ferrington acoustic baritone, a Ferrington electric, two Fender Stratocasters, and a couple of other things mucking around.
Bonzai: The current album, *Mirror Blue*—is it the best one of your career?
Thompson: I wouldn't know, really. I think I've been fairly consistent for the past ten or 12 years, haven't fallen below a certain level. I think it's pretty good, and it's up there. There are songs on this album that I really like, and in a year or two I'll know if it's any good. We'll see if it has a shelf life.
Bonzai: The triumvirate of yourself playing, Mitch Froom producing and Tchad Blake engineering has been an ongoing relationship. How does a team like this help out a steadily developing product?
Thompson: Or regressing product. [Laughs] It can be both a good thing and a bad thing. It can be revitalizing, or stimulating to change and find new people. But there is definitely something to be said for developing an understanding with people. We've made four records together, and improved. I always felt that there was somewhere else to go, there were more ideas and it was getting more exciting. Excitement is an important word: It's fun to make records with Mitchell and Tchad. We go and have a good time.
Bonzai: You certainly get some exotic sounds. Has Tchad ever been pushed to the wall and blown a gasket trying to accommodate you?
Thompson: I think so, yeah. The good thing about the three of us working together is that we pull in different directions, in terms of style and aesthetic, and tension. It's a great and friendly tension, so it's generally creative.
Bonzai: The new album has some rather strange instruments, attributed to Phil Pickett. Who's he?
Thompson: *Professor* Phil Pickett. Let's give him his fair due. He's probably the leading British early music specialist at the moment. He has his own consort, which is known internationally. When I first met him he was nothing, of course [laughs], and I've put him where he is today. Phil is great, an early musician with a rock 'n' roll heart. He loves to actually play loud and aggressively. He plays everything, and manages to play stuff in the wrong key, thanks to masking tape.

Bonzai: In the wrong key?
Thompson: Well, you take a shawm, a very inflexible instrument, which plays in C or F, and I'll say, "Sorry, Phil. This track is in B flat. Is there any hope? Do we have to speed the machine up?" He'll say, "Just a minute." Then he gets out his masking tape and starts blocking holes off, and half holes and manages to get things in tune. He's a fine musician and a great eccentric.
Bonzai: Who picks the instruments?
Thompson: In Phil's case, I know enough about early music to suggest something. He might come back with, 'Actually that would sound better if you used two alto krumhorns, two shawms, and maybe we'll bring a sackbutt in.' He has the arranging experience. On some records, we've had Phil playing up to eight parts, which just sounds wonderfully aggressive, and really has a rock 'n' roll sensibility. Much more than a synthesizer, because it's much ruder—an ill-tempered selection of instruments. And he gets that real nasal, double-reed sound. Wonderfully impolite.
Bonzai: Do the strange instruments ever slow down the recording process?
Thompson: In these cases, we do overdubs. We basically try to get everything live, and then fly to England for Phil's parts.
Bonzai: As a solo artist, how is it different from your many years as a member of groups and collaborations?
Thompson: It gives you a lot of freedom, pays the rent.
Bonzai: You mean your group work didn't pay the rent?
Thompson: When I left Fairport Convention, we were on £20 a week, back in 1970-71.
Bonzai: Of course the pound was worth a lot more then...
Thompson: Not that much more. [Laughs] We were only on subsistence wages. Started off on £12 a week, just enough to pay the rent and scrape by. It was great because we wouldn't have cared if there was no money. It was total enthusiasm, and you can do that for a while when you're young.
Bonzai: And you were so young—17, 18 years old and playing some pretty good guitar. When did you start playing?
Thompson: I started when I was 11. Had a classical teacher for one year, and my sister's boyfriends used to teach me. They'd come round to pick her up, and she was always two hours late. We'd listen to the latest Buddy Holly songs and such, and I learned a lot.
Bonzai: Who were your heroes then?
Thompson: It was a real mixture, but I grew up with a lot of guitar music in the house because my father played. He had Django Reinhardt, Les Paul. My sister, who is five years older than me, was into rock 'n' roll, so we had Buddy Holly, Gene Vincent, Eddie Cochran. I also listened to classical players and started seeing live music when I was 14, going to folk clubs and listening to Davy Graham, Bert Jansch. We'd go to rock clubs like The Marquis and see The Who, which was very exciting, and The Yardbirds.
Bonzai: Did you ever see The Bonzo Dog Doo Dah Band?
Thompson: Many times, and we did

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some shows with them. I'm still in touch with Vivian Stanshall, wonderfully sweet man. London had 'em all: Spencer Davis Group, The Action. In my bands that preceded Fairport—same lineup, different names—we started listening to imported records, because we were interested in songwriters. We'd listen to Phil Ochs, Richard Fariña, early Joni Mitchell. A focus of the band was to do songs with great lyrics, and when we started to write our own material we were very lyrically conscious. This was actually unusual at the time.

Bonzai: Were you the main writer?

Thompson: Myself and Sandy Denny.

Bonzai: In the early days of Fairport you weren't singing, and then stepped forward in...

Thompson: 1970. Sandy Denny left the band, and she was a great singer. We thought, she's irreplaceable. We looked at each other, looking for the next vocalist and there wasn't an apparent one, so we just shared it. Three of us sang, and we weren't born singers, so we had to learn, and I'm still learning.

Bonzai: Is playing the guitar a form of exercise?

Thompson: Depends on whether you play sitting down or standing up, I suppose.

Bonzai: A form of escape?

Thompson: Could be a form of escape, but I think actually it's more a form of connecting with your inner being, your inner reality.

Bonzai: Aggression?

Thompson: It can be a way that aggression is expressed. I think performance is a way of expressing aggression. I would broaden the idea to include the whole of performance. I find that you have to attack the audience sometimes—do a preemptive strike and get to the audience's airfields before they can start throwing tomatoes at you.

Bonzai: Are audiences treating you nicer now than in the past?

Thompson: Generally, they're treating me nicer and nicer. Depends on what part of the world.

Bonzai: Where are you most popular?

Thompson: Probably the United States. Europe's pretty good. Japan's not bad—I'm overdue a trip to Japan, so I hope they forgive me. I'm trying to get back, but we just had a baby, and it's hard to travel for a while.

Bonzai: When you look back, do you ever cringe at the confessional nature of your songs?

Thompson: No, if anything I tend to regret that I wasn't more forthright. Especially when I was younger, I was afraid of expressing myself. I just couldn't say "I love you" in a song. It was too naked, so I pulled veils over it and I am guilty of that.

Bonzai: My Thompson theorem: You grew up singing the sad stories of other people, the folk troubadour with a fiery guitar, and now tell tall tales of your own troubles with a resonance that reaches back through countless centuries. How did your folk days help you?

Thompson: I think tradition is very important. To come from tradition gives you solidity, and a confidence to experiment and explore. As they say, "those who don't know their history are doomed to repeat it." If you don't know what the past is, you can't invent the future. To be modern, contemporary and forward-looking, you have to know where you came from. There is such strength in

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Ah, decisions, decisions. You want to buy a new multitrack recorder, and you want to go digital so that you'll get the best possible sound quality. And you'd like to buy a hard disk recorder, rather than tape, so you can get random access editing power. And finally, it's got to be something you can really afford. But there's a problem.... don't all hard disk systems require expensive add-in hardware and software, to already expensive computers? Not anymore!

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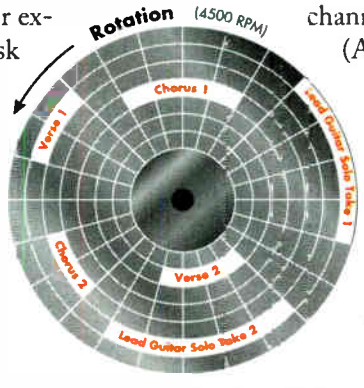

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traditional music. Compare a typical pop song with a Scottish ballad—no question which is the greater song by several hundredfold. It's been sung for hundreds of years, and all the bad verses have been dropped. The language is refined, and so strong, colorful, immediate. So much is conveyed in one verse, staggeringly good, and yet, it is popular music. If you study that, it can give you a strength, a wonderful base to build on.

Bonzai: What's the story with that little statue of you on the cover?

Thompson: They made 17, and we smashed two. I intend to smash them all: The whole point is "anti-iconic icon."

Bonzai: Who is the most amazing artist you've worked with?

Thompson: [Drummer] Jim Keltner is pretty amazing. He does things in a quiet way, and you find yourself asking, How does he do that? He'll do something technically outstanding, in a very musical way. John Kirkpatrick, the accordion player, is so good, so subtle. He's singing and he's playing harmony on this hand, and countermelodies with the other. He's got to have three brains.

I look up to a lot of people. Especially dead people. Charlie Parker is somebody to look up to. Ravel. If you are a rock 'n' roll musician, you can look up a long way—there's a long way to go. You look at your jazz and classical heroes, and you realize that it's a long hill to climb.

Bonzai: What's your opinion of the music scene today? Are we going someplace?

Thompson: It's hard to say. There seems to be a lot of recycling around.

Bonzai: Good for you, though?

Thompson: It's probably good for me. Great for Rod Stewart, or Black Sabbath, who probably thought they'd never have a career past the age of 25, and they're still going strong at 50. That's fairly amazing. It's amazing there's another generation listening to the old fogeys. It's surprising and encouraging and depressing all at the same time. A lot of dance music I find very dull. A lot of rap music I find very, very dull. It's just endless recycling of old cliches, but surely popular music was ever thus. Popular music has always been 80% total tack. I suppose it takes time to see who survives the trends. Elvis Costello came out of punk, although he probably never was. Blondie came out of punk. A lot of good people came out of rock 'n' roll. There are waves and trends, and some musicians have more substance, more resilience, and are more serious about music than megalomania.

Bonzai: What is your next challenge as a musician?

Thompson: Oh, the next few records. I think of albums as challenges, so the next three or four records will be different things.

Bonzai: So you're thinking that far ahead?

Thompson: I'd like to do them all this year. I doubt I'll manage it, though.

Bonzai: What do you do now, about an album every two years?

Thompson: The whole cycle has gotten longer. It's harder to get through the touring cycle, the recording cycle, and then the promotional cycle in less than a year and a half, minimum. Which is a shame. It would be nice to put more records out.

Bonzai: Didn't artists used to release two records a year?

Thompson: One year, Fairport Convention had three records out: '68 or '69. But today, the media has become so important, and it takes so long to get the media geared up, and to get promotional departments geared up. It's the same with writing a book, or getting a film out. The machinery has to go into operation, because there is so much competition for media attention. If you're not out there being reviewed, or on the breakfast chat show, people won't be aware that you have something in the marketplace. It's a crowded market, and you have to shout as loud as everyone else.

Bonzai: But you're not afraid of this machinery, are you?

Thompson: Not afraid of it, but sometimes I don't think it's the best use of my time. I could be at home writing, or on the road performing. But I do see it as very necessary.

Bonzai: Here's another theory: I was listening to "Easy There, Steady Now," and it struck me that some of your songs are capturing a split second, a moment, an epiphany. This song is about someone who nearly crashes, but catches himself—that split-second perception.

Thompson: A song can often be about a stage rather than a station. A song can be a mood that passes very quickly. Sometimes you feel sad, but it doesn't last forever. Sometimes you feel crazy. It's good to have these things that change all the time, and it's good to have a song for those things. It's good to reflect those things. "Easy There, Steady Now" is about someone pulling themself back from the brink, and in the end, perhaps, he doesn't succeed. It's open-ended.

Bonzai: What is the biggest mistake of your life?

Thompson: Hmm...so many. You actually learn a lot from mistakes. I think that musically I wasted time, especially in the '70s. I should have been more focused, should have made better records. That's a professional regret. It was a tricky time, and it wasn't until punk came along that I felt that I knew what I was doing.

Bonzai: Any inspirational words for those thinking of entering, or leaving, the music business?

Thompson: Be honest. Tell the truth. Trust your instincts. And never eat at a restaurant called "Mom's." ■

Mix roving editor Mr. Bonzai first broke into the music business with Celtic rockers Erin Go Bragh-less.

Denzil Foster & Thomas McElroy

FROM OAKTOWN TO YOUR TOWN

by Chris Patton

With Platinum productions for such acts as Club Nouveau, En Vogue, and Tony! Toni! Tone! behind them, Denzil Foster and Thomas McElroy could undoubtedly coast on their reputations for a while. After all, what more do they need to accomplish? Well, *plenty*.

As partners in 2 Tuff-E-Nuff Productions, the Bay Area-based duo has ambitiously embarked on a project to build a world-class production facility in Oakland. The facility will host a recording studio, video editing room, practice hall with soundstage, offices and a lounge. Though primarily for in-house projects, parts of the facility will accommodate other commercial endeavors. Also new for the pair, using the name FMob, is a hot new album on East/West Records called *Once in a Blue Moon*, which blends elements of rap, jazz, hip hop and funk in a dynamic package.

Foster & McElroy's studio is being built in a renovated warehouse just a quarter-mile from the *Mix* offices, so we decided to meet there. Foster arrived first.

What were your musical influences growing up?

Foster: Being born in '62, the earliest stuff I remember was the Philadelphia sound that was big in the '60s. I also liked the Beatles and Otis Redding—man, I listened to a lot of Otis Redding. Aretha was big at the house. Blues, too, was big in the house. In the mid-'70s I got into funk. I kind of snuck in some Sly [Stone] before then, but after that, I really got into the Parliament-Funkadelic thing. When it took off, I was definitely there!

Did that influence the way you produce?

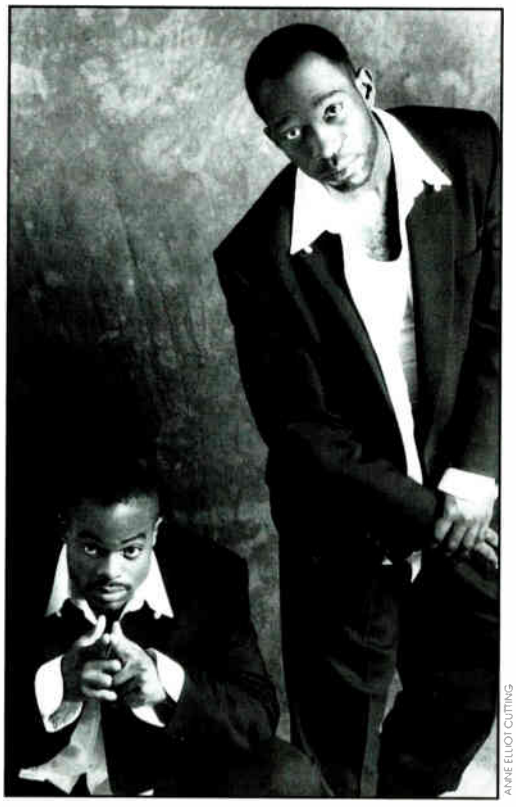
Foster: Oh, definitely! Even now I refer to that period for a sound when I'm recording.

When I listen to Tommy play, I hear some jazz influence.

Foster: Right. That's the way it was in his house. His father was a jazz pianist, so Tommy was introduced to that jazz fairly young. He picked up the flavor at home. My jazz training came in school.

Where did you guys meet?

Foster: We met at Laney College [Oakland, Calif.]. Neither one of us was enrolled there! [Laughs] We were there playing basketball. He was going to San Francisco State at the time, and I was going to USC. Laney had a summer school program that Tommy was enrolled in, and a mutual friend introduced us. We started talking and hit it off. He was into the musical vision I had about fusing different styles of music to create something new.



ANNE ELLIOT CUTTING

Thomas McElroy and Denzil Foster

At that time, around 1983, R&B was declining and modern rock was kicking in—Men at Work, Culture Club—and rap was emerging, too. We felt we needed to keep R&B alive. The songs were there, but the production wasn't anymore. There was nothing there to stimulate the youth to hold on to it. So I thought, if we were to take some rap beats, place vocals over the top, we could grab all these people. That's how the Rumours, Club Nouveau thing came about—take a big beat and sing some serious songs on top of it.

So, in 1986, this sound was the basis of Club Nouveau?

Foster: Tommy and I had been working on that sound since 1983. The day we met, we started writing songs and formulating ideas. Every time a big-beat rap record came out, like "Roxanne Roxanne" or something like that, we would say, "If someone were to sing a song to that, that would be hip!" So we started writing stuff like that, and later hooked up with Jay [King] and an investor. As we got into the project, however, the investor bailed out. I mean he bailed out hard, leaving us standing there with this bill from Starlight [recording studio located in Richmond, Calif.] and a distributor in L.A., wondering what happened. We realized we had to come up with something fast, so at that point we did a record for another act the investor had on his independent label. A friend of Jay's brought us the 4-track demo of what was Rumours. We listened and thought the song was funny—the lyrics were just out there. We thought if we could pull off a record like that, it would be like The Time of its day. All this was a fluke—there was no Timex Social Club yet. It was just Mike Marshall, myself, Tommy and Jay. Nobody got it at first, but it wound up selling 3 million copies.

Did you make any money?

Foster: No. That was our first lesson on being ripped [off]. I had dropped out of school to pursue this stuff. My mother was mad! I kept telling her about this record we had done, even

—CONTINUED ON PAGE 92

Patrice Rushen

LOOKING FOR THE MAGIC

by Robin Tolleson

For Patrice Rushen, producing Sheena Easton's *No Strings* seems almost a natural culmination to a career that's included roles ranging from jazz-fusion wonderkind to pop funkstress to TV arranger and session star. It's a ride that's seen her burning studio synth solos behind Jean Luc Ponty and John McLaughlin, arranging strings for Prince's first album, singing and "selling" pop vehicles like her tune "Forget Me Nots," co-founding the fusion supergroup The Meeting, and working as musical director for the Emmy Awards, the People's Choice Awards, the NAACP Image Awards and *Comic Relief V*. Rushen also scored the Robert Townsend film *Hollywood Shuffle*, Sandra Bernhard's *Without You I'm Nothing*, and the ABC-TV series *The Women of Brewster Place*, starring Oprah Winfrey.

Easton's album (for MCA) is the first Rushen has helmed, other than her own solo albums for Elektra, which she and partner Charles Mims Jr. produced for their Baby Fingers Productions. With a production credit like Easton's *No Strings*—illustrating her keyboard chops, finely honed arranging skills and ideal demeanor for the studio—Rushen's likely to be getting more calls to produce. Easton is completely sold on the pianist/producer's talents.

"I've always had this vision of doing an album of very classy songs, with contemporary arrangements," Easton says. "And here I was with a producer/arranger who had the same vision, surrounded by musicians who had become as excited as we were. While we were making this album, I kept feeling that we were experiencing moments of magic. It's the closest thing to a live concert [you could achieve in the studio]. There's no layering, no piecing together; there may be flaws, but that's what makes it feel so live. We were all there living it and experiencing it together for one moment only." Or, as Rushen would say, "Hittin' it...boom!"

Patrice Rushen was born in Los Angeles and was enrolled in a music preparation class at USC at age three. Persistent piano studies through high school led to her winning a solo competition at the Monterey Jazz Festival in 1972 and being signed to a recording contract with Prestige Records, for whom she put out three R&B-tinged jazz albums. She became in demand for session work, and in 1978 moved to Elektra Records, where her style continued to streamline into a pop-funk groove. She regularly made the R&B charts until choosing other musical directions in 1987.

TIM ALEXANDER

In 1993, Disney's Hollywood label invited Rushen, still a couple years shy of 40, to record a solo album. But the result, a funky, melodic and classy set titled *Anything But Ordinary* (as consistently strong as her best pop work of the '80s) was not to the fledgling label's liking, and they chose not to put it out. To a lesser talent it could have been a crushing blow, but Rushen keeps pushing ahead, seemingly too busy to give much of a thought to how or when that project will be released. Rushen's legacy as a premier keyboardist continues to grow with her featured status in The Meeting (with Ndugu Chancler, Ernie Watts and Alphonso Johnson), as well as her guest appearances on guitarist Fareed Haque's *Sacred Addiction*; drummer Terri Lyne Carrington's *Real Life Story*; and on Roland Vazquez's never-before-released tracks from 1977, *Best of the L.A. Jazz Ensemble*.

And if imitation is the sincerest form of flattery, Rushen is blushing all the way to the bank. Her music has been sampled (and she's been compensated) by many artists, including Mary J. Blige and R. Kelly on "Remind Me," rapper Def Jeff who sampled Rushen's "Hang It Up," Shabba Ranks who used Rushen's "Feel So Real" on "What You Gonna Do," and Zhane who credits Rushen for songwriting on the '94 Naughty by Nature-produced hit "Groove Thang." We spoke with Rushen about her music and growing list of production credits.

I noticed that you sampled your own hit song from 1984, "Forget Me Nots," on your new solo album. Was that the producer in you coming out?

I love making records. I could go in the studio anytime with anybody any day and have a great time. The creative effort, the interplay and the camaraderie that comes out of the

—CONTINUED ON PAGE 183

Nick Martinelli

THE ROAD FROM SOUTH PHILLY

by Blair Jackson

For producer/songwriter Nick Martinelli, it's been a long, circuitous road from the tough streets of South Philadelphia to presiding over (with partner Herb Moelis) his own custom record label, the recently launched Watch Out Records (distributed by Mercury/PolyGram). He started at the bottom: working first as a stockboy in the late '60s for the Philly-area distributor of Motown Records. His dilligence, fueled by his intense love of music (particularly R&B), was rewarded as he moved to warehouse manager and, later, to a job doing dance music promotion for the label in New York, Philadelphia, Washington and Boston. During this period he started doing DJ work in Philly clubs—that led to his learning how to do his own spicy dancefloor remixes. He credits Philadelphia International Records' Dexter Wansel for his technical training.

With his strong reputation for being a master of the groove, Martinelli managed to parlay his DJ spot into doing actual production, though it was in England that he earned his first big successes, first with Fat Larry's Band, then with Loose Ends, with whom he notched his first Number One single, "Hanging on a String." He had other chart singles with Loose Ends and also scored with the British act Five Star (their Platinum LP *Luxury of Life*) before returning to the States and working on a slew of records, including the top-selling remix of Ray Parker Jr.'s "Ghostbusters." A stint in prison in the early '80s on a drug charge took him out of the studio for a while, but it focused Martinelli in another direction: songwriting. During his time behind bars, he wrote Number One hits for Miki Howard ("Love Under New Management") and Stephanie Mills ("I Feel Good"), as well as hits for Regina Belle, with whom he has had his longest professional relationship.

In the second half of the '80s, Martinelli continued his winning ways with top R&B vocalists, adding names like Teddy Pendergrass and Phyllis Hyman to his already-impressive production resume, while continuing to do occasional remix work. Last year, he produced four tracks for Diana Ross' boxed set and worked with Ben E. King, Regina Belle and others. He spent two years working out of Miami but relocated to Los Angeles in early 1993. Now, based in Santa Monica, he and Herb Moelis (together they formed the MNM Music Group and their Watch Out label) are hoping to become a sort of Gamble & Huff of the West Coast. Their first signing, a Long Island funk outfit called Shabazz, have just put out their first disc, so the wheels are in motion...

How do you juggle the demands of writing and producing?

The writing is what inevitably will get you the project a lot of times, and of course you want to get your own songs played, so you make the time for writing. That's not really how I've always done it in the past. It's really only in the past few years that I've been writing. Years and years ago, when I first got into the business, I did a little bit of writing, but then I got so busy remixing and then producing these acts that were self-contained, I never really had the time to write. It's nice producing other people's songs, but I want to do some of my own, too.

Do you write with specific artists or at least a style of artist in mind?

Not really. Sometimes you can tailor a song for someone and then if they don't do it, you're stuck with it.

When you were a kid growing up in Philadelphia, how aware were you of what was happening there musically? Bobby Rydell and Frankie Avalon broke out of there...

I wasn't even a teenager when that was happening. I mean, I remember Bobby Rydell and Fabian and everything. *American Bandstand* had started in Philadelphia, but I think it was gone by the time I was ten. My years of being really into music was more the Gamble & Huff days, Motown and so on.

Were you a musician?

Not really. I took piano lessons, but I never became a formal musician or anything. I wasn't in bands. Actually, my background in music started more in the sales end. Wholesale distribution is what I did for ten years in the record business. Then I did some deejaying in clubs and that kind of thing.

What did you use as a model for being a successful DJ?

When I started doing it in '80, I didn't have any models. I had a partner named David Todd, and we used to do remixes. We'd basically just

—CONTINUED ON PAGE 96

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now, I'll get a bunch of cats over and just have them play the grooves and sample that. It's better that way. Like with the FMob, we used the old-school players. The music scene had kind of disappeared for them for a while, but now it's coming back. I ask them, "Can you give me the sound like so and so?" And they say something like, "Oh, yeah, I was doing that!" Marlon [McClain] pulls out his old tricks and stuff on guitar, and they become new tricks again. Check out Hammer—he's using Maceo [Parker] and the rest of James Brown's old horn section. You don't get just music from using these players, you're getting knowledge, too. For the newcomers, there's a lot of knowledge these people have about things that aren't done the same way anymore, like how to arrange for something live. When your main work is in a studio, you're not thinking about how this is going to sound once this artist takes this out live.

So sampling is really just a recording studio tool?

Foster: Sampling enabled artists to go into the studio and cut records in a matter of hours. It works on that side. But when it comes to the live side, you have to basically take your record or studio out there, or the performances are not the same. When you're using real musicians, they understand how to get that live sound. It's easier on the artist because it relieves the pressure of having to duplicate that studio "performance" live. When we were with Club Nouveau, which was basically a keyboard band, me and Tommy were under a lot of pressure. If one of the sequencers were to go off sync, or one MIDI cable wasn't connected right, or the wrong button was hit, we were in trouble! When you play with real musicians, if the drummer slows down, then everybody slows down! [Laughs]

Do you feel it's getting back to recording artists having to play live again?

Foster: Yeah. An artist has to put on a real show, instead of having 13 people on stage running around flipping over each other, body-slammin' one another, with the audience trying to make out who's who. Of course, the record companies won't like it, because they will have to pay for real musicians. They say they would rather have real musicians, but you know they don't want to pay for it. They'll pay for a couple DJs and a DAT, though. I'm telling you, rap is going to be around for a long time. To record companies, that's the cheapest way to make money. Other productions aren't as cheap.

(Now it's Thomas McElroy's turn to take the hot seat. He's calmed down a bit from the self-described "kill mode" he was in. Though a bit more relaxed, he prefers to stand.)

When you guys were looking for a site to build your production facility, what made you decide on Oakland?

McElroy: It was just the feel of the Bay Area. It's home, it's where we are most comfortable. We could have moved to a lot of different places by now. But we would rather keep our Bay Area flavor than move somewhere like L.A. and get washed out.

What projects have you had in recently?

McElroy: Just the FMob. We're doing remixes right now from the album. That's about it. We really haven't been here long enough to cut anything else.

How do you choose projects? What is it that you look for in an artist or group?

McElroy: Basically, we look for somebody that's doing something a little different. Someone who is trying to be creative and willing to take some chances. We get pretty bored trying to do the flavor-of-the-month type of thing. We always strive to be a little different ourselves and put a different kind of twist on things.

No En Vogue clones, huh?

McElroy: We would be doing "Lean On Me, Part 10" right now if that was the case.

Let's talk about FMob. When did you feel it was time for you two to record another album?

McElroy: We felt it was time to do one when the record company told us we had to.

So you weren't exactly longing for self-expression...

McElroy: [Laughs] Well, we were, but we had been putting it off for a while, so [East/West Records] kept bugging us. We had been giving a lot of attention to our other projects like En Vogue, To Be Continued, Nation Funktasia, who we were pushing, and Something for the People, who we were developing. We were caught up in that and weren't paying atten-

tion to our stuff. When we finished those other projects, we committed to do it. That's just where our heads were at. Denny always wanted me to do a jazz-influenced album. I didn't really want to do that; I wanted to do a rap album. So we went back and forth. Eventually, we just combined ideas and took it from there, and developed it into FMob—an R&B, hip hop, jazz thing. Sort of what the Blackbyrds were in the '70s.

How is this project different from FM² back in 1989?

McElroy: FM² was just Denny and I manipulating everything. In FMob, it's us not being as manipulative and letting the situation grow. It was more spontaneous, with more people involved—contributing to the overall sound.

We knew what the rappers could do. Same for the instrumentalists—we let them do their thing. We would give them a basic melody, or idea, and let them bring something to the table. Most of these guys we had used before on other projects. The thing that we really wanted to get across to everyone was this is an album in a jazz tradition, produced with the new school technology. When I say that I mean that in a jazz tradition you make several takes and keep the best one. That's basically what we did here. It was about capturing that moment in time, not manipulating it to the extent that we usually do. Then after getting the best performance, maybe we would then use technology to "tighten" things up, or to do some rearranging of sections or whatever.

At first listen, one can't help notice the minimal use of effects. Was that intentional?

McElroy: The only thing we wanted as far as technology goes were the keyboards. We didn't want to go into the studio and start using a bunch of delays, reverbs, etc. We wanted to keep it close as to how it went down in the studio. The overdubbing was enough for us. There were some transparent things going on as far as reverbs, but only for room ambience.

The album also has sparse samples. Did you feel adding them would take away from the "rhythm section" sound you were creating?

McElroy: Most certainly. A lot of the samples we used were "live" samples we created. We tried to stay away from the old-sounding samples everyone else uses.

DENZIL FOSTER & THOMAS McELROY

Which samplers did you use?
McElroy: [Akai] S1000 and the Emax II.
What producers have influenced you?
McElroy: Quincy [Jones]; a lot of his earlier stuff especially. George Clinton. You see, I'm kind of funny—I listen to so much stuff that sometimes I don't know who the producer is. I'll listen to almost anything, from jazz all the way to Kraftwerk.
I see you've been using Ken Kessie as your mix engineer. How did you start working together, and why did you choose him?
McElroy: Before we got into music [production] real well, we used to hang out with Felton Pilate from Confunktion. Ken would be assisting him over in Sausalito at The Plant. We liked the way he worked. On the first Tony! Toni! Tone! project, the first project where we were on our own, we asked him to come over and mix. He did a great job! He was real patient and had a lot of good ideas. We've been using him ever since. Same thing with Steve [Counter]. He has worked on a lot of our stuff. He used to work over at Starlight.

There are certain guys who know what they're doing, have good ideas and can communicate with people. Some studios hire a bunch of roughnecks, and you can't even talk to them. You feel like you're speaking another language! [Laughs] Ken and Steve know what a producer wants and can get the sounds he's looking for. They listen to rap and shit, and they know what's happening. They've worked on "fat" records, not just on some paper-thin shit. We're fortunate—if these guys die, we'd be in trouble!
Do each of you have your own project studios at home?
Foster: I don't want to see work at home anymore. I used to, but now it's just too much. I'm at the studio all day—when I go home I don't want to see another keyboard. Now my home is going to be home—rest time!
McElroy: I don't have one right now because my home is being redecorated, but after that, I'll have all kinds of stuff in there. I'll leave what I brought here and replace it with the same stuff for my house. Currently, I have a piano that I have to play; it's like my drug. I have to have stuff at home I can play. I'll even play a keyboard at home while I'm in bed! Just give me a [Yamaha] DXII and some headphones, and I'm all right.
Is there a Foster/McElroy sound?
McElroy: We do certain things over and over sometimes, like work in certain tempos or approach bass lines. It's not something we do on purpose. Our influences come out. It's the essence that creates that "sound." But orchestrally, we never try to duplicate ourselves. I get scared—anybody can pull up a keyboard patch and type it as "that Foster/McElroy sound." I think I'm going to start making my own patches. I'm going to edit more and do more MIDI stacking, so people can't tell what patch I'm using.
Aren't you MIDI stacking now in your sequences?
McElroy: A lot of times I'll play over a sequenced part real time because I don't want the part to feel exact. It sounds better to me like that. Doing it the other way sounds too...MIDI. [Laughs]
So you're recording your sequences in real time?
McElroy: Yes. I'll play 4- to 8-bar phrases straight into the computer.
Any wisdom you want to impart to those aspiring producers who would like to be as successful as you in the music business?
McElroy: Stay focused, don't get distracted. The music business is full of distractions. Remember what you got into it for. If you got into it for the music, you'll be fine. Also stay away from the hype and drugs. Don't get with any wild no good women. [Laughs] Stay hungry. If you're hungry, you'll most likely be doing something in the industry, even if you don't know to what extent. But at least you'll be in the game. Take care of business! ■

Christopher Patton is owner/operator of Ars Nova Productions, a MIDI preproduction studio in Oakland, Calif.

NICK MARTINELLI

—FROM PAGE 90
vibe off these records. We'd bring in a musician and change whatever we felt like changing and try to make it into a different-sounding record. We worked with this engineer named Bruce Weeden. In a lot of ways, it was an education doing that because when someone sent me a record to remix, I'd listen to it so carefully and learn things *not* to do from it—the way sounds were done, when arrangements were bad. You learn from other people's mistakes.
This predates the widespread use of samplers.
Actually, there was a little bit of sampling in the early '80s. There was the AMS and things like that.
Some producers are deeply offended that people like you are sometimes brought in after a project is done to take their work and dismantle it and turn it into something different. You've been on both ends of that—how do you feel about someone doing a remix on tracks you've produced?
Well, there've been times I've loved it and times I've hated it. About a year ago, Frankie Knuckles remixed a hit I had with Loose Ends called "Hangin' on a String," and it happened to become a hit again in London. It was a hit in '84, and it was a hit again last year. He did a very nice job. He changed it, and I liked what he did to it. But there have been other ones that seemed to miss the point I was getting at with the original song. But that's life.
Do you think a remixer has any obligation to talk to the original producer?
I don't think so. I don't think the record companies would want that either, because obviously if they're using a remixer, it's because they want to get another view of a song—they already had the producer's view of it.
You've worked with lots of great singers. Is there any special art to that, as opposed to working with a band? More hand-holding, whatever?
It depends. Sometimes you have to do a little hand-holding. Sometimes you have to guide a singer through *everything*. It depends on how long they've been around and how confident they are in the studio and with the material they're singing.
So do you take your cue from them

as to whether you'll do multiple takes of something or whether you'll just do a couple of takes and then move on?

I think today almost everybody does multiple takes. But you can't sit there and do 50 takes in a day, because the singer probably won't have any voice left after 25. Even that's a lot, though. I prefer to get a whole performance where I can, but certainly I have no problem doing editing, too. I usually try to get a lot of whole performances and then do editing later from those, because I think you get a much better flow that way. If you're just singing a line or two over and over again, it's not the same. But if someone can't learn a song the way it's supposed to be sung, you might have to do it line by line. I try to be flexible.

Are there certain engineers you like to work with?

