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SEPTEMBER 1991, VOLUME 15, NUMBER 9

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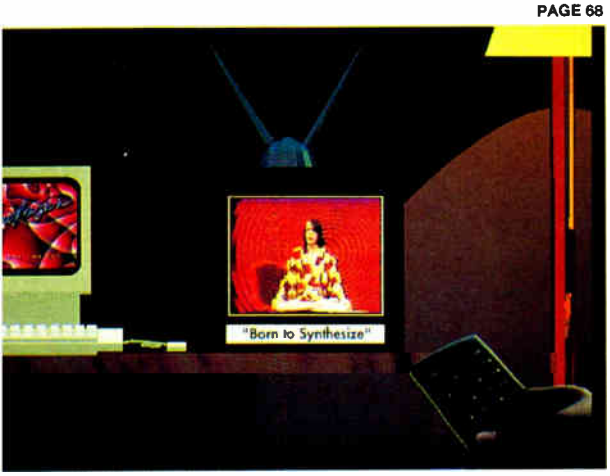

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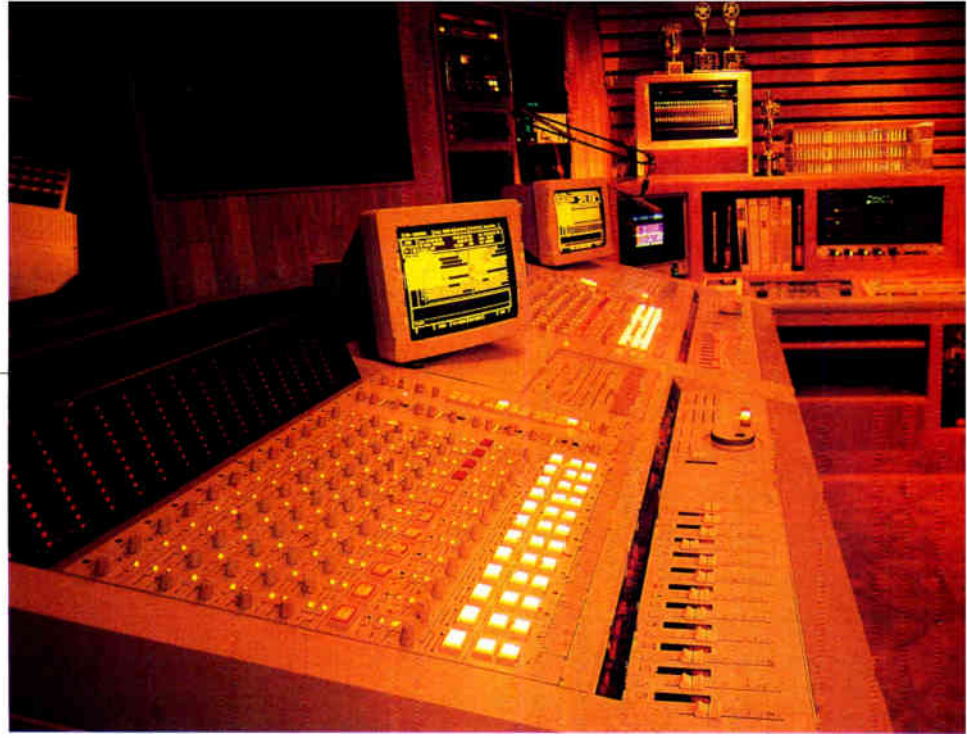

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Cover: Studio B, "The Bridge," at The Enterprise in Burbank, is equipped with an 80-channel SSL 4000 G Series console with Ultimation, which can operate as a dedicated VCA system, a dedicated moving fader system, or a combination of the two. Designed by Jeff Cooper and George Augspurger, the room also features Studer recorders and Augspurger monitors. Enterprise CEO Craig Huxley, composer of music for the *Star Trek* films, took a cue from the futuristic series in the overall design of the facility. **Photo:** Ed Colver.

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FROM THE EDITOR

We're keeping an eye on an interesting situation developing in the Republic of Bophuthatswana, located in Southern Africa. A $25 million recording complex is being built in Bophusthatswana's capital city of Mmabatho, in the 14-year-old homeland state near Botswana. The complex is designed, as this kind of investment tends to indicate, to be the "finest in the world," with the biggest and best of everything. The schedule calls for the Tom Hidley-designed studios to be opened by the end of the year. It is presumed that the owners hope to time the event to coincide with the lifting of sanctions against South Africa and the emergence of true civil rights in the area.

This multimillion-dollar facility is being partially financed by the "independent" government of Bophuthatswana, which is not recognized as independent from South Africa by any other country except South Africa. Located within the borders of South Africa is Mmabatho, also known as Sun City, the casino resort area that Little Steven, Miles Davis, Herbie Hancock and others warned their fellow performers to avoid in their anti-apartheid anthems of the '80s. But have times changed, will they continue to, and when? Talk about gambling. If the bet is correct, politically and economically, the well-to-do will flock to a great remote getaway for some high-end creative expression. If not, a very expensive museum of modern technology may gather dust.

♦ ♦ ♦

Also looking to the future, we'd like to hear from Hispanic readers out there who are interested in being on the mailing list to receive our Spanish language supplements to *Mix*. Response to the summer edition has been so strong that we are planning to increase the frequency for '92. Please let us know if you or a Spanish-speaking friend is involved in pro audio in Mexico, other Latin American countries, or Spain.

♦ ♦ ♦

Highlighting this month's issue, we look at how digital audio workstations have penetrated their way into sound for film and video operations. While many facilities are still waiting for the workstation market to shake out, or for the economy to pick up, others have found ways to pump up business and cut down costs and production time by taking computerization in their studios to the next level. Mel Lambert, Blair Jackson and Iain Blair all consider the topic this month.

Keep reading,

David Schwartz
Editor-in-Chief

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Mix magazine is published at 6400 Hollis St. #12, Emeryville, CA 94608 and is ©1991 by Act III Publishing. *Mix* (ISSN 0164-9957) is published monthly. Subscriptions are available for $46.00 per year. Subscriptions outside U.S.A. are $61.00 per year. Single copy price is $4.95, back issues $6.00. Missed issues within the U.S. must be claimed within 45 days of publication date and abroad, within 90 days. Send subscription applications, subscription inquiries and changes of address to *Mix* magazine, PO Box 41094, Nashville, TN 37204 or call (800) 888-5139. Outside U.S., call (615) 377-3322. POSTMASTER: Send address changes to *Mix* magazine, PO Box 41094, Nashville, TN 37204. Address all other correspondence to *Mix* magazine, 6400 Hollis St. #12, Emeryville, CA 94608; (415) 653-3307, Fax: (415) 653-5142. Second class postage paid at Oakland, CA, and additional mailing offices. *Mix* magazine is distributed in pro audio stores, music stores and other related businesses. If you have a recording or music-related business and would like to distribute *Mix*, please give us a call at (415) 653-3307. Display advertising rates, specs and closing dates are available upon request. This publication may not be reproduced or quoted in whole or in part by printed or electronic means, without written permission of the publishers.

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Founded in 1977 by
David Schwartz and Penny Riker Jacob

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See Page 184 for Reader Service

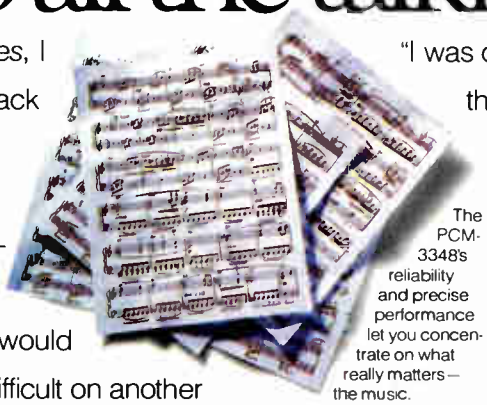
Hugh Padgham makes a career out of listening. But when it comes to our digital multitrack, he wants to do all the talking.

Grammy®-award winning producer and engineer, Hugh Padgham, is a man of few words. So when we asked him about Sony's PCM-3348 DASH 48-track recorder, we had no idea he'd have so many.

He spoke about its incredible transport. "It's so fast and precise, I never have to wait for the machine. Neither does the artist. And that makes sessions run a lot smoother."

The PCM-3348's incredible transport works so quickly and accurately, the machine allows the engineer, or even the artist, to be more creative.

He went on about its easy digital editing. "For Sting's latest record, *Soul Cages*, I did a lot of multitrack editing from the original tracking sessions very simply. And I mean 'simply.' Edits that would be unbelievably difficult on another machine are actually very easy on the 3348. In fact, I don't think we could have made that particular record in any other way."



The PCM-3348's reliability and precise performance let you concentrate on what really matters—the music.

He also mentioned its 48 tracks. "When I was recording Phil Collin's *Another Day in Paradise*, I got ahold of a 3348 halfway through the session. It completely eliminated the need for another slave. Which made overdubbing much, much easier."

And, he had a few words about its user-friendly design. "I was convinced that a recording engineer designed the thing. It's so easy to use, you never really notice it's there. That's when you know a machine is good."

For even more words, call the Sony Professional Audio Group at 1-800-635-SONY, ext. 903. But for now, we'll let Hugh have the last one: "Phenomenal."

The PCM-3348's built-in sampler lets you easily move around bits of a sax solo, for example, without changing anything else.

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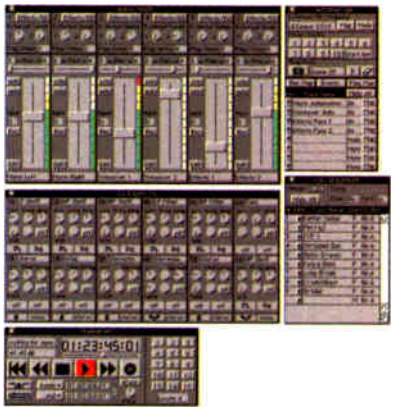

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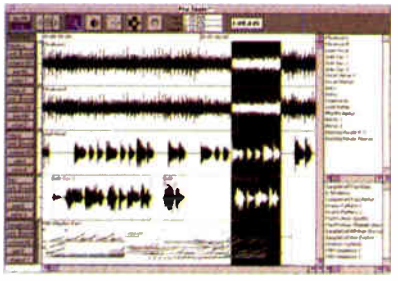

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CURRENT

Industry Compromise on Home Taping

Consumer electronics, record industry and music publishing interests have announced a historic agreement resolving their differences over home taping. The parties to the accord, which ends more than a decade of divisive wrangling, pledge to jointly seek legislation from Congress reflecting their compromise on the issue. The main players in the breakthrough are the Recording Industry Association of America, the Electronics Industries Association and the National Music Publishers Association. The agreement is intended to clear the path for new technologies developed for consumer recording.

The proposed compromise would impose modest home taping "royalties," 2% of "manufacturer's price" on digital recording hardware and 3% on blank tape. The RIAA and the NMPA have been seeking these levies for years to compensate copyright owners for revenue lost due to home taping. In return for dropping opposition to the royalties, hardware interests won provisions explicitly stating that home taping for private, non-commercial use is legal. The pact also mandates inclusion of the Serial Copy Management System on all consumer digital recorders. Analog recorders and media are exempted from the royalty and SCMS provisions of the legislation. Look for details in next month's "Tape & Disc News."

—Phil De Lancie

Ampex Announces New Analog Tape

Ampex announced the availability, starting this month, of a new analog studio mastering tape, 499, the first major addition to Ampex's leading line of analog studio mastering tape since the introduction of Grand Master 456 in 1975.

Ampex audio products marketing manager Steve Smith cites the increased performance available in a new generation of multitrack decks from manufacturers like Studer, Otari and Sony as the primary impetus for the new analog tape. "We optimized the performance of the new hardware by providing an enhanced new tape to bring out the full potential of analog recording," according to Smith.

In terms of specifications, Ampex 499 has increased headroom of at least 3 dB and provides operating levels of +9 dB. Ampex 499 is compatible with 456 alignment parameters; however, to get maximum benefit from the new formulation, the bias setting should be increased 1.5 dB over the 456 spec and the reference level can be increased up to 3 dB over the 456 spec.

"Aside from the technical aspect," Smith says, "499 reflects a continuing commitment to analog technology. 456 Grand Master remains the industry standard for analog in situations where previous-generation machines can't handle the increased headroom and 499 accommodates the new generation of multitrack decks. Ampex 499 brings [analog recording] that much closer to digital capability."

The tape is being manufactured in all pro size configurations at Ampex's Opelika, Alabama, manufacturing facility.

—Dan Daley

Padgham, Nichols and Ramone at Grammy® Recording Forum

Mix will be one of the sponsors when the Recording Academy (NARAS) presents its third annual Grammy Recording Forum, set for the New York Marriott Marquis on October 5, the second day of AES.

The Forum features a Master Class in Modern Engineering and Production Techniques—a repeat of last year's hugely successful event, and once again moderated by Grammy Award-winning engineer/producer Bruce Swedien. On the panel this year with Swedien will be three big names from the recording world—Phil Ramone, Roger Nichols and Hugh Padgham.

For more information, contact NARAS at (213) 849-1313.

TEC Goes Platinum

Four leading companies in the professional audio industry have pledged their support as Platinum Sponsors of the 1991 TEC Awards: Act III Publishing, Ampex Corporation, JBL Professional and Neve/Siemens have each contributed $10,000 to support the TEC Awards and its charities.

The 1991 TEC Awards are slated for Saturday, October 5, at the Grand Hyatt Hotel in New York City. Monies raised through sponsorships help offset production costs for the awards ceremony, as well as increase contributions to the House Ear Institute's "Hearing is Priceless" campaign and to audio scholarships.

AKG Acoustics and Yamaha have each pledged $7,500 as Gold Sponsors, while Alesis, Aphex, Crown, Dolby, Lexicon, Meyer Sound Labs, Panasonic/Ramsa, Studer/Revox, Tascam and 3M have each contributed $3,000 as Silver Sponsors.

A limited number of sponsorships are still available. Interested parties should contact Penny Jacob, Director of Development for the Mix Foundation for Excellence in Audio, at (415) 653-3307. For more information about the TEC Awards, call (415) 562-7519.

Convention News

Radio professionals from around the country will convene in San

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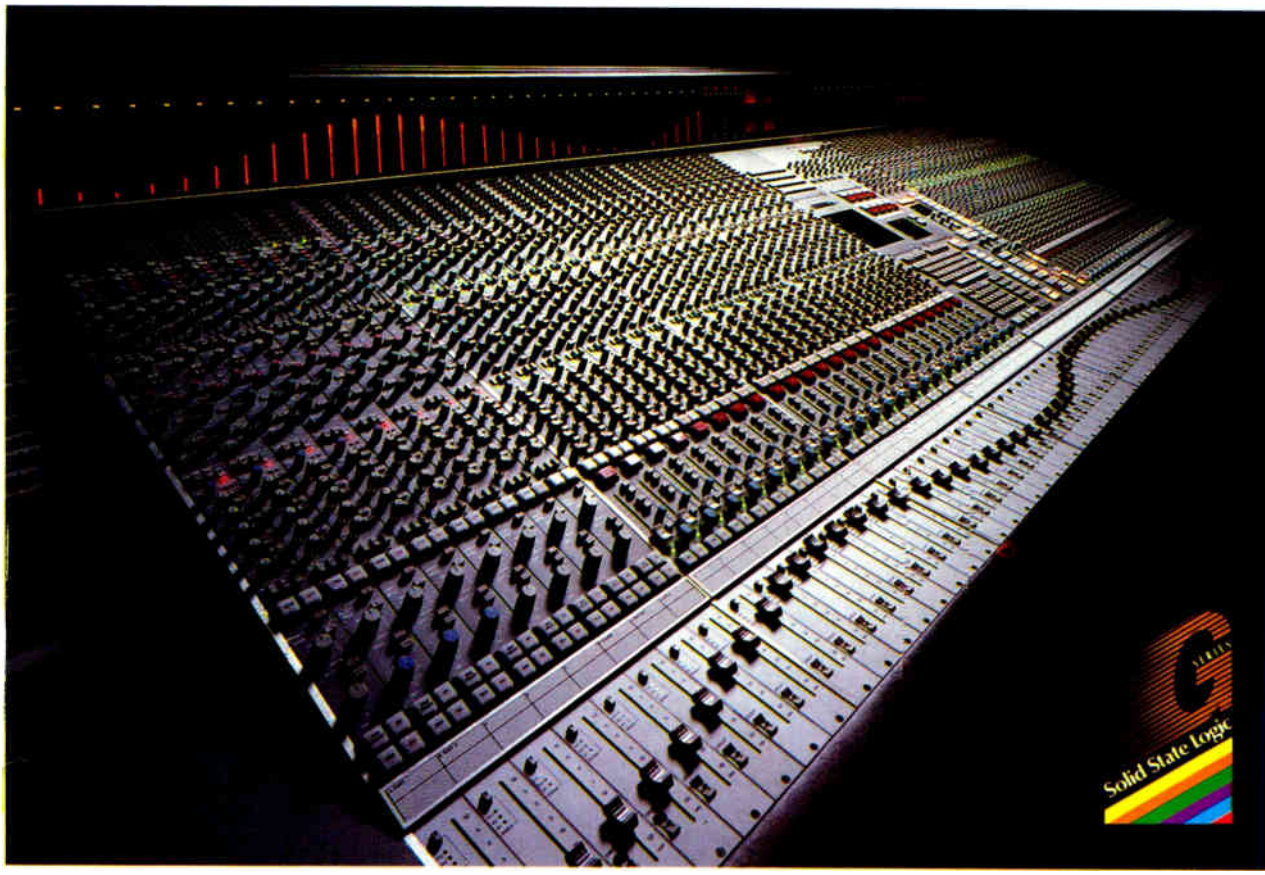

Now the world's favourite recording console has added the ultimate moving fader system

THE SUCCESS of Solid State Logic's SL 4000 Series console is legendary.

The system remains successful by growing alongside the creative individuals who use it. An example of this evolution was the introduction of G Series electronics, where new technology allowed subtle improvements to be made to the entire audio path. Now, SSL has changed the face of console automation by devising an automation system which combines the best features of both moving faders and VCAs.

Called ULTIMATION™, this unique dual automation system has been fully integrated with the G Series console. It reads existing G Series mix data, and its commands are immediately familiar to all SSL users. The system's unique dual signal path circuitry allows the engineer to select operation – either as a full feature moving fader system, or as standard G Series automation. Ultimation even allows moving faders to perform SSL-style Trim updates without resorting to complex subgrouping software.

Today's G Series consoles, with Ultimation, take the art of recording one stage further. Together they set new standards, continuing in the innnovative tradition of the world's most respected console system.

Solid State Logic

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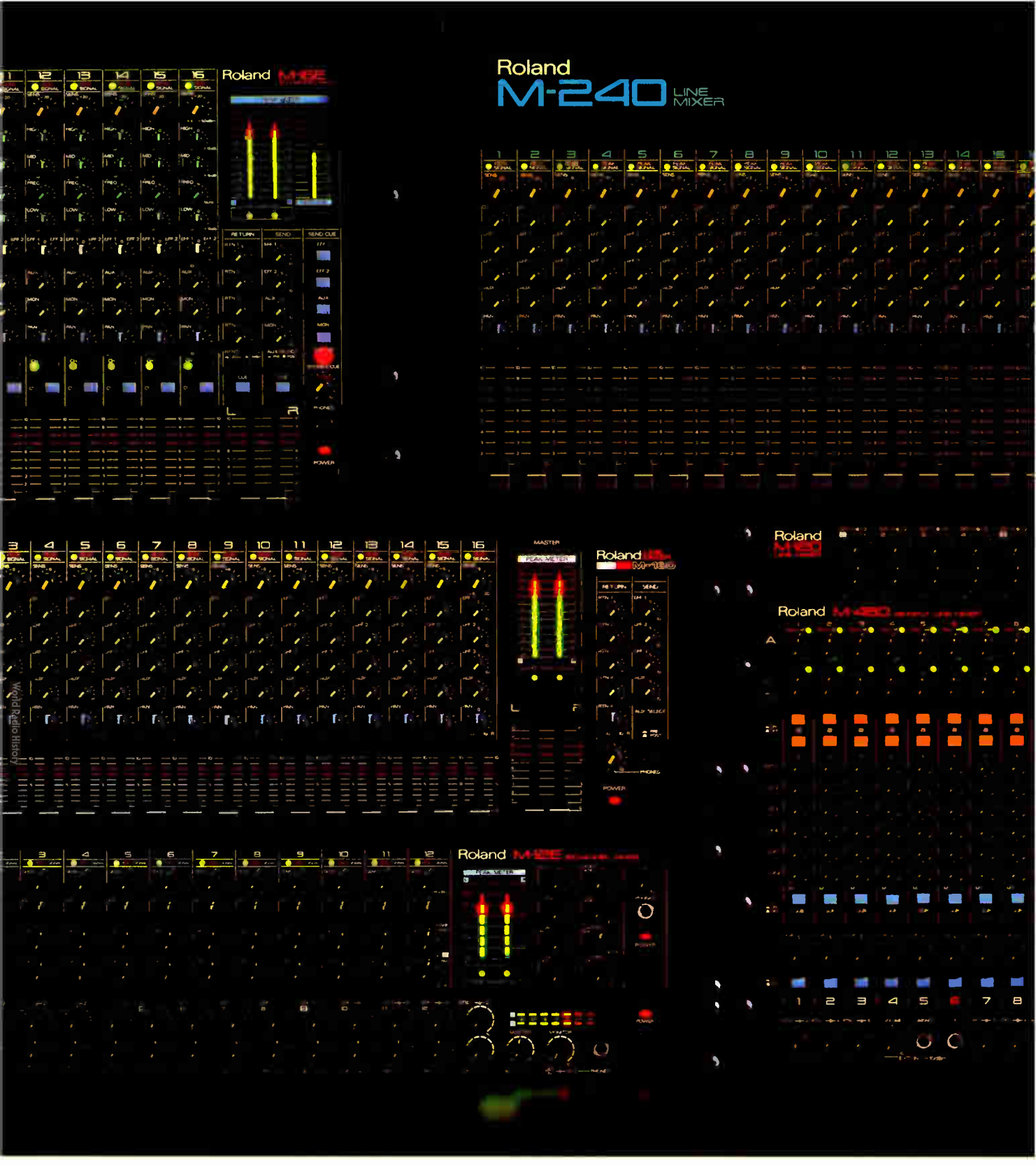
World Radio History



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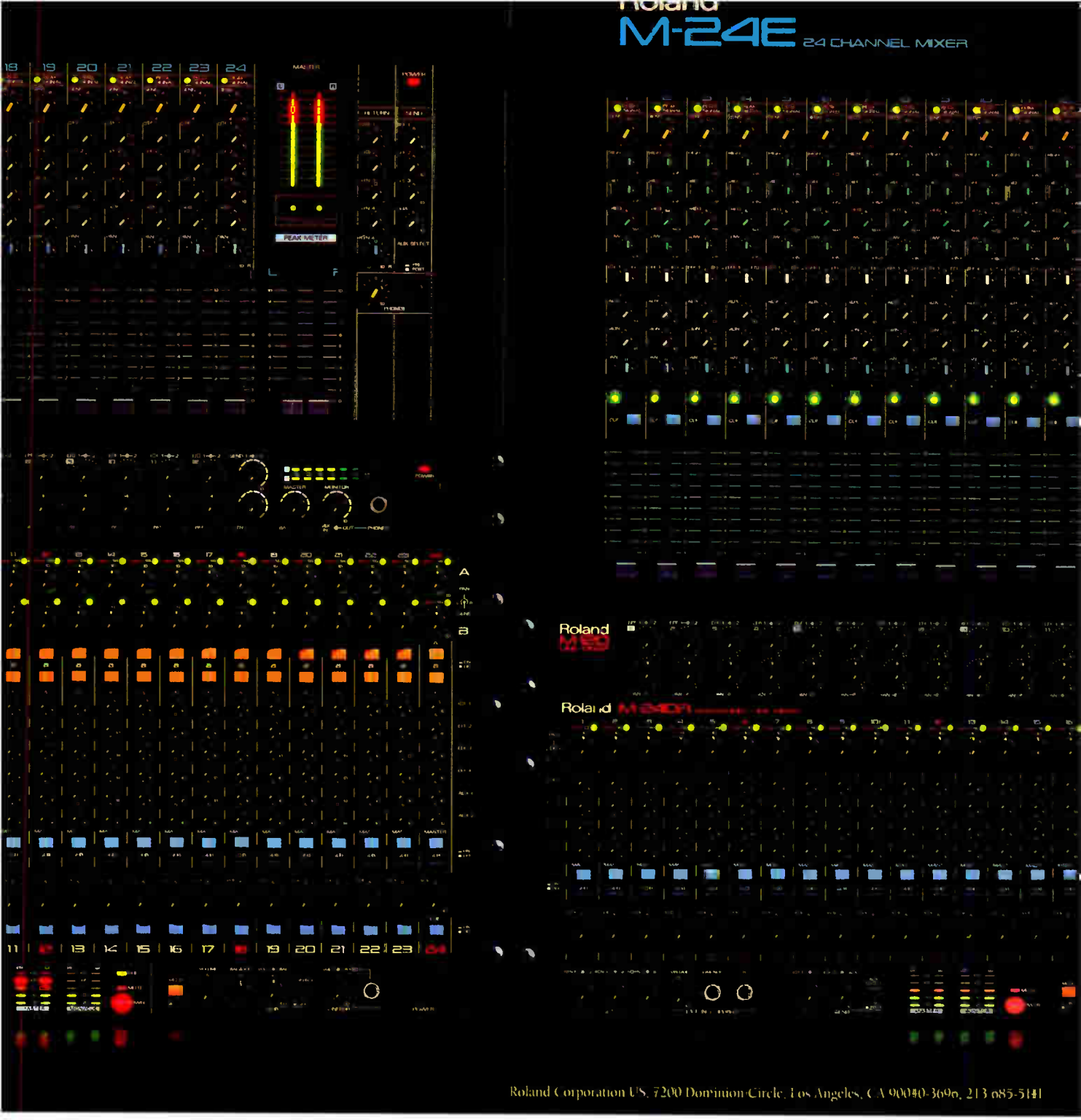
If you have trouble in candy stores

Here's what you say to the little angel standing on your left shoulder: "No matter what I play or how I play it,



perhaps you should turn the page.

Roland has the mixer I need." And here's what you say to the little angel standing on your right: "Let's rock, dude."

Roland®

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INDUSTRY NOTES

The 1991 International **CINDY Competition** is accepting entries from virtually all segments of the audio-visual industry until October 15. For details on criteria and awards, call Cristina Molina, AVC National Office, (818) 787-6800...UK-based **Digital Audio Research** reorganized and enlarged its sales team: **Ian Dodd** is the new director of sales, and will be responsible for worldwide sales of the SoundStation and DASS 100. **John Wase** was promoted to European sales manager, and **Jonathan Redman** and **Mike Wood** joined the general sales force... **Mark IV Audio** welcomed another vice president, **John Bolstetter**; Bolstetter will coordinate and assist in managing of financial reporting for all companies in the Mark IV Audio group, and will assist the president with other projects... There were some changes at **New England Digital** (Lebanon, NH): **Ray Niznik** was promoted to Western regional manager, and **Kerby Long** joins as sales rep for the Western states...**Euphonics** relocated to Boulder, CO. The new general number is (303) 938-8448; the fax number is (303) 938-8885...**Grass Valley Group** and **BASYS** are working together in a worldwide development and marketing venture aimed at the television industry; call Roland Boucher Jr. at (617) 244-0354 or Eddy Jenkins at (916) 478-3724...**NVision** (Nevada City, CA) appointed **Charles Meyer** vice president of engineering...**Symetrix** ([206] 282-2555), maker of signal processing equipment for recording, broadcast, touring sound and installations, will be represented by **Quad-Tech Marketing** in Kansas, Missouri, Nebraska, Iowa, and North and South Dakota...As a new district sales rep at **JVC Professional Products**, **Howard Kirsch** will cover northern California, Oregon, Washington, Alaska, Montana, Idaho and northern Nevada...**Abekas Video System** and **Sony Corporation of America** received awards for excellence in engineering achievement at the International Monitor Awards, sponsored by the **International Teleproduction Society**...**Intersonics** took on **Barry Bozeman** as director of sales and marketing; for details, call (708) 272-1772...**Solid State Logic** expanded its sales and support staff with the addition of **Clarke Carr** and **Don Wershba**. Carr will concentrate on ScreenSound, while Wershba deals with consoles and Ultimation...**QSC Audio Products** (Costa Mesa, CA) welcomed **David DeLeon** as applications engineer for the company's line of pro power amp products...**Mases Electronics** chose **QMI** as the exclusive North American distributor for the MASELEC 9001, a retrofit EQ card for SSL 4000 and 6000 Series consoles. Call Scott Berdell at (508) 650-9444 for further information...**BBE Sound** is now represented in Michigan by **Rick Wright**, **Carl Ludwig** and **William McCall** of **Shalco Inc.** (Ferndale, MI)...**Allen and Heath USA** appointed **Burhans and Burhans** as manufacturer reps in Missouri, Kansas, Nebraska and Iowa. Burhans and Burhans will cover the territory from their offices in Crystal City and Kansas City, Missouri, and a new office in Cedar Rapids, Iowa...**Electro-Voice** named **Wilson Audio Sales** of Nashville, TN, their rep firm of the year...**Bag End** is now represented by **Audio Biz** (Mundelein, IL) in Wisconsin, Illinois, northeast Indiana and eastern Iowa... **Neve** added two reps for the Mitsubishi and Neve product lines: **Leader Sound Technologies** covers British Columbia, Alberta and Saskatchewan; and **Soundings** covers the states of Washington, Oregon, Idaho, Montana and Wyoming... **Tony Balboa** is a new sales rep for **Lexicon** in Southern California... The **Phoenix Music Conference and Showcase** will be held in Phoenix, AZ, from November 7-10. This year's theme is the business of music, and will examine how all facets of the music industry interrelate. ■

—FROM PAGE 10, CURRENT

Francisco for NAB Radio 1991. Taking place September 11-14, the show will focus on the changing world of radio, with sessions on programming, sales/marketing, station operations and technology management. For more information, contact the National Association of Broadcasters at (800) 342-2460.

The Audio Engineering Society will host the 91st annual conference at New York City's Hilton Hotel, October 4-8. Call (212) 661-8528 for more information.

What You Need Is a Tax Break

Excess inventory of audio equipment, records, tapes and compact discs can now be turned into a federal tax deduction when donated to a nonprofit organization called NAEIR, the National Association for the Exchange of Industrial Resources. Regular corporations may deduct the cost of products donated, plus half the difference between cost and fair market-selling price. Deductions may be up to twice cost.

For example, if a manufacturer donates a microphone that costs $200 to make and which sells for $300, it may deduct $250 (Cost = $200 + half the difference between $200 [cost] and $300 [selling price] = $50, or $250 overall). Simple enough, eh?

S corporations, partnerships and sole proprietorships earn a straight deduction.

Under the tax code that permits this deduction, inventory must be new, unused and part of the donor's stock-in-trade. NAEIR redistributes this donated merchandise to a network of 7,000 schools and charities across the country. Typical recipients of equipment would be high schools, colleges, universities, public radio and television stations, church groups of all denominations, and a variety of social service agencies.

For more information, write to NAEIR, Dept. 78, 560 McClure St., Galesburg, IL 61401; or call (309) 343-0704. ■

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See page 184 for Reader Service

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DIC Digital

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by Ken C. Pohlmann

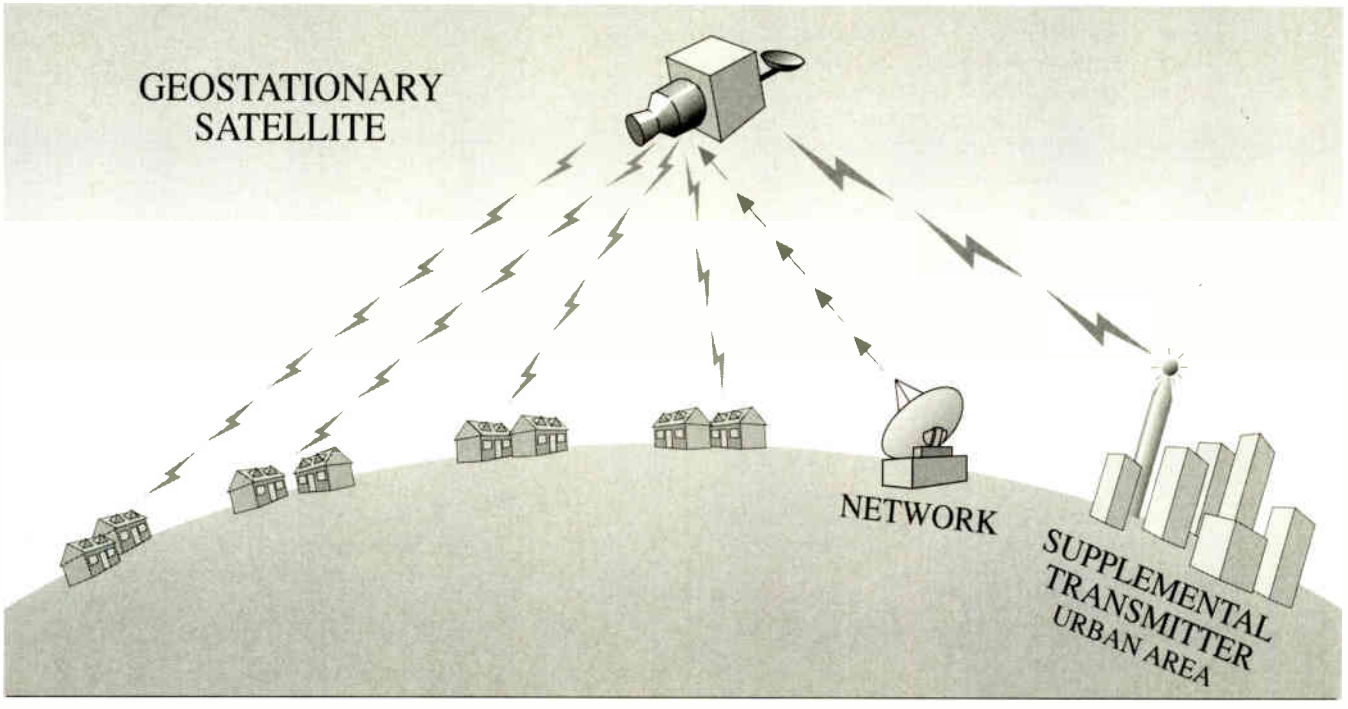
THE DAB DEBATE

Those of us who live a life cloistered in recording studios think we understand controversy, but we do not. We think that economic issues such as home taping and home studios are fierce, weighty concerns, but they are not. We think that technical problems such as approval of the MADI protocol and which XLR pin should be hot are supremely important, but we are wrong. All of our concerns pale in the face of the DAB debate.

Digital Audio Broadcasting will redefine the single most important audio medium on the planet—radio. While our attention is focused on things like CD, DAT, DCC, MD and other short-lived, fleeting plastic formats, broadcasters have quietly contemplated their universe. Change does not come easy in radio. AM and FM broadcasting harken back to the earliest days of audio, and the last successful evolutionary step, FM stereo, took place almost 40 years ago. But now the giant is stirring, and the time has come.

DAB will complete the triumvirate victory of digital audio, with the airwaves joining tape and disc in the digital domain. Digital radio will similarly provide ultra-high-fidelity audio, as well as freedom from multipath and other kinds of interference, and provide greater user flexibility through sub-carriers such as the 57kHz RDS system. In short, DAB will return radio to a more competitive position. No one questions the tremendous advantages of—and need for—DAB. The problem is deciding which standard to choose, what spectral space it will occupy, and how to handle the marketplace transition from analog to digital.

No one can agree on how DAB should be broadcast. Traditionally, terrestrially inclined organizations—such as the NAB—advocate a continuation of locally originated stations in which independent stations use ground-based digital transmitters. To its advantage, a terrestrial DAB system could be implemented rather quickly,



Direct broadcast satellite system.

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at low overall cost. There are other advantages; for example, such ground-based transmitters would require only about 1 kW of power—consuming a fraction of that gobbled by analog transmitters. Other upstart companies argue for a direct broadcast satellite system in which programs are uplinked to geostationary satellites, then downlinked directly to consumers. The resulting national radio broadcasting networks would particularly benefit rural areas unable to sustain independent stations. However, to ensure good signal strength in urban areas, local supplemental transmitters known as "gap fillers" would be needed, and implementation would take time and capital.

To complicate the issue, International Cablecasting Technologies' Digital Music Express (New York), General Instrument's Digital Cable Radio (Hatboro, PA) and Digital Planet (Carson, CA) have already inaugurated digital audio cable services in which programs can be broadcast over home cable—perhaps 30 CD channels for a $10 monthly fee. (See "Tape & Disc," April '91.) Although half the homes in America are wired for cable, cable systems don't work for mobile applications, and for all their benefits are tangential to the central DAB debate.

A major complication for broadcast DAB systems would occur whenever a DAB band is located in the radio spectrum. Any band from 100 to 1,700 MHz could be used for DAB, but the spectrum is already jammed with applications, and many of them are lobbying hard for additional space. In general, lower bands are preferable, but hard to come by. A 2,400MHz band may be available, but can be prone to ISM interference. In general, the upper UHF-TV band is off-limits because of the needs of advanced television systems. Likewise, the 728 to 788MHz band, now home to 100 UHF stations, has been informally pledged to advanced television systems.

A CCIR conference proposed a worldwide 60MHz band at the 1500MHz L-band for both terrestrial and satellite DAB. That would work, but terrestrial broadcasting at 1,500 MHz is prone to absorption and obstruction, and satellite broadcasting requires repeaters. In the best of all possible worlds, the use of either adjacent or separated bands would permit DAB compatibility between terrestrial and satellite channels. In practice, there is not a mutually ideal bandspace, and any space will involve compromises.

The other question is one of extent of the spectrum standard. On one hand, a worldwide allocation would assist manufacturers, and would ultimately lower cost, but that kind of agreement is hard to come by. The World Administrative Radio Conference (WARC) in 1992 will certainly consider the question, but in lieu of a decision, may instead simply leave the problem for regional solution. That would effectively add years to the debate, delaying DAB introduction.

Another spectrum question is the ultimate fate of AM and FM broadcast systems. If DAB is to replace them, their bands would become available. If the systems are to coexist, new space is required. Alternatively, perhaps DAB could use a shared-spectrum technique to locate the digital signal between FM stations. As DAB becomes commercially viable, the FM station frequencies could be converted to DAB stations. As an interim solution in crowded markets, unused TV frequencies could be used as temporary DAB frequencies until there is room in the FM band.

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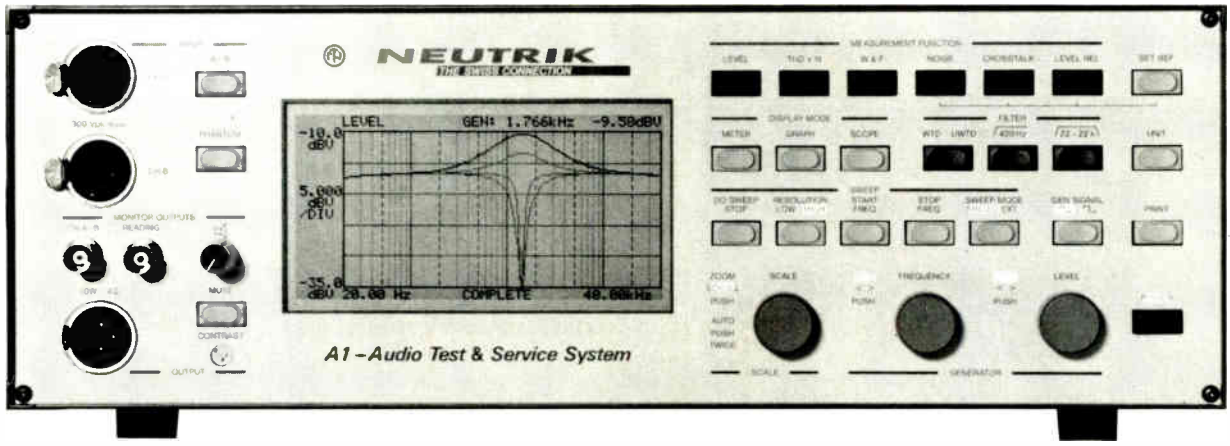

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Power multiplexing could be used to provide compatibility with the FM band. The digital signal would share the power of the analog FM signal, thus no new spectral space would be needed. Because of its greater efficiency, the DAB signal would transmit at half the power of the FM station. An FM receiver would ignore the weaker signal, while new DAB receivers could receive both DAB and FM broadcasts. The trick is development of a new demodulator that would allow recovery of the weak DAB signal. No matter how DAB is implemented, the eventual disposition of AM and FM is a major concern. Should the nation go cold-turkey, perhaps throwing away their AM/FM receivers on some New Year's Day, and turn on their DAB receivers? More likely, a transition period will be required, perhaps lasting until AM and FM die from natural causes.

Another tricky issue is data compression. It would be impractical to transmit digital audio signals in a linear PCM format, because the bandwidth requirements would be too great. Instead, DAB must employ data compression to reduce the broadcast data capacity by a ratio of at least four to one. There are a multitude of candidates. For example, Eureka 147 has used MUSICAM, in which sub-band ADPCM is employed. Dolby's AC-2 system uses transform coding of 256 spectral bands. The ASPEC system uses transform coding with as many as 1,024 bands. Such systems can compress a standard sample-rate, 16-bit signal to a 64, 96, 128 or 256 kps signal. That's the easy part. The problem is to make the decoding hardware affordable (i.e., a cheap DSP chip), and the sound quality palatable (i.e., sounds as good as CD). Clearly, before any DAB standard is carved in stone, its data compression method will have to prove itself.

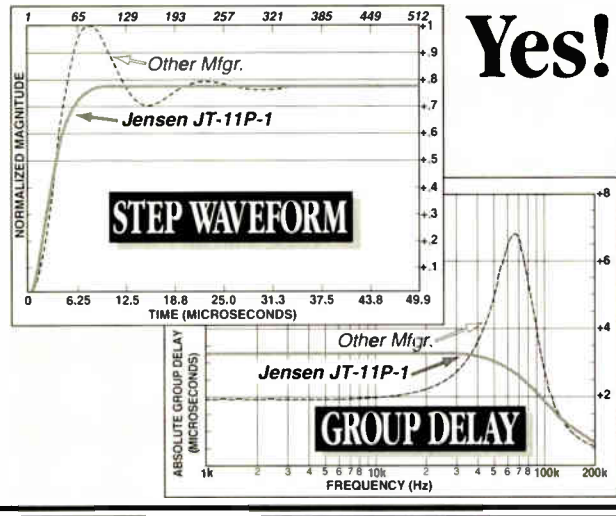
So, which standard should DAB employ? The NAB supports the European-born Eureka 147 system, and would license the system if adopted. Reportedly, the EBU will endorse Eureka 147 as well as a timetable for market launch by 1995. This seems to be a safe position, because Eureka 147 is the most advanced system. However, Eureka 147's orthogonal modulation dictates relatively expensive receivers. Another major player is the domestic Satellite CD Radio/Stanford Telecommunications system. It reportedly offers greater spectrum and power efficiency, and receivers would be less costly than Eureka 147 models. Satellite CD Radio proposes a 100-channel system with 66 satellite channels and 34 terrestrial channels, at 1,435 to 1,530 MHz.

Ultimately (at least for those of us stateside), the FCC will determine how DAB will be implemented. The Commission is already hard at work, soliciting inquiries and opinions. On one hand, it is comforting to know that the government agency that promoted FM stereo will handle DAB. On the other hand, it is not comforting to know that this is the same government agency that dithered on AM stereo.

Of course, Congress must approve any DAB service. You remember them, don't you? They're the guys who approved deregulation of the S&L industry. You know, actually, AM doesn't sound that bad. ■

Ken Pohlmann, on rare occasion, has been known to fire up his Panasonic VP-7633A and VP-8191A and indulge in a little pirate broadcasting.

Do Jensen Transformers Have a Clearer Midrange and Top End?



Yes! ...but *Why*?

The high frequency rolloff of a Jensen Transformer is computer-optimized to fit the Bessel Low Pass Filter response. This produces minimum overshoot and ringing, as well as flat group delay, for best time alignment of all spectral components of the musical waveform. In other words, the harmonics arrive at exactly the same time as the fundamental frequency.

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by Stephen St. Croix

YOU AND ME

From time to time, I like to ask friends who are engineers or who have studios what gear they like or dislike, and why. You know, a reality check.

One of the nice things about live, interactive conversation is that you can ask the other person questions and, if the two of you are getting along okay, you will probably get answers. When you read my column, on the other hand, we can't interact. You are sort of stuck with only two choices; read what I say, or don't.

Though nobody I know would ever be silly enough to use *me* for an actual reality check, it occurred to me that perhaps two or three of you might be a bit curious about the gear I like and why. Maybe those two or three of you might not have thought of this by yourselves, but with this prompting perhaps you could be stirred to read on.

So with this, my shortest setup ever, we dive in. Oh, by the way, I would also *love* to tell you about the stupidest gear, the stuff I hate the most, the equipment that simply does not work or is a profound waste of money, but alas, I cannot. I tried this once. That is the column you never saw.

I present the following in no particular order, with no particular allegiances, and no particular reason other than I *like* them. Since these are things I like, one may interpret them as endorsements. They may in fact be, as they might be if you were sitting in a friend's studio and they were telling you what they have come to like. I assure you, however, that these are by no means paid or even arranged. In fact, only one manufacturer mentioned in this column is even aware that I am doing this (I had to call Yamaha with some questions.).

Okay, so now it's not my shortest setup ever. But here goes.

Meyer HD-1s

As I have mentioned before, I *need* these speakers. They cut you no breaks. The accuracy is shocking. You might not like shocking, but you just might need it. They make life simple. Every album that I have done since I got these things sounds considerably better than any done before. HD-1s do not lie. If you are brave enough to face the truth (and you had better be), stick your face in these.

They include internal bi-amplification, and each unit is hand-calibrated for frequency response, phase response and who knows what else. They *are* reference speakers. They have a Truth-Or-Dare light on them. When it's green, it's the truth; when it's red, they dare you to see if you can push them any harder.

Known negatives: They ain't free and they won't break a window unless you throw them through one (then they'd probably break a wall).

Yamaha QY10

This is a *very* neat toy. I fly coast to

World Radio History

coast a lot. I take eight sets of batteries for my portable CD player on every trip, and I have heard every CD that I have ever wanted to hear a few too many times. Then I got this Yamaha thing. There is nothing else made that I am aware of that is as cool as this thing if you want to do what this thing does. For those of you who might not know just what that is, the QY10 is a sequencer/editor/sampled synthesizer/

drum machine/composer-type thing. Now, I know that you know that there are too many devices that fit this description to count, but are the other ones the exact size of a VHS cassette?

This one is (in fact, they ship it in a cassette box), and it runs all day on a handful of AA cells. It knows a bunch of root music rules; can loop, mix and play multiple tracks of 16-bit,

PCM-sampled instruments; transposes; stores songs and patterns (it has a bunch of patterns from the factory to start you off) and remembers what *you* write.

Known negatives: Since it is so small (and has only 46 buttons), there is quite a steep learning curve involved in mastering a QY10, but if you're in an airplane for seven hours, you're probably *looking* for something to do.

If you write or play music, you might want one of these. I use it to write backing tracks to test arrangements or to back me for practicing lead guitar work while I fly. It is great. It interfaces perfectly with my...

Zoom 9002

Stereo, digital, guitar effects processor/amp. This pocket-sized, 16-bit machine can be programmed with several sets of combined effects, such as stereo reverb, echo, flanging, EQ, distortion, compression—you get the idea. Each of these effects can be modified individually. One button recalls entire combinations of this stuff, and if you do it right, you can be instantly transported to Wembley Stadium or the L.A. Coliseum, or any venue you choose. Very convincing, very impressive, but most importantly, real fun. I think Captain Picard has one of these.

Known negatives: EQ could be neater, distortion is a bit harsh and thin, you will use up hours of valuable time just showing the Zoom to people who ask what it is.

I carry two sets of Sony MDR-6 cans, one for me, and one for whomever might sit next to me. The Zoom will mix your live playing with outputs from a CD player or, of course, a QY10. Obviously, this means that the third piece needed to round out the official Entertainment in the Sky Kit is a...

Steinberger carbon fiber guitar

Small enough to fit in the overhead, sturdy enough to drive nails with (I have actually *done* this), and stable enough to come out of the bag in tune, this guitar is short enough to play sitting in a plane without stabbing the person to your left.

Known negatives: Strings are really a pain.

Nintendo Game Boy

The Quaalude of the '90s. This is a dangerous piece of technology. If you are one of the millions who have become addicted to this dweeb device,

you understand.

Known negatives: My youngest brother consistently gets better scores than I do.

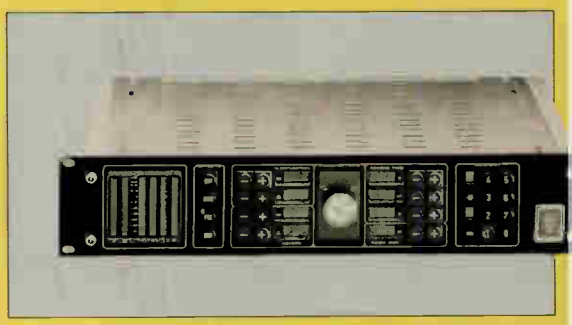
Apple Mac IIfx

Currently the fastest and most powerful incarnation of the only personal computer designed for humans to use. Years ago the Mac brought us out of the dark ages, and today I can hardly even remember what a backslash-greater than prompt means. I will *not* be accepting letters of complaint from you MS-DOS people, thank you.

Known negatives: If you buy the fastest model now, it will be the slowest model in six months. Again and again and again.

Quantec XL with XLC software

My personal favorite for reverb and other DSP. It does *exactly* what I think it should (but this could possibly be



because I wrote the controller software package). My opinions on this machine are totally unbiased, of course.

Known negatives: Definitely *very* far from free.

Laguna Beach, California

The best place in the United States to get a tan if you want to have fun at the same time (unless you are an adoles-

World Radio History

cent, then it has to be Florida on spring break).

Known negatives: Same as the rest of SoCal; more traffic, less water and air every year.

Lamborghini Diablo

The official car to drive to Laguna Beach (or the studio). Must be black with cream leather interior. The side windows dip so low that your left knee is actually visible to those whom you may choose to pass. No sunroof (that's why you need the beach). Note: I *don't* own one of these.

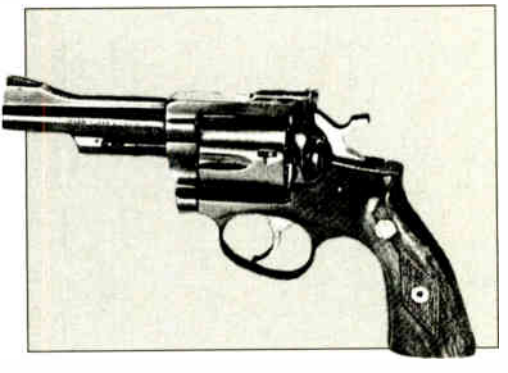
Known negatives: Come *on*. If you need to ask...

Expensive audio wire; Mogami or Monster

This is real simple. Improved crystalline structure and lower oxygen contents make these new metals more conductive. More conductive means quieter, and even less distortion (*less* conductive can mean mildly *semiconductive*, and this means non-linear).

But that's not the biggest improvement this stuff delivers. Modern wire theory pretty much states that it is actually the boundary between the conductor and the dielectric that is where the problems arise. By concentrating development there, recent advances in these super wires, along with basic logical improvements like separate grounds and single-ended shields, are yielding noticeable improvements in low-level signal transmission.

Known negatives: The top-of-the-line stuff uses exotic dielectrics that can be very frustrating to strip for soldering.



.357 Magnum

Nothing you can do will make a noisy line amp or power supply quiet like servicing it with one of these. Not only will the offending piece of equipment instantly resolve its internal conflicts and become literally noiseless, but your entire control room will become *very* quiet for at least five minutes, until the others in the room dare to speak, or your profound hearing threshold shift settles down. British gear responds exceptionally well to this approach, perhaps because they love to use capacitors so much (more caps, more reaction).

Known negatives: Very easy tool to abuse. Should not be used on most organic life forms.

THD amps

These are the finest tube guitar amps in the world, and I don't just say that because my little brother owns the company.

Known negatives: *I* don't own the company.

Dolby SR

Now, this noise reduction sounds *good*, as long as you never try to use it more than once. By this I mean that if you use it on your multitrack analog, you might not want to bounce with it.

Known negatives: Only the multiple-generation limitation.

I love it because it keeps me online with my ancient...

MCI 24-Track

With double-resolution optical tach discs, hot-rodded Woelkies and Sakis, and huge high-torque motors, in addition to the obligatory power supply and head amp mods and all the other standard mods, this is a very sweet machine. It only blows up once a day or so, but then, so do I.

The greatest thing about the MCI is that it kept me out of a digital multitrack. With SR I was able to slide through that era and go directly to hard disk multitrack recording. Thank you Jeep and Ray.

Known negatives: Power supply, connectors.

Cramolin and Tweek

How did you think I keep all this stuff working?

Known negatives: They can't keep *everything* working. ■

Mix contributing editor Stephen St. Croix is a great guy to sit next to on an airplane, except when he wants to practice guitar and you don't.

You Can Hear Right Through It.

Whether you're involved with recording, touring, broadcast, pro-audio or performing, you simply can't do better than Whirlwind's new HotBox Active Reference DI. Advanced active electronic circuitry completely eliminates low-end saturation and provides an incredibly wide band-width with virtually no signal loss. Plus there's tons of headroom; more than in any existing active DI!

The HotBox can be powered by two 9V batteries (minimum life of 500 hours), or you have the option of utilizing the 48V phantom power built into most mixing consoles. And a ground lift provides true, switchable ground isolation... even when using phantom power.

For true transformerless, totally transparent direct-box operation, the HotBox is your only real choice.

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World Radio History

by Mel Lambert

DIGITAL AUDIO WORKSTATIONS: WHITHER THE FUTURE?

A REPORT FROM THE SPARS "WORKSTATION SHOOT-OUT"

With dozens of disk-based systems and configurations available, it may be all but impossible to make direct comparisons...

More astute readers of this column might recall my musing on the appropriateness of the expression "Digital Audio Workstation." I offered that the label was useful in many respects, but rather limiting in others. My rationale was this: In order for potential users to understand the operational flexibility and creative potential of digital recording, editing and signal manipulation, standard definitions are needed for the types of interface/display features and record/edit/mix/DSP functions that a DAW might offer.

But, as I have discovered, each manufacturer has its own idea of hardware/software configurations for implementing myriad user choices and systems functions, making comparisons all but impossible.

So how can a potential customer decide which system represents the best value in terms of features and functions? With analog, things are easier. Mixing consoles and tape machines are familiar technologies, and each design offers recognizable advantages.

With digital, however, things aren't so clear-cut. Until you've had the opportunity to experience for yourself the speed and creative advantages—and the inevitable steep learning curve—of digital-based systems, decisions have to be based on word-of-mouth, manufacturer's literature and other, sometimes less than perfect, information sources.

Against this background, the Society of Professional Recording Services (SPARS) is to be congratulated for holding its annual Digital Audio Workstation shoot-out at the Penta Hotel in Orlando in late May. Ten companies demonstrated their hardware, answered questions from current and prospective customers, and stuck around for one-on-one sessions into the wee hours.

Otari

Mark Calice of Otari Corporation kicked off the proceedings with an overview of that firm's range of workstations. Because of the recent acquisition of Digital Dynamics, Otari's offerings now range from the stand-alone 2-channel system based on the Digidesign Sound Tools software and interface units, through the 64-channel ProDisk-64 system. Commenting that the Otari DDR-10 comprises an "all-in-one" stereo system with an ergono-

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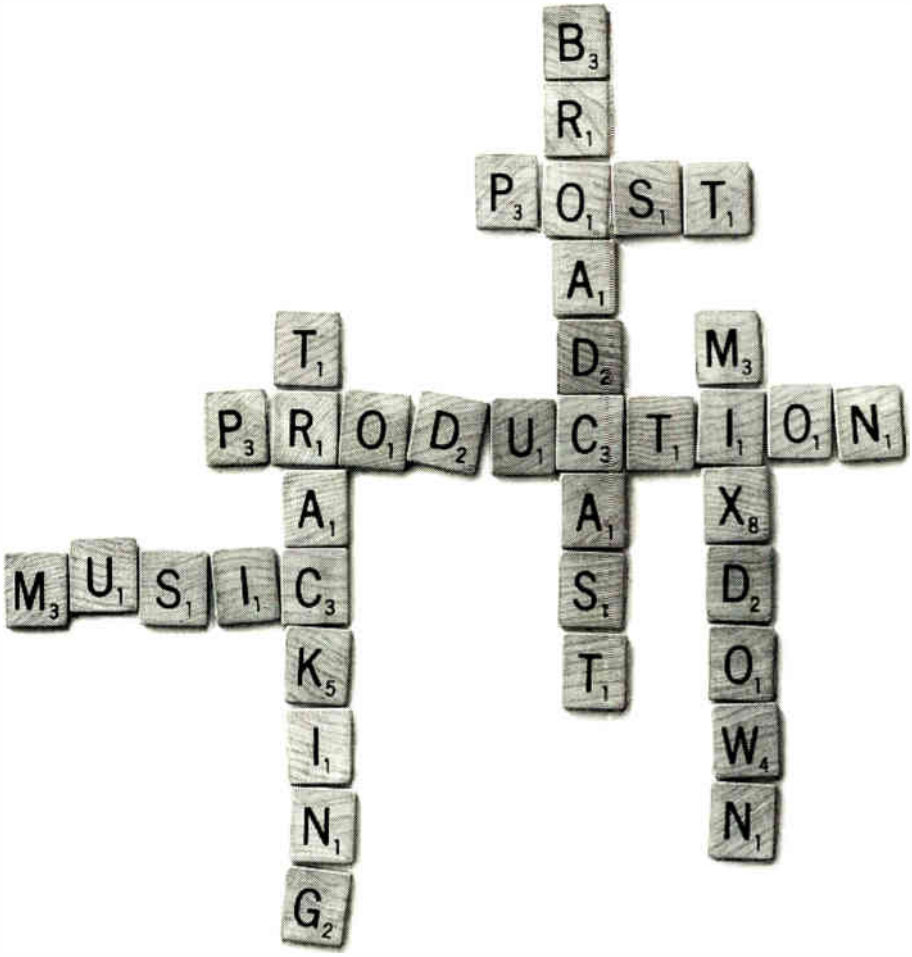
How Neotek can help you win the board game.



Picking the best mixing board is tough no matter what your game. We can help make sure you come out a winner.

Make your first move a Neotek console. Our systems set the standards for performance and flexibility. With proven value, year after year. Then, when you get down to putting all the pieces in place, we'll work with you to create the custom system you need to keep your facility ahead of the game.

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So whether you're making your play in music recording, broadcast, or film and television sound, start by putting our experts to work on your board. When you need something special, Neotek is the only game in town.

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mically designed hardware controller and dedicated function buttons. Calice said that a standard configuration sells for $19,900, complete with Mac platform. Newly developed software will streamline the preparation of WORM-format recordable compact discs.

Bob Snider, former president of Digital Dynamics and now director of Otari's Digital Systems Group, went on to describe a 24-track version of Macintosh-based ProDisk that was demonstrated at the conference. (Systems are available with between four and 64 tracks.) Otari will actively continue to develop the system, and is refining ProDisk's waveform editor and other operational functions. ProDisk-464 prices range from $30,000 for a 4-track system to around $115,000 for a 24-track version.

Studer Editech

Studer Editech VP of marketing Gerry Kearby and product specialist Matt Ward put the 2- and 4-channel, Mac-based Dyaxis and Dyaxis 2+2 systems through their paces, describing the System Synchronizer's time code lock-up functions. Also detailed was the system's real-time EQ, sound design functions, time scaling, sample-rate conversion, and a new magneto-optical drive for storing sound effects and other online data. The latest Dyaxis upgrade incorporates the Events Edit window, which allows EQ and gain-change settings to be modified against a time code track, and a direct interface for the new Studer D740 CD-R recorder.

AMS

John Gluck, new president of AMS North America following the company's recent acquisition by Siemens, provided an overview of the transputer-based AudioFile Plus system, now available in two formats providing eight inputs and a choice of eight or 16 simultaneous outputs. AudioFile Plus offers up to eight hours of disk storage, and can now be connected directly to the companion Logic 1 digital console (Logic 2 being the stand-alone version); a new software upgrade will also allow the workstation to function as a master ESbus controller for enhanced synchronization and machine-control capabilities.

An upgraded EDL function allows global or single changes to be made to audio segments within a video-based edit list, and also permits the linking of cue names to time code designations—a combination that allows word processing-style manipulation of discrete elements against a video worktape. Also available is a custom-developed ADR software package for streamlining looping sessions, with automated take numbering. In addition to current DAT backup, AMS now offers archiving to the new Exabyte 5000, providing up to 4x offload speeds per drive. Typical price for a 16/4 AudioFile with four hours of audio storage and full ESbus control is $150,000.

Akai

Akai Digital's presentation was handled by regional sales managers Mack

Catching Up With Developments from Other Workstation Manufacturers

Since several companies were unable to attend the recent SPARS Workstation shoot-out in Orlando, I've included details of new developments from those manufacturers.

❐❐❐

Digital Audio Research recently unveiled the new SoundStation SIGMA, which integrates a redesigned touch-screen console with enhanced DSP functions. The firm's proprietary segment-based processing enables 4-band EQ and gain and pan for each audio segment, the parameters of which can be altered instantly in real time and stored to disk. Other features include full waveform editing, multitrack "reel rocking," plus eight (expandable to 16) channels of analog/digital record/playback with varispeed, a built-in 650MB MO drive, and high-speed CPU for faster touch-screen response.

❐❐❐

Doremi Labs has been adding enhanced functions to its Mac-based DAWN (Digital Audio Workstation Nucleus), which features up to eight simultaneous analog inputs, eight outputs and eight tracks of hard-disk recording; a 16-track version is scheduled to be unveiled at the upcoming AES convention in October. CMX-format EDLs can be imported or generated by the system and automatically executed to conform audio to time code events. In addition, direct remote control is now available via a dedicated Transport Control window of Sony 9-pin serial formats, as well as TimeLine System Supervisor and MotionWorks MotionWorker-compatible ports, plus Panasonic SV-3900 Pro-DATs. DSP functions, including EQ, compression, resynthesis and sample-rate conversion, will also be implemented via third-party software such as Passport Designs' Alchemy.