I've been working with the same engineer for almost 13 years now—Bruce Weeden. Since I moved to L.A., I've tried a couple of other guys. I worked with Humberto Gatica on this Diana Ross project—he engineered the mixes and did a great job; he's a good guy.

As someone who grew up loving Motown, is it at all intimidating working with someone with a reputation like Diana Ross?

I was a little nervous going into it, but as soon as I met her, I felt very comfortable, and I think I made her feel comfortable, too, so it worked out well. In that case, she would usually come in in the evening, after the tracks were done, and sing as many takes as we needed. Then the next day, I'd compile them and let her hear it, and whatever changes needed to be made, we'd try it again. She was very professional.

When you're working on the regular mix of a song, are you sometimes thinking about what you might do on the remix?

I haven't been doing that much dance stuff for a while. Even though that's where I started, now it seems like everyone's coming to me to do ballads and midtempo things, because I had a lot of hits with those styles in the late '80s. But when I did do a lot of dance stuff, I always thought about remixes.

Is there a danger of becoming pigeon-holed? If you're suddenly the

"ballad guy," does that hurt your chances of doing a hard rock project if you want?

A little, probably. I don't think hard rock is my forte, but I wouldn't mind doing an alternative band sometime, or someone like Don Henley, a soft-rock kind of thing. I have varied tastes: I like classical, I love soul, some of the hip hop. So I am working on music I like.

Do you have any feeling about working on just a track or two with someone vs. doing the entire album?

In the beginning, I used to do mainly whole albums, and sometimes it was good and sometimes it was bad, because after a certain amount of time, it can get nerve-wracking to be with somebody so much in the studio. And sometimes you get stuck in situations where you realize a ways into it that maybe it wasn't a good move to be doing it. I think now I prefer doing sides, because you can really focus on the work you have to do, and you don't get tired of each other.

Do you do those sides in isolation of the other songs they've done, or do you listen to what the other producers have done with that artist?

Occasionally you get a chance to do that, but not usually. I remember last year I did something on Lulu's album, and the A&R guy sent me some stuff that had been done by other people so I'd have an idea of where the album was going, but that's not usually the case. You might be the first producer on a project, and then you're the one setting the pace for it. Or the other guys might have cut stuff but not mixed it yet, so you don't hear it.

How into the technical end of things are you?

I'm not up on every reverb that's out there, if that's what you mean. I usually leave decisions about reverb and things like that up to the engineer. But I know when I want more or less of something, and I can talk with the engineer to get what I want to hear.

Will having your own label take you away from the studio much?

Sure, but at the same time I'm building my own studio, so everything will eventually be right there. I'm building a place in Santa Monica that will have the studio and offices and everything under one roof. It'll be for me, my writers and the acts we're working with. Bruce [Weeden] is designing it and will be running it. I've purchased 56 tracks of ADAT, and those will be the basis of it. We used the ADATs with Diana and on some of the other recent projects I've done, and they've all turned out well. The ADATs have really turned out to be a dream. I really think they sound better than a lot of the really expensive systems. I used to cut on Mitsubishi [digital], and after a while, I just couldn't stand it and I went back to analog. In fact, when I went back and did a remix on a digital tape I did with Phyllis Hyman two years later, there were drop-outs and all sorts of weird stuff. It wasn't until I heard these ADATs that I decided to go back to digital. [Other equipment in Martinelli's facility includes KRK 9000 and Yamaha NS-10 monitors, an Amek BIG console, Focusrite EQs and SSL compressors.]

Do you have favorite L.A. studios?

I've used Westlake a lot. I liked Ground Control before they closed that. I like The Enterprise and Sound Castle.

Do you ever miss Philadelphia, or being in a smaller, more contained scene?

No. I went back there not too long ago, and after about a day, I didn't want to be there anymore. I'm not really sure why. I was in Miami for two years before I came out here. I loved the city, but there wasn't enough musically going on for me, other than the Estefan camp, which is pretty self-contained. There's a lot of very good Latin music happening, but not much mainstream stuff.

Is it easier or harder to make a hit than it was ten years ago?

I think it's harder to get a good song played on the radio today. There's so much hip hop and rap now, and there's less rock really. It seems tighter. You have to have a great tune, and you have to have promotion behind it. It seems like everyone is gearing everything toward that big teen audience. I think record labels have to start promoting older artists in a different way that doesn't entirely depend on radio. I think we're already seeing more of that—people using cable TV as a way to promote music. The business has changed, and you have to change with it or you'll get left behind. ■

Blair Jackson is managing editor of Mix.

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BY TOM KENNY

POST·SCRIPT

SOUND FOR FILM

Movie Rock

by Larry Blake

Sound for theatrical motion pictures is a pretty rarefied beast. There are probably fewer than 150 re-recording stages in the world where stereo feature films can be mixed, with fully a third of them located in Southern California. I can't imagine what the comparable figures are for 24-track recording studios, especially in this era of modular digital multitracks.

With this in mind, I try to make what could be an arcane "Sound for Film" column relevant to the largest number of readers by talking about relatively common subjects such as monitoring requirements and time code. This month, I've decided to drop all pretense and cut right to the chase: how music has been done for rock music films through the ages. Are you still with me?

Of course, there was a lot of music in movies before Bill Haley, and there was music in movie theaters before there was a track on the print. Silent movies were accompanied by pianists and organists virtually all the time, and in New York in the '20s, you could at times expect to hear a 60-piece orchestra. Indeed, the logistics of bringing orchestras to smaller cities often has been cited as a prime catalyst behind sound movies.

In the early days of film sound, there was competition between the Vitaphone process, which used 16-inch phonograph discs (33⅓ rpm, playing inside-out) in interlock with the camera for recording, and in interlock with the projector during re-recording and exhibition. Imagine! "Cumbersome" is a kind word for Vitaphone, and it soon lost out to optical recording for all production and exhibition, the latter being on the same piece of film as the picture, just as it is today. Think of this: You can play a 1929 optical mono print in any theater today, and you will still be able to do so 20 years from now.

PHOTO: COURTESY OF TRI-STAR PICTURES

It's going to be a long time before any high-definition video system will offer anything approaching the visual quality of a 35mm print at a per-screen upgrade price that is less than astronomical. And as long as you need the film image, there's simply no reason to eliminate the humble stereo optical track, no matter what any of the companies offering digital sound for films will tell you. But I digress.

Although disc recordings became obsolete in actual production, they continued to be used for immediate playback of music on the scoring stage (because the optical recording had to be developed and printed before it could be heard the next day) and for synchronous playback during the shooting of lip-synched musicals. The former application, of course, became obsolete once magnetic recording arrived in the early '50s, while discs continued to be used for on-set playback through the '60s! Crystal camera motors and self-resolving Nagra tape recorders changed this situation by the early 1970s.

Around the same time, multitrack recorders started to make inroads in film scoring. In fact, before 16-track, 2-inch came into play, there was no advantage, track-wise, to using nonsprocketed 4- or 8-track tape machines. Mag film offers up to six tracks on a piece of film, which can easily be edited and combined with other 6-track mag "units" as needed. On the "Before the Parade Passes By" number in *Hello, Dolly!* re-recording mixer Murray Spivack was blending eleven 6-track music premixes and origi-

—CONTINUED ON PAGE 104

"It's the Wrong Trousers, Gromit!"

by Tom Kenny

Move over, California Raisins. Wallace and Gromit, a fiftysomething inventor who enjoys a bit of gorgonzola and his faithful, silent dog, are the new international claymation superstars. They may not have their own action figures or TV commercials...yet, but then the Raisins don't have an Academy Award.

Wallace and Gromit are the plasticine stars of director/animator Nick Park's 1994 Oscar-winning *The Wrong Trousers*, a 26-minute action-adventure animation short that took 13 months to shoot—frame by painstaking frame. It's the story of Wallace the tinkerer, who's created a pair of programmable techno-trousers to take Gromit out for "walkies." When money gets tight, Wallace decides to take in a lodger to help pay the rent.

The lodger turns out to be Feathers McGraw, a mysterious penguin who assumes Gromit's place of affection with Wallace while plotting a diamond heist with the aid of the techno-trousers. The film weaves in and out of elaborate indoor and outdoor sets, culminating in a wild chase scene, complete with gunfire, on a toy train that runs through the main floor of the Wallace and Gromit residence.

"*The Wrong Trousers* sort of aspires to be a feature film on every level—in terms of the sound, the visuals, the story, the plot, the characters, the lighting," says Park, who began working on his first major claymation film, *A Grand Day Out*, as a graduation project in 1985 while at the National Film and Television School. He finished it after signing on to the staff of Britain's acclaimed Aardman Animations, owned by Peter Lord (an Academy Award nominee himself) and David Sproxton, who produced *The Wrong Trousers*.

The Wrong Trousers ac-

—CONTINUED ON PAGE 105

Above: A scene from Nick Park's 1994 Oscar-winning animation short,* The Wrong Trousers, *which took 13 months to shoot. Below: Nick Park modeling the plasticine characters on the tiny set of* The Wrong Trousers. *Below right: Director/animator Nick Park.

BETA Bio

ROGER LINDSAY, *SOUND ENGINEER*

HOMETOWN:
Liverpool, England

CLIENTS:
Sade, Mark Cohn, Basia, B.B. King, David Gilmour, Frank Sinatra, Frank Zappa, Joe Jackson, et al.

ON GETTING STARTED:
"As a keen young roadie in Liverpool in 1967, my family thought I would do it until I was 21, then 'get a haircut and a proper job.' Thanks to my wife's patience, some talented artists and a little luck, the former is infrequent and the latter has evolved into a long and enjoyable career."

ON BETA MICROPHONES:
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Walter Murch Receives C.A.S. Life Achievement Award

by John Michael Weaver

If versatility is the survival skill of the '90s (and beyond), then legendary sound designer Walter Murch should continue to be a major player in the motion picture industry for some time to come. However, what he has already achieved during the first quarter-century of his career has been so outstanding that the Cinema Audio Society, a group of professional film and television mixers, felt that the time had come to pay tribute to the man who coined the term "sound design." Murch was given a Life Achievement Award before an audience of approximately 300 at the C.A.S. Annual Awards banquet, held on March 5 at the Beverly Hilton Hotel in Los Angeles.

Murch has suggested that a soundtrack is the "soul" of a movie. If this is so, then his work in film sound has helped define and enrich the soul of contemporary cinema. Over the past 25 years, he has made major creative contributions to the soundtracks of a number of landmark films, including *The Conversation*, *American Graffiti* and *The Godfather*. In addition, as a lecturer, teacher, writer and interviewee, the erudite and articulate Murch has become one of the most visible and effective advocates for the creative use of sound in film and television.

What makes Murch's career particularly remarkable is the fact that his involvement in the projects he works on is seldom limited to one area but often extends into the realms of picture editing, sound and screenwriting. In a letter read at the C.A.S. ceremony, producer Howard Koch aptly described Murch as a "renaissance man," someone with the unique ability to contribute on many different levels to the filmmaking process. Written messages from directors George Lucas and Francis Ford Coppola echoed Koch's praise.

Murch's skill and versatility have been acknowledged by his peers many times during the past two decades. He has received numerous Academy Award nominations in both the sound and picture editing categories. In 1980, he was not only nominated as a picture editor on *Apocalypse Now* but won an Oscar for his work on that film's extraordinary and highly acclaimed soundtrack. Most recently (1991), he was nominated in the Best Editing category for two films simultaneously, *Ghost* and *Godfather III*.

After the tribute to Murch, a number of other film and television mixers received recognition at the C.A.S. event for their recent accomplishments. Among them were the 1993 Emmy Award winners for best sound, as well as this year's Academy Award nominees in that same category. In addition, for the first time in its 30-year history, the C.A.S. handed out an award of its own. The 1993 Cinema Audio Award for Outstanding Achievement in Sound Mixing for Television went to Christopher Haire, Douglas Davey, Richard L. Morris and Alan Bernard for their work on a *Star Trek: The Next Generation* episode called "Descent—Part 1." The award for Outstanding Achievement in Sound Mixing for Motion Pictures went to Donald O. Mitchell, Michael Herbick, Frank A. Montano and Scott D. Smith for the feature film *The Fugitive*. ■

—FROM PAGE 100, SOUND FOR FILM

nal recordings.

Where multitrack came into its own in film sound was, of course, where rock 'n' roll was concerned. The turning point was the Woodstock concert film, which opened around the country in 1970 with glorious 4-track mag sound. Indeed, seeing and hearing *Woodstock* (with my older sister, whose presence was required to get me past the R rating) at the Cinerama theater on Tulane Ave. in New Orleans was the first time that I was aware that films had s-o-u-n-d (unlike most of my friends, who had lost their film sound cherry at the same theater during *2001: A Space Odyssey*, which I didn't see until a few years after its 1968 release).

That the filmmakers had properly exposed film in their cameras and biased audio on tape in light of the horrendous conditions during Woodstock is enough of an achievement in my book; that it sounds superb is amazing. Eddie Kramer's original 8-track recordings (six for the music, one for audience, and one for mains-referenced sync pulse) were handled in post-production by Dan Wallin, who did an excellent job of integrating the live recordings with studio recordings of pre-existing songs, not to mention overdubbing on certain numbers. This mix really holds up.

The 16-track barrier was broken (I'm assuming for the first time) later that year for rock's first end-of-an-era concert film, *Gimme Shelter*, the Maysles Brothers documentary on the Rolling Stones' fateful Altamont concert. Synchronizing multitrack tape with film footage was accomplished in those days with jerry-rigged systems of "bloop" lights (aim the camera at a light, press a button to light it and to send a tone to the recorder) and probably even standard clapsticks. Although this gave you a sync reference, and the sync pulse would continue to hold you in sync the length of the take, there was no way to interlock the original multitrack tapes during re-recording. This would be changed by the late '70s, when our friend SMPTE/EBU time code established itself with the first generations of time code synchronizers.

The first movie I know of that was actually mixed by locking multitracks to film projection was yet another end-of-an-era rockumentary, Martin Scorsese's *The Last Waltz*. Again, if my memory serves, the initial stages of premixes during the six-month mix at Goldwyn Studios entailed multitrack-to-multitrack mixing. These premixes were then split off to multiple rolls of fullcoat for final editing and mixing. A similar procedure was used for the beginning-of-the-rock-era film *The Buddy Holly Story*, which used live recordings to great dramatic effect where it would have been much simpler to shoot to playback. This film was also one of the last to be released in the 4-track mag format, with mag stripes on both sides of the sprocket holes on the print.

I'm sorry to say that I can't give you any inside poop on the movie *Pink Floyd The Wall* other than to rhapsodize about how incredible it sounded at the Village Theater in Los Angeles in 1982. Ask anyone who works in film sound in Los Angeles what their favorite film sound experience has been, and the chances are about 50/50 that they will mention the Village Theater engagements of either *The Wall* or *Altered States*.

One of the toughest technical challenges in the annals of music films was faced by the crew of Laurie Anderson's 1986 concert film (and then some) *Home of the Brave*; they had to sync up film cameras and film projectors while playing back from a 1630 processor and recording on a 3324 digital multitrack—in front of a crowd in a theater. Post-production involved multitrack-to-multitrack editing and mixing, with the bulk of the work accomplished at Sync Sound in New York. The film was recorded and mixed by Leanne Ungar. "All digital" is ultimately a meaningless buzz phrase, but in this case, the result was deserving of whatever hoopla it received. (Too bad the film received limited distribution.)

An entirely different, but equally challenging, set of obstacles were met and overcome for Oliver Stone's film *The Doors*. The integration of Val Kilmer's live vocals with Jim Morrison's original studio tracks in the concert scenes must have been a real pain in the ass, but it was accomplished seamlessly. [See the May 1991 issue of *Mix* for complete information on the recording, editing and mixing.] In fact, the sound jobs

for all of Oliver Stone's recent movies, including *Born on the Fourth of July*, *The Doors*, *JFK* and *Heaven and Earth* have resulted in a body of work by Wylie Stateman and Mike Minkler that has set a standard for all of us in the world of film sound. I think it's the best work done anywhere since the San Francisco American Zoetrope guys turned out *Apocalypse Now*, *Dragonslayer* and *Rumblefish* in the late '70s/early '80s.

Next month, I will offer some hints on recording and playing back music in films, with zero sync grief. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans because of reasons too numerous to mention, although going to a great restaurant like Bayona, knowing that there are a dozen others like it waiting to be "discovered," would be a good start.

—FROM PAGE 101, THE WRONG TROUSERS
tually marks the second appearance of Wallace and Gromit. They were introduced in *A Grand Day Out*, which was nominated for a 1990 Academy Award but lost to Park's other nomination, *Creature Comforts*. Three films, three nominations, two wins.

The lighting and staging of *The Wrong Trousers* combine the most elaborate aspects of film noir feature-film production with the intimacy and detail of theatrical stage presentations. And the audio tracks are every bit as full and rich as a Hollywood feature, from the padded Foley footsteps of the penguin (animated primarily by Steve Box) to the dramatic Bernard Herrmann-esque score.

The soundtrack, particularly the score, is effective because it is straight—few cartoon effects, no huge tympani-roll music selections. "The score is almost one you could have in a live-action thriller," says composer Julian Nott. "We made no concessions to the fact that all the characters are made out of plasticine, and no attempt to ridicule any of the characters because they are fake. The score uses Hermann-esque musical conventions from a Hitchcock thriller, rather than the conventions of a Tom and Jerry film. I feel the value of this is that a comic absurdity is created—the audience starts to accept Wallace, Gromit and the Penguin as real characters, with real human idiosyncracies, when at the same time they realize this is absolutely illogical, creating a comic tension."

Nott has worked with Park since their days together at the National Film and Television School. His composing setup is simple, as it is mainly used to provide temp music and demos for a director and to produce ideas for later orchestration. He relies on Mac-based Notator Logic synched with Opcode Studio 3 to a VHS deck, with LTC time code on one of the audio channels. His keyboard of choice is the E-mu Proteus 2 Orchestral, with piano sounds coming from an E-mu Proformance. If he blends acoustic sounds with synth sounds, he generally uses a Korg WRV Wavestation, which, he says, "provides good atmospheric

sounds—perfect for film scores."

The acoustic sessions for *The Wrong Trousers* were recorded at Abbey Road 1 in London to take advantage of the large room. "British films these days rarely can afford full-size orchestras," Nott says. "So I find that the large halls tend to make the sound 'bigger,' even though we could often fit the orchestra into much smaller studios." The score was recorded to 24-track with Dolby SR, then mixed down to SR-encoded 4-track 35mm film (LCRS).

As with most animated projects, the dialog tracks—the voice of British actor Peter Sallis as Wallace—were recorded prior to production, with only a few off-camera lines placed in post to achieve story continuity. The Sallis tracks were edited and layed in by picture editor Helen Gerrard on 35mm, then premixed by dubbing editor (the Stateside equivalent would be supervising sound editor) Adrian Rhodes to 35mm SR-encoded 4-track, panned and positioned as necessary. For a claymation feature, the lip sync is remarkable.

"After recording the dialog on its own," Park explains, "we break down the track and transfer it to 35 mag. Then we put it on a flatbed, and an editor goes through to mark the track phonetically by syllables. That is then copied onto a dope sheet, and that tells us exactly how many frames it takes to say each sound—basically, the animator's guide to getting good lip sync."

In light of Park's distinctive animation style, it's interesting that the actors' voices, whether in *Creature Comforts* or the two Wallace and Gromit pictures, help to shape it. "I've found that the voices dictate to me the modeling," Park says. "They suggest to me the various extremes and the movement, and the different kinds of intonations and accents that the character has. For example, Peter Sallis' voice helped to establish my style—the wide mouth, close eyes—especially the way he says things like 'chhheeese.' Maybe it's just a very British way of saying things. I knew Peter from the TV, from a show he's been on for 20 years called *Last of the Summer Wine*. I never really considered anyone else."

Audio post took place at Interact Sound Limited, a private editing and dubbing facility in London's West End. Adrian Rhodes supervised and cut most of the effects, music and dialog, then sat in with Aad Wirtz for the final mix to 12-track Dolby Stereo. Bill Morgan recorded many of the original sounds, both in the studio and on location (toy train and garbage can rattle, to name a couple).

Approximately 70% of the effects in *The Wrong Trousers* are original to DAT; the other 30% came from Interact's in-house DAT/disc library. Effects were processed—pitch-shifted, reversed, flanged, looped, etc.—using a Casio FZ1 MIDI keyboard sampler in combination with the Spectral Synthesis Audio Engine, a 16-bit, 256-track PC-based hard disk system. Interact has three systems set up in three edit suites. Editing took place on the Spectral, and two 6-track effects premixes were made direct from the Spectral system onto SR magnetic. Interact houses Perfectone mag dubbers.

By the end of the tracklay, Rhodes had created more than 14 hours of sound effects with more than 10,000 edits—for a half-hour

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film. But the most interesting and challenging sound design element was unquestionably the techno-trousers. Wallace presents them to Gromit on the dog's birthday, accompanied by an ominous, menacing score and the creak, squeak and clank of a mechanical contraption with a mind of its own.

"The sound for each step goes something like: Shhtump-der-weeewip-dikadika-ptschhhhhh!," Rhodes says. "The plan was to imply an internal mechanism made up of ratchets, cogs, knee-lifting electric motors and pneumatic gas struts. Then we added a turbo-drive motor for high speeds and a vacuuming sucker pod for wall and ceiling walking. In the Foley sessions, Jack Stew provided the surface impact with the aid of a circa-1950 metal bread bin and whatever he could find.

"The hissy, air-rush sounds were mostly me hissing into a Sennheiser 416," he continues. "Then we forwarded and reversed it, combined with the gas strut of a car trunk. A sink plunger and me slurping and kissing pulled the techno-trousers against the walls and ceilings. The electric motor element came from the rewind motor on a SLR camera, which we bent on the keyboard's pitch wheel. Rapid creaks were usually from slower ratchety sounds that were heavily sped up. In fact, many of the sounds were created by human mouth—a versatile instrument!

"Once the basic design of the trouser sounds was agreed on with Nick, I laid them up on the Spectral Multitrack page, synching, editing and overlapping them to make one homogenous sound. By the end of this process, the ingredients were spread over 12 virtual tracks. Internal premixes of these to two tracks made things more manageable, but at the same time enabled me to keep the original ingredients intact in the hard drive library for future use."

One final note: Listen for the Foley effects, especially the penguin's footsteps as he plots the heist, which is Rhodes' favorite Foley moment. Foley walker Jack Stew found the perfect slap for webbed feet, Rhodes says; add a bit of Lexicon 480L "alley" reverb and presto! It would have been quicker and cheaper to do all the Foley electronically, but they opted to record directly to 6-track SR-encoded mag and transfer into the Spectral for cutting.

"I like the kind of realism that the sounds have, and the earthiness," Park says. "Because the animation to me is more earthy—it's there and it's 3-D, rather than the sort of Tom and Jerry whoooooop! There is a slight bit of that, but it's a fine balance. You just tweak all the buttons in the mix. In a way, I find that the effects are as important as the animation. When I do the animation, I always imagine what sound they'll make. Just like the music. I don't find that any element is more important than another. It's just a matter of finding the right balance in all of it, and all of it is serving the film."

Currently, *The Wrong Trousers* is touring the country on the animation festival circuit, garnering rave reviews from the *New York Times*, *Los Angeles Times* and countless other news agencies. Wouldn't it be nice if Hollywood woke up and decided to put the nominees for Best Animated Short Film at the head of summer releases, turning the movie-going experience into something you can't get at home. Then again, something as well-produced as *The Wrong Trousers* might just blow away the feature presentation. ■

Tom Kenny is a Mix *associate editor.*

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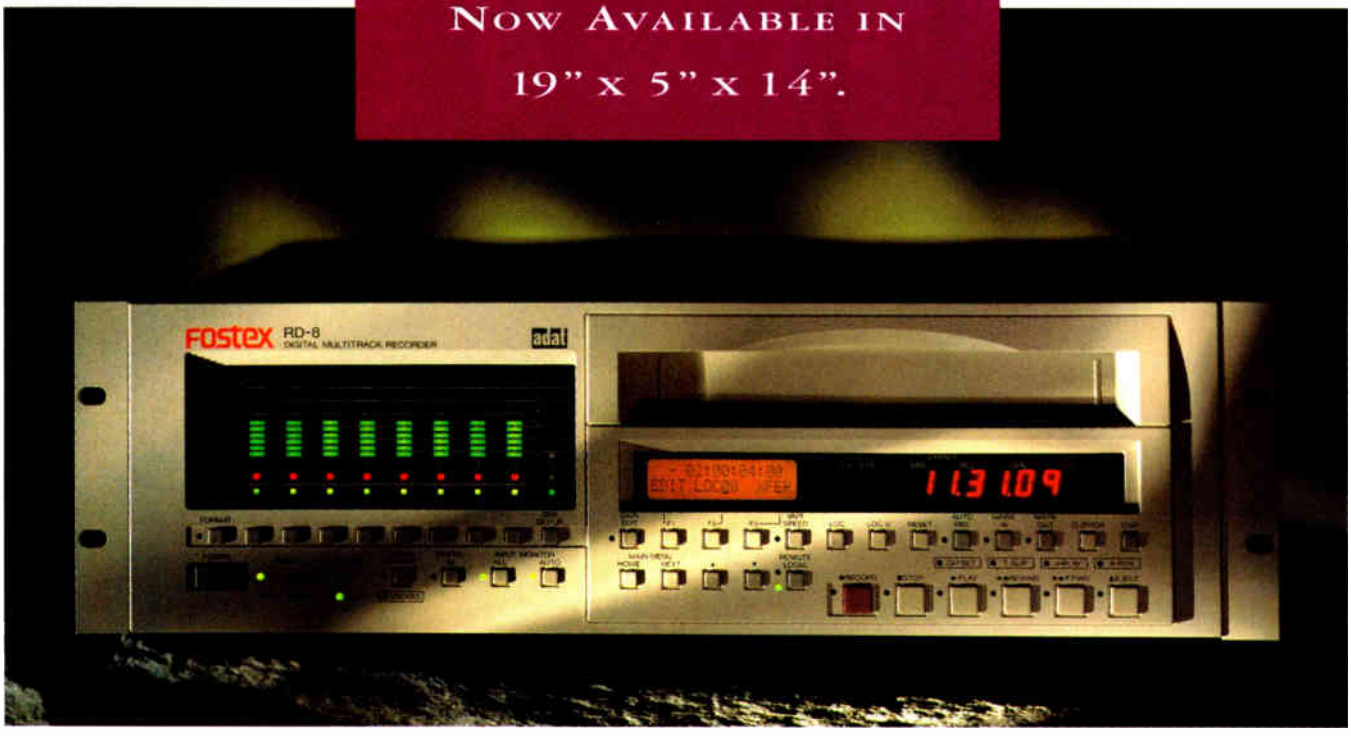

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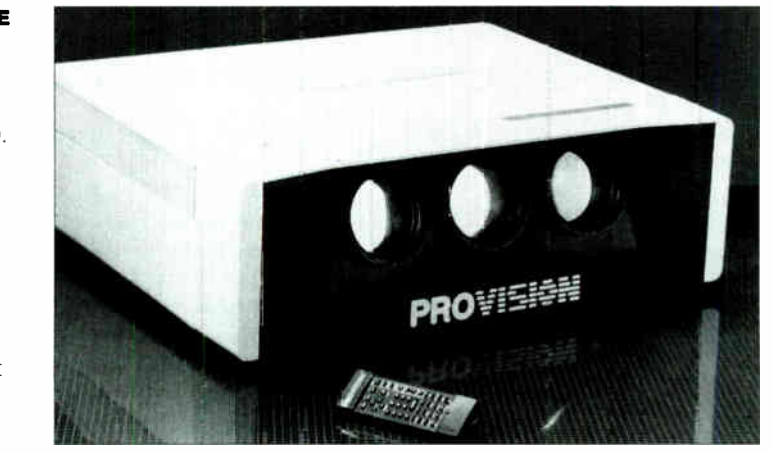

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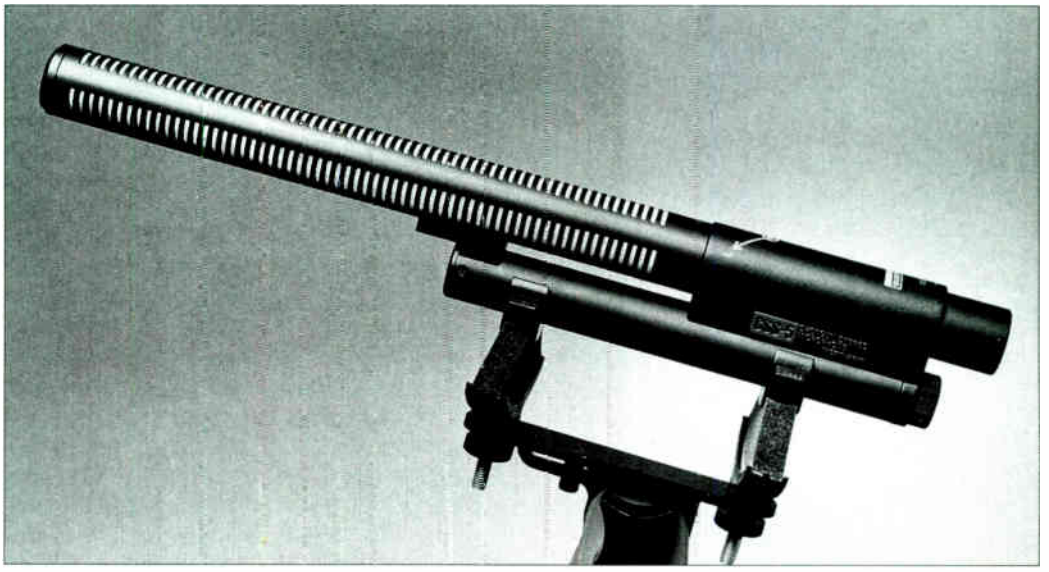

AUDITIONS

PRODUCT CRITIQUES AND COMMENTS

Z-SYSTEMS SAMPLE RATE CONVERTER

by George Petersen

Sample Rate Conversion. Three words that strike fear into the hearts of many recording and mastering engineers, and usually with good reason. In the past, when audio pros had to perform an otherwise trivial task such as changing a 48kHz DAT to 44.1kHz for CD release, the options were few:

1. Use some very expensive (and usually terrible-sounding) outboard sample rate converter.

2. Use the convenient (but usually also terrible-sounding) sample rate conversion algorithm built into a digital audio editing workstation.

3. Skip the digital-to-digital transfer stage entirely, and take the analog output of the first device and route into the analog inputs of a second device, whose converter is set at the sampling rate you need.

Most engineers typically have handled sample rate conversion chores via method #3: It's cheap, easy and usually sounds preferable to the other methods. Of course, method #3 requires routing the audio through a couple of additional unnecessary analog/digital and digital/analog converters. This degrades the signal slightly, but while doing this, you could also put an analog EQ into the audio path, which could be advantageous in a mastering situation.

However, with last year's debut of the Analog Devices Asynchronous Sample Rate Converter chips (*Mix*, October 1993), we are now seeing low-cost/high-performance tools that take advantage of this new technology. One of the first such products is the Z-Systems Z-1SRC sample rate converter, which offers high-quality digital signal conversion at an affordable $1,750.

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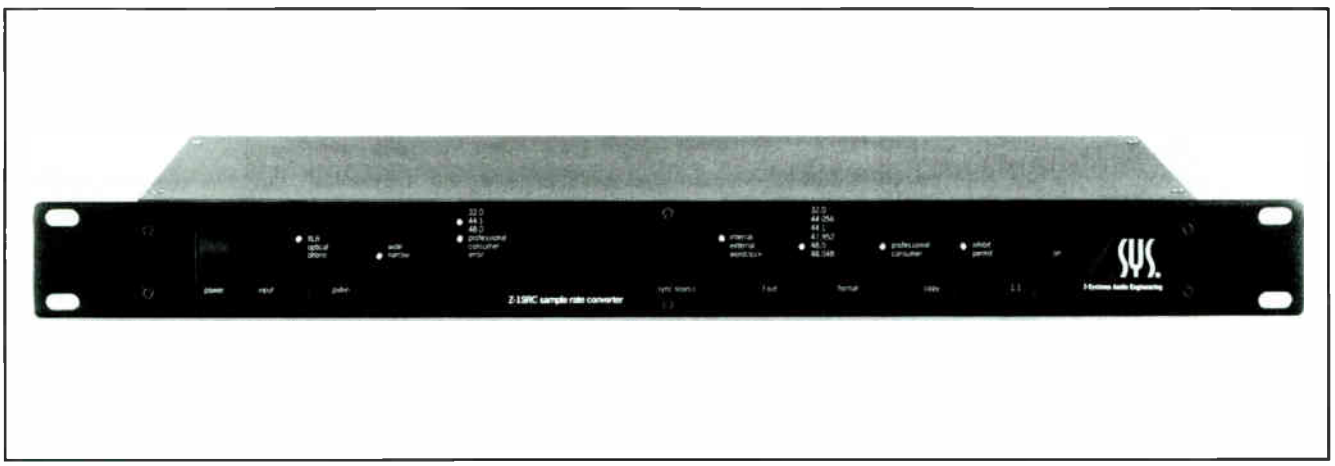

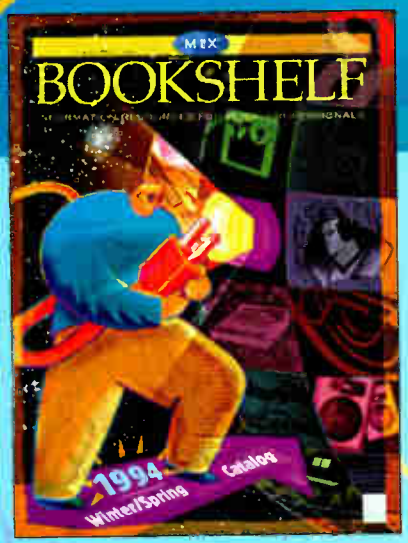

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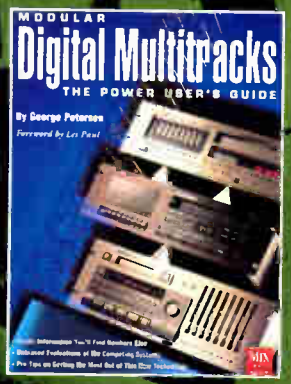

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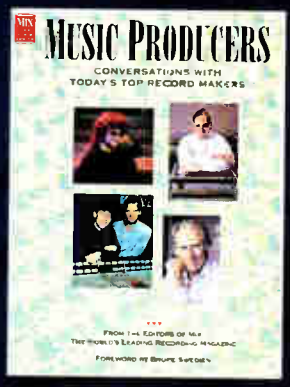

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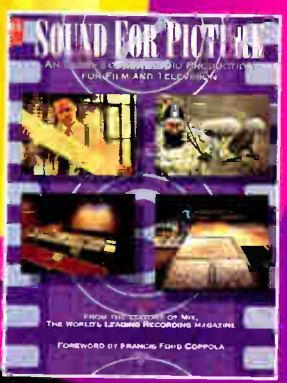

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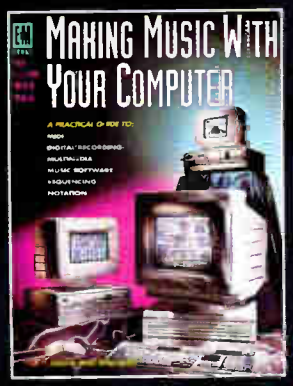

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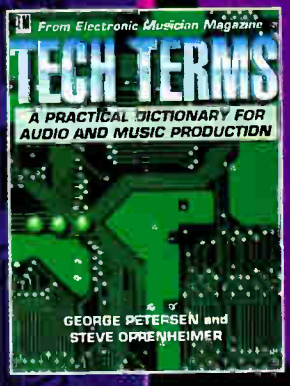

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Much more for less
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[1] *EM, December 1992*
[2] *Sound on Sound, October 1992*
[3] *EM, September 1992*

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outputs, and all can be driven simultaneously from the input.

The Z-1SRC also throws in a couple of other slick features. On the input side is a mysterious switch labeled "pull-in: wide or narrow." This allows the user to tailor the unit to track time-varying sample clocks. Set at "wide," tracking occurs quickly, a requirement in applications such as varispeed transfer. In narrow mode, the unit locks onto the input sampling rate and is fairly insensitive to sample rate jitter, tolerating up to 10 nanoseconds of input or output jitter without increasing THD+N by more than 1 dB.

Another control that bears some explanation is the 1:1 switch, which bypasses the sample rate conversion functions but still allows use of copy-inhibit and format functions. One obvious use for the 1:1 switch is in using the Z-1SRC as a format interface, for converting AES/EBU to S/PDIF signals and vice versa.

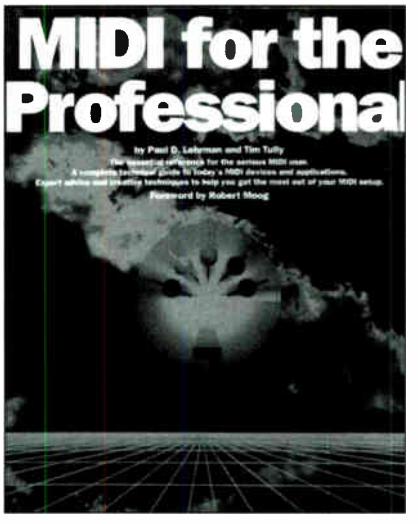
A jumper inside the Z-1SRC allows users to reassign the ground pin on the output connector from chassis ground to signal ground. Also inside is a 110/220 VAC line voltage selector switch, a nice touch for intercontinental engineers.

Features aside, the best part about the Z-1SRC is its audio performance, which was top-notch. The actual "sound" of the unit was nearly imperceptible, whether handling the typical 48-to-44.1kHz transfers, long-range 32-to-48kHz or the ±0.01% change to/from 44.056/44.1 kHz. In these applications, the Z-1SRC proved to be light years ahead of the usual sample rate conversion alternatives

BOOK REVIEW: MIDI FOR THE PROFESSIONAL

Although *MIDI for the Professional* is (as the name implies) written primarily for professionals, anyone who would like to know more about MIDI applications will find this 240-page text informative. Although most of the software examples are illustrated on a Macintosh, the information is equally valuable to those using Atari, DOS or Windows systems.

Co-authors Paul D. Lehrman and Tim Tully present a brief history of the subject and a guide to basic MIDI principles. The technical aspects and attributes of the MIDI protocol are discussed in byte-sized detail. A discussion of professional MIDI equipment includes keyboard, guitar, wind and percussion controllers, samplers, synths, and experimental controllers such as the Power Glove.



Live performance, sound editing, audio production and post-production are clearly dealt with. Other topics include composing techniques (such as creative quantization and instrument combining), limitations of MIDI, MIDI in education, programming and the future of MIDI.

Many pearls of wisdom and shortcuts are illustrated—complete with examples using popular software—such as spicing up dynamics by using different timbres, changing volume levels on certain voices in a chordal instrument or changing the envelope of two sounds in different directions at different times.

Lehrman and Tully co-authored a smart, informative—although curiously laid-out—volume. (Why the extrawide margins?) The authors are obviously familiar with the technical aspects of the subject. They bring a clear understanding of what it means to use MIDI in everyday work situations, and they do a good job of explaining at a professional level. However, the omission of an index is bad form for an otherwise comprehensive book on this technical subject.

MIDI for the Professional is published by Amsco Publications (a division of Music Sales of New York City) and is available in technical bookstores or through Mix Bookshelf, (800) 233-9604.

—J. Holiday

presented earlier.

Overall, the Z-Systems Z-1SRC has it all: great sound, great price and features that serious pro users require. The Z-1SRC marks an excellent debut from this new company, and it will be interesting to see what new products lie ahead.

Z-Systems Inc., 4641-F N.W. Sixth Street, Gainesville, FL 32609; (904) 371-0990, (800) 371-0991.

MILLENNIA MEDIA HV-3 PREAMP
by George Petersen

Let's face it. Mic preamps are not exactly the most exciting pro audio devices. Now before I start making enemies, I should say that there is nothing wrong with classic designs, such as the discrete Neve, API and Focusrite preamps, or vacuum tube models such as those from Summit or Tube-Tech. Each of these has its place, and, depending on the intended use, all are important tools for the creative recordist.

It should also be noted that preamp *aficionados* fall into one of two camps: those who seek a particular preamp for smoothing, warming or brightening the sound; and those who seek absolute purity in reproduction. The Millennia Media HV-3 is an example of the latter school of design.

Housed in a single-rackspace chassis, the HV-3 is a 2-channel microphone preamp designed for use with condenser (+48 phantom power) or dynamic mics. A $300 option allows use of the HV-3 with Bruel & Kjaer high-voltage mics, such as the 4003, 4004, 4009 and 4012, which require a 130 VDC supply.

The HV-3 is a high-headroom, high-speed design, using a matched transistor hybrid front end with an 88V P-P FET-based, DC monolithic output stage. The audio pathway is minimalist throughout, avoiding the use of transformers, highpass filters or PCB connectors for audio. The Millennia approach is to eliminate all unnecessary components, including such obviously passive components as phase-reverse switching, which, even when bypassed, present another connection that could possibly degrade the audio.

In keeping with this philosophy, each HV-3 is hand-built, with hand-soldered Mogami OFC Neglex wiring on all internal audio connections; Neutrik gold-plated XLRs are used throughout, and gain control is via Grayhill gold-contact rotary switches. In place of the rotary gain controls, Bourns-sealed, conductive-plastic pots are optional; Millennia recommends these for users of high-output mics, such as the Sennheiser MKH Series and the high-voltage B&K mics.

The HV-3 sets up simply. The front panel has phantom-supply on/off switches, gain controls for each channel, four LEDs that indicate status of the four rails on the internal toroidal power supply, and large, bright overload lights visible at distances up to one furlong. While HV-3 operations are straightforward, the overload lights are *not* clipping indicators. These lights glow when output levels reach a level of +27 dBu, although the HV-3 can produce a maximum output of +32 dBu (nearly twice the voltage of +27dBu) before clipping. Hence, the main function of the overload lights is to indicate a nominal level when a recorder connected to the preamp will typically begin to clip.

XLR inputs/outputs (all wired pin 2 hot) are on the rear panel. The AC power can be set for 115 or 230 VAC, 50/60 Hz, although this procedure also requires changing the main fuse, so pack extra if you frequently travel to distant locales.

Over a period of months, I used the HV-3 on all types of sessions, ranging from stereo-miked chamber ensembles, to choirs and acoustic groups (folk and historical), to multitrack pop sessions, where the HV-3 tracked directly to tape. In all cases, the HV-3 provided an absolutely faithful rendition of the microphone's sound, without imparting any coloration of its own. Transients, in particular, were stunning and crystal-clear, even on tough-to-capture, percussive instruments such as triangle. And these results were consistent, with tube or FET microphones, whether used on instruments, lead vocals or backup vocals.

I was tracking some narration sessions where the voice talent requested an Electro-Voice RE20. We do a constant stream of radio sessions at my studio, and I'm quite familiar with the sound of this particular mic. I was surprised to hear a very audible improvement using the HV-3 with the RE20, so I tried it with other typical dynamic mic applications—snares, kick drums and guitar amps. The difference was noticeable, and even with a Shure SM57, snares really came alive.

Of course, listening is one thing, but I wanted to confirm what I heard with some bench-testing. Frequency response from 20 to 40k Hz was ruler flat (+0, -0.15dB) and continued well beyond 100 kHz. THD+N was under 0.0006%, (20 to 20k Hz, both channels measured).

Every engineer knows about Bruel & Kjaer microphones, but many seem to be confused about the high-voltage microphones such as the 4003 and 4004 (omnidirectionals) and the 4012 cardioid. These mics are transformerless, direct-powered and need a 130VDC source. Unlike phantom-powered mics, the direct-powered B&K mics dedicate one of the conductors to carrying the +130 volts to the mic. The mics are unbalanced, so cable runs should be kept as short as possible, typically under 100 feet. While only three conductors (ground, "hot" unbalanced signal and +130VDC power) are needed, the mics use 4-pin XLRs to avoid the possibility of connecting a standard mic to the 130VDC supply.

The 4004 and 4012 mics are capable of handling SPLs of up to 168 dB and, combined with their low self-noise, offer a usable dynamic range well over 140 dB, which is suitable for the 20- and 24-bit digital systems

on the horizon. While these mics are not unduly expensive, the 130-volt B&K power supply model 2812 retails at approximately $1,700, which makes the ($300) high-voltage option for the Millennia HV-3 a cost-effective alternative for anyone interested in these high-performance mics.

About the only fault I could find with the HV-3 is lack of a signal presence indicator, which would speed gain setting in applications where one (or several) HV-3s were placed some distance from the recorders or console, such as in remote recording sessions. However, this would not be a problem in typical studio use or on remote dates where the preamps are placed near the recorder.

Priced at $1,595 ($1,895 with the 130-volt option), the Millennia HV-3 is an excellent value offering impeccable audio specs, first-rate construction, and sonic transparency under any recording conditions. The HV-3 ranks among the best microphone preamplifiers I have heard and deserves the consideration of any serious recordist.

Millennia Media, Box 277611, Sacramento, CA 95827; (916) 363-1096.

PINNACLE MICRO SIERRA 1.3GB OPTICAL HARD DRIVE

by Paul Potyen

The Sierra 1.3GB rewritable Optical Hard Drive from Pinnacle Micro is the hottest talk in SCSI-based removable magneto-optical cartridge systems. The MO cartridges contain about 620 MB of data per side (after formatting), making it the first generation of these devices equipped to handle chunks of data large enough for a CD's worth of audio. The 5.25-inch cartridges look identical to the previous generation of MO carts (see "The Byte Beat," July 1993), but faster disc-spin rate (4,500 rpm) and improved laser technology allow more data to be written to the disc.

Pinnacle claims the Sierra can sustain a data transfer rate of 2 MB/sec synchronously off the media, with an average effective access time of 19 ms —fast enough for recording, playing and editing of digital audio. Add to this the increased stability of MO compared to conventional media, and the Sierra would appear to be an excellent choice for digital audio applications.

The drive can be used with any computer that supports SCSI; I used a Macintosh Quadra 650. Unlike con-

ventional hard drives (but like other removable systems such as Syquest), the Sierra requires installation of the PMO Init 2.3r0 in the extensions folder of a Macintosh system.

The procedure for connecting the Sierra to the SCSI bus is similar to that of a typical SCSI device. Originally, I connected it at the end of my SCSI chain of five devices, with a terminator connected to the open socket on the back of the unit. In this configuration, I was unable to see the drive on the desktop or get SCSIProbe to recognize it. Changing the order of drives so that the Sierra was the third device in the chain solved my problem. Go figure.

Formatting a disc is a bit tricky with the Sierra. Don't insert an unformatted cartridge into the drive until you've opened Pinnacle's PMO formatter (V.2.3, included) and the automatic SCSI scan is complete. Otherwise, your system will crash. The formatter itself is full-featured, with several options for formatting, verifying and testing the media. One of those, Quick Setup, is just that, initializing your volume in about a minute. (Each side must be separately formatted.)

Cartridges can be ejected by dragging the icon into the trash, as with floppy disks. However, if you use a utility such as SCSIProbe, make sure you don't enable the Close Driver After Eject option, or you'll see problems when you insert another cartridge.

Before attempting to record audio data to the Sierra, I performed some basic speed tests on a newly formatted empty cartridge. For comparison purposes, I ran the same tests on some other drives. My results showed an average access time comparable to that of a Syquest drive.

I tried recording directly from a DAT onto the Sierra using Digidesign's Sound Designer software. About nine minutes into the recording, I got an error informing me that recording had been interrupted due to a disk error, with instructions to increase the RAM buffer. Referring to the Sound Designer manual, I discovered that a maximum RAM buffer setting of 32 (which corresponds roughly to the number of seconds of buffer memory) is recommended for operation with MO drives. Increasing the buffer corrected the problem, and I was able to record about 50 minutes of continuous audio flawlessly.

Editing from the Sierra was only slightly slower than from a magnetic media, mostly in terms of seeking to and playing from a new location on the timeline. Part of this increased sluggishness is a result of a larger buffer setting. Other editing procedures—fade-ins and fade-outs, normalizing, selecting regions, assembling playlists, scrubbing, etc.—seemed to be minimally affected.

I connected the Sierra to a Quadra 950 set up with a 16-channel Pro Tools system, only to discover that the Sierra does not work with Digidesign's System Accelerator or NuBus Expansion Chassis; I had to connect directly to the SCSI bus. I then used Sound Designer II and the Q10 plug-in from usWaves (Knoxville, TN) to perform some EQ changes to a stereo sound file on the cartridge. At one point, I ejected the cartridge and flipped it over to load material from side B, which mysteriously failed to mount. Norton Utilities failed to fix the problem, telling me that "A BTree Header node is missing." It was necessary to reformat side B. Moral: Back up your work.

I achieved excellent results using the Sierra with Opcode's StudioVision and OSC's DECK II. As with Sound Designer II, both programs offer the option of enlarging the RAM buffer for recording to magneto-optical media, and when I did that, I was able to simultaneously record four tracks of audio at 44.1 kHz directly to the cartridge without any errors.

If you are using a Pro Tools system with a System Accelerator, you might want to look at the PortaMezzo Desktop MO from Grey Matter Response Inc. (Santa Cruz, Calif.). This system uses the same Pinnacle MO hardware, but GMR's proprietary firmware is said to allow a single PortaMezzo/MO drive to be configured for up to eight tracks of audio playback with Pro Tools. And a GMR representative said the company is planning to offer its proprietary software to users who purchased their MO drive directly from Pinnacle Micro.

Priced at $2,995 for a Macintosh ($3,195 for the PC version), the Sierra is worth considering as an alternative to fixed storage systems. It ships without MO cartridges, which typically sell for $249 apiece.

Pinnacle Micro, 19 Technology Drive, Irvine, CA 92718; (714) 727-3300. ■

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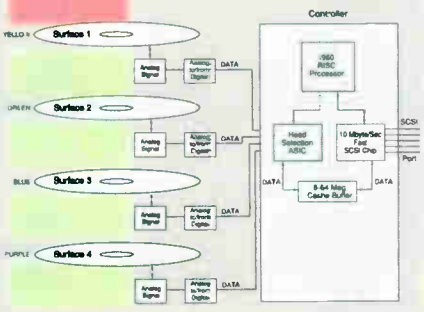

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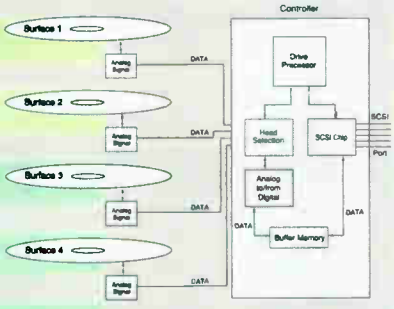

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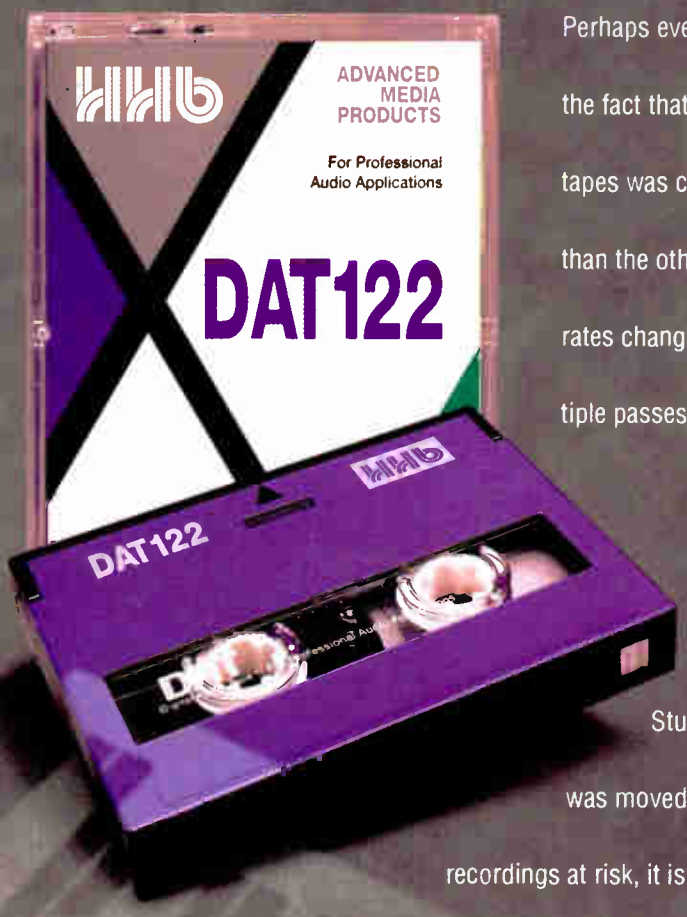

In the critical area of block errors, the tapes fell into two distinct categories of performance. Three exhibited similarly low error rates with the others presenting error levels considerably higher. HHB DAT Tape was one of the leading three.

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USE READER SERVICE CARD FOR MORE INFO

By Mel Lambert

SONIC SOLUTIONS MEDIANET

NETWORK FILING SYSTEM

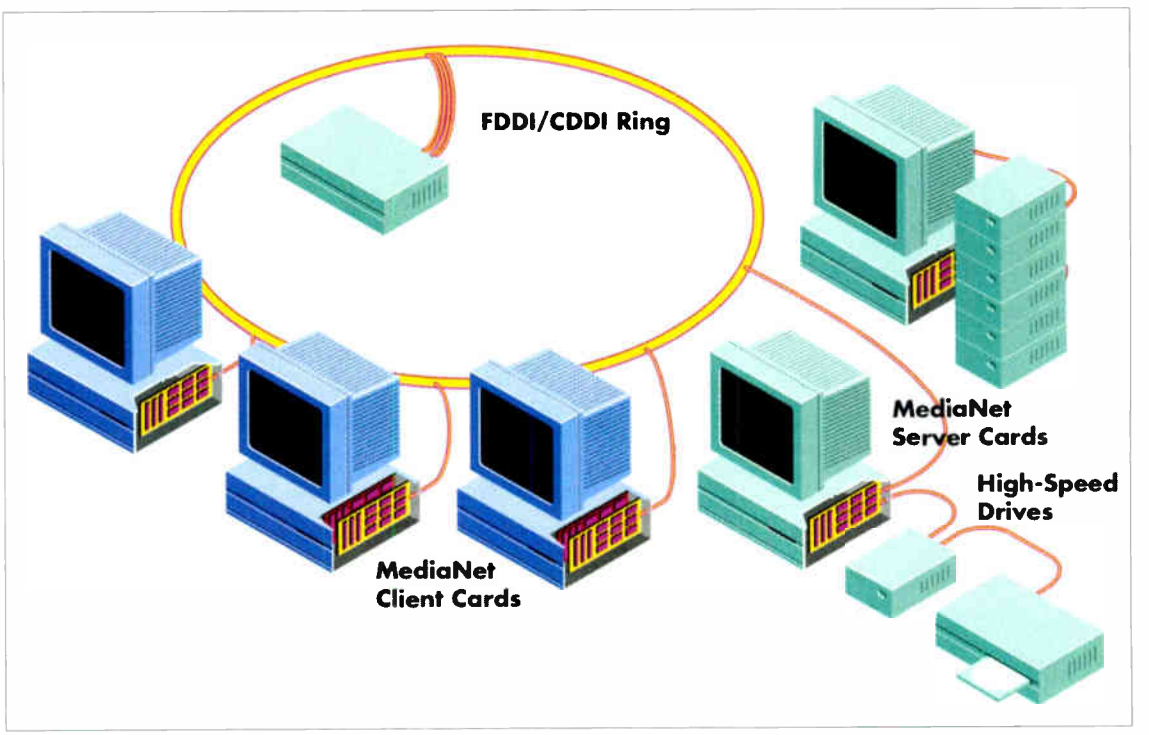
A major limitation of random-access audio is that sound files require a lot of storage space. An increasingly attractive alternative to adding more hard disks to a digital audio editing system is the use of centrally located drives that are shared by an array of users.

Many facility owners take this route to extend the usefulness of their multiple DAW systems. Setting up an efficient, cost-effective digital audio network, however, is not for the faint-hearted. A truly useful network should be able to perform all of the following:

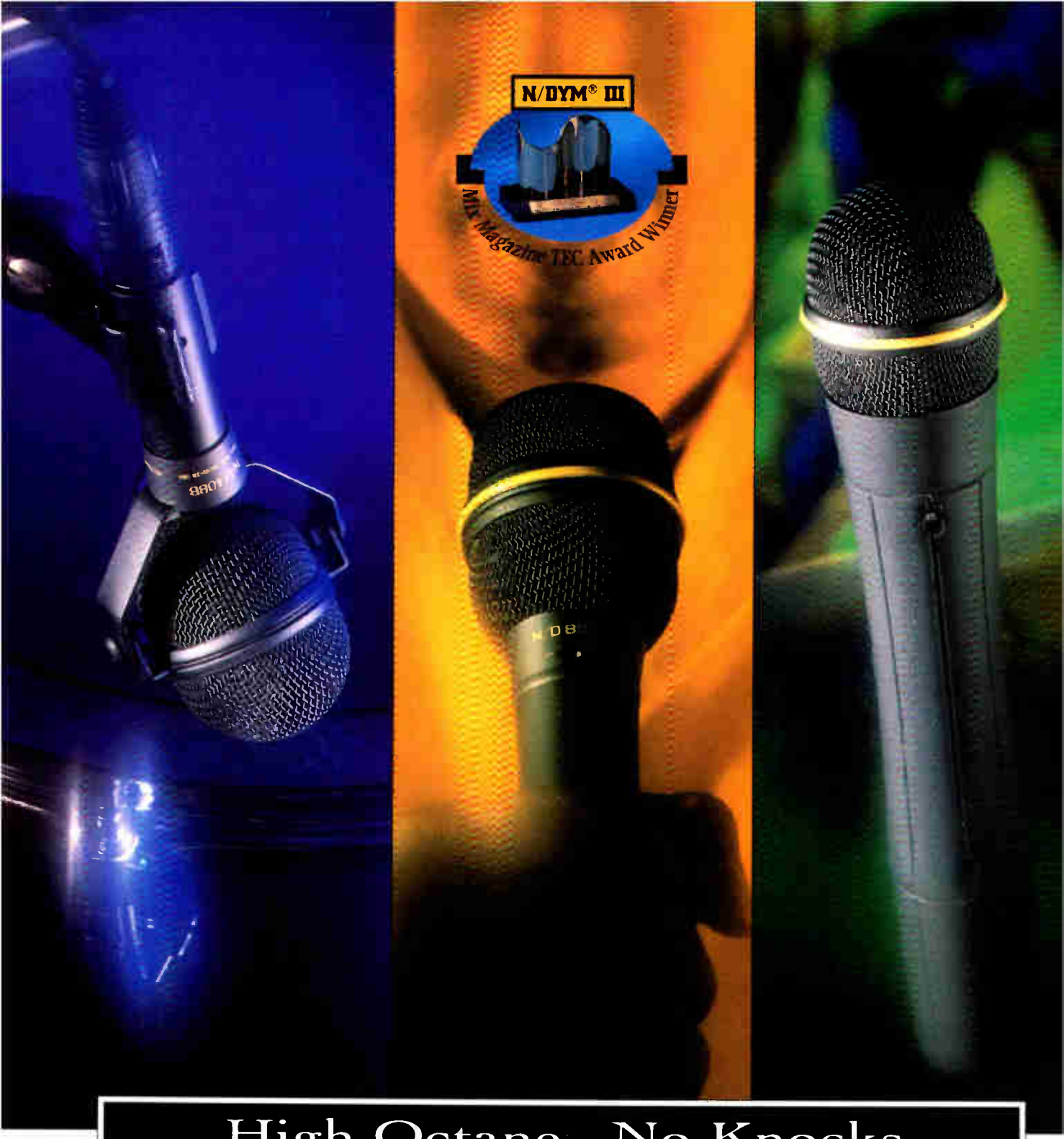
- Optimize the loading and archiving of editing projects.
- Provide multiple users with unrestricted access to stored sound files.
- Allow users to be located anywhere within a multiroom complex.
- Provide high-speed search through (and importation of) sound effects and music cues.
- Provide background or offline backup of stored audio files.

MediaNet™ from Sonic Solutions provides a reliable, user-friendly solution to most of these requirements and even allows sharing of sound files between workstations from different manufacturers. MediaNet users can open, play and edit material from disk volumes located anywhere in a facility. The system's remote drives function as if they are mounted on the user's Macintosh workstation, with transparent and seamless access to digital audio data that may be physically located up to a mile or more away.

In this way, an effects editorial



An example of a MediaNet networking system.



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room, for example, might be finishing a SFX prelay while a mix-to-picture session can be using the same material in another part of a studio complex. Under MediaNet, multiple users can even use the same file simultaneously with no loss in channel capacity or slowdown in response.

MediaNet is also used to interconnect Mac workstations in other industries, including desktop publishing, graphics, pre-press and similar areas that require fast access to remote storage media.

SYSTEM COMPONENTS

MediaNet consists of a NuBus interface card, control software and interconnect cables. The NuBus card plugs into the Macintosh, residing beside one or more of Sonic Solutions' SSP-3 audio processing cards, which provide four channels of digital I/O per card.

The MediaNet card comes in two varieties: a Server that also connects to external SCSI drives and a Client that connects to the network for transferring sound files from remote systems to the user's workstation. The Server card is provided with two SCSI ports, enabling connection to up to 14 discrete storage devices; also supported is connection of high-speed RAID (Redundant Array of Inexpensive Disk) systems. For users who do not need media files attached to their local workstation, the Client card is available without embedded SCSI controllers. They enable "diskless" random access to multimedia data from other MediaNet Server systems on a network.

Separate versions of the Server and Client cards enable connection via FDDI (Fiber Distributed Data Interface) or CDDI, a copper implementation of the FDDI standard that uses twisted-pair cabling rather than optical glass fiber. FDDI-based systems can be separated by up to 2 kilometers (1.25 miles), while CDDI systems are limited to 100 meters between nodes. Token Ring software controls data traffic on the local-area network. Unlike other LAN implementations, MediaNet's token-passing protocol has been adapted to the needs of digital audio by tailoring the size of the data packets and the number of packets transmitted with each pass, thereby assuring that network bandwidth can be used efficiently even with multiple audio streams.

MediaNet cards connect to one another via duplex (two-conductor) optical-fiber or conventional twisted-pair cables. The FDDI implementation utilizes a Single Attachment Station (SAS) 62.5 µ/1300 nm multimode transceiver, while the CDDI version uses familiar RJ-45 connectors for Class 5 unshielded twisted-pair. For interconnecting multiple MediaNet-equipped stations in a star configuration, you need a central concentrator unit, which monitors bus traffic and vectors connection between assigned sources and destinations.

Each MediaNet board comes equipped with four 1MB dynamic SIMM chips. Sonic Solutions recommends providing at least 16 MB of RAM on each server board; additional memory speeds up disk-intensive operations. (MediaNet requires the use of fast 60nS SIMMs.)

Software loading involves the Apple Installer, which quickly and automatically transfers AppleTalk, plus Sonic's FDDITalk and MediaNet extensions. Also included is MediaNet Admin, which allows users to control individual files and functions like an enhanced version of the Apple Users & Groups Control Panel.

To use MediaNet, you simply access the required remote drive(s) via AppleTalk and the Chooser, in the same way you call up a printer or other network-capable device. Once selected, access might require a password, depending on ownership and the File Sharing Status of a particular drive. In every other respect the process is transparent. Anybody who has used AppleShare or a similar Mac-based networking utility will be up and running with MediaNet in just a couple of minutes.

The MediaNet user manual is sparse on a couple of details, including exact memory requirements for specific system configurations, and fails to mention the use of concentrators and hubs. In every other respect, it's written clearly and comprehensively. It also contains valuable information about the best way to set up a system with multiple servers.

I looked at a three-node MediaNet system installed at Future Disc Systems in L.A., where two disc-mastering rooms connect via MediaNet to a dedicated prep room. They've been using the system since the beginning of the year. Typically, audio is off-loaded from the network drives in the prep room, after the two other rooms have edited material located on these

network drives. All computers are equipped with server cards to allow for maximum in-load/oblique archive and data access.

SYSTEM ADVANTAGES: SO WHAT IS FDDI AND CDDI?

While AppleShare and Ethernet may be more familiar to Mac users, because of their slow speed and/or data-transfer protocols they have little application in audio workstations for real-time playback. AppleShare can quickly be eliminated from consideration because of its snail-like 250KB transfer rate: A single channel of 16-bit data at a sampling rate of 44.1 kHz requires at least 100 KB of channel capacity.

Ethernet's 1.25MB specification might seem okay at first, until you realize that its protocol involves the electrical equivalent of a CB radio. Anyone can transmit at any time into the network, but if any two or more transmissions collide, the only recourse for the sender is to try again. This makes Ethernet inappropriate for real-time playback, although it does play a role in system control, archiving and other data-transfer operations that are not time-critical.

In terms of data bandwidth, replay of 24 channels of audio plus a large-format QuickTime or similar digitized video source represents as much as 4 MB per second. While today's SCSI-equipped drives can achieve sustained data rates as fast as this (particularly using SCSI-2 I/Os and proprietary storage formats like Sonic's Media Optimized File System), accessing it via a network is beyond the power of even the fastest Macintosh or PowerPC. Instead, we need some way to bypass the workstation's overstressed master microprocessor and supply the network directly from the drive's output.

This is exactly what MediaNet achieves. A dedicated MediaNet card can currently provide guaranteed throughputs in excess of 3 MB/sec from one node to another. With RAID configurations, plus a DMA software upgrade, Sonic says this performance can be upped to 5 MB/sec—a data throughput that will handle just about any chore in a multisystem network. Sonic Solutions also claims that MediaNet will be capable of simultaneously handling more than 80 channels of CD-quality digital audio or between 15 and 50

channels of compressed digital video.

My only operational complaint involves reserving data bandwidth. When you open a new project on a Sonic System, the software automatically determines how much system bandwidth will be required based on the number of audio channels and other parameters. It is then possible to reserve this amount of capacity on the network via a normal Apple pull-down option. However, if another user opens a subsequent session that requires more capacity than is currently available, network access to the remote drives is denied and a message is displayed on the user screen. What isn't displayed is an indication of which users are utilizing what percentage of system capacity. A subsequent software upgrade should correct such anomalies and provide a more user-friendly system alert.

The network installation at Future Disc did not push the envelope of the system's capabilities, since mastering applications typically involve only stereo audio. However, at the recent NAB convention, Sonic Solutions demonstrated data transfer between a Mac running the firm's Sonic Station II and a remote Avid Media Composer editing system.

Just around the corner is an upgrade path from FDDI- and CDDI-based networks to Asynchronous Transfer Mode (ATM), which offers—on paper at least—data bandwidths in excess of 1 GB/sec. ATM MediaNet will permit simultaneous transmission on a single network of more than 800 channels of CD-quality digital audio, more than 50 full-resolution digital video channels or from 150 to 500 channels of compressed digital video. Desktop performance, Sonic says, will range up to 15 MB/sec per node (for up to 150 simultaneous audio channels, or between 20 and 75 channels of compressed digital video). Cost per node will be two to three times more expensive than FDDI MediaNet.

Currently under consideration is an NFS MediaNet for connecting MediaNet and Networked File System workstations, which will enable transparent networking between Mac- and UNIX-based systems from Silicon Graphics, Sun Microsystems, Hewlett Packard and so on. Also announced at the NAB convention was the first set of MediaNet Partners: Cisco Systems, Data Translation, ImMIX, Radius, SGI and Sun. They will cooperate with Sonic on MediaNet technology and will in-

vestigate techniques for connecting video workstations to MediaNet.

For those wondering how MediaNet might relate directly to Open Media Framework, I predict that these two technologies can only benefit one another. OMF describes a set of standards for the different way in which audio, video and editing information is written into data files, and allows both the content and descriptions of edited program material to be shared, exchanged and augmented. MediaNet, on the other hand, provides a way for a number of individuals within a multi-environment facility to easily and quickly access sound/video files.

From that point of view, OMF and MediaNet address different issues. Yet because OMF doesn't make a great deal of sense without an easy technique for sharing multimedia files, and MediaNet doesn't offer any advantage unless the networked systems can read or output the same files, it's clear that OMF and MediaNet can symbiotically advance the state of the art in networked systems.

WHAT DOES IT COST?

FDDI MediaNet Server cards cost $4,495; CDDI versions are $3,595. Client versions are $2,900 and $2,000, respectively. Concentrators cost around $1,000/node for FDDI and approximately $700/node for CDDI. Cable costs are modest: around $350 for a 15-meter FDDI optical connection, and $105 for a similar length of straight- or cross-connected copper.