❐❐❐

The Sonic Solutions Sonic System 2-track Edit–Master and 4-track Expanded Edit–Master Mac-based systems are now expandable up to 24 tracks, with waveform editing, real-time EQ and mixing. New options include Sound for Picture, which adds a Universal Clock Module for slaving the system to all video and film time code rates, plus software for cue sheet editing, looping and time compansion. Real-time declicking and "decrackling" options for NoNoise were scheduled for midsummer. The current CD premastering system will also be upgraded to enable preparation of special compact discs that can then be used to prepare glass masters directly at the CD manufacturing plant, thereby eliminating a second-generation PCM-1610/30 master tape. Several U.S. and Japanese plants are said to be ready to accept such CD master discs.

❐❐❐

Symetrix is finalizing development of its innovative Mac-based DPR44 recording and editing station. Its proprietary object-oriented editing projection allows each discrete sound segment or track on the full-color control screen to be assigned the attributes of a graphics object, for editing and sound manipulation via a custom-designed Graphics Control Tablet. Scheduled to be unveiled by the fall AES convention is a Universal Clock Card, which will allow full time code and sample-rate synchronization to external video transports and outboard processors. A final production version of the 4-track DPR44 will be released by year's end.

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Introducing the NV4448 Digital Audio Sample Rate Converter with the power to shift smoothly between rates from 32 kHz to 50 kHz.

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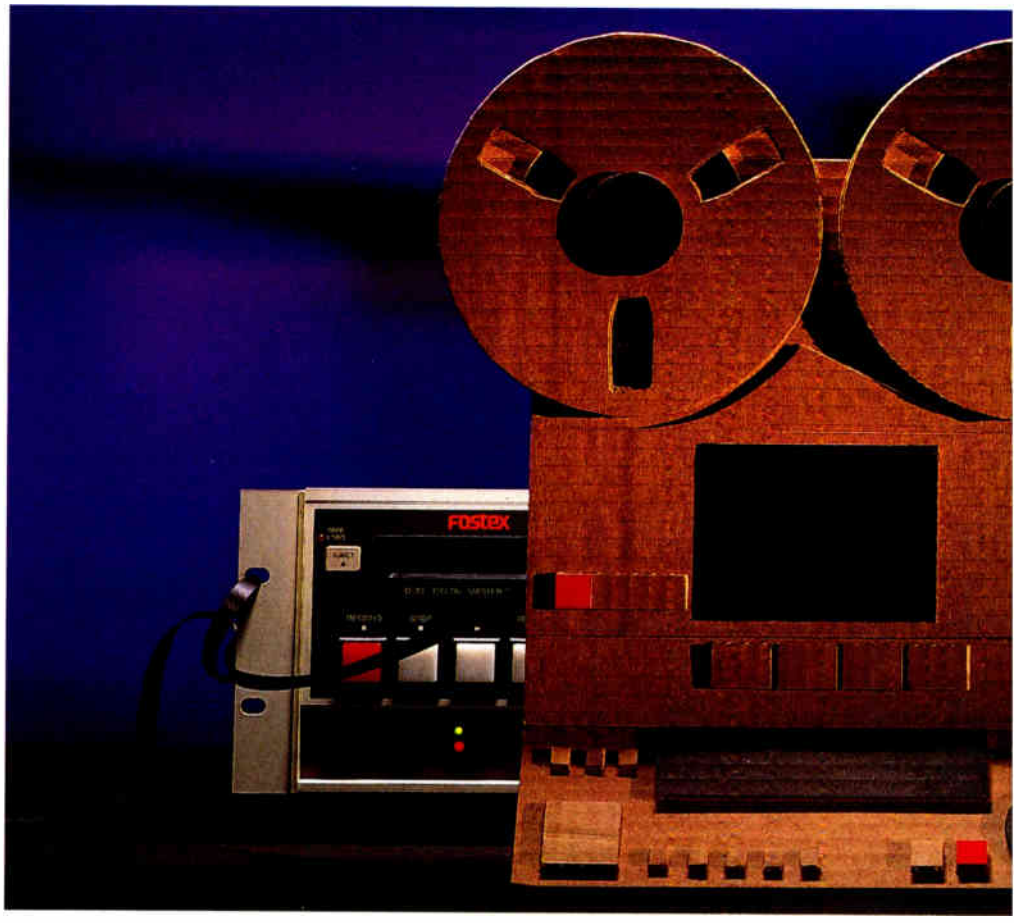
This industry-standard RS-422 serial port, plus a proprietary CPU mounted on our 8310 plug-in card, make the Fostex D-20 the first DAT recorder to emulate all leading professional VTRs and edit controllers.

Repeated edits at the same timecode address can ultimately destroy subcode data. The Fostex D-20 is the first DAT recorder to eliminate this problem altogether. The result? True editing, another Fostex breakthrough.



Only Fostex offers a fully functional, proven, professional DAT recorder today. It's called the D-20. And because of an electronic disguise known as VTR emulation, the D-20 is the only four-head DAT recorder guaranteed to plug directly into today's leading video edit controllers. Whether you use Grass Valley, CMX, Synclavier, Ampex or Sony, now your transition to DAT can be virtually seamless.

Fostex D-20 installation is as simple as a single RS-422 serial port. And the D-20 operates exactly like the standard two-track analog SMPTE timecode machine you already know. So you're ready to roll right away.

The D-20 also gives you true editing. While other DAT recorders are plagued with the risk of audio drop-outs, this Fostex feature lets you edit over and over

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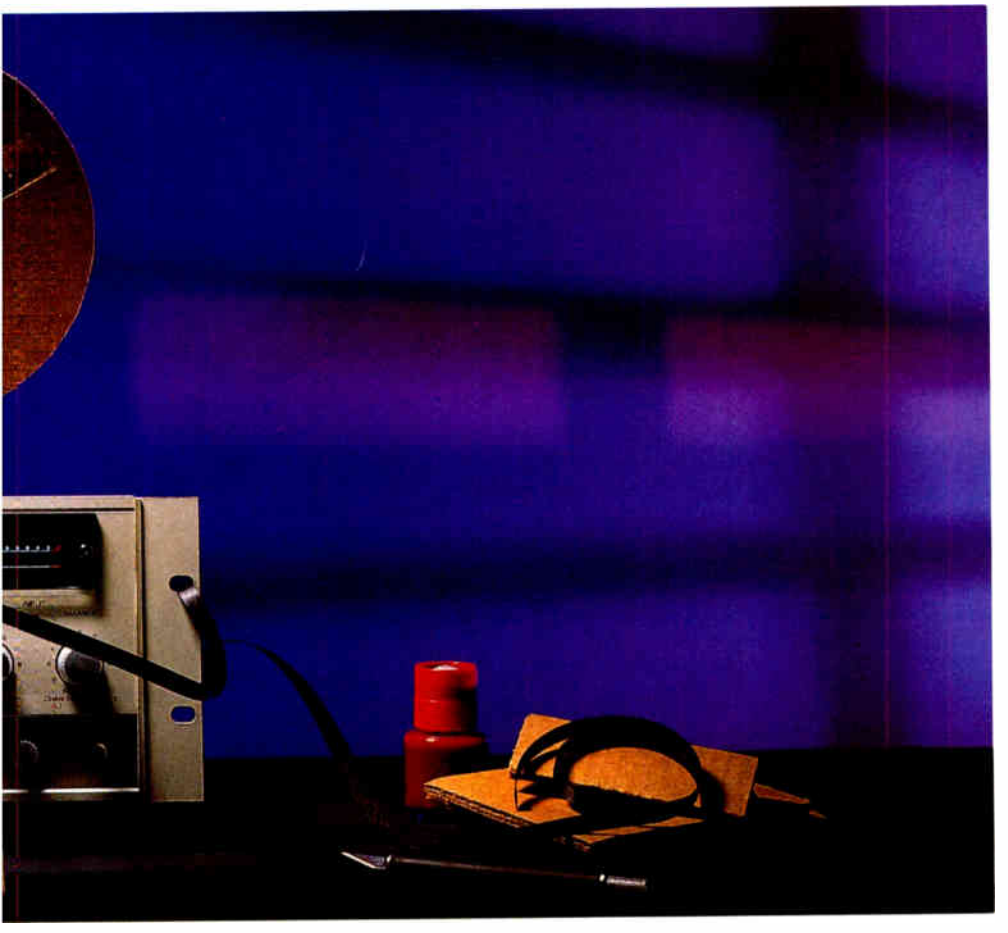

again at the same timecode address without destroying crucial subcode data — all with SMPTE/EBU timecode accuracy and IEC compatibility.

So what's the end result? Nothing less than all you expect from DAT. Digital sound. Increased productivity. Easier operation. Added economy. Greater flexibility. And a head start in the DAT revolution.

To experience the future of DAT today, call 1-800-7-FOSTEX now. A DAT technician is ready to answer your questions, provide you with free literature or schedule an on-site demonstration.

In addition to its superior sound, the DAT format is compact, convenient and cost effective. Shuttle speeds are faster. Stock is less costly. Uninterrupted recording times are longer. Storage and shipping costs are less.

The optional 8320 Intelligent Controller adds complete remote control. Plus it can read, write and edit all ID formats and record up to 799 program numbers. Its LED display is switchable between SMPTE/EBU timecode and A-time.

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COMING FACE TO FACE WITH THE FUTURE IS A LOT MORE FAMILIAR THAN YOU MIGHT THINK!

We don't ship tape recorders to you in pieces; you won't get our new disk recorders that way either.

Our new DDR-10 digital disk recorder is a fully integrated system that comes ready to roll in and turn on. There's no assembly, no cabling, nothing more to buy. *And because it looks great, clients simply love it!*

If you know tape recorders, you're ready to go the minute you sit down at the DDR-10's control panel. The buttons and knobs are familiar, and they do what you expect. It's the only audio disk recorder in the world designed in this way – designed for the professional.

With up to 60 hours of the highest quality, full-bandwidth digital audio, *and* extensive editing capabilities, the DDR-10 delivers the best "power-to-price" ratio you can buy. And its standard Macintosh® SCSI buss (rather than a proprietary design), means you're free to take advantage of future advances in the computer industry. This way, you're not locked-in to a system which seemed "special" at first, but quickly became *ancient*.

For your convenience, CD replication directly from your DDR-10 soundfile is now available. For more information about this service, and the DDR-10, call Otari; a company famous for technical support and customer service, worldwide.
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Workstation & Editing Systems

Workstation System	Primary Product Applications	Computer Platform	Intro Date	Base Price	Storage Media	DSP	Transport Control?	Digital Interface	Networking?	Playback Channels	Number U.S. Installations
Akai DD1000 Magneto Optical Disk Recorder (817) 336-5114	Music, post, production broadcast and live production	Proprietary, with Mac control option	11/90	$13.5k	Magneto-Optical	Yes	Yes	AES/EBU	Yes	2 stereo pairs	20+
AKG Acoustics DSE 7000 (415) 351-3500	Radio production	Intel 80386	5/89	$28k	RAM with Hard disk archive	optional	N/A	AES/EBU optional	No	8	30+
AMS AudioFile Plus (203) 792-4997	Audio-for-video post- production	Proprietary	Spring 1987	$95.5k	Hard disk	Yes	Yes	SDIF-2, AES/EBU Pro-digi, SPDIF	No	16	85+
Cypher Digital CDI 328 (800) 331-9066	Audio for film & video post-production	Intel 80386	Q4 1991	$11.9k	Hard disk	No	Yes	optional AES/EBU, SPDIF SDIF-2	optional	2 (4 opt.)	N/A
Digidesign Sound Tools (415) 688-0600	Digital recording, editing, remixing and mastering	Macintosh II-Series	1988	$3.3k plus Mac II	Hard disk and MO	Yes	No	AES/EBU, SPDIF	Via Mac	2 (4 with optional software)	3,000+
DAR Sigma and SoundStation II (213) 466-9151	Audio for film and video post-production	Proprietary	1987-91	N/A	Hard disk and MO	Yes	Yes	AES/EBU	No	8 (16 opt.)	100+ (worldwide)
Doremi Labs DAWN (818) 966-2454	Audio, film and video post and broadcast	Any Macintosh controller	02/90	$14.5k plus Mac	Hard disk and MO	Third-party	Yes	AES/EBU, SPDIF	Yes	8 (16 or 24 opt.)	50+
Ediflex Systems Audiflex (818) 502-9100	Dialog and sound editing	Intel 30386	1990	$115k	Rewritable MO	No	Yes	opt. AES/EBU	No	4 (8 opt.)	3
Electric Sound & Picture (Australia) Fairlight MFX 011 612 212 6111	Audio post-production	Proprietary	10/87	$90k	Hard disk	No	Yes	AES/EBU	No	16	28
Hybrid Arts ADAP II (213) 841-0340	Audio for video, film & broadcast	Atari	1989	$10k	Hard disk MO opt.	Yes	No	AES/EBU, SPDIF	No	2	800 (worldwide)
Korg SoundLink (516) 333-9100	Audio post-pro & radio production	Proprietary	Q4 1991	$40k	Hard disk	Yes	No	AES/EBU	No	8	N/A
Lexicon OPUS (617) 891-6790	Music and Audio-for-video post-production	Proprietary	1987	$180k	Hard disk and MO	Yes	Yes	AES/EBU, SPDIF	No	8	70+ (worldwide)
Micro Technology Unlimited MicroSound (919) 870-0344	Audio production	IBM PC/AT	1/90	$2.7k plus computer	Hard disk	Yes	No	AES/EBU, SPDIF	Yes	2 (4 opt.)	100+
N.E.D. PostPro SD and Synclavier TS (603) 448-5870	Audio, film and video post-production	Proprietary plus Mac-II front-end	1977, with upgrades	$104.9k	Hard disk and MO	Yes	optional	SynthNet AES/EBU, SPDIF SDIF-2	No	8 (16 opt.)	600
Otari DDR-10 (415) 341-5900	Broadcast spot production, music editing	Mac IIci	12/90	$19.9k (Including Mac)	Hard disk and MO	Yes	No	AES/EBU, SPDIF	Yes	2	30+
Otari ProDisk 464 (415) 341-5900	Audio-for-video post-production, music recording and broadcast	Macintosh II-Series	8/89	$29k (Including Mac)	Hard disk and MO	Yes	No	opt. SPDIF AES/EBU, SDIF-2 Pro-Digi	No	User config. 2-64	45+
Roland DM-80 Multitrack Hard Disk Recorder System (213) 685-5141	Audio production	Proprietary and optional Mac control software	Q3 1991	$5.4k for 4-track; Requires remote ($2k) or Mac software ($500)	Hard disk and MO	Yes	No	AES/EBU	via optional Mac software	4 (8 opt.)	N/A
Solid State Logic ScreenSound (212) 315-1111	Audio post-production	Proprietary	1/90	$90k	Hard disk and MO	Yes	Yes	AES/EBU	Yes	8	40+
Sonic Solutions Sonic System (415) 394-8100	Audio and video post- production, Sound Restoration	Macintosh II-Series	10/88	$8.5k plus Mac	Hard disk and MO	Yes	Yes	AES/EBU, SPDIF SDIF-2	Yes	user config. 8-72	175 (worldwide)
Soundtracker (818) 547-1952	Audio for film and video post-production	Intel 80386	Q4 1991	$50k	Hard disk and MO	Yes	Yes	AES/EBU, SPDIF	Yes	8 (up to 24 opt.)	N/A
Spectral Synthesis Digital Studio (206) 487-2931	Audio production	IBM PC/AT	1990	$9.5k (plus computer)	Hard disk	Yes	No	optional AES/EBU, SPDIF	No	user config. 4-8 (up to 16 opt.)	100+
Studer Editech Dyaxis (415) 326-7039	Audio, film and video post-production	Macintosh II-Series	1987	$15k	Hard disk and MO	Yes	Yes	AES/EBU	Yes	2 or 4	350
Symetrix DPR44 (206) 282-2555	Audio, film and video post-production	Macintosh II-Series	Q4 1991	$65k	Hard disk and MO	Yes	Yes	AES/EBU, SPDIF SDIF-2	Yes	4	N/A
Turtle Beach 56k (717) 843-6916	Audio production	IBM AT or 80386	1990	$2.7k (plus computer)	Hard disk	optional	No	AES/EBU, SPDIF	No	2	275
WaveFrame AudioFrame and CyberFrame (818) 981-9235	Film/video post-production	386-based PC	1988-90	$35k	Hard disk and MO	Yes	Yes	AES/EBU, SPDIF SDIF-2	No	up to 16	100+

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Leathurby and Ron Franklin, who demonstrated various features of the new DD1000 stereo magneto-optical recorder/editor. Providing up to 52 minutes of mono storage per double-sided, 650MB drive (at a 48kHz sampling rate), the DD1000 can be controlled from its front panel or via optional F-Mac software for the Macintosh. Up to three drives can be added for enhanced record/playback capacity.

Built-in RAM storage provides flexible edit location, scrub and waveform display via the unit's LCD, plus triggering of samples and audio segments. Time code sync to external audio and video transports is also featured. Up to six systems can be interlinked via the optional DL1000 Autolocator for enhanced track capacity and VITC synchronization. Future options include Version 2 software, adding more editing commands, time compression/expansion and EQ; a MIDI-based triggering function; and Q-Mac software for assembly editing against imported EDLs. The self-contained DD1000's suggested price is $13,500.

Digidesign

Steve Krampf, Digidesign's VP of marketing, brought the SPARS audience up to speed with recent developments in the Sound Tools Mac-based, stereo, hard disk recording and editing system, which comprises the Analog Interface A-to-D card, Sound Accelerator DSP card (time compansion, parametric EQ, compression/limiting, etc., plus background archiving to DAT or streamer tape), and Sound Designer II editing software. Options include several analog/digital I/Os, ProStore magneto-optical drives for enhanced storage capacity and new CD premastering software.

The SampleCell playback card extends the system's capabilities by adding 16 voices, eight polyphonic outputs and up to 8 MB of RAM. Q-Sheet A/V software streamlines audio-for-video, while DECK software provides MIDI file playback, snapshot/dynamic mix automation and 4-track digital recording. Scheduled to begin shipping by September, the new ProTools Multitrack Audio Production System provides four (expandable to 16) channels of record/playback, unlimited "virtual" tracks, full DSP functions, MIDI sync, digital mixing and automation. Prices will range from $6,000 for a 4-channel system to $24,000 for a 16-channel format, excluding Macintosh controller and hard drives.

Lexicon

Will Eggleston, Lexicon's VP of marketing, discussed the Opus and Opus/e Digital Audio Production Systems, which are now available with Version 3.0 software offering full machine control, CPEX time compression, sample-rate conversion, pitch shift, and Automix automation. The latter provides storage of up to 16 discrete settings of all Opus front-panel settings, including faders, mutes, switches and pots, with ten revisions per mix, plus full editing and joining of partial mix segments.

The Opus 12-channel/8-track combination hard disk recorder, editor and mixer interfaces with a variety of analog and digital input/output formats, and resolves/generates all species of time code. It also now supports full serial control of external transports, including TEAC videodiscs, Sony and Ampex 9-pin VTR dialects, plus the new Sony PCM-7000 Pro-

World Radio History

DATs. (Opus/e offers the same record/edit functions but with a smaller 8x2 monitor mixer in place of the dedicated user interface). Prices for the Opus system range from $150,000 to $200,000, depending on system options and storage capacity.

New England Digital

Steve Zaretsky of New England Digital summarized NED's product line as covering two main areas: the Synclavier RAM-based sequencer and sampler; and the PostPro multitrack, hard disk recording and editing station. The Mac-based PostPro SD represents a combination of these two complementary functions, and provides up to 16 tracks of random-access and real-time signal processing. New software for the Mac controller/front-end offers enhanced color graphics and on-screen, icon-based functionality, via interlinked EditView, TransferMation Library and Mixing windows. Audio segments can be treated as discrete or grouped objects and freely moved against the onscreen Now Line and time code locations. AutoConform software enables dialog elements to be synched quickly to picture, and offers direct machine control plus full compatibility with CMX and other EDL formats. The new SoundDroid software can be used as a stand-alone system for cue list generation, or with an existing PostPro to provide linked cue lists and library functions.

Roland

Bob Todrank, newly appointed national sales/marketing manager of RolandCorp.'s Pro Audio/Video Group, demonstrated the DM-80 hard disk recording system, which offers 4/8 tracks of simultaneous record/replay, dependent upon the number of drives. Several units can be locked together to provide up to 48 tracks of storage. Storage time is 18 minutes of mono per 100MB drive fitted to each base system. Delivery is slated for late September.

The system features three independent SCSI ports—one each for tracks 1 through 4 and 5 through 8, plus a third port for interface with tape backup/archive and magneto-optical devices. Sampling rates to 16-bit resolution are 32, 44.1 or 48 kHz. A separate DM-80F fader tray (a 12-in/stereo, 24-bit digital mixer with EQ), DM-80-R controller and keyboard interface allow upward expansion of the base recorder. Optional Mac-based track-management software provides control of all transport, cut/paste, dynamic snapshot mixing and hardware functions, while a proprietary circuit resolves SMPTE time code rates to the unit's sampling frequency, to ensure sample-accurate synchronization to film/video, as well as external digital systems. The 4-track DM-80 will sell for $5,496, and the 8-track version for $7,695; the remote costs $1,995 and the fader unit $1,695—any brand of SCSI-capable hard drive can be connected to a 4/8-track base system.

Solid State Logic

Solid State Logic CEO Piers Plaskitt and product manager David Powell organized a last-minute demonstration designed to illustrate a "typical real-world application" for ScreenSound. Explaining that their video source material "hadn't made it to Orlando," the team spent the lunch break recording a 30-second commercial from an off-air feed, and developing a voice-over script for the piece. During their allotted demo segment, library music was recorded into ScreenSound from a

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CD player, followed by male and female voice-over elements. These were then edited, mixed and balanced, and various sound effects were added from a companion MO drive, and synched to the visuals.

Also described was the new SoundNet software that allows up to seven ScreenSound systems to be connected via a local area network, with any controller accessing sound elements from any one of up to 16 optical drives located within the configuration, for a total of 48 hours of online storage. A single controller pad can be used to access and command all seven systems for a full 56-channel remixing system. Background archiving and/or inload from any of the networked subsystems is also possible. A basic ScreenSound with four hours of hard-disk storage costs $101,000; SoundNet adds an additional $34,000 per installation.

WaveFrame

WaveFrame Corporation's VP of marketing, Bill Hughes, provided a brief overview of the AudioFrame system before handing off to composer and sound designer Michael Bard of Newton/Bard (Portland, Ore.), who demonstrated the system's music, voice and effects capabilities with examples of his work for Children's Television Workshop. New features include Release 5.0 software, with a reconfigured and faster user-interface based on Windows 3.0, and a built-in macro recorder that memorizes complex operations. Release 5.0 also offers time companion, on-the-fly punch recording, sound effects spotting, plus additional EDL enhancements.

New hardware options include a removable magneto-optical disk media, the Audiomatica control panel for hands-on digital mixing, and the MDI-32 multichannel digital audio interface, which provides 32 digital I/Os with level matching, digital emphasis correction, and format conversion. An AudioFrame Core System ($32,500) contains all the components required for any final configuration; additional modules can be added for specific applications. Up to nine additional modules and storage devices can be plugged into the Core System's digital audio rack.

Discussion Forum

On the second day, there was an animated discussion chaired by Dick Trump, president of Triad Productions, during which participants addressed some of the more thorny problems facing users and manufacturers of workstations.

AMS North America's John Gluck commented that "enhanced speed of system backup and incorporation of MO drives" figure strongly in AudioFile's development schedule, along with other "unique"—but unspecified—applications for workstations. Steve Krampf of Digidesign commented that the firm's intention was to "develop cost-effective/no-compromise digital editing products," and will continue to work with outside software developers, including Opcode and Mark of the Unicorn.

Mack Leathurby of Akai noted that the DD1000 RAM/hard disk systems will be expanded to include a family of related, cost-effective units. Software revisions will include full serial remote control, automated EDL conformation, enhanced editing and real-time DSP, features he considers essential for fourth-generation workstations.

Otari VP of marketing John Carey said that the recent acquisition of Digital Dynamics will allow the es-

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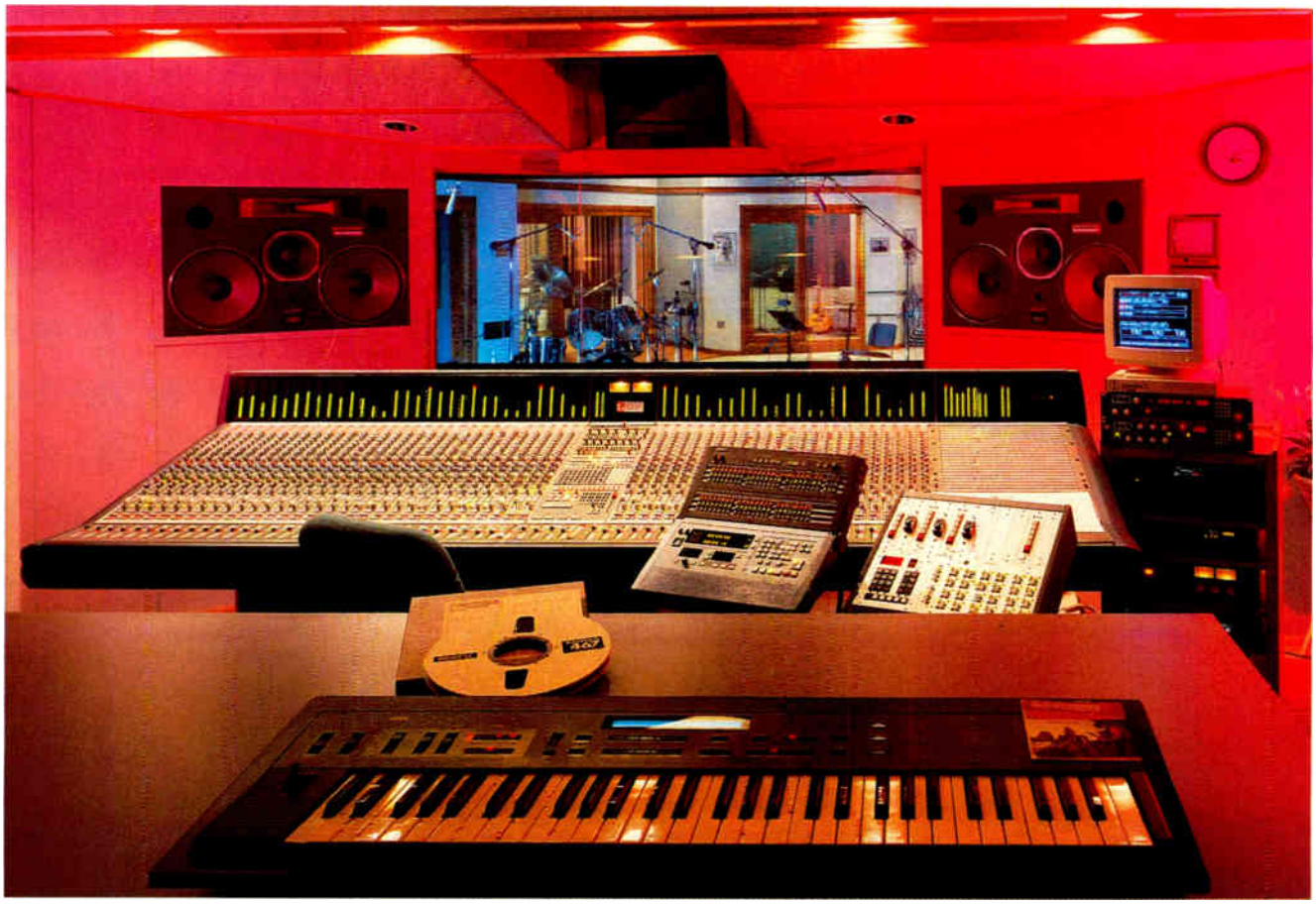

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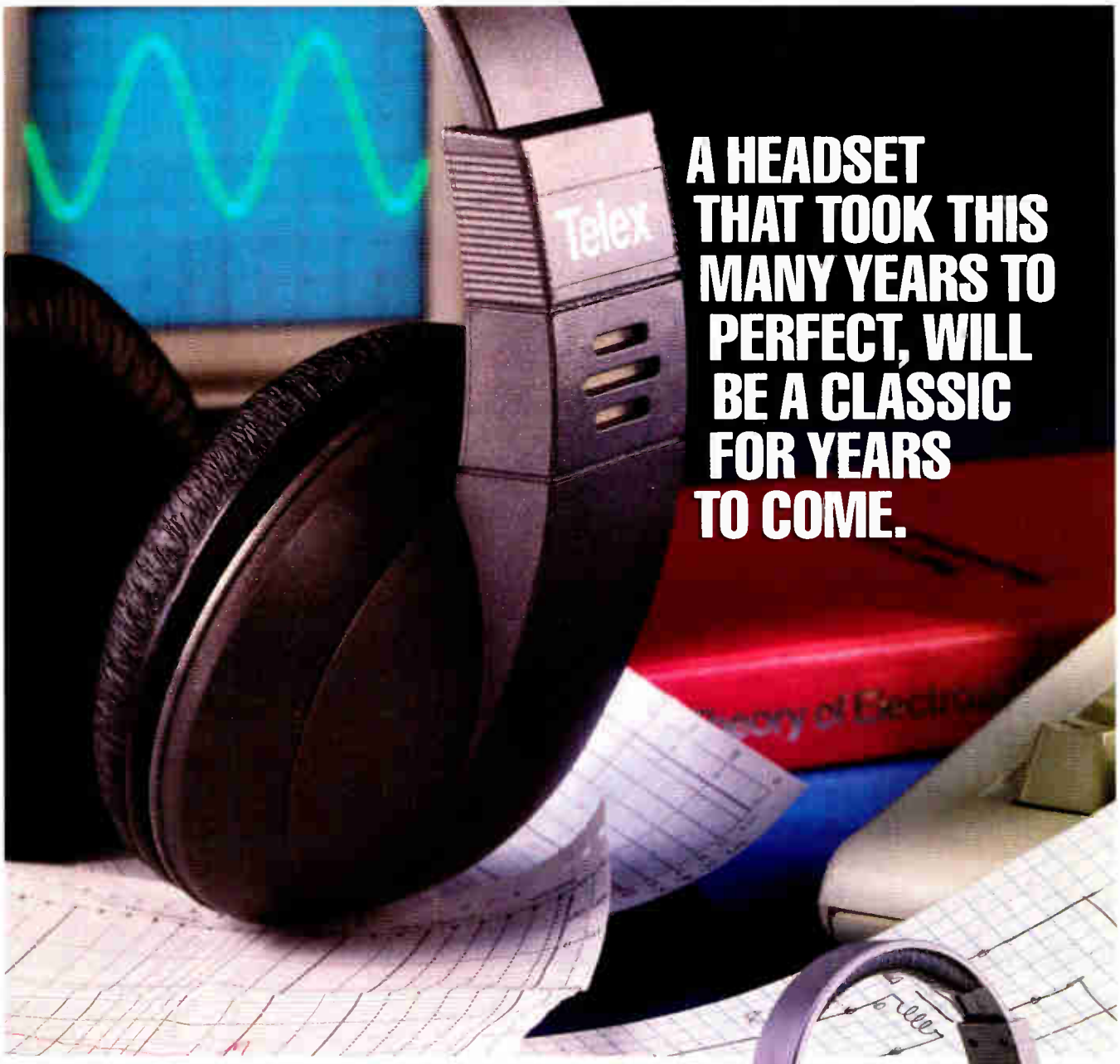

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TELEX

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tablishment of a "full line of digital products" that will be expanded to other application-specific front ends, including unique combinations of "screen-based functions and dedicated hardware controllers." On the immediate horizon, he said, are techniques for exchanging both audio data files and companion edit/mix information.

The capabilities offered by Opus will be enhanced, said Will Eggleston, to accommodate larger hard disks (up to 2.5 GB), MO drives and Exabyte archiving. Although he conceded that advances to the unique control surface would be difficult, the firm will be considering techniques for adding greater track capacity to existing systems.

Curtis Chan, GM of Roland's Pro Audio/Video Group, said that the company was actively expanding into the world of audio and video, and that new products would be simple to use, reliable in operation, innovative in technology and offer outstanding price versus performance.

Piers Plaskitt conceded that Solid State Logic was, in the long term, "R&D-driven by the need for a totally digital production suite," and that the SoundNet adjunct for ScreenSound will enable mass storage of centrally held materials that will be available to multiple users on a network. SSL was also, like many other firms, "investigating the viability of standardized data-exchange formats and media."

According to Studer Revox America president Tore Nordahl, in the two years since it purchased IMS, the new Studer Editech division has "merged various technologies from the studio and post industries, to provide interactive and integrated workstation systems." In the immediate future, he said, Dyaxis 2+2 would benefit from additional track capacity and enhanced functionality.

NED's Ted Pine felt that the Synclavier/PostPro systems offered "power, flexibility and product breadth." Future versions would incorporate interface enhancements and DSP functions, while the company encouraged the development of third-party software projects.

Bill Hughes remarked that WaveFrame would continue to supply to the high-end audio markets, plus OEM sources and industrial markets. "For the future, we will provide existing and

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Bob Ludwig
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Randall Wallace

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new users with cost-effective systems that provide a quick return on investment."

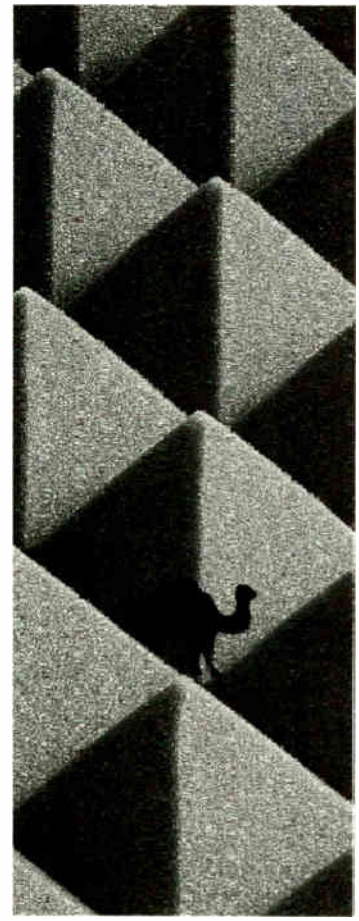
Responding to a question from the audience regarding the possible use of data-reduction techniques to provide enhanced record/storage capacity, several companies said that they were actively investigating its potential. Lexicon is examining the Dolby AC-2 Transform Compression system, for example, while SSL has a majority share in Audio Processing Technology, developers of the 4:1 apt X-100 ADPCM Codec system.

Turning to the topic of data exchange, Bill Hogan of Sprocket Video, chairman of the AES subgroup on operational requirements for disk recording, discussed his panel's ongoing evaluations of media and file formats. He ran through the committee's proposal (detailed in my January 1991 column and currently being circulated to workstation manufacturers). In response, NED offered that it continues to support AIFF (Audio Information File Format, a structure used by a variety of companies, notably Apple Computer), via translation to/from the firm's proprietary file format. Digidesign also supports AIFF (from a total of five different formats), and felt that "standardization benefits everyone."

Otari is also an active participant within the AES subgroup, and readily acknowledges that standardization is a "very complex situation," and one that needs to accommodate a variety of platform types, including Mac and IBM, in addition to different techniques for storing digital audio data.

On a related front, AMS plans to focus on a single digital I/O format—AES/EBU—as well as adopt standardized ESbus protocols for machine control. Conceding that several complementary MO formats still exist, John Gluck suggested that now is the right time to "begin the dialog toward possible standardization," an opinion that was shared by the majority of those attending the SPARS Conference. ■

Drawing upon over 15 years of active involvement with all dimensions of professional audio on both sides of the Atlantic, Mel Lambert now heads up Media&Marketing, a high-tech consulting and marketing service for pro-audio firms and facilities.



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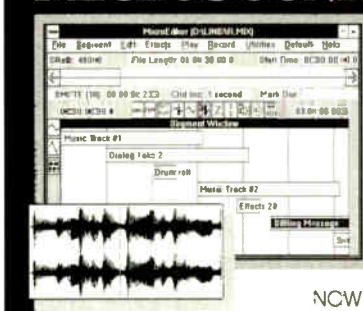

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DIGITAL

BY BLAIR JACKSON

"For sale: One box of razor blades, formerly used for audio post-production. Utilized on impressive list of films. Will sell to highest bidder, or will donate to audio museum."

We may not be seeing ads like that in the *Mix* Classifieds section any time soon, but the fact is that the current generation of digital audio workstations (DAWs) and disk recorders has made an enormous impact on the way post-production professionals do their jobs. Long nights of splicing miniscule bits of mag tape and fullcoat are virtually over for dialog cutters and effects wizards, who are benefitting from the many advantages of working on disk-based systems.

The most recent developments in DAWs hardware and software are outlined in Mel Lambert's "Juxtapositions" column this month. For *this* article, we queried a number of end-users to find out how this first generation of workstations makes the day-to-day grind of post work just a little bit easier.

Alan Howarth, Electric Melody Studios, Glendale—NED Synclavier

We've actually signed up for a PostPro, which we'll be getting soon, but I've been using the Synclavier [9600] for a long time. We hope to do all our background cutting to the PostPro. We have 40 MB of RAM in the 9600, and that's good for stereo backgrounds up to about 90 seconds and still have two backgrounds up, so you can A-B cut. When we get the PostPro, we'll be getting to the more feature-length stuff where we can have four or six minutes of material and it's just linear, with no looping.

With any of these systems, the library that goes with it is critical. You can run out and buy the latest whiz-bang, high-technology, magneto-optical, everything's-in-there machine, but you can't turn around and do a job with it until you take some time to get some stuff into the machine, and get a backlog to the point where it's sort of off-the-shelf. I've had the Synclavier about three years and we're on our 16th optical, which gives us about 32 gigabytes of effects—this is getting serious! This is the kind of density it takes to have somebody walk in here and give them a show in a relatively short period of time.

An interesting show we did recently in conjunction with LucasArts is a film called *Salmonberries*, directed by Percy Aldon, who made *Baghdad Cafe*. This one stars [country singer] k.d. lang as an Eskimo woman who's trying to find her identity. There was almost no music in this show; instead, it was all sound effects, but the director didn't want layers and layers of effects. It became an example of minimalist

Alan Howarth of Electric Melody Studios

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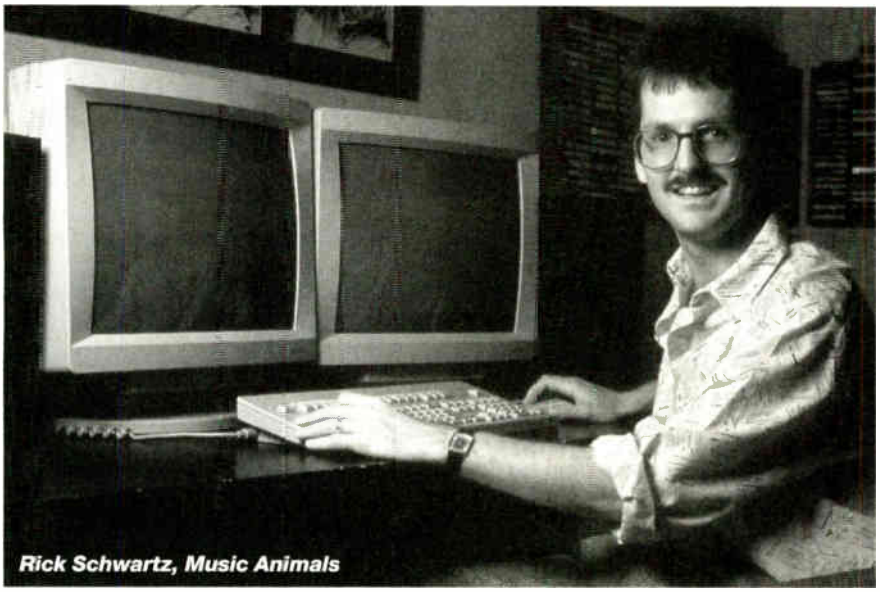
POST

SOUTHERN CALIFORNIA SOUND DESIGNERS AND EDITORS TALK ABOUT THE FIRST GENERATION OF DAWs


Rick Schwartz, Music Animals

sound design, where we really had to give the director the right thing for each scene. The big elements were wind and dogs—dogs because in these Alaskan towns there might be 4,000 people and 15,000 dogs, so orchestrating these dog sounds became one of our big tasks.

[Aldon] had recorded some production dogs during the filming, and then we collected as many other dogs—and some wolves, too—as we could. I took the production recordings, put them in the Synclavier, spliced out all the unwanted material to get to the essence of dog-howls, and sequenced the dog stuff, really orchestrating the sounds to the action. We did a lot of envelope shaping on the dogs to get the right moments to synchronize through all these dog choruses. There were several scenes, too, that really let me stretch out on the Synclavier and do some multichannel sound design. Because I've got the multiple outputs, I was able to use individual sequencer tracks, quadruple them, assign four outputs to four different sequencer tracks. Then I went through with the mod wheel, doing some delays and creating quad panning among the four sequencer tracks, firing them out at real time.

Rick Schwartz,
Music Animals, Los Angeles—
Studer-Editech Dyaxis

Recently we did some spots for Nike that really turned out well, and they were done almost entirely within the Dyaxis. One of them, this new spot with [tennis star] Andre Agassi, was unique because [Nike] wanted it to be sound design only—no voice-overs, no music—just sound. So it really gave us the opportunity to go crazy. We started out with some stuff that had been recorded in the field. It sounded way too wimpy, so we ended up re-recording just about everything.

We brought in tennis rackets and we did our own swishes, ball hits and everything else. We basically recorded all our own sounds into the Dyaxis. We learned that the best swishes came from hitting with the racket sideways. All the ball hits were pitched down using [Passport] Alchemy software and extensively digitally EQ'd to make them sound the way we wanted. We probably had 300 sound effects in that

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30-second commercial, and they were all built in the Dyaxis. We used bottle rockets for some of the swishes; we used pile drivers for ball hits; we used backward cannon for a preserve wind-up. Lots of pitching up and down, a lot of level changes, enveloping. Reality never plays; you've got to go bigger. And I think it works.

One of the things we find useful about Dyaxis is that it doesn't have any arbitrary limits. The system we were using has two outputs, but there are unlimited internal tracks. Basically, the spot was recorded, mixed and EQ'd entirely in the Dyaxis.

After we approved the mix, the tracks were transferred back into Dyaxis. They said the ending was a little too wet, so we slugged in a couple of changes and saved a whole remix.

The Opus room at Blue Light Sound

John Ross, Digital Sound and Picture, Los Angeles—Doremi Digital Audio Workstation Nucleus

We have five DAWN systems and we've been very happy with them. Basically, the DAWN is an 8-track disk-based recording system that works with the Macintosh at the front end, and it's set up in a very interactive fashion: You can get in and move snippets of audio around. It's very flexible and its use of the Mac allowed us to get into networking, which is what we've implemented in our facility. We've set up an Ethernet system, linking all five of our 8-track systems together, allowing us to do file transfers and sound pooling and things of that nature. We can also use any Macintosh peripherals for archiving, such as magneto-optical or whatever we may want to use later.

We use [Digidesign] Sound Tools systems here—we have three of them with SampleCell setups, and they also hang on the network. The DAWN has the ability to work with AIFF files, as does Sound Tools/SampleCell, so we can basically swap files between the dialog editors and the effects editors on the network. It makes for a very powerful system and allows a number of people to work at the same time—all the advantages of a mainframe-style system.

We do a lot of Fox movies here, such as *Seeds of Tragedy* [which aired in late June]. In a case like that, when a tape comes in, a dialog editor working on a DAWN will split the dialog out into its various components—typically into eight tracks, which include the dialog and production effects and all. We build and balance with fade-ins and fade-outs across the eight tracks of a DAWN unit. This information is then integrated with the ADR, and various fills and takes are created to make it work in different interpretations, depending on how the director wants to hear it. It's all pre-built on the hard disk. When we mix, the dialog elements themselves come from another DAWN, which is in the mixing stage. The background sound effects—birds, traffic and various long continuing sound effects—were also cut on the DAWN system and split across eight tracks as well. Then all the hard effects are built in the SampleCell system, and we do Foley on the multitrack. So at the end of the day, you're mixing Foleys from the multitrack, dialog from one DAWN, background elements on another DAWN and hard effects from a SampleCell system.

Larry Blake, Weddington Productions, North Hollywood—ScreenSound

I've been cutting sound on a film called *Kafka*, directed by Steven Soderbergh. I cut all the dialog and ADR and half the Foley on the film, and Mark Mangini, the film's sound designer, has cut the other half of the Foley and virtually all the sound effects by himself. In this case, everything in the film, with the exception of background sound effects, is cut with ScreenSound. It's a pretty simple delineation because [the background effects] will wait until the show is locked, and then they will be cut directly to multitrack by Ron Bartlett. *Kafka* has been a pretty straightforward show for me.

One reason I liked the ScreenSound initially was that it appeared to be very easy to get up to speed on it—and it actually *has* worked out that way. It's a very simple user interface. At first, the bit pad and pen might look downright silly, but it has proven to be a comfortable, not-very-strenuous way of doing things. The backup and restore in the background is a real timesaver.

We cut the majority of the show to a TEAC WORM laserdisc. It amazes me that other companies aren't pulling them off the shelf like SSL has done. In the still-frame mode, it's rock-solid.

For dialog editing, I really like the flexibility and precision you have when editing. I would match this [ScreenSound] against anything—which is not to say there aren't improvements the system could have. I am especially bothered by the lack of easy looping of fill. Also, CMX autoconform software still isn't here. But it's superb in that area. For sound effects, the system isn't really designed to be a sound design tool. It's not a RAM-based system in any way, shape or form, and it doesn't pretend to be. So I can't very well criticize it for that. That's a trap a lot of companies fall into—trying to make one box fit all. For the majority of straightforward editing, though, it's a very well thought-out piece of machinery.

Jeff Largent, Blue Light Sound, Burbank—Lexicon Opus

We've been working on a Jean-Claude Van Damme martial arts flick [*Double Impact*] with lots of footsteps, lots of bangs, lots of props, lots of effects. So far I've been concentrating on the Foley, and actually Foley is the main reason Blue Light got an Opus. The owner [Bob Rutledge] wanted to get something that would give us really clean Foley. So far, we haven't been doing a lot of editing within Opus, simply because it's been more profitable to keep the stage where the Opus room is online as long during the day as we can. So we really crank the stuff out, dump it out from Opus eight tracks at a time to single stripe, and usually let the film editors cut it.

Actually, though, there is a project now we've been editing within Opus—a film about a female serial killer. It's been very interesting; it's a completely

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different approach to doing a traditional Foley session. Instead of just saying, "Yeah, that's going to cover it," or backing up and punching in, I've got the ability to not only do all of that, but also very rapidly bring editing into the picture by doing a quick edit—position things, pull tracks up, splice some air into it, all the things to make sure the footsteps are going to be where we want them.

In that film we did eight tracks of footsteps, movement, props. We were working with a very limited budget, so we kept it all in an 8-track environment. We would build as many as 16 or 17 tracks and then edit and consolidate down to an 8-track playback, spit the whole thing out to Dolby SR 2-inch, and then they'd mix from that.

The great thing about Opus is its 99 tracks, so I bring up the first set of eight—maybe it's eight tracks of props. I sub them to 2-tracks on the SR, put the original source tracks away, call up eight more tracks of footsteps. I play back the submix and add more footstep submix to it. As I add it, I realize that, say, one prop needs to come down, so I recall the mix that has that prop on it, fix it, punch it in, and we're done. For a desk that's only 12 modules and eight disk events back at any given time, the 99 tracks really come into play, because you can build wider and wider than the desk can do at any given moment, sub down and pull it back.

Harry Snodgrass, Vision Trax/ 20th Century Fox, Los Angeles—Digidesign Sound Tools

I'm using Sound Tools extensively on a film right now, but it's one of those lovely "secret films," so I can't talk about it. It's one of those multi-multi-million dollar productions, and the application is really extensive: The whole show is being done with Sound Tools. For a film I did a while ago, *Predator 2*, we used it to create the voice of the creature—loading in a lot of animals, human voices, different kinds of machinery—playing with the pitch and reversing sounds. We used it in odd ways, too: using the scrubbing feature but taking that scrubbed sound and actually transferring that off again while I was scrubbing. Also, we really integrated the whole thing into a different environment, not just staying with the Mac—in other words, dumping things off in real time and then dumping them back in and working with them. We also used it to pre-layer a lot of those sounds to create the voice of the creature, making it as big and monstrous as we could.

It seems as though we work a lot with directors who like to change their films up until the very last minute. Actually, even beyond that—we've changed films *after* they've been optically printed. We work on a lot of those big extravaganzas, where it's a full-effects show. And if you go to multitrack you're screwed, because we sometimes get two sets of changes a day, with 20 picture changes, and we'll have hundreds of units to change. We might have one whole crew that's just doing changes. And [Sound Tools] is great for that.

I use it in more subtle ways, too. I'm doing a film for Fox right now called *29th Street*, which is more of a talky film, and for that I've used it to create and layer backgrounds before they get to the stage—it's less complicated. In other words, I've been doing things like making a ghetto background with different people and different areas and doing a layer of that so we don't walk into the stage with 25 tracks just to create one background.

—CONTINUED ON THE NEXT PAGE

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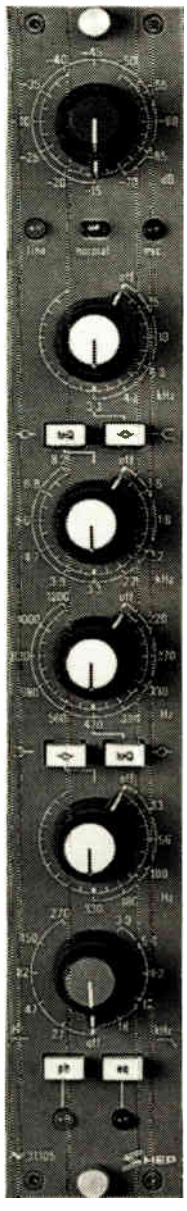

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Jeff Payne, WAVES Sound Recorders, Hollywood—AMS AudioFile

I use the AudioFile all the time, and I've been very happy with it. Recently I worked on a commercial for Henry Weinhard's Beer [an Oregon-based brew popular in Northern California], part of a big campaign they did that was basically, "And now for something completely different," where they set you up for one thing and then something else pops up. In this case it was a commercial called "Spleen," a take-off on those old science films they used to show in school—you know, "Here's your friend Mr. Spleen!"—and that sort of thing. So the writer came into the studio with the talent—two people we recorded separately. We figured out what we needed for sound effects, in terms of holes. The announcer came back in and we recorded him, we got everything down to time, and then we started playing with it. Everything was recorded directly to disk in the AudioFile.

The way I like to work is to compile a list of effects based on reading the script beforehand, and have somebody else pull the effects from libraries or whatever. Generally we do a lot of Foley, but on this particular project I used only CD effects. Normally I'll stay completely in the digital domain, but on this we went outside once to create the effect of the sound warbling, like an old film being projected badly. The one drawback with the AudioFile is it doesn't have varispeed. So I went out to tape and played it back to give it a warble effect, playing with the [recorder's] varispeed as I went.

Of course, the advantage of working in the digital domain on a random access system is the flexibility of moving things. Say you want to move a door slam or a footstep from the front to the back of a spot—you can do it almost instantaneously. You just hit a grab time—it's all done by numbers because it's time code-based—and just move it that way.

The other thing it's really good for is compression and expansion, which is very important in the commercial work we do. If you have to make a radio spot that's exactly 59.5 seconds, and you work and work on the spot and it comes in at 61 seconds, you can Timeflex it, which is a compression system that will allow you to get two or three seconds out of a spot without any noticeable speed or pitch change. That's a cool feature.

Scott Gershin, Soundelux, Hollywood—AudioFrame

The tools I use the most are the AudioFrame and an [Hybrid Arts] ADAP system that I have sort of married together so they can exchange information back and forth in the digital realm. I've been working on a big animated feature, which I unfortunately can't tell you the title of at this point. But it's a big, *Little Mermaid*-style feature with some very good people involved all the way down the line. In my system I've got 30 megs of RAM, 16 voices, eight outputs, and eight tracks of disk recording built into the machine. I've got 3 gigabytes of hard drive space. Then on the ADAP I've got 4 megs of RAM. I use the ADAP as a utility tool primarily: doing some sound design and then throwing that back into the Frame for cutting.

I love the WaveFrame because of its interpolation. The premise of this project is that it takes place in a rainforest, so everything has to sound very natural. So I have to stay away from anything that insinuates any kind of digitalness. We're going for a very organic sound, and I find the WaveFrame's interpolation feature enables me to do that. I can drop something down four octaves and get no aliasing. Here's an example: I can take a pulley sound, drop it six octaves and make it sound like a whale call; it has that kind of purity because it's a fixed sampling rate, so the sound doesn't start breaking up like it does in a lot of systems.

Another neat feature is the digital audio buses that let me transfer audio information within the machine to different parameters of the machine. It's a multitasking environment and a modular environment. It's not like the old IBMs where you had menus and had to go back and forth. I can see my disk recorder, my EDL and four different waveshapes all at the same time. That makes it incredibly powerful.

We've also been incorporating the Roland RSS system, which is a piece of outboard gear that basically gives you rear speakers out of a stereo track, sort of a simulation of 3-D sound. Everything is being run and automated via the WaveFrame and an Atari. And I've got a Niche Audio Control Module. It's a powerful system.

Lew Goldstein, EFX Systems, Burbank—NED PostPro

EFX totally revolves around the Synclavier and the Direct-to-Disk [PostPro]. We have five Synclavs and two PostPros, and complementing

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those we have eight [Sony] PCM-3324 digital multitracks, so we're a large digital house. Recently I've been using the PostPro mostly for dialog.

The hardest part about the digital domain is dialog editing, partially because dialog editors using tape and mag have incorporated some very idiosyncratic techniques. There are some amazing tricks they use to make production dialog work. It's a very weird animal because you've got directors talking, you've got different pieces coming from different takes with varied inflections, and editors have come up with odd ways to fix those problems. So to take a very logical machine and try to do the same thing is difficult, to say the least. And I think a lot of companies haven't had a good idea of how dialog editors actually work.

Recently, we've been getting into using the edit decision list conform on the PostPro. To my knowledge—and I've really checked out all the machines that are out there—the machine that does the conforming the best is the PostPro. It is capable of taking your production dialog from whatever format it was originally cut from—say 1-inch if it was a TV-type conform; or 1/4-inch with time code, or even DAT with time code—and record it to the edit points, plus recording 3- or 4-second handles on either side of the edit point, which I know for a fact the other machines don't do. I can go in on the edit view or the sequence editor and grab the in-time of the edited cue, open it, and I'll have that three or four seconds of audio before the cue that might have fills or other pieces of dialog that I might want to cheat in and use. So once the material is conformed, a lot of the extra source material I'm going to need is already loaded with it.

The edit view is a very, very convenient way of editing: to be able to see a graphic representation of your block; to be able to see a cue of audio with a ramp at the front and back is really a great feature. Some editors would probably rather see waveforms—which you can do with the PostPro, though it's more complicated—but as an editor I've always relied more on hearing what I'm cutting than seeing what I'm cutting. I can scrub across all of my eight tracks, hearing them simultaneously, and all of the audio under the playhead of the machine. So I really have quick access to any aspect of the sound audibly. And it's probably one of the best scrub sounds of any of the machines.

I've been doing dialog cutting on a relatively low-budget sci-fi *Road Warrior*-esque film called *Neon City*. The mag tracks were put into the machine, and I then spent about two or three days with another editor rolling through and splitting all the mags out to their individual edits. That's unbelievably simple on the PostPro. You just roll through, make a point, make another point, and split that piece out. Once I had my basic split, I then went back in, found the pieces that I'd split out that were either clipped from the mag edit or just poor quality, and slowly replaced each of those pieces. Once I had that, I ran down each reel and did my fills and my fades and crossing in and out of the different tracks. For a low-budget situation, where we didn't have the money for a total rebuild, it worked out quite well.

Hans Zimmer and Jay Rifkin, Media Ventures, Los Angeles—Akai DD1000 Disk Recorder

Zimmer: We used the DD1000 on *Thelma & Louise*. On that film, the

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ending kept changing—originally there weren't going to be any opening titles. Then after it was basically done, Ridley [Scott, the film's director] suddenly decided he wanted some titles after all. We recorded pretty much all the music for it in London with English musicians. Once I was back here, I wasn't able to get a hold of the original musicians, and we didn't really have time for that anyway. So we just started hacking things up in the DD1000 and making up new cues completely out of old bits—take the drums from one piece and something else from another. It's great for sticking things together and trying things out without investing too much time in the process. The challenge for all of us is to stop thinking about these various machines as just tape machines without razor blades, because you can do much more interesting things with them.

Rifkin: Aside from taking different instruments from different cues on *Thelma & Louise* and assembling them all, we supplemented that with new recordings, as well—I can't remember now if it was MIDI-triggered or SMPTE-triggered. So we were using the DD1000 as a tape recorder, but because of instant access, it made it possible to write over it using sequencers and so forth. To continue, or adapt, or loop different pieces was very quick, and I think it's safe to say we couldn't have done what we did without it.

One of the things I like is that in some ways you can look at it as a musical instrument. It can be MIDI-driven, so if your sequencer is SMPTE-driven, it's easier to have the DD1000 MIDI-driven. Then, when tape isn't running you're still listening to it, so it's actually slaved to your sequencer in that kind of application most of the time. It's easier going into the sequencer and offsetting it in whatever direction you want, manipulating it there, than going into the DD1000 and going into a cue list and nudging it back and forth. But it's a good combination in that way.

The other thing I'd say is that I don't know of anything that does as long a crossfade—you can do up to 60 seconds; and it accepts and puts out every digital format I know about: optical, SCSI, its own DBus, as well as handling sample rate conversion. ■

Mix managing editor Blair Jackson is currently working on a screenplay entitled Hudson Hawk II.

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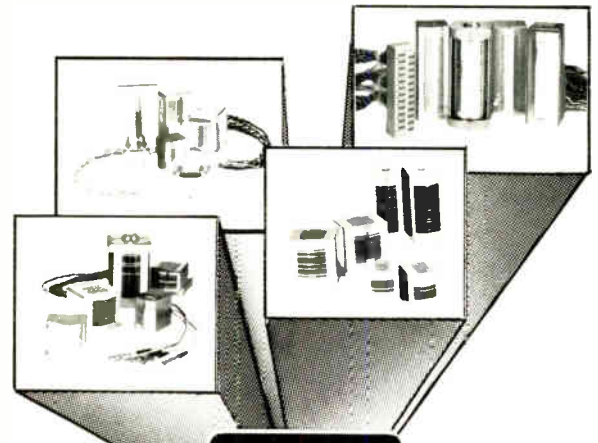

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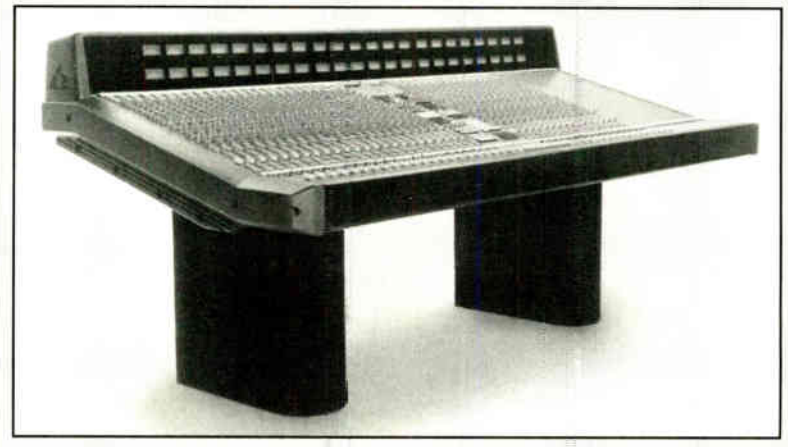

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Cinema Sound Revolution

Three new digital sound formats for 35mm film are changing the way we hear movies.

by Barry Ferrell

THE LONG-AWAITED EMERGENCE OF A digital sound format for widespread theatrical exhibition is imminent. Historically, digital sound in the cinema has been limited to expensive installations usually found only in theme parks and special exhibitions. Three digital sound formats for 35mm film have been announced in the past year, and at least one of these formats will be used for theatrical features in general release.

Three Competing Formats

ORC and Kodak announced the development of a 35mm version of their Cinema Digital Sound system at the SMPTE convention last October (for more information, see the Sept. 1990 *Mix*). CDS uses a digital optical soundtrack printed directly on the film, in place of the standard analog track. Two other companies, Strong International and Dolby Laboratories, announced their systems at ShoWest in February 1991. Strong uses a "double system" approach, where the digital soundtrack recorded on laserdisc is synchronized to the projector by means of a time code track printed on the film. This allows the conventional analog track to be retained for print compatibility and emergency backup. Dolby's system provides for both digital and analog soundtracks, optically recorded on the same print. The conventional analog track is retained, while the digital information is recorded in the space between the sprocket holes. The print compatibility and emergency backup are achieved without the need for a separate playback source for the digital soundtrack.

All three digital formats share some common characteristics. They support five full-range channels and one subwoofer channel. The five full-range channels include left, center and right (LCR) installed behind the screen, and stereo surrounds installed on the auditorium walls. This channel configuration is the same as current analog 70mm formats with the split surround option. It will also be possible to remove restrictions on the frequency response of the surround channels. Optical surround channels are currently limited to a frequency response of 100 Hz to 7 kHz due to the limitations of the technique being used. A digital system does not have the same restrictions, so requirements for surround channel performance may increase. To take advantage of these high-performance systems, most theater installations will require higher-powered amplifiers and improved speaker systems.