All in all, MediaNet represents a reliable, affordable solution to the problem of interconnecting multiple workstations and achieving the high-capacity bandwidth required by today's multimedia sessions. The cost of an all-FDDI network—including interface cards, concentrators, cables and connectors—is about $4,000 per node. While CDDI maintains the functionality of FDDI in terms of bandwidth and protocols, its use is limited to a maximum of 100 meters between nodes. However, CDDI's slightly lower installation cost may prove attractive for owners and operators of smaller studio facilities. ■

Formerly editor of Recording Engineer-Producer *magazine, Mel Lambert currently heads Media&Marketing, a pro audio consulting service.*

by George Petersen

AUDIO-TECHNICA AT4050/CM5

STUDIO MICROPHONE

Take everything you've ever heard about Audio-Technica and forget it. Over the years, mentions of Audio-Technica usually have sounded something like: "great mics...*for the money*." Compliments paid to A-T mics always seem to be accompanied by some kind of qualifier. And many engineers—never having heard A-T's excellent 40 Series mics—base their comments on 10-year-old experiences with $39.95 vocal mics that they once used with a garage band.

Five years ago, in developing its 40 Series studio condensers, Audio-Technica looked at breaking out of the "good for the money" mold and began focusing on producing microphones that would hold their own against any competition—at any price. Beginning with the AT4031 cardioid, the series was expanded to include the AT4049/AT4053/AT4051 modular (interchangeable capsule) system, the AT4071a shotgun and the AT4033 cardioid. The latest addition is the AT4050/CM5, Audio-Technica's first multipattern studio condenser microphone.

The 4050 takes the transformerless, direct-coupled electronics developed for the 4033 and combines it with a 2-micron-thick, gold vapor-deposited diaphragm on a large diameter capsule that is one-third larger than that of the 4033. The 4050 is a true condenser design (requiring 48VDC phantom power), and its two condenser elements are mounted back-to-back to provide a choice of cardioid, omnidirectional or figure-8 polar characteristics.

One of the design differences between the 4033 and the 4050 is that the new mic can handle sound pressure levels of up to 149 dB (or 159 dB with the -10dB pad in place). However, with a (non-padded) sound handling capability of 149 dB, it's unlikely that you'll encounter many situations requiring the extra -10 dB of attenuation.

Physically, the 4050 weighs in at just over a pound (16.9 ounces) and is about 7.5 inches long. Standard features are the -10dB pad, a switchable bass roll-off filter (-12 dB/octave at 80 Hz) and a shock mount, which is included in the mic's $995 price. The shock mount is a definite plus: Other mic manufacturers charge up to hundreds of dollars for a shock

mount, and the model that comes with the 4050 is no lightweight. It holds the mic securely and does an excellent job of isolating it from vibration noise. The capsules inside the 4050 housing are also internally shock-mounted, so the mic is effectively double-decoupled from all but the highest Richter-scale levels of stage rumble.

I began checking out the 4050 in the figure-8 pattern, used in an MS stereo pair with a 4033 as the cardioid front mic. This particular session was an acoustic guitar duet. When the guitar tracks were being cut, the client was still unsure of the final arrangement, so by recording an MS pair, we would have complete control over the stereo imaging in the mix. The mics were placed about five feet back from the players, who were about five feet apart, forming an equilateral triangle with the mics. This combination proved to be ideal for the project: The 4033 has a bright sound, which added a nice presence punch to the center track, and the 4050's pickup of the room ambience was round and full—very smooth for a figure-8.

Results with the 4050 in the cardioid and omni patterns were different, as the mic has a slight presence peak in the cardioid and omni positions. This was more noticeable on the next 4050 session—this one with master percussionist Pete Escovedo, who dropped by to do shaker overdubs on a new age album session. In this case, the cardioid pattern was used about four feet away, and the mic excelled in capturing all of the transients with punch and clarity. The mic's small presence peak was just enough to help keep the percussion from disappearing into the mix without adding harshness.

I rarely use condenser mics on snare for a couple of reasons: First of all, they don't enjoy being smashed by drumsticks; and second, they can sometimes overload due to the high SPLs that always seem to go up by 3 dB or so once the tape is rolling. On one session, the drummer seemed to be under control, and I decided to try the 4050 on snare. Placement may be problematic, because the shock mount is cumbersome in tight quarters, and the top edge of the grille sticks up about an inch above the top of the capsule, so the mic's size can interfere with the drummer's playing. Undaunted, we tried the 4050 in a cardioid pattern, with the capsule angled downward, about six inches from the drum head.

The soundcheck (soloing on the snare) sounded fine. Unfortunately, when the whole kit came in, the air pressure from the closing hi-hats slammed into the back of the capsule vents, providing an audible reminder of why you shouldn't blow into mics. The solution, of course, was to slap a piece of duct tape over the rear windscreen—not for pattern control but to keep the wind out of the ports. It looked ugly, but after this simple mod, the 4050 sounded great on snare, and we never even needed the -10dB pad.

I also had the chance to use the 4050 on that same project, this time as a distance mic for a guitar cabinet. The ideal combination on this 2-12 Fender cabinet proved to be a Shure SM57 located 15 inches in front of the cabinet, slightly off-axis to the cone, about an inch in from the speaker's pleated edge, and the 4050 placed (in the omni position) 12 feet back across

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the room on a tall stand. Both mics were printed to tape. Adding 15 ms of alignment delay to the near mic and combining it with the distant 4050 track provided a perfect blend of the crunch with the smoothness of the room ambience. The delay trick is cool, because the room reverb occurs simultaneously with the guitar's attack, creating a sound that is bigger than life.

On horns, the 4050 offered an accurate and generally uncolored rendition in the cardioid pattern, and when tight-miking lead trumpet, I kicked in the -10dB pad just to be on the safe side. Though I probably didn't need the pad, I was pleased by the performance of the non-capacitive pad design, which reduced the level of the signal without changing the timbre of the instrument.

Obviously, vocals are the *raison d'etre* of large-diaphragm condenser mics, and I was anxious to check out the 4050's performance in this area. Mics with excessive presence boosting can be shrill on some female lead vocalists, but I had excellent results with the 4050 on a variety of female voices, both alto and soprano. The mic's grille is a bit too transparent to use without some kind of breath filter, but my Popper Stopper mesh screen took care of that problem pronto.

I liked the sound of the 4050 on about two-thirds of the male vocalists I auditioned (.666 is still a pretty good batting average), but the other male voices needed a stronger presence boost than the natural sound of the 4050 provided. In these cases, a gentle touch from a Summit tube EQ was just right. (I tend to avoid EQ when tracking and prefer changing to a brighter mic—such as the 4033.) One thing that I liked about the 4050 on vocals, male and female, was that the articulation, intelligibility and clarity of the vocals were retained, while sibilance was almost nonexistent.

With the introduction of the AT4050/CM5, Audio-Technica has stepped up to the plate and hit a grand slam, with a versatile world-class mic that can hold its own against units costing more than twice as much. At $995, this mic should find a happy home in the mic locker of any studio, large or small.

Audio-Technica U.S., 1221 Commerce Street, Stow, OH 44224; (216) 686-2600. ■

New Products

MODULATION SCIENCES STEREOMAXX

StereoMaxx, from Modulation Sciences (Somerset, NJ), is a "Spatial Image Enlarger" that allows users to deepen and widen the stereo spread of any balanced analog signal. Said to provide full mono-compatibility, the single-rackspace unit features independent width, depth and diffusion controls, along with an automatic width-limiting circuit that prevents over-enhancing widely spaced material.

Circle #226 on Reader Service Card

SPL OPTIMIZER

Distributed by Beyerdynamic (Farmingdale, NY) is the SPL Optimizer, a unique processor offering four high-quality parametric equalizers, each assignable to ranges from 10 to 23k Hz. Up to -60dB notch filtering is available on each band, along with high/low/bandpass filters. A variable roll-off feature sets the center-frequency slope characteristics, while "proportional-Q" equalization offers precise musical control.

Circle #227 on Reader Service Card

DYNAUDIO BBC MONITORS

Dynaudio Acoustics (dist. by AXI of Boston) is now offering the BBC LS5/12A, a commercially available version of the monitors it custom-designed for the British Broadcasting Corp. The LS5/12A is a two-way system featuring Danish Dynaudio drivers in a ported 11.6x7.25x8.1-inch, 16-pound enclosure of BBC design. Features include a 50 to 20k Hz (±3 dB) frequency response, Neutrik Speakon, and gold-plated binding post inputs and mag shielding. An optional subwoofer system extends LF to 35 Hz.

Circle #228 on Reader Service Card

TASCAM M-5000 CONSOLE

The Tascam (Montebello, CA) M-5000, at $29,999, offers features and functions of much more expensive consoles. Available in a 24-bus, in-line package with a 40-input channel frame, 32 input channels, 24-group routing and onboard TT patch bay, the M-5000's additional eight channels can be fitted with standard or dual stereo input modules. Features include eight aux sends, PFL or in-place solo, dual input paths on each channel, fader reverse, three mute groups, assignable 30-segment LED metering and 4-band EQ that can be split between the channel and monitor signals.

Circle #229 on Reader Service Card

ART CS2 COMPRESSOR/ LIMITER/GATE

Applied Research & Technology (Rochester, NY) offers the CS2, a 2-channel compressor/limiter/gate featuring balanced inputs/outputs, hard- or soft-knee operation, and controls for slope, attack time, release time, output level and switchable input/output LED metering. The gating section includes threshold and release time controls. A link switch enables stereo operation.

Circle #230 on Reader Service Card

AUDIO-TECHNICA TESTER

Audio-Technica (Stow, Ohio) offers the AT8520 audio comparator/tester for quick, easy checks of microphones, headphones and XLR cables. Two balanced mic inputs have switchable phantom power; dual amp sections feed a stereo headphone jack, a 1kHz oscillator checks balance, and eight LEDs indicate any combination of shorts, opens or miswired connections.

Circle #231 on Reader Service Card

APHEX EASYRIDER

Easyrider™ from Aphex Systems (Sun Valley, CA) is a 4-channel compressor using Aphex VCA 1001 voltage-controlled attenuators and "smart" circuits with intelligent detectors that look at the input signals to vary attack and release—fast setups. Each channel has an

LED gain reduction meter, with -10/+4dB gain switches, drive and output controls, fast/slow process selectors and stereo link switches.

Circle #232 on Reader Service Card

KIQ GOLDEN EARS PROGRAM

KIQ Productions (Sherman Oaks, CA) debuts "Golden Ears," a unique ear-training program with two CDs and a manual to improve critical listening skills. Using test signals and commercial recordings, the student learns to identify frequencies, EQ problems, amplitude changes, types of signal processing and timbral differences. The course is available in two 2-CD volumes: "Frequencies" and "Effects & Processing" ($69.95 each, or both for $120).

Circle #233 on Reader Service Card

PANASONIC SV-4100 DAT

Panasonic Pro Audio Systems (Cypress, CA) announces the SV-4100, a DAT recorder, with features for the broadcast, studio, live performance and theatrical sound markets. Based on the successful SV-3700, the new machine offers a three-second RAM buffer for instant start capability, external sync inputs (video, word clock), sync output, A-time cue search, five cue memory locations, AES/EBU and consumer (coaxial and optical) digital I/O, programmable output level control, shuttle search wheel, balanced XLR analog I/O, and switchable 44.1/48kHz recording.

Circle #234 on Reader Service Card

DENON PRO CD PLAYER
The DN-650F from Denon Electronics (Parsippany, NY) is a rack-mount, single-play CD player for studio and broadcast use. Features include large LCD time/track/status indicator, ±8% pitch control, large cue and play buttons, dual 18-bit converters, instant start function, balanced XLR analog outputs and S/PDIF coaxial digital output. Retail is $750.
Circle #235 on Reader Service Card

SENNHEISER HD 25SP HEADPHONES
Sennheiser (Old Lyme, CN) released the HD 25SP headphones, designed as a lightweight and comfortable, yet accurate monitoring system for users who spend long periods wearing headphones. The units have a sealed on-the ear design for isolation, and all parts—elements, cushions and cable—are field-replaceable.
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HOT OFF THE SHELF

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by Barbara Schultz

PHOTO: LIDWIEN VAN NOORDEN

Dutch engineer Manuel Cooymans miking a "vliegerfoon" attached to the string of a kite (faintly visible at the upper right).

DREAMS OF TRANSFORMATION

NEW MUSIC FROM THE NETHERLANDS

by John Michael Weaver

All music is experimental. Each artist who goes into the studio hopes to create new sounds and new melodies, to affect listeners in new ways. That's why new music-recording technology is developed, and that's why American producer/engineer/professor John Michael Weaver jumped at the chance to join a trio of Dutch composers to make *Dreams of Transformation: New Music From The Netherlands.*

The group calls itself The Next Step, and its goal at the outset of this research-oriented recording project was to extend the frontiers of musical expression and recording techniques while using relatively accessible technologies.

Weaver spent an eventful summer in Holland, co-producing the *Dreams* CD with group member Manuel Cooymans, in a small commercial studio called DJC (Digital Jazz and Classical) Recording, located in the town of s'Hertogenbosch. The Next Step consists of Cooymans, a producer, recording engineer and music teacher, as well as composer; avant-garde composer Michèl Koenders; and Leo van der Zijden, a composer, computer programmer, software developer, audio engineer and sound designer. Before they met Weaver, the members were already known for staging elaborate multimedia events, often in unusual settings, such as castles, kite

Dreams of Transformation—Song by Song

"Scramble" *by Leo van der Zijden*

"Scramble" is an electronic version of an acoustic composition originally conceived for three percussionists playing traditional instruments and industrial objects like steel water pipes. The score was created with the help of an algorithmic composition program called CAST, written by Leo van der Zijden, who says that this program was designed to emulate the psychological processes of elimination, transformation and multiplication that composers often rely upon when they write music.

Working with a number of predefined musical "blocks," the computer generated a great deal of musical material, which was then edited and reorganized by van der Zijden. Finally, the completed composition was translated into a standard MIDI file format, read into Performer and used to trigger two Akai samplers during the final mix.

festivals and Spanish beaches.

To make *Dreams*, Weaver and his Dutch colleagues "relied on both relatively traditional and new technologies (everything from cannibalized gramophones to MDMs and DAWs), depending on the requirements of each particular piece of music. Computers played a key role during every phase of the production process, including composition, sound synthesis, performance, signal processing and recording.

"We spent a great deal of our time in the studio," Weaver says, "exploring the relatively under-used capability of DSP devices to respond to real-time parameter and program-change commands sent in the form of MIDI messages. Experimentation with 3-D audio, achieved through DSP (Roland's RSS system) and Jecklin system stereo miking techniques, was one of our major objectives.

"Elementary" *by Leo van der Zijden*
"In fact, what we were trying to accomplish was 3-D animation, realized purely with sound instead of images."
—Leo van der Zijden

"Elementary" has an abstract narrative structure that traces a journey through a fictional subterranean world. During the first phase of the voyage, we pass through a torrential wall of noise and emerge into a kind of aural hologram, representing a peaceful grotto. Once inside, we glide along the surface of an underwater lake while water drips from imaginary stalactites. The trip ends as we pass through another tumultuous din, created by a waterfall that is actually made up of multiple copies of the same drops we heard in the grotto.

To suggest a sense of movement through the virtual cave, the timbre, rhythm and location of each individual water drop were precisely calculated and progressively altered by means of an algorithmic composition program written by the composer, Leo van der Zijden. The score of this piece looks more like a topographical map than a piece of sheet music. This "map," once transposed into MIDI messages, was used to trigger the samplers and control the DSP devices used to create the illusion of space and motion.

Multitalented Dutch musician Manuel Cooymans helped compose, perform, produce and record the music on the* Dreams of Transformation *CD.

Composers Leo van der Zijden and Manuel Cooymans

PHOTOS: DORETTE STURM

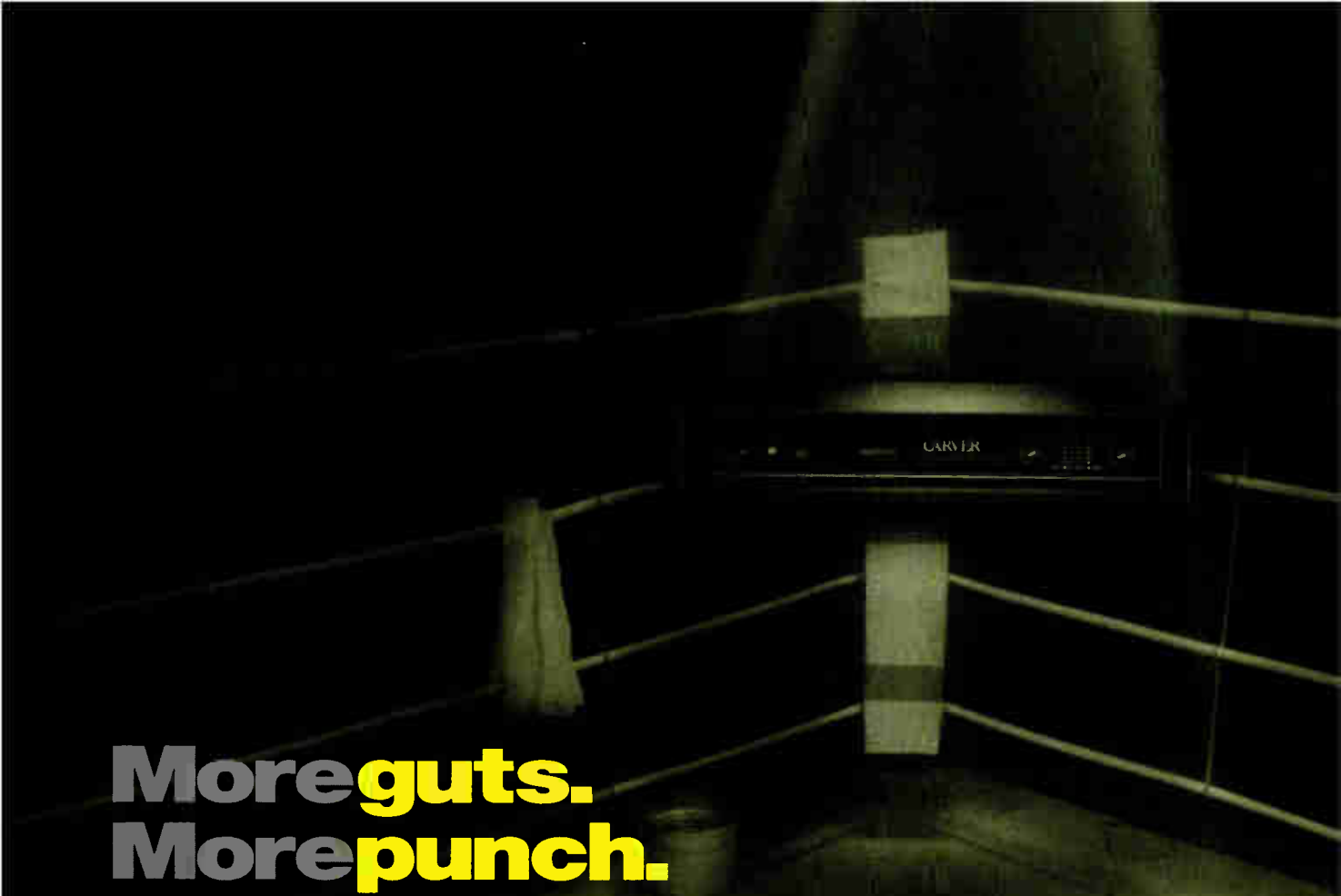
"After a great deal of testing, we found that our ability to reproduce or simulate a credible binaural psychoacoustic experience using these methods depended on a number of factors," he adds. "These included the timbre, envelope, mobility and quantity of the individual sound sources involved; the type of monitoring system employed; and the acoustical characteristics of the playback environment, as well as the listener's position within that space."

"Fractime" *by Michèl Koenders*
The title of this entirely electronic composition is an amalgam of the words fractal and ragtime. Self-designed software incorporating fractal equations made the initial melodic and harmonic choices for this piece. During the mix, the same concepts were used to generate the MIDI data that triggered real-time parameter changes within a Yamaha TX816 FM synthesis module and a Roland RSS unit.

Although producers of the *Dreams* project were often engrossed in technical matters, their principle focus was always the music they had come together to record. "One of the things that I like most about the way the project turned out," Weaver notes, "is the variety of musical and emotional experiences you can have while listening to the CD. Some pieces are rhythmic and visceral. Others are more environmental and abstract—even eerie and disturbing at times. These contrasting moods reflect the composers' distinct personalities and artistic intentions. The force that unifies the album, from a conceptual standpoint, is the commitment to experimentation that produced such diversity." John Michael Weaver details more about the production process behind the unique sounds you hear in this collection of *New Music From The Netherlands.* *—BJS*

SETTING UP

What makes this a very exciting time for the recording arts is that, to a great extent, our field has finally reached the long-awaited point of technological parity. It was the recent



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introduction of affordable MDMs and DAWs that put us over the top. Although there are still significant differences between the top-of-the-line and less-expensive studios and equipment, we are much closer today than ever before to the point where independent producers and artists can achieve respectable production values while working with relatively modest budgets.

"How to Rasp" *by Manuel Cooymans*
This piece was written for three percussionists playing various types of Mexican and Cuban rasps. In a live setting, the players would be situated on three different stages encircling the audience. For the recorded version, composer Manuel Cooymans overdubbed each part separately onto a Tascam DA-88, and these tracks were subsequently positioned (front, rear-left and rear-right) within a virtual acoustic environment, simulated by means of a Lexicon 300 and a 4-channel RSS unit.

Before we began recording *Dreams of Transformation*, we had already secured a small research grant from Loyola Marymount University in Los Angeles, but we still couldn't afford to buy or rent all of the equipment we wanted to experiment with. So, we approached vendors and studios in Holland and Belgium, asking for equipment loans. Amazingly, almost everyone we contacted agreed to help us, including the regional distributors of Tascam, Lexicon and Roland. In fact, the owner of a nearby facility, PreSound, not only loaned us his RSS unit but personally delivered it to our door.

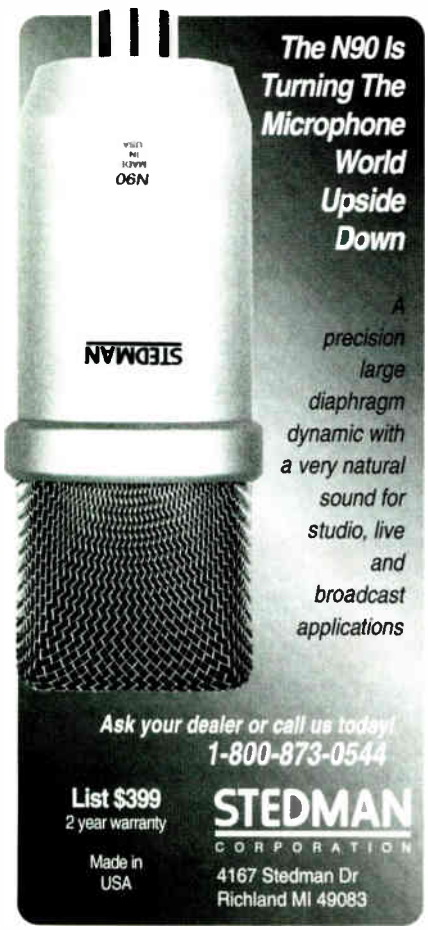
Once all the equipment was assembled at DJC Recording, sequencing, sampling and synthesis were accomplished using Mac IIfx, Mac SE/30 and Atari ST computers; two Akai S1000 samplers; Yamaha TX802, TX816 and DX7II synths; a MIDI Time Piece; and Sound Designer II, Performer, Digital Performer, Finale, Unisyn, C-sound, TurboSynth, S-edit, S-base and self-written software. Notable recording gear included a Soundcraft console; Tascam DA-88, DA-30 and DA-P20 recorders; Lexicon 300, LXP-1 and LXP-5, and Yamaha SPX990 signal processing gear; a pair of Behringer Composers; and a 4-channel Roland RSS system.

DJC's main monitoring system is a high-end D'Appolito satellite configuration designed by Maes Systems (Holland), consisting of modified Visatone ribbon tweeters, Viva 5-inch midrange elements and a dual 8-inch subwoofer. In the near-field, we monitored on Duran Audio's self-powered Axys NF-1s and modified Yamaha NS-10s. All final mixes were also checked on Sennheiser Ovation II headphones.

"St. John's Prelude" *by Manuel Cooymans*
This piece is a short improvisation played on a didjeridoo by Australian musician Alfons Crebolder. It was recorded direct-to-DAT in St. John's Cathedral in s'Hertogenbosch, using a Jecklin disc and a pair of Sennheiser MKH20 microphones.

EXTREME AND UNUSUAL COMBINATIONS

During the making of *Dreams of Transformation*, we took a wide range of approaches to composition,



sound generation, music performance, signal processing and recording. Each song required different equipment and techniques. In many cases, this lead us to explore the latent potential of old as well as new technologies. It also resulted in some unusual juxtapositions.

"Modus" *by Michèl Koenders*
"One of my goals was to allow musicians working with digital sounds to do what was possible with analog synthesis—make real-time, continuous sound modifications."
—*Michèl Koenders*

"Modus" is an interactive electronic percussion composition featuring digitally sampled and FM-synthesized sounds. What you hear on the *Dreams of Transformation* CD is an edited version of a live, semi-improvised jam session between a musician and a computer running an interactive composition program. During this performance, a Roland Octapad served as a multipurpose input device, each pad having been assigned a different function. For example, Koenders explains, "One pad of the Octapad is used to control the record and playback functions of an interactive sequencer. This allows the performer to play polyrhythmic duets with himself or to temporarily leave the performance completely to the computer." The Octapad could also be used to trigger real-time, envelope-parameter changes in a Yamaha TX816 module.

For example, the electronic composition "Fractime" is almost entirely the product of a fractal-based, algorithmic composition program, designed to make choices about the pitch, rhythm, envelope parameters and the spatial position of FM-synthesized sounds. At the other end of the spectrum, "St. John's Prelude" is a purely acoustic piece that consists of a live didjeridoo improvisation, recorded direct-to-digital in a 15th-century cathedral (with an RT of 11 seconds) using the Jecklin system OSS miking technique.

The contrast between other pieces on the CD is equally striking. In "Pijl & Boog," we hear a cello player performing music "composed" by a computer. "Kitewinds," on the other hand, features a score written by a human being but "performed" by a computer. Naturally, such descriptions oversimplify the complex processes involved in creating these pieces.

EXPLORING VIRTUAL SPACE

Many of the compositions found on *Dreams of Transformation* were originally written for live multimedia events, where the music would be reproduced through quadraphonic speaker arrays. For the CD version of these pieces, we wanted to go beyond the limits of conventional stereo without using more than two tracks. That's why we experimented with the Roland Sound Space system.

We also wanted to incorporate DSP parameter and program changes into our MIDI sequences whenever possible. The ability to automate effects changes opens up a world of creative possibilities, so it was a tremendous advantage to work with composers who understand this potential and have the programming knowledge necessary to use it.

"Kitewinds" *by Manuel Cooymans*
Cooymans says that "'Kitewinds' is an ode to the forces of nature." This piece's seemingly random sequence of auditory events conceals a meticulously calculated musical structure. According to Cooymans, nearly all of the sound sources heard in this piece belong to one of four elemental categories: earth, wind, fire or water. These include an earthenware urn, glass salad bowls, a ceramic coffee cup, a wooden table, a foot scraping along the ground, a babbling brook, a raging bonfire, gentle rain and howling wind.

The sound of wind is continually present throughout the entire 18-minute duration of "Kitewinds." The final mix of this piece contains four discrete wind tracks, positioned by means of the RSS system at equidistant points along an imaginary halo floating above the listener's head. No looping was involved in the creation of these extended wind recordings. Instead, each track was recorded separately in real time, using a "vliegerfoon" (kitephone), a self-made "instrument" consisting of the pickup and horn assembly of an old gramophone, attached to the string of a kite with a clothespin. As the gramophone's diaphragm vibrates in sympathy with the tug and pull of the airborne kite, haunting, ethereal music emanates from the horn and is captured by a handheld microphone.

For example, the RSS system can automate azimuth and elevation changes via polyphonic aftertouch data. The standard procedure for doing this is to manually adjust these parameters on the unit in real time while your sequencing program records the changes. During the mix,

this data can then be sent back to the RSS unit in the form of MIDI messages, and it will duplicate your original moves.

For some pieces on the *Dreams* CD, we wanted to skip this process and enter mathematically determined spatial-positioning coordinates directly into the sequencer. To accomplish this, one of our composers (Michèl Koenders) wrote a program that generates aftertouch data, which made it possible for us to record and edit RSS parameter changes even before the RSS unit arrived at the studio.

"Pijl & Boog" *by Michèl Koenders*
"Pijl & Boog" ("Arrow & Bow") was created using an algorithmic composition program called CAC II, written by Koenders. CAC II is an object-oriented composition tool kit, consisting of a generative section that uses several fractal- and attractor-based algorithms and an artificial intelligence section (ART-2 neural network) that helps with decision making and the organization of musical materials.

This computer-generated piece was performed in the studio by cellist Eelo Beinema. During the mix, fractal equations were used to formulate dynamic MIDI pitch-shifting instructions for a Lexicon 300 and to calculate the constantly changing location coordinates that were sent to an RSS unit in the form of polyphonic aftertouch messages.

I believe that one of the reasons we received so much encouragement and support was that we approached *Dreams* like a pure research project. All too often, the potential of new technology remains relatively untapped for a long time after its introduction because people working under-the-gun on commercial projects usually don't have the time to experiment as much as they'd like. Our sponsors appreciated the fact that we wanted to experiment with new production techniques and equipment configurations. We put as much emphasis on process as we did on product.

Dreams of Transformation will be released this month on DJC Records, Holland. ■

John Michael Weaver is a professor at Loyola Marymount University in Los Angeles, where he teaches sound design and recording. *He thanks Manuel Cooymans, Michèl Koenders and Leo van der Zijden for their substantial contributions to this article.*

BITS AND PIECES

EUROPE

Barcelona's **Duy Sonido** studio complex, which specializes in music, effects and dialog production and post-production for films and TV, acquired its second SSL ScreenSound, for digital audio editing in its new Studio 4...Swiss studio **Tonstudios Z** (Zurich) added a Scenaria digital audio/video production system to its Studio 1, as did another Zurich facility, Pro Ton Studios, which produces 30% of Switzerland's TV ads...In Paris, **Tigre Productions** purchased a Scenaria, and DC Audiovisuel installed a ScreenSound and SoundNet system...**ASP's Mobile** of Graz, Austria, installed a Soundtracs Sequel in the company's Mercedes Truck. The console was supplied by distributor Audiosales...**Fender Musical Instruments** opened a subsidiary in Dusseldorf, Germany. The 13,000-square-foot facility houses offices, a showroom and a warehouse...Ampex Media Corporation's European subsidiary **Ampex Media Europa, B.V.**, is now open in Nijmegen, the Neth-

erlands. Coinciding with the facility's unveiling was the formation of an alliance between Ampex and TCG, a third-party transportation and logistical support company in the same region...Apogee Electronics appointed **Pilote Films** to be its new distributor in France. Pilote's owner and chief sound designer, Gerard Loupias, is a former soundman with ABC's international news service...**France 2**, the largest French government-owned TV station, acquired a Fairlight MFX2 workstation for its Studio 50, the channel's principal audio post-production suite...After less than one year in operation, **Alchemea** college of professional audio engineering (London) received a London Regional Training Award from England's Employment Department...

ASIA

Indonesia's TV company, **SCTV**, purchased ARX EQ60 graphic equalizers and afterburner compressor/limiters for uplink equalization and gain control for the **Palapa Indonesian satellite**. The satellite is also used by TV3 Malaysia and the Australian Broadcasting Commission...In Korea, **Sountec Studios** and **TaeSung Records** recently bought SSL G Plus consoles... Japan's **Birdman Studios** installed four new SSL consoles in two of its Tokyo facilities: **Gardenia Studios** has two 4064 G Pluses, and **Birdman West** has two 4080 G Series consoles... **NHK**, Japan's national broadcaster, ordered three Scenaria systems for its facilities in Sendai, Nagoya and Matsuyama...

CANADA

The Canadian Broadcasting Corporation's Jeff Gruen received a Bronze Plaque Award at the Columbus International Film & Video Festival for a short promo he developed. The animation for the video, "CBC Sports: March Breakout" was done at **TOPIX** (Toronto) and brought to **Magnetic North Enterprises** (Toronto) for post-production...**Andrew Hermant** was nominated for a 1994 Juno Award as recording engineer of the year for his work on *Sweet Airs That Give Delight*. The album, a celebration of The Stratford Festival's 40th anniversary, includes compositions by Louis Applebaum, Alan Laiung and Berthold Carriere and performances by John Devorski, James Taylor, Mark Dubois and others. *Sweet Airs* was recorded at **Manta Eastern Sound** and **1:2:1 Recording**, both in Toronto...A.C. Simmonds & Sons is **Bag End**'s new exclusive Canadian distributor...**Pilchner Schoustal Associates** of Toronto was selected to be the acoustic and audio consultants for the Canadian Television Network's new facilities at the Eaton Centre in downtown Toronto. The complex will be the network's new broadcast origination site...