Dynamic Range: Theater is Now the Limit

For years, the Academy (mono) soundtrack was the limiting factor in cinema sound systems, and the frequency response and dynamic range of the soundtrack could easily be reproduced by the sound systems of the day. The introduction of Dolby matrixed 4-channel stereo and noise reduction to optical soundtracks in the mid-1970s made it necessary to install more pow-

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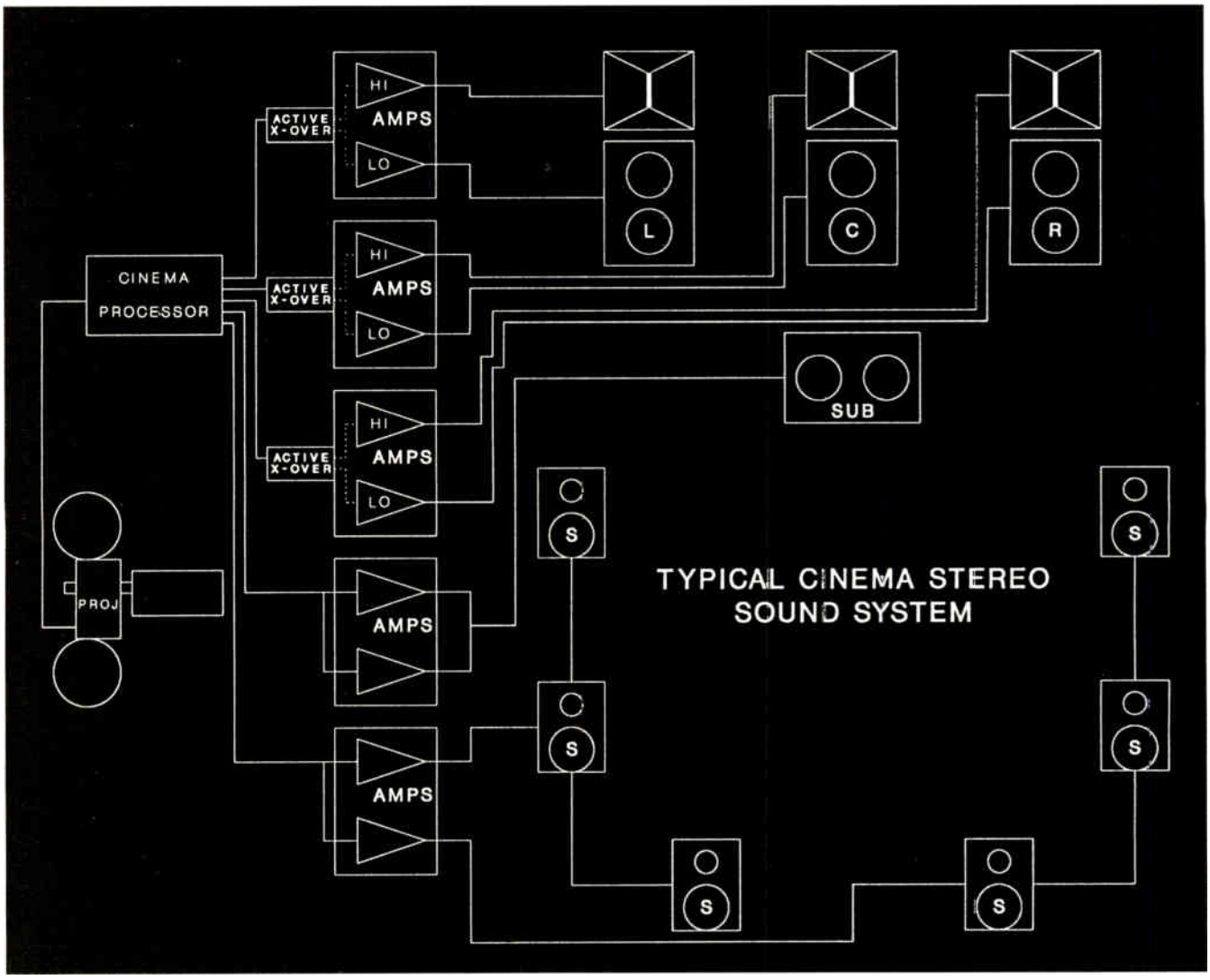

erful amplifiers and better speakers. The industry was not quick to respond and the theater became the limiting factor in audio performance. The work of John Eargle, Mark Engebretson and Tomlinson Holman in the early 1980s led to the development of better loudspeakers, more powerful amplifiers and the use of bi-amplification. The Lucasfilm THX sound system employs all of these features and serves as a good example of the techniques that a digital-ready sound system will need to utilize.

Digital Demands on Amplifiers

Digital soundtracks require optimal performance from all parts of the cinema sound system, and it is up to the theater owner to install the best possible components, starting now. It is much more expensive to upgrade later than to install a digital-ready system in the first place.

The selection of power amplifiers is a key factor in determining playback quality. Dolby Type A noise reduction allows 6dB peaks above the reference level; Dolby SR noise reduction allows 9dB peaks. A 3dB increase may seem small, but this requires a doubling of amplifier power to insure that clipping does not occur. Digital soundtracks will likely allow peaks of 15 dB above the reference level—an increase of 9 dB from the original Dolby Stereo. Such an increase requires eight times the amplifier power to eliminate clipping.

It may not be possible to increase power by this amount, but fortunately, it may not be necessary to do so. The increase in level can be accomplished by the use of speaker systems with greater directionality and efficiency. Speaker sensitivity is a measurement that indicates how loud the speaker will play at a distance of one meter. The sensitivity can be increased by making the speaker more directional, focusing more of the sound power to the audience. The other practical method is to increase the efficiency of the loudspeaker system by using multiple low-frequency speakers.

A typical small cinema loudspeaker has a sensitivity of 97 dB, driven from one watt and measured at a distance of one meter (1W/1m). This speaker could be used in an average auditorium with a 100W amplifier for a conventional stereo installation. It would be desirable to install a 200W amplifier to use this speaker for a Dolby SR installation. An alternative would be to use a large THX-style speaker in all auditoriums, even small rooms. The large speaker has a more directional horn that improves dialog intelligibility in any room at any volume; in addition, the dual-woofer bass enclosure has 3 dB greater sensitivity than its smaller counterpart. The sensitivity of a typical large speaker is 100 dB (1W/1m). This type of speaker can be used with the 100W amplifier for Dolby SR installa-

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tions because the 3dB increase in sensitivity makes up for the additional power that would be required. An additional 9dB increase in capability for digital soundtracks would theoretically require the use of an 800W amplifier with the smaller speaker—hardly a practical solution to the problem. A 400W amplifier could be used with the larger speaker to achieve the necessary output capability.

Better Sound through Bi-amplification

While a 400W amplifier is not totally unreasonable, bi-amplification is a better technique for powering speakers in a digital system. Bi-amplification allows the use of two smaller amplifier channels to take the place of a single, much larger, amplifier channel.

A conventional speaker uses a passive crossover located at the speaker to split the low and high frequencies before they are routed to the woofers and horns. Signal processing options with a passive crossover are limited: Some high-frequency boosting is possible, but little can be done to improve the alignment of the drivers in the time domain. The roll-off of the crossover is usually limited to 12dB/octave, which provides minimal protection of the high-frequency driver and causes a wider range of frequencies that can experience peaks and dips in the response due to interaction between the horn and woofers.

Bi-amplification allows the audio signal to be split into HF and LF portions *before* it is sent to the amplifiers. This requires two channels of amplification for each speaker, but the improvements in sound quality and output capability can be dramatic.

The ideal cinema amplifier should allow the addition of an active crossover to the amplifier as a plug-in accessory. In THX installations this is not required, as the THX crossover is installed in a special monitor or card frame. The plug-in approach is the most convenient and cost-effective means of using a bi-amplified loudspeaker. The crossover should contain circuitry to correct the frequency response of the HF horn and provide a delay to the low-frequency output to accurately adjust the time domain alignment of the woofer and horn. An active crossover can have sharper roll-offs—typically 24dB/octave—offering greater HF driver protection, while reducing the range of overlap between the horn and woofer frequency ranges.

The benefits of bi-amplification include reducing the chance of amplifier clipping and minimizing audible effects if clipping does occur. Let's look at an example of a typical 200W amplifier used in cinema applications. This amplifier can produce an output voltage of 40V RMS. For a bi-amped installation, assume that a high-frequency signal uses 10 volts from one channel, and a low-frequency signal uses the full 40 volts available from the other channel (LF information typically requires most of an amplifier's power.). This would require 200 W for the low frequencies and 12.5 W for the high frequencies, for a total of 212.5 watts—well within the capability of the amplifier.

For a passive crossover installation, the amplifier must reproduce the full frequency range with just one channel. For a worst case example, the high- and low-frequency voltages would add in phase (40V + 10V = 50V). A single amplifier would need to be rated at 312.5 watts to reproduce this voltage without clipping.

Bi-amped systems can play at the same levels with less total input power than passive systems. If clipping does occur in either type of system, it's usually caused by the low-frequency signal. This clipping produces high-frequency noise that is reproduced by the horn of a passive system; this noise is quite audible and can damage the high-frequency driver. In a bi-amped system, high frequencies will probably not clip. Clipping of the low frequencies can't send the damaging high-frequency distortion to the high-frequency driver, and the woofer does not reproduce this distortion at high levels.

It's important to install enough amplifiers to do the job correctly. The days of doing a stereo system with only two amplifiers is over. A minimum system will now require at least three amplifiers, due to the addition of a subwoofer and a second surround channel. Such a system would probably be acceptable only in the smallest of auditoriums, and it wouldn't provide the quality of performance that we've come to expect from digital audio. It would be short-sighted to install any sound system that is incapable of accepting two surround channels.

A Typical System

For small to average cinemas, a typical

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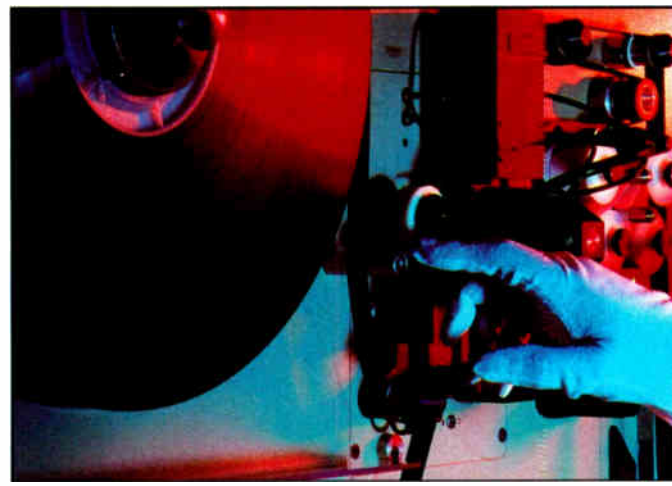

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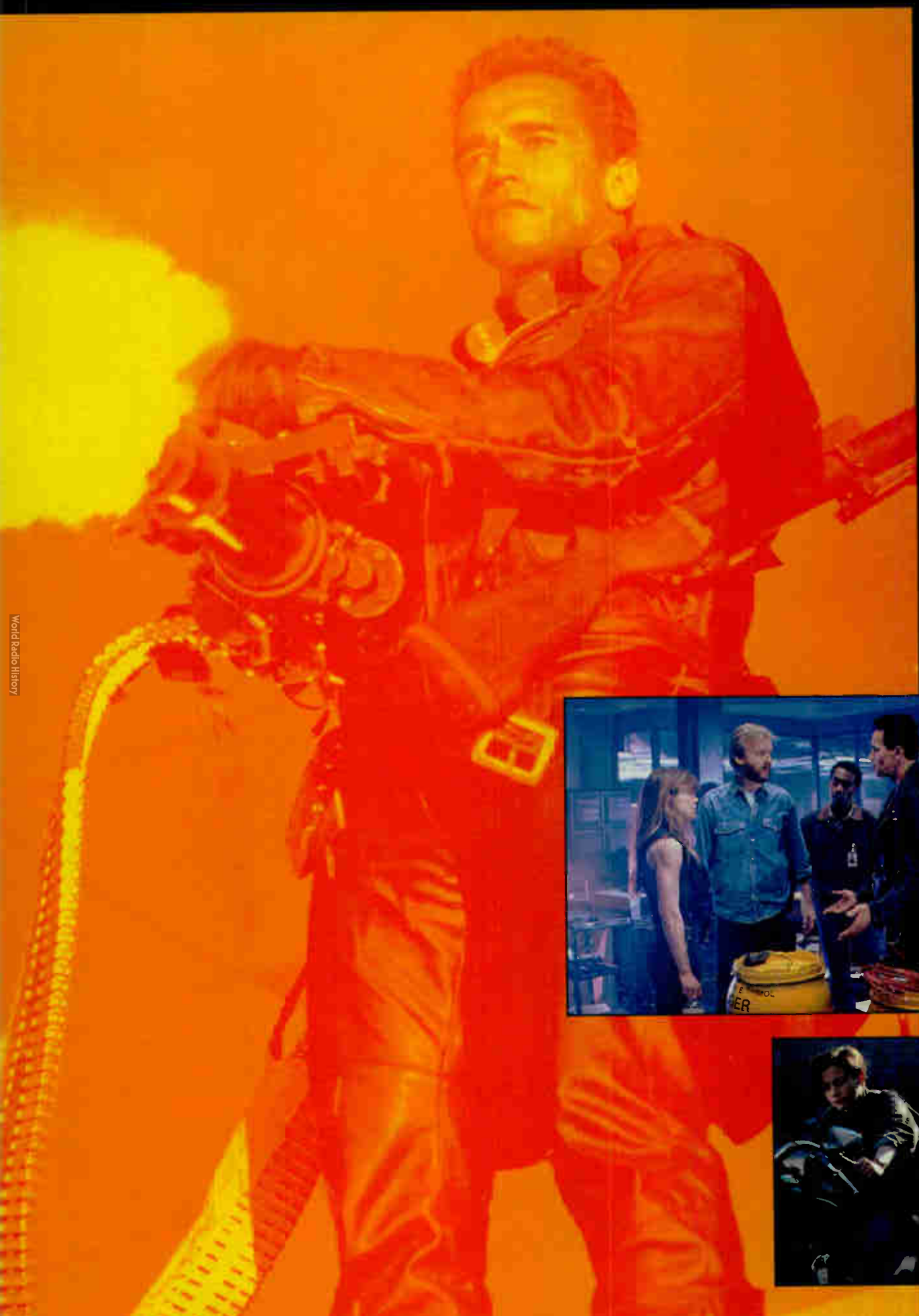

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Prerecorded sound effects, from the actual steel mill of metal and machines, captured on Sony 2000 R-DATs, reinforced the hyper-realism of* Terminator 2's *soundtrack.

double that in domestic sales alone. It came together in just a shade over a year, from first rough draft to its July 3 release date. And we all know by now that Arnold Schwarzenegger received a private jet in lieu of $14 million salary. Would it surprise anyone at this point that the sound of the wind in the opening scene comes from the crack of an open door to the main mix room at Skywalker Sound, and the sound of the crushed skull is actually a pistachio being crunched by a metal plate?

The re-recording on *T2* began at Skywalker Sound, San Rafael, Calif., on May 23, and it ended on June 21. That's four weeks, from premix to final to 70mm CDS master. And this is a big movie. With big sound.

"We had every mix room in the facility going," says Gloria Borders, sound supervisor. "We recorded all the effects in the movie before the sound crew came on—all the motorcycles, guns, cars, semis—knowing that when the editors came on we were going to have four weeks to cut the thing, and it *had* to be ready to go."

Two weeks before the premix, the film was still 2 hours and 45 minutes long. Because of a clause in writer/director/producer James Cameron's contract, a week before the premix it was cut to 2 hours 15 minutes. "We had about 2,000 units built, ready to mix," Borders says, "and they cut 30 minutes. It meant going into every single unit to take out a foot, then another bit, then 30 feet, then 50 feet. A lot of patchwork was done. We had 35 editors and assistants, and we worked non-stop. After we premixed it, we had very few picture changes, which was wonderful because then we could just go into the final, and that was where Gary Rydstrom took over and did a genius of a job."

Rydstrom, sound designer and re-recording mixer, would be the first to admit that he had plenty of help. Beside him at the SSL 5000 for the final sat Gary Summers for the music mix and Tom Johnson on dialog. All three credit the editors for delivering quality units under pressure. And through it all stood James Cameron, a hands-on director till the end.

"[Cameron's] approach to sound is hyper-realistic," Rydstrom says. "I wouldn't call it stylized, but everything is very big, and you can make it movie-sized. But he also likes it to be fairly authentic—realistic, but hyper-realistic. A sort of testosterone, macho approach to match what he's doing with the visuals.

"Your first thought when you see a lot of special effects is that sound's job is to not only do something as fantastical as the visual, but also to make it real. It's not competing with the special visual effect, because people perceive the visual and the sound differently. [Sound designer] Walter Murch had a way of putting it: 'The eyes are the front door, and the ears are the back door.'"

What *is* the sound of a nuclear holocaust coming in through the back door? Or a liquid-metal Terminator walking through steel bars?

SOUND EFFECTS

The gathering of sound elements began unofficially in November 1990, when Rydstrom visited the steel mill set used for the climactic final sequence in the film. Production granted post-production two days of access to the mill, and two Skywalker recordists, Scott Chandler and Tom Myers, armed with Sony 2000 R-DATs, came back with seven hours of metal and machines on tape.

"Most of what's in the film is ambience, like steam hisses, metal clanging, conveyor belts," Rydstrom explains. "The conveyor belt that Arnold comes up on in the end before shooting T-1000 is a conveyor belt from the steel mill. In the fight scene [between the two Terminators] you hear some of the sheet metal being dropped."

From November on, sounds were gathered, often from the field, and sometimes created in the studio by Rydstrom and assistant sound designer David Slusser. Video arcades, car crusher junkyards, and all the vehicles and guns were recorded to DAT. The sound for the motorcycle that Arnold drives comes from a Harley owned by a construction worker at Skywalker Ranch. People brought in dirt bikes, SWAT vans and all sorts of specific vehicles. Though production provided the actual motorcycles and semis from the film, they were used mainly for

***Sarah Connor (Linda Hamilton) as the tough warrior/mother in* Terminator 2: Judgment Day.**

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suspension squeaks and running over boards, not for engine sounds.

Production also provided many of the guns used in the film, including the hard-to-find Mini Gun that Arnold uses in the police shootout outside the Cyberdyne building. Three recordists went to the Stembridge shooting range outside of L.A., two with R-DATs and one with a Nagra (with Dolby A card). "I was thinking of combining the R-DAT version with the Nagra," Rydstrom says, "trying to get the snap of the digital sound. It usually has a nice transient snap to it, but sometimes doesn't have the full-body punch of the Nagra." The R-DATs were coupled with Sanken M-S mics; the Nagra had a Neumann on one channel, a Schoeps on the other.

When you record a Mini Gun at full speed, Rydstrom says, it doesn't sound like a machine gun, but a rapid-fire spray. So, it was recorded at less than top speed, then speeded up in sound design, with a touch of EQ added and a thunderclap from the house library to sweeten the initial burst of sound.

"That was a fun scene to do," Rydstrom says. "The difficulty was that he is so in control of shooting this gun, that the destruction he creates has to be within reason. It has to be such that you don't believe any cops are dying. So, we couldn't use ricochets, because standard Hollywood ricochets would imply that the bullets are flying out of control and killing somebody. And we couldn't use explosions on the cars, which look like they are exploding, because they weren't exploding. They were just being demolished to the point where they would collapse. It was tricky to just use hits on metal and glass breaks, and suspension drops and ricochets that sounded like thuds."

The wind sounds, so ominous in the beginning of the film and so prominent in the desert scene, were often performed off of a Synclavier. "Some of that, I have to admit, is me going 'whooooo,'" Rydstrom notes. "Some of it is from the door to the mix room that I usually work in. By playing it on the Synclavier, you can put in as long a loop as you can afford to. You set the octave ratio on the keyboard so that it's not in usual steps—much smaller musical steps—then you just put long attacks and decays on the wind and ride the pitch wheel. Very often you can perform the wind while watching the picture."

The biggest sound design challenge, however, was the sound of the T-1000 Terminator moving into and out of liquid metal, the quality that makes him virtually indestructible. "It's not really liquid, because it doesn't look like mud," Rydstrom says. "It doesn't have any bubbles in it. It doesn't gurgle. It doesn't do anything visually except flow like mercury. But mercury doesn't make a sound. It's very silent."

So Rydstrom and Tom Myers, his assistant, developed a number of sound elements, sampled them into a Synclavier, and played them against picture to see what worked. When the T-1000 is just sort of flowing and transforming, that's Rydstrom spraying Dust-Off into a flour and water mixture, with a condom-sealed mic stuck in the goo. "It would make these huge goopy bubbles," he says. "And the moment when the bubble is forming, it has this sound that's similar to a cappuccino maker, or a milk steamer. Funny enough, it had this metallic quality to it, so I believed it. And it also had sort of an evolving quality to it, so I believed it for transformation."

For the sound of bullets hitting T-1000, Rydstrom slammed an inverted glass into a bucket of yogurt, getting a hard edge to accompany the goop. The sound of T-1000 passing through steel bars is nothing more than dog food being slowly sucked out of a can. "A lot of that I would play backward or do something to," Rydstrom explains, "but those were the basic elements. What's amazing to me is the combination of Industrial Light & Magic using millions of dollars of high-tech digital equipment and computers to come up with the visuals, and meanwhile I'm inverting a dog food can."

Processing on the effects, as with the music and dialog, was pretty standard. There was no time to be outrageously experimental—Lexicon 224s and 480s, Quantec QRS XLs, and an AMS Harmonizer or two. Sometimes Rydstrom would feed the Lexicon back into itself, sometimes he would flip-flop it on the Synclavier for a truly reverse delay.

MUSIC

"I think the score in this movie works as sort of the driving element that holds parts of the mix together," Rydstrom says, "something that keeps driving the scene forward without telegraphing the suspense. Using score in that traditional way has been used so much that it loses its impact. So we did other things to give dynamics to the scene. It's not traditional screeching violins leading up to a fight scene." Often it is just

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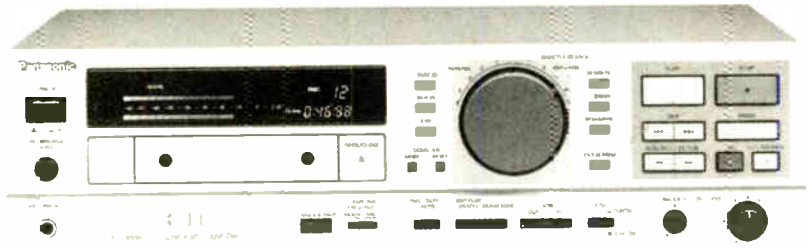

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a soft "boom boom" from the percussion track, as when Arnold lands his Harley after a short, silent flight in the canal chase scene. And sometimes it's delicate guitar in the desert.

The soft yet militaristic score was composed by Brad Fiedel and mixed in the final by Gary Summers. Fiedel was on the tightest of tight schedules, still composing as the mix was taking place, sometimes delivering cues for the second half of a reel as the first was being finished. It wouldn't have been possible, according to Summers, without Fiedel's chain of three Fairlights.

"He did all the sampling and sequencing from the Fairlights," Summers says. "He would do that over to 24-track and mix down. Then he would deliver to me, per cue, two or three 3-tracks—basically a left-center-right mix of percussion, strings, and maybe some synths. He would separate out the different groups so that we could rebalance or whatever.

"[The score] was mixed very well by Brad," Summers adds. "I did very little to it, some EQ and reverb occasionally. I had a 224 and two Quantecs for the music, so I could filter it as well as put it into rooms. I like the rooms on the Quantec—the small-room programs are great."

T2 was mixed in a THX monitoring environment, and no surround sound was laid on the masters. "Surround is what we call magic surround," Summers says. "The out-of-phase component will automatically go to surround. Now when I'm making the 70mm master, we have our 18 channels in the board—music, dialog and effects separate. I take the left-center-right of the music and send that to left-center-right of the 70mm master. But I also feed it into the DS-1, and I bring that up in the console and add it in as a discrete surround.

"We were mixing in a discrete, split-surround 70mm format," he continues, "and in the monitor mix, I was listening to that magic surround component. I was hearing the whole time what was going to happen, although none was going down on tape. It's a little bit complicated, but it worked out real well, and it gave me free tracks on the recorder."

DIALOG AND FOLEY

According to Gloria Borders, around 70% of the dialog in the film and most of the breathing is ADR, which should not surprise anyone, since most of the

—CONTINUED ON PAGE 116

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World Radio History

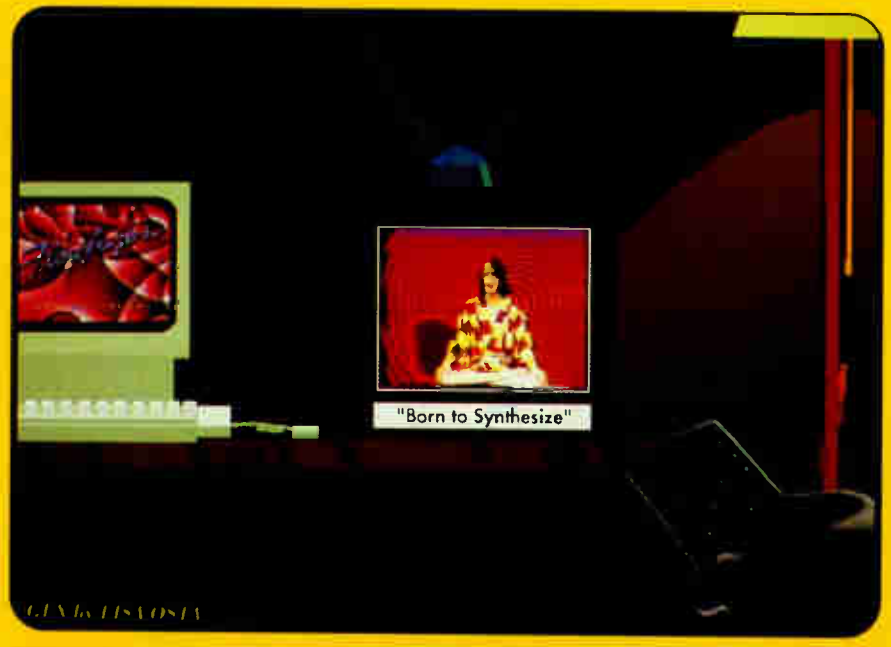
by Paul Potyen

SEYBOLD DIGITAL WORLD CONFERENCE

IS IT REAL OR IS IT DIGITAL?

In the L.A. area, where commute distances can be measured in light-years, it's a little-known fact that you can actually *walk* from the Beverly Hilton Hotel to Rodeo Drive without packing a big stash of sunblock and a canteen (although in this particular desert, one also has the option of drinking from a lawn sprinkler). And the chances are good that at some point during that ten-minute walk from the posh hotel—sight of the recent Seybold Digital World Conference—to the famous avenue of tastefully haughty boutiques, you will be hit up for spare change. I know.

It was, for me, an arresting juxtaposition of contrasting events, in a part of the world known for contrast between opulence and deprivation. This second Digital World Conference was bristling with bright, creative minds—people like Steve Jobs, Nolan Bushnell, LucasArts' Steve Arnold, Sony's Takao Ihashi and author/producer/editor Christopher Cerf. Utopian visions of the future were rampant, spirited dialog was in evidence, and emerging digital technology was the order of the day. It was a technology junkie's smorgasbord: three days of sessions covering a wide range of topics, including digital video (the last significant roadblock to true multimedia), infrastructure and standards, digital telecommunications, and intellectual property rights in interactive media. The sessions were complemented by a demo center where high-tech companies unveiled their latest offerings.



Screen image from Todd Rundgren's QuickTime Video Room. This section of the interactive CD-ROM prototype shows a remote control unit (bottom right), which is used via mouse to play archived Rundgren videos on the Mac.

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SuperMac demoed its VideoSpigot Pro digital video and audio system.

It's About (Quick)Time

For those who were hoping for new developments around the next bend, rather than somewhere out on the horizon, the announcement of QuickTime multimedia extensions by Apple, along with an associated family of third-party applications, was exciting news. QuickTime offers software-based digital video and audio for color-capable Macs with at least a 68020 processor. The new software package incorporates a flexible new file format called a movie, which can contain (and offer effortless synchronization for) separate time-dependent components such as video and audio.

Movies created using the QuickTime movie format can be imported into and played from other applications, such as HyperCard 2.0, MacroMind's Director and even word processors like WordPerfect. QuickTime utilizes software-based digital video compression and JPEG (Joint Photographic Experts Group) standards for compression and decompression of still images and animation. Stereo and mono digital audio is supported in 8-bit and 16-bit resolution, and with independent sampling frequencies. Designed as an Apple System 7 extension, QuickTime is also compatible with System 6.0.7, and is expected to be available in the fourth quarter.

While playback of QuickTime movies requires only the QuickTime extension, recording of video (and audio) into the Mac requires additional hardware. Several manufacturers, including Radius and RasterOps, offer video-capture and playback boards, but SuperMac (Sunnyvale, Calif.) demonstrated two of its own solutions—VideoSpigot ($499) and VideoSpigot Pro ($1,899)—that take advantage of QuickTime. SuperMac also unveiled a software package called ReelTime. It provides for sophisticated editing of video and audio on the Mac, and initially it will be bundled with both video boards. VideoSpigot Pro offers accelerated 8- and 24-bit graphics support on Mac IIsi computers with monitors up to 21 inches. VideoSpigot Pro users will need only an NTSC encoder to transfer digitally edited broadcast-quality presentations to videotape. However, a caveat is appropriate here: Be aware that such transfers involve significant computing power and could take a long time. Be that as it may, it is true desktop video at an affordable price. I'm impressed.

Several other companies presented their own QuickTime-based video solutions. DiVA (Cambridge, Mass.) showed its VideoShop sequencing, display and manipulation environment for QuickTime movies. Light Source (Greenbrae, Calif.) announced MovieTime, which allows conversion of VHS videotapes into QuickTime digital movies using the NEC PC-VCR and any flavor Mac II with a video capture card. MovieTime will work with any Quicktime-compatible compression algorithm. Light Source has licensed the product to Apple for inclusion with QuickTime. According to Ty Roberts, co-founder of Light Source (who comes from Lucasfilm software spinoff Pixar, and who was also instrumental in the development of StudioSession for the Mac), his company will be rolling out its own video editing software in the first quarter of '92. And on the IBM PC front, Fluent Machines (Framingham, Mass.) introduced its Fluency hardware/software family, which offers video and audio capture and playback over networks using Windows 3.0.

The Sessions

While it was generally agreed that the trend toward exchange of digital information among the worldwide consumer market is inevitable, there was a variety of visions about how and when the network architecture will be accomplished. Jim Clark, founder of Silicon Graphics, described a digital decoder and network controller that would replace your cable TV box in the next three to five years. It would provide subscribers with such services as on-demand digitally encoded movies. Trip Hawkins, founder of Electronic Arts, agreed with that vision, adding that it could also be used for interactive games, simulations and such things as instant shopping. Seth Homayoon of Northern Telecom offered his view of enhanced information services over wideband telephone lines, complete with a souped-up telephone as the interface. He described a pilot project called "Mississippi 2000," which currently provides a location-independent interactive learning environment in Mississippi via telephone networking.

Tom Edrington of Raynet Corporation discussed the development in the '90s of ISDN, FITL (Fiber In The Loop) and SONET (Synchronous Optical

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Network) systems capable of handling data at more than 150 megabits/sec. (Compare that to the 1.5 megabit/sec rates of the '70s.) And Jim Albrycht of Digital Information Management and Technology advocated the use of EtherNet via Cable TV (ETV) as a platform for interactive personal services.

Didier Le Gall of C-Cube discussed the current status of the MPEG video compression standard, and outlined MPEG II, a suggested superset of MPEG I. And Steven Blank of SuperMac predicted the emergence of MPEG CD-ROM playback devices on computers in the next year.

The highlight of a "show and tell" session on new creative media was Todd Rundgren's new video, *Change Myself*, a feast of special effects created using an array of NewTek VideoToasters and Amiga computers. Light Source's Ty Roberts also demonstrated a CD-ROM of QuickTime movies and stills he assembled from Rundgren's extensive video archives. Rundgren is reported to be excited enough about the possibilities of the new media tools that he intends to go into business as a "multimedia record producer," creating CDs with interactive liner notes, QuickTime movies, animations and still images, along with digital audio using a Macintosh.

Conference attendees saw one of the most powerful manifestations of CD-ROM technology in "The Procession Within," a collection of still images and narration on disc created by photographer Pedro Meyer. The project, which also included an effective soundtrack, chronicled the last three years of his parents' lives. The Voyager Company plans to publish the CD-ROM disc.

Among the other highlights were a lively debate about where the markets are—and will be—for the new technology. The panel, which included Bob Stein, president of Voyager Company, venture capitalist Miles Gilburne, Tim Mott, president of MacroMind, and Peter Blakeney of IBM, covered a wide range of issues without coming to much of a consensus. Blakeney's comment that "there is already a $100 billion corporate training industry that is largely untapped" seemed an appropriate reflection of IBM's slant on things, and launched one of the many interchanges between IBM and Macintosh advocates during the three-day event.

Finally, a team of lawyers from Irell & Manella joined Federal District Judge Steven Wilson in a mock trial on the use of a movie clip from *West Side Story* in an interactive CD-ROM product. It was a clever idea, skillfully executed and, together with the subsequent discussion, educational and entertaining. The issues are thorny, and experts agreed that a similar legal scenario is likely unless the creators of this new generation of intellectual property can organize and lobby the government for legislation similar to the compulsory license agreements we see in the music industry.

Once again, Digital World provided an exciting and fertile atmosphere for an exchange of ideas among those people in a position to bring the new digital technology to the marketplace. I wonder how long it will take for these ideas to become real enough to trickle down to the guy who hit me up for spare change. ■

Paul Potyen is an associate editor at Mix *and a sensitive American male.*

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Chip Shots

Last month we talked to James Grunke of Atari computers, as well as a number of software developers, about Atari's place in the pro audio market. This month, as promised, I'd like to follow up with a brief "State of the Software" report for Atari.

ADAS

Perhaps the biggest news for Atari ST users who are looking for a digital audio system is the appearance of the ADAS. Designed and built by two British companies—D2D Systems and Plasmec—this system provides stereo recording and playback to and from a hard disk at 44.1 and 48kHz stereo sample rates and 16-bit resolution. The pro version, aptly called ADAS Pro, consists of a 1U rack-mount box with level meters and a DMA/SCSI converter controller card that connects to a 40MB SCSI hard disk and to the computer, and a software bundle that must be copied to the hard disk. An optional S/PDIF card is also available.

Audio files can be edited into a cue sheet, which can be controlled via internal clock or synched directly to MIDI Time Code via the Atari MIDI ports. SMPTE synchronization can also be accomplished by means of an optional hardware interface. A desk accessory version of the software allows operation of sequences to be run concurrently from either Steinberg Cubase or Cubeat, or C-Lab Notator or Creator—a very important feature for those who want to take advantage of the MIDI domain *a la* Opcode's StudioVision for the Macintosh.

The program does not offer waveform editing or DSP. I was unable to obtain a system for evaluation in time for this report, and I was told by the U.S. distributor Digital I/O (Marina Del Rey, Cal.) that ADAS Pro has been submitted to the FCC for approval. I was also told that, when approved, the system will be very competitively priced. Stay tuned for details.

Sequencers

Leading the pack of full-featured sequencers for the Atari are two

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German offerings: Cubase 2.0 from Steinberg and Creator from C-Lab. Both are readily available in this country—Cubase from Russ Jones Marketing (Northridge, Calif.) and C-Lab from Thinkware (San Francisco).

I had an opportunity to play with Cubase 2.0 and was impressed with its features and overall ease-of-use. The program supports all the bells and whistles of a high-end Macintosh MIDI sequencer, and I suspect a few more. A built-in MIDI processor allows easy chorusing and pitch-shift effects in connection with Steinberg's M•ROS (MIDI Real-Time Operating System), a program that creates a multitasking environment for the Atari. Included with Cubase, M•ROS functions in much the same way as Apple's MIDI Manager for the Mac. Another inherent advantage of the Cubase-M•ROS combination is the variety of synchronization options it provides, including direct internal and external SMPTE sync, internal and external tempo sync, MIDI Time Code and Human Sync.

C-Lab's Creator has traditionally been regarded as the other high-end sequencer for the Atari, but with its recent redesign, KCS Omega from Dr. T's Software is now a third viable alternative.

Editor/Librarians

Atari editor/librarian programs for individual synthesizers are available from Dr. T's, Steinberg and SoundQuest, among others. For those looking for a universal editor/librarian, there is X-oR from Dr. T's (Needham, Mass.) and MIDI Quest from SoundQuest (Toronto). I took advantage of the opportunity to check out X-oR, and found that despite a somewhat daunting installation and setup procedure, the program was easily customized to my system. Profiles are included for almost every MIDI synth and drum machine imaginable, and help files are available for dealing with the idiosyncracies of each one. A MIDI switcher is recommended, and X-oR can easily incorporate it into your system for increased automation. (For those who prefer to manually plug and unplug MIDI cables, the software will even remind you what you need to do!) ■

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not in a strictly harmonic sense—just the way it operates as a melody. Nursery songs are loaded with that kind of attitude.

Bonzai: Was this in the South?

Kottke: I was born in Georgia, so I would have heard it then and there. But I remember noticing music in general when we moved to Michigan. We moved every couple of years. Then it was the radio in my father's car. And I was as interested in the dial as I was in the sound. I liked the glow of the thing and the smell of my dad's cigar, which I don't enjoy too much anymore. All of those experiences have stayed with me, especially that emotional quality and the sense of place, the feeling of geography that I get with music.

Bonzai: What is the first song you wrote and when?

Kottke: I started on the violin when I was five and started the trombone when I was about eight. I know I tried to write something on the trombone after hearing a particular record. Jimmy Giuffre had a trio and made two records with Jim Hall and Bob Brookmeyer. One of them was called "Travelin' Light." I was listening to it at a trumpet player's house, and I remember going home and trying to find it on the trombone. I came up with some kind of melody, so that would be it. The first time I tried to generate something.

Bonzai: No lyrics?

Kottke: No lyrics. The first lyrics came later, when I was in high school, an imitation of Lester Flatt meets Leadbelly. It was a terrible piece of stuff. The first one that kind of stuck for people who had to hear it was a song I wrote called "Louise," not to be confused with Paul Siebel's "Louise," one of the great tunes for guitar and voice. It was a blues thing with a slide.

Bonzai: Did you ever have a teacher?

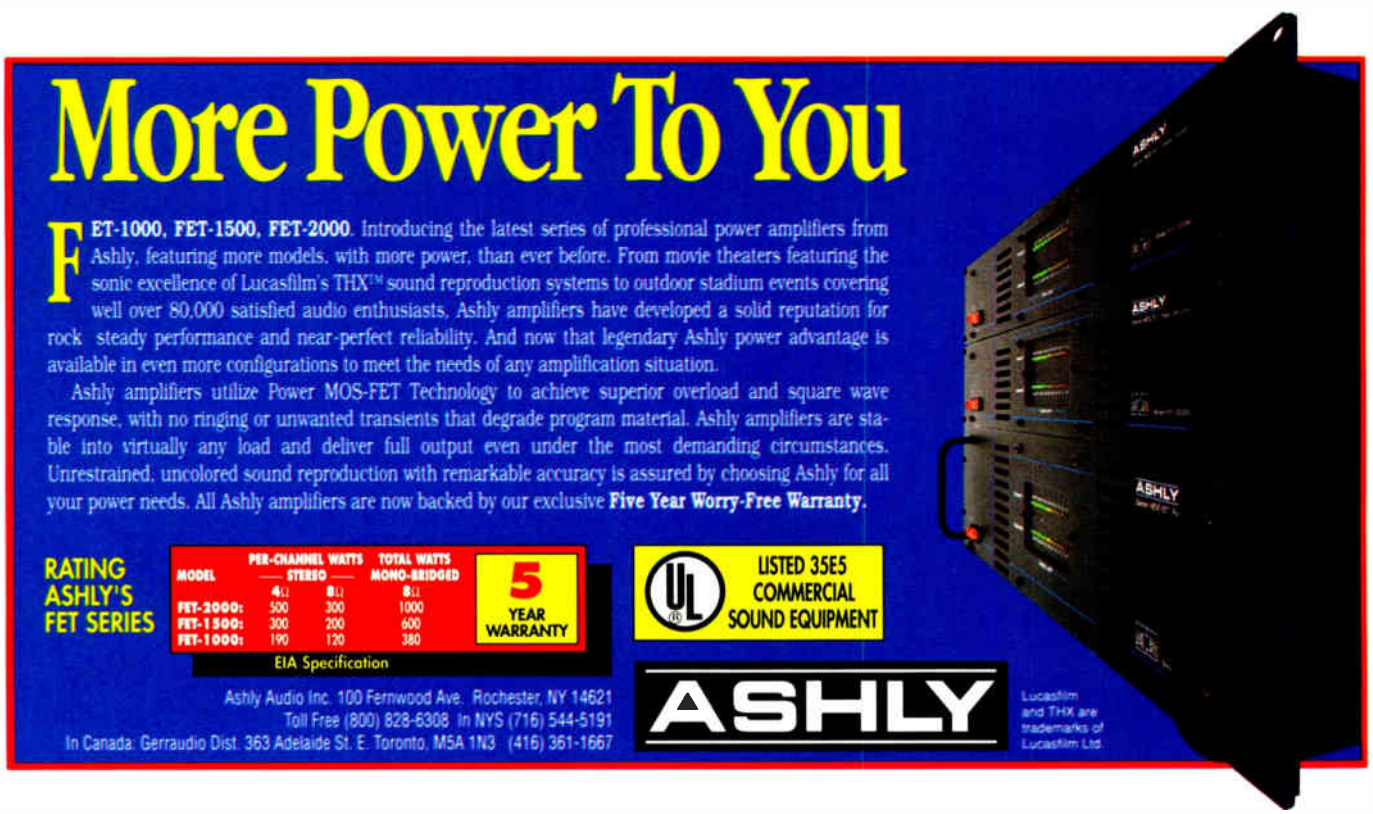
Kottke: Not on the guitar, but I went through about three trombone teachers, who I don't think liked me very much. One of them was playing bass trombone for the Tulsa Symphony, and he sent me off to the state music competition with a piece called "Down Home on the Farm." You walk out in front of three judges, and you announce your piece and then play it. Just announcing the title got a big laugh from the judges, and when I played the first few bars they were done for. All I could think of was this teacher of mine sitting back home in Tulsa laughing his head off. He didn't like my tone. He was convinced that there was something tragically amiss with my embouchure.

But I ended up playing the trombone because of an embouchure problem. I tried out for the flute in Cheyenne at my grade school. The idea was that if you could make a sound on the instrument that you preferred, then you could borrow it for a year. I asked for a flute, and the teacher said my lips were too big, and gave me a trombone. I stayed with it for about nine years. It says something about my character, or lack of same, that I took whatever they gave me.

But I really wanted to play, and fortunately I found the guitar. That's really the instrument that I'm best suited for.

Bonzai: When you're composing or playing, do your hands have a mind of their own?

Kottke: When things are going right, yeah. When things really work well, the reasoning, tracking part of my brain just parks itself and remains disconnected. It's the part that remembers or



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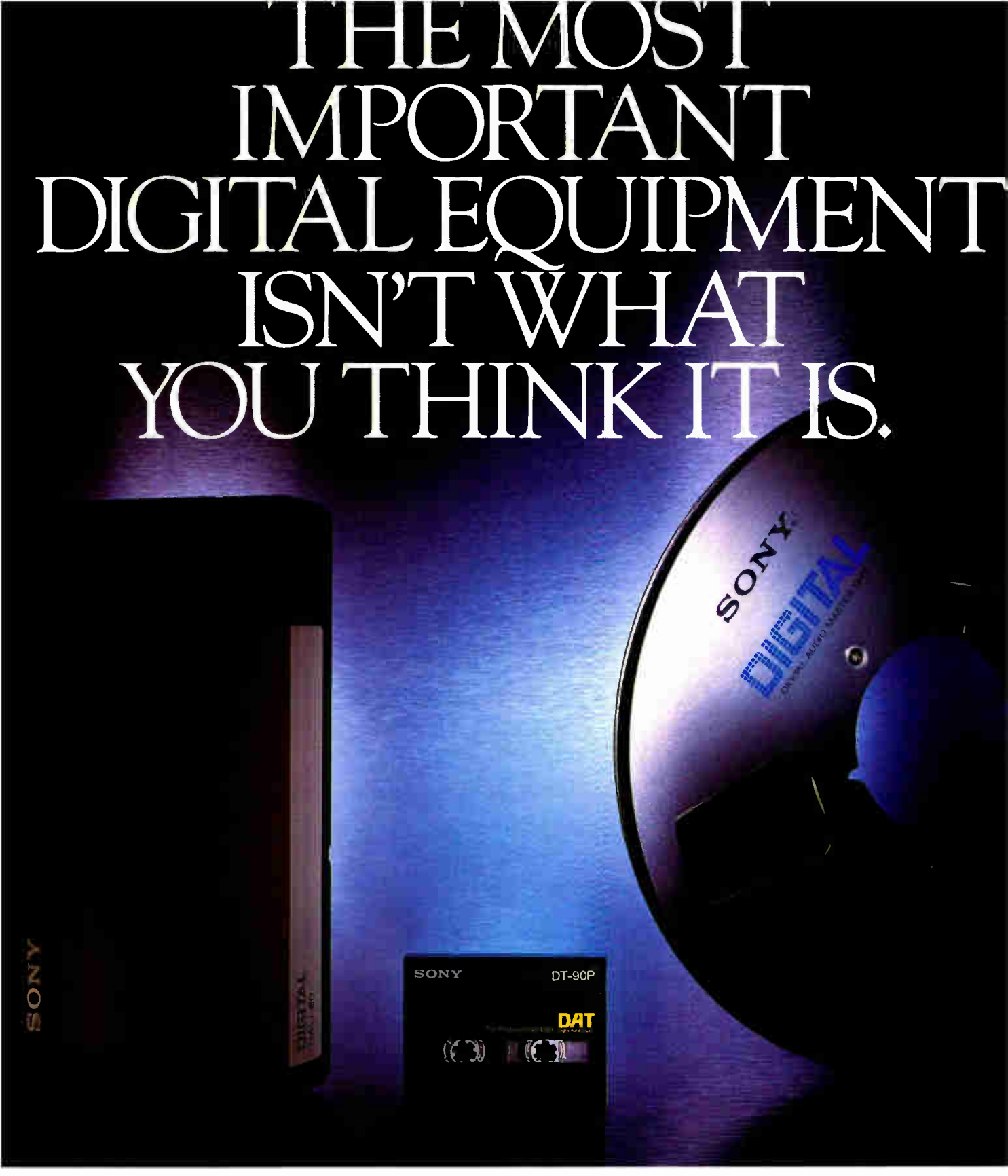

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notices when something good happens, but it's the same part that screws everything up when I can't get it to relax. So, it waits—that's its job.

Bonzai: Maybe it's the deeper, reptilian, instinctual brain that's playing.

Kottke: [Laughs] Yes, it may have preceded me. I don't mean to be lofty about all this, but it's more for me a process of tuning in on that frequency and getting the transmissions that invent something. I like the idea of the reptilian brain—I know it's in there somewhere.

Bonzai: While composing, do you hear the music in your mind first, or do you discover things while you're noodling around?

Kottke: It's the latter, absolutely, although I did work on a movie called *Little Treasure* and generated something in my head and then worked it out on the guitar. That turned out to be a pretty satisfactory approach. I've tried it again since with a tune called "Ice Fields," and it can work. It involves finding a melody, just a melody, which I ordinarily don't pursue. Rather, I don't think of melody being disconnected from the rest of what I do with the guitar. But if I find a melody that I like and bring it to the guitar, it can be really rewarding. But I don't do it very often. It's hard for me to think that way. I think better through my muscles and with the instrument.

Bonzai: How many guitars do you have?

Kottke: Far too many. I went through several years where I would buy a guitar because I thought it was good, and if I just took enough wood out of it, changed the finish, the strings and so forth, it would really be great. So, I have about 20 guitars that are wrecks because I exercised my ideas on them.

Bonzai: Physically, you get out the tools and operate?

Kottke: Yes. One time, it involved stepping on the back of the guitar, which happened as an accident. An accidental kick got rid of the low midwoof that had always plagued me, which is a problem with a lot of guitars. I took one of the instruments, which suffered from that problem, that I had already decimated, and set up the same situation—leaned it up against the wall, took a step backward and stepped into it. And it worked. It eliminates a certain part of the frequency spectrum, or lessens it.

Bonzai: Who are the good builders of guitars?

Kottke: There are several. Geoff Elliot, from Seattle, builds extraordinary guitars, almost exclusively classical. I have two of his. There is a builder named Bob Benedetto, who makes arch-tops that are beautiful to look at. Both of these guys build instruments that are breathtakingly beautiful to see and sound wonderful. And they have two different philosophies.

I have to throw in a plug for my signature model 12-string that Taylor is building. Bob Taylor and I spent about four years sending prototypes back and forth, and talking about what I thought a 12-string needed in order to sound good. They tried everything I suggested and finally came up with a guitar that I am glad is available. It's very hard to find a decent 12-string because they usually have too much wood in them, and they are not pointed in the right direction from their inception. So, I'm very happy with that guitar—the best 12-string I can find. It's nice to know that they're being built in a way that makes them playable, because they're such cantankerous instruments. To find a good one has been a matter of luck. Now you can actually go out and buy one right off the wall.

Bonzai: Who's influenced your development?

Kottke: There are an awful lot of them. I continue to operate off of ideas that I heard Pete Seeger using. He made a record in '55 called "The Goofing Off Suite," which was folk music, but instrumental renditions of common melodies, including Beethoven's Fifth. He's a great player. He made a series of records for Folkways that were instrumental. I finally met him once in New York and asked him when he was going to do some more instrumental recordings. He told me, "I'm too old for that." I don't believe him, because he has a very unique way of approaching rhythm, which is a challenge when you play with your fingers on the guitar. There's a lot of him in my music.

And in a very strange way there's a lot of Kenny Burrell in what I do, because I could never approximate what he was up to. I didn't know enough actual harmony, whereas a lot of Pete Seeger's stuff I could find by just playing a 1-4-5 kind of route. It was more a right-hand search. But I saw Kenny Burrell perform a couple of times at the Showboat Lounge in Washington,

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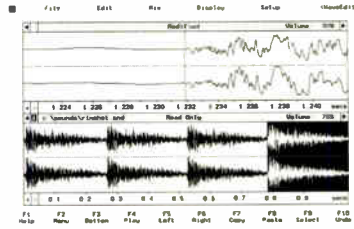

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D.C., and he really stuck with me. When I hear him now, it's an attitude in his playing that I think I use, or at least admire and try to find.

Recently, I don't seem to zero in on any one place. The name that comes to mind most often, though, is Pierre Bensusan, who has recorded a few things that give you a glimpse of what he plays live. He improvises a lot and plays things like tangos and an odd mixture of Irish and French folk sources with a pretty sophisticated harmonic concept. He's a very good improvisor, and can move around the keys and the fingerboard without any trouble. He has a great rhythmic touch. I guess I'm drawn to that more than anything else—finger-style players who have a unique approach to the problems of rhythm on the guitar.

Producer Steve Berlin (L) and Leo Kottke with engineer Bob Schaeper at L.A.'s Brooklyn Recording Studio.

Bonzai: What about this new album—you're singing on all the cuts...

Kottke: Well, there is one instrumental on tape, but whether we end up using it or not is another story, and it's a very uninstrumental instrumental. It doesn't do much, it's more of a repetition than a song. Everything else is vocal. I wanted to do that because it gives me a chance to do more with a band. It's easier to work out an arrangement that includes other players if you don't have to keep that guitar—especially with my style—free and clear, or as free and clear as you can get it.

Bonzai: Haven't you in the past referred to your singing voice in self-deprecating ways?

Kottke: Yes. I did in '69, and it's haunted me ever since. My voice did stink then. It really stank.

Bonzai: In listening to your most recent albums, I thought your singing voice sounded a little like Frank Zappa. Did anybody ever mention that to you?

Kottke: No, but I hear that now that you mention it. I'm glad to hear that.

Bonzai: And your spoken-singing style reminds me of Garrison Keillor's approach.

Kottke: Yeah, we are in the same register. One of the reasons I stank so badly in '69 was that I couldn't admit that to myself. I thought I was a tenor. It was hopeless.

Bonzai: Getting back to the new record, are you pleased with this new singing phase of your career?

Kottke: Yes.

Bonzai: Is it going to shake your audience up?

Kottke: Oh, yeah. As usual, there isn't anything I can do that will really answer the demands of my audience. They're so spread out in every which way, with a lot of different tastes. I hear it all the time, since the beginning, from club owners and promoters, that you can't define my audience one way or another. There are people who come who you don't frequently see with each other. Another common comment I get is, "Jeez, these people would be at each other's throats in any other situation."

It's always dangerous for me to even think about who listens to this stuff, 'cause if I do I know I'm going to irritate some of them no matter what I do. There are vocal fans, instrumental fans, people who want to hear it solo, hear it with a rhythm section. They're pretty opinionated about it.

Bonzai: So, you're a brave soul bucking the marketing folks?

Kottke: I've been lucky. I don't have any industry horror stories. I've been allowed to do pretty much what I wanted to do when it comes to records. It has worked for me in a commercial sense, but I'm aware that most people spend a little more time deliberating about it. I just sort of indulge myself and it does seem to work out.

This new record definitely has more in it than anything I've done in a long time. That's generated by the lyrics and the way the instruments are working, the arrangements, more than by the singing itself or the sound of my voice. It gives me a chance to include some of what I do performing live, because I love to talk to an audience. There's something additional that happens in a set, which I have never been able to get on a record. And that includes recording me live and putting it on tape—but it sounds wrong that way.

Early on I ran into the fact that there is a difference between "live" and a record that dictates a different approach to each form. They aren't the same thing. The people who can do both well are few and far between.

Bonzai: With your wisdom at this late stage in your life, if you could go back and run into Leo Kottke at 20 years old, what would you tell him?

Kottke: I should think about that one. I'm overwhelmed by the opportunity...

Bonzai: Let's come back to that thought. Speaking of audiences, would you like to have a bigger audience than you do now?

Kottke: The perfect-size room in my experience is 3,000 seats. There is something magical about that size. I was tickled to read the same thing in Arthur Rubinstein's autobiography. I don't often play to a room that large anymore, but wouldn't care to play to

PHOTO MR BONZAI

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rooms larger than that ever again. I have done it when I was hot and...

Bonzai: When you were hot? Is this a period in the past? Aren't you hotter than ever now?

Kottke: Well, maybe we have to define our terms. By industry terms, I got to 28 or 29 in the *Billboard* album charts a couple of times in the late '70s. That's what I would call "hot" in my career. But I've always had two careers: recording and performing. Performing has been consistent in terms of how much I work and how good the work is. I haven't suffered any of the dumps that seem to be common for a lot of players. But I definitely don't sell *that* many records. On the other hand, last year was the busiest I've ever been, and I made more money than I've ever made. So, it's odd. I run into people who say, "Jeez, everybody knows who you are now," and others say, "God, where have you been all these years?" I think they both might be right.

Bonzai: Does your clock run slower than most people's?

Kottke: I think it does. I know I talk slower than a lot of people. And I inject long pauses at inappropriate times. As a kid, when I expected to live my life as a trombone player, I noticed that there were two tempos at which I could function. One was very frantic, and the other was the one that I chose, which is kind of glacial.

Bonzai: Do you think that speed or pace is showing itself in the overall unfolding of your life, as some people mature later?

Kottke: I do think so. I'm a slow learner, slow developer, and what amazes me is that even in the depths of my ignorance, things seem to be progressing in a humane fashion. What I've learned with that "wisdom" you asked about is that there is no point at which the level of my ignorance is really much less than it's ever been. But as I go along, I do learn more and more. And I've developed some respect for my own blindness. It doesn't disappoint me anymore that I don't really know what's going on, and I don't feel as compelled to figure it out. It dawned on me somewhere along the line that no one has, and everyone has tried. I can get along pretty well by paying attention to other people's efforts, including my own experience.

That's something I might tell that guy who was me 20 years ago. I was operating at the same pace I am now. I would tell him there is no rush. Trust your senses and accept it.

Bonzai: Ever thought about what music you'd like played at your funeral?

Kottke: I have! Yes, I have, a lot. And I've come down to *no* music.

Bonzai: That's what Leonard Cohen told me.

Kottke: Is that right? Hmm. Yes, I'd rather have nothing. That's my funeral; I'm done. And I know if they played something of mine, I'd want to jump out of my grave and change the selection. [Laughs] It's always the wrong tune.

Bonzai: Do you have a favorite song from all your material?

Kottke: I think I do. It's a piece called "Mona Ray," which is on two albums. I did it on *Dreams and All That Stuff* for Capitol, and I re-recorded it with T-Bone Burnett on *My Father's Face* for Private Music. And I still didn't get what I get from it in live performance. This tune, more than any of the others, stands up and plays itself for me. I just go away on the thing and it's perfect that way. It's really got a life of its own.

Bonzai: How about some advice for the youngsters? Many people have told me that this is such a cutthroat industry. Anything you could offer in the way of a survival tactic?

Kottke: Absolutely, although it's not a tactic. I believe that if you pursue something that you have a passion for, you can't go wrong. You may starve, but you're satisfying something that is outside of yourself as much as it is a part of you. It doesn't depend on success. The only thing that needs to be nourished is this passion. I know that if you ignore that, and do something else in the name of sanity, let's say, or revenue, you suffer for it. I've seen musicians do it, switch to another kind of living so that they could either support their family or find a saner day-to-day existence, and all of the people I think of wound up being unhappy. In some cases, profoundly unhappy.

If you're not playing because you have to have it every day, if it's not a matter of appetite but a matter of fascination, I think you would be in terrible trouble pursuing it.

I know that if I fall flat on my face commercially, I can always play. I can *always* play. And no time I've spent trying to play will ever be wasted. It's good for you. It's like food. ■

Roving editor Mr. Bonzai was working on an instrumental version of this interview when his hard disk crashed.

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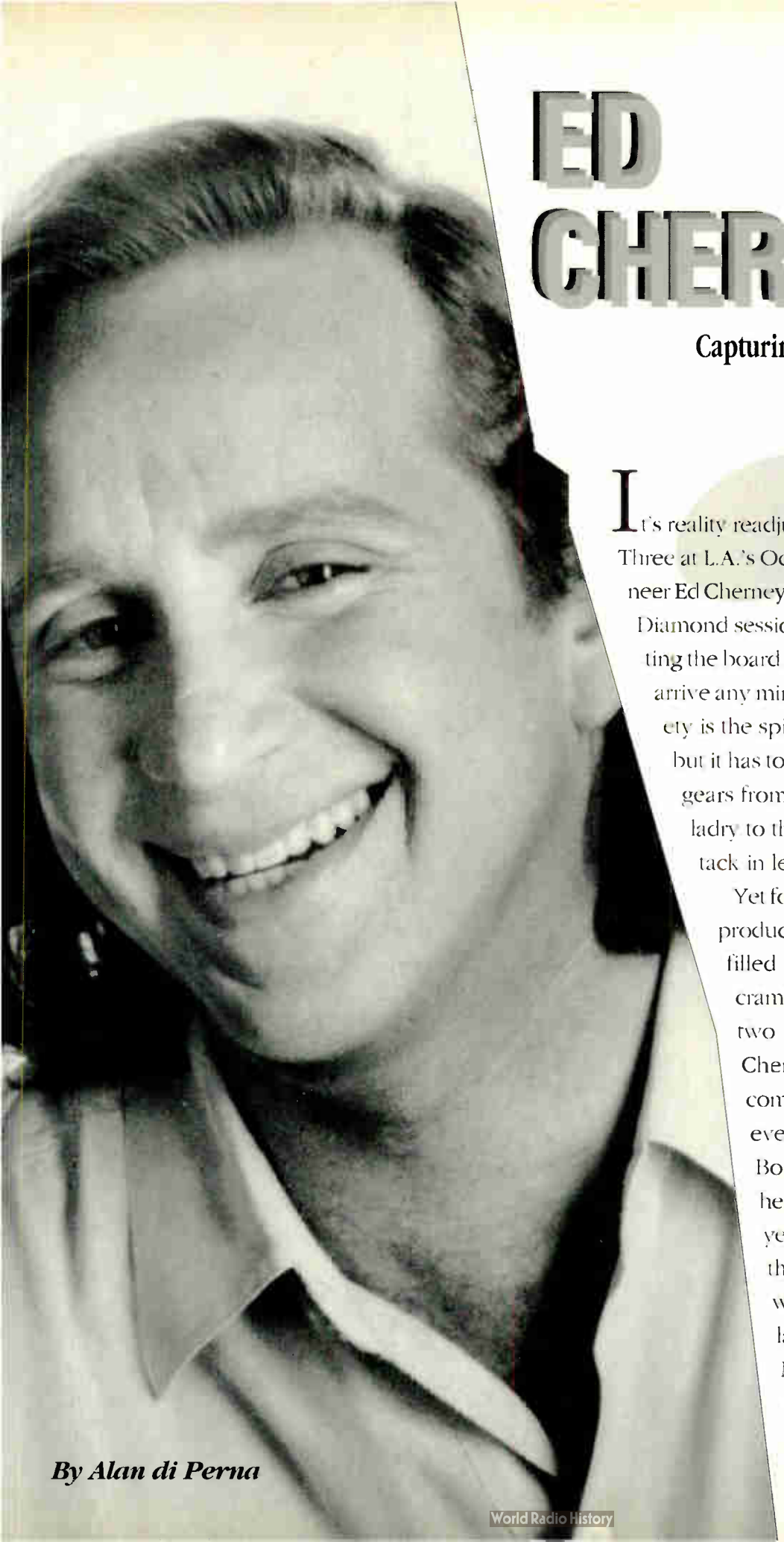

ED CHERNEY

Capturing Musical Dialogs

By Alan di Perna

It's reality readjustment time inside Studio Three at L.A.'s Ocean Way Recorders. Engineer Ed Cherney has just wrapped up a Neil Diamond session and is now busily resetting the board for Iggy Pop, who's due to arrive any minute for a remix date. Variety is the spice of the engineering biz, but it has to be a bit harrowing to shift gears from Diamond's sensitive balladry to the Iggster's all-out rock attack in less than an hour's time.