SOUTH AMERICA

Arbol Records (Quito, Ecuador) is the newest addition to the World Studio Group—the only member in South or Central America. Arbol recently hired a full-time, in-house arranger and a graphic artist; the facility also took delivery of a Superscope loader for its Electrosound cassette duplication department...**Panda Studios**, in Buenos Aires, Argentina, is the home of the country's first SSL console: a 4040 G Plus with Total Recall. ■

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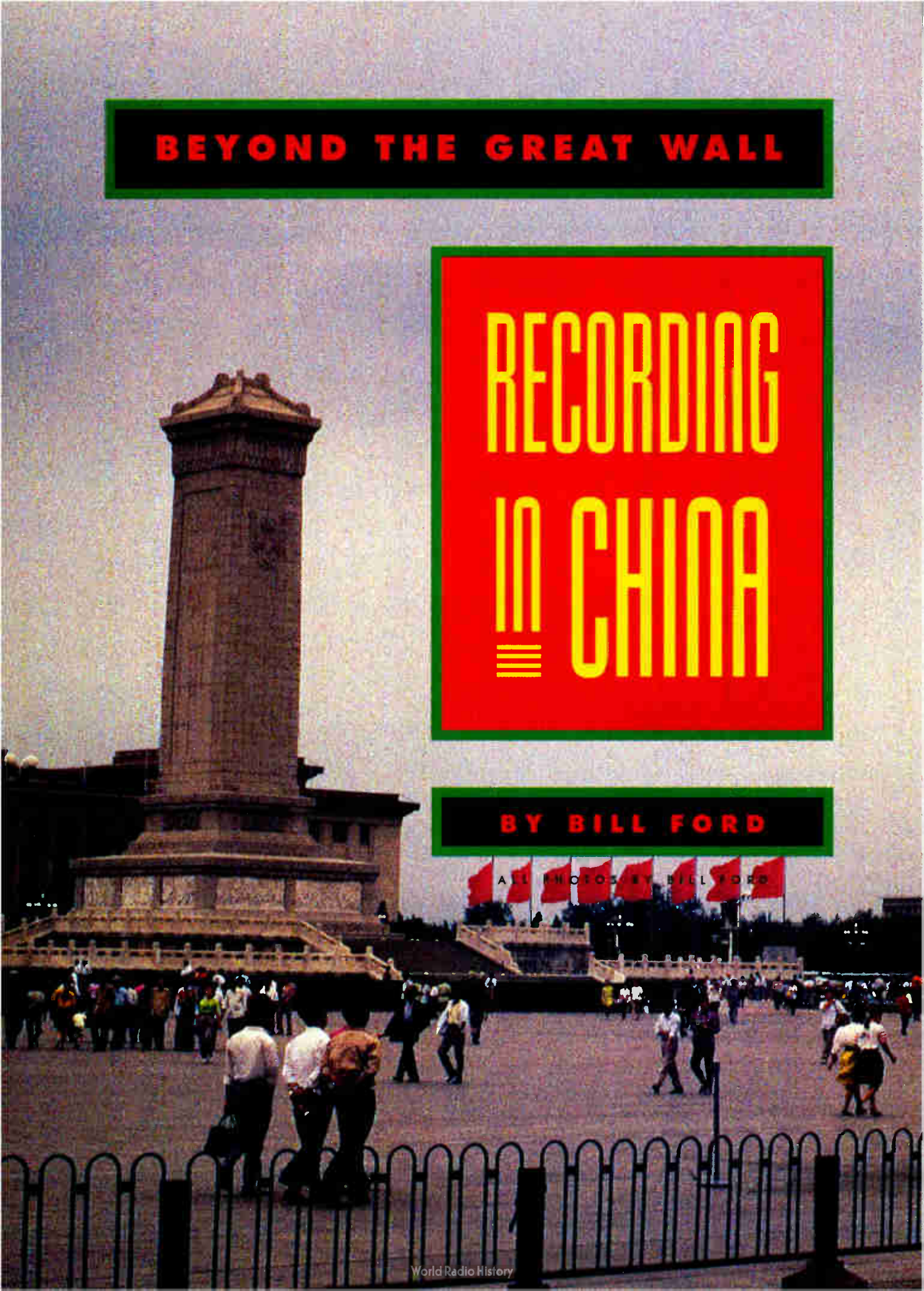
BEYOND THE GREAT WALL

RECORDING IN CHINA

BY BILL FORD



Ever wonder how recording facilities in the Far East obtain equipment and training, or just do business in general?

During a recent visit to China, I found that the studio scene there is particularly interesting as the nation shifts from a Communist collective environment to "Market Leninism" (read capitalism). For the first time, China's government-owned studios will be competing with private entrepreneurs, who will address markets that currently are not served adequately (or at all).

Because almost every studio in China is governnment-owned and -operated, studio managers must provide recording services to government entities (at favorable, government-set rates) and are prevented from profiting by providing services to groups whom the government deems not worthy. For example, there are no well-known alternative/rap/punk bands—these musicians can't find studio time, so record stores can't sell their music, and they can't get air time either.

In China, studios are considered production environments: They exist to get products out. Without private competition, the government facilities have not had to concentrate on employee or client comforts, such as lounges with phones, mineral

Overall: Tiannenmen Square; Above: The Great Wall; Below: Engineer Li Dakang mixing at the SSL 4000E

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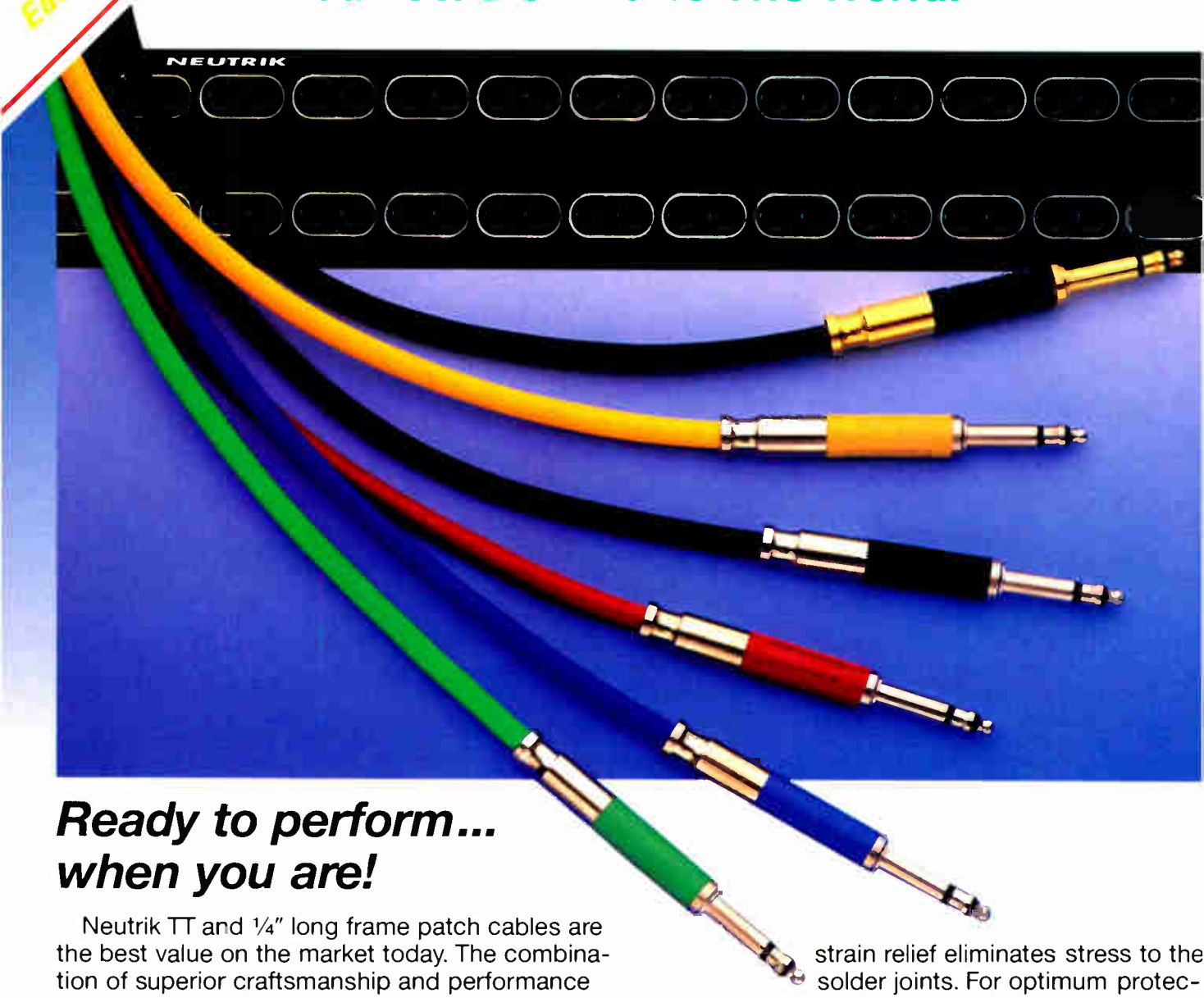

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water and baskets of fruit. It is very difficult (sometimes impossible) for a studio manager to bring in an outside acoustical/studio designer. Each central government branch that operates studios has its own acoustics/systems design arm for studios, stadiums, theaters and so on. An outside acoustician is an expense that's very hard to justify, because the purchase is not tangible, like a console or tape machine. Paying for concepts is a new concept. In one control room, I saw the condensation hose from a wall-mounted air conditioner dripping into a gas can on the floor right in front of the console. Another studio had a wooden box of AC connectors and cabling on its floor, sort of a prehistoric Waber strip.

In Beijing, a city of 10.5 million, most hotels, factories, stores, apartments and office buildings are heated with coal furnaces. One evening, the sunset appeared at about 30 degrees in the horizon, thanks to the coal pollution. Chinese studios typically do not have filtered HVAC systems, although there are wall- and ceiling-mounted air conditioners in most control rooms. There must be some sad stories about the effects of Beijing's air pollution on studio equipment.

When I was in Beijing for the city's International Radio and Television Convention, I observed the variety of companies serving or trying to enter this burgeoning market. In addition to suppliers of products of Chinese origin—such as consoles, computers, amplifiers, loudspeakers and microphones—all of the major importers from Hong Kong, Taiwan and Guangzhou (Canton) exhibited products from many familiar UK, U.S. and Japanese manufacturers.

Of the 50 or so studios in Beijing, there are at least five digital multitrack rooms. Of the nine SSL consoles in use throughout China, most are in Beijing and were installed in the mid-1980s. A Euphonix console recently was installed at CCTV-Beijing.

A LOOK AT THREE BEIJING FACILITIES

The control room at China Recording Company is outfitted with equipment normally found in any major studio in L.A. or London. CRC's SSL 4032E, however, was commissioned in 1984 and uses an early version of software that is unfamiliar to most Westerners who have received updates from SSL within the last decade. With a Mitsubishi X-850 digital multitrack coupled to the SSL, the control room sports a full array of outboard equipment, such as AMS, Yamaha, and Deltalab DDLs, Lexicon 224X reverb, and lots of Valley People Gain Brains and Kepex's. Mastering decks are two Studer A-80 2-tracks with Dolby A noise reduction. A Yamaha DX-5 keyboard sat behind the console for control room overdubs. Although very well-equipped (state-of-the-art ten years ago), the control room shows signs of wear and neglect and was not visually appealing.

The main studio at China Recording Company is about 36 feet by 70 feet and incorporates a huge piano/overdub booth of about 300 square feet. Another vocal overdub booth of about 200 square feet is to the left of the control room, European-style. This room could easily hold an orchestra or capture the largesse of a wall of Marshalls.

Just next door to CRC are the multitrack rooms of the China Broadcast Company, where I sat in on a vocal overdub for a radio spot to be sent to stations around the country. Much of the current advertising work consists of dubbing in the local dialect for commercials produced elsewhere. Big businesses such as airlines, hotels and large stores are starting to advertise to the masses. A job in ad sales in China is sure financial growth.

Although there are many older Amek/TAC consoles in China, China Broadcast Company's studios have two new Amek Mozart consoles with Supertrue automation locked to new Otari MTR-100-24 tape machines loaded with Ampex 456—with full racks of Dolby XP, no less. In one control room, UREI 813 monitors are supplemented by JBL Control 1 near-fields on the console bridge; a pair of Studer A-820 2-track machines, using Chinese tape, stand near the Sony Pro portable DAT machine. Readily accessible are a pair of Klark-Teknik DN-780 digital reverbs, an Eventide HR 3000 Ultra-Harmonizer, dbx limiters, and the Aphex 602 Aural Exciter, ubiquitous in Chinese studios.

At China Radio International, also known as Beijing Radio, the number of studios must rank it as one of the major production houses in the

world. In addition to some seriously equipped multitrack studios, the complex has editing and dubbing rooms capable of supplying its 27 on-air studios with primary and background source material.

When China Radio moves to new facilities in early 1995, its 1,500 employees will gain more working area and more new studios. Manufacturers, get your visas in order.

When I visited China Radio, the engineers in one studio were midway through vocal overdubs for a TV docu-play to be sold to other stations. The project was being co-produced by separate government audio and video production companies. The room I saw was built around an Amek Angela 36x24 console; again, the vocal booth is set off to the left of the console, with a large window to see the talent. UREI 6250 amps drive JBL main monitors of a vintage I'd never seen. An Otari MTR-90 feeds a rack of the ever-present Dolby XP cards. A Sony DAT and two Studer A-820 MkIIs serve as mastering machines. Cassette dubs are made to a Tascam 122 MkII. Processors include an Aphex Studio Dominator, Yamaha SPX-900, Lexicon Super Prime Time, dbx 900 rack and an old AKG TDU-7000 time delay unit.

Next door, control room B has separate tielines into the same main studio. Although it's in use, this room isn't finished yet; the centerpiece is an imposing new DDA 48-input DCM-232 console, which cost $130,000 (in China). A new Otari MTR-100-24 multitrack machine with a Dolby XP-24 rack feeds the dual Otari MTR-15 2-track mastering decks. Microphones are the usual complement of Neumann, AKG, Sennheiser and Schoeps. A Crown Monotech 600 is the power behind the soffitt-mounted JBL 4345 monitors. Processors from Orban, Audio & Design, ART and Klark-Teknik capably handle the wide variety of voices encountered here. Beijing Radio (CRI) broadcasts in 43 languages!

LEARNING THE GEAR

Due partly to the fact that only a few manufacturers print operation manuals in Chinese, many of China's engineers are not familiar with current techniques for getting the most out of their equipment. Until recently, engineers did not have access to Western recordings and films to hear many of the techniques we take for granted in the West. Many Harmonizers here have never been used for gated snare effects (thankfully).

Because engineers didn't have access to hearing the effects and how they were to be used, a lot of records in China "sound like crap," one Chinese pro audio salesman commented, "because engineers overcompress and overuse reverb, flanging and other production tools." Many engineers working in Dolby surround still use the surround channel as an effect channel only, for such sounds as airplane fly-bys and tire screeches.

Seminars help, naturally. For example, in conjunction with Hong Kong-based distributor A.C.E. and the China Recording Company, Stuart DeMaris of SSL-UK recently presented a seminar in CRC's main studio regarding SSL's SoundNet, SL 5000, and SL 8000 systems. It spurred a lively discussion regarding the introduction of new film formats such as Dolby surround, Dolby AC-3, and 4- and 5-channel surround. The audience of about 60 people put the Chinese translator to the test in devising ways to interpret technical issues.

Because Beijing Radio is such a large organization with so many studios, it organizes its own operator and service training sessions in-house. Many committees get involved, and the Chinese are quite adept at organizing and disseminating information.

Recognizing the hunger for this information, a few audio importer/distributors are laying the foundations for long-term success by providing equipment training and education services to the growing mainland market. This year, A.C.E. will hold seminars in Beijing, Shanghai and Guangzhou (Canton). Manufacturers such as JBL, Otari, Shure, Soundcraft, DOD and Jands (Australian lighting) will be represented. A.C.E. expects more than 1,000 attendees in each city. A.C.E. and manufacturer support personnel will total more than 40 people for the three-city tour.

OUTFITTING THE STUDIO

With headquarters in Hong Kong and offices in Beijing and Guanzhou (Shanghai), A.C.E. is one of the largest importers providing equipment to the Chinese market. Bingo

Tso, a director of A.C.E., provides unique insights into the structure of the studio business in China.

According to Bingo, "all things are government," so each Ministry (culture, education, agriculture, broadcast, etc.) is somewhat of a political fiefdom acting as a self-governing company. Revenues are submitted to the Ministry, which then budgets it out to the central-, provincial- and city-level operations.

The revenues from big Beijing studios (central government-level) must revert to the Ministry of Broadcast, unless the studio uses the profits for employee benefits such as a uniform-washing service, food (such as a chicken for each worker's family) or anything else necessary for daily life.

The government allows smaller facilities to keep more of their profits, so these studios frequently are able to upgrade more often than larger studios that start out better-equipped. If a studio has time available, it is encouraged to seek commercial production work.

In most purchasing situations, if there is a Chinese equivalent for the required equipment, the government orders the facility to purchase equipment of Chinese origin. Nonetheless, Chinese studios often refuse and purchase products from the U.S., UK or Japan. When the financing government agency asks about the purchase, studio managers say they forgot about the directive or can't remember what they bought. Apparently, this answer is sufficient for the government paper-pushers, because this is standard operating procedure in China.

There is a master list of about 20 government-controlled items frequently used in studios. An okay from the central government is necessary before a studio is allowed to purchase an ATR or VTR, for example. Not even the provincial (state) government has the authority to grant permission to purchase these pieces.

A Chinese facility typically goes through the following maneuvers in order to buy a piece of equipment, such as a tape machine:

1. Chief engineer requests and receives permission from the central government to buy the tape machine;

2. The necessary amount of foreign money is allocated to the studio account;

3. An import agency within the Ministry negotiates pricing with the sales agent/importer, usually located in Hong Kong;

4. The contracts are signed, and information is forwarded to the bank (all government-owned);

5. The bank issues a Letter of Credit (in U.S. dollars) to the equipment seller's bank;

6. At this point, the equipment supplier knows the government is a guarantor and ships the tape machine;

7. The supplier is paid through a transfer of funds from the government bank to the sales agent/importer's bank account;

8. Because the manual is no doubt written in English, staff engineers must figure out how to align, operate and maintain the new tape machine.

So, for all the equipment junkies out there screaming for the latest multigigabyte storage medium, remember there is someone on the other side of the world who gladly would make use of any old 4-track TEAC/Tascam 33-40 lying in some basement...if only the government would let them have it.

PROSPECTS FOR DOING BUSINESS WITH CHINA

As China opens to the world, new opportunities abound for many in the studio business. Western artists in the not-too-distant future might record a project in Chinese studios; Chinese artists may some day freely travel to record overseas.

Certainly, more immediate opportunities are available to studio and broadcast equipment manufacturers and import/export experts. With the yearly growth in the economy currently averaging 15%, the market in China is potentially several times larger than South America's.

And touring companies that have developed Asian connections should be positioned for the day when Western artists will be able to tour China freely. With a population of 1.25 billion, many cities housing over a million people and a culture rapidly developing a taste for Western music, the nation of China promises to be a dynamic market for the world of professional audio. ■

Bill Ford has a background in the studio business, broadcast news and systems design.

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by Mark Frink

SOUNDCHECK

Celine Dion at San Francisco's Palace of Fine Arts

The first date of Celine Dion's U.S. tour, in support of her new album, was at San Francisco's Palace of Fine Arts. The sound system, provided by Solotec of Montreal, uses a Meyer speaker system powered by Crown VZ 5000 on the subs and 3600s on everything else. Stephan Lemeux of Solotec admits that this is a little more power than Meyer recommends, but they like to have the headroom and their engineers are careful. Solotec is also using the MSL-2, a small trapezoid two-way enclosure with a front-mounted 15- and a 2-inch driver on a 70x60-degree modified radial. "They are perfect for soft-seaters—they sound like a big UPA with better sound quality than the MSL-3," Lemeux says.

House engineer Dennis Savage says, "We hang MSL-3s, and the MSL-2s and the 650s are on the floor. I'm using the MSL-2 more like a front fill, and that's normally what I listen to when I mix. I find it's more precise than the MSL-3 for my taste, so I have a better stereo image. It's very efficient. I used to have UPAs for the floor, [but they weren't] long-throw enough. These really cover the floor all the way to the back. In some venues, we put them two-high and couple the horns. That way, if there's a slope in the hall, it covers fairly high."

UPM-1s are placed downstage center for the front rows, because there are no monitors onstage to fill in there. UPA sidefills are placed on the stage as a safety net, but they're not turned on. Onstage band equipment is minimal: only two keyboard stands, a drum set and one small sub cabinet under one keyboard riser for the bass player. All the guitar and keyboard rigs are offstage. Everyone is using in-the-ear monitors: a Future Sonics Ear Monitors system for Dion, and Sennheiser transmitters and receivers for the rest of the band.

Dion prefers the soft-mold rather than the hard-mold monitors in her ears. Monitor engineer Daniel Baron explains, "We made some tests with Steve Forjet, an ear specialist who came and measured the level at the inside of the ear with the different molds, and that's what we found to be the best and the safest. You hear less of the ambient sound with the soft mold. People then have a tendency to listen at a lower volume."

At the front of house, Savage uses a Soundcraft Europa along with Lexicon 480L, Eventide H3000, Sony R-7 and Aphex compressors and gates, while Baron mixes on a Midas XL-3 for monitors. "The way we work is I do a mix-minus from the house for the singers, and [Baron] just adds vocals for the three backing vocalists and Celine, and stereo mixes for the band," Savage says. "With just two guys, we found that to be the best. All the cues are there. When you need more keyboards or more for the solos, it's all post-fader and the same

—CONTINUED ON PAGE 186

PHOTO: STEVE JENNINGS

On the Road With The Scorpions

Germany's founding fathers of hard rock, The Scorpions, are on tour in the U.S. again and, after using Germany's Rock Sound for sound reinforcement for many years, the band is out for the first time with Clair Brothers Audio Systems of Lititz, Pa.

For this tour, each side of the stage is rigged with 24 Clair Bros. proprietary S-4 full-range speakers hung on one 12-foot and two 8-foot bumper bars. On the deck, there are four S-4s per side and four trapezoidal P-4 "Pistons" on each side of the "ego ramp."

Hakim Schulze, the Scorpions' front-of-house mixer for many years, explains how he began his tenure with the Scorpions. "The band and I are from the same hometown, Hanover, Germany," Schulze says. "I think they weren't satisfied with their sound engineer at one point, so they decided to change. I was there by accident at the show in Hanover. I knew the sound company, and I was working for another local band. So they just asked me, 'Do you want to work for Scorpions?' So I said, 'I would love to, but I have to ask my wife, first.' So I asked her, and she said okay. A few days later, I joined the tour. That was in April of 1980."

Schulze uses a Yamaha PM 4000 console with 44 mono and eight stereo inputs. The out-

FOH engineer Hakim Schulze and monitor engineer Horst Hartman

PHOTOS: STEVE JENNINGS

SOUND REINFORCEMENT NEW PRODUCTS

PROSYSTEMS BULLET TWEETER

The 30HM2 "bullet" tweeter by ProSystems (Wheeling, WV) is presented as a cost-effective alternative to piezoelectric devices. A true diffraction ring radiator, the 30HM2 comes in a die-cast zinc housing with duralumin diaphragm and 1.25-inch, copper-clad aluminum voice coil. It handles 30 watts, with typical efficiency of 110 dB at 1W/1m. Weighing nearly 4 pounds, it is designed for front-mounting in nearly all types of enclosures.

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QUANTUM SERVODRIVE

Once manufactured by Intersonics Inc., ServoDrive low-frequency speaker technology has been re-engineered and reintroduced by Quantum Sound (Northbrook, IL). This subwoofer incorporates a servo motor that eliminates the voice coil; at a full-rate power of 1,600 watts, an array of four Bass Tech 7 systems generates 142 dB (145 peak) in the 28 to 125Hz range, with a smooth response down to 28 Hz. The ServoDrive design does away with distortion associated with power compression and is said to substantially reduce cabinet heat.

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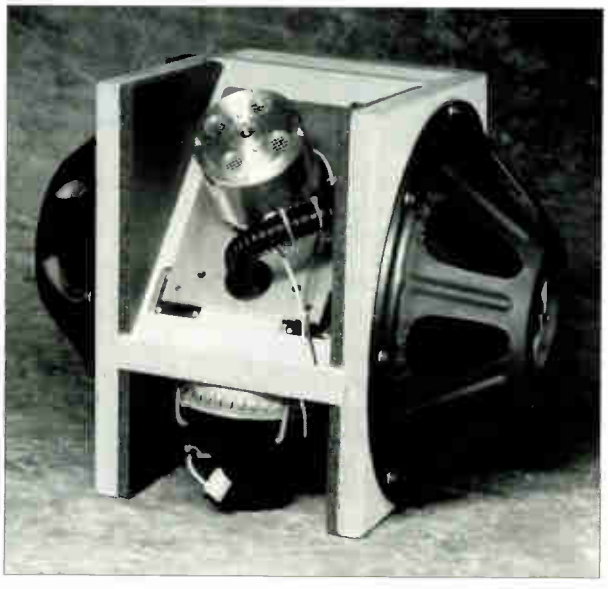

ARX SX POWER AMPLIFIERS

Power amps in the SX Series from Australian company ARX (U.S. offices in Petaluma, CA) are fan-cooled, 2U units that deliver from 150 to 600 watts/channel RMS at 8 ohms. Full-protection systems and heavy-duty power supplies complement the newly refined Ultra Pin cooling technology, which boasts a 250% increase in effective heatsink surface area.

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STAGE ACCOMPANY NEODYMIUM DRIVER

Now available for OEM sales is the SA8535 Neodymium Compact Driver from Stage Accompany USA (Cincinnati). This 9-pound ribbon device handles frequencies in the 1 to 30kHz range, with 4,000 watts peak power and 240 W continuous. Peak output at 1 meter is 143.5 dB, with distortion below 2.5%. The high-frequency driver's OEM price is $580.

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AKG BI-COLOR TRI-POWERS

Tri-Power Limited Edition microphones from AKG (San Leandro, CA) are customized with vivid swirling patterns (in yellow and anthracite or blue and orange) by the L.A. Sax Company; each paint job is one-of-a-kind artwork. The new bi-color models D3700 and D3800 also are available in the classic black finish with green ring.

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UNIVERSITY MICKIT

The Multiple-Input Connector Kit ("MICKIT") by University Sound (Sylmar, CA) converts virtually any audio input signal, including speaker-level input, to a balanced low-Z mic output and telephone line output—ideal for adding audio/visual equipment to a paging/background music system or phone line.

Circle #217 on Reader Service Card

On the Road With The Scorpions

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FOH engineer Hakim Schulze and monitor engineer Horst Hartman

PHOTOS: STEVE JENNINGS

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FLOODLIGHT is an optimum system for facilities with audience capacities ranging from 1,000 to 20,000. Developed for both touring as well as fixed installations, it offers engineers high power, high efficiency, proprietary wide bandwidth midrange as well as ingenious, compact packaging unique to *Flashlight* – ***combined with the flexibility of a 50° horizontal by 25° vertical coverage pattern.***

Floodlight delivers a 50° horizontal coverage pattern.

FLOODLIGHT utilises *Turbosound's* exclusive ***Axehead***™ horn-loading technology to provide a seamless coverage area with minimal overlap between adjacent cabinets. Axehead also increases system efficiency, power output and intelligibility – particularly in the ultra-critical mid-range frequencies.

Like *Flashlight*, FLOODLIGHT also features a three-way mid/hi enclosure (*TFL-760H*) with the industry's widest mid-bandwidth from paper cone drivers. Loaded onto our new generation Axehead device, a high-power 12" delivers impressive low-mid reproduction from 180 Hz to 1.3 kHz. A truly revolutionary 6.5" proprietary paper cone driver is loaded onto a specially-designed, hi-mid Axehead device and provides exceptionally clean response and projection through 8 kHz! Lastly, our proprietary waveguide horn coupled to a 1" titanium compression driver handles high frequencies through 20 kHz. Depending on user requirements, a choice of sub-woofers are available, including one utilising our 6" voice coil, 600 Watt RMS, 21" bass driver as used in Flashlight.

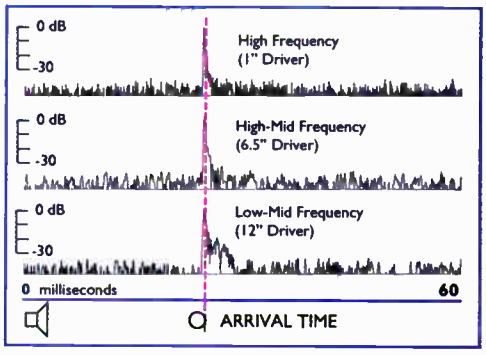
Since all transducers in a single TFL-760H are mechanically aligned and in-phase, external time correction is not required *(see ETC diagram)*.

Worldwide, live sound engineers have lauded the smoothness of *Turbosound's* paper cone technology without relying on harsh-sounding, metallic compression drivers. This unique design dramatically reduces mid-range distortion typical of other systems, thus giving sound engineers and systems designers a significantly smoother and more musical sounding system response.

FLOODLIGHT's labour-saving and truck space-saving design additionally features U.K. government certified flying hardware and rugged, exterior grade birch plywood construction.

We have prepared an illuminating monograph which explains the technical merits of the FLOODLIGHT in detail, including the **LMS-660** dedicated Loudspeaker Management System, a system-specific controller that includes crossover and limiting functions. To ensure consistent system performance, a select list of power amplifiers deemed compatible with FLOODLIGHT is available.

Energy Time Curve Diagram
As can be seen in this plot, external time correction is not required because of the near perfect arrival times for the 12", 6.5" and 1" drivers in the TFL-760H.



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* Winner, " ***Live*** " Magazine 1993/1994 *Live Sound Loudspeaker Award.*
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board chain uses BSS DPR-402 compressor-limiters and 502 gates. For digital reverb, there is a Lexicon 224 and a 300. "I have an Eventide H-3000," he continues, "and a 910, which was hard to get also, but I rely on that for the guitar sound and sometimes the voices. I also have two SPX-900s and a TC Electronic 2290. I had the new TC Electronic M-5000 at home for a couple of weeks.

Club of the Month

Bogart's, located in the Clifton Village section of Cincinnati, has a capacity of 1,300 and regularly features top touring acts. A major stop on the circuit of showcase nightclubs in the country, Bogart's recently had a new house and monitor sound system installed by Loud & Clear of Cincinnati.

Len Whaling, house sound engineer for Bogart's says, "It started out years ago as a vaudeville club. We have a mezzanine in the back with raised-area seating and a balcony upstairs. The stage is about five feet off the main floor and measures 35 by 24 feet deep. At each side, there are four Turbosound TMS-3s with JBL 2445s on the horns and two quad-18 subwoofers loaded with JBL 2245s."

The four-way system is crossed over with BSS FDS-360s and powered with Crown amplifiers. A Macro-Tech MA-5000VZ powers the subwoofers, four MA-2400s power the lows and mids, and a single MA-1200 powers the horn drivers. The monitor system uses eight JBL-loaded, double-12 wedges and two double-15s, which were designed by Loud & Clear and are powered by nine MA-1200s as well as double-15 sidefills, all with 2-inch horn drivers.

The front-of-house console is a Yamaha PM 1800, and the auxiliary gear includes two Klark Teknik DN-27As, two Yamaha SPX 90s, two Korg SDD-3000 delays, two Gatex quad gates and three dbx 166s. The mix position is about 120 feet back from the stage, on center. There is also a two-way, Crown-powered, ART-delayed speaker system for the balcony. The club

Len Whaling (engineer) and Steve Orr (manager)

uses the standard complement of Shure SM58s and 57s, Sennheiser MD-421s, AKG C-451s and the ever-popular D-112 kick-drum mic. Whaling comments that "since the new stuff has been in, everyone has just raved that this is one of the best club P.A.s they've ever used."

J. D. Daniels was recently at Bogart's with Joan Baez and has been through the club many times before with artists such as Mick Fleetwood and Huey Lewis. He says the new system is a big improvement. "It all comes together very well, and Len does a very good job for Bogart's. He's well aware of the system. I actually look forward to going back there now."

If you are a touring engineer and you have worked in a club where there has been an investment in sound equipment that makes it an exceptional place to mix, write to Mark Frink at Mix. ■

and I liked it. I didn't ask for it on this tour because I had my setup already completed. I made up all my programs for the units I have now. Probably on the next tour, I will use the 5000 with two processors. The problem is I would need a remote for it as well, and I don't like to have many remotes on the desk. The one for the 224 is enough. I drive my setup with the Yamaha MFC-1 MIDI footswitch. I also have two Wendell percussion replacement units." Even with all the new equipment coming out year after year, there are certain things that each engineer always likes to keep around.

Schulze's secret weapon is the Roland SRE-555 tape echo machine, which he relies on when mixing. He says, "It's really hard to find nowadays. I've used it for fifteen years now, just for [lead singer] Claus' [Meiner] vocals. Those things are not around anymore since digital stuff came out and DDLs took over."

I ask Schulze what's new on the tour. "Being from Germany," he says, "we have good contacts with Sennheiser. We're using some new stuff which is not out yet. We have a new microphone for the tom-toms, which I think may be the new [replacement for the] 409. It's very nice. We have the only prototypes, and I think they will release it at the [March, '94] Musikmesse in Frankfurt. It's very good for guitars as well."

Sennheiser's new instrument microphone is the MD-504. It is about two-and-a-half inches long with a taper and about half that diameter at the front. It looks like it will work well with a right angle XLR. It will list for about half the price of an MD-421.

"The new one is very small," says Schulze. "Just the membrane and [a small housing]. With a 421, you couldn't see the drummer anymore; with this one, it's fine. It's a dynamic, [with] a big membrane in there, and it's very warm-sounding. It's similar to the 421—very punchy, without the electric sound the small condensers have."

A Scorpions special edition of the Sennheiser Claus Meiner microphone is being used for vocals. It's actually a modified BF 530, a model that is no longer available in the U.S., although it is very popular in Germany. The stock BF 530, part of the Black Fire Series, has an adjustable inlet basket to change the proximity effect, as well as a noiseless switch. Both have been removed on this model. Horst Hartman, who has mixed monitors for the band for several years, explains, "The factory is five miles from where we live in Hanover. Claus Meiner lives very close, and he can walk over. One day he was in there and he tried a few microphones. They modified one for him, and we're using it on the vocals."

Hartman continues, "Claus is also using a Sennheiser prototype earphone monitor." The WEM-250 is a rack-mount UHF system with two SK-250 transmitters. The receivers are EK-2014s that were factory-modified to increase the power and bass response. "We had problems in the beginning," says Hartman. "It was not loud enough, but we changed the amplifier side, so we have a lot of headroom now. We tried all kinds of molded headphones and all these things, but we ended up with the top-of-the-line Sony Walkman-type, which are the normal, half-open kind. I just have his voice in there and a little bit of echo and reverb. He can actually hear the rest of it, and the voice is always over-the-top. So it's very simple, very easy. With the molded ones, you have to do a whole mix, and with these open ones, it's not necessary. It's mono at the moment, but when they bring it out, it will be stereo. It's only the voice in there, so mono is fine."

For a standby system, Hartman explains, "We have two lit-

tle speakers in front, just in case. Before I had really huge [wedges] with four 12s and two horns and four tweeters in there. I go for the 15s rather than the 12am [Clair Bros.' proprietary monitor system, which uses 12-inch woofers]. They might be good for vocals, but I need to [be able to] bring in kick drum and bass guitar."

The rest of the band's stage monitors include S-4s on the deck and low for sidefills. "We used to have flown sidefills," says Hartman. "[The bandmembers don't] like to listen to the horn straight into the ear. There's no need for putting the voice in so loud anymore, so they can be very low and they like it this way. For drums, I have what Clair calls the 'studio monitor.' It's basically the same as the 15-inch wedges, in a normal stand-up box. It has the same components—one 15, a 2-inch horn and a tweeter. I like bottom and high end, because everything else is in the middle anyway, and the front-of-house engineer doesn't like it either when I put so much mids in. I go for the low and the really high."

Hartman uses a 52-channel Yamaha PM 4000M monitor console to send 15 mixes and four effects. The reverbs and delay are for acoustic guitar and Claus' voice. "The Scorpions are using 35 inputs, so the [opening act] is on my console as well," he continues. "I am using 20 of the TC EQ units with the remote control, so it's very easy to swap over. I do my thing, and then the [other band's monitor engineer] can do what he likes using his own channels. It's quite a compact mixing area. The board is quite big, but compared to two consoles, it's actually small. It's the first Yamaha I've really liked. I think it's the best monitor board at the moment for me, for the way I work."

Hartman and Schulze work with system engineer Jo Ravitch and had high praise for him and the rest of Clair Brothers' personnel. What prompted the change of sound vendor, after using Rock Sound for so long? Ravitch explains, "Frances, the old bass player for the Scorpions, founded Rock Sound in 1978 together with another guy, Olaf Schrader. Frances put his money in, but he was never actually running the company; it was run by the other owners. Rock Sound grew as the Scorpions got bigger. Then all of a sudden, the band broke up with the bass player. I don't know the exact story, but it was a very bad thing. [After the separation], they had different court cases against each other. When we started this world tour, Frances was still the happy owner of Rock Sound, so the Scorpions' lawyers said, 'You can't use that company, or you might lose the case in court.' That was the reason we had to look for another sound company. Of course, we chose one of the best and one of the biggest for the world tour, so we can have the same system in Japan and the Far East, like we use in Europe, the U.S. and in South America." ■

SOUND REINFORCEMENT NEW PRODUCTS

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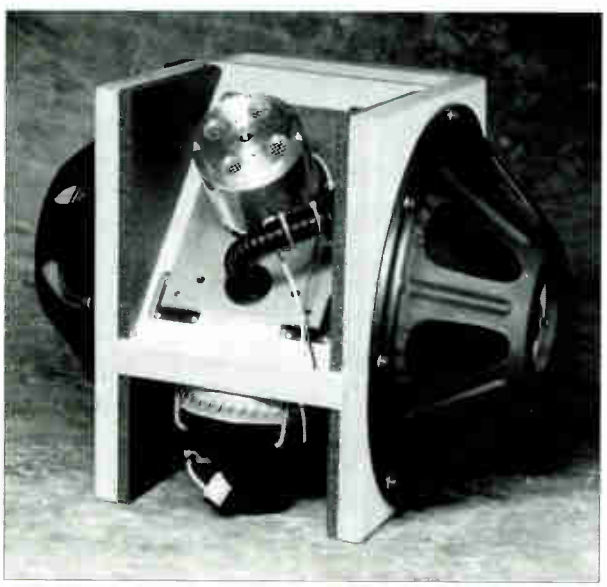

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Tri-Power Limited Edition microphones from AKG (San Leandro, CA) are customized with vivid swirling patterns (in yellow and anthracite or blue and orange) by the L.A. Sax Company; each paint job is one-of-a-kind artwork. The new bi-color models D3700 and D3800 also are available in the classic black finish with green ring.

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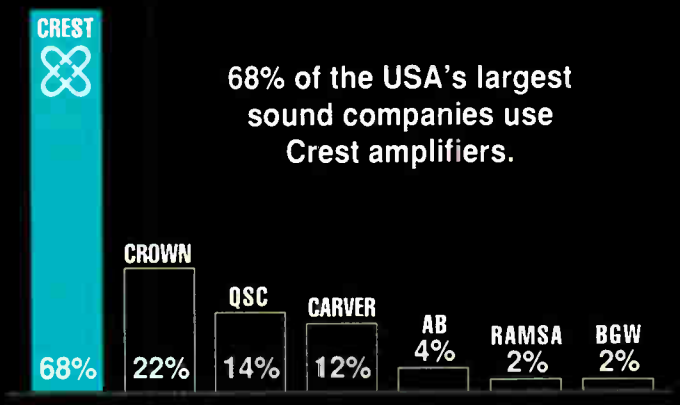

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BY BLAIR JACKSON

The Beastie Boys

RECORDING ON THE FLY

by Adam Beyda

It's been a strange road for the Beastie Boys—beginning in New York in the early '80s as a punk band, continuing with their first album, 1986's Rick Rubin-produced hip hop smash *Licensed to Ill* (quadruple Platinum), then jump-cutting three years later into more experimental, uncharted (okay, Gold) territory with their second LP, *Paul's Boutique*. That record upped the ante on the Beastie method of constructing wicked pastiches of bass-heavy beats, replete with out-there samples. But for 1992's *Check Your Head*, the trio of rappers set out on a whole new tangent, picking up their instruments again to resuscitate and incorporate their punk roots.

They've reinvented themselves a few times, but if the persistence of wild eclecticism in their music can be called stable, they may have found a more stable voice with their new joint, *Ill Communication*. From the opening dog yelp to the closing lordly drum reverberations, the new LP gets funky on the experimental tip. The album encompasses an amazing range of styles, mixing up old-school punk, cool-hand funk, and strident and jazzy hip-hop jams. Though it's crammed with fresh ideas and sounds, the new album bears a strong formal resemblance to *Check Your Head*. This is due, at least in part, to the similarity of the circumstances in which the two LPs were recorded, including similar methods, locale and personnel.

PHOTOS: ARI MARCOPGULOS

Top: The Beastie Boys are Adrock, MCA and Mike D. Below: Producer/engineer Mario Caldato at G-Son Studios.

Way up front in the Beastie personnel file is Mario Caldato Jr., who engineered *Paul's Boutique* and co-produced and engineered *Check Your Head* and *Ill Communication*. Caldato first crossed paths with the Beasties in the mid-'80s when the band played a fateful show at L.A. club Power Tools. Says rapper/drummer/bon vivant Mike D, "The club didn't have a professional sound man, so we blew out the whole bottom end of the P.A. after the first three bars of one song. So Mario [who was in the audience] went up to [club owner] Matt Dike and said, 'You guys should really get a professional in here.'"

"I got the job the following week," adds Caldato, who in addition to his studio work, mixes house for the Beasties on tour. And when Dike, with John King and Mike Simpson (under the *nom de produce* the Dust Brothers), went on to album work with Tone Loc, Young MC, then the Beasties, Caldato was onboard as engineer.

While Caldato became a fixture on the Beastie team, the band was busy indulging in some conspicuous nest building, starting its own record label, Grand Royal, and constructing a studio in time to record *Check Your Head*. G-Son Studios, set up in Grand Royal Headquarters in L.A., is the ca-

—CONTINUED ON PAGE 162

Adrian Belew

"HERE," THERE AND EVERYWHERE

by Blair Jackson

It's not quite accurate to call Adrian Belew one of rock's best-kept secrets. After all, his name recognition is quite high, thanks to a long career adding his distinctive, edgy guitar work to albums and tours by fellow innovators such as Frank Zappa, David Bowie, Talking Heads, Laurie Anderson, King Crimson and others. Less well-known, however, are the seven solo albums he's cut since 1982, the most recent being an exquisitely artful pop-fest called *Here*, just out on Caroline Records. Both 1983's *Twang Bar King* and 1989's *Mr. Music Head* earned him considerable critical kudos and decent sales, but it is his last two records—the woefully neglected 1992 opus *Inner Revolution* and *Here*—that show Belew at the peak of his powers.

The great secret you don't learn about Belew unless you check out his solo work is that he is also a great drummer (it was his original instrument), an extremely versatile singer and a consummate song craftsman. Indeed, on *Here* he wrote all the songs, plays all the instruments, sings every part, and there isn't a weak or self-indulgent moment on the entire record—quite a feat. Far from being just a guitarist's showcase (though there's an incredible range of guitar styles and timbres, not to mention electric sitar and cello), *Here* offers up a dozen compact, beautifully constructed, skillfully layered tunes that seem to owe more to the Beatles, and Lennon's and McCartney's solo work, than to any of the more "modern" artists with whom he's been associated in the '80s and '90s.

"In terms of song-crafting and spirit, the Beatles were my number one education," Belew says from his home studio overlooking Lake Geneva, Wisc. "They had a way of putting

—CONTINUED ON PAGE 166

PHOTO: PHOTO RESERVE INC.

Steve Tibbetts

HAVE TRAVELS, WILL GUITAR

by Blair Jackson

Curses. Why can't Steve Tibbetts be famous? Then I wouldn't be faced with the nearly impossible task of trying to describe his music for the uninitiated. The Minneapolis-based guitarist has been making records for 15 years, the last 13 years for ECM Records. Manfred Eicher's quirky, sort-of-jazz (or at the very least mainly improvised music) label, which has housed everyone from guitarists Ralph Towner, Pat Metheny, John Abercrombie and

—CONTINUED ON PAGE 167

—FROM PAGE 160, THE BEASTIE BOYS

sual if not trashy digs where the Beasties do their many things. Despite some jazz they were handing out about their "finely tuned" control room, what they have is not a high-end facility but a comfortable, effective place to work, an on-call spot for laying down the bits of fanciful whim and bone-crushin' funk that make up a B-boys album. Based around a 32-channel Neotek Elan console and a Tascam 2-inch, 24-track ATR-80, with Auratone Cubes and Tannoy 15 monitoring, the studio comprises a control room, a large room for live jamming and a pre-production/magazine-publishing room.

The studio is essential to the Beasties, because they don't write songs per se, instead constructing them out of all kinds of bits and pieces—accretion, pasting and cutting are the operative principles. Their current M.O. includes laying down dozens of hours of instrumental jams, recording a multitude of vocal parts, assorted sound effects and funky samples in no particular order, then combining and recombining these elements on the fly, making a variety of mixes. Having their own studio allows them the latitude to experiment. "That's the purpose of having our own place," Mike D says. "If we were at a place where we had to pay $1,500-a-day lock-out, we couldn't come in with a vague idea in our heads and say let's go for it."

But go for it they do—not from a particular starting point, instead employing a variety of approaches, as the mood strikes them. Some songs start with just a sample. In fact, a huge range of sampled sounds found their way onto the new album in one form or another: The hypnotic soul of "Bodhisattva Vow" mixes chanting Tibetan monks with an echo-drenched Beastie vocal; "Root Down" is based on a sweet Jimmy Smith groove, in tribute to that master of the Hammond organ.

Each of the Boys has a sampler at home, which they put to good use. Mike D, who uses an Akai MPC-60, says, "We'll have something that one of us will have done at our house, and everyone will hear it on a cassette. Then we'll come in here and start laying it down and play a bunch of stuff over it or play some beats or whatever." Although the Beasties get a lot of their raw material by sample hunting and gathering, they creatively respond to material they use, making it their own in surprising and inventive ways. "We're all huge music fans and listeners and collectors," says Mike D. "That just finds its way into what we do, whether it's through sampling or inspiration or misinterpretation."

Their sampling mania extends even to their own jams, which they will mine for interesting morsels. And because live jamming figures heavily into their work, they have to sift through hours of tapes: For *Check Your Head*, they laid down 90 hours of jams on their Panasonic SV-3700 DAT. "A lot of times, we try to get the multitrack going," Caldato says, "but when it's not quite together, we just roll the DAT."

When they go back and listen to DATs, they'll compare notes, and if they find something they want to use, they might sample it, dump it right onto the multitrack or do some digital editing. They used Sound Tools for the first time on the new album, and also liked editing on an ADAT.

Caldato says that DAT jams loom large on *Ill Communication*, particularly in several of the shorter songs: "'Eugene's Lament' was just a one-

minute jam on the DAT, then we repeated a couple of sections of it and had Eugene Gore overdub violins. The rest of the music was straight to DAT. That's why it sounds kind of screwed up, but it came out nice."

If this approach seems a little cavalier, it's important to understand that for Caldato and the Beasties, it's not about going for a pristine performance or a clean sound; it's about inspiration, imagination, feeling and experimentation. At root, they're 4-track-cassette kind of guys. "I'm definitely more impressed with people who can make records on a cassette 4-track than on a digital machine," Caldato says. "I give 'em way more props, and it generally sounds better to me." Mike D wryly adds, "People underestimate cassette compression: Cassette compression is where it's at."

Distorted sound is a vital part of their aesthetic—they like funky, dirty grooves and gritty sounds. (When asked about using SR on the 2-inch, Mike D goofs, "no 'Doubly' here—I don't know why you'd want to reduce the noise.")

They do all manner of messin' around to find sounds that interest and move them. For example, they get beats from old drum machines, toy key chain sound chips—you name it. On live drums, Mike D says, "We've recorded in practically every place in this building you could possibly do it. We throw a bed sheet over the entire kit and play it that way." ("Or tape $100 bills on all the heads," adds Caldato.)

Miking also provides plenty of hijinks. The way some people appreciate the fine sonic qualities of vintage tube mics, the Beastie Boys and Caldato appreciate the distortion offered by cheap, bizarre or broken mics. An old, broken Webster carbon mic comes in handy, and a $10 Radio Shack mic set on the floor somewhere near the drum kit gives an interesting drum sound. Though they'll use Shure 58s a lot (and sometimes an SM7) for rappin' and squawkin', they have a proclivity for decidedly nonprofessional vocal mics. A secret weapon? The $35 Sony Karaoke Variety mic. Caldato says he saw a demo one day in Little Tokyo and liked what he heard. "I got one and brought it back to the studio and tested it. Everybody liked it, so I bought them all one for Christmas.

"Most of the distortion on the vocals comes from the mic," Caldato adds, "because they usually cup the mic or yell into it or whatever. Then some of the time it gets distorted a little more at the mic preamp, and sometimes out of the compressors, too—I just slam the compressors [dbx 160 and 165] and crank the outputs, then add some effects."

In terms of effects, Caldato employs a limited palette. "I just use the old rack-mount Ibanez HD1500 and DM2000; they've been my right and left hand for the last two records. That's all I use—two echoes and two reverbs. The REV7 was the first reverb I bought, and I just use the shit out of it. And the SPX. And it sounds alright." A newly acquired EMT plate also got a good workout on the album.

As you might expect, they mixed the new album the way they recorded it—on the fly. "Since we've got our own studio," says Mike D, "it's not like we do a bunch of songs then mix a bunch of songs. The songs we have we'll mix, gradually through time. Maybe we'll do eight or ten different mixes of a song by the time we get to the end. And each time we do something, we add a couple of things, eliminate things, do overdubs or whatever. So, each

time it changes. A lot of times, we'll do a mix and completely change the hook or the verse."

They ended up with ten two-hour DATs' worth of mixes of *Ill Communication* material. What actually made it onto the LP includes some material mixed during their earliest sessions. The Beasties began laying down basic instrumental tracks for the album at New York's Tin Pan Alley Studios, and while there they threw together some mixes. "I had these rough mixes just using one reverb and one delay," Caldato says, "and we actually ended up using some of the rough mixes on the album—mixes that had no EQ; just pan, volume and a reverb send. Like 'Ricky's Theme.' That's basically the rough mix coming off the monitor section of this old board."

When it comes down to it, Caldato says, "We've got 24 tracks, so we lay it all down, and then in the mix we weed through it and try stuff. We make mixes and listen to 'em, live with 'em. We try a lot of shit, and if it works, it works. There are a lot of ideas in the group, and I throw in some, too. A lot of times, we end up going with our gut feelings, like using rough mixes. The stuff that we spend more time on doesn't come out as hype. It's weird. If it's there, it's there—it comes out by itself." ■

Ed Mann and Brian Hand's Global Drumming

by Jeff Forlenza

The captivating new CD from Ed Mann and Brian Hand—*Global Warming*, on the Interworld Music label—is an adventurous journey through different cultures, different sonic vistas and different drums. But this trip is not only for the rhythmically inclined; the varied percussive/melodic instruments that Mann and Hand shake, strum, pluck, hit and blow on the album are just as evocatively lyrical as they are infectiously grooving.

Mann, who is probably best-known for his percussion work with everyone from Frank Zappa to Rickie Lee Jones to Kenny Loggins, recorded the new release in the living room of his former home in southern California's San Fernando Valley. "The living room had wooden floors and one wood-paneled wall with a brick fireplace and a wooden mantle. This made the room a naturally live space, nice and bright-sounding," Mann explains. "Add to this the normal furnishings—shelves, a couch and wall hangings—and we had a nice-sounding acoustic space with a reasonable balance of reflective, absorbent and diffusive surfaces: the same general qualities that would be desirable in a professionally designed studio."

With two percussionists playing in the same room, it was Mann's duty to capture both players discretely on two separate DAT tracks. And what a variety of percussion instruments to mic: vibraphone, tuned pentatonic pipes, African thumb piano, Egyptian tar, varied gongs, tongue drum, wood block, congas, rainstick, finger cymbals, Amazon bird calls, camel bells, Phillipine buzz stick and lots of resonant toys and gizmos.

"My partner in the project, Brian Hand, and I decided that we would like to create and record some music based on these instruments," Mann says. "Our process was simple: We would find instruments that seemed to be complementary; I would set up microphones, get levels and roll tape. Then we would get a feel for what these instruments wanted to say and just have fun."

Microphones used on the project included Beyer Dynamic MC740N and 703 condensers, an Audio-Technica 813 condenser and Beyer Dynamic M88 dynamic microphones. All were run through BEG mic preamps, which were designed by Gary Creiman based on a Jensen input transformer and a 990 op amp.

"In order to capture any acoustic sound well, mic placement is critical," Mann explains. "I always try to take an intuitive approach based on listening to the instrument from various angles. Sometimes there are surprises. For example, the kalimba [African thumb piano] on 'Thumbs Up' was finally recorded with the mic underneath the instrument. For some reason, this position sounded more balanced and sweeter than at the position of the player's ears."

Mic placement is crucial for capturing percussive instruments, but when you have two musicians grooving together in the same room on wildly unique percussion setups, you have to think about the potential for phase problems. "In order to achieve an acceptable degree of phase coherency, I tried to keep the mic pickup patterns from overlapping as much as possible," Mann adds. "In a live room with no gobos and two players going at once, overlap and bleed will always be a factor. But by experimenting with different player and mic positions, we were always able to find a workable solution. In extreme cases, I would record a bit and then check the waveforms in Sound Tools, just to be sure."

One especially moving—literally so, with the right sound system—cut

Brian Hand and Ed Mann

on the CD is "Trance-portation," which features Hand blowing a huaca (a deep-sounding, three-chambered ocarina) and Mann playing a rack of Paiste Sound Creation gongs. Mann says, "I discovered that the challenge was to achieve a balanced sound on tape between these two very different instruments: the huaca, which you blow very softly, and a rack of gongs, which even when played softly, produce a tremendous amount of sonic energy.

"I put the [Beyer] MC740N in the center of the room at about six feet high in an omnidirectional pickup pattern," he adds. "This captured the gongs beautifully, while also picking up the room sound of the huaca, which was also close-miked with another MC740N set to a hypercardioid pattern to minimize the ringing from the gongs." The results are pretty effective: rumbling subtones from the gongs, haunting overtones from the huaca and sporadic sparkling finger cymbals in a trance-inducing mix.

All of the cuts on the new CD originated as live, improvised "percussion discussions" between Hand and Mann. The exception is the first tune on the CD, "Bell Garden," which began as a soundcheck for Hand and turned into a performance by Mann using Opcode Studio Vision and MIDI-generated percussion samples. "This tune began with Brian playing the tuned pipes, solo, just for fun, kind of demonstrating the instrument," he says. "Without him knowing, I recorded his performance. After Brian left, I listened to the recording of the soundcheck and realized that his timing, phrasing and choice of notes were just exquisite. I became inspired and loaded the stereo performance into Opcode's Studio Vision. Using samples of Indonesian gongs, camel bells, air tubes, a drum and some high wood blocks, I wove these elements around the original tuned pipes performance, and lo and behold—instant support and accompaniment."

Mann used a Fostex D-20 DAT to record all basic tracks: Mann on one track, Hand on the second and SMPTE time code on the third. Mann then transferred digital tracks to his Fostex A8 analog 8-track. "The analog 8-track tape was only for reference, so we could hear what we had done and play along with it," Mann explains. "When the analog 8-track played, the output of the time code (which was printed on track 8) would go to a Fostex 4030/35 synchronizer and then to the D-20, which would, in turn, chase and synchronize to the analog deck while recording new parts. This allowed us to record a potentially unlimited number of overdubs, all in the digital domain."

When it came time to mix, Mann rented an ADAT 8-track digital system and recorded the original stereo DAT "basic" audio and time code—tracks 1 and 2 for audio, and 8 for time code. "With ADAT track 8 as the new master time code source, all of the DAT overdubs were then assembled onto the remaining ADAT tracks, by having the Fostex D-20 running in-sync with the ADAT," he says of his mixing setup. "On one tune, we had to mix two extra tracks and there was no available space on the ADAT. In this case, the synchronizing capabilities of the D-20 saved the day. I let the D-20 play the remaining two tracks in sync with the ADAT, and we mixed directly to hard disk."

For monitoring mixes, Mann listened on four different sources, including a set of JBL 4406 near-fields; a pair of Electro-Voice 12-inch, two-way, live cabinets; a couple of Radio Shack Mini Speakers; and a set of Sony headphones. Mann selectively chose outboard gear for the project: an Alesis 3630 stereo compressor, an Aphex Expressor, a Lexicon PCM 70, a TC Electronic delay, a Korg SDD 3000 delay, a Yamaha SPX 90, an Alesis MIDIverb II and a Roland R8M were used to shape the sound of the percussion instruments. Other production equipment used on this other-worldly world music CD included a Mac IIfx computer running Sound Tools, SampleCell and StudioVision software, a Hafler power amp, a Studiomaster Mixdown console and a pair of Troisi A/D converters used for mixdown.

After numerous recordings in the studio context as sideman and solo artist, Mann favors the record-at-home method: "It is simpler, out of necessity, and that carries with it its own reward. To engage in a relaxed process at home, recording noncomplicated music that simply feels good was a great experience. I think this sense of fun translated well to tape. You can hear it in the performances. For me, that is what makes a successful recording." ■

—FROM PAGE 164, ADRIAN BELEW
parts together and using imaginative combinations of sounds and instruments that I still find very inspiring. But I've also learned from all the people I've worked with. Like one of the things I learned from Laurie Anderson is that *anything goes*. She takes the attitude that she wants to steer clear of conventional things, so when you do that, you're left with a whole new set of rules and tools; that's what she does best. Actually, you could say that about a lot of the people I work with, whether it's David Bowie or King Crimson. I'm drawn to innovative people."

Though he has a long history of layering his solo records part by part, *Here* marks the first album Belew has recorded entirely at home. He explains, "When I made *Inner Revolution*, I felt it was a good time to start investing in my own studio. I made a small investment and bought a Fostex [G16 ½-inch] 16-track recorder and a [AKG] C-24 stereo microphone and a Tube Tech [stereo tube mic preamp]. I also had a pair of Alesis 16-channel boards. I demoed about half the songs on that album, and some of that made it onto the record—some of the vocals and a few of the bass lines. That's what I recorded [*Here*] on, as well.

"When I began working on the material for the new record, which was November of '92, I got a call from The Conservatory in Phoenix saying they had their prize student, Noah Evens, who wanted to do an internship with me; he needed to work 180 hours. I said, 'My studio isn't much, but have him come here and we'll see what he's like, and we'll go from there.' From the first day he came, we began recording 'Brave New World.' A few weeks into his internship, I realized we were really making the record, even though we made it on what I'd call compromised home studio gear." (Since making the album, Belew has upgraded his studio with a Neotek Elan 48-input in-line console, 32 tracks of ADAT with the BRC remote, various Lexicon and Roland outboard effect units, eight channels of Drawmer compression and gates, and Genelec 1031A monitors.)

"Then I went to Full Sail in Orlando, and Gary Platt, who's been a friend of mine for years, mixed it there," Belew explains. "I did some concert work and a seminar for them, and in return, we mixed the album there. It was wonderful. I like the way it turned out, and Noah turned out to be much more than a student engineer. I hired him and housed him next door, and he's still here.

"Because I work alone so often, people think I'm some sort of wirehead, but I can barely plug two chords in the patch bay correctly," he adds. "I don't have the aptitude for engineering, and that's fine with me. I have a vision of how I want my records to sound, and I can communicate my ideas well. So with my records, it's always at least a two-person operation. You need to have another set of ears, eyes and hands. The engineer is very important."

Belew says he has no fixed writing regimen, "but more often than not, the ideas for a song are fleshed out in my mind before I begin recording. I can imagine the arrangements in my head, so oftentimes I can even play the drum part first and know that a chorus appears here and later there's going to be a double-tracked guitar part here, and so on. I leave space and time available for experimenting, and I always surprise myself with something in the arrangement that I never thought would work.

"The songs that I write on guitar or piano tend to have a more conventional style that I try to orchestrate in an unusual manner," he says. "But a song like 'Here' comes more from experimenting: That began with a guitar tone I liked, and then realizing what kind of melody might be above it, and then I had this idea that with string bass and a certain tone of drumming, I could create what I like to term a surrealistic love song. The vocal sound became very important, too. We processed that through a little bit of fuzztone and different delays, moving it around, trying to make it sit out there in space somewhere."

Belew's voice is a sure, powerful pop instrument, with echoes of Lennon, McCartney and even early Roger Daltrey (though Belew doesn't really acknowledge much Who influence). By judiciously using various signal processing effects on some vocals, and stacking parts in different ways throughout the record, Belew manages to make the record sound like four or five different singers. I'm reminded in places of the gorgeous, seamless vocal blend of Dwight Twilley and Phil Seymour, who made two of the best "power pop" records in the late '70s.

"I'm real happy with the vocals on this record," Belew continues, "and I think it's a direct result of being able to relax and do things when I wanted to do them. I'll give you an example: When I wrote the song 'Fly,' I wrote it upstairs in the living room on the dobro. I thought it might be a minute long, maybe a little connecting piece between two things. Then I began recording it, and I got more and more excited by the possibilities of the song. Since I was able to do it right then and not have to wait and book studio time, it turned out to be a four- or five-minute piece, and you can see how one singular idea evolved over the course of a day-and-a-half. I don't mean to talk down other recording situations. I've had great experiences in conventional studios. For me, the most magical place in the world has always been a recording studio. But to have one of my own is a dream come true."

Belew and Evens fashioned rough mixes as they went along on the project, but before heading for the formal mixing sessions at Full Sail in Florida, they "transferred the Fostex 16-track master to the Tascam format they were using, and we started mixing them over again, trying to keep the spirit of the original mixes and yet layer them differently," Belew explains. "Gary Platt was very helpful at that—re-EQ'ing everything and achieving a more dimensional sound [aided by a Spatializer and the Roland RSS system] and cleaning a few things up. Because of the limitations we had during the tracking stage, we weren't working with a lot of compression or gating, so we had to wait for the mix to add those." Belew says that his aim in a mix is "to be able to visualize that there are people playing this music together—I want it to sound like it's a band."

It's been a hectic year for Belew, between making the new album and doing sessions with Paul Simon, Laurie Anderson, Nine Inch Nails, Crash Test Dummies and Sarah Hickman. And the forseeable future is packed as well: In the early summer, he's touring to promote the album (backed by the one-time members of The Bears, with whom he made two records in the late '80s), and once again plans are afoot to revive King Crimson for an album (to be recorded at Applehead

On nearly all his records, including his latest ECM release, *The Fall of Us All*, Tibbetts moves easily from obviously Hendrix-inspired washes of squealing axe-work to delicate, melodic acoustic picking, sometimes even over the course of just one composition.

Studio in Woodstock) and tour. In addition, he's working on the first of a series of experimental guitar records for his own Caroline Records subsidiary, Adrian Belew Presents. That initial outing will be an orchestral record, "but all done on the guitar—the clarinets, tympani, drums and everything. The second [record] will be the animal kingdom, with lots of rhythm and percussion and jungle sounds.

"I live in my own world," he says. "I don't listen to anyone in particular or try to capture any trend that's going on. In fact, I try to keep my mind clear of those things. I've learned the most from making my own records and trying to achieve the sounds I hear in my head."

And that head is filled with strange and wonderful music. ■

—FROM PAGE 161, STEVE TIBBETTS

Egberto Gismonti, to pianist Keith Jarrett, sax player Jan Garbarek, bass-wonder Eberhard Weber, vibraphonist Gary Burton and the amazing eclectics known as Oregon. If there is a governing aesthetic shared by all of those artists, it is probably a certain sense of daring—a willingness to explore unfamiliar musical territories in deeply personal ways. And Steve Tibbetts fits into that category nicely.

But that still begs the question, what does he *sound* like? That depends on the moment. On nearly all his records, including his latest ECM release, *The Fall of Us All*, Tibbetts moves easily from obviously Hendrix-inspired washes of squealing axe-work to delicate, melodic acoustic picking, sometimes even over the course of just one composition. (The new record is roughly divided into two suites of songs, one mainly electric, one acoustic.) He is also an excellent percussionist, and two of his longtime musical partners, Marc Anderson and Marcus Wise, are percussionists as well—their conga and tabla parts help give the music its occasionally furious rhythmic drive.

The three percussionists are capable of producing dense sheets of rhythm, and then Tibbetts' layered guitars either echo the ferocious rhythmic assault with nimble runs up and down the fretboard, or lay back in stark contrast, instead offering long sustained moans and cries that rise and fall in a sea of reverb and carefully controlled feedback. Tibbetts is a master of moving from passages that are gloriously assaultive to spaces that are positively meditative—in this way, his work sometimes brings to mind John McLaughlin (both in his Mahavishnu Orchestra and Shakti phases) and Oregon.

Tibbetts cuts his albums in his own home studio, handling all the engineering himself, and building his compositions piece by piece until his peculiar muse is satisfied. "Why use an engineer?" he rhetorically asks. "It's so easy; I don't see why more people don't do it. You can work long hours and take three-hour breaks and go bowling if you need to; or in my case, go to the batting cage nearby."

From the cover artwork for *The Fall of Us All* to the song titles to the music itself, there is a serious Asian thread going through much of Tibbetts' music (Jimi in Java—what a concept!), and he is the first to acknowledge that his extensive travels through Asia have deeply affected his sensibilities. "One thing that influences my playing and my perception of sound is traveling a lot," Tibbetts comments.

"In '89 and '91, I spent a lot of time in Indonesia and Asia studying the double-drumming style of Balinese *gong kybar*," he explains. "And what happens when you travel for a while is you lose the studio, which more engineers should do. You lose your studio and the sounds you hear all day long every day, and you begin to hear lots of other different sounds. You become sort of groundless in a

—CONTINUED ON PAGE 190

COAST To

L.A. GRAPEVINE

by Maureen Droney

Okay, okay, so *Mix* wasn't one of the honored guests at the 1994 Academy Awards, but we were invited to attend the night-before rehearsal. There we watched presenter stand-ins enjoy their moments of faux glory and listened to real-life rehearsals by Springsteen, Dolly Parton and James Ingram, Janet Jackson and Neil Young. The sound, provided by Burns Audio with an all-Apogee speaker system, was first-rate at the L.A. Music Center's Chandler Pavilion. The house

—CONTINUED ON PAGE 171

Ken DeLoria fine-tunes the sound system for the Academy Awards at the L.A. Music Center's Chandler Pavillion.

PHOTO MAUREEN DRONEY

SOUTHLAND SPECIAL

by Jeff Forlenza

Ah, the glamour, the movie stars, the sparkling water, the Dodgers...And don't forget the music. Of course, L.A. is also known for its world-famous recording artists and world-class recording spaces. We checked in with several L.A.-area studios to get a feel for life in the "fast lane" and to make sure nothin's shaking.

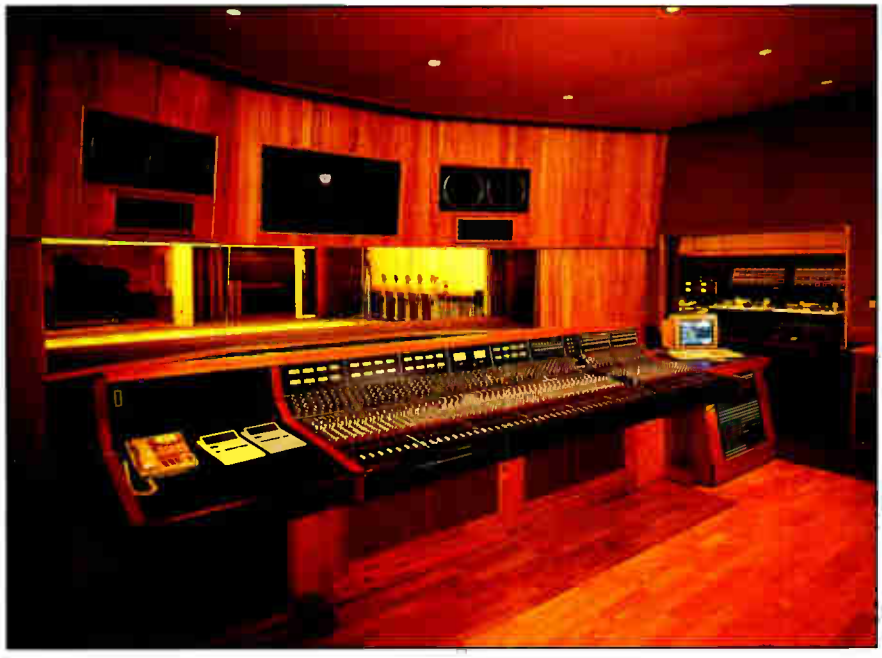
Royal Sound Studios in Hollywood is a division of Original Sound Records, owned by '50s rock 'n' roll

Musicians Institute in Hollywood recently expanded its curriculum to include the Recording Institute of Technology. Along with the new program comes a new room featuring an SSL 4000 G Plus console and Sony PCM-3324S digital recorder.

DJ Art Laboe. Wayne Pauley, chief engineer/studio manager at Royal, reports little damage from the Northridge earthquake. "With the exception of our tape library, which completely toppled over," he says, "the only real casualty was a Kurzweil K2000 keyboard crushed by a falling object." Otherwise it's business as usual at the Trident-equipped, 40-track facility. Recent gear acquisitions at Royal included some of Capitol Records' collection of Neumann microphones as well as a new video-editing system. Royal does a good amount of soundtrack and ADR work for film, and recent music-tracking sessions at Royal included En Vogue adding their vocal harmonies to Salt 'N Pepa's hit "Whatta Man."

In L.A. school news, Hollywood's Musicians Institute recently expanded

COAST



The API-equipped Control Room A at O'Henry Sound Studios in Burbank

its curriculum—and facilities—to include the Recording Institute of Technology to provide training in all aspects of recording and producing music. Grammy-winning engineer Roger Nichols will supervise the curriculum and instructors for the RIT program. Along with the new classes comes a new recording studio, which includes an SSL 4000 G Plus console, Sony PCM-3324S 24-track digital recorder and custom control-room monitors designed by George Augspurger. RIT Students can also record live performances at a new 500-seat auditorium, which is linked to the studio by audio tielines. In addition to audio, the new auditorium features a live video system, including a Sony Betacam, three Sony CCD color video cameras and six ¾-inch VTRs.