Yet for Cherney and his partner, producer Don Was, life has been filled with fast changes and crammed schedules for the past two years or so. Was and Cherney, of course, have become the hot production team ever since their work on Bonnie Raitt's *Nick of Time* helped the record sweep last year's Grammys. Since then, they've gone on to work with Elton John, Bob Dylan, Iggy Pop, Michael McDonald and Was' own group, Was (Not Was). When we spoke, Cherney was working on Bonnie

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Raitt's new album, *Luck of the Draw*, finishing off tracks for Paula Abdul and gearing up for possible future projects with Mick Jagger and Leonard Cohen. Seems like everybody wants a piece of Was and Cherney these days.

"I wouldn't be here today if I didn't know how to drive a truck," reflects the jovial Cherney, launching into a tale of how he used to drive his friend's band around to gigs in the Midwest during the early '70s. One night, the inevitable happened: The soundman didn't show and Ed had to mix the band. "I screwed it up pretty bad," he recalls, "but the engineering bug bit me. So I kept on doing it."

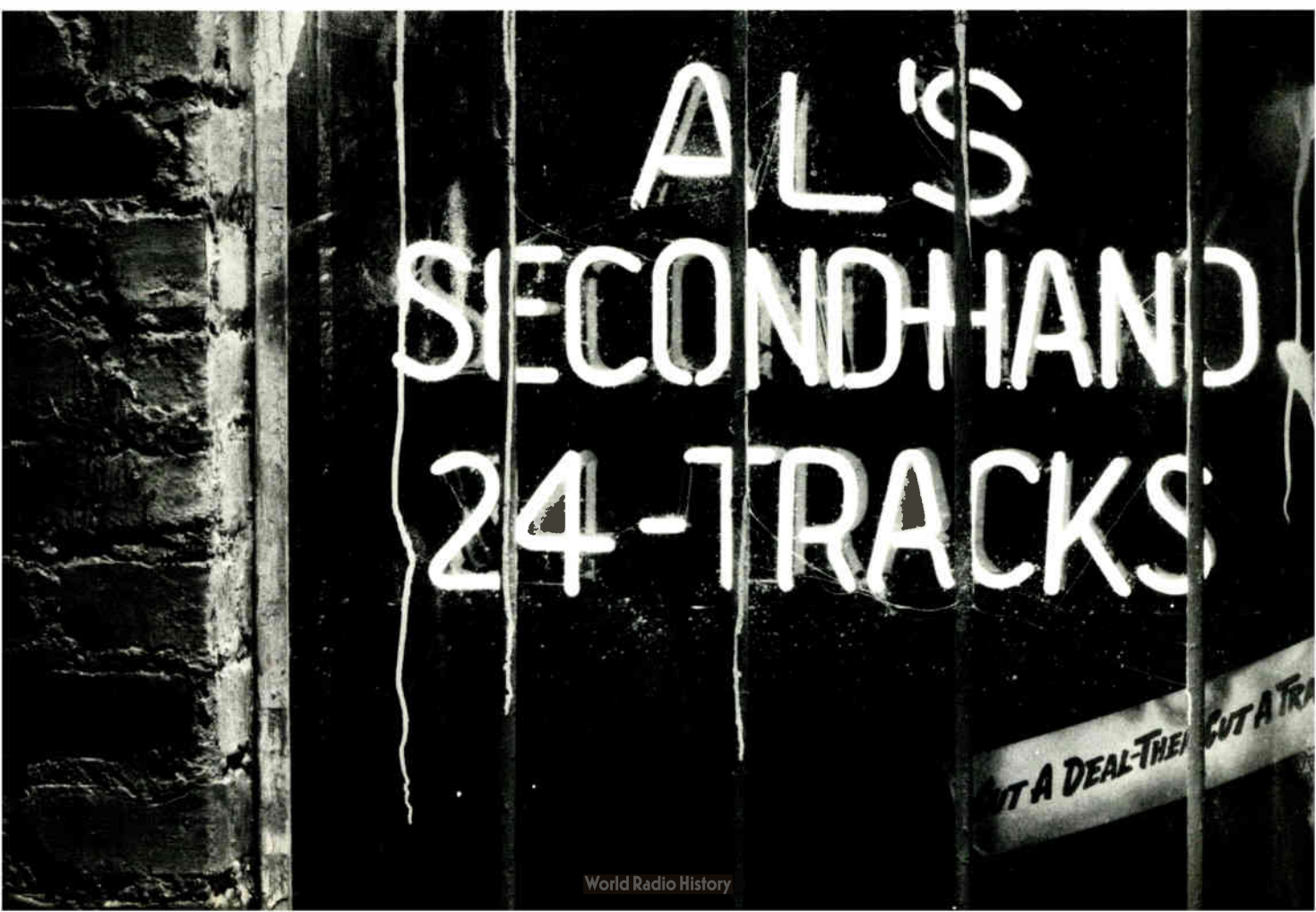
Cherney's native Chicago proved a good place to learn the trade. He studied engineering with Bruce Swedien and wangled a staff engineering post at Paradigm Recorders. When he moved to L.A. in 1977, he found himself working with Swedien again, assisting the legendary engineer on Quincy Jones' *The Dude* and notable Jones productions for Chaka Khan, Lena Horne and others—all at Westlake Recording, home base for Jones and Swedien at the time. "It was a total coincidence that I ended up with Bruce again," Cherney insists. "I just went through a studio directory backward instead of forward, looking for a job. Westlake was the first name that came up. I called them and they hired me as an assistant."

Cherney went independent shortly afterward. His first heavy, full-on engineering project was Ry Cooder's *Get Rhythm* LP. "There I was, all alone with the older cats," he says, "the virtuosos, you know? Van Dyke Parks was playing keyboards. Steve Douglas, who played on all those great Motown records, was on saxophone. Jim Keltner was the drummer. These were the real guys. Getting through that was frightening. You have to hold your own in there. You can't let those guys shake you up. It was a hard album to make. The music was very unique, and I must have had eight musicians crammed into Ocean Way's Studio B, all playing at once. There was no isolation. I learned a lot and learned it fast on that album."

Cherney's solid engineering on *Get Rhythm* ultimately led to his working with Raitt—albeit by a circuitous route. "I did all the slide guitar players!" he laughs. "Because of my work on Ry's album, David Lindley hired me to do his album, *Very Greasy*, and Bonnie wanted me to do her record because she liked what I'd done with the other slide guitar players. Meanwhile, Bonnie and Don had met and worked together on *Stay Awake*, the Disney album that Hal Wilner produced. So, about a month before starting Bonnie's record, the three of us had lunch at Musso & Frank's [a Hollywood restaurant]. We had lentil soup—broke bread together. Don and I have been working together ever since. I guess we're going on the third year now. But in that period, we've done more records than a lot of people do in a lifetime."

Mix: So Don and you hit it off immediately.

Cherney: Yes. We're both from the Midwest, we're both about the same age and we both like the same kind of music. We have a certain way of communicating; Don "aims" me. There are so many different ways to go with recording technology—so many knobs to turn, so many kinds of reverb you can use; if you don't have a clear picture, you can fiddle around until the



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world ends. But Don creates a very clear picture of where this artist should be, what the song should be. He can portray that to me. Maybe that's why we can make records in six weeks instead of a year.

Mix: Do you have a stock approach to recording things like drums that enables you to work fast in the studio, such as microphones or placements that you'll always go for?

Cherney: We move it around a bit. I've got a couple of B&K mics that I like for snare. I like to put some big diaphragm condenser microphones on top for overheads: C-12s, typically. And typically we use 57s on the toms. I've messed around with a lot of condenser microphones, but we try to use dynamic mics on the toms and kick drum because they're fairly forgiving. We would rather not beat up the drummer to get sounds. It takes us 15 or 20 minutes to get a drum sound. Hopefully, within two hours of a band's walking in, we're rolling tape and their headphones are fine and we're getting the stuff down. That way, they're still fresh enough to play the music.

Mix: What about tape?

Cherney: I've just started using 3M's new 996. We're using it on Bonnie's new record and on Paula Abdul and Neil Diamond. I love the extra headroom it gives you. Different types of music call for you to hit the tape differently. I've hit it light and I've hit it hard, and the 966 will definitely take the level.

Mix: Did you have a different approach to recording with Bonnie this time?

Cherney: Not really. You just have to be true to the music and the artist. Whatever it takes for that to come across, so it's emotional instead of some cold, removed thing. For me, analog is a little warmer.

Mix: How much do you typically get involved in pre-production? When do you generally first hear a song you're going to work on?

Cherney: We go up to Don's house and get the artist to play the songs with just guitar and a vocal. We'll set up maybe one mic and roll the tape machine. We use a DAT up there. That's what we did with Iggy Pop for *Brick by Brick*. He went up there and played ten songs; we did it in an afternoon. And we worked from those. If the performance was going to come across that way, it would definitely come across on the record. And if a song wasn't right, you would know then. We did the same thing with Bonnie in getting ready for her new album, only we did it with a few more musicians—we brought her bass player and keyboard player and guitar player in. But it was just a very simple recording. So I'll hear those demos, and Don and I will talk about what the song should be. Usually it's pretty intuitive. The band sets up and it starts happening.

Mix: Did you take that kind of approach with Dylan too?

Cherney: That was scarier. We really had no say in the songs. I think he was actually writing the songs as we were recording the album. Every time we recorded a vocal or punched in, the lyric would be different. These things were evolving as we did it. I think they were evolving all the way up to the time the record came out in the store, and then it had to stop. I think it turned out to be a brilliant and wonderful album. But it was challenging, because Bob doesn't allow you to make what the Grammy committees call a classically great-sounding album. You've got to capture the moment.

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Mix: So it was kind of a Zen experience?

Cherney: Well, you'd get about 20 minutes to mix a song. Then it would be [breaking into a Dylan imitation], "What's he doin' in there? What's goin' on?" Bob's very astute. During the record, the saying was, "Bob knows." He'd tell you something that at first would seem off the wall, but he was usually right. We were in New York mixing the record; I had just finished mixing *Under the Red Sky* and I was happy with it. But he came in, listened to it, and said [Dylan voice again], "Eaahh, it's screwed up. The mix is screwed up. I can hear everything." That was the first time I had that complaint. But you know, he was right. I went back and made it murkier, which is what old-time blues and rock 'n' roll records were about. They were a little dark, maybe a little ambiguous in terms of who was playing what. The mix was much better that way. Bob knows.

Mix: Certain players appear on a lot of records you do—Kenny Aronoff on drums, Slash on guitar. Have you locked in an approach for getting a good sound on these guys?

Cherney: Kenny was very hard to record at first. He's a wonderful musician, and strong. He gives 100% from the first time he goes out there and plays. But he hits the drums very hard, and as a result, when he's on the hi-hat it's tough. It starts to distort. Also he hits the cymbals so hard it's difficult to prevent them from bleeding into the tom toms. So you have to put a bit of work into placing your microphones and the way you use your EQ. In particular, the B&K on the hi-hat was something I had to use differently. You pad that thing down, and it'll take about 158 dB before it starts to turn to cottage cheese.

"I'm finding—and most of the musicians I'm working with are also finding—that less is more. I don't go for a lot of fancy processing."

Mix: What about guitars?

Cherney: It depends. When we're working on crunch guitar, a 57. Put it anywhere near the speaker and put the fader up. You may have to add a little upper midrange or high end. Maybe a little compression. Tube compression warms things up nicely. But I'm finding—and most of the musicians I'm working with are also finding—that less is more. I don't go for a lot of fancy processing.

Mix: You mean even something like Slash's guitar on Iggy's album is just a 57 on a Marshall?

Cherney: It was a 57 up close with a little bit of compression on it. And an omni 414 about eight feet back and roughly head-high. That mic had a good amount of compression on it. And there was a D.I. on there too, just for a little clean body. I put it to tape and let him rip. It's easy to underrate the guy, but he's really a fine musician. All these players—Kenny, Slash—they'll do a take, come in the control room to listen, and if you're anywhere in the ballpark with the sound, they'll adjust their touch and their instrument accordingly to make the sound really happen. Good musicians make good engineers.

Mix: An engineer of your stature can

—CONTINUED ON PAGE 155

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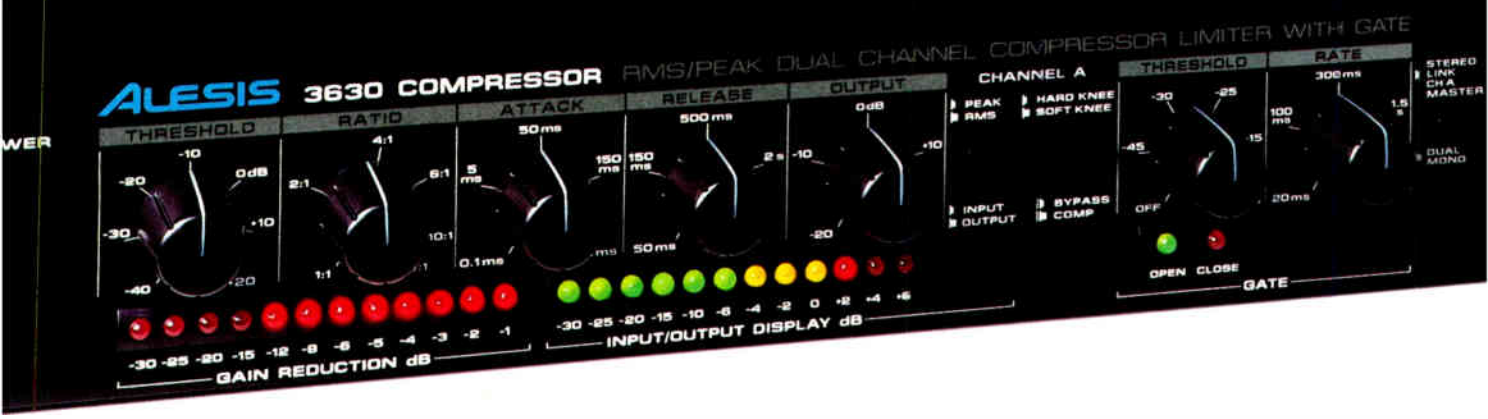

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B E F O R E

Larrabee North

An Expansion Success Story

"Chris Stone once said 'diversify or die,' because that's how he felt he could best move his operation forward," owner Kevin Mills explains. "My opinion is the exact opposite. Specialize, and grow within your specialization to corner your niche in the market."

World Radio History

by Amy Ziffer

Every industry has its elite—those who are perceived to be at the pinnacle of success in terms of product, service and, hopefully, profit. In the studio world, that envied position is occupied by facilities that book predominantly mixing dates. Mixing sessions command the highest rates, but also require the greatest capital investment in order to draw those high-paying clients.

Los Angeles certainly has its share of great mix rooms, in facilities of all sizes, but after a recent expansion, Larrabee Sound Studios might be the largest complex in the city almost solely devoted to mixing work. Studio manager and owner Kevin Mills and his staff of 25 are certainly trying hard to make Larrabee the first name to pop into the heads of major artists looking for a good mixing room, going to such lengths as hiring set designers to gussy up the control rooms for clients like Michael Jackson and Prince.

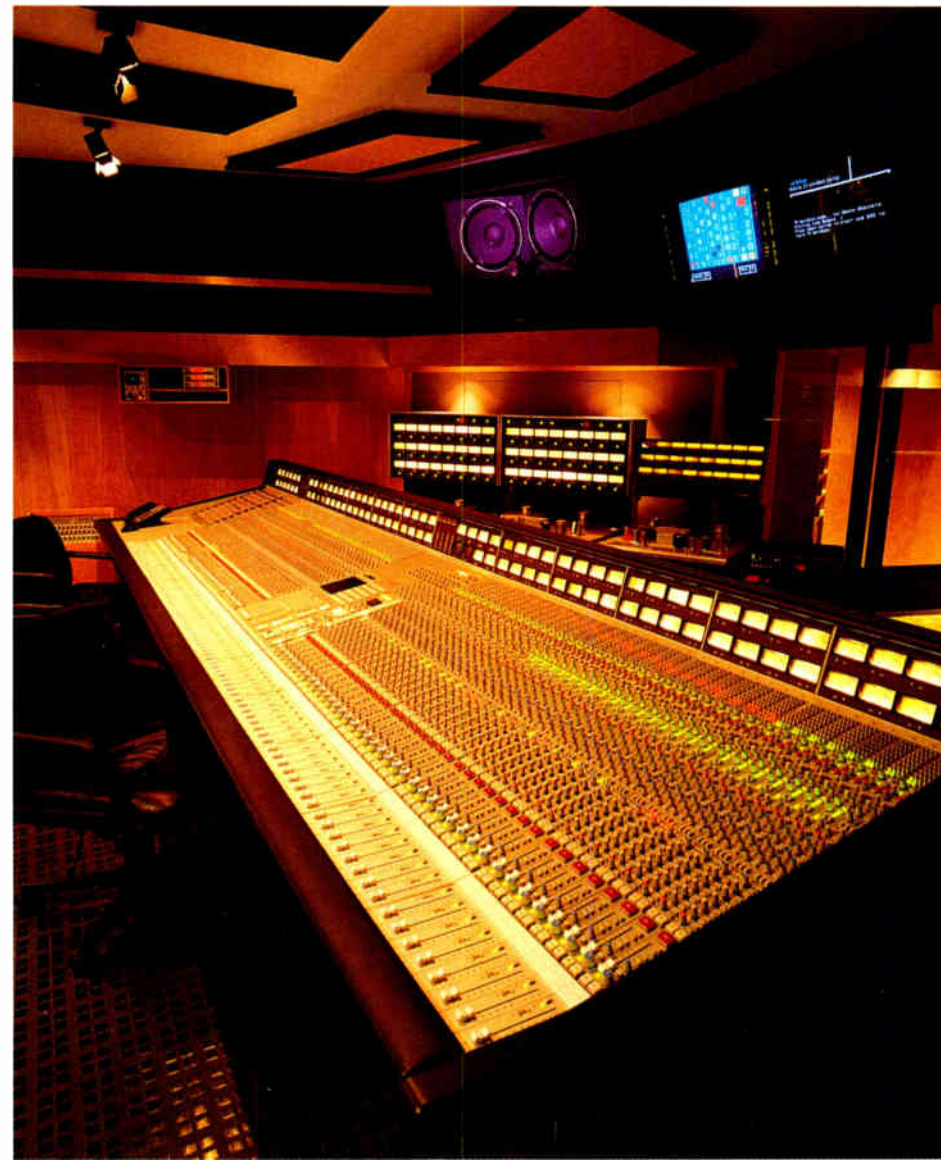
Larrabee now consists of five rooms, split between two locations. The original two-room Larrabee in West Hollywood (now called Larrabee West) was acquired from Gerry Goffin in 1969 by Mills' parents, Jackie Mills and Delores Kaniger. Jackie Mills was a producer, whose work with Bobbie Sherman (among others) in the 1960s made the purchase of Larrabee possible. "[At that time] it was somewhat better than a demo studio," remembers Kevin Mills. Over the ensuing 21 years, he says, Larrabee gained a reputation as an R&B, pop and dance-related enterprise. In 1986, Mills' parents retired, leaving the day-to-day operations to him.

Late last year, Larrabee North—consisting of three additional rooms on Lankershim Blvd. in Universal City—was unveiled. At a cost of $3.5 million, the project was financed by cash flow, equipment leasing companies and loans from Mills and his family.

With the expansion, Mills didn't set out to change the studio's reputation, but rather capitalize on the one it had already established. "[Former Record Plant owner] Chris Stone once said 'diversify or die,' because that's how he felt he could best move his operation forward," Mills explains. "My opinion is the exact opposite. Specialize, and grow within your specialization to corner your niche in the market. I can't be the best tracking, mixing, video post and overdub operation in the world. There's no way to do it all."

That appears to have been the right strategy. "I'm 100% booked," Mills boasts, after six months of operation. At the time of this writing, Michael Jackson had the new facility locked out for

A F T E R



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three months, tracking, overdubbing and mixing songs for his upcoming album, *Dangerous*, with engineer/producer Bruce Swedien and producers Teddy Riley, L.A. & Babyface. Mills lists several others who "pretty much live out of Larrabee"—notably John Gas (Whitney Houston, Robbie Nevil) and Keith Cohen (Paula Abdul, Prince, various Paisley Park projects).

Laying Groundwork

Mills actually set out several years ago to develop a roster of clients who wanted to work at Larrabee regularly. "I changed the way the West facility looked, added another lounge and increased staff. I put in a 72-input SSL to replace a 56-input," Mills continues. "In addition, I sought to develop one of the largest and most diverse outboard equipment inventories in Los Angeles.

"I was also trying to change the atmosphere, mentality and culture of Larrabee. We had field trips where we'd get a party bus, and 25 or so clients and employees would all go to Las Vegas or Cabo San Lucas. We developed relationships like my one with Keith Cohen, who has become a friend of mine and for the last three years has been working at Larrabee almost exclusively."

Mills chose to absorb the cost of these efforts instead of passing them along through a rate hike. "I thought it was better to make less and reinvest money into the business," he says.

His instinct paid off in the form of increased bookings, which went up 15% over the course of a year. "When you talk about having more runners, that's an expenditure of, say, $1,800 a month," he notes, comparing costs to income, "but if you go from an occupancy rate of 80% to 100%, that could mean an income increase of $30,000.

"It got to the point where I was turning away probably two times the business I was able to book. In the back of my mind, expansion was always there, because I felt the situation in L.A. was ripe for someone to come in and build a really good studio, and then I would be trying to compete against them," Mills explains. "I felt there was no one better positioned to expand than Larrabee, so instead of waiting to react, I started looking at studios, but none of them seemed right. I reviewed the operations, equipment and location, and what it would take to make them what I term a Larrabee-quality operation, and I couldn't see it."

Things Come Together

In April of 1990, Mills heard that Giorgio Moroder's studio, Oasis, was up for sale. He looked at it, and although he didn't like it the way it was, he saw that it had what he felt was needed to make a successful operation. "That's the difficult part of expansion," he insists, "taking a look at something and figuring what you have to spend and how long it will take, because you're taking on a huge risk with an unsure outcome."

The location was also just right. "I wanted to expand in the Valley, because I'd say three quarters of my clientele live in the Valley or surrounding areas," he explains, "but I also needed to be near Hollywood." Hence, Universal City was a good location.

The one-story, brick building is situated on one of the Valley's busiest streets, near a major freeway and close to the Beverly Garland Hotel, a favorite hiding place for visiting artists wishing to maintain a low profile. Its gated parking lot and entrance are accessed from a rear service road, insuring maximum privacy.

Larrabee North's hallways, lounges and "common" areas tend to be well-lit, bright and open, while the studios themselves display varying contrasts of blonde wood and primary colors. Birds-eye maple, generous amounts of glass brick and a large skylight make the front lobby a fitting introduction to the 6,000-square-foot complex.

Mills determined that Larrabee would require a 40% occupancy rate across all the rooms, old and new, to break even. Confident of that, he went ahead, only to find, with the benefit of hindsight, that the real figure is somewhere between 50% and 60% occupancy—almost a 50% difference.

The vagaries of costs versus income are understandably hard to calculate and dependent on a lot of variables. Mills began the project with everything budgeted individually. When he became aware of a cost overrun in one area, he sat down and figured out a way to make the amount up in another area. Mills has a few skills that helped him in these sorts of matters: a degree in economics from UCLA and seven years experience as a financial adviser and stock broker at Dean Witter.

"My construction costs kept going up because I wanted to do more," Mills says. "One example is the lounge outside Studio 2. I originally wasn't going to do much to it, but it was cramped. I decided to take out a wall, raise the

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ceiling and put in a skylight. I think I spent $10,000 extra in that one lounge. So given that $10,000 expenditure, where was I going to spend less?"

Where, indeed? "Of all the outboard equipment I bought," he confides, "very little was new. I bought through *The Recycler* [a local "green sheet"] for a third of the cost of new. I also used a network of used equipment brokers across the country, all of whom had a list of the stuff I was acquiring at that time. Also, much of the gear I wanted is no longer manufactured, especially many popular equalizers and compressors, so the only way to buy them is through the resale marketplace."

Mills also acquired nearly all of the equipment at Oasis as part of the sale, but he had to add substantially. "I think the budget for outboard equipment—not things I was financing, like multitracks and SSLs—was about $175,000. If I had bought new, it would have been in the area of $300,000 to $400,000. I wanted a Lexicon 480L, for instance: They sell for about $12,000 new. I bought mine for $6,000-$7,000 each. I was very careful to acquire all my equipment at the best possible prices."

Mills did manage to hold a rein on expenditures, staying reasonably close to his original bottom line figure, which is all the more surprising because construction cost estimates were guesses. Mills says he "doesn't believe in" hiring architects and acousticians, preferring to rely on the accumulated opinions of clients and people whose work he respects.

"I know a lot of people will laugh and say I don't know what I'm talking about, but there were certain people I trusted and listened to. I pretty much knew what I wanted. George Augspurger did the monitors, and he gave me some advice, and almost every major client I have walked in the rooms and gave me suggestions.

"I hired outside contractors, told them what I wanted, and I was here every day supervising. Almost every client has been happy. It's been unanimously successful." In fact, producer Teddy Riley has contracted Mills to oversee design and construction of his planned facility in Virginia Beach, Va., because he wants to ensure similarity between what he produces there and in Los Angeles.

With the exception of John Edwards, an electrical contractor for whom Mills has a great deal of respect, he refuses to name the people he

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–FROM PAGE 92, LARRABEE NORTH

employed. In some cases, his secrecy reflects a desire to keep the studio's design "proprietary," but in other cases he says work was simply performed unsatisfactorily and he doesn't want to give publicity to those responsible.

"To this day there are things that need to be fixed," he insists. "Doors that don't fit right or are warped—doors are a difficult thing; I've come to respect them. These are the little things people overlook. You don't realize how much you're going to spend just on locks! There are many things you don't really budget for adequately. I had to spend six months rent before I could open, plus insurance, and salaries for all the people working on the facility.

"Without the discipline I exercised, I could have run out of money, been half finished and never opened," Mills warns. "The risk is that your leases start, say, 30 days after you acquire the equipment. If I hadn't been ready to open, then my costs would have gone up dramatically, because I would still have had to pay rent, leases, etc., without any income. Another studio I know almost went under because it couldn't finance a delay."

Touring the Rooms

Cosmetically, the use of glass brick and primary colors at Larrabee West has been carried over to Larrabee North. Sonically, the North rooms are slightly deader. Monitors are Augspurger throughout, but those at Larrabee North have a more recent design.

All the rooms but the smallest have SSL boards of varying configurations; those at the North facility are each outfitted with 24 channels of the older Series E EQ (the remaining channels are G EQ) and the Real World Automated Cue Matrix. (The fifth room will eventually be a fully-equipped MIDI studio, with plans for an API console.) Studio 1 is the only one of the new rooms to have a sizable live recording area.

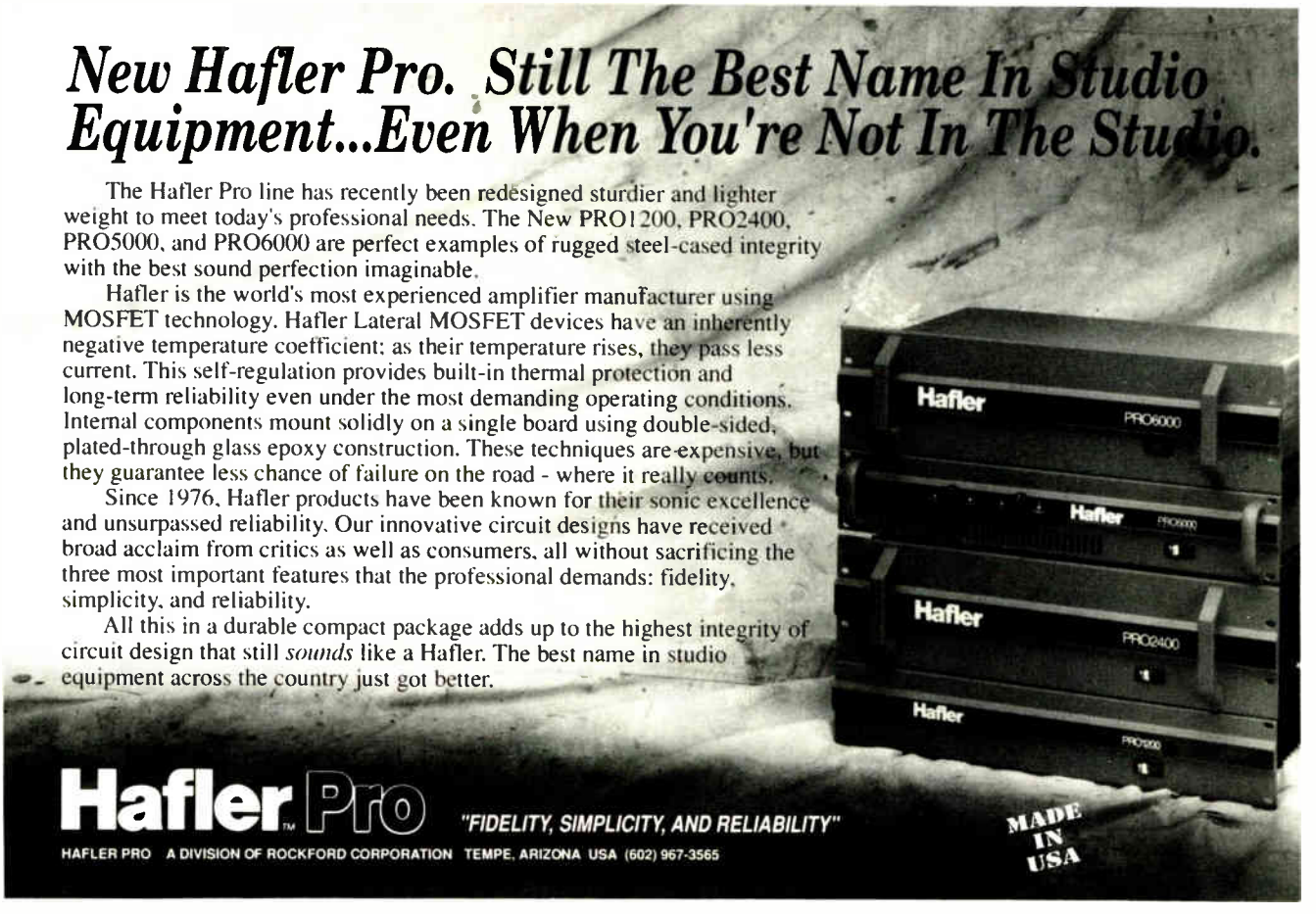
However, these and other differences are partially offset by Mills' insistence on a large minimum roster of equipment housed permanently in each mix room, and his practice of moving machines and floating outboard equipment regularly between studios and between the two facilities.

Interestingly, not only does equipment rotate, but so does staff. All employees work at both facilities to eliminate jealousy or lack of respect for one another's work. "An 'us and them' mentality sprang up at first," Mills notes, "but rotating the staff helped people pull together. The idea was to create a cohesiveness of equipment and service, so when you're at Larrabee there's no doubt you're at Larrabee, no matter which one you book."

But Mills knows that all of the things Larrabee has going for it don't guarantee success in a competitive market. He feels Larrabee's extra edge is a "can-do attitude." He asserts, "I don't feel we have any competition, because Larrabee has more of a service approach. My clients have that feeling that I'll do nearly anything to cater to them and make them comfortable. I'm the owner, but I also personally book the time. My relationship with my clients is very important.

"Another studio might have equipment, another studio might have a good-sounding room, another studio might have a nice second [engineer], but no other place has it all together." ■

Amy Ziffer is Mix*'s Los Angeles editor. Her column "L.A. Grapevine" appears monthly in the Coast to Coast section.*



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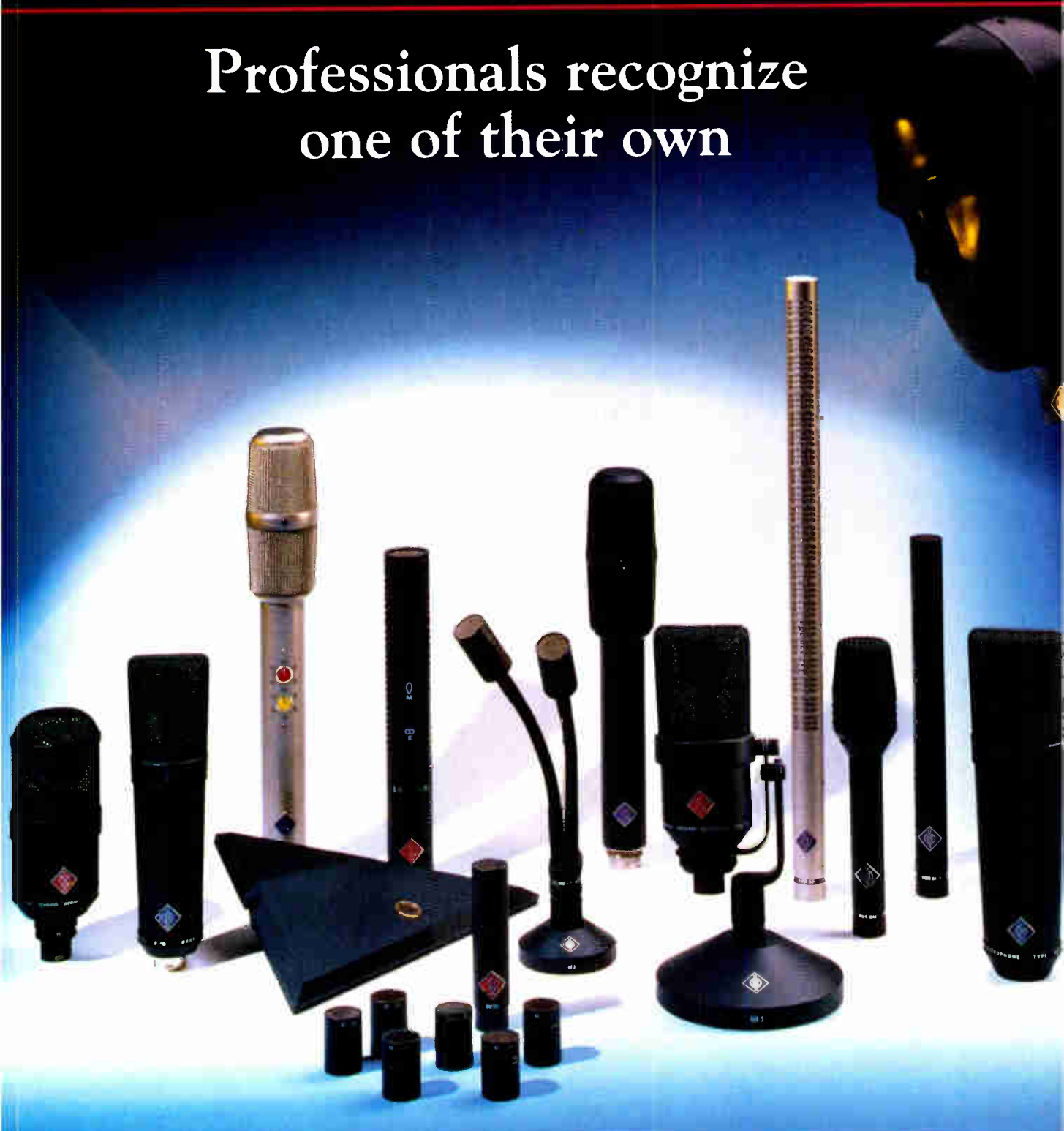

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by George Petersen

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Four years ago, Keith Klawitter began building custom monitors for a clientele of discriminating users. Last year, his company, KRK Monitoring Systems, unveiled a line of all-cone standard designs, with three models for listening in the close field, and two large, 3-way (bi-amped or tri-amped) systems with single and double 15-inch woofers. The 703s are the entry-level product in the series, and at 12x11x10.25-inches, they are a suitable choice for console-top monitoring.

The 703s combine a 1-inch, inverted, Kevlar dome tweeter and 7-inch Kevlar woofer. Perhaps best known for its use in bullet-proof vests, Kevlar is an extremely tough material, providing a unique blend of rigidity and light weight—an ideal combination of properties for cone transducers. The drivers crossover at 3 kHz, and the dividing network itself uses hand-wound, 14-gauge air core inductors, polypropylene caps, and 12-gauge, silver-plated copper wire throughout. I have always found it ironic that speaker manufacturers recommend the use of high-quality, large-diameter wire for the amplifier-to-speaker connections, while the internal wiring inside many speaker cabinets is usually 18-gauge zip cord. KRK's use of 12-gauge interconnects is an appreciated bit of attention to detail.

The 703's back panel currently includes an inconvenient plastic cup with recessed binding posts that make any sort of connection difficult, unless banana connectors are used. Fortunately, KRK's latest versions of the 703s incorporate heavy-duty, gold-plated, 5-way binding posts, flush-mounted on the rear panel; 703s with these connectors should be in circulation by

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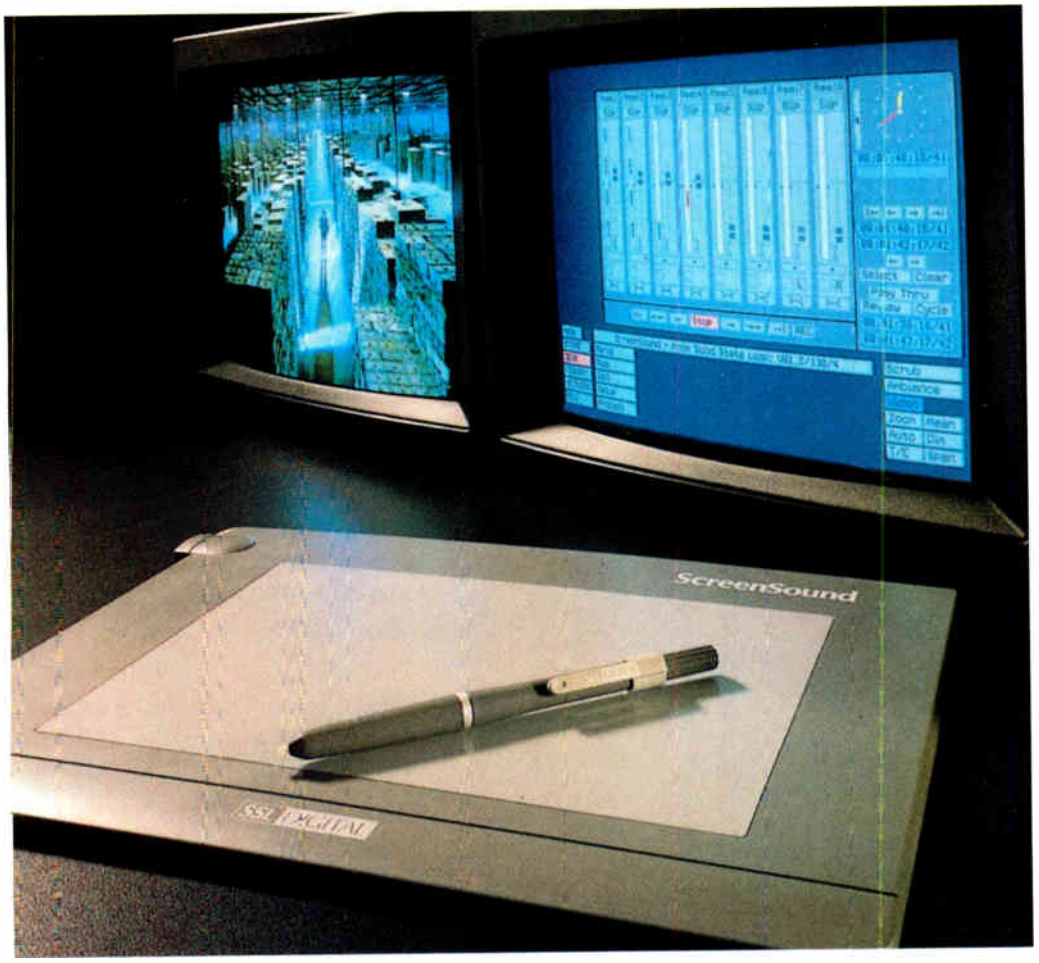

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The hard disk store of sound clips gives title and duration, in addition to powerful search and sort routines.

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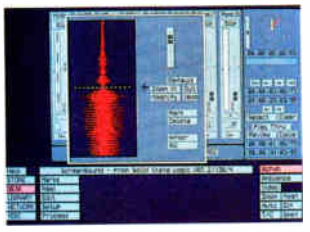
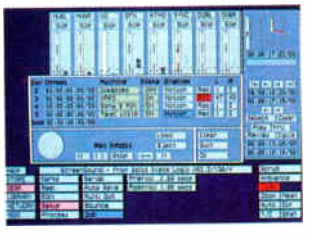


OPTICAL LIBRARY
An off-line library of sound clips and effects can be compiled on a Write Once Read Many (WORM) optical disc.

MACHINE CONTROL
For control of multiple VTRs, laserdisc or film reproducers.



Post production facilities need to take advantage of the efficiency offered by today's technology. Speed and creative flexibility are essential to commercial success. Digital sound quality is no longer a luxury.

ScreenSound is a fully integrated audio for video editing suite. It combines digital audio storage and editing with machine control of multiple VTRs, Laserdisc or film reproducers. It also interfaces with Quantel's digital video editor, Harry.

Simple to learn and fast to use, a cordless pen, tablet and RGB monitor provide control of all ScreenSound functions.

Multiple sound reels enable music, dialogue and effects to be laid back to picture and synchronised to the exact video frame.

Edit, review, time offset, track slipping, cross fades and many other production techniques are available at the touch of a pen. Gain and stereo pan controls can be automated to timecode.

AES/EBU interfacing keeps digital audio transfers free of analogue distortions and losses, preserving the highest audio integrity through to the final format.

Above all, ScreenSound is a dedicated system - purpose-built to bring the advantages of hard disk sound manipulation to audio post production.

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the time you read this.

For an additional $150, an optional 1.5dB tweeter attenuator pad is available. Rather than routing the audio through a switch, the pad is selected by a heavy-gauge jumper placed across brass posts on the rear panel. The pad serves the purpose of reducing the top-end response when the speakers are used in close proximity to the listener; this also serves to reduce ear fatigue that can occur during long sessions.

The cabinets are front-ported, with the components arranged as a mirror-image pair, although as a line-array, 2-way design, there is no apparent listening difference when the left speaker is placed on the right, or vice versa. The speakers do not include a grille cover (you know, those things that accompany most monitors, but are immediately removed and never used); in fact, no grille covers are even available.

The appearance of the 703s is definitely unusual, with the straw color of the woofer and tweeter juxtaposed against the black Formica finish of the cabinets. Weighing in at 25 pounds a piece, the 703s pack a noticeable heft for such a small box. No doubt the high-density composite wood construction, extensive internal bracing and heavy-duty components play a major role in the solid feel of these enclosures.

After some initial listening tests with a variety of material—jazz, pop, rock, classical—I became accustomed to the 703s. With most monitors, I have to listen for a period of several days before becoming comfortable with their sound; however, with the 703s, I felt ready to mix almost immediately. The 703s do not have a characteristic "sound" of their own—they offer a neutral, uncolored reproduction that may not be perceived as "impressive" when compared to some other monitors. In the near-field, the 703's stereo imaging was tight, providing an accurate soundstage and a strong directional sense: The most minor changes in panpots were clearly evident.

With a sensitivity of 92 dB (1 watt at 1 meter), the 703s can deliver a respectable 102 dB from a 10-watt input (with peaks in the 112dB range from 100 watts), which is ample volume for the near-field environment. Since I usually monitor in the 80-90dB range, the 703s packed plenty of punch with headroom to spare.

Over a period of weeks, I tracked and mixed a number of projects—rock tunes, a Renaissance instrumental ensemble, and a soundtrack for a historical video piece with dialog, effects and music. I was pleased with the 703's performance: The balance of mixes held up on all sorts of playback systems, from 3-inch TV speakers to double 15-inch studio monitors. The 703's low frequency response (-3 dB at 54 Hz) is solid and quite formidable, especially when you consider that the enclosure volume is well under one cubic foot.

Priced at $899/pair, the KRK 703s are not inexpensive, but provide serious monitoring in a compact package. Just right for console-top listening, the 703s would prove a welcome addition to the edit suite, remote recorder or control rooms of all sizes.

Distributed by Audio Intervisual Design, 1032 North Sycamore, Los Angeles, CA 90028; (213) 469-4773.

Sabine FBX™ Feedback Exterminator

Here's an example of a good idea that was waiting to happen. A typical requirement of modern sound systems is high sound pressure levels, and achieving adequate levels of gain-before-feedback can be problematic, particularly when stage monitoring systems are competing with loud instrumental sources. One proposed solution to the problem is the Sabine FBX, a microprocessor-controlled filtering device that automatically finds and reduces feedback in sound reinforcement systems.

Unlike prior approaches to automatic feedback suppression—which usually reduced overall system gain when feedback occurred—FBX's onboard microprocessor automatically assigns one of six 1/4-octave notch filters (-30 dB) to the offending resonate frequency, thus controlling the feedback. Three of the FBX filters are automatically set at the strongest resonant frequencies detected during the unit's setup procedure; the other three filters "float" to handle any intermittent feedback that may occur during a program.

The front panel is simply laid out, with LED indicators for audio level, filter activity, AC power and bypass, along with a sensitivity control and reset, bypass/active and power switch-

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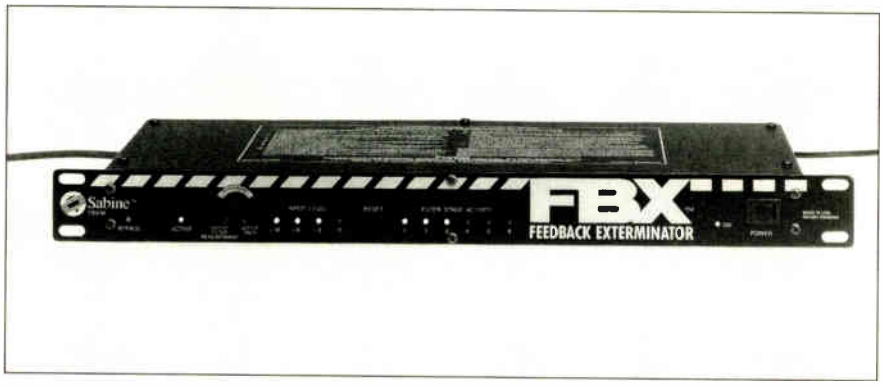
es. Power is supplied by an external AC adapter.

The FBX has both balanced XLR and 1/4-inch line inputs/outputs, easily accomodating almost any system. Unbalanced 1/4-inch mic in/out connections are also provided, but this feature will be of little use in pro installations. The FBX is placed just before the power amplifier (or electronic crossover in a multi-amped system) in the signal chain, whether used for mains or monitor. Since the FBX is a single-channel device, multiple units must be used for stereo mains or to run several different monitor mixes.



Setup requires nothing more than connecting the FBX, adjusting any system equalizers for *tonal* preferences (but *not* feedback control), and raising the mixer's master level until feedback occurs. As the filters start kicking in, the filter-active LEDs begin to glow; once the first three filters are active, the master level should be reduced. During soundcheck, the FBX input sensitivity control is adjusted so the overall audio level occasionally peaks at 0 dB. During the setup period, avoid talking into the mics and keep background noise (guitars, drums, etc.) at a minimum, or the FBX may falsely recognize these as feedback and notch these frequencies.

All filter frequency and notching data in the FBX are stored in a non-volatile memory bank so the information is not lost in case of power failure. (A non-memory version of the FBX was offered earlier this year, but is no longer available.) To clear the memory for entering a new setup, the reset button must be held for 5 seconds, which guards against accidental erasure in case the reset is inadvertently pressed during a performance.

In operation, the FBX is straightforward. The directions for calibration/setup are clearly outlined in the user-operating guide, and this information is also screened on the top of the case. Under a variety of conditions, the FBX did its job well, providing a substantial reduction in feedback. The FBX's microprocessor was extremely fast at responding to feedback, typically well under a second, and the system offered another 6-9 dB of level in monitoring systems.

While 9 dB may not seem like a major increase in level, it's the equivalent of adding about eight times the amplifier power into a system before feedback. This brings up a couple of points. With all filters active, the FBX's signal-to-noise ratio is about 70 dB, which is okay, but not exactly audiophile quality. Therefore, when the FBX's action raises a system's pre-feedback level by 6-9 dB, the noise of the entire system (mixer, FBX, amps, etc.) is also raised by that amount. However, any apparent increase in noise is certainly offset by the benefit of additional gain, particularly in stage monitor systems.

Another point to keep in mind is hearing protection. When a device like the FBX allows a geometric increase in audio levels, care must be taken to avoid overexposure to these high levels.

At $549.95, the Sabine FBX is a powerful tool for the sound pro, gigging band, contractor or anyone who needs a fast, simple remedy to feedback problems.

Note: At press time, Sabine announced the availability of a high-end Feedback Exterminator, model FBX 900, which features nine 1/10-octave filters and a signal-to-noise spec of 95 dB.

Sabine Musical Manufacturing, 4637 N.W. 6th Street, Gainesville, FL 32609; (904) 371-3829.

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Popper Stoppers

Breath pops from hard consonant sounds, such as Bs, Ps and Ds, can make an engineer's life miserable, at best; at worst, these can ruin a vocal or narration take. The old pantyhose-stretched-over-a-coathanger trick provides a solution to the problem, but looks downright disgusting. At $59.95, Popper Stoppers offers an elegant, affordable solution.

The Popper Stoppers system has a 6-inch hoop with two layers of nylon mesh, along with a stand clamp and gooseneck. The latter is 15 inches long,

and the clamp holds the gooseneck six inches away from the stand; exact placement can be made with just about any mic/shock-mount combination. Additionally, all of the components use standard 5/8-inch diameter mic stand threading, so the parts could be swapped or rearranged to suit any application.

On a variety of narration and vocal sessions, the Popper Stopper handled those troublesome consonants, while retaining full vocal clarity and presence. The only things that were missing were the pesky pops and breathy blasts. Whether 4- or 48-tracks, the Popper Stopper is an essential accessory in any studio's arsenal.

Popper Stoppers, Box 6010-658, Sherman Oaks, CA 91413; (800) 446-7677 or (818) 788-3635. ■

George Petersen lives with his wife and two musical dogs in a 100-year-old Victorian house on an island in San Francisco Bay.

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by Larry Oppenheimer

LEXICON 300 MULTIEFFECTS PROCESSOR

Now in its twentieth year of producing professional digital audio devices, Lexicon has certainly acquired the experience to produce mature, well-refined products for every facet of the audio industry. The model 300 is just such a tool, combining the features required in today's markets with Lexicon's well-honed processing algorithms.

The 300's model number might lead one to believe that it is the successor to the superb model 200. This is true only in the sense that the 300 is a slimmed-down version of Lexicon's current top-of-the-line technology (the 480L), just as the 200 was a compact culmination of the 224 architecture. Coincidentally, the 300's $4,795 price is about what the 200's was when it was introduced. Functionally, the 300 offers far more than the 200, but the 300 still shows a few curious oversights despite the fact that it's an excellent—perhaps even brilliant—product.

The 300 takes up two units of rackspace and weighs just under 19 pounds. Its front panel is full, yet uncluttered. Status indicators include LEDs for MIDI activity and sample rate (32, 44.1 or 48 kHz), ten-segment LED ladders for left/right metering (a level button that accesses input and output level adjustments) and a 2x40 alphanumeric display with two rows of soft buttons. The remainder of the front panel is staked out by the large soft knob, numeric keypad and buttons for selecting operational modes and functions. Additionally, there are two bypass buttons.

The rear panel is also quite full, with XLR analog inputs/outputs for left and right channels, a 16dB input gain switch, MIDI in/out/thru jacks, three sets of digital ports (XLR for AES/EBU, RCA and optical for S/PDIF), XLR time code input jack and the ever-useless DE9 communications port, "reserved for future enhancements." (Actually, this port is used for factory development/testing and is never intended for the end-user.)

In the software arena, the 300 offers

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four processing algorithms (called "effects" in this box): reverb, ambience, stereo pitch shift and stereo adjust. The reverb algorithm seems to be a version of Lexicon's famed hall algorithm, tempered to allow it to also fill the functions of plate, chamber and room algorithms.

The ambience algorithm is not intended to be "behind" or "envelope" the source as is the reverb algorithm, but to become an integral part of the sound. Essentially, this algorithm focuses more on the early reflections than on the later tail, and does not employ as much randomization as the reverb algorithm. Consequently, it is better for creating "nasty little rooms" (Lexicon reverb designer David Griesinger's term), such as households, offices or even larger spaces not generally known for their pleasing acoustics, such as garages or warehouses, which might have relatively lower diffusion and higher coloration than a concert hall). The recirculation that is the basis of virtually all digital reverbs is much more clearly evident in the ambience algorithm.

Both effects employ the 480L's concepts of shape, spread, spin and wander, but the reverb algorithm also offers substantial delay capabilities: two delays of up to a second, and two more with up to 2.8 seconds of delay plus feedback. In the early days of digital reverb, "predelays" were intended to allow simulation of the first few discrete reflections that occur before the smearing that we perceive as reverb. But even back then some of us were using them as slap or long echoes that occurred much later and louder than any common natural situation would allow. Apparently, Lexicon has recognized that demand in the 300.

The stereo pitch shift algorithm allows each channel to be shifted a maximum of two octaves down and one octave up. Inputs can be treated as a stereo input or dual mono inputs. To allow utter craziness, Lexicon has provided up to five seconds of delay with feedback for each channel, as well as a glide function that can be controlled manually or through MIDI.

The stereo adjust algorithm provides a host of high-resolution facilities for tweaking stereo program material, especially for mastering purposes. For example, not only is there a balance control that uses a sine/cosine curve for channel-to-channel level adjustment, but also a rotation control using phase-inverted crossfeed to produce a similar, yet distinctly different effect. There is treble and bass shelving EQ, with variable frequency, +6/-18dB response, and 0.5dB steps in the critical +6/-6dB range. Another crossfeed function—spatial EQ—tailors low-frequency response to enhance the apparent spaciousness of signals that include stereo bass information. Of course, there's also delay, not only five seconds per second (with feedback) but also short delays with individual sample resolution. And there are still a few other tweaks I haven't mentioned.

All algorithms allow programmable mixing of digital and analog sources, which brings me to what Lexicon calls a "setup." A setup is a combination of an effect and an audio I/O configuration (any combination of digital inputs and outputs). There are eight preset setups and 64 registers for storing user setups (there are also 99 effects presets and 64 effects registers).

As pioneers of MIDI control of effects processors, Lexicon provides sub-

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stantial MIDI implementation in the 300. In addition to the Dynamic MIDI™ first seen in the PCM70, the 300 can also transmit and receive parameter changes either as system exclusive messages or as non-registered parameter messages. It can even receive controller messages and re-transmit them as either sys ex or NR param messages. Of course, there's the regular program change mapping, too. The event list can also be dumped as a sys ex message.

The time code connector lets the 300 read SMPTE time code and execute program changes from a preprogrammed event list. The list can be created in real time (grabbing time code on the fly) or offline, using editing features. The machine button and two bypass buttons are for an upcoming software update that will allow the 300 to function in a split mode like the 224XL (it will not have two separate processors as does the 480L).

I used the 300 in a variety of circumstances, and it sounded great in all of them. The A/D/A conversion is very clean and the noise floor is low. There is not only ample headroom, but substantial gain is available on both analog inputs and outputs, as I had occasion to find out when I was forced to feed some very low-level material into the 300.

On several occasions, I used the 300's stereo adjust algorithm for enhancing or restoring stereo program material. In one case, I brightened a DAT master to make a cassette duplication master (to compensate somewhat for the loss of high frequencies experienced in the cassette medium). I took the AES/EBU output of a Sony 7050 DAT recorder, fed it into the 300's AES/EBU input, tweaked the material to my satisfaction and connected the S/PDIF output to the digital input of my Technics SV-DA10 consumer DAT deck. With no problem whatsoever, the 300 not only processed my material but performed a digital format conversion for me. I also had no problem using it as an A/D front end to feed a Spectral Synthesis hard disk recording system. Frankly, if I had a mastering house or a small studio that mastered to DAT, I would consider the stereo adjust algorithm and the audio I/O capabilities worth the purchase price without ever using anything else in the box.

There's not much I need to say about the reverb and ambience algorithms; I have always been partial to the sound of Lexicon reverb, which is the warmest and most natural-sounding digital reverb I have heard. On vocals, drums, electric guitar and a stereo recording of an acoustic trio (two violins and guitar), I easily found presets that required little adjustment to be perfect for the context.

Another experiment involved matching the acoustics of a live recording to a studio recording that was inserted in the middle of the track. I have always found ambience matching to be exacting and tedious, but in this case I was able to get a match that was quite acceptable. If you have a studio that is too small to cover the high ticket of the 480L or its ilk, but need one superb reverb, the 300 is a good investment.

The stereo pitch shift also sounds very good, although different pitch shift algorithms all seem to have some material where they excel and others that warble. Overall, I found the 300's pitch shifting to be excellent at small shifts and quite good at larger shifts on most material. I tried vocals, piano,

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guitar, bass, drums and synthesizer at different times. Polyphonic sources are the bane of a pitch shifter's existence, and the 300 had mixed luck in that department with, of course, piano being the most telling. For thickening of guitar, vocals and drums it was quite undetectable in the mix (you can almost always hear pitch shifting when it is soloed). Purity of sound aside for the moment, the extraordinary delay capabilities definitely made it easy to come up with some great warped and twisted vocal effects.

The 300 falls down somewhat in its user interface. Although the device has many features, it was more unwieldy to use than I would like. Of course, with any effects box there is always the problem of how to show a multitude of available parameters. Lexicon chose to show eight at a time in the display, with the default display showing abbreviations of the parameter names. A parameter value is shown while it is adjusted, after which the display automatically returns to the abbreviations. The value button toggles the display between the abbreviations and the values for all eight parameters—something I constantly did as I paged through and adjusted parameters. When you set up MIDI patches, the value display doesn't have sufficient room to show a double-digit controller number, forcing one to view that parameter individually. I would rather have only four parameters on a page and have the abbreviations and values simultaneously available.

The mode system seemed a little cluttered. I never really used the run mode, and didn't encounter a need for storing audio I/O setups. A majority of engineers use the same equipment most of the time, but if you move around to a lot of different studios for a variety of projects, this might be useful.

In my conversations with Lexicon concerning the model 300, it became clear that the product is aimed at markets other than mine (music recording and post-production)—specifically the "broadcast" market. This point came up particularly in reference to the 300's time code implementation. It's very nice that the 300 can read time code and perform program changes, but I would like to have seen a more powerful implementation that included MIDI time code. The setup message of

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the MIDI time code spec is designed specifically to allow off- and on-loading of event lists.

The ideal system for me would be to construct master lists in a sequencer or cue sheet program, then download to each individual device its list of tasks and times. The events would not just be program changes, but parameter changes over a specified period of time. Each device would then only need to see either SMPTE or real-time MTC messages to execute its list. The two benefits of this approach would be to distribute the load, thus relieving MIDI data stream clogging, and to allow the device to anticipate and compensate for any internal delays in execution. The 300 is unable to deal with either the real-time portion or setup portion of the MTC spec, and its event list dump is in a non-MTC sys ex format. According to Lexicon, the "broadcast" market does not employ MIDI and does not need more than program change capability. In my experience, however, the music recording and post-production markets do. The event list's 50-event capability is sufficient for most applications, although I can envision a complex mix for film or video where it would not be enough. Under the circumstances, I'd stick with sequencer control rather than use the 300's time code capabilities.

A few other things struck me as weird. There is no input or output mute, so it's back to stopping the tape or muting the source at the board to hear reverb tails, or flipping the reverb time down to nothing to kill a long tail. Also, I was annoyed when the 300 defaulted to register one as the destination (rather than defaulting to the register I started from, or the next empty register) every time I went to store a modified effect preset. More than once, in a hurry to save something before I changed it, I lost register one instead. Sure, you can get used to that, but you can get used to anything.

The slight awkwardness of the operating system is pretty well offset by the excellence of the manual. It is comprehensive, well organized and profusely illustrated. In fact, the only information I couldn't find in the manual was an explanation of the list of available modulation sources. Most of them were obvious to me, having used Lexicon MIDI-controllable processors extensively, but I wasn't sure if "InEnv L" was really an envelope follower function until I tried it. It was. This is not something that Lexicon should leave as a cryptic listing in an illustration; this is a truly wonderful thing that bears some elaboration.

However, none of these criticisms come even close to discouraging me from highly recommending the model 300. While the unit's lack of MTC implementation was a serious oversight resulting in the loss of a very potent opportunity, it's still possible to use a sequencer to control effects automation. The Lexicon 300 provides a useful collection of superb audio processing algorithms, packaged with stunning analog and digital connectivity and powerful MIDI control. In this day of $500 multieffects gizmos, it takes a lot to justify a $4,795 price tag, but in my mind there is no question about the 300's value.

Lexicon, 100 Beaver Street, Waltham, MA 02154; (617) 891-6790. ■

Larry Oppenheimer performs with and hustles for his band Phoenyx full-time nowadays, but still somehow finds time for freelance engineering and producing.

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World Radio History

NEW PRODUCTS

◄ A-T FIELD PACKAGE

Audio-Technica (Stow, OH) offers its AT4462 stereo field production mixer with the AT825 stereo mic and AT804 mic as a complete production package. The AT4462 has two stereo and two mono inputs (with pad and low-cut filter), pre-fade monitor cueing, onboard limiter, oscillator and slating. The AT804 is a dynamic omnidirectional mic with a tough steel body; the AT825 is a stereo, dual-cardioid condenser for ambience, music or event recording.

Circle #276 on Reader Service Card

DAR SOUNDSTATION SIGMA

The SoundStation Sigma, an integrated audio production environment from Digital Audio Research of Chessington, UK, offers eight tracks of simultaneous recording/playback, eight channels of AES/EBU digital I/O, four analog inputs and eight analog outs with 18-bit DACs. A 650MB optical drive (with removable, rewritable disks) and four track-hours of hard disk storage are standard. Also featured are Segment Based Processing (assignable, real-time EQ, gain and pan), multichannel varispeed, TimeWarp™ time compression/expansion, SMPTE chase, transport control and touch-screen operation. Options include 16-track capability and WordFit™ automatic dialog alignment.

Circle #275 on Reader Service Card

MICROSOUND™

Microsound, a 16-bit, PC-based recording/editing system from Micro Technology Unlimited (Raleigh, NC), is available in add-on or complete turnkey systems priced from $5,995, including computer and hard drive. Disk capacity goes to 1,000 MB, and digital I/O and analog balanced/unbalanced versions are available. Microsound provides 2- or 4-track record/play capability, waveform editing with crossfade or butt-splice cutting, chase-lock to MIDI or SMPTE, and Disk Layering™ for 2- to 32-track mixing from up to 20 recorded files.

Circle #277 on Reader Service Card

SATURN DIRECT

Formerly available only in Europe, London's Saturn Research Ltd. has launched "Saturn Direct," offering its 2-inch, 24-track recorders directly to U.S. customers at factory prices, delivered duty-paid to any major airport. The Saturn line includes the 824 (priced at $33,000, an advanced design featuring auto-alignment and a fast, microprocessor-controlled transport) and the new 624, a low-cost ($26,000) recorder.

Circle #278 on Reader Service Card

ZOOM ▼ 9030

Zoom (S. San Francisco, CA) launched the 9030, a half-rack processor with more than 50 effects programs for instruments and vocals. Up to six effects can be used simultaneously, and 100 user patches can be stored in memory. The 9030 offers 16-bit/44.1kHz audio quality and provides for both MIDI and footswitch jack control.

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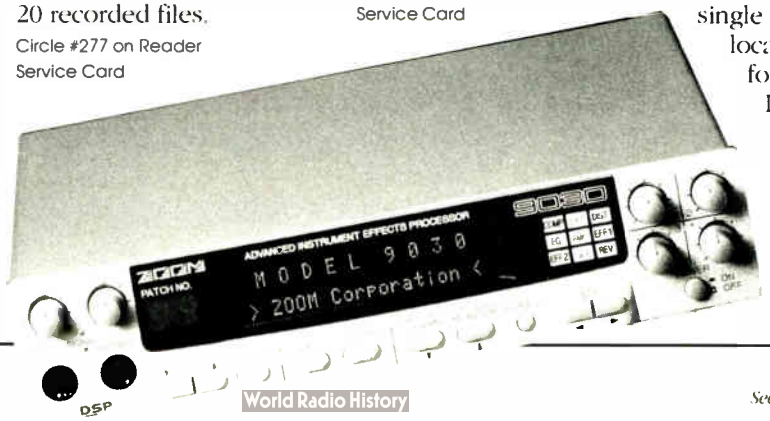

AKAI MPC60 II ▼

The MPC60 II from Akai Professional (Ft. Worth, TX) is an updated version of its original MIDI Production Center. Priced at $3,499, the MPC60 II combines a 99-track MIDI sequencer with a high-quality drum sampler in a single workstation, featuring pressure-sensitive drum pads, 11 polyphonic outputs, SMPTE and MTC sync, automated dynamic drum mixing, powerful step editing and 64 output MIDI channels.

Circle #280 on Reader Service Card

SENNHEISER MS PACKAGE

New from Sennheiser (Old Lyme, CT) is the MKH-MS stereo mic package, bundling two condenser mics (MKH-30 bidirectional and MKH-40 cardioid) with an M-S matrix/preamp/power supply, shock-mount, blimp windscreen, pistol grip and stand adapter in a single system. Suitable for location recording or for use with portable DAT and analog decks, the M-S package also includes a rugged case.

Circle #281 on Reader Service Card

World Radio History

See Page 184 for Reader Service

NEVE 44 SERIES

Designed for broadcast, remote and video post applications is the 44 Series from Neve (Bethel, CT), available in rack-mount (14-module) and table-top (26-module) versions. The console features stereo line and mono (mic/line) input modules, 3-band EQ with sweepable mids and 3-position HP filter, four aux buses, ESAM-II interface provision, and up to four group modules. The master module has built-in compressor/limiters and comprehensive talkback/oscillator routing.

Circle #282 on Reader Service Card

GROOVE TUBES TUBE MIC

The Model One ($1,000) from Groove Tubes (Sylmar, CA) is a side-address cardioid condenser microphone employing modern tube technology with a dual-triode providing a gain stage and impedance-matching circuit. Self-noise is stated as 18 dB, with a frequency response of 20 to 18k Hz (±5 dB). The model PS-1 power supply can power up to four mics.

Circle #284 on Reader Service Card

MIDIVOX™

MidiVox, from Synchro-Voice (Harrison, NJ), is a professional voice-to-MIDI converter priced at $1,895. Housed in a single-rack-space chassis, MidiVox uses bio-sensor—rather than pitch recognition—technology, whereby vocal fold movements are picked up by a neck-worn biomedical transducer and instantaneously converted to MIDI data. Features include a chromatic mode for keyboard-style effects; voice gate, loudness gate and voice sync outputs; and continuous pitch and velocity MIDI output from any vocal source.

Circle #286 on Reader Service Card

MONITOR ONE REFERENCE

From Monitor Technology (Odense, Denmark) comes the Monitor One Reference: compact, two-way speakers for studio and broadcast monitoring applications. Available in "limited edition" (with matched, hand-selected components) and standard versions, the monitors feature a 28mm textile-dome tweeter and 6.5-inch woofer in a ported, pyramid-shaped cabinet. Frequency response is stated as 55-20k Hz (±2 dB), power handling is 100W RMS, and sensitivity is 89 dB (1W/1m).

Circle #288 on Reader Service Card

AIRCORP MODEL 500

Designed to provide complete vocal processing in a one-space unit is the Pro Announcer Model 500 from Nashville's Advanced Instrument Research Corp. The 500 features a mic/line preamp, phantom powering, effects looping, compression, expansion, de-essing, equalization and metering. Inputs and outputs are balanced transformerless, and the 3-band EQ is optimized specifically for vocal enhancement.

Circle #283 on Reader Service Card

APOGEE ENHANCED DAC

Apogee Electronics of Santa Monica, CA, is shipping the DA-1000-E, an enhanced version of its DA-1000 digital-to-analog converter. Priced at $1,695, the new unit has two additional AES or S/PDIF inputs operating at any sampling rate from 32 to 55 kHz, and offers a more precise soundstage than its predecessor, while retaining the acclaimed Apogee 964-IV digital filters.

Circle #285 on Reader Service Card

SOUNDCRAFT DELTA AVE

Replacing the Series 200B/VE console, the Delta AVE from Soundcraft (Northridge, CA) is available in standard or custom configurations with 8, 16 or 24 input modules. With the Soundcraft VSA-24 serial interface, the Delta AVE can be directly controlled by a video edit controller; other features include four subgroups and a choice of stereo or mono input modules.

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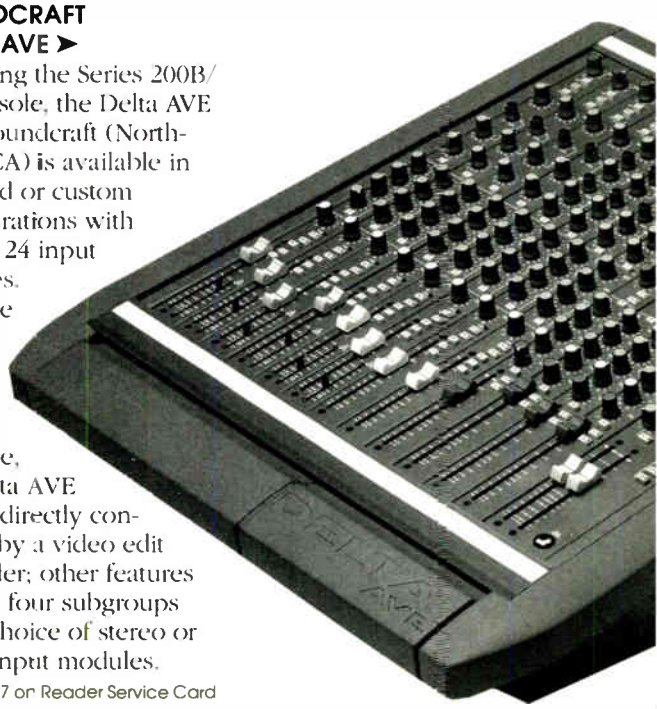

World Radio History

BEYER MC 833

The MC 833 from Beyer Dynamic (Hicksville, NY) is a stereo microphone with three cardioid, true-condenser capsules, offering X-Y, unmatrixed M-S and mono outputs. Two outer capsules are adjustable from 60°-180° when used for X-Y recording or summed to a figure-eight output in M-S mode. A front-facing capsule provides the "middle" output for M-S or mono recording. The mic is phantom-powered and has a 7-pin XLR output; options include a windscreen and dual XLR-3M output cable.

Circle #289 on Reader Service Card

SANKEN COS-11BP

Sanken (distributed by Audio Intervisual Design, Los Angeles) offers the COS-11BP, a battery-pack version of its COS-11 lavalier mic. Designed for field/location recording, the BP model operates with AA batteries or 12-52 VDC phantom power; a variety of mounting accessories are available.

Circle #290 on Reader Service Card

HOT OFF THE SHELF

New sounds for the Ensoniq EPS-16 Plus digital sampling workstation include hi-fi drum kits, electric and Moog basses, rock vocals, trumpet and trombone sections, Yamaha and Kawai pianos, and Chick Corea's Bosendorfer and Steinway pianos. Each volume is $39.95 on floppy disk; CD-ROM and removable media versions are to come. See your dealer or call (215) 647-3990...**Brainstorm's TDC-24** is a universal converter allowing any recorder with a tach/directional (or dual tach-pulse) output to be automatically chase-locked by a Sony APR-24 24-track. A beep output is also provided for ADR work. Call (213) 475-7570...**Light Wave's Cuemaster mic boom** is a lightweight portable unit with a 20-foot reach and full rotational or direct pivot aiming, with two axes of control. It can be handheld or used with a hip/shoulder harness, and folds to fit in a 50-inch carrying case. Call (818) 780-3002...**API 550s and 212s are mic preamp and EQ retrofits for Sony MXP-3000** consoles. The all-discrete (non-IC) modules install in minutes. Call (703) 455-8188...**Mag-Tags** are reusable, magnetic-backed labels printed with common instruments and sources used on consoles. Five 96-label sets are available: live/studio mixing, church sound, contractors, radio/broadcast and an elaborate percussion/instrument set. Call (800) 677-8247..."**This is Christmas**" is a CD collection of 20 holiday production music pieces in 60-, 30- and 10-second edits, buyout priced at $396. Call (216) 867-4448...A retrofittable XLR termination option is available for **Sennheiser MKE 2 and MKE 40 lavaliers** (used extensively in film and broadcast), eliminating the need for the K3U power module. Call (203) 434-9190...**Soper Sound** has released Volume 16 of its buyout production music, with 107 minutes of contemporary themes on two CDs. Call (415) 321-4022 or (800) 227-9980...The **ESE ES-237** ($195) is a 1x4 video distribution amplifier offering high (120 MHz) resolution in a compact unit. Call (213) 322-2136...Tru-Connectors offers a free **catalog of RF coaxial connectors**. Call (508) 532-0775 for a copy...Saki offers a new line of guaranteed replacement **heads for Tascam 8- and 16-tracks, Studer A80 and Otari MTR-10/12** models. Call (818) 880-4054...The 96-page "**Themes**" **catalog** of buyout production music from ZM Squared is yours for calling (609) 786-2693...**NovaStar's NSS-1** provides serial video edit control of Tascam ES-50 or ES-51 synchronizers, including jog, shuttle and master insert recording. Call (213) 467-5021...New releases in the **Valentino Production Library** include seven new music CDs (country, Broadway themes, horror/suspense, rock 'n' roll, national anthems and commercial spot "Beds and Bits") and five new sound effects volumes, for a total of 50 music and 37 SFX CDs. Call (212) 869-5210 or (800) 223-6278...**Audio Kinetics' ES 1.11 machine synchronizer** is now available with a console-top remote control/status display unit. Also, an **ES 1.11-to-Sony PCM-3348 interface** is now available. Call 21st Century Limited at (213) 465-2002 for details...**FutureVideo's TCG-2000** ($495) is a pocket-sized, DC-operated SMPTE time code generator. Call (714) 770-4416...New for the **AMS ST250 switchable format (M-S or X-Y) stereo mic**: a shock-mount that can be stand- or fishpole-mounted and accepts a Rycote windscreen. Call (203) 792-4997 for info...**Calzone's Studio Series S-88 and S-812** roll-around studio racks have eight or 12 spaces in a slant-top section and eight spaces below. Call (203) 367-5766 for details...**TRF Production Music's BMG CD** Production Music Library (on the RCA label), with orchestral and instrumental music, is available on a per-use or blanket license. Call (212) 265-8090 or (800) 899-6874...A variable-speed conversion kit for the industry-standard **Magna-Tech PR-600-B Electronic High-Speed Projectors** provides a range of 1 to 60 fps. Call (212) 586-7240...**JL Cooper's PPS-2™** SMPTE-to-MIDI synchronizer ($169.96) locks your sequencer to any tape transport. New features include auto-merge and a jam sync mode; optional Atari or Mac software ($14.95) provides remote system control. At your dealer now or call (213) 306-4131...Bargain of the month: **A free CD with over 80 sound effects** from the Hollywood Edge Sound Effects Library is now available to post-production professionals. No strings attached—the sounds can be used in your productions at no cost—but if you like what you hear, other SFX packages are priced from under $60. Call (800) 292-2755 or (213) 466-6723. ■

World Radio History
See Page 184 for Reader Service

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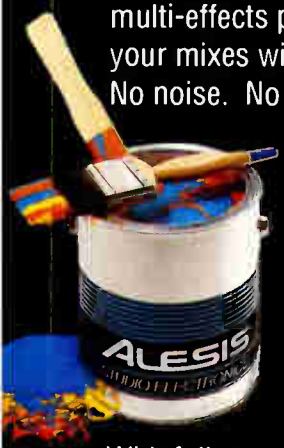

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SOME THOUGHTFUL NOTES FROM A FEW FRIENDLY USERS ON OUR DD1000.

Gordon Klimuck & Bart Chiate

"We put the DD1000 to the test every day, under the toughest of conditions, live television. Material we use time after time is kept 'on line' for instant retrieval and playback. The DD1000 has never failed us."

Gordon Klimuck & Bart Chiate, Paramount TV

Ken Davis

"Finally, after looking at nearly all the disk recording and editing systems available...we found everything we needed and wanted in the Akai DD1000. Mass storage, removable media, rugged and very dependable."

Ken Davis, KFI/AM & KOST/FM

Steve Levine

"I use the DD1000 producing television scores because it works perfectly with every standard, from PAL to NTSC. One box does it all, it's a breeze to use and sounds splendid."

Steve Levine, Do Not Erase Productions

Alan Parsons

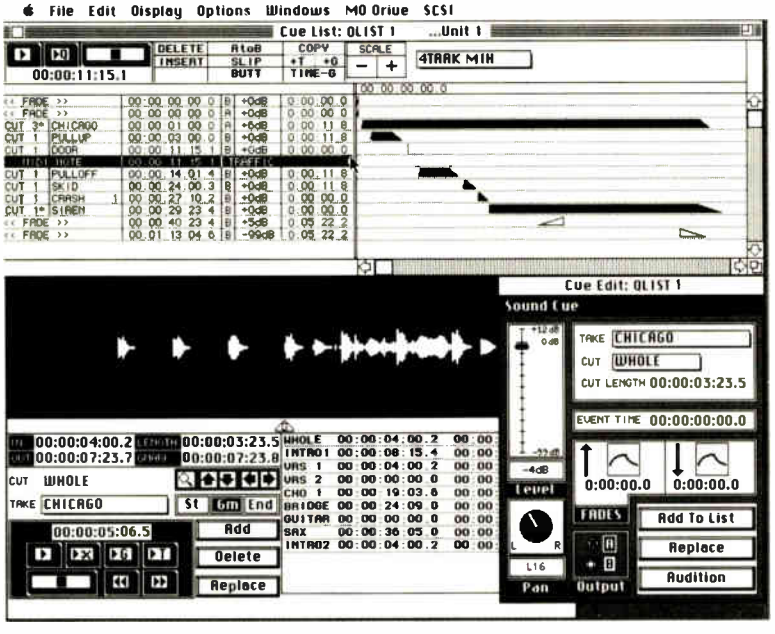
"The whole concept of the removable disk means hours saved... The DD1000 will find many a happy home among studios, musicians, post-production houses and in broadcasting."

Alan Parsons, MIX Magazine (February 1991)

Rick Schwartz

"Almost anything seems possible on the DD1000. The DD1000 is amazingly complete for a new product...all the bugs have been worked out. It's definitely worth checking out."

Rick Schwartz, Recording Engineer/Producer (October 1990)



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But you would expect us to be excited about the DD1000, it's our baby. Take a moment to read the comments at the left and see what others have to say about it. Then visit your Akai Digital dealer and test drive a DD1000 for yourself.

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World Radio History

–FROM PAGE 58, CINEMA SOUND REVOLUTION

system should probably be equipped with at least five dual-channel amplifiers in the 200 watts/channel power range. Output power should be quoted for full-range operation. Don't be misled by amplifier manufacturers that quote power only at 1kHz and 1% total harmonic distortion; full-range power will likely be much less than the 1kHz rating.

Three of the amplifiers should be equipped with crossover accessories. (Alternatively, separate stand-alone crossovers may be used, but at a greater cost.) The three amplifiers set up for bi-amplification should be used to power the left, center and right screen channels. Ideally, the speakers should be dual-woofer units with large-format horns and a typical sensitivity of 100 dB 1W/1m.

One of the amplifiers should be dedicated to the left and right surround channels. The surround speakers should be wired to provide about a 4-ohm load to each amplifier channel. This loading will allow the amplifier to provide each surround channel with 300 watts of power. The surround speakers should be of high quality and used in sufficient quantities to provide even coverage for the audience. Extended frequency response may be required for digital applications.

The last amplifier should be used for the subwoofer channel. This channel is often the most underpowered channel in the system. The cause is usually using too few speakers and improperly loading the amplifier. Subwoofers should be placed on the floor in front of the screen in the tightest possible array. In this configuration, four 18-inch speakers will produce the same output as a single 18-inch speaker with 25% of the power required by the single speaker. Each channel should connect to a pair of speakers, wired in parallel. The amplifier will then be able to provide a total of 600 watts to the subwoofer channel.

Large auditoriums may require the use of larger amplifiers that are rated around 325 watts/channel at 8 ohms and 500 watts/channel at 4 ohms. The same loudspeaker components can generally be used in all but the largest auditoriums. In very large auditoriums it may be necessary to use additional amplifiers for the surround and subwoofer systems, with a corresponding increase in the number of speakers used. The screen channels can also be specified to have two dual 15-inch woofer enclosures, for a total of four woofers per channel. The services of a cinema sound consultant are well worth the cost to get good results in a very large room.

Requirements Unaffected by Digital Sound

Many factors in amplifier purchasing decisions are unchanged by the fact that the amps will be used in a digital sound system. The most important requirement is that the amplifier be very reliable. It should provide a good value for the money, although a cheap amplifier can become very expensive if it fails during a sold-out show.

The amplifier manufacturer should be easy to deal with. Good customer service is important: Ask others in the field about their experiences with a potential supplier. A line of amplifier accessories can reduce the time and money required to tailor an amplifier to a specific application. Approvals and listings such as THX and UL can be important in narrowing a field of many choices. Trade association awards indicate a general acceptance of a company and its products.

Buy and install the best speakers possible in sufficient quantities. Once you have cut corners on the speakers, the best amp in the world won't be able to make the system sound right.

Why Upgrade Now?

It's important to start preparing now for the digital sound formats that are sure to come. There's no benefit in buying a new digital sound processor unless your entire playback system is ready for the dynamic range and frequency response extremes of digital reproduction. Also, a new sound system can improve the presentation of existing analog soundtracks.

The auditorium acoustics must also be taken into account. Isolation between adjacent rooms should be better than ever. The noise level in the auditorium will need to be very low to ensure that the softest passages in a film can be heard.

The time has arrived for the next major revolution in cinema sound. Start preparing your theaters now and be ready to cash in on the demand for high-quality digital sound when it's available on tommorow's box office blockbusters. ■

Barry Ferrell is an applications engineer for QSC Audio Products Inc. in Costa Mesa, Calif.

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See Page 184 for Reader Service

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—FROM PAGE 66, THE SOUND OF TERMINATOR 2

movie takes place on the run. By all accounts, the looping performances were excellent, even those by Eddie Furlong (playing the 10-year old John Connor), whose voice grew deeper over the nine months of production.

"I actually had to pitch all of his loops up quite a bit," says dialog mixer Tom Johnson. "I ended up using the Lexicon 2400—a device used mainly by TV studios—which will actually speed up or slow down a tape machine, or whatever, and pitch it accordingly so you don't get a pitch change. Using the AMS or even the Lexicon 480 pitch programs, you get artifacts after 1% or so. I was having to pitch the kid between 3% and 4%."

ADR constantly had to be matched to production dialog within scenes, sometimes within sentences. In the hospital scene where Linda Hamilton watches herself revealing her nuclear holocaust dreams on a TV monitor, the first half is from production, on 1/4-inch and videotape, the second half ADR. Johnson matched them up, then futzed it in the final mix. "All I had to do was match the natural room echo, which is easy if you get lucky. I used a Lexicon 480.

"I feel that it's important to retain as much of the natural sound of the production dialog as possible, smoothing the backgrounds out by using handles, or whatever," Johnson adds. "The editors give me handles on both sides of the line, and I just have to do a bunch of crossfades to make it sound like it was recorded by a microphone in one take. Then I smooth it out as much as possible, taking out weird tones with notch filters or really sharp parametric equalizers.

"Rather than using noise gates, I'll clean the track up as much as possible with EQ," Johnson continues. "There is a device that Dolby makes, and I think they're finally building more of them, called the 430 [Not in production yet, this piece is presently being beta tested—*ed. note*]. It uses a Dolby SR card and some other stuff to create a sort of sophisticated noise gate. It allows you to clean backgrounds up, but it doesn't sound like a noise gate where it's pumping a lot."

Johnson also helped premix two reels of Foley, and it was the Foley team that had perhaps the least time of anybody.

Since it would have been a nightmare to conform all the Foley elements to picture changes during the week before the premix, it was decided to hold off on Foley recording. "We decided to gamble and record Foley as close to the final as possible," says Gloria Borders. "We learned to take that chance on *Godfather III*. The final mix for *T2* started on June 6, and I think we were done with the last reel of Foley on June 10."

Despite the rush, it is flawless Foley, performed by Dennie Thorpe and recorded by Christopher Boyes. "I can never figure out how Dennie does this," Rydstrom says. "She's a very small woman, and in her history of Foley she's done Darth Vader, all the firemen in *Backdraft*, Arnold Schwarzenegger, T-1000. It's a combination of her performance and Chris recording it. It's quite amazing.

"Most audiences have no idea that we replaced all the leather creaks on the Terminator's jacket," Rydstrom continues, "and the buckle clinks, and the footsteps—all the incidental movements have been replaced.

"I think the shining moment for Foley in this movie is when Sarah is getting out of her straps in her hospital bed," Rydstrom adds. "She takes the paper clip, spits it out, it lands on the bed, she puts it in the buckle, she gets out of her strap, and she uses the paper clip to pick the lock of the door. The whole scene is nothing but Foley and music. And a lot of the tension is coming from focusing in on those little sounds from Foley—the paper clip into the tumblers of the lock."

Long after you leave *Terminator 2*, it's the small sounds, and the silences, that you remember more than the explosions. When Arnold shoots the frozen T-1000 in the steel mill, all background ambience fades out in the split second before the gun goes off. And when Arnold flies on the Harley, the engine, the music, everything cuts out until he lands.

"I learned on this film that silence works even for an extended period of time," Rydstrom says. "The biggest mixing challenge was making loud moments loud, at least apparently loud, when a lot of the time you have loud things happening simultaneously and in a row. It's not always easy to make something huge. I love moments like when the Cyberdyne building blows up—when the big explosion of the building is preceded just by a long period of silence and the click of a detonator." ■

Tom Kenny is a Mix *associate editor.*

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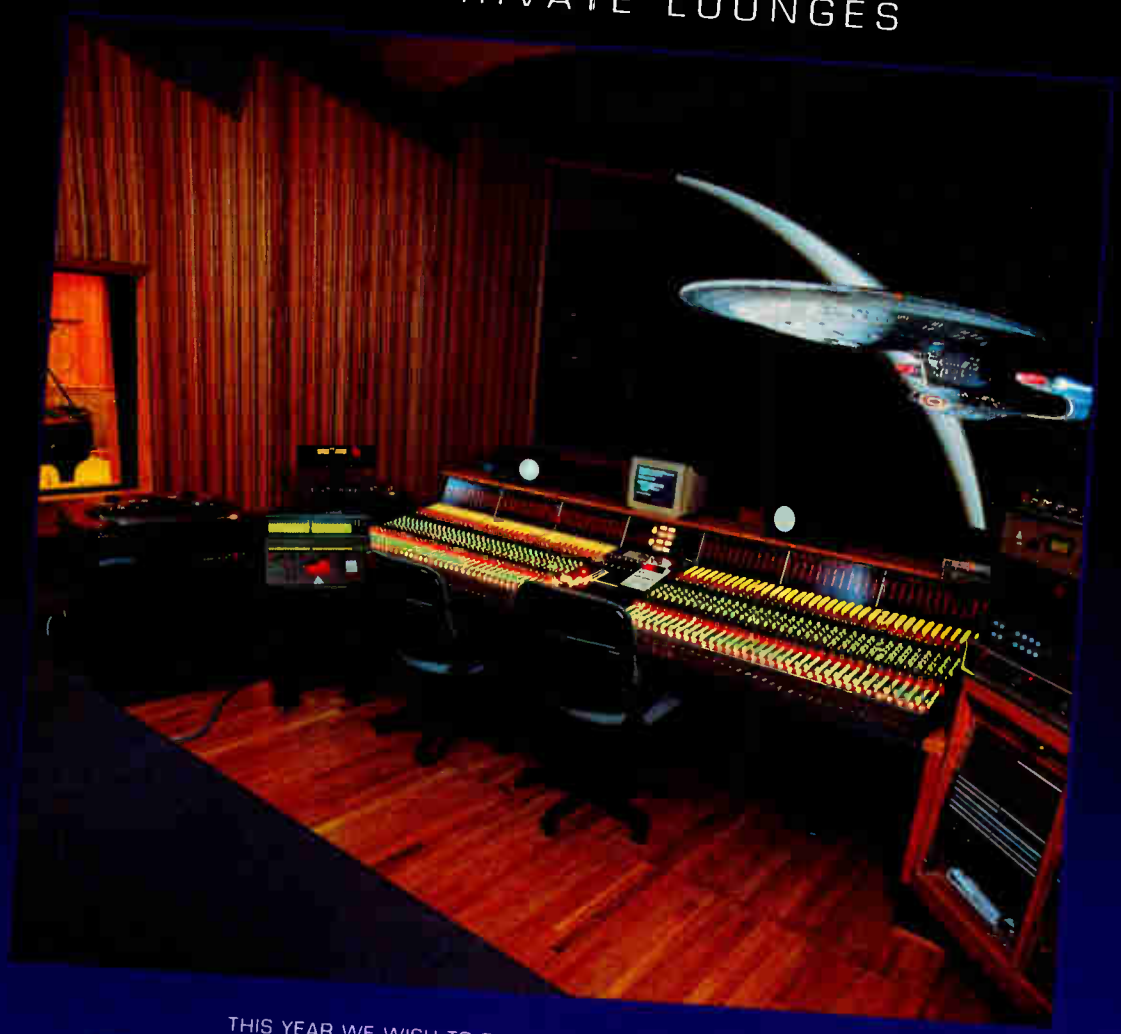

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(818) [illegible]

by David (Rudy) Trubitt

SOUNDCHECK

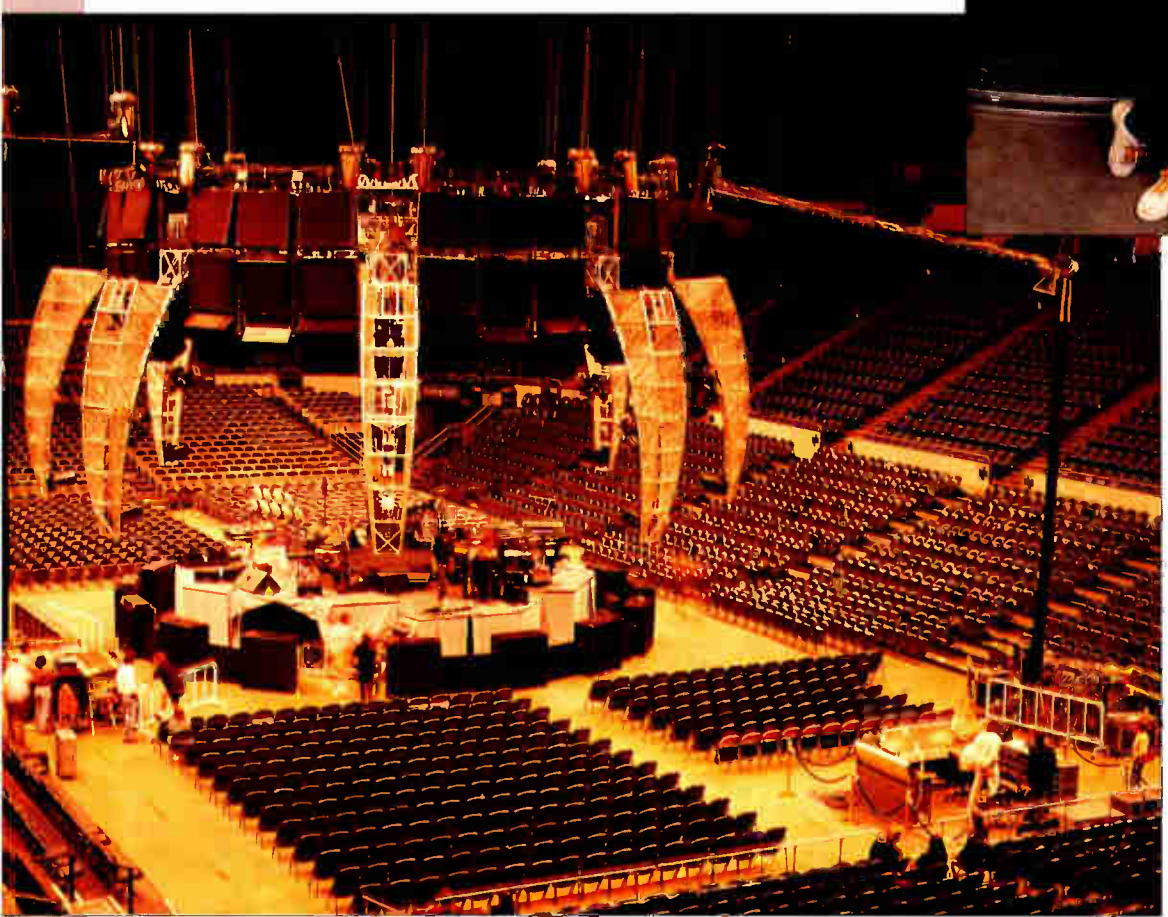
Southwest Happenings

Dallas' **Showco** is having a busy summer. Its domestic itinerary includes dates for ZZ Top, Diana Ross, Robert Palmer, Operation Rock and Roll (including Judas Priest and Alice Cooper), Willie Nelson and Reba McEntire, to name a few. International business is also brisk, with European tours featuring ZZ Top, Robert Palmer (they both seem to get around!), the Bee Gees, who have been filling 60,000-seat stadium dates, ELO with the Moscow Symphony, Living Colour and the Moody Blues.

Southwest by way of Southern California are **Maryland Sound Industry**'s West Coast offices. A chat with GM Mike Stahl brought us up to date on MSI's roster: Gloria Estefan, Whitney Houston, Simple Minds and Fishbone are out in the U.S., and Joe Jackson is touring Europe. Meanwhile, the company is working with Paula Abdul and Michael Bolton in band and production rehersals, respectively.

Canoga Park's **Electrotec** is out with Guns N' Roses, Ricky Van Shelton and Elvis Costello stateside and Rod Stewart in Europe. I caught a Costello show at Berkeley's Greek Theater in early June, with Dave Zammit mixing FOH. The system included Electrotec's own JBL-loaded cabinets, Crest amps (except for UREI 4x100W amps for highs), a Gamble EX

—CONTINUED ON PAGE 121



Above: Clair Brothers' Dave Natale and the house mix position for Yes in the round. Left: The stage on the floor of the Oakland Coliseum. Note monitor mix position to the left of the stage and house mix position at lower right.

PHOTOS: STEVE JENNINGS

World Radio History

YES UNION TOUR IN THE ROUND

Performer:
Yes Union Tour
Venue:
Oakland Coliseum, May 17, 1991
Rental Company:
Clair Brothers
FOH Mixer:
Dave Natale
Monitor Mixer:
Ed Dracoules

"It's different in the round," says Clair Brothers' Dave Natale. "It's *way* different." He's referring to late-spring's Yes arena tour, which centered around a rotating stage. (Yes' post-Europe shed dates won't be in the round.) On tour are members from all periods of the band's history—Steve Howe and Trevor Rabin on guitars, Rick Wakeman and Tony Kaye on keys, Bill Bruford and Allen White on drums, Chris Squire on bass and Jon Anderson on vocals. Natale has toured with the band before, including their last in-the-round tour in 1979. He recently finished a ten-month European tour with Tina Turner.

Yes is traveling with 64 of Clair's S4 Series II cabinets, which are loaded eight-per-bumper on the octagonal rig (see photo on page 118). The S4's are angled to provide long and medium throw, while individual 2 x 15" floor monitors hang for front fill. The S4's are powered by Carver amps, a part of Clair's High-D system that enables the longer than usual speaker runs of 190 feet. The entire sound and light rig flies in one piece, 30 minutes after the last motor is hung.

The stage is ringed by 16 subwoofers, powered by Crown Macro-Tech 10,000s. A foot-controlled volume pedal brought them in at strategic points in the show, making the low-end feed from bassist Chris Squire's foot-controlled bass synthesizer clean and dramatic. Interestingly, being in the geometric center of a ring of subwoofers has its drawbacks—Natale mentioned that center-stage musicians commented that the bass-buildup occasionally made them a bit queasy.

Happily, all this acoustical power wasn't used to make the audience uncomfortable. "A lot of people are tired of getting bowled over by volume at shows," Natale says. Although the show was certainly not quiet, it was always listenable. Lest we forget, the best sound system in the world is useless without quality sounds to reinforce, and the band more than held up its end of the bargain. Overall sound was excellent, one of the best shows I've heard in the Oakland Coliseum this season.

The stage was built by Mike Tate and Tate Towers. Its aluminum frame was used as a common ground point for all the sound gear, with six cables providing all its power, monitor and mains feeds. Located beneath the stage are each musician's technicians, perched into quarters reminiscent of old submarine movies. At various points in the show, as many as 17 people (including idle musicians) slowly spin along with the structure.

While a round stage is great for the audience, and at least interesting for the FOH mixer, it can be awkward to mix monitors seated directly in front of the house mains. This unusual task fell to monitor engineer Ed Dracoules, who quickly adjusted to the situation during production rehearsals. (Dracoules' previous tours include Peter Gabriel, Robert Plant and The Who.)

Sixteen monitor mixes were run from a Harrison 32x16 console, which received its first eight inputs via a drum submix from a Midas 24x8 board. Twenty-five Clair 12AMs were used in all. An additional mic split was provided for Bill Bruford, who does his own monitor mix from a Roland ME-16, and Rick Wakeman monitored portions of his performance from two Celestion cabinets.

Natale works in a comfortable and tidy mix position seated behind two of Clair's original custom folding 32x6 consoles, each with four sends. He keeps his use of effects to a minimum, for philosophical reasons—"people don't pay to hear me twiddle knobs."—and practical ones: The band has a lot of effects of their own. He credited a careful pre-tour check-out of the band's gear as the key to the tour's trouble-free operation. "It's worked every day since. Get it working, label it and you're done. It's the easiest way to not look like a bonehead!"

Above from top: Yes-men Trevor Rabin, Jon Anderson and Chris Squire.

PHOTOS: STEVE JENNINGS

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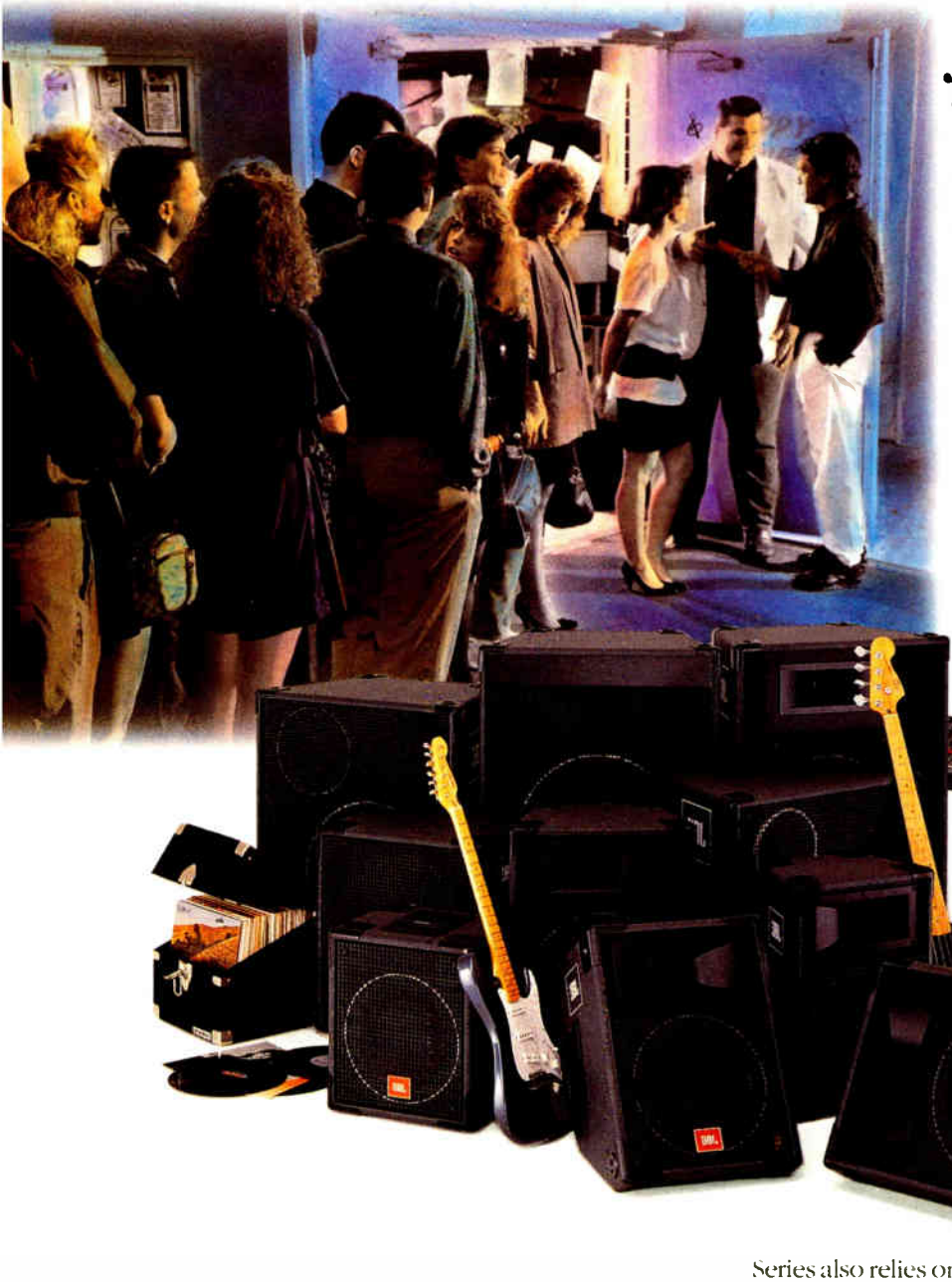

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—FROM PAGE 118, SOUNDCHECK

Series console, Klark-Teknik EQs and Summit Audio limiters, which Zammit spoke highly of. Sound quality at the Greek is usually good, and this show was no exception.

Albuquerque-based **Quickbeam Systems** provided sound for the WVUE/WNOE stage at this year's 17-stage New Orleans Jazz and Heritage Festival. Quickbeam's Apogee system provided sound for Rodney Crowell, Kate and Anna McGarrigle, Taj Mahal, Ritchie Havens, Bela Fleck & the Flecktones, The Indigo Girls, The Dixie Cups, Buckwheat Zydeco, Allen Toussaint and The Radiators. All shows ran smoothly, with peak crowds numbering 10,000 during the Fleck and Indigo sets.

All Apogee speakers were used, including 12 3X3's for mains, eight AE12 subs, two AE5s for center fill and two more for rear delay. Rear delay was used to combat winds up to 25 mph that were blowing directly onto the stage; the delay improved system response in the 4 to 8kHz range for an additional 125 feet. A Yamaha PM3000 was used for house and TAC Scorpion for monitors. John Klondike Kohler, the festival's audio director, said, "For five years running, Quickbeam Systems has provided the festival with superior sound quality, despite a challenging production schedule and often inclement weather."

Sound, Lights and Ribs

What weighs 100,000 pounds, floats on eight barges and smells like barbecue sauce? **Eighth Day Sound**'s custom stage for the National Rib Cook-Off, held in the inner harbor of Cleveland, Ohio! Performers at the rib-fest included B.B. King, the Four Tops, the Temptations, Charlie Musselwhite, the Neville Brothers, NRBQ, Hall and Oates and many more. Equipment provided by Eighth Day included 48 JBL-loaded Turbosound TMS-3s & 12 TSW124 subs, 12 Crown Macro-Tech 2400 IQ amps, and a Gamble EX 56 console for FOH. The system drive-rack contained Klark-Teknik DN360 EQ, dbx 160X limiters, and a Brooke-Siren Systems MCS four-way crossover. Signal processing included an Eventide H3000, TC 2290 delay, Yamaha SPX900 and REV5, Lexicon 480L and PCM70 and eight channels of BSS gates and compressors. Eighth Day provided a ten-person, full-time sound and light crew for the event, which included a second stage and "music to fireworks" soundtrack.

The unique National Rib Cook-Off stage in the Cleveland harbor; equipment provided by Eighth Day Sound.

A Little Something Extra

Sometimes a successful sound reinforcement business requires more than just sound reinforcement. One Southwest-based example came to our attention recently—**Dennis Lange Promotions** of Houston, TX. The company provides a wide variety of services, including equipment rental, installation, band management and bookings and equipment sales. I asked Lange how the various parts of his company's business fit together. "They all support each other," he says. "Our main goal is to invest in original music artists. I started a sound company because I had so much equipment for all my bands. I also have an agency to keep the bands working, and a management company."

Continued increases in the company's equipment appetite resulted in an expansion into equipment sales. "I got Yorkville and Crown dealerships because I needed so many of them for my own company. We did the Benson & Hedges Blues series at the Hyatt, The Alley Theater and the Black Forest with the Yorkville Elites. We've also installed them at several popular local clubs, including Club Flamingo and the Black Forest." These installs included Soundcraft consoles along with Yorkville's Audio Pro amps and Elite three-ways and sub-woofers. Lange reports absolutely no equipment problems at either venue in the year the installs have been in place. The company is looking to its artists to provide the next area of growth. "We'd like to see our artists on a major label so we can support them on tour," Lange concludes.

Mr. Cat Productions (Long Beach, CA) also provides more than just SR services. In addition to providing sound for a variety of live shows, theater and sporting events, the company offers sound design and music scoring services, most recently for Sony's High Definition Television promo video. The company also co-sponsors events, such as this summer's Jazz Concert Series at the Long Beach Museum of Art. But why Mr. Cat? "We didn't want another 'tech' name, and figured people would remember Mr. Cat," says co-proprietor Nancy

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World Radio History

A digitally controlled sound sy
the largest airport or the

Crown introduces digital system control that's affordable for even small installations.

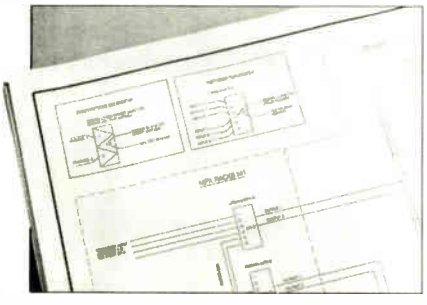
Installed sound is moving to digital control. But if you're like most contractors, the huge cost and steep learning curves of existing systems have made you think twice about specing digital sound control.

Crown changes all that with the introduction of the IQ System's MPX-6,™ SMX-6™ and IQ COM-Q components. Now, the same IQ System™ with the capability to handle airports, stadiums and convention centers also makes economic sense in bringing digital control to churches and boardrooms. With its intuitive operation, no other system is as easy to use as the IQ System.

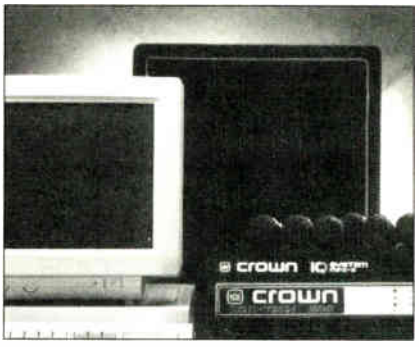
IQ SYSTEM 2000

A different approach to digitally controlled sound.

The IQ System is unlike existing digital systems which are expensive, difficult to learn and susceptible to total system failure. Designed around highly sophisticated yet relatively inexpensive components, the IQ System is easy to use and highly reliable. IQ components are designed to keep the system operating even if a host computer should fail.



The IQ System gives you the flexibility to design systems that match the exact needs of an installation—no matter how large or small.



Entry-level IQ System: MS/PC-DOS-compatible computer, Crown Com-Tech 200, MPX-6, loudspeaker and microphones. Approximate retail price of this system is $3,700. Prices may vary depending on specific components and configuration.

Because of its outstanding flexibility, the IQ System may be tailored exactly to installation needs, while leaving further expansion possibilities wide open.

As additional components are introduced in the near future, you'll discover there's no more flexible or cost-efficient system than Crown IQ.

MPX-6. Expanding signal routing and control capabilities.

The MPX-6 is one of two IQ System multiplexers which make sophisticated control and routing of signals easy and affordable. Digitally controlled by a host computer or IQ COM-Q tape controller, an MPX-6 can route and switch six mic/line inputs, two summed outputs and two independent bussing outputs. Any level of any input can be routed to any output with a controllable range of 120 dB in 1/2 dB increments. This ability to route both incoming and outgoing signals provides unsurpassed system flexibility. But that's not all.

Multiple MPX-6 units can be combined to create 6x4, 12x2, 24x8, etc., mixing capabilities. In fact, you can control up to 24,000 inputs with just one IQ System!

The MPX-6 may also be used remotely in distributed intelligent control systems to reduce long microphone line runs.

With the addition of the MPX-6, the ability to route signals in complex routines is not only possible, but easy.

SMX-6. Sensing multiplexer.

The SMX-6 builds upon the MPX-6 with additional sensing and configuration capabilities. It contains six mic/line inputs and four outputs like the MPX-6, but adds the capability of monitoring the pre-attenuated levels coming into the inputs.

Unlike other devices such as automatic mic mixers, control and configuration of the SMX-6 are achieved with downloadable software. These downloadable instructions, called Algo™ Packs, allow the contractor to program specific capabilities into the processor of the "intelligent" SMX-6. Automatic mic mixing, video-follow-audio switching and impedance and equipment checking are just a few of the many possibilities. It may also be combined with the MPX-6 for in-

The Crown MPX-6 multiplexer and SMX-6 sensing multiplexer provide unsurpassed mixing and routing/switching capabilities.

World Radio History

tem so versatile, it can handle smallest church budget.

IQ System software is available for both MS/PC-DOS-compatible and Apple Macintosh systems. Designed to be user-friendly and intuitive, the system eliminates the need for the extensive training required by other systems. The basic IQ software is available without charge with any IQ component.

creased mixing and routing capabilities at a reasonable cost.

PA-422 compatible.

Both IQ System multiplexers provide an option for being driven directly by any computer with RS422 or RS232 communication. An additional multiplexer option provides compatibility with the PA-422 standard and allows multiple PA-422 devices to be independently driven from each multiplexer. This permits control of compatible digital delay units, parametrics, third-octave equalizers and more.

No-Fee IQ System software.

Unlike other systems, the basic IQ System software is provided without charge with any IQ component. Software is available for both MS/PC-DOS-compatible and Apple® Macintosh® computers. Because of the many possible applications for these components, command codes and protocols are included so specific routines may be programmed by the contractor or system user.

IQ COM-Q. Complex system control made simple.

The IQ COM-Q component makes system configuration as simple as playing a cassette tape. Designed to digitally record the commands from an IQ host computer onto almost any tape medium (cassette, open reel, DAT), the COM-Q permits the system to be configured by simply playing back the appropriately recorded tape for a desired system change. This not only

The IQ COM-Q makes sound system configuration as simple as playing back a cassette tape.

allows for quick and simple changes, it permits those without extensive training to control the system. Contractors can pre-program configurations in-house for an installation which then requires only an IQ COM-Q and interface-capable component to run the system. With multitrack recording, the COM-Q can initiate complex audio and system commands useful in applications such as theater productions and crowd movement at theme parks.

Installation ideas.

The design flexibility and sophistication of the IQ System may make you rethink how you design installations. Here are just a few of the many possible applications.

Small Conference Center

The IQ System multiplexers can decentralize audio system installations, reducing wire and associated costs, without decentralizing control. For example, one multiplexer and one Com-Tech® can be used to control the signal routing for two banquet rooms.

Surveillance/Security

The IQ System can be used to create a surveillance system in high-security areas. With strategically placed microphones and Crown multiplexers, audio or video-follow-audio monitoring is easily achieved.

For more information on the IQ System and system components, see your Crown representative or call toll-free: 1-800-535-6289.

Free literature on the IQ System and IQ components, including data sheets and application guide are available from Crown or your Crown representative.

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O'Rourke. And if Mr. Cat seems too casual for the occasional straight-laced client? "Then they can call us CATCO," she laughs.

NEWS FLASHES

FGS Intergalactic Cartel and Holding Company of Topanga, CA, provided an all-volunteer sound system for the Topanga Fair last Memorial Day weekend. JBL VP of marketing Mark Gander (the "G" of FGS) informs us that this year's guest mixers came from Audio **Analysts, Delicate Productions, Schubert Systems Group, Ultra Sound, Electrotec** and **Maryland Sound Industries,** along with several independent engineers and other industry luminaries. A prototype of JBL's new digital system controller was used at the event...**Audiolease** of Brisbane, Australia, is changing its entire 500-cabinet inventory to incorporate McCauley loudspeakers. Systems manager Cameron Mercer says, "We have used every major speaker brand in the systems we build. The ability to remove the magnet assembly and inspect the voice coil ourselves is a must for any hire company. This feature alone makes other speakers seem restrictive."...**Pro Media** of El Sobrante, CA, is providing sound for the 11th straight year at San Francisco's Stern Grove Festival. According to the company, the festival is the country's longest-running free outdoor concert series, and attracts up to 30,000 people every Sunday for a ten-week period each summer...**Sennheiser** announced its first infrared theater installation intended solely to assist blind theater-goers. Installed at the Theater National De Chaillot in Old Lyme, CT, the wireless infrared headsets provide several user-selectable mixes of the live sound as well as a special narration track that describes the onstage action.

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Digital Control for Live Sound Equipment

or What Makes a Standard?

The advantages of quick reconfiguration and remote control and status monitoring of live sound systems are obvious. However, advances in automation have been slowed by lack of a single standard for interfacing equipment from different manufacturers. The AES entered the fray several years ago and formed a working group on sound system control. Their starting point was a protocol called PA-422, originally developed by IED of Louisville, Ky. Since 1981, IED has installed equipment in over 200 major installations, using the protocol.

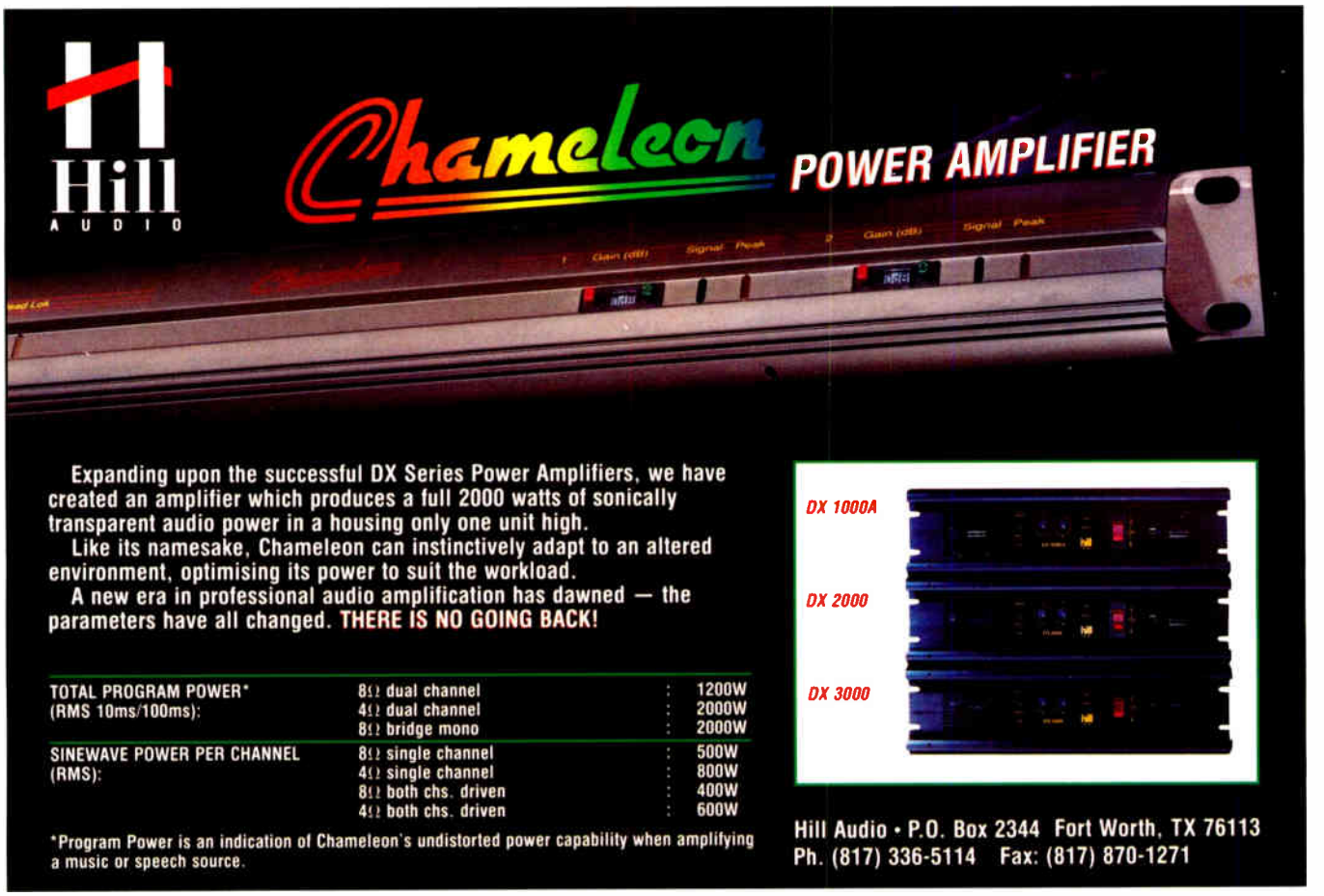
PA-422's hardware is based on the common RS-422 serial interface. PA-422 runs at 19.2k baud and is balanced (four twisted pairs plus shield). Each device in a PA-422 system is strung together serially, taking one PA-422 cable in and continuing to the next device through a second, outgoing cable.

PA-422's software protocol was enhanced at Altec Lansing by Bob Rodgers. Some of its commands include querying devices present in the system, changing their internal presets, locking/unlocking devices and muting. Control of more sophisticated functions (i.e., real-time adjustment of an equalizer or input attenuation on an amplifier) are not specified generically in PA-422, and require custom software.

The AES working committee has shepherded the spec through the standards procedure, and PA-422 seems likely to become "AES15-1991"—an honest-to-God ANSI standard. One would think this would be cause for celebration, but the manufacturing community is split over the usefulness of PA-422. A common complaint centers around the pass-through nature of the systems interconnection, and subsequent problems when a device in the chain fails.

"Everyone endeavors to make as reliable a product as possible, but the ugly truth is that sometimes things break," says Barry Andrews of QSC. "One problem with PA-422 is that if an amp goes down, everything else from that point on is taken off the network. You can get around that by putting relays in every single device, but that gets prohibitively expensive and creates reliability problems in itself. So that's one of the real problems with PA-422 from our standpoint."

Also cited is the device-specific software required to control equipment. Skip Taylor from Peavey says, "You need a standard set of codes implemented in much the way that MIDI is, where everybody knows that a particular code word refers to a particular function of every machine. If that's not the case, it's going to be



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awkward. Controller number seven is always volume in MIDI, but you don't have a standard controller that will always be power amp volume in PA-422."

Manufacturer's device-specific codes will be available online, as the AES plans to implement a database that will be available to any sound system designer, consultant or contractor with a computer and modem. IED's Tom Roseberry contends that some custom programming comes with the territory. "Any time you're building a custom installation, you've got a complex piece of software to write."

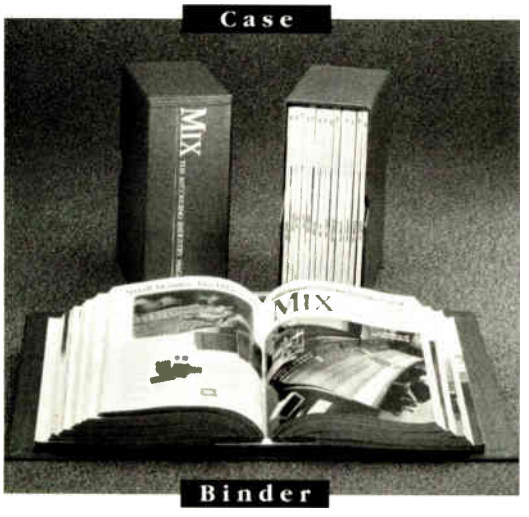
"PA-422 has a long track record," adds Altec Lansing's Rodgers, "and has been set up in a number of installations. Altec presently has no fear in supporting it, and apparently neither do a number of other manufacturers."

As you've probably gathered, there are more than a few differences of opinion on the subject. Rane's Bob Moses explains: "Unfortunately, not a lot of companies got involved early on, so by the time people started having some reservations, the spec was pretty much defined, and there wasn't a lot we could do to change it. It's probably going to be established as a standard the way it is, with many problems that everyone acknowledges."

Even PA-422's supporters recognize that change is inevitable. Moses continues: "I think everyone is in agreement that PA-422 is more of a stepping stone to something much better. It has a lot of limitations that no one really wants to live with. We've put together a small group of people [with Moses as chairman] to study existing network standards [in and outside the audio industry]. If we don't find something we can use, we'll take what we can from these other networks and design a new one." Committee members show a strong preference for upward compatibility for the existing PA-422 spec, but this may not be mandatory.

Amplifier manufacturers Crown and Crest both have their own proprietary control systems. Crown's IQ system is well-established and has been used in numerous high-profile installations. Crown has been involved in talks with other manufacturers regarding the possible license of IQ technology. Crest's NexSys system should also be shipping by the time you read this, and Craig Hannabury says a number of major sound companies are eagerly awaiting its availability.

However, if the AES subgroup does recommend the adoption of an existing system, it seems more likely that it would choose one less tied to a particular manufacturer, due to competitive issues such a move would raise. The most commonly mentioned alternative is Intelix's MIND Control System. It is based on an RS-485 interface, which requires only a single shielded pair. The system operates at about four times the speed of PA-422, and its interconnection scheme allows for addi-



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tion, removal and failure of devices without disrupting network operation. Mark IV Audio recently licensed Intelix's hardware and software for use by all of its companies. However, they did not buy the company. "It's important to note that Intelix wasn't acquired by Mark IV," says QSC's Barry Andrews. "Intelix sold them the hardware, and Mark IV is now in the business of licensing and maintaining the bus (the MIND system). Because Intelix is out of the hardware business, they're now totally neutral."

Hartley Peavey also sees some advantages to Intelix's system. "It's got two things going for it—it appears to address most of the shortcomings of the present PA-422, and there is an organization behind it. The only thing against it is that they want a pretty hefty licensing fee." Another option would be Lone Wolf's MediaLink fiber optic-based system. Lone Wolf is developing its own interface chip, which could make that system more price-competitive.

The AES subcommittee report on alternative networks should be complete by the time you read this, and will be presented at a meeting during October's AES convention in New York. The report will certainly advance the process, although no one is expecting a unified solution overnight.