Located in the L.A. home of A&M Records, Rondor Music recently added a DDA Profile console to its 24-track Showcase Studio. One of the world's largest music-publishing companies, Rondor owns complete rights to all former A&M titles. Along

—CONTINUED ON PAGE 175

NY METRO REPORT

by Dan Daley

BMG's 12-room post facility has opened. Aesthetics applied as much as acoustics in the design, as the 800-square-foot Studio A has an all-glass primitive root diffusor on the rear wall, which provides a nice view as well as nice diffusion. It was designed by ARcoustics' Francis Daniel, who also did the complex, phase-coherent ceiling design.

—CONTINUED ON PAGE 185

Guitarist Zachary Breaux was at River Sound (Donald Fagen's Manhattan facility) tracking his latest release for NYC Records with engineer Elliott Scheiner and vibraphonist/president of NYC Records Mike Manieri; (L to R) Scheiner, Breaux and Manieri .

PHOTO: THOMAS SKOVSENDE

SESSIONS & STUDIO NEWS

by Jeff Forlenza

SOUTHERN CALIFORNIA

Saturn Sound (Burbank) has been busy lately: Studio owner **Stephen Bray** co-produced MCA/Radioactive artists **Londonbeat** with co-producer/engineer **Michael Verdick**; and **Sergio Mendes** produced Brazilian artist **Lenini** with engineer **Moogie Canazio** for an upcoming album...**Tears for Fears** was at **Record Plant/Hollywood** recording preliminary tracks for their latest album with producer **Tim Palmer**, engineer **Mark O'Donoughue** and assistant engineer **Brandon Harris**...**Convent Studios** in Beverly Hills had L.A.-folkster **Ben Harper** in tracking his latest for Virgin Records, *Welcome to the Cruel World*, with engineer **Mikal Reid**. Harper co-produced the sessions with **JP Plunier**...Multi-instrumentalist **Alphonse Mouzon** was at L.A.'s Studio Masters producing and mixing his new album, *On Top of the World*, with engineers **Tom McCauley, Omie Craden** and assistant **Thomas Mahn**. The CD will be released on Mouzon's Tenacious Records label...Outburst Records artist **Domino** was at L.A.'s **Skip Saylor** Recording mixing his rap single "Enjoy the Ride" with engineer **Sean Freehill** and assistant Eric Flickinger...

Veteran rockers Foreigner were at Miami's Criteria Recording Studios tracking and overdubbing their latest album. In Criteria's West Wing, (L to R) Mick Jones, producer/engineer Mike Stone and Lou Gramm work on the Neve/Studer 48-track setup.

NORTHEAST

Bearsville Sound Studios, the Woodstock-area facility made famous by The Band and Bob Dylan, has been busy: **Blind Melon** recorded and mixed a track for the Atlantic Led Zeppelin tribute album with producer **Eddie Kramer** and Bearsville engineer **George Cowan**; and New Orleans rockers **Cowboy Mouth** mixed their

—CONTINUED ON PAGE 174

—FROM PAGE 168, L.A. GRAPEVINE
mixer was Patrick Baltzell, monitors were manned by Mike Abbott, and room tuning was covered by Ken DeLoria.

DeLoria, president of Apogee Sound Inc., gave us a tour of the facility and a demonstration of the company's "Correqt" (Computer Optimized Room Resonant Equalization Technique) system. He also described the challenges of staging an awards show at Chandler. A small stage, along with a large set and tiny backstage areas, combine with hundreds of giant egos to create huge headaches. Check it out, you live mixers—the only monitors available on stage for performers are sidefills on wheels, which get moved about to accommodate each situation!

Chandler, the winter home of the L.A. Philharmonic, won't allow the installation of large speaker systems. And although acoustically sound, the room still requires tuning. So DeLoria uses a judicious installation of different types of speakers for each audience tier, along with his Correqt system to make all the seats happy—from Meryl and Jack in the front rows to the hoi polloi ensconced in the steep upper balcony. Time for setup is limited, with only three hours to get the initial speaker system up and running before rehearsals and blocking begin. Fine-tuning can only be done at any opportunity that does not disturb the director's rehearsals.

One would think that after six years of tuning the room for the Academy Awards, DeLoria would be getting bored with the project, but he says, "It's still a thrill. On show night, the electricity in this room is unbelievable. The hopeful nominees, the fabulous outfits, the intense energy generated by all these celebrities in one room—it's always an exciting show to work."

I stopped by Brooklyn Recording in Hollywood for a visit and found Ed Cherney mixing on the vintage Neve 8078 with GML automation. Cherney was working on a duet for recent Canadian Juno Award-winner Jann Arden, performed by Arden and Jackson Browne. Cherney, who engineered and co-produced the upcoming A&M album *Living Under June*, gave us a sample of the abilities of one of his new favorite pieces of gear—the Spatializer, with its joystick controls and circular sound placement. After trying it out on the recently released Bonnie Raitt record, Cherney is now a true believer.

Although lodged in the Maverick Records complex, Brooklyn is a commercial studio, and manager Bill Dooley tells us that lately they've been host to projects for 4 Non Blondes, Chrysalis recording artists the Solsonics and South African artist Steve Louw, who was in tracking with Shelley Yakus as executive producer. Dooley amused us with the note that artist Chick Corea, who has his own 8078 console at his Mad Hatter Studio, ended up mixing at Brooklyn when he found himself in that bittersweet artist/studio owner dilemma—locked out of his own studio by another project!

We keep hearing that the '90s are all about downsizing, but not everyone is buying into that philosophy. After closing their home studio during the HARP/home studio wars of 1991, Hank and Jackie Sanicola decided to expand into a three-room commercial facility. Now their O'Henry Sound Studios may be one of L.A.'s best-kept recording secrets. Busy since they went online in February 1993 with a mixture of record, film and television scoring and advertising projects, O'Henry is one of the few studios in recent years to have been designed and built from the ground up.

The Sanicolas carefully chose the studio site by researching neighborhoods and finally settling on a quiet but convenient corner of Burbank. The Spanish hacienda-like design includes windowed studios and control rooms, full kitchens, private lounges and an inviting patio garden. Studio A offers a tracking space large enough to record 60 musicians and has a custom 64-input API console. Studio B has a custom Trident with 48 inputs. Both control rooms are extra-large, and both consoles are fitted with Flying Faders. The mic and outboard selection at O'Henry is impressive, much of it collected during Hank's years engineering for artists including Hiroshima, Ramsey Lewis, Billy Cobham, New Edition and The O'Jays.

Also not interested in downsizing is Record Plant/Hollywood, which continues to be a standard-bearer for the high end in equipment and client service. Record Plant celebrates an important birthday this month: It was three years ago that owner Rick Stevens closed escrow on the Sycamore Avenue facility. Determined to follow in the classic Record Plant tradition that combined the highest-quality gear with the utmost in customer service, Stevens redesigned the facility and added some service innovations of his own.

Stevens began construction on two additional rooms immediately, and in a testament to his determination, was somehow able to keep the previously scheduled sessions ongoing. A wall was built to separate the construction from the working studios, and clients continued their projects. Stevens, a firm believer in pampering clients, is the author of concepts including room service-type delivery of take-out food, complete with napkins and tablecloths, and the Record Plant's famed client service coordinators, who act like a luxury hotel's concierge. The coordinators take food orders, arrange transportation, book hotels or whatever else a client might need. Record Plant also continues its originated-in-the-'70s tradition of a tension-relieving Jacuzzi, housed in the beautiful two-story atrium.

The formula seems to be working, as Record Plant was so booked on the afternoon of our visit that we couldn't get into the studios to take a peek. The clientele was more than diverse—working that day were Neil Diamond, Nine Inch Nails, Jackyl and WEA multiplatinum Latin artist Luis Miguel. Bassist Paul Jackson Jr., taking a break from his tracking session with Miguel, offered his opinion on the continued success of Record Plant. "It wasn't designed like a studio," he offers. "It was designed like a music room, and musicians feel really comfortable and cared about here."

Hollywood's Music Grinder Studios has emerged from the trauma of earthquake damage and is celebrating with the installation of an SSL 6072 E/G console in Studio A. Owners Ron Filecia and Gary Skardina arrived at the studio on Quake Day to find their atrium damaged by falling inner walls and a massive hole in the rear wall of Studio A. Fortunately, there was no damage to the studios themselves, and after a lot of cleanup, they were ready to install the new board. Also new are eight Neve 1084 mic pre/EQ modules. (The 1084 is the same as the 1073, with the addition of an ad-

▪ STUDIO SHOWCASE ▪

Brooklyn Recording Studio

8000 Beverly Blvd.
Los Angeles, CA 90048
(213) 655-9200; Fax (213) 852-1505

Owned by music industry veteran Freddy DeMann and with former Atlantic Studios and Record Plant chief engineer Bill Dooley at the helm, Brooklyn Recording is entering its fourth successful year of operation. Our modified Classic Neve 8078 with GML Automation has served many of today's top producers and engineers, including Peter Asher, David Foster, Humberto Gatica, Hugh Padgham and Ed Cherney.

Akashic Recording Studio

1388 Deer Trail Road
Boulder, CO 80302
(303) 444-2428; Fax (303) 938-8765

The world-class studio of the Rocky Mountain region employs a no-holds-barred approach to quality. Designer Rich Zwiebel achieved superior isolation and great acoustics as well as "threshold of hearing" ventilation and balanced power. Extensively upgraded equipment featuring a JH-24 and breathtaking views from a pristine forest setting combine to provide one of the most inspiring and productive recording experiences available anywhere. Call for free video.

R/J Recording & Sound

PO Box 302; Geneva, IL 60134
(708) 232-1932; Fax (708) 232-1938

We pride ourselves on the highest quality in every facet of our business: recording studio, full tech rehearsal facility, on-location digital recording, and sound reinforcement for corporate events, seminars, local and national entertainment, county fairs and concerts. Clients include Starship, Roy Clark, Jack Jones, Kingston Trio, Count Basie Orchestra and more. Sounderaft consoles and multiple systems, along with a friendly staff have earned us the reputation as "the most consistent high-quality sound company in Chicagoland."

Smart Studios

1254 E. Washington Ave.; Madison, WI 53703
(608) 257-9400; Fax (608) 257-9600

Smart Studios houses two studios, designed by the Russ Berger Group, that offer excellent room acoustics and top-quality gear. Smart's professional staff brings an understanding of your needs together with their accomplished skills to produce true custom service in the best of recording environments. Clients include Depeche Mode, Walt Mink, Killdozer, Smashing Pumpkins, Nirvana, L7, Gary Glitter, Nine Inch Nails and U2.

Live Oak Studio

1300 Arch St.; Berkeley, CA 94708
(510) 540-0177; Fax: same & press "start"

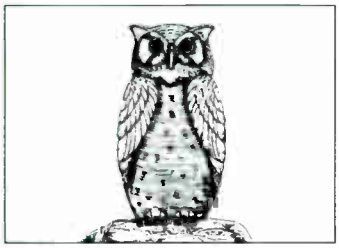
Live Oak is celebrating its tenth year of great recording. Nestled in the Berkeley Hills with breathtaking views of the San Francisco Bay, Live Oak is one of the most beautiful studios in the Bay Area, and also one of the best-equipped. Our 24-track studio now includes a Dyaxis digital workstation, and is home to Platinum recording artists En Vogue, Tony Toni Tone, Spice 1, Too Short and Will Smith. For albums, video or film soundtracks, Live Oak has it all. Good people, hit records...Live Oak!!!

MusicHead Recording

Hwy. 50 East, PO Box 1089
Lake Geneva, WI 53147
(414) 248-9100; Fax (414) 248-9641

Located just north of Chicago in the Grand Geneva Resort & Spa, MusicHead Recording offers a creative environment with all the amenities of a world-class resort, featuring an SSL 4072 E/G console, 64-track digital and 48-track analog recording. Some of our clients include Crash Test Dummies, Queensryche, Red Hot Chili Peppers, Ministry, Nine Inch Nails, Adrian Belew, Live and Guns N' Roses. Please call or write for further details.

STUDIO SHOWCASE



Sage Arts

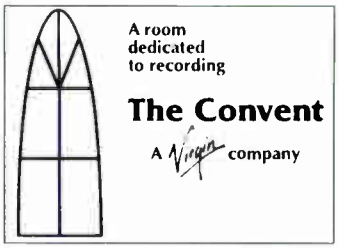
Littlefield Farm
14311 Stehr Rd.; Arlington, WA 98223
(206) 691-5203

Sage Arts is located an hour's drive north of Seattle in a strikingly beautiful rural setting. Our equipment and instrument roster are very impressive, a testimonial to our goal of providing the most accurate and transparent recording possible. The studio is homelike and comfortable, and our friendly and talented staff is devoted to making your visit sweet and satisfying.

A.R.P. Track Productions (Ambiance)

34 Chemin des Ormes; Ste-Anne-des-Lacs
Quebec, Can. J0R 1B0 (514) 224-8363

Located in a charming village in the Laurentian mountains, 40 minutes north of Montreal, A.R.P. features a classic Neve (36x4x24) with Optifile Automation. The control room and studio have skylights and bay windows overlooking forested hills. Accommodations range from cozy to luxurious, with hundreds of culinary and recreational treats within minutes. A.R.P. offers a private and personal atmosphere, free of corporate-studio hype and traffic.



The Convent

330 N. Foothill Rd.; Beverly Hills, CA 90210
(310) 288-2494

The Convent offers 24 tracks on 2-inch analog and 24 tracks in the currently popular modular digital multitrack format. Located on the Virgin Records lot in Beverly Hills, The Convent provides a very relaxed, spacious and uncluttered recording environment. The studio features top-of-the-line solid-state and tube signal processing and microphones and a complete array of MIDI gear. Clients include Ben Harper, Sam Phillips, Bonnie Raitt, Stray Cats, Katey Sagal, Gilby Clarke and Scott Henderson.

ZENITH Audio Services

32 W. Randolph; Chicago, IL 60601
(312) 444-1101; Fax (312) 444-1198

Situated in the heart of Chicago's loop, ZENITH is the Midwest's foremost audio studio. Specialties include services to the entertainment/television industry and corporate communications. The six Loop studios provide sound design and supervision, digital editing/recording, Foley artists, ADR recording and film services. A seventh sound design suite is housed in Lincoln Park at IPA/The Editing House for added convenience while completing video projects.

Oakdale Post Audio

3329 Eastern Ave. South; Las Vegas, NV 89109
(702) 734-3900

Located near major resorts, Oakdale Post Audio overlooks the Sahara Country Club Golf Course and provides a relaxing, productive work environment. Our staff is committed to client service and sensitive to the needs of media production, whether radio, television or corporate. We've won 36 Addy and 10 Telly awards working with such clients as Kenny Rogers, Jack Palance, BBD&O, Saatchi & Saatchi, the Trumbull Co./Luxor Hotel, the MGM Grand Hotel and many others.

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.

justable top frequency.) Other acquisitions include six additional Langevin AM-16 mic pre's, a 12-input personal headphone mixing system and—the owners' favorite—a red lava lamp!

The new SSL at Music Grinder was broken in by Virgin Records artist Mark Curry, re-recording a track for his album at the same time it was being filmed by actor/director Kiefer Sutherland. Also in a while back were Big Mountain with producer Ron Fair, tracking the Peter Frampton song "Baby I Love Your Way" for the *Reality Bites* soundtrack, with Tom Lord-Alge engineering. Owners Filecia and Skardina report, "Earthquake? It's going to take more than a stinking earthquake to stop us now!" And as a fellow Angeleno, I heartily agree!

Some record company studios are expanding their options also. After two years in operation as an in-house studio for Virgin Records, The Convent is opening its doors to the public. Located in a separate building on the Virgin lot in Beverly Hills, Convent offers 48 tracks of analog and three Fostex digital 8-tracks. The console is a Trident Series 80 reinforced with custom mic preamps and a good complement of outboard gear.

Convent house engineer Brad Cook tells us that the tiny main studio gets a good drum sound, with convenient sightlines between control room, studio and isos. On the evening that we stopped by, Gilbey Clarke, guitarist for Guns N'Roses, was in tracking drums for a project he intended to continue on ADAT at his home studio. Oh, and, for the record, Convent has the best bulletin board in town!

Got L.A. news? Fax me at (310) 472-8223. ■

PHOTO: KIERAN CONNELLY

The Spin Doctors were recently at Clinton Recording in New York City tracking their latest album for Epic, Turn It Upside Down. In Clinton's Studio A, (L to R) bassist Mark White, assistant engineer Mark Agostino, vocalist Chris Barron, guitarist Eric Schenkman, road manager Jason Richardson, engineer Peter Denenberg and producer Frankie LaRocka

—*FROM PAGE 170, SESSIONS & STUDIO NEWS*

new album for Ichiban Records in Studio B with producer **Gene Holder** and engineer Cowan...At **Victory Recording Studios** in Philadelphia, producers **David Cole** and **Robert Clivilles** recorded the recent release from **C+C Music Factory** for Columbia Records with engineers **Gene Leone**, and assistants **Tom Marino** and **Don Sabara**...At **Kajem Studios** in Gladwyne, PA, **Ocean Blue** completed tracks for a Sire Records release with engineer **Joe Alexander**...Contemporary jazz bassist **Gerald Veasley** recorded his album, *Highway Home*, for Heads Up Records at Philadelphia's **Sigma Sound Studios**. Veasley co-produced with **Mark Knox**, while **John Anthony** engineered the sessions...Epic artists **Shudder to Think** recorded their latest CD at **Oz Recording Studio** (Baltimore) with procuder **Ted Niceley** and engineer **Steve Palmieri**...Performance artists **The Blue Man Group** recorded a CD of music from their off-Broadway show *Tubes* at **Looking Glass Studios** in New York City. **Kurt Munkacsi** produced, and **Anne Pope** engineered the sessions for Euphorbia Productions...

SOUTHEAST

Singer/songwriter **James McMurtry** was at **Reflection Sound Studios** (Charlotte, NC) with producer **Don Dixon**, engineer **Mark Williams** and assistant engineer **Tracey Schroeder**...**Jimmy Buffett** mixed his latest Margaritaville release at **New River Studios** (Ft. Lauderdale, FL) with producer **Russ Kunkel** and engineer **Rob Eaton**...Motown artists **Boyz II Men** were at Atlanta's **Doppler Studios** working on various songs with producers **Tim Kelley** and **Bob Robinson**, and engineers **Blake Eiseman** and **Darin Prindle**... A&M recording artist **Amy Grant** mixed her new album at **Secret Sound** in Nashville with producer **Michael Omartian** and engineers **Terry Christian** and **Mick Guzauski**...**The Stone Temple Pilots** recorded the follow-up to their multiplatinum album, *Core*, at Atlanta's **Southern Tracks Recording** with producer **Brendan O'Brien** and engineer **Nick DiDia**...

NORTHWEST

Soundgarden recorded their album, *Superunknown*, at **Bad Animals/Seattle**. It's the latest album from a Seattle band to debut at Number One on the *Billboard* charts, and was tracked and mixed on the SSL 4064G in Studio X. **Michael Beinhorn** produced, **Jason Corsaro** engineered, and **Adam Kasper** assisted the grunge-rock sessions...At **The Plant** in Sausalito, CA, **Carlos** and **Jorge Santana** were working with engineer **Devon Reitvald** on their self-produced album, *Brothers*, on Santana's Guts & Grace label...Former Iron Maiden vocalist **Bruce Dickinson** was recently at **Granny's Recording Studios** in Reno, NV, cutting vocals for his solo release on EMI with producer **Shay Baby** and engineer **Bjorn Thorsrud**...**Mumbo Gumbo** were at **Studio Z** in Sacramento, CA, doing pre-production and overdubs for their new album....

SOUTHWEST

The Railroad Poets were at **Harsh Reality Recordings** (Flagstaff, AZ) track-

ing and mixing their new release with producer/engineer **Art Harsh**... At **Big Time Audio** in Dallas, contemporary jazz guitarist **Henry Johnson** recorded his second release for Heads Up International, titled *Missing You*. Johnson co-produced the album with **Martin Walters** while **Steve Browne** engineered...The **Blue Johnnies** from Amarillo, TX, were at **Planet Dallas** recording their latest CD release with producer/engineer **Rick Rooney**...

NORTH CENTRAL

At **Flyte Tyme Studios** (Edina, MN) producers **Jimmy Jam Harris** and **Terry Lewis** have been busy with a multitude of projects including the soundtrack for the film *Beverly Hills Cop III*, and music tracking for **Patti LaBelle** and **Gladys Knight**, both for MCA records...**Warzone Recorders**, a 24-track/API Chicago studio owned by Die Warzau founding members **Van Christie** and **Jim Marcus**, reports recent sessions by **Pigface**, Swans and **Liz Phair**. **Die Warzau** was mixing their third album at Warzone...

STUDIO NEWS

Multiplatinum international recording artists La Mafia recently opened their **Houston Sound Studio** in Texas. The room features a Sony MXP-3036 console with JL Cooper automation and a Studer A820 24-track with Dolby SR. La Mafia mixed their latest release on Sony Discos, *Vida*, at their new facility...**Caldwell Plus Productions** recently opened in Nashville with a Harrison Series Ten B console. Steven Durr designed the recording studio for Victor and Cedric Caldwell, whose client base includes Whitney Houston, Bobby Brown and Stephanie Mills... **Henninger Digital Audio** (Arlington, VA) added the IDB digital phone patch to its list of client services. The IDB patch enables clients to send and record narration, music or a complete audio mix over digital lines, both in mono and stereo. ■

Send nationwide sessions and studio news to Jeff Forlenza, c/o Mix, 6400 Hollis St. #12, Emeryville, CA 94608.

—FROM PAGE 169, SOUTHLAND SPECIAL

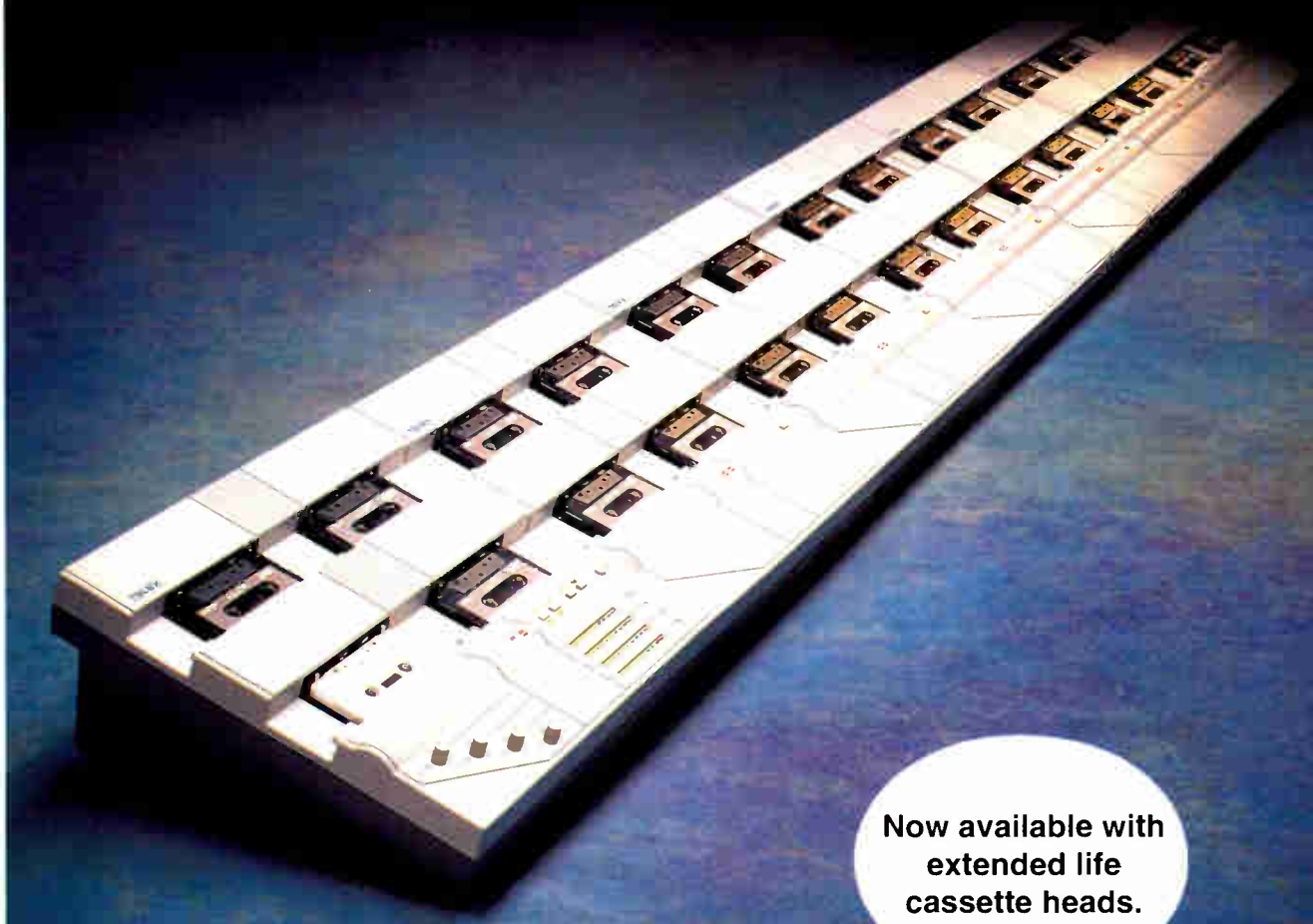
with the new console, Rondor's Showcase Studio underwent a complete equipment upgrade and is now configured more like a small club than a recording studio. "We use our studio for a wide variety of applications," chief engineer Steve Smith says of the new room. "We track live to tape and use live vocal mics at all times. It's like performing in a club, but you're in a studio."

From The Enterprise in Burbank, president Thom Brown reports the acquisition of four new Sonic Solutions systems, one for each room at the *Star Trek*/audio tech facility. Recent Enterprise music recording sessions included Roger Daltrey & Friends, a capella group Take 6, Motley Crue and Kenny Loggins. Regarding bookings, Brown reports increased business due to two new post rooms: "Our music-recording bookings have remained steady, but the added post work is really what makes the difference."

Andora Studios in Hollywood went online with their Neve-

—CONTINUED ON PAGE 185

Go forth and multiply.



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TELEX®

by Philip De Lancie

DADC's James Frische

AN EXECUTIVE VIEW OF THE OPTICAL DISC MARKET

It has been a decade since Sony and CBS Records (now Sony Music) joined forces to found Digital Audio Disc Corporation, the first CD replication operation in the U.S. DADC's Terre Haute, Ind., plant went online in 1984 with a monthly capacity of 300,000 CDs; ½ billion CDs later, the same site has a capacity of 14.6 million, which makes it the leading CD manufacturer in the world, according to Sony.

DADC's rapid growth over the years reflects the enthusiasm with which CD-Audio has been embraced by the music-buying public. But while CD-Audio remains DADC's primary business, the company also manufactures related optical disc formats, including CD-ROM, MiniDisc and LaserDisc. CD-ROM production began at DADC in May of 1986 and has grown at a rate of 120% or more every year since, with growth rates of more than 160% in recent years. The plant's 50 millionth CD-ROM was replicated last December.

Given the company's status as a Sony subsidiary, it's no surprise that DADC was also an early entrant in MiniDisc replication, building a 500,000/month capacity MD facility in 1992. MD's limited acceptance so far has kept demand below capacity, but two factors may eventually turn that around. One is the imminent introduction of a new generation of smaller MD portables from Sony, presumably accompanied by a substantial marketing push.

Perhaps more important in the long run is the recent launch by Sony of the MD-DATA format. MD-DATA

Technicians and robots work side-by-side manufacturing MiniDiscs at DADC's Terre Haute, Ind., plant.

stores 140 megabytes on a single 2.5-inch diameter disc. Sony envisions three types of discs: MD-ROM for prerecorded software applications, rewritable MD for blank media applications (equivalent to 100 floppy diskettes in one) and hybrid discs, which will combine prerecorded data with user-writable sections.

MD-DATA's 150kB/second data transfer rate precludes its use as a substitute for magnetic hard drives, but its size and capacity are sure to make it attractive, not only as the next-generation diskette for desktop computing, but for many portable computing and PDA (personal digital assistant) applications. Production model MD-DATA drives for PCs were introduced at the March *inter*Media show in San Jose, Calif. If the format takes off, DADC will be well-positioned to profit from its use as a prerecorded software distribution medium.

At the helm of DADC for these developments is chairman and CEO James Frische. Frische's responsibilities also include Sony Music's manufacturing operations in Pittman, N. J., with a CD-Audio capacity of 12 million monthly, and Carrollton, Ga., which will add replication capability in the fall of 1995. At around the same time, Sony will open another optical disc-manufacturing plant in Springfield, Ore. The plant will have a monthly capacity of 2.5 to 3 million units in its initial phase. In the following interview, Frische offers a manufacturing-oriented perspective on the outlook for optical disc markets.

DADC recently replicated its 50 millionth CD-ROM. Put CD-ROM in perspective. What proportion is it of overall CD replication business at your plant?

This past year it was 15 to 20 percent of our business at DADC.

What is CD-ROM's rate of growth compared to the CD-Audio rate?

The audio growth in CDs is probably ten to 20 percent. CD-ROM is basically just about doubling every year. And that has been true for the last several years. In that, I lump all the categories: games, computer software distribution and traditional CD-ROM applications. Some are growing faster than others, but I don't see any of them falling by the wayside.

What's the size of an average CD-ROM run compared to an audio run?

It is substantially smaller, but the CD-ROM order sizes are getting larger because of the consumer business, the game business and whatever else. But traditionally, the ROM orders have been relatively small. A lot of clients, but small orders. It is virtually all new releases. There are virtually no reorders in the traditional data-publishing CD-ROM business.

Is the CD-ROM business driven by consumer multimedia yet, or is it still mostly a database business? In other words, who are your CD-ROM clients, and have they been changing recently?

"We are looking anxiously at the second-generation MD hardware. I believe that will give the market another stimulus for growth."
—James Frische

We really have three markets. The traditional ROM business, the data publishers, is still growing. And we have the software distribution that the computer software companies are doing. A high percentage of PCs in the stores right now have a CD-ROM drive built in, so for a lot of the future software, instead of getting a handful of diskettes, you will get one CD-ROM. I don't know what the percentages are, but it is a growing business. Then we have a lot of consumer products like games and products for PCs for the average American consumer. All of these segments are growing.

What sort of support and advice are available from the technical staff at DADC to orient first-time CD-ROM clients?

We have literature and specifications so that we can guide a new client in what they need to do to make it the least troublesome to us and the

least expensive to them. And our account representatives work with the customers to help guide them on their data preparation. It depends on the knowledge of the customers themselves, as far as where they are in their understanding of what CD-ROM is and what they want it to do for them. They have to have an idea of how they want to use the data and how they want it formatted, because the product they get back will only be as useful as they make it.

What common threads do you see between the kinds of CD-ROM titles that seem to get the most reorders?

We don't get a lot of reorders in the traditional ROM business. When you put a database on CD-ROM and then the world keeps marching on, that database gets out of date. So for the typical data storage application where the data changes, you don't get reorders for additional copies of the same master.

As far as the consumer titles, that is really a difficult question for us to answer. We see the game business as having a good potential for CD-ROM, and we have done quite a bit of that. But as far as titles that John Doe is using in his PC, I don't know how to answer that for you. I don't know what a hit is for those titles. There is nobody in the industry capturing that kind of data. We never even know whether we are the only ones making a given title. The client may be getting product from more than one plant.

Which CD-ROM formats do you see growing most in the next three to five years: consumer set-top or computer-based?

Once again, I think the game business has great potential. And the traditional CD-ROM business—the database ROMs that companies are using—is growing as well, but that segment won't grow as fast as some of the new consumer applications. The interactive aspects will make those applications grow faster than the traditional business that started a few years ago. But as far as what direction I think the hardware is going, that is really more of a question for the hardware manufacturers than for a software-manufacturing executive like me.

How do you react to the idea that within a very few years some form of mixed-mode disc with both Red Book audio and CD-ROM data will replace CD-Audio as the norm for music industry releases?

I think that is a possibility. As we all

know, if there is enough of a market, then some type of company, be it a computer company or an entertainment company or whatever, will provide the hardware and software for the consumer to buy. That's just the way the market works. So there is that possibility.

How large a factor are CD-ROM formats in the decision to open the new plant in Oregon?

The building of the plant in Oregon is a strategic decision which is heavily related to our ROM clients because we have a lot of ROM clients on the West Coast. To be competitive, we need capacity to service our clients in that market. And that is primarily a ROM market. We see that market with great growth potential, so we want to position ourselves to best serve the clients we have and that market in general.

How big a market are you projecting for Video CD (White Book), and what sort of preparations have you undertaken to get ready for it?

We are aware of it. Sony is [part of] that group. But we will have to see a mass market for it. We are basically in the business to make whatever disc format is required by a mass market or by our own music, film or video companies. So at this point, it is really a matter of waiting to see what the requirement is. If there is a requirement for any kind of optical disc product, then we will make it. But to this point, there has been very minimal preparation for Video CD.

I do believe that Video CD or some other kind of smaller disc video format definitely has a future. But it is still some time off. There is still a lot of work going on with the next generation of video disc.

How has MiniDisc performed compared to your projections when you started the MD lines at DADC a couple of years back?

We have not increased our MD capacity. We have enough capacity at this point, and we are making an increasing number of selections. There are at least 350 to 400 selections out now. We never had any real good way of predicting how fast the format would grow. You never do. But compared to the first year and a half of CD, the MD is doing pretty good.

We are looking anxiously at the second-generation MD hardware, which will be introduced in a couple of weeks. I believe that will give the market another heavy stimulus for growth. The new player is really a shirt-pocket type of Walkman, the thickness of a deck of cards. It is very portable. It has a very light, lithium ion battery. The new recorder is only a fraction of the size of the original recorder, only slightly larger than the new player. So we truly have Walkman-sized products, and I think that will give a lot of new stimulus to the MD market.

What about the new MD-DATA format? Will that be made at DADC or other U.S. Sony plants, or mostly manufactured in Japan?

The MD-ROM or prerecorded MD-DATA will be made at DADC. I don't know about the recordable, the magneto-optical MD. We are not making any blank media at DADC presently for the MD-Audio. That is a different technology. We are importing those discs from Japan at this point.

What impact do you expect to see MD-DATA exerting on the market for MD-Audio?

I think anytime you have greater awareness of a format, such as when a consumer has an MD-DATA drive, for instance, then the consumer would be more knowledgeable as far as purchasing an MD-Audio player. So anytime you have a format like that, it influences other applications of that format.