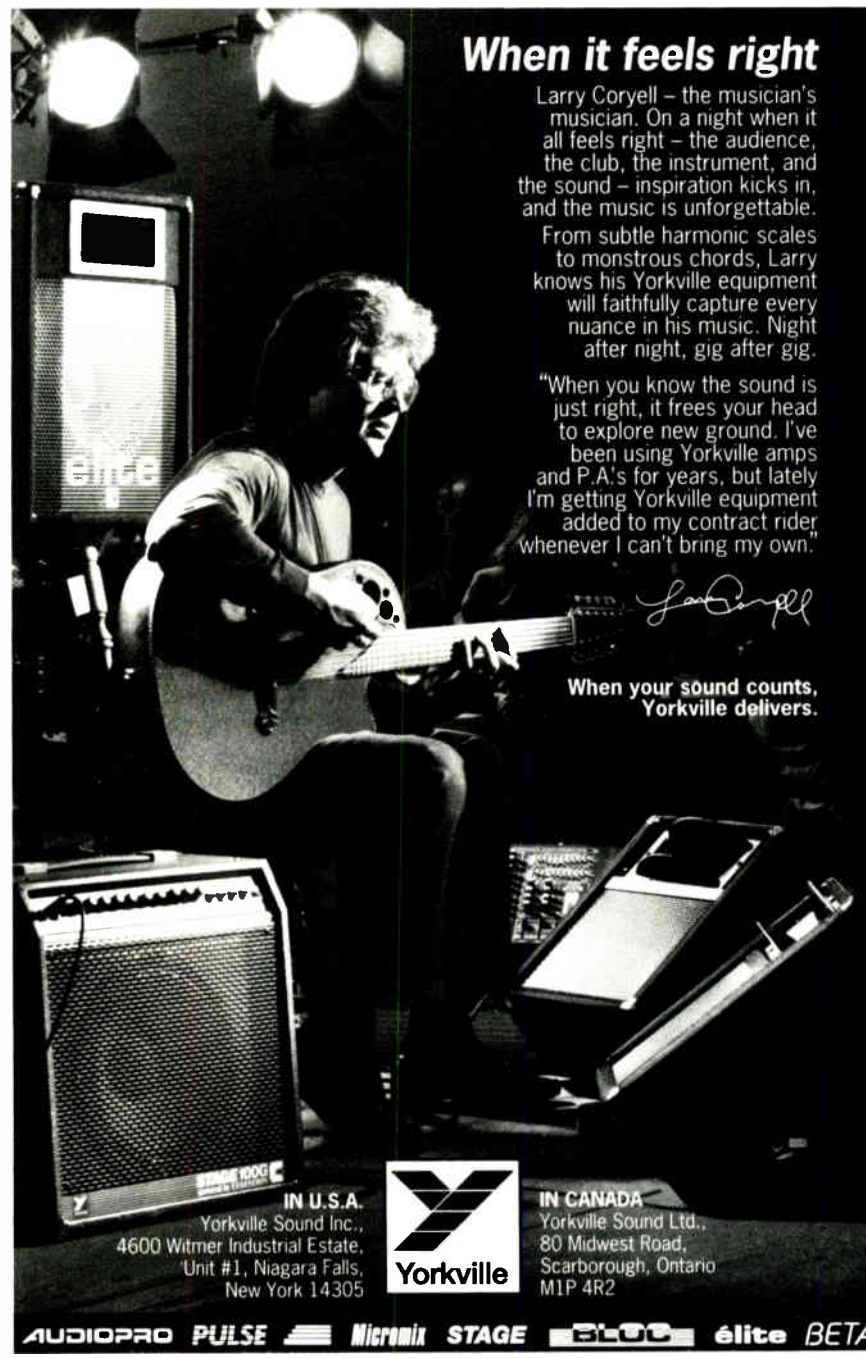
But what about people trying to put together systems now? Peavey's Skip Taylor says, "It's clear that there's a lot of work still to be done. Many companies have implemented RS-422 or RS-485, but have not implemented what is currently called PA-422. I believe that there's a lot of confusion and frustration out there, because a lot of people think there's a standard, but there's not."

Despite this uncertainty, designers are successfully creating computer-controlled systems using the options at hand. Some successful designs have incorporated MIDI, and the AES Committee and the MIDI Manufacturers Association (MMA) have been talking. Several control systems will have optional MIDI links, including Crest's NexSys. And, the MMA has been doing some work on its own, developing a cue/time code-based MIDI extension called MIDI Show Control.

There's one thing most agree on. "If computer control's going to be successful," says Barry Andrews, "there's going to have to be a single industry standard. If PA-422 emerges as the standard, we'll go with that."

The debate will continue, but this installment's last word goes to IED's Tom Roseberry, chairman of the AES Committee on sound system control: "PA-422 is an operational standard. It's not the end of the line, but it's currently available and proven. It does have limitations, because it's based on the technology of the period when it was developed. But the industry has to stay together, or we'll never get system designers to use a single standard." ■

David (Rudy) Trubitt advocates plate lunch and manapua as main staples in a well-balanced diet.



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SOUND REINFORCEMENT NEW PRODUCTS

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Tech Tape™ from Coe-Weiser (Boise, ID) is a new adhesive material that secures cables to floors or carpets without leaving a sticky residue. Available in 4-, 6-, and 8-inch wide rolls, this strong, fiber-reinforced tape comes in high-visibility yellow or unobtrusive black. The secret to Tech Tape is that the adhesive coating is only on the outside edges (where you need it), while the center area forms a non-stick "tunnel," keeping cables under control. It removes easily after the gig.

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Distributed by Freed International (Ft. Worth, TX) is the SKB line of ATA-spec rack cases. Available in 2, 4, 6, 8, 10, and 12-unit sizes, these are priced from $139.95 and are less than half the weight of conventional road cases. The lids feature stainless twist latches and gaskets to seal out dust and moisture.

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TANNOY CONTRACTOR SERIES

The CPA Contractor Public Address Series from Tannoy (Kitchener, Ont., Canada) is designed for the sound reinforcement and contracting market. The CPA 5, the smallest model in the line, combines a 5-inch Inductively Coupled Transducer with a 1-inch, passive Duralumin dome radiator, with a phase plug and wave guide extension for a rated frequency response of 80-22k Hz. The larger CPA 12 and 15 (trapezoidals) and 15FM (floor monitor) models feature 12- or 15-inch Dual-Concentric drivers, and are based on the successful DMT™ technology developed for Tannoy's Studio Monitor Series. The CPA 15.2, a dual 15-inch sub cabinet, is available, and—except for the 5—all CPA cabinets include Aeroquip-compatible tracks for flown installations.

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BEC AUDIO PLEX

The Audio Plex Pro Series, from BEC Technologies, Orlando, FL, is a system that digitizes and sends 16 channels of DAT-quality audio up to 1,000 feet, over a single wire pair. With pricing approximately $0.31 per channel-foot, the system provides an attractive option for temporary or permanent setups. For example, to upgrade a facility with 24 lines from stage to booth, one or more Audio Plex systems could provide additional channels by sending over the existing wiring. Also, BEC fiber optic modules can be used for runs over 1,000 feet.

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ATM FLY-WARE UPDATE

The ATM Group (Carson, CA) has released new versions of its AMFS flying hardware for use with the EAW KF-300 and KF-600, Apogee Sound 3X3, and in the near future, EV's DeltaMax Series. Also, new yoke assemblies for the 1X2 Series provide for 360° tilt and splay adjustment.

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Offering quality at an affordable price is the MR line of sound reinforcement loudspeakers from JBL of Northridge, CA. Ten models range from three-way, 15- and 18-inch systems to 12- and 15-inch, two-way floor monitors. Also in the series are guitar and bass cabinets, two-way 12- and 15-inch systems and an 18-inch sub box. Several models are trapezoidal for tight grouping in concert systems, and the series uses the finest JBL components, including the reliable 2416H HF driver, flat-front Bi-Radial™ horns, and new 12- and 15-inch woofers with 3-inch voice coils and 16-pound magnet structures. Steel grilles, comfort grip handles and locking corner protectors are standard.

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second and use it as often as you like.

"Overall, you have an incredible variety of sounds and tempos, and sequenced programs allow you to create many options," he adds. "For example, often people don't like the sound of sampled cymbals, so you can lay down all the drums in a sequencer, triggering other keyboards, and then you can add live cymbals." For another jingle, Van Steen used a 30-second loop of a two-bar library track and then built up the spot by stacking layers over it.

Van Steen goes on to recommend a new sequencer program, Studio Vision, which "allows you to trigger sound files out of a direct-to-disk recording system. So you could store sound files on the Mac hard disk and then edit them into sound cues that can be triggered along with the sequence. That gives you amazing flexibility."

John Trivers and Liz Myers of Trivers/ Myers Music Production.

Trivers/Myers Music Production of Manhattan Beach, Calif., takes a very different approach from most other companies. Well known for their *CBS Evening News* theme and spots for Apple Computer, Budweiser and Nissan, Trivers/Myers combines digital and analog, with the emphasis very much on analog.

"There are many composers who use the Mac and various scoring programs for stepping music in and cutting and pasting," according to John Trivers. "But we much prefer to use live musicians wherever possible. If it's a long film cue, adding up to several minutes, and we need to make changes, then we'll use a scoring program and the Mac. Otherwise, we go into the studio and record with a live band."

This approach doesn't stop the team from using a lot of electronic percussion in conjunction with a live drummer—"usually Chad Wackerman from Andy Summers' band or John Ferraro from Larry Carlton's band," Trivers explains. "And I always use a percussionist who either plays live, or he'll write sequences for me using the Mac. That's an area where I use computers a lot."

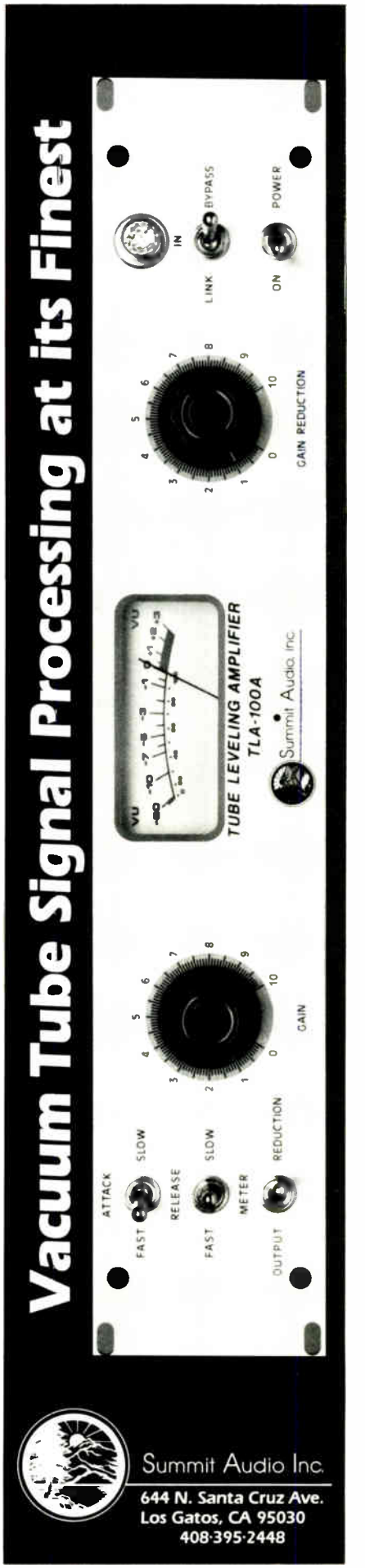
But generally the team doesn't rely on their computers to write the material or to perform it. "We use a lot of synthesizers, but we'll always have the musicians play them live," stresses the ex-musician and songwriter. "I feel that if you totally rely on computers, you sacrifice some of the musical feel, and anyway, I like to get the players' input, so my approach is more along the lines of making a record."

Trivers admits that this approach may be "slightly slower" than that of most people making jingles, but states that "it's a lot faster than making a record, and you have the advantage of a more musical result."

Trivers cites a recent spot created for Acura called "Office," which utilized a "rumbling drum pattern." For the demo, the team used a drum machine, but when it came time to record, they called in drummer John Ferraro and added an acoustic guitar. "The result was that it breathed," says Trivers, who adds that "we also used a couple of sequenced electronic percussion parts using the Mac, and the combination of live instruments and triggered sounds worked well."

Like Trivers/Myers, Music a la Carte also prefers to "combine the latest computer technology with real, live musicians," reports Rene Barge. Yvette and Rene Barge, owners, composers and producers at the well-known commercial music production company, maintain offices in Miami and Los Angeles, and their clients include JC Penney's, Continental Airlines and Pizza Hut.

"Budgets are not usually a problem with such clients, but even so, we



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usually do all our demos on computer using samples and sequenced parts to give them an idea," Barge explains. "Then we'll keep the bits everyone likes and add a live rhythm section, or perhaps combine sampled strings with a live orchestra."

Rene and Yvette Barge of Music a la Carte.

Barge generally works with a Mac SE functioning as a sequencer in combination with Master Tracks Pro 4, an Akai S1000 sampler, and a Proteus 1, which provides a lot of the percussion and drum sounds. He estimates that over 95% of their pre-production is done on computer.

"We've been in the business since 1983, and computers have changed jingle production in every aspect," Barge says. "A lot more people have been getting into the business since the advent of sequencers in the mid-'80s, because it's so much easier for anyone to produce a professional-sounding product today."

Unlike most other companies, however, Music a la Carte doesn't see a future totally dominated by computers. "I actually think there's a trend back toward using more of a combination of live and computer," Barge says. "For a while, everything in this business was synthesizers and sequencers, but now clients want a mixture, and I think the companies that will do best in the future are the ones who can do both." ■

Our new post-production editor, Iain Blair, is a freelance writer based in Southern California.

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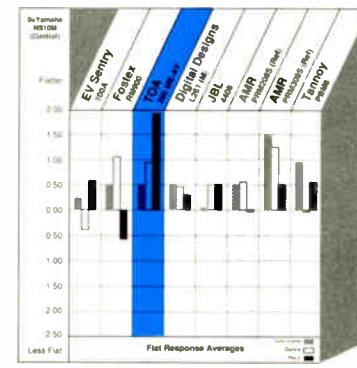

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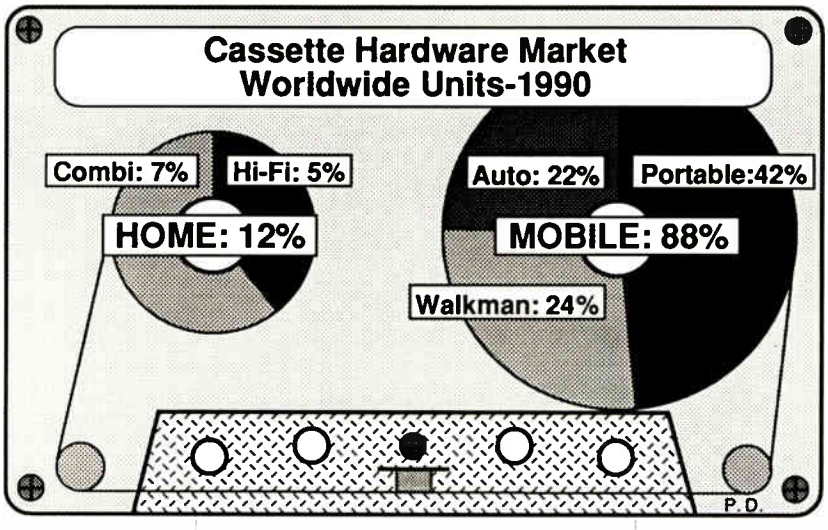
by Philip De Lancie

TOO HOT TO HANDLE?

DIGITAL BINS STRETCH DUPE CHAIN LIMITS

Each year, the ITA "How and Why" audio cassette seminar provides an opportunity to explore issues of concern to the cassette duplication community. Last month, we presented an overview of a wide range of topics covered at the event. This issue, we'll focus on digital master reproducers, better known as digital bins.

Many presentations at the seminar emphasized improved quality as a means of extending the life of the cassette format. At the same time, there was strong interest in DCC and how duplicators can best prepare for it (to be covered next issue). In both areas, the digital bin plays a crucial role. But the bins are also reminding the industry that strengthening any link in a chain can point up weaknesses elsewhere that need to be addressed. Fortunately, a new tool from Sony Music Technology, the "MDL meter," will soon be available to make that process easier.



SOURCE: PHILIPS/MUSIC BUSINESS INTERNATIONAL

Figure 1

Duplicators Under Pressure

Digital bins are by no means standard equipment in duplication plants today. But for those major label manufacturers and large independents who don't already have the gear, the only remaining questions seem to be "when?" and "which system?" Why is the industry, after all the investment that has already gone into improving prerecorded cassettes, feeling the need to put out the kind of money it will take to go digital? The technical advantages of the new bins are considerable. But the answer probably lies more in changing market conditions that are keeping pressure on duplicators to upgrade fidelity, consistency and productivity.

The phenomenal growth of the cassette as a music carrier over the last two decades has largely been fueled by America's appetite for music on the go (see Fig. 1). The auto cassette player, followed by the Walkman and the boom box, stimulated demand that couldn't be met by less portable formats like records. By serving a distinct market, the cassette was able to thrive through the 1980s, even as the LP, previously the format of choice for home hi-fi listening, was displaced by the CD. In the 1990s, however, the cassette's leading role in this market is under siege.

The main cause for worry is that consumer electronics manufacturers, having successfully made hundreds of millions of turntables obsolete, are now ready for new areas in which to stimulate sales. Several factors come together at this time to turn their attention to the portable market. The CD is safely established in the home. Digital media are proven in the field, and disputes about their sonic superiority are pretty much over. Growth in cassette sales is leveling off, possibly indicating declining enthusiasm for the format. And advances in technology make possible systems that are better suited to portable applications than DAT or CD.

For duplicators, this unwanted attention from hardware makers to "their" market must be disheartening. While dupers have been working on extending the life of the cassette, the electronics giants have been perfecting technology intended to hasten its demise. Philips and Sony, with their announcements of DCC and Mini Disc, have put cassette interests on notice. Since record labels and music retailers would prefer to stick to only two configurations, the new formats won't be competing just against each other. They'll share the common goal of eventually eliminating the cassette.

If Sony's Mini Disc prevails, duplicators will find themselves without a future in the music business. If, on the other hand, Philips' DCC catches on, duplication can survive. But the transition is likely to be very costly. So duplicators will want to keep the cassette going for as long as possible, maximizing their re-

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turn on equipment they already own, while building up the capital needed to switch to DCC.

In the view of many at the seminar, digital bins are integral to this strategy. They can be adapted for DCC use when demand dictates. But in the meantime, they can be used to produce better-sounding analog cassettes, which advocates claim will breathe new life into the configuration. WEA president Henry Droz, in introducing the company's DIGalog process at last March's NARM convention, stated that "supporting the continued popularity of the analog cassette is an important goal for our industry." DIGalog, built around the DAAD digital bin from Concept Designs, is now in use at WEA's Specialty and Allied plants. The process was introduced at ITA by Joe Vayda of WEA Manufacturing with Pat Shevlin of Specialty.

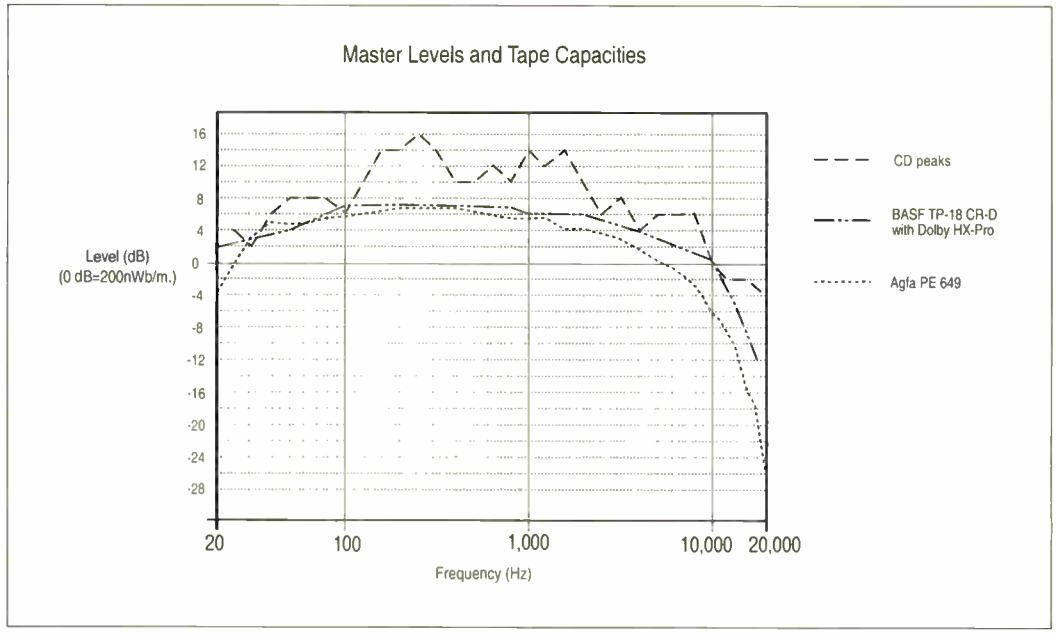

Figure 2: Composite peak energies of ten contemporary CDs compared with MOL/SOL curves (1% distortion) of chrome (BASF) and ferric (Agfa) duplication tapes.

The Digital Difference

Vayda predicted that consumers will respond positively to digitally duplicated tapes, and backed his claim by citing research conducted for the Warner Music Group by Chilton Research Services. The company conducted listening tests involving 448 consumers, 15-44 years old, who had bought at least one prerecorded cassette in the prior three months. Comparing ferric tapes, 69% preferred the sound of DIGalog to analog duplication in at least two of three listenings. Comparing DIGalog cobalt-ferric to analog ferric, the preference went up to 83%. Perhaps most important to labels, 84% were "somewhat or very willing" to spend $1 more for DIGalog—even some of those who didn't hear the difference.

Attendees were allowed to hear the difference themselves in Shevlin's part of the presentation. Shevlin A/B'd DIGalog cassettes, one ferric and one cobalt, with a regular ferric cassette and a CD of the same program. All cassettes were Dolby B encoded. Though monitoring conditions were less than ideal, the DIGalog ferric sounded more defined—less smeared and smashed—than the analog ferric. Compared to the CD, the DIGalog ferric was boosted on the low end and, of course, somewhat noisier. The DIGalog cobalt, meanwhile, was significantly louder and clearer than the analog ferric.

Not all attendees were impressed by the demonstration. DIGalog proponents claim that by removing the distortion component that would be introduced from an analog loop bin master, the process allows more level to be put on tape. But several critics claimed that the use of tapes recorded at different levels made the demonstration meaningless. Further, the analog ferric tape was felt by some to be less than state of the art, primarily intended to provide the most dramatic comparison with the DIGalog.

Despite these doubts about WEA's methods, nobody questioned the basic point that digital bins can make very fine-sounding cassettes. The reasons become obvious when the performance of digital and analog bins are compared side by side, as Terry O'Kelly of BASF did as part of a panel discussion on how to best transfer from a digital bin to an analog cassette.

O'Kelly pointed out that even the best 4-track analog loop bin master, recorded at 3-3/4 or 7-1/2 ips, has certain limitations in dynamic range, frequency response and print performance. Added to that are problems of wow and flutter, physical wear and phase consistency that come up in running the master through a bin at high speed. In analog-to-analog duplication, these deficiencies are passed from master to copy, effectively compounding the limitations of the cassette itself.

Much the same point was demonstrated graphically by Richard Clark of American Multimedia (parent of Concept Designs). Using slides of a scope, he showed intermodulation distortion on a loop

—CONTINUED ON PAGE 144

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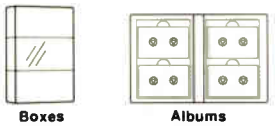

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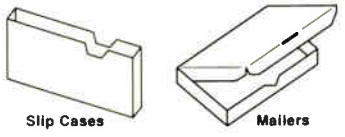

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Tape & Disc News

Home Taping Swap: Royalties for Stability

After more than a decade of divisive wrangling, consumer electronics, record industry and music publishing interests seem to have settled their differences over home taping. The Electronics Industries Association, the Recording Industry Association of America and the National Music Publishers Association, representing a coalition of assorted interested parties, announced agreement in July on a package involving compromise on all sides. The parties have pledged to jointly seek enactment of the accord's provisions by Congress.

For hardware makers, the proposal represents a significant change in position.

As described in a joint statement, the proposed legislation would include the following key points: Private, noncommercial recording, analog or digital, would be exempted from the infringement provisions of copyright law. All present and future digital consumer music recording devices made in or imported to the U.S. would incorporate the Serial Copy Management System (SCMS). Importers and domestic manufacturers would pay between $1-$8 per digital recording device to the Copyright Office, based on 2% of wholesale price or customs valuation. For blank digital audio media, the royalty would be 3%.

The plan involves creation of two copyright owners' royalty funds, one for musical works and the other for sound recordings. The funds will be distributed to record companies (38.41%), featured artists (25.6%), songwriters (16.66%), publishers (16.66%), the American Federation of Musicians (1.75%) and the American Federation of Television and Radio Artists (.92%). Within each category, payments would be based on record sales and, in some cases, airplay.

For hardware makers, the proposal represents a significant change in position. The RIAA and the NMPA have been trying for years to get Congress to impose royalties on consumer audio recorders and blank tape. The levies are intended to compensate copyright owners for revenue lost due to home taping. The EIA had long blocked the idea, but their opposition was not without its costs. Hardware industry obstructionism gave software interests a handy stick with which to beat DAT. And when DCC was made public by Philips, record industry support was conditioned on resolution of the home taping controversy.

The first sign of movement in the long deadlock came at June's Consumer Electronics Show. The EIA issued a statement saying it was "time for the digital recording stalemate to be broken." The group reaffirmed its oft-stated position that consumers have a "right to record for their own personal use." But it also alluded to the possibility of a "legislative compromise, which could include reasonable royalties." The statement reportedly gave new life to behind-the-scenes efforts aimed at bringing the warring camps together.

By agreeing to support the royalties, on digital recording only, the EIA apparently hopes to avoid future obstacles to the marketing of its new technologies. The legislation, if it passes, will also win the group long-sought affirmation of home-taping rights. And any notions entertained by record companies of restrictions or levies on analog taping will effectively be laid to rest.

Perhaps most important, the legislation would create, in the words of Tandy CEO John Roach, "a stable environment for product introduction and use." That's good, of course, for everyone in the industry. True, somebody's going to have to pay for the royalty provi-

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sions. But even so, consumers may be relieved to return to the contemplation of specifications and features, rather than lawsuits and legislation, in their selection of audio hardware.

Denon Demonstrates Disc Development

Denon America used the Summer CES to show off its progress in increasing CD data capacity. The company has been able to produce 3-inch CDs boasting 70 minutes of stereo audio. What's interesting about the "Quad discs" is that the quadrupling of information is achieved with no data compression. Instead, Denon doubles track pitch and halves rotation speed. The discs do not play back on conventional CD players.

Denon's method of increasing data density sounds straightforward enough, but it means a substantial reduction in the size of the CD's pits. Smaller pits need to be read by a smaller beam, and blue is the only color of light with a wavelength short enough for the job. So the process uses a type of blue laser diode, which, according to Denon's Mark Knox, wasn't even available until the middle of this year.

Knox says that the CES demonstration was intended to show Denon's technical prowess rather than to herald the introduction of a new product. Denon has no intention of offering the Quad disc in the portable market as an "uncompressed" alternative to Sony's Mini Disc, despite the choice of a 3-inch disc for the demonstration. The company expects further refinements of the Quad disc approach to eventually allow a standard 5-inch CD to hold as much as 32 times its current capacity. So there's little motivation for hardware makers to agree on a standard this early. But the potential for future applications is enormous, not only in audio, but video.

The increases in data density, combined with data compression techniques, may someday allow manufacturers to realize their dream of fitting feature-length films on one side of an optical disc. Perhaps as a first step in that direction, Denon Digital Industries, the company's U.S. replication arm, announced plans to manufacture a laserdisc that's single-sided like a CD. The new discs will be playback-compatible with conventional laserdiscs, which are made of two sides laminated together. Denon's 8-inch discs, with a capacity of 20 minutes of audio and video, will be targeted toward the growing music video market.

CD Packaging Update

The RIAA, which had predicted consensus on CD packaging by early June, has officially conceded that the issue will take longer to resolve. On the surface, there's a struggle between proponents of the Eco-Pak and the shrink-wrapped jewel box. That battle has even spread to Congress, where Dow Plastics' Scott Sanderude, chairman of Jewel box Advocates and Manufacturers (JAM), has testified before a House subcommittee. But behind the scenes, the issue is further complicated by several new package designs.

The new contenders are plastic packages that are oversized at re-

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tail, but convert to jewel box size after purchase. Physical details of the designs are not available, but according to *Billboard*, one or another of the packages has reportedly gained favor at all the major labels except WEA, which is committed to the Eco-Pak. That leads some observers to predict that various packages, all of the same external dimensions, will coexist. Unfortunately, introduction of a multitude of packaging styles would be a costly headache for replicators.

Meanwhile, Shape Inc., whose Shape South division is the nation's second largest maker of jewel boxes, has confirmed that it is working with Warner subsidiary Ivy Hill on the Eco-Pak. The announcement came as no surprise, since Shape provided diagrams of the new package to *Billboard* as far back as early April. The company has also issued a release enigmatically terming rumors of an impending sale of Shape South to WEA or PolyGram as "greatly exaggerated."

SPLICES

Sonic Solutions (San Francisco, CA) announced its intention to offer a real-time version of the "de-clicking" and "de-crackling" options for its NoNoise system. The new version will perform both functions simultaneously in a single pass, with no reduction in output quality or user control of the process...**DIC Digital** (Fort Lee, NJ) has introduced a line of DAT tapes for the professional market. The tapes feature a new dust-inhibiting shell design. DIC has also provided two extra minutes over standard lengths, offering the tapes in 48, 62, 92 and 122-minute lengths. Fifteen- and 30-minute DATs will also be available...**TDK** (Port Washington, NY) is upping its profile in optical media markets with an information campaign on its MO and WORM discs. The company offers magneto-optical discs in five sizes and data capacities. WORM discs are available in both Pioneer and CD compatible formats...ODM (Charlotte, NC) is offering a new Optical Disc Tester, the LHH 3470. The automated device evaluates quality and specification conformance for a wide range of optical and MO discs, including the CD family. Both metalized and non-metalized substrates as well as finished discs may be tested...**Eagle/TDT** (Madison, CT) has taken orders from nine duplicators in the second quarter for high-speed duplication gear. According to Eagle, the average order includes seven slaves for 64:1 duplication. The company also plans to introduce a new line of bin loop systems "compatible with digital formats."...**Precision Sound** (Burnaby, BC) has taken delivery of a new Versadyne 1500 series high-speed duplication system. Precision intends to offer customers a "complementary alternative" to its real-time duplicating services, built around 225 Nakamichi decks...**Duplication Factory** has added an Otari T-700 Mk-II TMD duplicator to its 52,000-square-foot facility in Chaska, MN. The company, which also produces the Hometime Series of home improvement videos, says the "desire for high-quality EP tapes was the principal purchase criterion."...**duplication equipment brokerage** (Englewood, CO) announced the sale of a Roldex model CR-2 Platemaker to Robert Burns Cassettes...**Europadisk** (New York, NY) reports recent mastering work by Jim Shelton on Stevie Wonder's *Jungle Fever* soundtrack, as well as a David Byrne project...**A&M Mastering** (Hollywood, CA) has been busy with current projects by Aaron Neville and Amy Grant, as well as reissue packages from Quicksilver Messenger Service, Grand Funk Railroad, Grass Roots and Dr. Demento...**Digital House** in New York City reports that a recent CD project mastered for the Minnesota Department of Education is one of the first to use all 99 index points available in the CD format. The disc uses samples of a wide range of compositions to demonstrate a variety of classical music styles... **Rocket Lab** in San Francisco has been mastering for Raw Fusion, MC Sway & King Tech and The Dynatones... Nashville's **Disc Mastering Inc.** has been working with Rick Medlocke on the album *Medicine Man* by Blackfoot. ■

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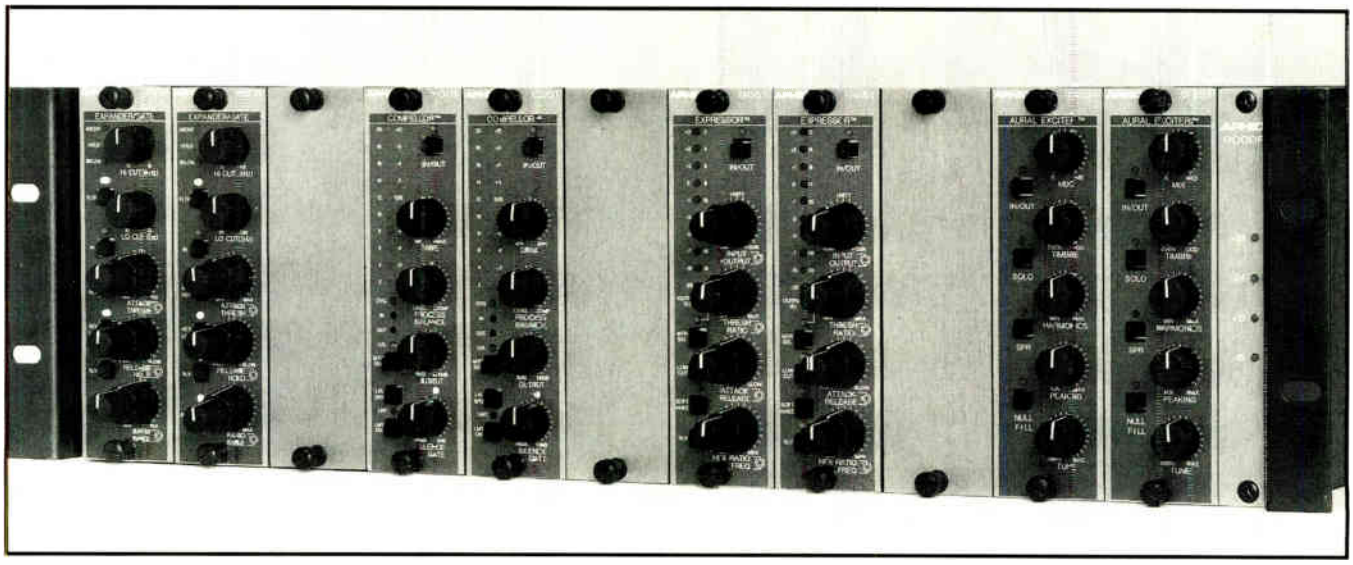

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—FROM PAGE 137, TOO HOT TO HANDLE?

master and how it builds up in the transfer to cassette. Clark went on to claim that a cassette made directly from DAAD will actually have less IM distortion than a 3-3/4 ips loop master.

Too Much of a Good Thing?

Despite these glowing assessments of digital bins' advantages, they haven't made the duplicators' job any less challenging. Several panelists noted that it's already been hard to keep up with producers and artists determined to take full advantage of the level and frequency-response capabilities of the CD. The production masters coming into their plants are generally optimized for CD rather than cassette. Duplicators have been left to figure out how to get this super hot program onto cassette tape without excessive distortion, particularly in the 5kHz-8kHz range.

It's widely felt that the use of digital bins adds to this problem. That's because analog loop masters tend to compress high-frequency transients, "preparing" the signal for cassette. With a digital bin, this extra layer of protection is gone, and the difference between the master's signal and dupe tape's capacity is more exposed. That's the crux of a dilemma that was compared at the seminar to "getting a 12-ounce beer into a ten-ounce glass."

As explained by Joe Kempler of Sunkyong, duplication involves trade-offs between distortion, linearity and level. At low and mid frequencies, the maximum output level (MOL) of a given tape stock is limited by its tendency to produce third harmonic distortion. At high frequencies, tape capacity is measured in terms of maximum output before saturation (SOL), though self-erasure and non-linearity can begin to be a problem for signals as low as -15 dB. Between MOL/SOL above, and the noise floor below, lies the usable region for recording.

As one might expect, the usable recording region of cassette tape doesn't exactly correspond with the signal sound on a typical digital source. Charles Johnson of Sonopress described to the seminar his comparison of tape capabilities and CD levels, which reflect levels found on digital production masters (see Fig. 2). He charted the composite peak energies of ten contemporary hit CDs and overlayed MOL/SOL curves (at 1% distortion) from ferric and chrome stock. The composite CD levels exceeded the usable areas of the tapes by 8-10 dB.

A Look at Solutions

One answer to the problem is, obviously, to lower the level sent to tape. The choice of an optimum transfer level is already part of the master preparation process that goes on in dupe plant mastering rooms. But to use level alone to make up an 8dB or 10dB gap would mean a drastic loss of signal-to-noise ratio, and perhaps lessen the competitiveness of cassettes in the music marketplace, as well. So it's not a particularly attractive option.

A more appealing possibility is to improve the signal handling abilities of duplication tape. Kempler described Sunkyong's efforts in this area. The way to improve high-frequency saturation characteristics, he said, is to raise coercivity. Chromium dioxide is a higher-coercivity tape than ferric, and it adds about 4 dB of linear response. But as it begins to saturate in the high frequencies, it has a characteristic sound that some find displeasing. That's why suppliers like Aurex (with its new Digipro tape) and BASF have given customers another option by developing cobalt-modified ferric formulations.

The promise of these new tapes is borne out by the consumer listening tests presented by Vayda. In a comparison of DIGalog ferric with DIGalog cobalt, 75% of the participants chose the cobalt tape at least two out of three times. That's more than the percentage that chose DIGalog ferric over analog ferric.

Unfortunately, higher-coercivity cobalt tapes require more bias current to overcome reduced sensitivity at low frequencies. Too much bias can lead to head saturation and high-frequency erasure.

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So Sunkyong turned away from the high-bias IEC Type II approach. Instead, it has developed a "Type I-1/2" tape, adding a small amount of cobalt to ferric for a coercivity of about 450 Oersteds. The new tape (temporarily designated "CMX") uses a lower bias than chrome or cobalt Type II. Kempler says it behaves like a ferric, but with better high-frequency response (though not quite as good as the Type II tapes).

Beyond higher-performance tape stocks, several panelists mentioned Dolby S-Type as a helpful development. Johnson, for instance, noted that S-Type encoding tends to compress the high end going to tape. But he went on to say that better tape and Dolby S can only provide part of the solution. For the time being, the rest will have to come from reduced levels—or judicious modification of dynamics and frequency content.

There's a lot of resistance to the suggestion that signal should be "tampered with" to get it on cassette. But as Clark pointed out, the tape itself will compress transients if they are left untreated. The saturation and self-erasure thereby created introduces non-linearity inside the noise reduction loop (after Dolby encoding), which makes for NR tracking errors on playback. Better to deal with the problem outside the NR loop, he argues, by sending the tape a signal it's capable of reproducing.

The MDL Meter

How does a duplicator know what kind of levels are on a production master, and what has to be done to make them work in duplication? "Run it and see if it saturates" isn't a particularly satisfying answer. What's needed is a way of previewing the program and evaluating its peak content. That's the point of the Maximum Duplicating Level meter under development by Sony Music Technology.

As described at ITA by Sony's Julio Suarez, the MDL meter is made up of a pre-emphasis network followed by a peak read-

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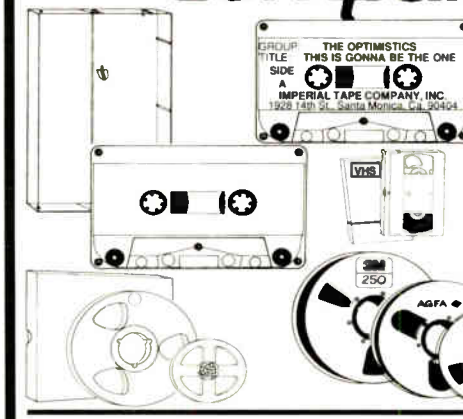

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ing meter. The first section is switchable between the pre-emphasis curves applied to Type I and Type II tapes. After appropriate pre-emphasis for the tape type to be used, the signal is sent to the peak meter. The idea is that overloads indicated on this meter will alert the user that the signal is too hot to be duplicated without distortion. The meter has a 10ms attack time to weed out overloads that are too short to affect sound quality.

Sony has been working with the Recording Industry Association of America to develop a standard for cassette duplication production masters that would be based on use of the meter. According to Sony's Tom Rucktenwald, specifics of the MDL are being revised following input from the RIAA's engineering committee. Final versions of the standard and the meter are expected following further meetings of the committee later in the year. It is hoped that the device will show how far the signal has exceeded the MDL standard, so the amount of correction required will be easy to figure. Rucktenwald expects the meters to be made by a number of companies, with a variety of added features.

As envisaged by Sony, the MDL meter isn't intended primarily for use in duplication plants. Suarez, Kempler and fellow panelist Pat Weber of MCA all spoke of the need for "the studios" to provide duplicators with masters that take into account the capability of the cassette. The meter is intended to allow them to do just that. But the question of where in the production chain to tailor the program for cassette remains open.

Weber, in particular, seemed to feel that producers and mixing engineers have a responsibility to provide dupers with cassette-ready masters, especially since cassettes account for at least 60% of prerecorded music product. But the likelihood of getting producers to make special mixes with restricted signal content seems remote at best. Besides, masters don't come to dupers directly; they usually come from mastering houses. So the question becomes a matter of which mastering step is the best place to make the necessary adjustments: at the traditional mastering house, or in the master-making area of the duplication plant.

Duplicators seem united in their aversion to taking on the task. For one thing, there is a fear that clients would be upset to know that compression, high-frequency limiting or EQ are being applied to their projects at the plant. Since these techniques have aesthetic as well as technical consequences, it's felt that they should be done in a setting where the client can approve or disapprove of their effect on the sound. Further, it takes time, qualified personnel and a reasonably accurate monitoring environment to do the job right. Those items cost money, and it's not clear that clients would be willing to pay extra for the service. All things considered, it seems that duplicators would prefer to stick to the role defined by Suarez: "Our task should be to produce cassette product that is consistent with the (production) master."

That said, the ball falls into the mastering houses' court. After all, mastering houses are used to making compromises in signal content, because that's what they had to do all those years in cutting for vinyl. Plus, the client can be right there during the mastering session to give thumbs up or down to the cassette version of the program. And if cassette and CD each require separate rundown and transfer processes, that just means added revenues for the mastering house.

The arguments are reasonable, but there are a couple of problems with the scenario. For one thing, the clients have to be willing and able to pay the extra costs. That might not be a problem with major artists, but for independent labels the additional charges could be a substantial obstacle.

Perhaps more important is the problem of varied tape stock, standards and equipment between duplicators. The client isn't going to want the signal compromised any more than necessary to get it on tape. But without knowing in advance the tape to be used and the characteristics of the particular

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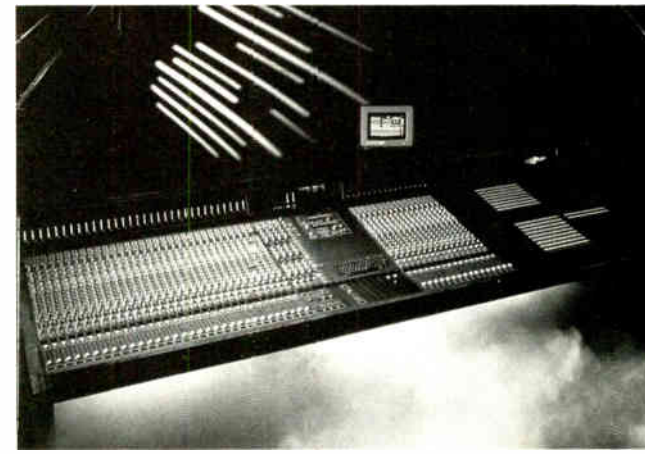

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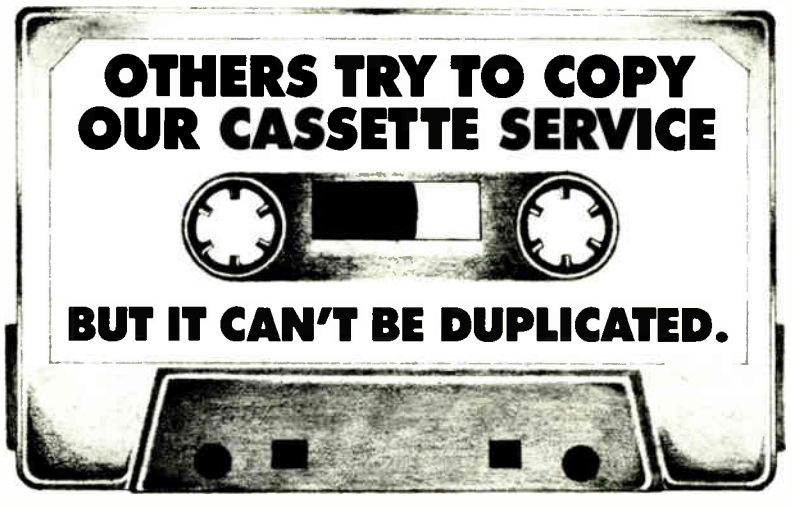

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duplication line, it's next to impossible for a mastering engineer to know exactly what to do to make a given project work. That's because the duplication process involves a system where tape, bin and slave all interact to determine the cassette's signal-handling capabilities.

So what's the industry to do? A solution will take cooperation among the various parties involved. First of all, clients will need to be willing to spend a bit more and switch to the better-quality tape stocks. The RIAA could be useful in educating its members about the need for such a move, and perhaps in coordinating a campaign to further develop consumer demand for products using premium stock.

Within the technical community, the AES and the ITA could certainly be more active in encouraging better communication between mastering and duplication. And mastering houses should be willing, at the least, to purchase MDL meters, and to use them when making cassette production masters. That way, masters can be provided to the duplicator with an indication such as "peaks at +5 above Type II MDL," which would avoid the need for a separate preview pass at the plant.

Duplicators, after some experimentation, should each be able to develop their own internal guidelines on how to respond to these MDL readings. By basing their procedures on the particular equipment and tape they use, they can ensure that any signal modification employed is optimized for their specific situation. The process would be easier if the forthcoming RIAA standard were to specify a more sophisticated MDL indicator—one capable of giving the frequency of peaks, not just their amplitude. But even as currently planned, the standard and the meter can play a valuable role in getting the best from the digital bin. ■

Tape & Disc editor Phil De Lancie is a mastering engineer at Fantasy Studios, Berkeley, Calif.

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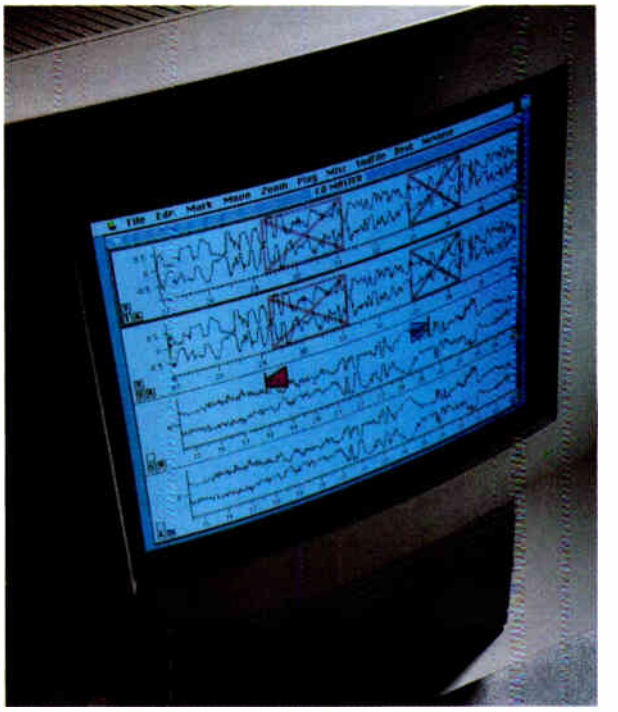

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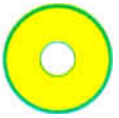

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World Radio History

COAST To

L.A. GRAPEVINE

by Amy Ziffer

One nice thing about a town the size of L.A. is that there's room for studios of every shape, size and specialty. Sound Design Music Group in Studio City is an example of a small facility with a strategy. Outfitted with a modest but selective array of moderately priced equipment, owner Eric Byak concentrates on selling services, not an equipment roster, and has been doing it successfully for five years. Four other composers constitute the "group" in his company's name.

Byak has been scoring for

—CONTINUED ON PAGE 152

Effective communication is the key to any successful session. Seen communicating here on a recent Ofrah Haza session at Record Plant's Studio 1 are producer Don Was and engineer Ed Cherney with second Craig Block.

PHOTO CREDIT: ELIZABETH ANNAS/PHOTOSENSATIONS

SESSION SPOTLIGHT

THE BLUES ACCORDING TO CLIFFORD ANTONE

by Jeff Forlenza

Austin's Sixth Street is legendary for its live music: On a given Friday or Saturday night, blues, rockabilly, conjunto, punk rock, jazz and country all can be heard by a hearty barhopper. But before there were any music clubs on Sixth Street, there was Antone's nightclub.

This month we Coast into Austin to speak with the nightclub and record company founder Clifford Antone to discuss the recording of the club's week-long 16th anniversary celebration.

Known for extended jam sessions lasting long into the night, Antone's nightclub opened for business in July 1975. Sixteen years later, Antone's is a thriving Texas institution, with enough of a rep among musicians that the club's anniversary lineup looked like something out of a blues hall of fame: Buddy Guy, Otis Rush, Albert Collins, Lazy Lester, Snooky Pryor, Matt "Guitar" Murphy, Hubert Sumlin, Pinetop Perkins, Jimmy Rogers and Calvin Jones. Some of the magic of that celebration is captured on *Antone's Anniversary Anthology, Vol. 2*.

But Antone's original aspirations for the club were more humble. "We just wanted to bring blues to Austin," he says. "We had a lot of friends—like guitar players Stevie and Jimmy Vaughan, Denny Freeman and Derek O'Brien; singers like Angela Strehli and Marcia Ball—who didn't have a place to play. So in 1975 we built a club for the blues, which was kind of unusual in a town based on progressive country music only."

Engineer for the Antone's Anniversary, Malcolm H. Harper Jr., aboard the Reelsound Remote.

But before the nightclub there was Clifford Antone's love of blues. Antone grew up on the Texas/Louisiana border in a town called Port Arthur, Texas. "All you heard was rhythm & blues," Antone recalls. "On the radio from New Orleans, Lafayette, and right there in Port Arthur, itself." Not coincidentally, Port Arthur spawned both Janis Joplin and Johnny Winter.

Having heard great blues music on recordings, Antone wanted to see and

World Radio History

COAST

(LtoR) Clifford Antone with Jimmy Rogers and Kim Wilson.

hear live performances of the blues greats. "I was 25, and I just wanted to make a club to play blues," Antone remembers. "My friends all pitched in to help build it. Things were really cheap back then: The rent was $600."

Rent was cheap because nobody thought Sixth Street had any potential. "We were the first club on Sixth Street," Antone says. "Now it's full of clubs. My friends the Thunderbirds [Jimmy Vaughan, Kim Wilson and Lou Ann Barton] were just starting then. They had their first rehearsal at Antone's. I put them on shows with Muddy Waters and people like that, and they got to be known. I put Stevie [Ray Vaughan] up there with Albert King, and you know the rest of it."

As the club's popularity and the whole Sixth Street scene grew, Antone began to think of capturing some of those great nightclub jams on tape. "I've always wanted to record, and I even did a few mobile unit live recordings from the club: one on John Lee Hooker with Eddie Taylor and Hubert Sumlin, and another one on Albert Collins," he recalls. "Then, in the '80s, we went into small studios recording people—James Cotton, Angela Strehli, Kim Wilson, Marcia Ball—we just kept using different studios and recording people, but we never pressed any records."

Singer Angela Strehli played an active role in getting those live recordings pressed to record. "I thought it was important to start putting some of Clifford's recordings on albums, because they were quality 24-track recordings," Strehli notes. "Not only did we have historical recordings, we also had younger artists, like myself, who needed a label."

Antone's Records was born in 1987. The first release was Strehli's *Stranger Blues*, followed by discs from several other artists who had been playing at the club: Ronnie Earl, Memphis Slim and Eddie Taylor. Antone's original idea was to press records of his existing live recordings and to record more shows. But with the success of his live recordings, evidenced by the Grammy-

—CONTINUED ON PAGE 152

N.Y. METRO REPORT

by Dan Daley

Sound On Sound Recording has upgraded its Neve VR console from a short-loaded 60/48 configuration to a full 60/60. Owner Dave Amlen says the move was driven by a desire to bring in more rock album recording, which he believes is on an upward swing again locally. "There's enough in town these days to warrant it," says Amlen. "The thing a studio owner has to recognize, though, is that the mega-budget days when when no one cared how much you spent are over. These days you have to be sleek and mean."

Amlen is also adding more microphones—mainly AKG and Neumanns—to his closet as part of a general inventory upgrade in preparation for adding a new room early next year. Amlen will be part of the design team that also includes acoustician Francis Daniel and architect Victor Schwartz.

Regarding Amlen's sanguine estimate of a resurgent rock recording level in town, a few calls to other record rooms seem to bear him out, at least in part. Power Station manager Barry Bongiovi says that he noticed a substantial upswing beginning last March, including tracking for an upcoming Eric Clapton project. "The city still has an energy that no place else has," Bongiovi claims. "I'm seeing a lot of ex-New Yorkers coming back here to record."

Nancy West, manager of Right Track Recording, also has seen

—CONTINUED ON PAGE 155

World Radio History

—FROM PAGE 151, SESSION SPOTLIGHT
nominated *James Cotton Live*, Antone started recording studio efforts from some of Austin's finest.

When it comes to producing and working with engineers, Antone knows what he likes: "Derek O'Brien does a lot of our mixing. I always tell Derek what I like, but when you have an ear like Derek's working with you, you don't have to give too many directions. And Malcolm Harper [Reelsound Recording] is great. Malcolm has made it so easy to have the best recordings you could possibly get."

When asked how to describe the sound of his blues recordings, Antone replies, "Authentic. The more authentic—the better the tone, the closer it gets to being the real thing—the better."

For information on Antone's recordings and to get a catalog, call (512) 322-0617.

SOUTHWEST REMOTE ROUNDUP

Malcolm Harper, who runs **Reelsound Recording Co.** out of Manchaca, TX, keeps busy recording projects in Austin, San Antonio and New Orleans. For the Antone's anniversary gig, Harper worked with fellow engineers **Mason Harlow, Greg Klinginsmith** and **Gordon Garrison**. They ran tape over eight nights of the club's anniversary celebration shows, and sometimes the music went until 5 a.m.

Another project Harper's 18-wheel audio truck has been working on is a production date for *Riverwalk, Live from the Landing*. This nationally syndicated broadcast, which is heard on 100 American Public Radio stations, spotlights live recordings from The Landing nightclub in San Antonio featuring the **Jim Cullum Jazz Band**, along with guest jazz artists such as vibraphone legend **Lionel Hampton** and master trumpeter **Clark Terry**. The "Riverwalk" project was produced by **Pacific Coast Productions**; engineering the live-to-2-track recordings was **Jim Anderson** from New York City with the assistance of the Reelsound crew: Harper, Klinginsmith and Garrison.

Omega Audio and Productions out of Dallas provided 24/48-track remote audio recording services when they took part in the New Orleans Jazz and Heritage Festival 1991 and saluted New Orleans hitman and famed producer **Allen Toussaint**. For the program *Dew Drop Inn Revisited: The Toussaint Legacy*, Omega's remote was sent to the Riverboat Hallelujah Concert Hall. The evening's lineup, recorded for a CD release, included Toussaint, **Irma Thomas, Art Neville, Ernie K. Doe** and **Earl King**. Producing for **MJI Broadcasting** was **Josh Fiegenbaum**. Omega's **Paul Christensen, Steve Lowney** and **Julie Haldeman** engineered.

AUSTIN SESSIONS

With the success of the Texas Tornados, guitarist Eric Johnson and Poi Dog Pondering, listeners are responding to the diverse sounds coming out of Austin. Often considered merely a great live music town, studios like **Arlyn Studio** and **Fire Station Studios** are earning respect as great recording centers. And with live jams being captured to disc, remote engineers are keeping busy on the scene. Here's a roundup of some of the Austin audio action:

Located 20 minutes from South Austin in San Marcos, TX, **Fire Station Studios** is one of the few digital studios in Texas. This month, new studio manager **Corey Moore** reports that **Bob Johnston** (producer/engineer for Bob Dylan's *Blonde on Blonde*) was working with various local bands; **Ian Moore** (a hot blues guitarist) was working with engineer **Bill Johnson**; and Grammy Award-winning accordion player and Texas Tornados member **Flaco Jimenez** was working on a solo album with engineer **Gary Hickin-**

—FROM PAGE 150, L.A. GRAPEVINE
movie trailers for several years, and is now expanding into feature films and jingles. His operation is based around a Tascam MSR-16, Carvin 24x8x2 console, Technics and Tascam 2-tracks, Panasonic AG6300 1/2-inch industrial VHS machine, and Sony 3/4-inch video playback and recording decks. A Tascam MTS1000 MIDiiZER is used for synchronization of audio and video.

Two recent projects also made use of a Photon MIDI guitar controller. On the internationally distributed, half-hour *Sacred Heart Kids' Club* television series, and the album *Bursting with Joy, Una Celebracion*, Byak scored, arranged and orchestrated songs that came to him in basic form. "All the music was performed on the Photon, which controlled digital samplers and synths to achieve orchestral and synth sounds," he says. He'll soon have Gibson's Max pickup guitar controller system as well. Some of Byak's other credits include music cues for MCA Television's *Charles in Charge*, and scoring of commercials for movies such as *Bird on a Wire* and *Back to the Future Part III*. Sound Design is at 11012 Ventura Blvd., Studio City, CA 91604; (818) 842-2210.

Practically next door is Burbank's six-month-old Blue Nile, a 24-track, one-room, synth studio owned by Stephan Baer. Baer is from Switzerland, where he composed radio jingles; he's now trying his hand at record production. Steve Shepherd is handling engineering duties at Blue Nile.

There has been a studio at its location for 15 years or more. It was formerly Satellite Sound, a rehearsal facility for the band Ambrosia. Shepherd says some acoustical treatments are being done to improve the studio's sound, but that the existing design is well-suited to the type of work done there.

Shepherd says Blue Nile's work is split 50-50 between live recording and synth work. For the former, the 800-square-foot live room and a pair of isolation booths will comfortably accommodate a four-piece band. For the latter, Shepherd says, Baer has built an "incredible MIDI setup."

A sampling of Blue Nile's bookings includes a number of gospel recording dates, a video mix for Vaya Con Dios and Chris Lindsey Productions, and an album from new Arista artist Carmen Carter with John Bokowski producing.

A 36-input Amek Mozart console with Supertrue automation comprises the heart of the hardware, which is fleshed out by an Otari MX-80 (soon to have a companion in the form of a Studer A827), and an ADAP II 2-track hard disk recording system. The board is a 56-frame, and Baer is adding modules regularly to increase its capacity. Finally, and most importantly, Shepherd claims to know all the engineering jokes ever told. Test him by calling (818) 840-0743, or just stop by 2317A W. Victory Blvd., Burbank, CA 91506.

Lastly, in June I erroneously reported that construction on several video-editing suites at Post Logic had already begun; in fact, construction will not get underway until late 1991.

Send your studio news to Amy Ziffer, c/o *Mix* magazine, 19725 Sherman Way, Suite 380, Canoga Park, CA 91306; or call (818) 567-1429 or fax (818) 709-6773. ■

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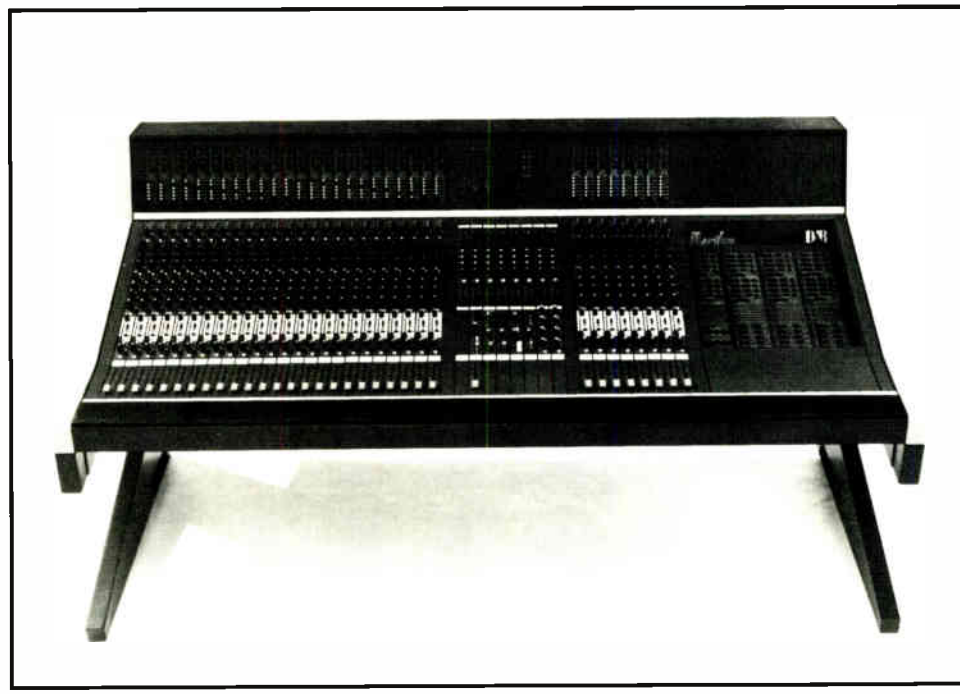

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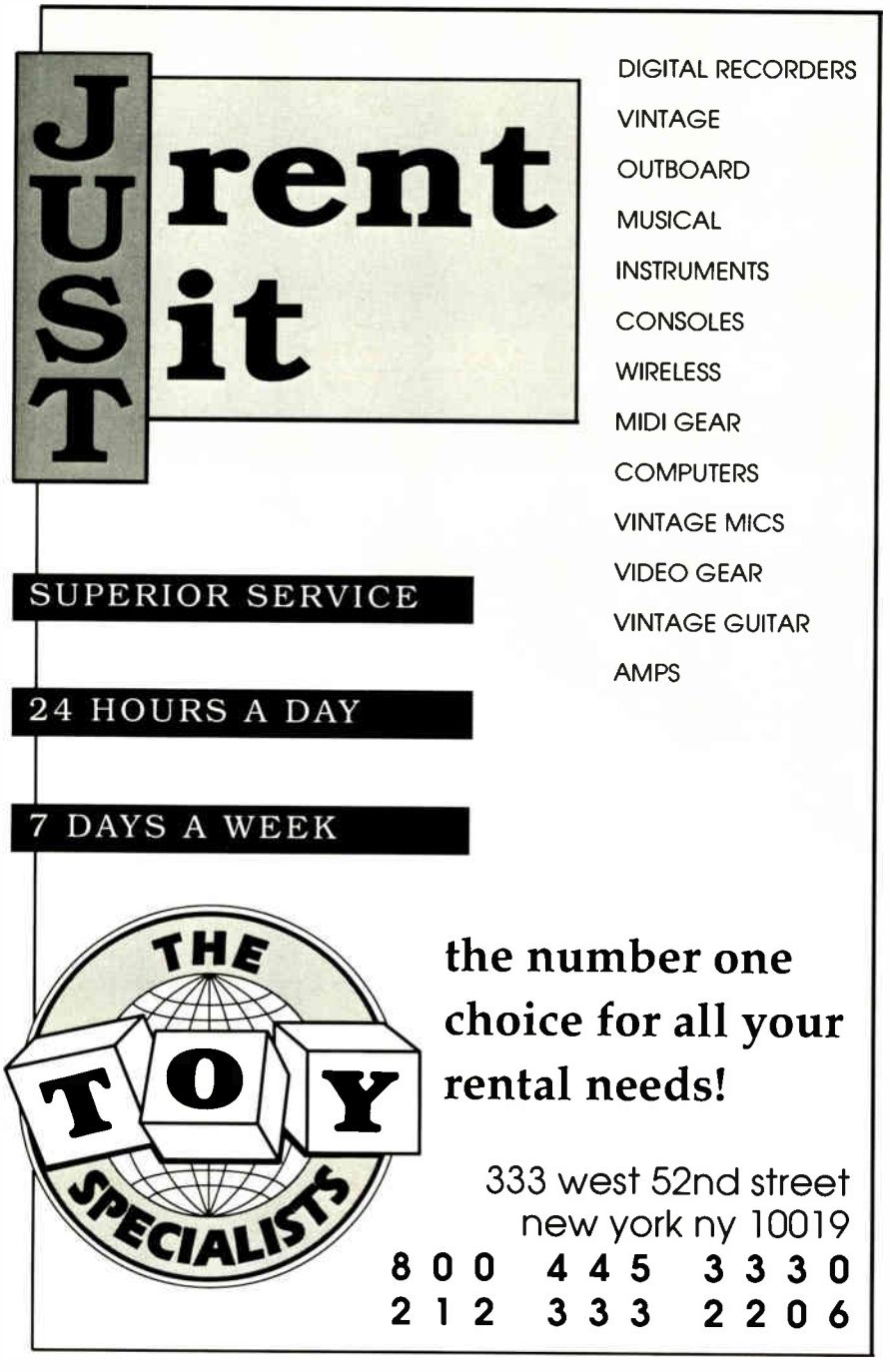
botham and engineer/producer **Bill Halverson**...**Arlyn Studio**, which has tielines to the Austin Opera House stages for live recordings, had **Snooky Pryor** in recording for Antone's Records with engineer **Stuart Sullivan** and producer **Derek O'Brien**...**Austin Recording Studios**, complete with their totally automated SSL console, worked on the audio soundtrack for the Dolly Parton movie, *7*, with producer **Ray Benson**... **Congress House Studios** reports **Will Sexton** finished a record for Zoo Records with producer **Mark Hallman** and engineers **James Tuttle** and **Bradley Kopp**; and **Big Car** recorded an album for Giant Records with producer **Dennis Harring** and Kopp engineering...**Cedar Creek Recording Studios**, a 24-track studio that has recorded everything from punk to gospel, reports the **Lost Gonzo Band** (backing band for Jerry Jeff Walker) was working with producer **Lloyd Mains** and engineer **Fred Remmert**; and the **Trance Farmers** self-produced an album with engineer **Tim Dittmar**...**Loma Ranch Studio**, a 24-track Studer/Neotek studio operating out of **John** and **Lauri Hill**'s spacious ranch in Fredericksburg, TX (about 70 miles outside of Austin), reports Austin rockers **Firecreek** recorded an album with producers **Paul Tenison** and **John Hill**, who also engineered with help from **Steve Mendell**; another Austin band, **The Chromatics**, worked with producer **Al Billings** and engineer **Andy Murphy** as they tracked a six-song demo; and Mexican conjunto band **Satellite Tropical** self-produced an album with the help of engineer/producer Hill...**Bee Creek Studio** had **Noel Eskew** in with engineer/producer **Spencer Starns**...



SESSIONS

SOUTHERN CALIFORNIA

At **Westlake Audio** (L.A.), **Ringo Starr** was working with producer **Phil Ramone** and engineer **Bill Dresher**; engineer **Patrick Smith** worked with **Ellis Marsalis** on piano, and sons **Branford Marsalis** on sax and **Delfeayo Marsalis** producing, along with assistants **Chris Fogel** and **Brad Aldredge**... **David Byrne** was at **The Bakery Recording Studio** (North Hollywood) mixing his new album, *The Forest*, with **Andy Waterman** in charge of the board...

NORTHWEST

The **Duke Ellington Band**, under the direction of **Mercer Ellington**, was in at **Lawson Productions** (Seattle) for an all-day session with the 17-member band during a stopover in its national tour to record material for an upcoming CD. The session was recorded by engineers **Andrew Berliner**, of Crystal Recording in L.A., and **Carol Howell** of Lawson... **HOS Recording** in Menlo Park, CA, reports that rap artist **Paris** finished his latest single and was working on an upcoming self-produced album with engineer **Mike Martin**...

NORTHEAST

Unique Recording Studios in New York City reports **The Stylistics** were working on their new album *Love Talk* for Amherst Records with producers **Burt Bacharach** and **Carol Bayer Sager**. **Richard Joseph** engineered the sessions with assistant **Ken Quartarone**... Composer **John Daniels** produced his track "Angel" for the soundtrack of *And You Think Your Parents Are Weird* at **Krypton Studios** in Manhattan. **Mark Mandelbaum** engineered, with **Anne Pope** assisting...

NORTH CENTRAL

Paisley Park Studios (Chanhassen, MN) reports **Ivan Neville** was in mixing "Just

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Another Girl to Love" for PolyGram with producer/engineer **David Z** and assistant **Tom Garneau**; and **Trip Shakespeare** was mixing an album for A&M Records with engineer **Justin Niebank** and assistant **Steve Noonan**... **Royal Recorders** of Lake Geneva, WI, had **Adrian Belew** recording for Atlantic Records (his seventh recording at Royal)...

SOUTHEAST

At Recording Arts in Nashville, famed guitarist Duane Eddy's son **Chris Eddy** was working with producer **Matthew Beckett** and engineer **Willy Pevear** for a Warner Chappell release...Also in Nashville, **Bela Fleck & the Flecktones** recorded at **The Castle** and mixed at **Groundstar Studios** for Warner Bros. Records with **Bill Vorn Dick**. ■

—FROM PAGE 151, NY METRO

more rock work in her rooms, the vast majority of it from major labels, since the inherent cost of New York shuts out a lot of the indies. "But I'm definitely seeing more rock 'n' roll records recorded in town, and I like that," she says. Right Track is expanding its control room in Studio B this summer, partially to accommodate bands. A new iso booth will also be installed.

Over at Platinum Island, on the other hand, studio manager Richie Kessler hasn't noticed any real rock upswing. While Yes did part of their latest project there last December, most of the recording work at the studio is still based on New York's current forte, pop/dance/R&B records, according to Kessler.

Film sound production in town appears to be making a comeback. The recent signings of local unions with film producers caps a resurgence, most noticeably at BMG Studios, where Don Frey reported a number of films having music done, including *Naked Gun 2-1/2*, *Billy Bathgate*, *Jungle Fever*, *Butcher's Wife* and Disney's *Beauty and the Beast*. Frey attributes relationships he developed with the film industry when he owned A&R Studios as the key to increased film work for BMG. "The union problems set us back," Frey acknowledges, "but it's turning around here and at other studios. And the number of calls for scoring and mixing is increasing."

Audio posters Sync Sound picked up both first and second place at the recent Houston International Film Festival for their work in the category Sound For TV & Video Production: News and Documentary Programming. Specifically, PBS' *Robert Motherwell and the New York School: Storming The Citadel* took the gold medal for John Purcell's sound editing and Ken Hahn's dialog, effects and music track mixes, while Regine Mullen and John Purcell took the silver award for audio work on Yerasha Productions' *The Long Way Home*, due for video release this summer.

Speaking of awards...The Grammy Awards will do an encore in town next year, the second year in a row. The show will again originate from Radio City Music Hall, and will mark the sixth time in the 22-year history of the presentations that New York hosts the program. The announcement was made jointly by NARAS president Michael Greene and New York mayor David Dinkins, who noted that the Grammys boost the local economy by over $40 million (about the average annual income, including overtime, of a city hall chauffeur).

Send items (or small furry rodents) for "New York Metro Report" to East Coast Editor Dan Daley at 147 East 30 St., NY, NY 10016; or fax them to (212) 889-8874. ■

—FROM PAGE 86, ED CHERNEY

record pretty much anyplace on Earth. But where do you like to record?

Cherney: We like it here at Ocean Way a lot. We like old Neve consoles, and the 1073s here are great. We typically mix on Neve V consoles with Massenburg automation. It's hard to find that combination. We like to mix at the Record Plant. We mixed Bonnie Raitt's album there and were happy with it. For tracking, we've been using Studio B here at Ocean Way a lot. It's a bigger room. We like to get a live vocal when we can, and there's a pretty good vocal booth in there. The console is an old Delcon built by Bill Putnam. It's got nothing in it. It sounds fabulous, because there are very few components to get in the way. That's best for the kind of music we've been doing. We've been cutting with bands—five or six guys all playing together. We've been trying to get that dialog between them—the musical conversation that happens when great players get together. ■

Alan di Perna is an L.A.-based writer.

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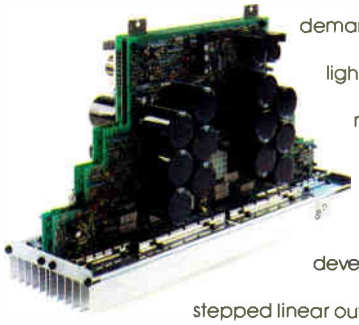

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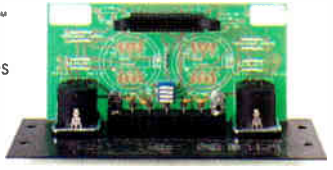

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World Radio History

So. California Hawaii & Southwest Studios

Information in the following directory section is based on listing applications mailed earlier this year and was supplied by those facilities listed. *Mix* claims no responsibility for the accuracy of this information. Personnel, equipment, locations and rates may change, so please verify critical information with the companies directly.

Located in Los Angeles, the newly completed Brooklyn Recording Studio saw its first clients in March of this year. Designed by Vincent Van Haaff, the facility incorporates a Neve 8078 console with Necam 96 automation, an Otari MTR-90 Mk III recorder, and a custom monitoring system that uses TAD components. Set up primarily for album projects, Brooklyn was used to mix down the recent Leo Kottke CD (see this month's "Lunching With Bonzai"). **Photo: Ed Freeman.**

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Upcoming Directory Deadlines:
Mastering, Pressing & Tape Duplication Facilities: **September 16, 1991**
Remote/Location Recording & Sound Reinforcement: **October 17, 1991**
Recording Schools & Programs: **November 15, 1991**

Mix listings procedure: Every month, *Mix* mails listing applications to recording studios and/or other vital facilities and services for the recording, sound and video production industries. There is a nominal charge to list a Boldface Listing (name, address, contact) and an Extended Listing (equipment, credits, specialization and photo or logo). If you would like to be listed in a *Mix* Directory, write or call the *Mix* Directories Department, 6400 Hollis St. #12, Emeryville, CA 94608; toll free (800) 344-LIST (344-5478).

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24-track studios

[24+] A TO Z STUDIOS; 680 Arrow Hwy.; La Verne, CA 91750; (714) 599-1301; FAX: (714) 592-9888. Owner: Richard A. Zahniser **Manager:** Ann Thomas.

[24+] AAZTEC RECORDING AND TAPE DUPLICATING INC.; 1110 E. Missouri, Ste. 400; Phoenix, AZ 85014; (602) 279-0808; FAX: (602) 277-6552. Owner: Ron Briskman. **Manager:** Venus Villamagna.

[24+] ADAMO'S RECORDING; 16571 Higgins Cir.; Huntington Beach, CA 92647; (714) 842-2668. Owner: Gerald Adamowicz. **Manager:** Gerald Adamowicz.

[24+] AIRE L.A. STUDIOS INC.; 1019 S. Central; Glendale, CA 91204; (818) 500-0230; FAX: (818) 240-1463. Owner: Craig Burbidge, Raymond Shields. **Manager:** Eve. R. Glabman.

AMIGO STUDIOS
N. Hollywood, CA

[24+] AMIGO STUDIOS; *also REMOTE RECORDING.* **11114 Cumpston St.; N. Hollywood, CA 91601; (818) 980-5605. Manager:** Victor Levine, Mickie Scott. **Mixing Consoles:** Neve V Series, SSL 4000, Neumann/Sony mastering. **Audio Recorders:** 3M 32-track digitals, Studer & Sony analog. **Cassette Recorders/Duplicators:** Real time cassette duplication. **Other Outboard Equipment:** Complete mic & outboard selection. **Video Equipment:** Film & TV scoring room. **Specialization & Credits:** Amigo Studios offers a complete recording facility for tracking, overdubs, mixing, mastering and real-time duplication.

[24+] ANDORA; 3249 Cahuenga Blvd. W.; Hollywood, CA 90068; (213) 851-1244; FAX: (213) 851-5228. Owner: Andora Inc. **Manager:** D. Parry.

[24+] ARLYN STUDIO; 200 Academy; Austin, TX 78704; (512) 447-2337. Owner: Fred N. Fletcher. **Manager:** Robert Dodds.

[24+] THE ARTHUR COMPANY'S LAST STOP POST PRODUCTION SERVICES; *also REMOTE RECORDING:* **100 Universal City Plaza; Universal City, CA 91608; (818) 505-1200; FAX: (818) 505-1900. Owner:** The Arthur Company. **Manager:** Tom Buel. **Engineers:** Brian Buel, Dave Schultz. **Dimensions:** Room 1: control room 20x25. Room 2: control room 10x20. Room 3: control room 13x14. Room 4: studio 10x10, control room 13x14. Room 6: studio 5x6, control room 10x20. **Mixing Consoles:** Neve 8108 48-input w/NECAM automation, Trident 80B 30x24, TAC Matchless 26x8, Soundtracs MXR 34x8x16, Ramsa 820 20x16x20, Soundcraft 500 24x8x8. **Audio Recorders:** (3) Otari MTR 90II, (4) MCI JH-110/24 24-track, (6) MCI JH-110C 4 track, (3) Otari MX-55 2-track w/center stripe, MCI JH-110C 2 track, MCI JH-110C 1" video layback, (2) Magna-Tech 35mm Mag Dubber **Noise Reduction Equipment:** (13) Dolby 363 SR A (dual channel), (24) dbx 911. **Synchronization Systems:** (23) TimeLine Lynx modules, (6) TimeLine Lynx keyboard controllers. **Echo, Reverb & Delay Systems:** (4) Lexicon LXP 1, (2) Lexicon LXP 5, Lexicon PCM60, (3) Alesis Microverb, Yamaha SPX1000, (4) Yamaha SPX90, (3) dbx 166 (dual channel), (2) dbx 160X compressor, (4) Aphex expander/gate/ducker (dual channel), Aphex compellor, Aphex Studio Dominator II, Eventide H3000 Ultra-Harmonizer, Yamaha REV5, UREI 565 "Little Dipper" filter set (2) Orban 674 paragraphic EQ, (2) Orban 622B parametric EQ, (2) BBE 822 sonic maximizer (dual channel), (2) UREI 1176 compressor/limiter, Valley Arts PR2 parametric/dip filter (dual channel). **Microphones:** (4) Sennheiser, Neumann, (2) AKG. **Monitor Amplifiers:** (6) Hafler Pro 230, (5) BGW 85, Crown PSA-2. **Monitor Speakers:** (2) Westlake BBSM studio monitor, (4) JBL 4425, (8) Yamaha NS 10M, (2) Tannoy PBM-5.5, (6) Auratone 5C, (8) Auratone T6. **Musical Instruments:** E-mu Emulator 3, (4) E-mu Proteus module, (4) Roland S550 sampler, (2) Akai S950 sampler, Akai S900 sampler, Roland U220 module, (2) Roland U110 module, E-mu Emax sampling keyboard, Roland D10 keyboard, Yamaha DX7 keyboard, Kawai K3 keyboard, (2) Akai AX73 keyboard. **Other MIDI Equipment:** (3) Lexicon MRC, (5) Opcode Studio 3. **Video Equipment:** (6) Sony BVU 9850 3/4" VCR, (3) JVC BR8600 1/2" VCR, (9) video monitors (various makes). **Other:** (2) Apple Macintosh IICX w/Alchemy, Q-sheet, performer, (3) Apple Macintosh SE w/performer, Epson Equity Plus computer w/sound manager, Sony CDK006 CD jukebox w/Sound Ideas SF (5) DeltaLab cart deck, Dolby 361 w Cat 43 card. **Rates:** Call for rates.

[24+] ATELIER X; 34700 Pacific Coast Hwy., Ste. 307; Capistrano Beach, CA 92624; (714) 489-8656; FAX: (714) 489-8658. Owner: Robin Cox **Manager:** Eric Gabriel.

AUDIO RESOURCE HONOLULU

AUDIO RESOURCE HONOLULU
Honolulu, HI

[24+] AUDIO RESOURCE HONOLULU; *also REMOTE RECORDING:* **1084 Young St.; Honolulu, HI 96814; (808) 526-3733. Owner:** Tony Hugar, Milan Bertosa.

[24+] AUDIO SUITE; 1110A W. Glenoaks Blvd.; Glendale, CA 91202; (818) 241-9090. Owner: Eric Sclar. **Manager:** Kevin Lange. **Specialization & Credits:** Special services: 3/4" Video sweetening (ADR, Voice-Overs, Foley, Needle drops, Scoring, Mixing to picture). Phone Patch; MIDI programming/tracking; Live band recording. Clients inlcude Warner/Chapel Publishing, Filmtracks Publishing, Merrit Publishing, Columbia Pictures Publishing, Walter Egan, Nelson, Tramaine Hawkings, The B.H. Surfers, IRS World Media, Magic Lantern film & Video, Vista Media, MGS Video Productions, Frontier Teleproductions, Writer's Guild of America. Comments Completely remodeled—large comfortable working environment. Just 10 minutes from Hollywood and Burbank.

[24+] BARE TRAX STUDIOS; PO Box 4988; Culver City, CA 90231; (213) 390-5081. Owner: Jon Bare. **Manager:** Jon Bare

[24+] BEE CREEK STUDIO; Spicewood, TX 78669; (512) 264-1379. Owner: Spencer Starnes. **Manager:** Spencer Starnes.

[24+] BLUE MOON STUDIO; 28205 Agoura Rd.; Agoura Hills, CA 91301; (818) 889-8920; FAX: (818) 889-1208. Owner: Joe Vannelli, Gino Vannelli. **Manager:** Diane Ricci.

[24+] BRANAM'S FOX RUN STUDIOS; 216 Chatsworth Dr.; San Fernando, CA 91340; (818) 898-3830; FAX: (818) 361-8438. Owner: Joe Branam.

BROOKLYN RECORDING STUDIO
Los Angeles, CA

[24+] BROOKLYN RECORDING STUDIO; 8000 Beverly Blvd.; Los Angeles, CA 90048; (213) 655-9200; FAX: (213) 852-1505. Owner: De Mann Entertainment Co. **Manager:** Bill Dooley. **Engineers:** Bill Dooley, Scott Stillman, Scott Tobinsky. **Dimensions:** Studio: 30x27, control room 27x25. **Mixing Consoles:** Neve 8078 40-input console. **Audio Recorders:** Otari MTR-90 III, Ampex ATR-102 1/2" or 1/4", Ampex ATR-104 1/2" or 4 track, (2) Panasonic DAT 3700. **Cassette Record-**

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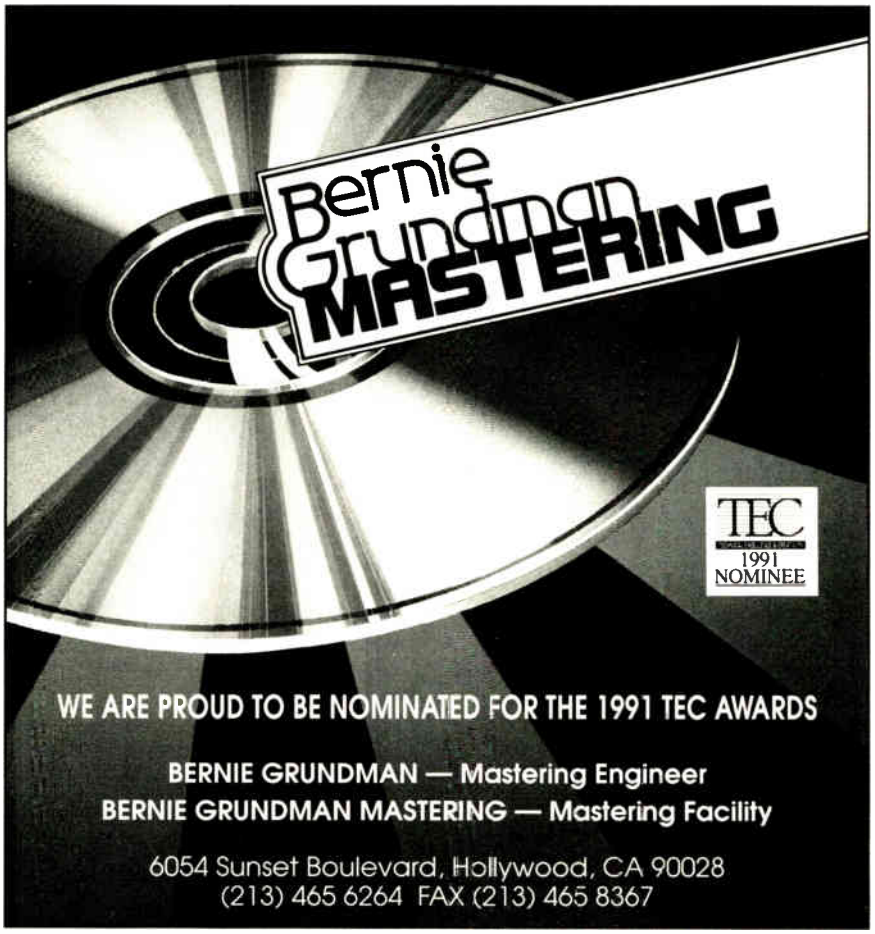

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HL A05

Southern California Hawaii • Southwest

24-track studios

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ers/Duplicators: (2) Sony 850 ES. **Noise Reduction Equipment:** Dolby 363 SR. **Synchronization Systems:** (2) TimeLine. **Echo, Reverb & Delay Systems:** AMS RMX 16, AMS DMX 15, Lexicon 224, Lexicon 300, Yamaha REV5, Eventide H3000SE, Yamaha REV-1, EMT 240 stereo tube plate, (2) Roland SDE-3000A, Lexicon Primetime. **Other Outboard Equipment:** (2) Fairchild 660 tube compressor, (2) Teletronix LA2A, (2) Pultec EQP-1A3, (4) Pultec EQ-H2, (2) Focusrite mic pre EQ, (2) dbx 160, (4) dbx 160XT, (2) UREI 1176N, (2) Neve 32264 limiter/compressor, (3) Drawmer DS-201 gate, **Microphones:** (2) Telefunken 250, Neumann U67, Neumann U47, Neumann U47 FET, (2) Neumann U87, (4) AKG 414, (10) Shure SM57, (2) Shure SM58, (5) AKG 451, (6) Sennheiser 421, (4) Sennheiser 409, AKG D-12, AKG D-112, (2) Shure SM81, (2) Beyer 160. **Monitor Amplifiers:** (6) Yamaha P2700, (3) Bryston 3B. **Monitor Speakers:** Custom enclosure w/TAD components, (2) NS10 MS, KRK 7. **Video Equipment:** (2) Sony SLV575UL VHS Hi Fi **Specialization & Credits:** Our goal is to provide our clients with the very finest audio recordings possible. Our extensive equipment list features mostly hand-picked "classic" audio gear as well as most of the fastest digital audio processing devices. Recent clients include The Smithereens, Leo Kottke, Peter Criss and Alannah Myles.

[24+] WALLY BURR RECORDING; 1126 Hollywood Way, Ste. 203; Burbank, CA 91505; (818) 845-0500. Owner: Wally Burr. **Manager:** Ellen Burr.

[24+] CALIFORNIA AUDIO POST RECORDING; 5203 Sunset Blvd.; Los Angeles, CA 90027; (213) 668-1244. Owner: Del Casher. **Manager:** Kevin Cobb.

Capitol REG. U.S. PAT. OFF. RECORDS

CAPITOL RECORDS STUDIOS
Hollywood, CA

[24+] CAPITOL RECORDS STUDIOS; *also REMOTE RECORDING:* **1750 N. Vine St.; Hollywood, CA 90028; (213) 871-5001. Owner:** Thorn-EMI. **Manager:** Paula Salvatore **Engineers:** Peter Doell, Charlie Paakkari, Leslie Ann Jones, Ray Blair, Wally Traugott, Ron McMaster. **Dimensions:** Room A: studio 47x44, control room 25x25. Room B: studio 33x31, control room 22x20. Room C: studio 12x10, control room 19x22. **Mixing Consoles:** Neve VR Series 60x48 w/film/TV "VS" monitor module and w/Flying Fader automation, Neve 8068 32x24, Neve 8108 48x32. **Audio Recorders:** Studer A800 24-track, Studer A827 24-track w/fast punch mods, (3) Studer A820 2-track, (12) Ampex ATR-100 4-track 2/4-track 1/4" and 1/2", Sony 4000/1630 systems available, Pro 2-track DAT, Panasonic SV-3500 Pro DAT, Panasonic SV-3700, Mitsubishi X-880 32-track, Mitsubishi X-86HS 2-track. **Cassette Recorders/Duplicators:** Yamaha C300, Aiwa 660, Aiwa 770. **Noise Reduction Equipment:** Dolby A, Dolby SR. **Synchronization Systems:** TimeLine Lynx, Lynx video controller. **Echo, Reverb & Delay Systems:** (8) Live echo chambers, EMT 250, (4) Yamaha REV7, (2) AMS DDL, (2) AMS reverb, (3) EMT 140 plate, (2) Lexicon Super Prime Time, (3) Roland 3000A, (2) Roland 3000, (2) Roland SRV-2000, (2) Yamaha SPX90, (2) Yamaha SPX90II, (2) Yamaha SPX1000, (3) Eventide 949, Eventide 910, TC Electronic 2290, (2) Roland DEP-5, Lexicon 480L, Lexicon PCM70, Eventide H3000 SE/B w/sampler, Ro-

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land R880 reverb. **Other Outboard Equipment:** Various tube and solid-state limiters, (2) Studio Technologies stereo simulator, Valley People Kepex II gate, Drawmer gate, ITI parametric EQ, (2) Trident parametric EQ, (5) Neve 8078 EQ w/mic pre, dbx de-esser, (7) Pultec EQ, Neve stereo compressor, (8) Summit Audio tube EQ, (4) Summit Audio tube limiter, (4) JBL/UREI 7110 limiter, dbx 900 w/902, 903, 904 & 905 mods, (2) Fairchild 670 stereo limiters, Fairchild 660 mono limiter. **Microphones:** Over 200, including Neumann, AKG, Sennheiser, Shure. **Monitor Amplifiers:** Hafler modified. **Monitor Speakers:** UREI, TAD, JBL custom 2-way, Yamaha NS-10, Auratones. **Musical Instruments:** Yamaha 9' concert grand piano, Steinway 7' grand piano, Hammond B-3, Marshall guitar amp. **Other MIDI Equipment:** Macintosh II w/Performer, Vision, Galaxy. **Video Equipment:** 1/2" and 3/4" video duplication capability. **Specialization & Credits:** Capitol Studios specializes in live recording, overdubbing and mixing for records, TV and film. Large dates are our forte. For digital editing or mastering call Docken Polk (213) 871-5003.

[24+] CARAVAN OF DREAMS RECORDING STUDIO; 312 Houston St.; Fort Worth, TX 76102; (817) 877-3000; FAX: (817) 877-3752. Owner: Caravan of Dreams Inc. **Manager:** Kenny Bergle.

[24+] CEDAR CREEK RECORDING; 5012 Brighton Rd.; Austin, TX 78745; (512) 444-0226. Owner: Fred Remmert. **Manager:** Fred Remmert.

[24+] CHACE PRODUCTIONS INC.; 7080 Hollywood Blvd., Ste. 515; Hollywood, CA 90028; (213) 466-3946; FAX: (213) 464-1893. Owner: Rick Chace. **Manager:** Robert Heiber.

CHATON RECORDINGS
Scottsdale, AZ

[24+] CHATON RECORDINGS; *also REMOTE RECORDING:* **5625 E. Nauni Valley Dr.; Scottsdale, AZ 85253; (602) 991-2802. Owner:** Ed and Marie Ravenscroft. **Manager:** Marie Ravenscroft. **Engineers:** Steven Escallier, chief engineer; Ed Ravenscroft; Rusty D'Angelo; Andy Seagle. **Dimensions:** Studio A: room 1: studio 13x24, control room 13x24. Room 2: studio 13x15. Studio B: 20x20, control room 15x18. Remote truck: control room 8x15. **Mixing Consoles:** Trident 80C 32x24x48 w/Diskmix moving fader automation, Trident 80B 30x24x24, Soundcraft 800 30x8x24. **Audio Recorders:** Otari MTR-4011 24-track, Otari MX-70 1" 8-track, Otari MTR-90 16/24 tracks, (2) Otari MTR-10C w/center track SMPTE, Otari MX-80 24-track, (2) Otari MTR-12, Otari MTR-1211 1/2", (2) Otari MX-5050B, Sony PCM-F1 w/JVC VHS VTR, Nakamichi DMP-100 w/JVC VHS VTR, (2) Tascam DA-30 R-DAT, (2) Panasonic SV-3700 R-DAT, (10) Tascam 122 MkII. **Noise Reduction Equipment:** Dolby SR 54 channels. **Synchronization Systems:** (4) Adams-Smith Zeta-3 w/remote autolocator. **Echo, Reverb & Delay Systems:** Lexicon 480L w/LARC, Lexicon 224X w/LARC, Lexicon 200, (7) Lexicon PCM42, (4) Lexicon PCM70, Eventide H949 w/keyboard, (4) Yamaha SPX90II digital effects processor, Eventide H3000 SE, Lexicon PCM60. **Other Outboard Equipment:** (2) Valley People DSP, (2) TC Electronic 2240 Para EQ, Valley People Maxi-Q, dbx 900 rack w/assorted comp/limiters, gates, Aphex C line mixers, (2) Valley People PRIO racks, (2) UREI 1178 compressor, (4) Valley People Kepex II gate, (2) Drawmer dual gate, (2) UREI LA-4 compressor, (5) dbx 166. **Microphones:** AKG, Neumann, Sennheiser, Shure, Beyer, Sony, Crown PZM, PML. **Monitor Amplifiers:** Bryston, Crown, UREI, BGW. **Monitor Speakers:** Tannoy FSM w/PIM-ACT dividing network, Tannoy PBM-6.5, Tannoy LGM, Yamaha NS-10M. **Musical Instruments:** Gretsch drums, Kurzweil 250 RMX, E-mu Emulator II, E-mu Emax-HD, E-mu SP-12, Roland D550, Roland Super JX, S-550+HD, (2) E-mu Proteus, Yamaha TX816 FM racks, (2) Kawai K1, (2) Baldwin grand piano 7' and 6'3." **Other MIDI Equipment:** Macintosh SE +20MB HD, Roland Octapad, Yamaha KX88 controller, complete line MIDI software. **Video Equipment:** Ikegami monitor, JVC BR7700 1/2, JVC CR850U w/remote, Mitsubishi 1/2" VHS, Sony & Videotek monitors. **Other:** Complete SFX/music production libraries including Killer Tracks, Symetrix phone patch, Technics SL-P1200. **Specialization & Credits:** 48-track capability, Diskmix 3 Automation, multitrack Dolby SR, PCM digital processors, R-DAT digital mastering, full audio/video/MIDI lockup capabilities, 24 to 24-track 2" transfers, audio post-production for video, A.D.R., "C.A.T." 24-track mobile unit full creative production and scoring, including support services; offering the finest in state-of-the-art recording by a dedicated and experienced staff. For further information call Marie Ravenscroft at (602) 991-2802. Credits include Paul McCartney, Lyle Lovett, George Strait, Johnny Rodriguez, Randy Travis, Phil Ramone, Ray Herndon, Charlie Byrd, Glen Campbell and daughter Debby Kay, Alice Cooper, Judas Priest, Icon, John Gary, Doc Severinson, Dan Fogelberg, Joey Defrancesco, Dick Van Dyke, Pat Metheny, Louis Bellson, Dave Brubeck, The Phoenix Symphony Orchestra, Emanuel Ax, James Galway, Alicia de Larrocha, Midori, Itzhak Perlman, Isaac Stern, also audio for *B.L. Stryker, ABC Mystery Movies, Don Bluth Productions*, Fisher-Price, A.G. Communications.

[24+] CHEROKEE RECORDING STUDIOS; 751 N. Fairfax Ave.; Los Angeles, CA 90046; (213) 653-3412; FAX: (213) 653-3546. Owner: The Robbs. **Manager:** Susan Donaldson. **Engineers:** Dee Robb, Bruce Robb, Joe Robb. **Dimensions:** Room 1: studio 32x52, control room 32 x 14. Room 2: studio 14x14, control room 44x15. Room 3: studio 23x16, control room 13x33. Room 4: studio 15x11, control room 16x13, room 5: control room 21x24. **Mixing Consoles:** (2) Trident "A" range 36x24, Cherokee custom 48x24, Neve VR console 60 input, Neve V3 console 60 input. **Audio Recorders:** (6) Otari MTR-90 MkII 24-track, (6) Otari MTR-12 2-track 2 1/2, (2) MCI 1/2" 4-track, (2) MCI 1/4" 2-track VRL. **Synchronization Systems:** BTX, Lynx. **Echo, Reverb & Delay Systems:** Assorted reverbs, assorted auxiliary, (6) EMT plates. **Microphones:** Assorted tube microphones, assorted condenser microphones. **Monitor Amplifiers:** Perreaux. **Monitor Speakers:** (5) Custom Augbspurger monitor system. **Musical Instruments:** Yamaha C7 grand piano, (2) Hammond B-3. **Other:** Assorted tube equalizers, Fairchild limiter and assorted etc.

[24+] CLEAR LAKE AUDIO; 10520 Burbank Blvd.; N. Hollywood, CA 91601; (818) 762-0707; FAX: (818) 762-0256. Owner: Brian Levi. **Manager:** Brian Levi.

[24+] THE COMPLEX; 2323 Corinth St.; W. Los Angeles, CA 90064; (213) 477-1938. Owner: S-1 Corporation. **Manager:** Nick Smerigan; Sharon Kaizer—tr. mgr.

CONTROL CENTER

CONTROL CENTER
Los Angeles, CA

[24+] CONTROL CENTER; 128 N. Western St.; Los Angeles, CA 90004; (213) 462-4300; (213) 413-2522. Owner: Aseley Otten, Rick Novak. **Manager:** Aseley Otten, Rick Novak. **Engineers:** Aseley Otten, Rick Novak, Frank Blue Sposato, Mike Kapitan, Eric Westfall. **Dimensions:** Room 1: studio 18x24, control room 12x16. Room 2: studio 7x12. **Mixing Consoles:** API custom 32x16x24 console w/550A and 560 EQs. **Audio Recorders:** Studer A80 24-track, Ampex ATR-102 2-track. **Cassette Recorders/Duplicators:** (2) Technics, Sony K950 ES. **Echo, Reverb & Delay Systems:** Yamaha REV7, Yamaha SPX90, Ursa Major ST-282 Space Station, Roland SRV-2000, Roland SDE-3000 DDL, MXR DDL, Eventide 910 Harmonizer and delay, Lexicon 200, Lexicon LXP-1, Lexicon LXP-5. **Other Outboard Equipment:** (2) dbx 161 compressor, (2) UREI 1176LN limiter, (2) Valley People Dyna-Mite, (2) dbx 166, (4) Valley Audio Gatex, BBE. **Microphones:** AKG 414, AKG 451, Neumann U87, Sennheiser 421, Sennheiser 441, Shure SM57, Shure SM77, AKG V-2. **Monitor Amplifiers:** Hill DX3000, Crown D-75, Crown 300, BGW 250, BGW 750. **Monitor Speakers:** Tannoy 15X, JBL 4312, Yamaha NS-10, Auratone 5C. **Musical Instruments:** Howard baby grand piano, LinnDrum and synthesizers upon request. **Rates:** $75/hr. Call for block rates and off-hours. **Specialization & Credits:** Clients include Los Lobos, Earth, Wind & Fire, CBS artist Louie, Louie, John Mayall, John Adams, Gene Clark, Long Ryders, Green on Red, Dream Syndicate, Textones, Rappin' Duke, Heavy Traffic, Malice, Taxxi, Pat Boone, Holland-Dozier-Holland, Mike Huey, Steve Barri, Tony Peluso, Jimmy Haskell, PolyGram, A&M, Warner Bros., MCA, Atlantic, Dunhill, Rhino, Slash, Enigma, Bug, Demon, Down There, etc.

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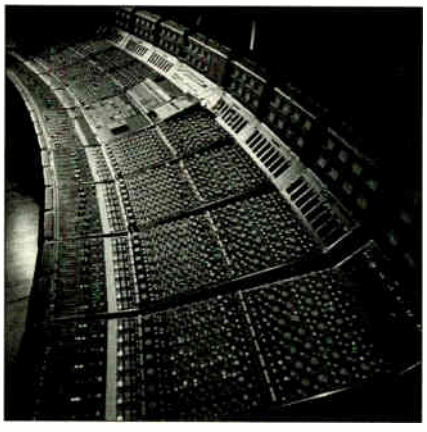

CONWAY RECORDING STUDIOS
Hollywood, CA

[24+] CONWAY RECORDING STUDIOS; 5100 Melrose Ave.; Hollywood, CA 90004; (213) 463-2775. Owner: Buddy and Susan Brundo. **Manager:** Jill Pearlman **Engineers:** Mick Guzauski, Daren Klein, Mamie Riley, Bryant Arnett, Bret Swain Gil Morales. **Dimensions:** Room 1: studio 25x50, control room 26x25. Room 2: studio 10x20, control room 25x26. Room 3: studio 55x40x25, control room 25x19. **Mixing Consoles:** Neve VR 60 50x48 w/Massenburg automation and recall. Neve VR 72 72x48 w/Massenburg automation and recall, Focusrite 64 32 w/Massenburg automation. **Audio Recorders:** (3) Mitsubishi X-880 32-channel digital, (5) Studer A827 24-channel analog, (2) Mitsubishi X-86HS 2 channel 96kHz sampling digital, (4) Ampex ATR-102 2-channel analog, Studer 48-track digital. **Cassette Recorders/Duplicators:** (6) Revox B215, (6) Panasonic SV-3500 DAT. **Noise Reduction Equipment:** Dolby Type SR **Synchronization Systems:** (7) Timeline Lynx **Echo, Reverb & Delay Systems:** (3) EMT 250 reverb, (4) Eventide 2016 reverb, (3) AMS RMX 16 reverb, (3) AMS 15-80S delay, (3) Lexicon 480L reverb/delay, (3) TC Electronic 2290 delay/sampler, (6) Lexicon PCM70, (4) EMT-140 S. **Other Outboard Equipment:** Just about everything else. **Microphones:** (3) Telefunken ELAM 251, (2) Neumann U47, Neumann M49, (3) Neumann U67, (3) Neumann TLM17), AKG C 24, large assortment of common mics. **Monitor Amplifiers:** Perreaux. **Monitor Speakers:** TAD components in custom Brundo enclosures, Yamaha NS-10, Tannoy SRM-10B, Aura tone and others. **Musical Instruments:** Yamaha 9' concert grand piano, Steinway 9' concert grand.

[24+] CORNERSTONE RECORDERS; 9626 Lurline Ave., Unit K Chatsworth, CA 91311; (818) 341-1358. Owner: Preferred Sound Inc. **Manager:** Matthew Soindel **Engineers:** Matthew Spindel, John Paterno, Scott Campbell Joe Barresi **Dimensions:** Studio 30x25, control room 25x25 **Mixing Consoles:** Neve VR-60 w/Flying Faders automation **Audio Recorders:** Studer 820 24-track, Otari MTR-90II multitrack Studer A80VL 2-track Studer A810 2-track, ATR 104 4-track 1/2", Panasonic 3500 DAT. Studer A820 multitrack **Echo, Reverb & Delay Systems:** AMS RMX 16 digital reverb, AMS 15-80S DDL Yamaha REV5, Yamaha REV7, (2 Yamaha SPX90I, SRV-2000, Roland SDE 3000, (2) Lexicon LXP-1 Eventide H3000, (2) TC Electronic 2290 (32 sec. sampling fast trigger), Lexicon 480L/3.0 software, EMT 240 gold foil, (2 Yamaha SPX90I Lexicon PCM70, H910 **Other Outboard Equipment:** Valley People de-esser, (3) dbx 165, UREI 1176, Lang EQ, (2) Drawmer gates, (2) Simon Di box, Summit Audio audio stereo mic pre, (2) Summit Audio audio compressor limiter, Summit Audio audio stereo program EQ, BBE 812 exciter, Ampex 612 expander/gate, Rackman. **Microphones:** Full complement of tube, condenser and dynamic. **Monitor Amplifiers:** Perreaux H & H bi-amped system. **Monitor Speakers:** (2) TAD TSM 1b playback system. **Video Equipment:** 3/4 video lockup. **Other:** 35'x30'x12' expansion-design live room (2) 10'x10' isc booths w/video lines.

[24+] CRYSTAL CLEAR SOUND; 4902 Don Dr.; Dallas, TX 75247; (214) 630-2957. Owner: Sam Paulos. **Manager:** Keith Rust **Engineers:** Keith Rust, Sia Ahmadzadeh. **Dimensions:** Studio 35x45 control room 23x17. **Mixing Consoles:** DDA 224V w/Uptown moving fader automation. **Audio Recorders:** Studer A827 24-track, Sony 5002 2-track 1/2" and 1/4", Studer A810 2-track, MCI JH-110B 2-track. **Cassette Recorders/Duplicators:** (50) KABA real-time, (2) Panasonic SV-3700 & 3500 DAT. **Noise Reduction Equipment:** (24) Dolby SR & A, Dolby A in 361 rack. **Echo, Reverb & Delay Systems:** AKG 68K, Eventide H3000, Lexicon 200, Yamaha SPX90, Lexicon PCM41, Lexicon LXP-1, Lexicon LXP-5, Yamaha SPX900, Korg SDD-3000, Eventide H910 pitch changer/DDL. **Other Outboard Equipment:** Akai S1000 sampler w/memory expander, API 5502 2-channel 4-band EQ, (2) Tube-Tech PE1B 2-channel tube EQ, (4) JBL 7110 comp/lim, Summit Audio LA-100 tube comp, (6) Aphex 612 expander/gate, Aphex Compellor stereo gain control, (2) dbx 165 comp/limitor, dbx 160X comp/lim, Orban 622B stereo parametric EQ, (2) Orban 526A de esser. **Microphones:** Neumann U87, Neumann KM84, AKG 414ULS, AKG D-112, AKG 452, Shure SM81, Milab VIP-50, Shure SM57, Sennheiser 421, Sennheiser 441, Yamaha MZ205BE, EV RE20. **Monitor Amplifiers:** Crown, BGW, Hafler. **Monitor Speakers:** UREI 811, Yamaha NS-10M, JBL 4311, Auratone T-5. **Musical Instruments:** Baldwin SD-10 concert grand, Hammond B-3 w/Leslie cabinet, Ensoniq VFXSD MIDI workstation. **Other MIDI Equipment:** Tanna The Cat (analog), Adams-Smith Zeta-3 syncronizer. **Rates:** Very competitive. Please call.

DALLAS SOUND LAB
Irving, TX

[24+] DALLAS SOUND LAB; 6305 N. O'Connor Blvd.; Irving, TX 75039; (214) 869-1122. Owner: Russel Whitaker. **Manager:** Don Seay. **Engineers:** Tim Kimsey, David Rosenbad, Thom Caccetta, Michael Vasquez **Dimensions:** Room 1: studio 46x52, control room 24x21, Room 2: studio 10x8, control room 16x14. Room 3: studio 24x12, control room 28x26. Room 4: studio 24x18, control room 20x16. **Mixing Consoles:** SSL 6056 48x24 automated w/Total Recall, MCI JH-636 24x24, MCI JH-536 28x24 automated. **Audio Recorders:** Sony PCM-3324 24-track digital, Otari MTR-90 24-track, MCI JH-114 24/16-track, MCI JH-110 3-track 1" video layback, (2) Otari MTR-10 4/2-track, (2) MCI JH-110 4/2-track, Tascam ATR-60 24-track, Tascam ATR-80 2-track center stripe, Sony PCM-F1, Panasonic SV-3500 R-DAT. **Cassette Recorders/Duplicators:** Studer Revox B710, Sony TC K4444, (8) Sony TCFX-45 **Noise Reduction Equipment:** Dolby 56 channels, dbx 24 channels. **Synchronization Systems:** BTX Softouch, Audio Kinetics Q-Lock 3.10, BTX maxi-pad/shadow, Tascam ES 50, Tascam ES-51. **Echo, Reverb & Delay Systems:** AMS RMS 16 digital reverb, AMS DMX 15-80S digital delay/harmonizer/sampler, Lexicon 224 digital reverb, (2) Yamaha SPX90 digital processor, Yamaha REV7 digital reverb, Lexicon PMC41 digital delay, Lexicon PCM42, Lexicon PCM70 digital delay, Lexicon PCM70 digital reverb, Lexicon PCM60 digital reverb, Quantec room simulator. **Other Outboard Equipment:** Compressors, limiters, gates, expanders, EQ, exciters by: UREI, Allison, dbx, SSL, Valley People, Dietz, Aphex and Yamaha. **Microphones:** Full array of mics by: Neumann, Sennheiser, Sanken, AKG, RCA, EV, Sony, Crown, Beyer, Shure. Vintage tubes mics by: Neumann, AKG, RCA. **Monitor Amplifiers:** Crown Omega 200, assorted amps by: Yamaha, Crest, Crown and BGW. **Monitor Speakers:** (2) UREI 813B, (2) Sierra, (8) Yamaha NS-10, (2) Tannoy SRM-12, (6) Auratone 5C, (2) JBL 4330, (6) JBL 4673, (2) JBL 4401, (2) Fostex SM6000. **Musical Instruments:** Synclavier digital production system, Steinway 9' concert grand, Kurzweil 250, Hammond B-3 w/Leslie, Yamaha DX7IIFD, Yamaha DX7, Yamaha QX3, Yamaha RX5, Yamaha TX7, Yamaha TX816, Yamaha REX50, Roland MKS-20, Roland D-50, Roland MT-32, Oberheim Xpander, Linn 9000, Sequential Circuits Prophet-5, Moog Minimoog. **Video Equipment:** Monitors by: Sony, NEC, MGA, Barco. **Other:** 16/35mm high-speed projectors, dubbers and master recorders by MTM. **Specialization & Credits:** Studio A: up to 48-track digital/analog recording with interlock to video or film. Services include 40-piece-capacity orchestra scoring to picture, video sweetening, and album/jingle production with audio and video tielines to three soundstages (15,000/6,000/3,000 sq.ft.) for live TV shows, concerts, etc. Studio B: 2/4-track voice-over and SFX production studio. Studio C: 24-track digital/analog post-production control room interlocked to

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video or film with a large isolation booth for ADR (looping), SFX assembling and mixing to picture. Studio D: 24-track studio with video interlock. Studio E: 16-track MIDI production studio with SMPTE/video interlock. Dallas Sound Lab is designed to meet the complete clientele dealings regarding any aspect of audio production from simple voice-over recording to complex 48-track digital/analog recording to video or film.

[24+] DEVONSHIRE AUDIO/VIDEO; 10729 Magnolia; North Hollywood, CA 91601; (818) 985-1945. Owner: David and Dee Mancini. **Manager:** Kelle Creamer. **Engineers:** Mike Mancini, Larry Goodwin, Scott Gordon, Mike Bosley. **Dimensions:** Room 1: studio 20x35, control room 20x26. Room 2: studio 17x22, control room 14x12. Room 3: studio 30x45, control room 26x20. Room 4: studio 15x24, control room 15x24. **Mixing Consoles:** (2) Neve V 60x48 GML automation, Neve 8128 56x48 Necam 96, MCI 538 38x32, Ramsa WR-8428. **Audio Recorders:** (2) Sony PCM-3324 w/Apogee filter 24-track, (2) Otari MTR-90 II 24-track, Sony/MCI JH-24 24-track, MCI JH-16 24-track, Tascam ATR-80 24-track, (3) Otari MTR-20 4-track 1/2", Sony PCM-3402 2-track digital, Ampex ATR-100 2-track 1/2" or 1/4", (2) MCI JH12-track 1/2" or 1/4", Studer A80RC 2-track 1/2", (2) MCI 2-track 1/4" , Studer ABORC 2-track 1/2", MCI JH-110 2-track 1/2", MTM 16/35mm 1/3/4-stripe mag, Studer A820 1/4" or 1/2" 2-track, Studer A827 24-track, (2) Panasonic SV-3500 DAT. **Cassette Recorders/Duplicators:** (2) Nakamichi MR-1, Nakamichi ZX-9, (2) Sony TC-WR730, (2) Yamaha C300. **Noise Reduction Equipment:** (5) Dolby A M24 rack, (25) Dolby SR CAT 280 card, (10) Dolby 361, (2) Dolby CAT 43, (48) dbx K9-22 card, (4) Dynafex DX2, (2) dbx 363 dual SR/A. **Synchronization Systems:** (6) Adams-Smith 2600 w/compact controller, VITC capable, Adams-Smith 2600 A/V editor w/c-sound. **Echo, Reverb & Delay Systems:** (2) Lexicon 480L, (7) Lexicon PCM70, Publison Infernal 90, AMS RMX 16, (2) EMT 240 gold foil plate, (6) Yamaha SPX90 II, (4) TC Electronic 2290 fully loaded, Eventide H3000SE, Eventide SP2016, Yamaha REV5, Yamaha SPX1000, Yamaha SPX900, very extensive, call for list. **Other Outboard Equipment:** Very extensive, call for list. **Microphones:** Very extensive, call for list. **Monitor Amplifiers:** (2) Boulder 500, (2) Carver PM-1.5, (2) HH Electronics VX 1200, (4) Phase Linear 700, (3) Phase Linear 400, (3) Carver PM-175, (2) SAE P250. **Monitor Speakers:** (6) George Augspurger custom w/TAD TL1603/4001, (8) Tannoy LGM 12", (8) Yamaha NS-10, (8) Tannoy NFM 8", (8) Auratone. **Musical Instruments:** (2) Yamaha grand piano, Emulator II w/20MB HD, Steinway grand piano, Hammond B-3 organ . **Other MIDI Equipment:** Opcode Studio +2 MIDI interface, Macintosh SE w/Q sheet. **Video Equipment:** Sony BVH-2000 1" recorder, (5) Sony BVU-850 3/4", (4) large-screen projector, VTR transfer room w/24- and 4-track, etc. **Other:** 4,000-cubic-foot live echo chamber. **Rates:** Call for rates.

[24+] DIGITAL SOUND & PICTURE; 2700 S. La Cienega Blvd.; Los Angeles, CA 90034; (213) 836-7688; FAX: (213) 836-7499. Owner: John Ross. **Manager:** Nancy Ross.

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DIGITAL SERVICES RECORDING
Houston, TX

[24+] DIGITAL SERVICES RECORDING; *also REMOTE RECORDING*; **5805 Chimney Rock; Houston, TX 77081; (713) 664-5258; FAX: (713) 663-6518. Owner:** John Moran. **Manager:** K.T. White. **Engineers:** Larry Greenhill, John Moran, Keith Risinger, Roger Tausz. **Dimensions:** Room 1: studio 35x30, control room 25x30. Room 2: studio 60x45, control room 8x19. Room 3: control room 15x13. Room 4: studio 30x50. **Mixing Consoles:** SSL 6056E w/Total Recall 48x32, MCI 636 w/JH-50 40x24, MCI 628 32x24, Neve 5442 10x4. **Audio Recorders:** SSL Screen Sound digital disk recorder, 16-track/1.2 GB hard drive, (2) Sony PCM-3324 digital multitrack, Otari MTR-90II analog multitrack, Sony PCM-1610 digital 2-track, (3) Sony PCM-F1 digital 2-track, Otari MTR-12 1/2" 2/4-track, Otari MTR-12 1/4" 2-track, Otari MX-55 1/4" 2-track, Otari MX-5050 1/4" 2-track, (2) Tascam DA-20 DAT, Sony DAE 1100 digital editor. **Cassette Recorders/Duplicators:** (20) Nakamichi MR2B. **Synchronization Systems:** (5) Adams-Smith 2600, (3) TimeLine Lynx, TimeLine Lynx keyboard controller, SSL ScreenSound, 4-machine control. **Echo, Reverb & Delay Systems:** Lexicon 224XL w/LARC reverb, (6) Lexicon PCM70 reverb, Lexicon PrimeTime, Lexicon PrimeTime II (2) Lexicon LXP-1, Eventide 969 Harmonizer, Eventide H3000 reverb/harmonizer/processor, AMS DMX delay/sampler/harmonizer, DeltaLab ADM 1020 delay, Yamaha REV7 reverb, Yamaha SPX90 effects processor, (2) Lexicon LXP-5, Lexicon MRC. **Other Outboard Equipment:** (4) Tube-Tech mic preamp, (2) Tube-Tech compressor/limiter, (2) Tube-Tech EQ, Audio & Design Vocal Stresser, (4) UREI 1176 limiter, (2) UREI Little Dipper Filter Set, (8) dbx 160x compressor, (2) Orban stereo parametric EQ, (2) Klark-Teknik stereo graphic EQ, (4) Audio & Design Scamp compressors, (8) Audio & Design Scamp noise gates, (2) Audio & Design Scamp de-esser, (4) Summit EQF-100 EQ, (2) Summit EQP-200 EQ, Summit TPA-200A mic preamp, (4) dbx 166 compressor. **Microphones:** (2) Neumann TLM, (2) Neumann 87, (2) Neumann 89, Neumann 69 stereo mic, (6) Sennheiser 421, (4) Sennheiser 441, (2) AKG 414, (4) E-V PL-20, (6) Shure SM57, (4) Shure SM81, (4) Shure SM58, (2) Crown GLM, (3) RCA 77-DX, (2) Countryman DI. **Monitor Amplifiers:** (3) Crown PSA-2, (3) Crown D-75, (5) QSC 3500, (2) Crown PS-400. **Monitor Speakers:** (2) Meyer Sound Labs 833/834, (8) Yamaha NS-10M, (2) JBL 4411, (2) JBL 4311, MDM-4, Auratones, Klein & Hummel. **Musical Instruments:** Fairlight CMI Series 3, 14MB RAM, 16 voices, 190 MB drive, Yamaha DX7II-FD synthesizer, E-mu Emulator II+, E-mu SP-12 drum machine, Yamaha TX816 synthesizer. **Other MIDI Equipment:** DSR steam-powered Hoo-Doo V 2.0, Jambox 4+, Yamaha MJC 8, Tascam MM1. **Video Equipment:** (2) Sony BVU 800 3/4." **Other:** Solid State Logic ScreenSound 4-hour system 1.2 gigabyte HD. **Rates:** All services and equipment are free to qualified clients. **Specialization & Credits:** Digital Services produces high-quality audio for music, television and film. 48-track digital, 24-track analog and ScreenSound disk editing with our SSL console make Studio A a complete world-class environment. Studio B is Fairlight and Macintosh MIDI systems. Our remote truck offers dual 24-track in analog or digital, mixing for video and broadcast. Our Sound Stage is exactly that, air conditioned and big. All this under one roof. Digital Services, Houston. Clients: Clint Black, Neil Young, B-52's, 3 Times Dope, Houston Grand Opera, Z107 Radio, Placido Domingo, Willie Nelson, ABC Television, *Young Riders*, *Gunsmoke 3*, Talking Heads, B.B. King, Barbra Streisand, Carl Lewis, Compaq Computer, Houston Astros, *For All Mankind*, *Mittelman's Hardware*, Van Cliburn International Piano competition, Timbuk 3, Little Joe y la familia, La Mafia, CBS, RCA, Warner Bros., Arista, IRS, Justice Records, Heart Music, The Rounders, Frank Zappa and one or two others...

[24+] DIGITAL SOUND RECORDING; *also REMOTE RECORDING*; **607 N. Ave. 64; Los Angeles, CA 90042; (213) 258-6741. Owner:** Van Webster.

DODGE CITY SOUND

DODGE CITY SOUND
Glendale, CA

[24+] DODGE CITY SOUND; 1717 Victory Blvd.; Glendale, CA 91201; (818) 242-0222. Owner: Jeffers Dodge. **Manager:** Jeffers Dodge. **Engineers:** Jeffers Dodge, Stoli Jager, Randy Pekich, Jeff Shannon. **Dimensions:** Studio 30x30, control room 20x25. **Mixing Consoles:** Trident 80B 40-input, 68 mixing inputs. **Audio Recorders:** Studer A827 24-track, Otari MTR-12 1/2" 2-track, Ampex ATR-800 1/4" 2-track, Sony 500ES R-DAT, Technics 150G 1/4" 1/4-track w/1/2" playback. **Cassette Recorders/Duplicators:** Nakamichi MR-1, Nakamichi MR-2. **Echo, Reverb & Delay Systems:** Optifile Automation w/40 faders & mutes, Lexicon 480L digital effects processor, Klark-Teknik DN780 digital effects processor, TC Electronic 2290 delay effects w/11" sampling, (2) Yamaha SPX90II, Yamaha REV7, Korg DRV3000 digital effects processor, (2) Alesis Quadraverb, Roland SDE-1000 delay, Eventide H910 Harmonizer. **Other Outboard Equipment:** Tube-Tech CL-1A (tube compressor), Tube-Tech MP-1A (stereo tube preamp), Tube-Tech PE-1B (tube program equalizer), Orban 622 parametric EQ (stereo), (4) dbx 160, Aphex 651 expressor (limiter/compressor), Drawmer DS-201X noise gate/expander (stereo), Strate Gate noise gate/expander (stereo). **Microphones:** Telefunken 251 (tube), Neumann U47, Neumann U87, (2) AKG 414 BULS, (2) AKG C-451 EB, (2) AKG C-451E, AKG

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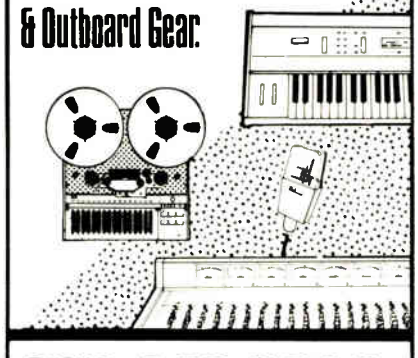

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24-track studios

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C452 EB, Telefunken M221A, (5) Sennheiser 421, Sennheiser 441, (2) EV RE20, (2) Beyer M88, (6) Shure SM57, Shure SM58, Shure SM81, Sony F-K97. **Monitor Amplifiers:** Crest 7001, Crest 4001, Crest FA800. **Monitor Speakers:** Custom Lakeside & Assoc. design w/TAD dual 15" woofers and TAD horns, Yamaha NS-10, Tannoy 6.5. **Musical Instruments:** Korg SG-1 digital grand, Roland D-50, Kurzweil PX1000 expander module, Lynn 9000 drum machine. **Rates:** $75/hour, $750/12 hr, daily rate. Block rates negotiable. Midnight Sound: $400 cash (8 hrs). Studio rates w/engineer (Jeffers Dodge) including all rental equipment: $100/hr., $1,000/12 hr, daily rate. **Specialization & Credits:** Great live room (800 sq. ft.) for drums, guitars, vocals. Great control room (400 sq. ft.) for mixing middle-budget record projects. Comfortable lounge/kitchen with 45" screen TV and satellite. Great staff, great rates and very private. Clients: all major record labels plus: ARTISTS: Warren Zevon, XYZ, Natalie Cole, Death Angel, Ice T, Legs Diamond, Dirty Looks, Haunted Garage, John Kilzer, Rock City Angels, James Reyne, Lizzy Borden, Jeff Scott Soto, Alez Masi, Hello Disaster. PRODUCERS/ENGINEERS: Warren Wachtel, Pat Moran, Neil Kernon, Michael J. Jackson, Max Norman, George Tutko, Ronnie Champagne, Jim Scott, Jeffers Dodge, Mark Desisto, Mike Stone, Randy Pekich, Joel Stoner, Mark Andes, David Knight.

[24+] DOUBLE TIME PRODUCTIONS; *REMOTE RECORDING only;* **9257 Stoyer Dr.; Santee, CA 92071; (619) 448-1717. Owner:** Jeff Forrest. **Manager:** Suzanne Forrest.

[24+] DYNAMIC SOUND RECORDERS; 8217 Lankershim Blvd. #42; **N. Hollywood, CA 91605; (818) 767-4744; FAX: (818) 767-2231. Owner:** Mike Milchner/Jim Davis. **Manager:** Geoff Gibbs.

ECHO SOUND RECORDING
Los Angeles, CA

[24+] ECHO SOUND RECORDING; 2900 Los Feliz Blvd., **Los Angeles, CA 90039; (213) 662-5291. Manager:** Mike Williamson. **Dimensions:** Room 1: studio 18x18, control room 20x18. Room 2: studio 26x27, control room 18x16. **Mixing Consoles:** Trident 80C 32x24x24, Trident 80B 30x24x24, Aries 24x16x8, Yamaha DMP7 8x2 submixer, Otari/DiskMix Arms III 32-channel automation, moving fader. **Audio Recorders:** Sony/MCI JH-24 24-track, (2) Fostex B-16D 16-track, Sony APR-5003 2-track, Otari MTR-12 2-track, TEAC A3440 4-track, Sony PCM-2500 digital, Studer A827 24-track, Panasonic SV-3500 DAT. **Cassette Recorders/Duplicators:** (4) Yamaha K1020, (2) Yamaha C200. **Noise Reduction Equipment:** Dynafex D-2B 2-channel. **Synchronization Systems:** Fostex 4035/4030, Jam Box 4, SMPTE Time Window. **Echo, Reverb & Delay Systems:** Lexicon 480L, AMS 15-80S, (2) Yamaha REV7, (2) Yamaha REV5, ((8) Yamaha SPX90 (2) Aphex Aural Exciter, (2) dbx 166 comp/limiter, (5) dbx 160X comp/limiter, (5) dbx 160 comp/limiter, (3) dbx 903 comp/limiter, (3) dbx 904 noise gate, (2) dbx 902 de-esser, (2) Eventide H949 Harmonizer, Lexicon Super Prime Time, Roland SDE-3000 delay, Yamaha R1000 reverb, Aphex Dominator limiter, Eventide Omnipressor comp/limiter, (3) Orban 622B parametric EQ, dbx 906 flanger +, Eventide H3000S, TC Electronic TC 2290. **Other Outboard Equipment:** UREI/Teletronix LA-2A, (4) Gatex noise gate, Drawmer DL231, dbx F900 rack, API mic pres, API EQ. **Microphones:** Neumann U87, (2) Neumann TLM170, (2) AKG C-414, (3) AKG C-460, (7) Sennheiser MD-421, AKG The Tube, (4) Shure SM57, (5) Shure SM58, (4) EV PL80, (2) EV BK-1, EV RE20, Crown PZM 30-GPB, (2) Sennheiser MD-409. **Monitor Amplifiers:** (2) BGW 750B, (2) Yamaha P2200, Crest 7001, Crest FA800, (2) Crest 4000. **Musical Instruments:** LinnDrum drum machine, Linn Electronics 9000 drum machine/sequencer, Emulator II keyboard sampler, Roland D-50, Yamaha DX7, Schafer & Sons grand piano, Yamaha TX816 MIDI modules. **Other MIDI Equipment:** Southworth Jam Box/4 MIDI interface, Macintosh Mac Plus sequencer, Mark of the Unicorn Performer. **Specialization & Credits:** Echo Sound provides professional-quality, cost-efficient recording services. Studio A: 16/24-track; studio B: 16/24-track with new Trident 80C console with 32 channels of DiskMix Arms III moving fader console automation and Studer A827, 24-track. We have provided recording services for Capitol Records, Arista Records, A&M Records, Ice Capades, *Phantom of the Opera*, Troop, Full Force, MCA, Warner and various independents and trade shows. MIDI production facility offering the producer, arranger and songwriter Mark of the Unicorn Performer sequencing software and a selection of MIDI sound sources complete with Fostex 16-track or 24-track recorder, console and outboard effects, in-house arranging and production services. Sequenced tracks may also be transferred and/or sync-locked with studio A/B, 24-track rooms. Echo Sound Recording provides a professional, creative, comfortable, studio environment conveniently located in the Griffith Park area with secure off-street parking. Our experienced staff engineers strive to have clients work comfortably and efficiently, with emphasis on technical expertise and client satisfaction. We invite you to please call so that we may discuss your project requirements and arrange for a tour of our facilities.