Do you think that the much-talked-about plans to use the "information superhighway" for online delivery of entertainment—linear and interactive—pose any threat to those who manufacture and distribute physical storage media such as CDs and tapes?

We really don't know what the landscape will look like ten years from now, but we believe that the need for software products will be strengthened and that there will be both a potential for direct transmission to consumers as well as a very healthy consumer-shopping kind of environment that will still require the kind of products that we make today. We are committed right now to dealing with the reality of today's market, but also to the change in whatever the market will be. It will be a challenge to adapt, but the love affair that the American consumer has with shopping and browsing and touching and owning and storing is not going to change overnight. ■

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

Tape & Disc News

BLOCKBUSTER MARKET FOR CD-ROMS

The number of CD-ROM titles in print increased 54% in 1993 over 1992 to 8,100, while the installed base of playback devices shot up 155% to 11.4 million units, according to a worldwide survey of CD-ROM activity. The research was conducted by InfoTech of Woodstock, Vt., and the findings were reported in the sixth edition of the Optical Publishing Industry Assessment, presented at the *inter*-Media exposition in San Jose, Calif.

According to InfoTech's Julie Schwerin, last year's drive sales mean that "CD-ROM is now moving rapidly past the ten percent mark in penetrating the installed base of desktop computers, and has a lot of momentum to move beyond the five percent mark in penetrating the installed base of TV set-top machines in 1994." The report pointed to a dynamic OEM business (CD-ROM drives sold with desktop or set-top machines) on top of vigorous aftermarket sales, especially in the U.S. and Europe.

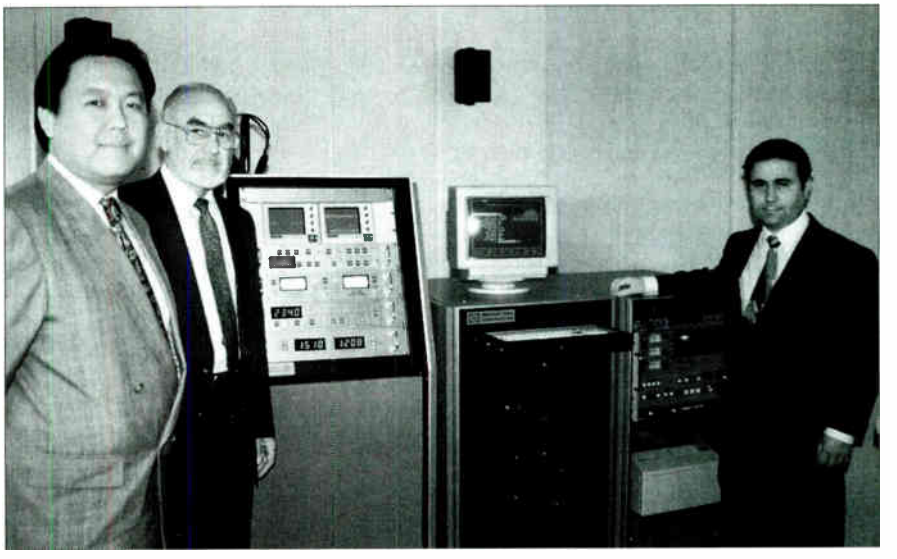
The study also estimated a 149% increase in worldwide title revenue, which it attributed primarily to strong sales of more expensive titles ($700 to $900) in the original core CD-ROM market of library, professional, corporate, government and other non-consumer users.

Noting that "80 percent of the attention is paid to 20 percent of the sales," InfoTech described consumer multimedia titles sold in higher unit volumes at lower average prices ($50 to $125) as a secondary factor in title revenue growth. Overall, the "diversity of revenue streams, price points and geographic variations" evident in the CD-ROM market are, according to Schwerin, "characteristic of its print publishing forebear."

While the survey results indicate that traditional CD-ROM applications continue to dominate, the relative importance of consumer titles may be set to jump over the next couple of years. Assessing the CD-ROM market from a retail perspective, *Billboard* quotes Blockbuster Entertainment's business development director Michael van der Kieft as saying that the video rental chain's 58-outlet, in-store test of consumer interest in the San Francisco area is "ahead of all objectives." The test has been extended through June.

The store's Interactive Experience kiosks feature titles and software for the Mac, IBM, Sega CD, 3DO and CD-I platforms. In the *Billboard* report, Van der Kieft noted that game titles start strong, but interest in children's titles appears to be more sustained. Sega CD is apparently the leader as far as format.

Despite its reported success, the test has proven very costly, largely due to the 100 hours a week per location of added labor for training and orienting employees and customers. Van der Kieft said Blockbuster will decide in June how to proceed with CD-ROM marketing. The opening of new markets in 1994 is expected to be selective rather than nationwide.



Zhuhai Gold Laser Mastering consultants (l to r) Henry Fai of Datalink Computer Systems and Wan Seegmiller of Future Optics, shown at pre-shipment check with Jim Schlaffer, director of sales support, Optical Disc Corporation. The OCD Series 500 CD Mastering System is bound for installation in Zhuhai, China (PRC).

UPGRADES UP IN MASTERING BIZ

Reflecting an upsurge in either mastering business or PR mailings, news has been pouring in of facility construction and upgrades in the mastering field. West Hollywood's Pacific Coast Sound Works hired "acoustic architects" studio bau:ton to design a multimedia and mastering facility in Burlingame, Calif. Set to open this month, the satellite operation is situated midway between Silicon Valley and San Francisco's Multimedia Gulch.

Back East, meanwhile, Airshow in Springfield, Va., opened a remodeled editing and mastering suite, featuring two Sonic Solutions Sonic Systems linked via Sonic's MediaNet, as well as a custom API Legacy analog mastering console. The company also reported that seven of its projects received Grammy nominations this year, with the Nashville Bluegrass Band album winning.

Not to be outdone, London's The Town House is in the process of rebuilding its audio post-production facilities to provide five mastering suites "fully equipped for all aspects of analog and digital mastering work." Two rooms will be outfitted with Sonic Systems, new A/D converters and Marantz CD-R recorders. The company will continue to offer lacquer and DMM cutting as well.

Finally, Digital Domain in New York City has added a Sonic System and upgraded the D/A converter in its mastering suite to 20 bits.

COMPTON'S BIFURCATES; EXHUMES LENNON

Leading CD-ROM publisher Compton's New Media has split its title development operations into two divisions: Compton's Information and Compton's Entertainment. The information division will concentrate on children's titles and reference-oriented works such as the company's oft-bundled *Interactive Encyclopedia*. Compton's says that more than 35 new titles are in the works in this area.

The entertainment group, meanwhile, will focus on strategic alliances with the entertainment industry for

program development in the CD-ROM, cable and online markets. The company also will move to expand its distribution channels into more traditional entertainment-oriented outlets.

One example of things to come is a "virtual gallery" on the life of John Lennon, produced in conjunction with Warner Bros. Consumer Products and with the cooperation of the late Beatle's estate. The CD-ROM will include nearly an hour of video, previously unreleased music ("CD quality"), and examples of Lennon's writing, poems and art. Lennon, through the magic of archival video clips, will guide the user through some sections of the program. The Mac and MPC title is expected to be available in the third quarter for $69.95.

MATSUSHITA SET TO BOW VIDEO CD

Japanese electronics giant Matsushita (Panasonic, Technics, MCA, Universal) looks to be the first to roll out players for the Video CD format, which stores up to 74 minutes of MPEG-1 compressed video per disc. The format, agreed to by the company and co-conspirators Sony, JVC and Philips last August, is based on an extension of the White Book standard (karaoke CD). As reported in *Billboard*, the company will sell the drive, which also plays CD-Audio and CD+G discs, as part of a high-end ($1,190 in Japan) mini-component system including a radio, cassette deck and speakers. The company projects 1994 worldwide sales of 300,000 for the system, due to appear in the U.S. "sometime this summer."

AMERIC DISC GOES SOUTH

Canadian CD replicator Americ Disc will open a 20,000-square-foot plant in Miami as part of a long-term development strategy to bring production closer to markets. The facility is scheduled to open in June with an initial annual capacity of 12 million discs. The company's Drummondville, Quebec, plant will continue to be its main facility for new products, including MiniDisc and DCC.

ITA PLANS BRIEF RETIREMENT

Henry Brief announced plans to retire at the end of 1994 from his position as executive VP of the ITA, the trade group representing the magnetic and optical media industries. Brief, who has presided, guided and occasionally chided at ITA seminars and events for 15 years, plans to continue with the group as a consultant for one or two years. He has recommended to the ITA board that executive director Charles Van Horn be elected to succeed him. Van Horn is rumored to be negotiating for access to Brief's renowned portfolio of one-liners.

SPLICES

Optical Disc Corporation (Santa Fe Springs, CA) reports the sale of a Series 500 CD mastering module to **Zhuhai Gold Laser Mastering** of Zhuhai, China. The system, which masters all CD formats, will be used to supply stampers to CD replicators throughout China... **KOCH Digitaldisc** (Elbigenalp, Austria) introduced the TBE analysis board for its CDCS 4 test system. The board allows the system, without additional external hardware, to test for compliance with newly developed "jitter and effect length deviation" specifications for Orange Book CDs. According to KOCH, the recommendations, developed by Philips and Sony, are set to become part of the Red Book (CD-Audio) standard soon... **RAKS Electronik** (Izmir, Turkey) purchased **Gauss** high-speed audio cassette-duplicating gear for **Dessauer Magnetband**, a new subsidiary duplication operation in Dessau, Germany... **Concept Design** (Graham, NC) reports the sale of DAAD-R duplicating systems to Canadian duplicator **Canatron** as well as Philadelphia's **Disc-makers**. The company also sold four of its CD 9002 cassette loaders to **MGA** in Bangkok, Thailand...**Future Disc** (Hollywood, CA) completed mastering for the European release of the latest from Hammer, *The Funky Headhunter*. The album will be released on CD, vinyl, cassette *and* DCC...**Trutone** (Hackensack, NJ) mastered a new single from 95-South on Ichiban Records, as well as two compilations of independent label material for distribution at the recent NARM convention in San Francisco... *The Grammy's Country Moments* was mastered for Atlantic by Paul Stubblebine and Ken Lee at San Francisco's **Rocket Lab**...Barry Manilow worked with Robert Vosgien of **CMS Digital** (Pasadena, CA) on the upcoming *Thumbelina* soundtrack album...New York City's **Digital House** worked with Howard Jones to make the limited-edition CD *Working in the Back Room*, which Jones will distribute only at his concerts. ■

—FROM PAGE 89

process is something I really enjoy. I've been trying to take advantage of things that I've learned and people I've met along the way, and I've had a great time. Even though I wasn't making records for a few years, I've been doing some other kinds of projects that have been really meaningful for me, which have helped me grow as a person, as a musician and as an artist. There's been this imbalance of where the music-making process meets the record business, and that began to affect my enjoyment level. So rather than get frustrated to the point of saying, "to heck with it," I just wanted to step back and turn my attention to other areas.

The job of musical director for a show like the People's Choice or Image Awards is an underpublicized but very important one.

People aren't aware of the demands and the artistic and commercial elements that go into those shows. If somebody's in there that doesn't know what they're doing, it doesn't happen. More and more name artists, in order to be fulfilled with the challenge of getting it right and having to make it right right now, also participate in those bands and orchestras for TV and film. It's kind of cool.

No Strings ***is a shockingly good jazz departure by Sheena Easton and is the first project you've produced other than your own.***

It's interesting because it's an album of standards, so it's very atypical for Sheena Easton, and people wouldn't necessarily imagine me arranging and producing these songs. It was kind of a happy accident. Sheena was asked to make a cameo appearance as herself in the film *Indecent Proposal*, singing Hoagy Carmichael's "The Nearness of You." The only problem was they only gave her 24 hours notice to go into the studio and cut this track. So she called me a little distressed. We had never worked together before. So I said okay. And we went in all acoustic—just with piano, bass and drums—and did it live. She was there. Hit it...boom! Her record company was knocked out, because they hadn't heard her do this type of thing. And I think she kind of surprised herself, like "I can do this!"

And this is going to crack you up, because it never happens. The record company said, "Here's some money, go do some more." So we said, "let's hurry up and do it before they change their minds." We went in and did four more songs—same type of material, although we used a couple of horns for variety. She picked the songs that she wanted to do, again standards, and they loved them.

Now you're halfway to an album, and they give you the go-ahead to complete it. How did things proceed?

I told them, "you can only have so many trios and quartets," and they said the only stipulation was they didn't want to spend a lot of money, so no strings. So there was the title of the album. We said, "okay, we'll keep it an intimate and small ensemble." But with the songs she chose, it really demanded variance in textures. So I suggested that we use some different combinations of horns. They didn't say "no horns." So we had a great time.

Is it true that **No Strings** ***was recorded with no overdubs?***

Everybody was right there in the studio at the same time—they hit it. And what you're hearing on there is like second or third takes. We had a great time because of the camaraderie and the good feelings and the challenge of it. So it was a real good experience for her, great experience for me, and I think it came out really nice.

Was it a challenge to hold it all together from the piano bench?

I wore three hats on the session. I don't know if I'd like to do that again soon. Since I was producer, the whole shootin' match became my responsibility. I was also the arranger, thinking of the sound of things and working with her. And then I played piano also. I ain't gonna lie: The only way that it gets done is that you have good people who are there, and they are attentive and enthusiastic about doing it. Everyone who was there was chosen not only for their musicianship, but for being the kind of people that could create an environment where Sheena would feel supported, since it was something new and different for her, and where I would feel supported because of the level of responsibility that I had in trying to help it happen. When the chemistry is right, you can have a good time even though you are under an interesting, pleasant kind of strain. I had Kenny Wild on bass, Ndugu Chancler on drums, some saxophone solos by Bob Sheppard, Phil Upchurch and Paul Jackson Jr. on guitars, and Rick Baptist, a first-call L.A. trumpet player.

> I love making records. I could go in the studio anytime with anybody any day and have a great time. The creative effort, the interplay and the camaraderie that comes out of the process is something I really enjoy.

You did horn arrangements, and it looks like you picked the players carefully—an ace on french horn, a flute specialist.

I enjoy doing that, and have been more and more, especially for the Emmys and Image Awards and things where I've had to get into arranging for horns more. I used to do string and horn arrangements on my older albums (when I had a certain amount of creative control), so that I'd have a chance to learn how. And, of late, I'm having more opportunities to do it for other people, which is nice. I used to experiment on my own projects, so I'm not experimenting quite as much on other peoples' projects now. Now I know a little more about what I'm doing.

There's plenty of very sophisticated pop stuff on your new solo album—modern, state-of-the-art things—and your vocals sound good, too.

After '86, I didn't know if I was going to make records anymore; it just wasn't fun. So when people would come up to me and say they wanted to hear *my* thing, that made me feel real good.

What keyboards are you predominantly using these days?

I used a Kurzweil PX1000 for most acoustic piano sounds, and a Roland JV80. But I found myself more and more using the Yamaha TG-500: It represents some of the finest tech-

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148	068	Leo's Professional Audio
55	069	Lexicon
170	070	Lightwave systems
97	071	Los Angeles Recording Workshop
95	072	MacBEAT
IBC	073	Mackie
147	074	Manhattan Production Music
182	075	Markertek Video Supply
94	076	Masterdisk
99	077	Maxell
77	078	Micro Technology Unlimited (MTU)
115	079	The Microphone Company
179, 182	080	Mix Bookshelf
32	081	Mountaingate
11	082	Neumann/USA
146	083	Neutrik
46	084	Night Technologies International
76	085	Ontario Institute of Audio
6-7	086	Opcode Systems Inc
142	-	Optical Laser
106	087	Optical Media International
84	088	Optifile/Sascom Marketing
117	089	OSC
63	090	Otari
130	091	Peavey Electronics
175	092	Philips Key Modules Group
119	093	Pinnacle Micro
140	094	PolyQuick
178	095	Progressive Music
39	096	QCA
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62	098	Rane
50	099	The Recording Workshop
59	100	Record Plant
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97	103	Rich Music
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60	105	Rocket Lab
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65	114	SoundTech
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34	116	Spatial Sound
54	117	SPL
140	118	Stedman
3	119	Studer Editech
95	120	Studio Consultants
167	122	Summit Audio
45	123	Sweetwater Sound
118	124	Sweetwater Sound #2
165	125	Sweetwater Sound #3
79	126	Tactile Technology
2	127	Tannoy
19	128	t.c. electronic
56	129	Tech 21
176	130	Telex
117	131	Thoroughbred Music
91	132	3M Corporation
86	-	Trident
154	133	Turbo Sound
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131	135	Walters-Storyk Design Group
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nology to date for combining real sampling with FM synthesis. The sounds are incredible, because there's a depth to the sound that sometimes synthesizers have lacked because they're not moving any air. I don't know what they put into it to bring some of that back into it, but the end result is that the sounds have dimension, and you're able to put together sounds that have dimension.

I'm a Yamaha endorsee, and when they come up with something they just send it over. I was one of the people they got to do the first initial feedback on the TG-500. They said, "Try it, there's no manual, just go for it." I was blown away, and said, "I know you're not finished with it yet, but let me keep the prototype, because I want to use it on my album."

Productionwise, how were things different on your new album from your last one?

On this album, unlike my previous albums, all of the songs are a combination of sequenced stuff with a live rhythm section. I was experimenting with mixing a lot more of the acoustic-sounding instruments with the synthesizer-sounding instruments. Now that the instruments are so much more sophisticated and our ears are so much more attuned to fidelity, and we've got stuff on CDs, it was just interesting for me to mix these two very different textures. There's a whole slew of synthesizers playing, but with acoustic drums. On some tracks, we've got live bass and electronic-generated bass. On other tracks, all the keyboard stuff was done first, and then the rhythm section of guitar and drums played together. We did very few overdubs, because I wanted the live feel that comes out of people who are reacting to something. We don't do as much of that now as we used to.

When I was first making records, "Forget Me Nots" for example, we were all there at the same time [in the studio]—just hit it. We probably spent all day trying to get that pocket just like we wanted it, but we would get it. Now, a lot of times I'll do a week's worth of sessions and only see two other people besides myself—the engineer and the producer. That has its place and it's been fun, but it's not like sitting across from the guitar player and the drummer and the bass player.

As we speak, you've got a good product, but no one willing to put it out.

There was a time when I probably would have freaked out about it, but in the time I've been making records, working with people, and having these behind-the-scenes major responsibilities, what I've begun to find out is that I enjoy all of it, and the biggest thrill for me is the process. So as long as I'm able to be viable and active and doing what I love, which is the process of making music and the playing, then I'll feel okay. I've done *Bandstand* and *Soul Train*, I've gotten Grammy nominations, and I've had hit records, and the most important compliment that people have paid me is that I have music that was recorded 15 years ago, and they're sampling and playing it now—that people are having hits all over again [using my music]. So how much better can it get? ■

Robin Tolleson is a Marin County, California-based writer, drummer and dad.

—FROM PAGE 175, SOUTHLAND SPECIAL

equipped Studio A nearly two years ago, when owner Doug Parry conceived and supervised the construction and acoustical treatment of the facility. Since then Andora has seen sessions by some of the music industry's biggest names: Dolly Parton, Carole King, Boz Scaggs and Duran Duran have all done production work at the facility. On the sound-for-film/TV front, post work for Fox-TV's *The Airheads* was done at Andora by scoring engineer Michael Farrow who moved to L.A. from the old BMG Studios in NYC.

At Echo Sound in L.A., studio manager Mike Williamson reports a new Trident Vector MkII console with DiskMix ARMS III automation went in to Studio A recently. The installation didn't deter the steady stream of album-recording projects, however. Williamson reports recent sessions at Echo included Def Jam artists South Central Cartel recording a new album with producer Prodigy and engineer Mike Calderon, and Gangsta Dee was working with producer Wino and engineer Bob Morse, also for Def Jam Records.

Award-winning film composer Hans Zimmer added a second Euphonix console to his facility in L.A: A Euphonix CS2000 system with SnapShot Recall was installed along with a Yamaha VL-1 Virtual Synth. Zimmer used the new console to score this summer's animated Disney release, *The Lion King*. Zimmer works in conjunction with partner/engineer Jay Rifkin under the banner of Media Ventures, and their facility also houses Cyberia, a new scoring division for TV commercials. ■

—FROM PAGE 169, NY METRO

The room also has the Neve VR 60 from the original facility on Sixth Avenue.

The Soundtrack facility expanded more deeply into nonlinear editing. In March, the studio added two new rooms—bringing it up to nine total—with the implementation of two Avid suites. One contains an Avid AudioVision system and the other an Avid Media Composer. The studio also added an SSL Scenaria system and expanded one of its SSL consoles from 56 to 72 inputs and added Ultimation to it. "We're definitely getting more heavily into nonlinear editing and offline work," says studio manager Chris Rich. The upgrades come on the heels of the installation of an API Legacy console late last year. That console was upgraded with Uptown automation. Jim Falconer did all the new room designs.

Paul Schallack Productions in Williamsburg, Brooklyn, upgraded from an 8-track demo room to a 24-track analog studio, according to partner Rick McKim. The new console is a vintage API with 26 inputs, running to a Sony/MCI analog multitrack. The upgrade includes new iso booths, a rack of Neve 1079A preamps and Siemens tube preamps, large Tannoy monitoring and SMPTE lock-to-picture. Based around Schallack's production company, the studio will be available for hire, according to McKim.

New York post house Room With a View recently installed a 64-input SSL G Plus console 32-track digital/24-track analog facility. The SSL board replaces a Sony MXP-3036 desk.

Fax your NY Metro news to Daley at (212) 685-4783. ■

—FROM PAGE 152, CELINE DION

as the house mix."

Ambience microphones are placed next to the stacks, left and right, which Baron rides on a fader. Says Savage, "We're using AKG 451s rather than shotguns because [the latter produced] too tight of a pattern." Celine Dion works with a hard-wired SM58 for her vocals. "We've tried a few different things, and it's what she's comfortable with. It's like an old shoe." ■

NEWS FLASHES

The *Mix* Live Sound department's Electronic Bulletin Board Service (LiveMixBBS) went online in April. The BBS runs at 2400 baud, with 8 bits, no parity and 1-stop bit. Its main purpose is to facilitate transfer of editorial material from contributors, as well as press releases from manufacturers and sound reinforcement companies. All material is welcome for submission, particularly concerning recently released products and their use in the field. Other services will include databases, private and public message sections and a classified section. The BBS can be reached at (206) 933-8478...**Soundcraft** (Northridge, CA) introduced four new consoles at the April NSCA in Las Vegas. The SM 16 is a stage monitor console that supplies 16 discrete mixes along with a dedicated stereo mix and is available in 32-, 40- and 48-channel versions. Each channel has four mute groups, four-band sweep EQ, input metering and individual pre/post and on/off switches. A full-function, logic-controlled soloing system allows several modes of operation. Similar in features is the SM 24 monitor console with eight mono and eight stereo sends. The Delta Theater console, available in 8-, 16-, 24- and 32-channel configurations,

extends the functionality of the Delta Line with a new input module. The Folio Rac Pac is a 28-input, rack-mountable stereo mixer with six auxiliary and solo-ins, making it a perfect choice for churches, small P.A. setups and A/V suites...JBL (Northridge, CA) introduced three amplifiers in the new MPX line—the MPX-300, MPX-600 and MPX-1200—with the model number referring to the rated power per channel with both channels driven into 4-ohm loads. These amplifiers are designed to take advantage of Lone Wolf's MediaLink™ technology...TOA Electronics (San Francisco) introduced its new generation of digital signal processing called the DACsys II. The DP-0202 and DP-0204 processors fill one rackspace and feature a wide array of functionality including ⅓-octave EQ, delay on inputs and outputs of up to 1.3 seconds, compression and limiting, and asymmetric crossover filters. They have both analog and digital ins and outs and 20-bit A/D and D/A at a sample rate of 48 kHz and provide a dynamic range of 107 dB...Electro-Voice (Buchanan, MI) introduced its new PI Series of modular, high-performance trapezoidal speakers. A two-box, three-way system, all enclosures measure about 57x30x30 inches deep. The horn-loaded mid-high box comes in three coverage patterns—60x40, 90x40 and 60x60—with rotatable horns and is loaded with a DH-2A coaxially mounted in front of a DL10X. The PI-115L enclosure features a horn-loaded EVX150A driver...Showco (Dallas) introduced the Prism SRM Stage Reference Monitor System featuring a low visual profile and high SPL capabilities. The system is available as a complete package including amp rack and speaker cables, and there is an integrated matched electronic crossover built into each amplifier. ■

Sound reinforcement editor Mark Frink can be reached at (206) 933-8404; 4050 Admiral Way #305, West Seattle, WA 98116.

QuickTips: Gaining Respect by Giving Respect on the Road

Rob Mailman is house mixer for Lindsey Buckingham and has toured with Sound Image of San Marcos, Calif., for the past ten years. He offers several tips for forming positive working relationships with local crews.

- **While having a first look at the venue, take time to introduce yourself to people. Get to know the crew and let them get to know you.**
- **On the load-in, have the crew put each piece in the right spot the first time rather than having to move things several times.**
- **Take the time to learn the venue's house rules, as far as "dark stage," fire laws, etc., and respect them (even if you don't agree with them).**
- **During the load-in, keep an eye out for key people whom you'll want to work with in your area during the day. "If I can pick, I do. Once you have your team for the day, I gain their respect by always treating them like I would want to be treated."**
- **Never ask anyone to do anything that you wouldn't do yourself, or that isn't safe.**
- **Make plans with the crew chief to get the same people back after the show for the load-out. You'll know them already, and they'll be familiar with the tasks they did on the load-in. At the end of the show, immediately assign tasks that they are familiar with so that everyone can get the "strike" moving as quickly as possible. ■**

MARKETPLACE

—FROM PAGE 167, STEVE TIBBETTS

way, then all sorts of weird things start sprouting up in your mind. This is the turf that artists need to work on, and engineers should consider themselves artists. When I come back [from traveling], I have better perception and acuity as far as picking up overtones of sounds. Working in the studio all the time tends to deaden the ear. Traveling allows you to erase your mind and come back with a fresh and fertile field.

"When I came back from Indonesia," he adds, "I wanted to do things with gong cycles, so I made 'gongs' out of voices. In Bali and Java, usually to accompany a shadow puppet play, they have one person who plays the gongs; there are usually eight different ones. There are the huge ones you're probably familiar with—what we in the West would say are stuck on the one of a cycle of 16 to 64 beats. In the course of a gong cycle, the player will go around the set of gongs in a certain prescribed way so you come back to the one, but it might be 54 beats later, it may 128 beats later. What happens, though, is after four or five hours of this, your mind begins to see the arc of the music.

"So I wanted to make my own gongs out of sounds and create my own [condensed] arcs," Tibbetts continues. "I fashioned gongs out of people's voices by sampling them [on an old Roland S-50 Tibbetts describes as "real grainy"] and putting it across the keyboard and then screwing around back and forth with digital delays and trying to bring out all the overtones. I triggered the gongs from a drum machine, and then after that, it was catch as catch can: add guitars, add other stuff, strip away other things and then forget about it for a few weeks and go away."

Tibbetts' studio is equipped with a Tascam 2516 board, "ancient" Bang & Olufson and Fulton speakers; a 16-track Tascam 3516 recorder, his main signal processor these days, a Lexicon LXP-1, and other assorted gear. "We'll take everybody's cast-off analog gear," he says wryly. "The studio is just a box. I dropped the ceiling and brought in the walls of my last studio, a room I was using in a warehouse in South Minneapolis. The landlord came in and saw it and said, 'Great. A studio. Your rent is going to double.' And it did."

Given ECM boss Manfred Eicher's reputation for being a sonic perfectionist of the first order (not to mention a bit of a control freak), it's somewhat surprising that Tibbetts has been given such free reign for his DIY proclivities. He had already made two independent records himself when a friend suggested he send a copy of the second album, *Yr*, to Eicher at ECM. "So I sent that along with this press kit, which was a sort of William Burroughs cut-up of something like 200 rejection slips I'd received and compiled into one letter. ECM at that time was like the Holy Land. It was the glittering Emerald City." Much to Tibbetts' amazement, Eicher called him and said he wanted to make a record with him.

"Actually, I wanted Manfred to [distribute] my second record, but he didn't want to do that," Tibbetts says. "He wants his fingers in the pie at all times. So he said, 'Why don't you come over and make a record our way [at Talent Studios in Oslo, Norway], in three days'—*right!*—'and then maybe we can do one your way.' I thought it was insane, and indeed, when I was finished I didn't think it was done. I didn't really care for that album at the time [*Northern Song*, 1982]. He was not the easiest man in the world to work with.

"My memory of him is looking to my left through the studio window and seeing him gesturing magnificently to extend the space," he continues. "I thought if I was going to work with ECM, here was a chance to make a record that was going to come out on quiet vinyl. Not only would I get a chance to work with space, I'd *better* work with it, because I only had three days to make a record. I knew they had state-of-the-art reverb—the Ursa Major and the Lexicon and a few other things. He called the sound he liked 'fjord echo.' He kept saying he wanted me to extend the space. He wanted sounds to go out into the fjord and ricochet off the rocks, spend some time thinking about themselves and then come back. [Marc Anderson and I] were just two terrified kids from Minnesota; we'd never even been out of the country before. So I guess he did what he could with us.

"A lot of people liked that record [me included—it made me a lifelong Tibbetts fan], but a lot of people who'd liked the previous one were disappointed because it didn't come out and punch you in the face. It was no Mike Tyson; it was more like some wraith, some ghostly figure from north central Europe," Tibbetts says with a laugh.

Eicher produced Tibbetts' next two records, as well—the exquisite *Safe Journey* and *Exploded View*—but was involved mainly just at the mix stage; as agreed, Tibbetts got to record the tracks himself back in Minnesota, taking his time and layering the guitars, percussion, tapes, *whatever*, to his heart's content. Tibbetts says he views those two records, as well as 1989's *Big Map Idea* and, now, *The Fall of Us All*, as being linked conceptually.

"They're all vast, full-scale canvases of sound with lots of overdubbing," he explains. "They're all travel-informed. They're suites of music, and they're arranged internally by tempo and key change to make little symphonies. The reason I thought they were a quartet of records is that I really think I shot it all on this one [*The Fall of Us All*], and I'm not going to do anything any better than this. Oh God—I won't say that. It looks so cheesy in print, because then I'll probably say that about the next record, too." And he'll probably be right. ■

FEEDBACK

A VANISHING WAY OF LIFE

It has become painfully obvious that the digital world is here to stay, and there is no stopping it or slowing it down. This is a world of bits and bytes, ones and zeros. A non-destructive world where you can always go back to the original, a world of never-ending possibilities. It seems that the entire industry has bought a one-way ticket down the digital bitstream. That includes everyone from the home studio owner with his sampler, sequencer and an ADAT, to the high-end user with his Neve Capricorn console, digital multitrack and a hard disk, digital editing system. While there are still a few diehard analog users, they are becoming an elite group that lives on the fringes of our industry. Soon they, too, will jump ship much like the audiophile who ten years ago insisted his vinyl pressings were superior to compact disc.

Now, I'm not one of these diehard analog guys who won't let go. In fact, I am part of the new generation of audio recording professionals—a generation that insists things sound clean. There will be no unwanted noise in my signal path. And I demand to hear things the way they should sound: free of tape hiss, wow and flutter. I guess what I'm saying is that I am guilty. I have purchased a seat on this digital vessel that will bring us to a noise-free digital world, but like most of us, I still have a warm place in my heart for analog as a recording medium.

I'm sure that all of us made our first recording using analog equipment. My first experience was recording a Beatles song from a small television speaker onto a ten-dollar Philips cassette recorder. I still remember the feeling I had when I rewound the tape and played that song back ("Lucy in the Sky With Diamonds") with tape hiss, distortion and I'm sure the smallest bandwidth in recording history. But it was mine, and as far as I was concerned, I might just as well have been George Martin recording *Sgt. Pepper's*.

I think we all share similar memories, and it is these memories that bring about a fondness for analog recording. It is not just a recording medium; it represents a way of life, a way of thinking and a way of working. We have developed valuable skills that are in jeopardy of being lost in the digital domain. As we move closer to an all-digital world, it may be important to stop and realize what we are giving up.

The digital world may offer us a lower noise floor, broader dynamic range and, most importantly, a faster and less expensive way of working. But with these advantages come new problems: computer crashes, digital distortion and format compatibility. The perfect world may yet be found in a hybrid of the two worlds. A world where recording time is measured in both megabytes and inches per second.

Ron Skinner
Audio Technician,
Canadian Broadcasting Corp.
Toronto, Canada

A CALL FOR STANDARDS

I work primarily in the corporate/industrial market in Chicago, doing location sound for film/video, editing/mixing on a Waveframe 1000 and Sonic Solutions, live TV and the occasional sound reinforcement job. I enjoy the work on DAWs the most, but the changes of pace aren't so bad.

The interchange issue between DAWs of different manufacture is the single most frustrating factor I run into. Many of my clients will have one shot this decade to make a choice between the bazillion available DAWs. In the late '80s, the high-end facilities bought and leased as many AMS AudioFiles as they could. For some in-house or small facilities, $100k was more than their annual billings. Now, Sonic Solutions, with systems available for just about any user, is the new DAW purchase of choice around town at all facility levels.

If a project was started at one facility, moving it (for whatever reason) to another with a different DAW was a hideous pain. With the advent of ADAT, transfers are much simpler, and depending on the situation, the tape can be locked right up for the mix.

I guess my long-winded point is that hardware/software developed primarily for the music market is still merging quickly into film/TV/radio sound, and we all would benefit from using the best of all worlds and standardizing our interchange methods as best we can, given the speed at which the technology is changing.

Bruno Strapko
Strapko Resources Inc.
Streamwood, IL

CORRECTIONS

A correction to the February Directory: The number for Sound Master Recording Engineer School in North Hollywood, Calif., is (213) 650-8000.

In April's "Current," we misspelled two names. They should be Paul de Benedictis of Opcode and Tom Virden of Digidesign. Also, a caption on Page 52 should read "OSC's DECK II" software. ■

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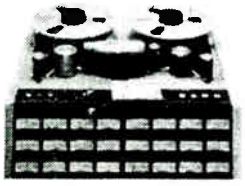

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Sound on Sound (UK/Europe) 12/93

32•8 shown (instead of 24•8) because we had a cooler picture of it.

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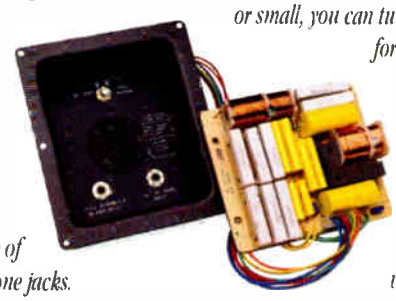

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