[24+] EDENWOOD RECORDING STUDIOS; 7319-C Hines Pl.; Dallas, TX 75235; (214) 630-6196; FAX: (214) 637-1835. Owner: Jerry Swafford. **Manager:** Jerry Swafford.

ELUMBA

ELUMBA RECORDING STUDIO
Hollywood, CA

[24+] ELUMBA RECORDING STUDIO; 1538 N. Cahuenga Blvd.; Hollywood, CA 90028; (213) 461-4515; FAX: (213) 461-4622. Owner: Marie Josephine Dabany. **Manager:** Adrienne Dixon, traffic mgr., Jo Keita. **Engineers:** Spencer Chrisla. **Mixing Consoles:** Solid State Logic 6056E w/G Series computer. **Audio Recorders:** Mitsubishi X-8520 digital 32-track, (2) Studer A800 MkIII 24-track, Studer A820 2-track, Ampex ATR-102 2-track, Akai DAT digital. **Cassette Recorders/Duplicators:** (2) Studer 710. **Synchronization Systems:** (2) TimeLine Lynx. **Echo, Reverb & Delay Systems:** AMS RMX, AMS SDMX, Lexicon 480L, Lexicon PCM 70, Lexicon Prime Time II, Publison Infernal machine 90, TC Electronic 1210, Eventide 2016, Eventide H-3000 Ultra Harmonizer, (2) Yamaha SPX90, (2) Yamaha REV7, Roland SDE 3000, EMT 162 Plate, Eventide 910 Harmonizer. **Other Outboard Equipment:** (6) API 550A EQ, (2) API 560B EQ, Sontec 250C dual parametric EQ, (2) dbx 905 parametric EQ, Orban 622 dual parametric EQ, (2) dbx 165 compressor, (2) dbx 160X compressor/limiter, (2) Inovonics 201 compressor, (2) Summit Audio tube limiter, Teletronics LA-2A, Aphex Studio Dominator, Drawmer DS-201 dual gate, (2) Valley People Kepex II, Barcus-Berry 802, Dynatronics FS-1 cyclosonic panner, Aphex Exciter Type C. **Microphones:** Neumann, AKG, Sennheiser. **Monitor Amplifiers:** (2) Bryston 3B pro, (2) Bryston 4B pro. **Monitor Speakers:** (2) Yamaha NS-10M, (2) Augsberger custom design w/TADS, (2) Yamaha NS-10M studio, (2) Auratone 5C, JBL 4430. **Musical Instruments:** E-mu Emulator II HD, Yamaha DX7 HD, Roland Super Jupiter MKS-80, Akai S-900, Sequential Circuits Studio 440 drum machine.

[24+] EMERALD STUDIOS INC.; 2411 NE Loop 410, Ste. 132; San Antonio, TX 78217; (512) 656-2427; FAX: (512) 656-8024. Owner: Mitchell and Sunny Markham. **Manager:** Sunny Markham.

[24+] ENTOURAGE STUDIOS; 11115 Magnolia Blvd.; N. Hollywood, CA 91601; (818) 505-0001; FAX: (818) 761-7956. Owner: Guy Paonessa. **Manager:** Keith Blake.

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[24+] EVERGREEN RECORDING STUDIOS; 4403 W. Magnolia Blvd.; Burbank, CA 91505; (818) 841-6800; FAX: (818) 841-8931. Owner: Charles Fox, Artie Butler, Gayle Levant. **Manager:** Sandra Smart. **Engineers:** John Richards. **Dimensions:** Studio A: 46x70, control room 20x26. Studio B: 35x36, control room 20x26. **Mixing Consoles:** (2) Harrison customized consoles: "A" 48-input/48-output; "B" 40-in/32-out. **Audio Recorders:** (2) Studer 827 24-track, (2) ATR-104 4-track, (2) ATR-102 2-track, (2) Mag Recorders, 3- and 6-track. **Cassette Recorders/Duplicators:** Sony, Panasonic DAT. **Synchronization Systems:** (2) Adams-Smith 2600 w/remote. **Echo, Reverb & Delay Systems:** EMT 140, (2) live chamber, Lexicon 200, Lexicon 224. **Other Outboard Equipment:** UREI 1176 limiters, Inovonics, Valley People Kepex noise gate, Eventide 949 Harmonizer. **Microphones:** Most standard brands and models. **Monitor Amplifiers:** H & H. **Monitor Speakers:** UREI 813A (control room main small speakers), Yamaha NS-10 (control room small speakers). **Musical Instruments:** (2) Yamaha C7-D grand pianos. **Video Equipment:** BVU 800 3/4" VCR w/monitor for control room & studios. **Other:** Complete transfer facilities for 1/4", 1/2" tape, cassette, DAT.

[24+] FANFARE STUDIOS; 120 E. Main St.; El Cajon, CA 92020; (619) 447-2555. Owner: Ron Compton. **Manager:** Carol Compton. **Dimensions:** Studio 25x30, control room 17x20, iso room 10x12. **Mixing Consoles:** MCI 636 36x36 (full mixing automation). **Audio Recorders:** MCI JH-24 24-track, MCI JH-16 16-track, MCI JH-100 2-track, Ampex 440B full-track, Ampex 440B 2/4-track, (3) Revox A77 2- and 1/4-track, (2) Sony DAT, (2) Tascam DA 30 DAT machine, Digidesign Sound Tools hard disk workstation. **Cassette Recorders/Duplicators:** (2) Aiwa, Otari high-speed duplicator. **Noise Reduction Equipment:** (2) Dolby A-361, (2) DNR Dynamic noise reducer, (4) Kepex noise gate, (4) Furman noise gate. **Synchronization Systems:** Adams-Smith Zeta-3 w/MIDI and for 16/24-track machines, MIDI Time Piece (128 MIDI channels), Video Time Piece. **Echo, Reverb & Delay Systems:** EMT stereo plate, Lexicon 224 w/all programs and non-volatile memory, Alesis Quadraverb, Yamaha REV7, (2) Yamaha SPX90, Alesis Microverb, (2) DigiTech DSP 128, Eventide Harmonizer, DeltaLab digital delay. **Other Outboard Equipment:** (2) dbx 165 compressor, (4) UREI LA-3A compressor, UREI 1176LN limiter, (2) Gain Brain compressor, (4) Orban parametric equalizer, (2) Orban sibilance controller, UREI digital metronome, (2) dbx 166 compressor. **Microphones:** (4) Neumann U87, (4) Neumann KM86, Neumann KM84, Neumann U47 original w/tube, (4) AKG 414, AKG 202E, AKG 119, (8) Shure SM57, EV RE10, (4) Sony 337, (2) RCA 44BX, Altec condenser, over 50 mics to choose from. **Monitor Amplifiers:** (4) BGW, (8) Crown. **Monitor Speakers:** (4) JBL large monitor, (2) Yamaha NS-10M close-field, (6) Auratone small monitor, (2) Bose small monitor. **Musical Instruments:** E-mu Emax II digital sampling keyboard, E-mu Proteus 1 and Proteus 2, Oberheim Matrix-1000, Yamaha C7 conservatory grand piano, Ludwig trap set w/concert toms, Alesis HR-16 drum computer, Roland R-8M percussion module, Yamaha TX7, Yamaha RX5 drum computer, Roland Octapad 8, Casio CZ-101 w/interface librarian, Yamaha FB-01 synth, (2) conga, orchestra bells, (25) hand percussion. **Other MIDI Equipment:** (2) Macintosh SE w/Performer sequencer, Yamaha QX5 sequencer, Macintosh IIci w/Performer, Beyond and Galaxy and Editors. **Video Equipment:** Sony VO-5600 3/4" U-matic recorder, (2) monitor VHS and 8mm.

[24+] FIESTA SOUND; 1655 S. Compton Ave.; Los Angeles, CA 90021; (213) 748-2057. Owner: R.G. Robeson. **Manager:** Rick Robeson, Ed Contreras. **Engineers:** Octavio Villa, Victor Flores, Salvador Sandoval. **Dimensions:** Studio 30x60 plus isolation rooms, control room 25x15. **Mixing Consoles:** MCI 428 32 x 24. **Audio Recorders:** MCI 32-track, MCI 2-track, Otari 2-track. **Echo, Reverb & Delay Systems:** Lexicon 200 digital reverb, Eventide H969 Harmonizer, Lexicon DDL, Master-Room III echo, Yamaha REV7, Yamaha SPX90. **Other Outboard Equipment:** UREI graphic EQs, 31-band EQ, Dolby, UREI 1176, dbx 160 compressor/limiter, Orban 424 comp/limiter. **Microphones:** Neumann U87, Neumann KM84, AKG C-452, AKG C-414, Sennheiser MD-421, Shure SM57, Shure SM7, Sony ECM-33F, EV RE20. **Monitor Amplifiers:** Crown DC-300. **Monitor Speakers:** JBL 4333. **Musical Instruments:** Steinway 6' grand piano, Fender Rhodes electric piano, D-6 clavinet, ARP Omni, ARP Odyssey synth, Fender Twin Reverb amp, Steinway grand. **Rates:** Call for rates. We encourage block booking.

[24+] FIRE STATION STUDIOS; 224 N. Guadalupe; San Marcos, TX 78666; (512) 396-1144; FAX: (512) 396-2296. Owner: Lucky Tomblin. **Manager:** Cory Moore; John Ferrell co-manager.

[24+] FLYIN' HAWAIIAN PRODUCTIONS/SYSTEMS EXCLUSIVE RECORDING; 4942 Likini St.; Honolulu, HI 96818; (808) 839-5431; FAX: (808) 537-1818. Owner: Lester Gantan. **Manager:** Lester Gantan.

[24+] FORTUNATE SUN STUDIO; 720 Iwilei Rd., Ste. 214; Honolulu, HI 96817; (808) 531-5744. Owner: David Tucciarone, Wei Chen, Bazio Chen. **Manager:** David Tucciarone. **Engineers:** David Tucciarone, Wei Chen, Bazio Chen, Steve Kramer **Mixing Consoles:** SSL 4040E w/G computer and total recall, Trident 24 28x24 w/360-pt. patch bay. **Audio Recorders:** Otari MTR-90 MkIII 24-track, Tascam MS-16 16-track

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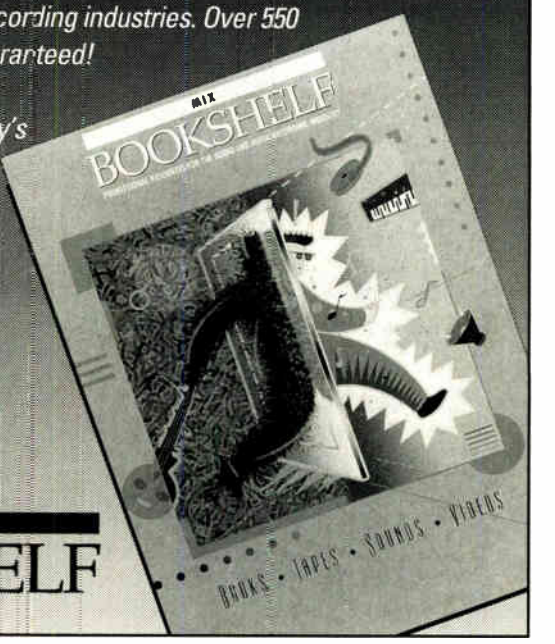

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Southern California
Hawaii • Southwest
24-track studios

—LISTING CONTINUED FROM PREVIOUS PAGE

w/dbx, Sony PCM-2500 DAT, Sony 55ES DAT, Fostex E 2 w/ center-track. **Cassette Recorders/Duplicators:** Akai GX912, Nakamichi MR-1, Sony TCWR82 double. **Synchronization Systems:** Fostex 4010, Fostex 4050. **Echo, Reverb & Delay Systems:** Lexicon 300, Lexicon PCM70, Eventide H3000SE, TC 2290 digital effects processor, Drawmer DS201 noise gate, Valley People Gatex, Lexicon LXP-15, (2) Lexicon LXP 1, (2) Lexicon PCM42, Yamaha REV7, Yamaha SPX90, (2) Effectron ADM 1024, (3) dbx 160x compressor/limiter, UREI 1176N limiter, dbx 166 comp/limiter, Aphex Compellor, BBE 822, Valley People Dyna Mite, Yamaha 2031 dual 1/3-octave equalizer, Orban 622 parametric. **Microphones:** (2) AKG "The Tube," (2) AKG C-414, Neumann U87, (4) Sennheiser MD 421, (4) Shure SM57, AKG D 12E, (2) AKG C 451, AKG C 12. **Monitor Amplifiers:** (2) Crown PSA2, AB900A, AB 6220. **Monitor Speakers:** TAD TSM-1, JBL 4430, (2) Tannoy PBM-6 5, Auratone 5C, Westlake BBSM-5. **Musical Instruments:** (2) Roland U220, Roland D 50, Roland D 550, Roland MK 550, Roland MK-570, (2) Proteus 1, Roland 5330 sampler, Roland D70, (2) Roland R8M drum machine, Korg workstation, Casio FZ-1, Yamaha DX7IIFD, Korg MI, wide assortment of electric guitars and amps, Martin D35, Fender Precision bass. **Other MIDI Equipment:** Opcode Studio 5 interface, Opcode Studio Vision. **Other:** Macintosh SE/30 w/8MB RAM, 600 MB HD, Digidesign SoundTools. **Rates:** Available upon request.

[24+] 4TH STREET RECORDING; *also REMOTE RECORDING*, **1211 4th St.; Santa Monica, CA 90401; (213) 395-9114. Owner:** 4th Street Recording Inc. **Manager:** Rod Clark, Jim Wirt. **Engineers:** Keith Wechsler, Jim Wirt, Rod Clark, Richard Jallis, David Blade, Steve Barncard, Robin Lamble. **Dimensions:** Room 1: studio 32x14, control room 14x16, front room (iso) 12x8, iso booth 4x4. **Mixing Consoles:** MCI JH 428 28x24 modified w/ Aphex VCA DC, subgroups and mutes and J.L. Cooper MIDI automation, Allen & Heath 12x4x2 Scepter effects mixer. **Audio Recorders:** MCI JH-114 8 16/24-track w/ AL and VSO, Fostex autolocator, Ampex ATR 102 2-track 1/2" and 1/4", Ampex ATR 104 4 track 1 2" and 2 track 1/2" and 1 4", MCI JH 110 1 2 track w/ VSO, Technics 1500 1 2-track, Sony TC 854 4 track. **Cassette Recorders/Duplicators:** (3) Nakamichi MR-1, Nakamichi 680ZX. **Noise Reduction Equipment:** (11) Dolby A/SR 2-channel. **Synchronization Systems:** Fostex 4010 SMPTE reader/generator, Fostex 4030, Fostex 4035 controller. **Echo, Reverb & Delay Systems:** Lexicon 224X LARC 8.2 digital reverb, (2) Yamaha SPX90, (2) Lexicon PCM60 reverb, Roland SRV-2000 MIDI reverb, EMT 140ST stereo tube plate reverb, Echoplate III reverb, AKG BX 10E reverb, (2) Lexicon Prime Time delay, Roland SRE-555 tape delay, DeltADM 1024, Marshall time modulator, AMS gear at additional cost. **Other Outboard Equipment:** Aphex Studio II Aural Exciter, (2) UREI 1176LN limiter, (2) UREI LA 3A limiter, (2) dbx 160X limiter, (3) Drawmer DS-201 dual channel gate, (2) Orban 622B dual channel parametric EQ, Orban 3 channel de-esser, Klark-Teknik DN 27 and other graphic EQs, Trace Elliot GP11 bass preamp, Rockman guitar preamp, Systech flanger. **Microphones:** Over 50 including Neumann, AKG, Sennheiser, RCA, E-V, Shure, Sony, etc., tube and ribbon and Steven Paul modifications on U87s and 414s. **Monitor Amplifiers:** Bryston 4B bi-amp low, Bryston 2B bi-amp high, (2) Custom tube (alt. high), (2) Hafler P-230, BGW 100B (cue). **Monitor Speakers:** PAS TOC studio 1 w/Mastering Lab crossover, Yamaha NS-10M, Sony APM 700, Auratone. **Musical Instruments:** Yamaha C7 7'4" grand piano, Yamaha DX7, Roland JX 10, Roland S 330, Roland D 550, Ensoniq ESQ-M, Linn 9000, Linn LN2, Moog MIDImoog, Moog Mini moog, many guitars, basses and misc. percussion, Fairlight, Synclavier and Emulator at additional cost. **Other MIDI Equipment:** Macintosh SE/30, Macintosh SE w/various software, Southworth Jam Box 4+. **Video Equipment:** Sony VO-5800 3 4", Sony Beta, NEC Hi fi VHS, NEC 26" rec/mon, NEC 20" rec/mon. **Specialization & Credits:** 4th St. Recording, formerly Sound Solution Recording, has been providing recording services in Santa Monica for over ten years. Located four blocks from the beach, 4th St. is within walking distance of hotels, shops, clubs and dozens of restaurants and bars. Producers, musicians, arrangers, programmers, as well as world-class engineers, are available to provide the highest-level product for album, film, TV and radio. Our location, fun, unpretentious personnel, great equipment and years of experience make 4th St. Recording a welcome alternative to the Hollywood Los Angeles recording scene. Then there's the price—we don't cost an arm and a leg. Past clients projects include: The Beach Boys *Kokomo*, *Make it Big*; Brian Wilson; Simon & Schuster, George Clinton; Little Richard; Fat Boys; *Tracy Ullman Show*; *Cocktail*; Stanley Clarke *Free Flight*; ABC; CBS; Electra Records, Ferde Grofe Films, Houseton Films.

[24+] FUNKENSTEIN'S LAB; 7811 La Cosa; Dallas, TX 75248; (214) 239-4075. Owner: Mike Taylor. **Manager:** Sharal Taylor. **Engineers:** Mike Taylor, Steve Wolf, Laurence Lee. **Dimensions:** Studio 26x19, control room 26x19. **Mixing Consoles:** Soundtracs 72 channel automated speak, MIDI. **Audio Recorders:** Tascam MS 16 1" 16-track, Fostex G16 1/2 16-track, Panasonic 3700 R DAT, Alpine F 1 digital processor, IBM Turtle Beach direct to-disk recorder. **Cassette Recorders/Duplicators:** (3) Tascam 122. **Synchronization Systems:** Fostex 4035 synchronizer w/remote. **Echo, Reverb & Delay Systems:** Lexicon 200 digital reverb, (2) Roland R 880 digital reverb, Klark Teknik digital reverb, Yamaha SPX900 digital reverb w/ remote, (2) Lexicon Prime Time delays.

—LISTING AND PHOTO/LOGO CONTINUED TOP OF NEXT PAGE

4TH STREET RECORDING
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B08 ❑ Sound Reinforcement

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FUNKENSTEIN'S LAB
Dallas, TX

BBE exciter. **Other Outboard Equipment:** Symetrix 528 vocal processor, ADR stereo limiter, Loft Quad, Furman Quad. **Microphones:** Neumann U87E, AKG "The Tube." **Monitor Amplifiers:** Hafler. **Monitor Speakers:** Tannoy, TOA. **Musical Instruments:** E-mu SP12 sampling drum machine, E-mu percussion drum module, E-mu Proteus, Korg sampling grand, Korg M-1 rack, Emax rack-mounted sampler, (2) Synergy digital keyboard, Oberheim matrix 6 rack. **Other MIDI Equipment:** IBM texture 24-track sequencing, Fostex 4050 SMPTE-MIDI converter. **Other:** Double Rick set D-Drum w/II Brain. **Digital Workstations:** IBM Turtlebeach direct-to-disk recording and editing. **Rates:** 32-track recording at 16-track rates. **Specialization & Credits:** Funkenstein's Lab is a Christian-based 32-track recording facility specializing in state-of-the-art recording, either live with D-drums or with SMPTE-based sequencing or both run together. Mixdown to R-DAT F1 digital or direct to hard disk. Relaxed atmosphere with pool and hot tub. Living quarters available for out-of-town bands. Call Mike Taylor at (214) 239-4075.

[24+] FUTURE AUDIO; 7700 Carpenter Freeway, Ste. 1000; Dallas, TX 75247; (214) 630-8889; FAX: (214) 630-9433. Owner: Marcos Rodriguez. **Manager:** Randy Adams. **Engineers:** Randy Adams, Doug Phelps, Conan Reynolds, Gerard Hairston, Barry Garrett, independents. **Dimensions:** Room 1: studio 42x51, control room 34x37. Room 2: studio 10x18, control room 10x18. Room 3: 20x35. **Mixing Consoles:** Mitsubishi Westar 44x24 w/Diskmix automation, Neotek Series III, Tascam 16x8. **Audio Recorders:** Otari MRT-90II 24-track, MCI JH-24, Tascam 38 8-track, Ampex ATR-102 2-track, Panasonic SV-3500 DAT. **Cassette Recorders/Duplicators:** (4) Nakamichi MR-2. **Synchronization Systems:** (2) Adams-Smith Zeta-3. **Echo, Reverb & Delay Systems:** Yamaha REV5, (2) Alesis MIDIverb II, Lexicon LXP-1, Lexicon PCM70, Roland SRV-2000, Roland SDE-3000, BBE 882 processor, (4) UREI LA-4A, UREI 1176, Aphex 303 Compellor/Exciter, Aphex Dominator, Aphex Aural Exciter, (2) ADR stereo pan, (2) ADR comp/limiter, ADR parametric EQ, Lexicon 97 Super Prime Time, (2) Yamaha SPX90. **Microphones:** (3) AKG 414EB, AKG C-24 stereo tube w/Klaus Heyne mod, (2) Beyer MC740, (7) Sennheiser 421, (4) Shure 57, AKG D-12E, (5) AKG 451, Wright condenser, (8) Countryman DI, Innovative Audio tube DI, Neumann U87 w/Klaus Heyne mod, (2) Crown PZM, Beyer 201. **Monitor Amplifiers:** UREI 6500, Crown PS-200, Crown D-75. **Monitor Speakers:** (2) UREI 813B, (6) Yamaha NS-10M, (2) Auratone, (2) Yamaha NS-1000, (2) JBL 4311, (2) UREI 811. **Musical Instruments:** Kawai 7'4" grand piano, Yamaha KX88 controller, Roland D-50, Casio FZ-1 sampler, E-max sampler, (2) Yamaha TX, Roland R8 drum machine, Emulator SP-12 turbo, Roland Octapad, Sequential Circuits Prophet-5, Sequential Circuits Drum Traks, Proteus 1 and 2. **Other MIDI Equipment:** Mac Plus w/Performer, IBM clone w/Voyetra. **Video Equipment:** (2) Sony 2850 3/4" VTR, Sony 5800 3/4" VTR, Sony 3/4" editor, (2) Mitsubishi monitor. **Other:** Complete radio production suite w/CD music and FX library. **Rates:** Available on request.

[24+] GOLDEN GOOSE PRODUCTIONS; 2074 Pomona Ave.; Costa Mesa, CA 92627; (714) 548-3694. Owner: D.P. & E.I. Rose. **Manager:** Dale "Spanky" Kimberlin. **Engineers:** D.P. Rose, Les Howard, Spanky the K. **Dimensions:** Room 1: studio 22x20, control room 18x16. **Mixing Consoles:** Custom 40x24 Spectra Sonics w/API mic-pres. **Audio Recorders:** Ampex MM-1100 24-track 2", Ampex MM-1100 16-track 2", Ampex ATR-102 stereo 1/2" and 1/4", Ampex AG-440C stereo 1/4". **Cassette Recorders/Duplicators:** Nakamichi 600, Denon DRW 750 cassette dubber. **Synchronization Systems:** ECHO SMPTE. **Echo, Reverb & Delay Systems:** Lexicon PCM60, (2) Lexicon PCM41 DDL, Marshall Time Modulator, DeltaLab Echotron DDL looper/sampler, DeltaLab Effectron DDL flanger/dubler, Eventide H910 Harmonizer, Ursa Major space station, AKG BX10 spring reverb, (2) Echoplate 3, Alesis MIDIverb. **Other Outboard Equipment:** (4) dbx 160, (6) Allison Kepex, Allison Gain Brain comp/limiter, SAE impulse noise reduction, Altec graphic EQ 1/3-ocatve and seven-band. **Microphones:** Neumann U47, Neumann U87, (2) Neumann KM84, (2) AKG C-414E, (2) AKG C-414EB, (2) AKG C-451, (2) Beyer M160 dynamic ribbon, (2) RCA 77-DX, Sony C-500, Sony ECM-22P, Sony ECM-250, Electro-Voice RE20, Electro-Voice 666, Electro-Voice 678, Electro-Voice RE15, Electro-Voice 635A, Sennheiser 421, AKG shotgun, Shure SM57. **Monitor Amplifiers:** (2) BGW 700, BGW 500D, (3) Marantz 260, G.A.S. "great American sound" (Son of Ampzilla). **Monitor Speakers:** UREI 813 w/Altec 604E drivers in control room, Altec 604E in studio, JBL 6411. **Musical Instruments:** Steinway 7' grand piano, Hammond M-10 organ, Fender Rhodes Stage II (75 keys), Guild F50 jumbo guitar, Jose Ramirez flamenco guitar, National (resonator guitar) Lap steel, pre-CBS Fender Strat custom, Fender 1959 "tweed" bassman amp—limited edition #25 of 100 made, 1967 Gibson SG with kaler tremolo bar, Rickenbacher 360 12-string guitar, 1972 Fender Precision bass, 1968 Gibson G-3 bass—very rare, Moog (micro-mooag synth +), Roland PV synth (guitar synth), Roland Juno 6 (analog synth), 1966 Slingerland 5-piece drum kit with Zildjian cymbals, Russian Balilika, miscellaneous Latin percussion, instrument amps, Fender 1968 twin reverb tube amp, Roland Jazz chorus. **Other MIDI Equipment:** MIDI keys, Roland D-50, Roland S-550 sampler, E-mu Proteus 2X module, Kawai K1R. Yamaha TX module, Macintosh II computer with music seq and writing software, Oberheim DMX drum machine. **Video Equipment:** Hitachi VHS cassette recorder, Panasonic VHS cassette recorder, Panasonic camera w/tripod.

[24+] GOLDMINE RECORDING; *also REMOTE RECORDING;* **1393 Callens Rd.; Ventura, CA 93003; (805) 644-8341. Owner:** Goldmine Productions. **Manager:** Jeff Cowan. **Engineers:** Mick Young, Jeff Cowan, Mike Horn, various independents. **Dimensions:** Studio 66x26, control room 18x16. **Mixing Consoles:** Neotek Series II 28x24 w/Jensen 990s. **Audio Recorders:** Otari MTR-90 24-track, Tascam TSR-8 24-track, Otari 5050B 2-track, Technics 1506 2-track, Panasonic SV-3500 2-track digital. **Cassette Recorders/Duplicators:** (2) Sansui SC-1110, (2) Aiwa F770, (2) KABA duplication system. **Synchronization Systems:** TimeLine Lynx. **Echo, Reverb & Delay Systems:** Lexicon Prime Time DDL, MXR DDL, DeltaLab Effectron, Eventide H910 Harmonizer, Yamaha REV7, Yamaha REV5, Korg DRV-3000, Roland SRV-2000 digital reverb, Ecoplate II, TC Electronic 1280 DDL, Yamaha SPX90 II. **Other Outboard Equipment:** (2) UREI LA-2A limiter, UREI 175 limiters, (2) dbx 161, (2) Valley People noise gate, (4) Omni Craft gate. **Microphones:** (9) Neumann, (4) Sennheiser, (4) Sony X, (6) AKG, (4) Shure, (2) Crown PZM, (2) E-V, (2) RCA. **Monitor Amplifiers:** Hafler DH-500, Fostex 600, Phase Linear 700B. **Monitor Speakers:** (2) Westlake BSM6, (2) UREI 813, (2) Yamaha NS-10, (2) Auratone. **Musical Instruments:** Yamaha C7 grand piano, Yamaha DX7, Yamaha PF15 electric piano, E-mu Emulator SP-12 drum machine, Akai 900, Roland D-50. **Video Equipment:** JVC 3/4" U-Matic, Sony video monitor. **Rates:** $55/24-track, $40/8-track, $35/2-track, call for block rates.

[24+] GOODNIGHT DALLAS/REAL TO REEL STUDIOS; 11260 Goodnight Ln.; 2545 No. Fitzhugh Ave. (75204); Dallas, TX 75229; (214) 827-7170; FAX: (214) 241-4037. Owner: Gordon Perry. **Manager:** Ron Morgan.

[24+] GRD/INVINCIBLE RECORDING & TAPE DUPLICATION; 2323 E. Magnolia, Ste. 119; Phoenix, AZ 85257; (602) 275-2101; FAX: (602) 275-2022.

[24+] GROUP IV RECORDING INC.; 1541 N. Wilcox Ave.; Hollywood, CA 90028; (213) 466-6444; FAX: (213) 466-6714. Owner: Angel L. Balestier. **Manager:** Lisa Burrowes. **Specialization & Credits:** A facility well known for its excellence in film/TV scoring (*Sibling Rivalry, Quantum Leap, Cheers*) Group IV has expanded its expertise to video sweetening and audio post-production for films. Studios A, B and the Pablo Room can collectively accommodate ADR/narration, Foley/sound effects, music recording/mixing, prelay (effects, music, dialogue); video sweetening or trailer dubbing (with video or 35mm mag interlock); film, video and audio transfers, and streamering. Their recent joining of forces with the acclaimed video production and post-production facilities, *Starfax and The Editing Company*, now allows Group IV to offer clients a complete video/audio production package.

[24+] HALLMARK PRODUCTIONS; *also REMOTE RECORDING;* **31320 Via Colinas, Ste. 118; Westlake Village, CA 91362; (818) 991-4857; FAX: (818) 707-2693. Owner:** Steve Hallmark. **Manager:** Steve Hallmark. **Engineers:** Steve Hallmark, Rich Thomas, various independents. **Dimensions:** Room 1: studio A 10x11, studio B 10x14, control room 14x17. Room 2: video/editing 10x12. **Mixing Consoles:** Soundcraft 2400 28x24 (52 in remix). **Audio Recorders:** MCI JH-110 1/2" & 1/4" 2-track & 1/2" 4-track, Otari 5050BII 2-track, Otari MX-80 24-track, Mac IIci w/Digidesign sound accelerator; SoundTools DAT I/O, 650 by hard drive. **Cassette Recorders/Duplicators:** Yamaha C200, Yamaha C300, (2) Panasonic SV-3500 DAT 2-track. **Synchronization Systems:** Adams-Smith Zeta-3 B w/remote. **Echo, Reverb & Delay Systems:** Lexicon PCM70 w/3.0 software, Yamaha REV7, (2) Yamaha SPX90, Alesis Quadraverb, (2) Roland SDE-3000 DDL, (2) ADA 1280 DDL, Roland R-880 reverb. **Other Outboard Equipment:** dbx 166 comp/lim/gate (stereo), Symetrix 155 comp/lim/gate (stereo), (2) Symetrix quad noise gate, Barcus-Berry BBE-202R, Aphex Type B. **Microphones:** AKG 414EB-P48, Sony C-48, (2) Sony C-36P, E-V RE20, (4) Shure SM77, (2) Neumann U87A, Sennheiser MD421. **Monitor Amplifiers:** (2) Crown, Symetrix, (2) Hafler Pro 500x. **Monitor Speakers:** JBL 4411, Tannoy NFM-8, Yamaha NS-10M, Auratone 5C, Digital Design. **Musical Instruments:** Korg M1R, Roland MKS-20 digital piano, Roland MKS-70 Super JX, Roland MKS-80 Super Jupiter w/programmer, (2) Roland D-550 LA synth, Yamaha TX816 FM synth, Roland A80 keyboard controller, Oberheim DPX-1 sampler player, (2) Akai S900 sampler, Kurzweil 1000-PX, 360 Systems Pro MIDI bass, Sequential Circuits Prophet VS, Roland Octapad MIDI drumpads, E-mu Proteus II RX, Ibanez electric guitar, Ibanez bass guitar, Washburn acoustic/electric guitar, MIDInet, Oberheim 1000 analog synth, Kurzweil 1000-SX, E-mu Pro-Cussion module, E-mu Proteus II. **Other MIDI Equipment:** Macintosh IIci 8 meg. RAM, 105-meg internal drive, Opcode Time Code (SMPTE sync), Garfield Time Commander, J.L. Cooper MSB-16/20 MIDI patch bay, Opcode librarians for MKS-80, D-550, DX7, DX7II, M1, Mark of the Unicorn MIDI TimePiece Mac interface/SMPTE sync, Performer Sequencer 3.42. **Video Equipment:** Panasonic synchronizable VCR 1/2", Sony VO-5800 3/4" VCR, Sony 25" monitor. **Rates:** Please call for rates.

[24+] HAMMERSOUND RECORDERS; *also REMOTE RECORDING:* **9612 Lurline Ave., Unit N; Chatsworth, CA 91311; (818) 998-9990; FAX: (818) 341-1330. Owner:** Chris Apthorp. **Specialization & Credits:** After 15 years in Chatsworth, we have completely remodeled and tuned our control room and upgraded our equipment. The facelift has left the ambience of our studio and iso booths unchanged. Our clients loved them then and still love them today, so will you. Our equipment includes an Amek-TEC Matchless console, Otari MTR-90 24-track, gobs of outboard gear and a full complement of microphones. While we are equally adept at all types of projects, the acoustical environment at HammerSound was originally conceived as a studio for music that needs air to breathe. All types of acoustic music—bluegrass, country, roots-based rock bands, traditional jazz—will find magic in the sound of this room. HammerSound is part of a trio of studios including Cornerstone Recorders and its Neve VR w/Flying Faders, so whatever your project, we are ready to serve.

[24+] HIT SINGLE RECORDING SERVICES; 1935C Friendship Dr.; El Cajon, CA 92020; (619) 258-1080. Owner: Scottman Ltd. **Manager:** Randy S. Fuelle.

[24+] THE HOOK RECORDING STUDIO; 10700 Ventura Blvd., Ste. A; Studio City, CA 91604; (818) 980-4396. Owner: Mike Frenchik. **Manager:** Mike Frenchik.

HOT TIN ROOF STUDIOS
N. Hollywood, CA

[24+] HOT TIN ROOF STUDIOS; 5250 Vineland Ave.; N. Hollywood, CA 91601; (818) 763-7110; FAX: (818) 763-6140. Owner: Soundland Inc. **Manager:** Frank De Luna. **Engineers:** Bryan Stott, Humberto De Luna (mastering), John Lowson, Colin Mitchell. **Dimensions:** Room 1: studio 55x45, control room 24x26. Room 2: studio 16x20. **Mixing Consoles:** Trident 80-B 30-input w/24-track monitoring. **Audio Recorders:** Studer A827 24-track, ATR Ampex 1/4" and 1/2" heads, Otari MTR-1112 1/4" and 1/2" heads. **Cassette Recorders/Duplicators:** (3) Aiwa 3-head synchronous. **Noise Reduction Equipment:** (2) Dolby 361-A w/SR cards. **Echo, Reverb & Delay Systems:** Lexicon PCM70, Yamaha REV7, (2) Yamaha SPX90, Roland SDE-3000, (3) Korg DRV-3000. **Other Outboard Equipment:** (2) UREI 1176B limiter, (4) dbx 160XT limiter, dbx 163 limiter/gate, Dual Strate gate, Aphex Dominator 2-channel, API 5502 2-channel EQ, Rocktron aural exciter. **Microphones:** (30) Various mics—Neumann, Sony, AKG, Sennheiser. **Monitor Amplifiers:** UREI 813 w/modified crossovers/Carver amps, Yamaha NS-10, Hafler amp. **Musical Instruments:** Complete double bass TAMA drum set. **Other:** Sony 1630 digital audio processor for CD mastering, Sony DMR 4000 digital audio 3/4" U-matic, Sony BVU 800 digital 3/4" U-matic, Sony 75ES DAT, Sony CD player, CDP 75es, ESD 507 CD player w/digital output. **Digital Workstations:** Sonic Solutions hard disk editor for CD mastering w/Macintosh computer. **Rates:** Rates quoted on request. Contact Frank De Luna. **Specialization & Credits:** Multitrack recording—CD prep and sub mastering with Sonic Solutions hard disk editor. CD

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24-track studios

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pressing and cassette manufacturing referrals. Studio credits include tracking for Judson Spence and Raindogs for Atco/Atlantic, produced by Don Grehman, Recording Japanese female group "Reg Wink" for Sony Japan through Blue Jay West Productions. Tracking for Dread Zeppelin album for IRS. On-dub and mixing of Argentina's new teen idol Diego Sabattini. On-dub and mixing of former "Flans" now Solo, mimi for Capitol-Mexico.

[24+] IGNITED PRODUCTIONS; *also REMOTE RECORDING*: **1645 N. Vine St., Ste. 614; Hollywood, CA 90028; (213) 461-0734; FAX: (213) 461-3453. Owner:** Thomas Appleton Jr **Manager:** Eric G. Lauenberg.

[24+] IMAGE RECORDING; 1020 N. Sycamore Ave.; Hollywood, CA 90038; (213) 850-1030; FAX: (213) 850-0895. Owner: Harry Maslin, John Van Nest. **Manager:** John Van Nest. **Engineers:** Harry Maslin, John Van Nest, Tally Sherwood, Jason Roberts. **Dimensions:** Room 1: studio 40x20, control room 18x15. Room 2: studio 15x10, control room 18x14. **Mixing Consoles:** SSL 4056E 60-input w/G computer and Total Recall, Trident A Range. **Audio Recorders:** (2) Ampex ATR-102 2-channel, (3) Studer A827 24-track. **Cassette Recorders/Duplicators:** (2) Aiwa, (2) Tascam, (2) Nakamichi MR 1. **Noise Reduction Equipment:** Dolby M-24 24 channel rack. **Synchronization Systems:** (4) TimeLine Lynx. **Echo, Reverb & Delay Systems:** EMT 140 plate reverb, AMS RMX digital reverb, Lexicon 480L, (3) Lexicon PCM70 digital reverb, (2) Yamaha REV7 digital reverb, (5) Yamaha SPX90 II, (2) LXP 1 digital reverb, Roland SRV-2000 reverb, TC 2290, AMS DMX delay/harmonizer, Roland SDE-3000 delay, Lexicon Delta T, Marshall tape eliminator analog delay. **Other Outboard Equipment:** (2) AMS flanger/phaser, Eventide H910 Harmonizer, Cyclosonic panner, Panscan, (2) Neve 1064 mic pre/equalizer, (8) Neve 1073 mic pre/equalizer, (2) Trident A Range, (2) Teletronics LA-2A limiter, (4) UREI 1176LN limiter, (4) dbx 160X limiter, (6) dbx de-esser, (4) dbx gates, (6) Drawmer noise gate, (24) Neve 1059 mic preamps, (2) Tube-Tech tube equalizers, (2) Lang PEQ-2 tube equalizer. **Microphones:** (60) Neumann, Akai, Sennheiser. **Monitor Amplifiers:** (2) Yamaha 2200M, (2) McIntosh 2300. **Monitor Speakers:** (2) UREI Time Aligned, (2) Yamaha NS-10M.

[24+] INDIAN HILL AUDIO/VIDEO; 224 N. Indian Hill Blvd.; Claremont, CA 91711; (714) 625-2396; FAX: (714) 625-2397. Manager: Terrance Dwyer. **Engineers:** Thomas Orsi (audio), Adam Falk (video), Terrance Dwyer (audio). **Dimensions:** Studio 22x37, control room 18x22, video suite 12x12. **Mixing Consoles:** Neve "Classic" w/Necam automation. **Audio Recorders:** Ampex ATR-102, Sony JH-24, F1-3/4" U-matic digital. **Synchronization Systems:** 24-track audio lock to 1" video suite for film/video. **Echo, Reverb & Delay Systems:** Large assortment of reverbs, limiters, effects boxes—all ERAs. **Microphones:** Extensive collection of tube & contemporary microphones. **Video Equipment:** 1" on line video editing suite, featuring Ampex Ace editing system, ADO 100, U-matic & Beta formats. **Digital Workstations:** Macintosh FX with soundtools, Q-sheet, Studiovision, designer.

[24+] INDIGO RANCH RECORDING STUDIO-MALIBU; PO Box 24-A-14; Los Angeles, CA 90024; (213) 456-9277; FAX: (213) 456-8474. Owner: Richard Kaplan, Michael Hofmann. **Manager:** Michael Hofmann. **Engineers:** Richard Kaplan, Chris Brunt, Chuck Johnson, Thom Panunzio, Chris Kupper. **Dimensions:** Studio 22 x 30 plus iso rooms, control room 20 x 20 (keyboard player's dream). **Mixing Consoles:** "Deane Jensen", Aengus custom 32 x 24 fully automated plus eight, echo returns and 24 mon/line returns and, 14 sends. **Audio Recorders:** 3MM-79 24-track 1/2" and 1/4" stereo, Sony 3324 4-track digital, Mitsubishi X-850 digital, Mitsubishi XX-86 digital, NED Synclavier DAT VHS and 3/4" PCM. **Cassette Recorders/Duplicators:** Panasonic 3500 DAT. **Echo, Reverb & Delay Systems:** EMT 140S plate, EMT 250 digital reverb, AMS and, Publison Infernal 90 available on request, Lexicon 224 digital reverb, Yamaha SPX90 processor, Roland SRV-2000 processor, Roland SDE-3000 processor, Alesis XT digital reverb, MXR 01 digital reverb and DDL, Ursa Major Space Station digital effects, Telefunken reverb, Eventide Harmonizers, DDLs and instant phaser, Loft delay/flanger, Marshall time modulator. **Other Outboard Equipment:** Teletronix LA-1, Teletronix LA-2, Pultec EPQ-1A, Pultec EQH-2, Pultec MEQ-5 equalizers, ADR stereo compex limiters and selective stereo, processors, UREI 1176, UREI UA175, UREI 176 tube limiters and little dippers, Fairchild tube limiters, API, Aengus and B&B equalizers, Valley People Kepex IIs, Gain Brain, Drawmer Electrospace strate gate, Orban parametric equalizer, EXR, Aphex Exciters and stereo enhancers, RCA BA6A tube limiters, Collins 26 tube limiter, dbx 900 rack w/de esser, dbx 160 limiter. **Microphones:** Huge collection of new and vintage tube, Neumann U47, Neumann M49, Neumann KM53, Neumann U67, Neumann U87, Neumann SM2, Neumann SM23, Neumann SM69 and others, Telefunken ELAM250, Telefunken ELAM201 classic tube, AKG C-12, AKG C-12A, AKG C 24, AKG C 28 and others, over 100 tube mics including AKG, Schoeps, Neumann, Sony PML, Telefunken, etc. **Monitor Amplifiers:** HH Electronic custom bi-amp 1600 watts per side. **Musical Instruments:** Steinway grand piano, (2) ClapTrap, guitar accessories, most things available on request. **Video Equipment:** The Indigo Ranch Studio's support facilities and grounds (orchards, mountains, canyon, and ocean view) are very picturesque, private and conducive for film and video production. **Rates:** Ask about our block booking rates. Daily, weekly, weekend and monthly lockouts. **Specialization & Credits:** Secluded 60-acre ranch with satellite TV, minutes from beach; living and cooking facilities. Great for artists from out of town and a wonderful retreat for those living in the Southern California area. Indigo Ranch provides a unique environment conducive to musical creativity in a homelike but professional setting. Located in the Malibu Hills overlooking the Pacific Ocean, Indigo services top recording artists from all over the world. The ranch offers sleeping accommodations, kitchen facilities and a gourmet cook (on request). The ranch and its fully equipped, state-of the-art studio are beautifully maintained by an experienced and conscientious staff doing their utmost to make clients feel welcome and comfortable. We are pleased to announce that Indigo Ranch Studios is entering its 17th year of continuous service to the musicians, producers and engineers of Los Angeles and the world.

[24+] INGENIERIA ELECTROACUSTICA DEL CENTRO, S.A. DE C.V.; *also REMOTE RECORDING*: **Capitan Caldera No. 408A; San Luis Potosi, S.L.P., Mexico; (48) 13-03-50. Owner:** Ing. Jorge Fernandez. **Manager:** Jorge Fernandez Noyloa **Engineers:** J. Refugio Garcia Campos, Jose Manuel Carrillo N., Daniel Fernandez N. **Dimensions:** Room 1: studio 30x36, control room 18x30. Room 2: studio 24x20, control room 15x24. **Mixing Consoles:** TAC Scorpion 28x24x2, Tascam 320 20x8x2. **Audio Recorders:** (2) Otari MTR-90 24 track, Tascam MS-16 16-track, Studer Revox PR99 MXII 2 track, Sony PCM 2500 DAT, Sony TCD-D10 Pro DAT, Tascam 32 2 2 track, TEAC X2000R 2-track, Philips Pro 12, (2) Technics 1500 2-track. **Cassette Recorders/Duplicators:** (2) Sony TCR 503, Pentagon cassette copier, Tascam 122, TEAC R425, BIC T2. **Noise Reduction Equipment:** (2) dbx DX80S, (2) dbx DX40. **Echo, Reverb & Delay Systems:** DeltaLab TimeLine DL 4, Yamaha REV7, Yamaha SPX90, BBE Sonic Maximizer 822A, Aphex aural exciter, MICMIX master room. **Other Outboard Equipment:** Audio Logic MT44, (4) Yamaha 6C-2020-B comp/limiter, Thompson VE-1 vocal eliminator, (4) Tascam MH40 multiheadphone, (3) Furman AR117 power conditioner, (8) Tascam MU-40 meter unit. **Microphones:** (2) Neumann U87, (4) Bruel & Kjaer 4007, (2) Bruel & Kjaer 4006, (4) AKG 224E, (3) Sennheiser MD-441, (5) Sennheiser MD 421, (5) Shure SM81, (2) Sony ECM 989 stereo, Sony ECM MS5 stereo, (4) Sony ECM 33F, (9) Shure SM57, (4) Crown PZM 306P6, (2) JVC M510, (4) Shure SM99, (2) Shure SM98, AKG D12, (2) AKG 414, (4) Nakamichi CM-100, Nakamichi CP2, Nakamichi CP4, Nakamichi CP1. **Monitor Amplifiers:** Crown DC-300A Series II, Crown D-75A, McIntosh MC-7270, Denon POA 1500, Nikko Alpha 3, Adcom 555 6FA. **Monitor Speakers:** B&W 801 Matrix Series II, (2) JBL 4333A bi-amplified, (2) Tannoy PBM-6.5, (2) Altec 604E, (2) Yamaha NS-10M, (2) B&W 200 Series, (2) Auratone 5C cube, (2) Toa 265 MD, (2) JBL Control 5. **Musical Instruments:** Wagner 7' grand piano, Ensoniq EPS. **Rates:** $50—24 tracks Studio 1, $40—16 tracks/8 tracks Studio 2.

[24+] INSIDE TRACK STUDIOS; 313 N. Locust; Denton, TX 76201; (817) 566-2367. Owner: Jim Vincent. **Manager:** Jim Vincent.

[24+] INTERSOUND INC.; *REMOTE RECORDING only*: **8746 Sunset Blvd.; Los Angeles, CA 90069; (213) 652-3741; FAX: (213) 854-7290. Owner:** Ahmed Agrama. **Manager:** Kent Harrison Hayes.

[24+] JAMLAND STUDIOS; 10988 Noble Ave.; Mission Hills, CA 91345; (818) 361-2224. Owner: Roger Curley. **Manager:** Roger Curley.

[24+] J.E. SOUND PRODUCTION AND ENTERTAINMENT; 1680 N. Sycamore Ave.; Hollywood, CA 90028; (213) 462-4385. Manager: John.

[24+] KINGSOUND STUDIOS; 7635 Fulton Ave.; North Hollywood, CA 91605; (818) 764-4580. Owner: Eddie King. **Manager:** Steve Cormier. **Engineers:** Eddie King, Steve Cormier, Rob Ruscoe. **Dimensions:** Room 1: studio 40x24, control room 27x19. Room 2: control room 12X12. **Mixing Consoles:** Neve 8128 56x48x56 w/Flying Faders Automation. **Audio Recorders:** Studer A827 24-track 2", (2) Panasonic SV-3500 DAT machine, Otari MTR 102-track 1/4", Otari MX-5050 2-track 1/4." **Cassette Recorders/Duplicators:** (2) Akai GX-8 3 head, (2) Nakamichi MR1. **Echo, Reverb & Delay Systems:** Lexicon 480L digital effects unit, Lexicon PCM70, Lexicon PCM41 digital delay, Roland SDE-3000, Yamaha SPX90 digital effects, Effectron 256 digital delay, TC Electronic 2290 digital delay. **Other Outboard Equipment:** Aphex Aural Exciter Type III stereo, Aphex Compellor stereo, Summit Audio TLA 100 tube leveler, BSS 402 stereo compressor/limiter/de-esser, dbx 165A compressor, dbx 165 compressor, (2) Valley People Gain Brain compressor, Valley People Kepex II gate, Valley People Maxi-Q equalizer, Valley People 610 stereo compressor/gate, Drawmer DS-201 dual gate, BBE 822 Sonic Maximizer stereo, Garfield Digital Click. **Microphones:** (2) Neumann U67 tube, (2) Neumann TLM170, (4) Neumann KM100, Neumann U89, Neumann U47 FET, AKG 414TLS transformerless, AKG C-460 w/CK1S, (2) Schoeps CMC-5 cardioid, (2) Sennheiser 421 cardioid, Sennheiser 441, (3) Shure SM81, Shure SM57, (3) Crown PZM, EV PL20, Sony C-37P, (2) Countryman Isomax. **Monitor Amplifiers:** Bryston 4B, Bryston 3B, Bryston 2B, Carver 1.5T, Eagle 2, Acoustat TNT200. **Monitor Speakers:** Auratone 5C, Yamaha NS-10M Studio, Custom 3-way tri-amp w/TAD components, Tannoy Little Reds 12". **Musical Instruments:** Yamaha C5 grand piano, Roland JX-3P, Ampeg Reverb Rocket. **Other:** Studer/Dyaxis digital audio workstation. **Rates:** Call for rates.

[24+] KIRKWOOD STUDIO; 7027 Twin Hills Ave.; Dallas, TX 75231; (214) 692-8332. Owner: Rick Woodul. **Manager:** Rick Woodul.

[24+] KNIGHTLIGHT STUDIOS; 1609 Tantor; Dallas, TX 75229; (214) 869-9405. Owner: Tim Miner. **Manager:** Jeff Adams.

[24+] LAHAINA SOUND RECORDING STUDIO; *also REMOTE RECORDING*: **840 Wainee St.; Lahaina, HI 96761; (808) 667-2587; FAX: (808) 667-2589. Owner:** George Benson. **Manager:** Amos Daniels.

[24+] LARRABEE SOUND; 8811 Santa Monica Blvd.; W. Hollywood, CA 90069; (213) 657-6750; FAX: (213) 659-1717. Owner: Kevin Mills. **Manager:** Kevin Mills. **Mixing Consoles:** SSL G 80 input, (2) SSL G 72 input, SSL E 56 input w/G computer. **Audio Recorders:** (6) Studer A800 24-track, (4) Studer A827 2-track, Mitsubishi X-850, (2) Sony 3324.

[24+] LOMA RANCH STUDIO; *also REMOTE RECORDING*: **Rt. 1, Box 97A3; Fredericksburg, TX 78624; (512) 997-3521. Owner:** John & Laurie Hill. **Manager:** Laurie Hill.

[24+] LYON RECORDING STUDIO; 2212 Newport Blvd.; Newport Beach, CA 92663; (714) 675-4790; FAX: (714) 675-2139. Owner: Curt Lyon. **Manager:** Naomi Davis.

[24+] MAD DOG STUDIOS INC.; 1717 Lincoln Blvd.; Venice, CA 90291; (213) 306-0950; FAX: (213) 578-1190. Owner: Michael Dumas, Dusty Wakeman. **Manager:** Michael Dumas. **Engineers:** Michael Dumas, Dusty Wakeman, Don Tittle, Tom Green, Eric Westfall. **Dimensions:** Studio 25x20, control room 15x18. **Mixing Consoles:** Neve 8108 28x32 w/Necam automation. **Audio Recorders:** Studer A800 24-track, Ampex ATR-102 2-track 1/2" or 1/4", Otari MX-5050 2-track 1/4", Tascam DA 30 DAT. **Cassette Recorders/Duplicators:** Tascam 122 MkII, Yamaha C-300. **Echo, Reverb & Delay Systems:** (2) Yamaha REV7 digital reverb, (3) Yamaha SPX90 digital reverb, Lexicon PCM70 digital reverb, Lexicon PCM60 digital reverb, (2) Roland SDE 3000 digital delay, Eventide 910 Harmonizer, (2) Alesis Quadraverb, EMT 140 stereo plate reverb, Dynacord DRP-20. **Other Outboard Equipment:** (2) dbx 166 stereo limiter, (2) Drawmer DS-201 noise gate (dual channel), (2) Gatex noise gate (4-channel), (2) dbx 165A limiter, (3) dbx 160X limiter, (2) UREI LA-4 limiter, Klark Teknik DN 360 dual graphic EQ, BBE 802 aural processor, (2) Lang PEQ-2, (2) UREI 1176LN limiter, (2) dbx 263 de-esser, UREI 546 dual parametric EQ. **Microphones:** Crown PZM, Neumann TLM170, Neumann U47 tube, (2) Neumann U67 tube, (2) Neumann U87, (4) AKG 414, (2) AKG 451 CE, AKG D-12E, (6) Shure SM57, (2) AKG C-28 tube, (2) Neumann KM84, (4) Sennheiser 421, Shure SM77, Shure SM85, Shure SM81, (2) Sony C-37P. **Monitor Amplifiers:** (2) Crown Micro-Tech 600, Bryston 4B, Bryston 3B, Phase Linear. **Monitor Speakers:** (2) Westlake BBSM-12, (4) Yamaha NS-10M, (2) Tannoy NFM-8, (2) Auratone 5C. **Musical Instruments:** E-mu Emulator EIII, E-mu Emax, Alesis HR-16 drum machine, Yamaha C7 grand piano, Fender Telecaster guitar, Silverton Danelectro Elektro guitar, Yamaha DX11 synth, (2) tambourine. **Other:** Ampeg B-15 bass amp, Fender Showman guitar amp (blonde), Fender Bandmaster 2-12 speaker cabinet (blonde), Wendel Jr. drum replacement. **Rates:** Call for reasonable rates (213) 306-0950. Come by and see us for great rates.

[24+] MAD HATTER RECORDING STUDIO; 2635 Griffith Park Blvd.; Los Angeles, CA 90039; (213) 664-5766. Owner: Chick Corea. **Manager:** Mark Francovich. **Engineers:** Larry Mah, Bernie Kirsh, Darren Mora, Robert Read, Mick Stern. **Dimensions:** Studio 38x26, control room 18x22. **Mixing Consoles:** Neve 8078 40 inputs 32 monitor, 24 buses w/GML automation. **Audio Recorders:** Studer A800 MkIII 24-track, Studer A80 24-track, (2) Studer A80RC 2-track stereo (1/2" or 1/4"), Otari MTR-12 4-track 1/2". **Synchronization Systems:** (2) TimeLine Lynx. **Echo, Reverb & Delay Systems:** AMS 15-80S DDL, EMT 140 stereo plates, EMT 240 Gold Foil reverb plate, Lexicon 224XL digital reverb, Lexicon Super Prime Time, (4) Yamaha SPX90, Eventide 949 Harmonizer, (2) Teletronix LA-2A compressor/limiter, (2) UREI 1176 limiter, (2) dbx 160X lim-

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MAD HATTER RECORDING STUDIO
Los Angeles, CA

ner/compressor, Sontec stereo EQ, (4) API 550A EQ, (2) Drawmer dual gate. **Other Outboard Equipment:** (4) Kepex noise gate. **Microphones:** (10) Schoeps CMC3, (4) AKG 414EB/P48, (2) Neumann U67, (2) Sanken CU32, (4) Bruel & Kjaer omni, (4) Shure SM57, (6) Sennheiser 421, (2) AKG C-12, (2) AKG C-12A, (2) Neumann U87, (5) AKG 414, Neumann M49, Neumann KM84 AKG D-12E. **Monitor Amplifiers:** Hafler 500, Hafler 2200, (2) Bryston. **Monitor Speakers:** Yamaha NS-10, Tannoy SRM-10B, Auratone, Vincent Van Haaff custom. **Musical Instruments:** Bosendorfer 9' concert grand w/MIDI, Steinway D 9' Hamburg concert grand. **Video Equipment:** JVC CR6000 U 1" recorder/playback, NEC 26" monitors, JVC VHS Hi-fi video recorder, Toshiba 19" video. **Rates:** Upon request. **Specialization & Credits:** "The building of Mad Hatter Studios is the realization of a place where musicians could make music in a free, easy atmosphere. Our technical concept is clarity and sound. Our musical concept is the artist's vision realized."—Chick Corea. Our clients include: Prince, Robert Palmer, Paul McCartney, Chick Corea, Pebbles, Wayne Shorter, Lavert, Marc Ferguson, Chico Debarge, Los Lobos, Teena Marie, Jennifer Warnes, Warren Zevon, Madame X, Robben Ford, Jean LucPonty, Yellowjackets and Billy Crystal. Movie soundtracks and TV credits include: *Quantum Leap, Dad's a Dog* pilot, *Anything for Laughs, Teenage Mutant Ninja Turtles* soundtrack, *Nightmare on Elm Street, Surrender, The Principal, School Daze*, and our commercials include: Budweiser, Bud Dry, McDonalds, Rosarita, Coors, Coors Lite, Gatorade Lite.

[24+] MARTINSOUND RECORDING STUDIOS; 1151 W. Valley Blvd.; Alhambra, CA 91803-2493; (818) 281-3555; FAX: (818) 281-3092. Owner: A.J. Martinson II. **Manager:** Annette Martinson. **Engineers:** Toby Foster, engineer and house engineers available. Independent engineers welcome. **Dimensions:** Room 1: studio 45x47, control room 28x18, machine room: 16x10, Room 2: studio 23x14, control room 13x14. **Mixing Consoles:** Neve VRP 60 w/recall and Flying Faders Automation, AMS Logic One. **Audio Recorders:** (2) Sony/MCI 24-track, (2) Mitsubishi X-880 32-track, DAT, AMS Audiofile, Ampex ATR 102 and 104 2- and 4-tracks. **Noise Reduction Equipment:** Dolby 24-track, Dolby 4-track, Dolby 2-track, Dolby SR. **Synchronization Systems:** (3) TimeLine Lynx, Audio Kinetics pacer, house sync. **Echo, Reverb & Delay Systems:** AMS, (2) Yamaha REV7, (2) Lexicon SPX90, (4) EMT echo plate. **Other Outboard Equipment:** Misc. EQ equipment, Valley People Kepex II noise gate, UREI LA-2A, various digital delays, UREI LA-3, UREI 1176 (modified), AMS, Trident EQ, Sontec EQ. **Microphones:** Over 60 tube and solid state mics: Telefunken, Neumann, AKG, AMS, Sennheiser, Shure, EV, Sony, RCA, etc. **Monitor Amplifiers:** Boulder, Crown, Hafler. **Monitor Speakers:** Yamaha NS-10M, 5-channel (LCRS) custom TAD system, Meyer Sound Labs HD-1. **Musical Instruments:** Yamaha 7' grand (Studio I), Steinway 7' grand (Studio II). **Video Equipment:** Sony 3/4" U-matic deck, (2) Sony color monitor, TimeLine Lynx lock-up. **Other:** Digital metronome, Silent Clock.

[24+] MASTER CONTROL; 3401 W. Burbank Blvd.; Burbank, CA 91505; (818) 842-0800. Owner: Aseley Otten. **Manager:** Aseley Otten, Scott Sheets. **Engineers:** Aseley Otten, Andrew Ballard. Scott Blockland, independents. **Dimensions:** Main room 58x24, iso room 14x18, vocal booth 7x8, control room 20x24. **Mixing Consoles:** SSL 4048E 52-32 w/G Series computer and Total Recall. **Audio Recorders:** Studer A827 24-track, Studer A80 VU-KI III 24-track, Studer A80 RC-MkII 2-track (1/4" and 1/2"), Revox PR99, ATR-104 4-track 1/2" & 1/4", Panasonic PV-3500 R-DAT. **Cassette Recorders/Duplicators:** Studer A710, Revox B215, Studer A725 CD player. **Noise Reduction Equipment:** Dolby 363/2 channels SR or A noise reduction. **Synchronization Systems:** TimeLine. **Echo, Reverb & Delay Systems:** Lexicon 224XL, Lexicon 200, Lexicon PCM70, Lexicon PCM42, AMS RMX 16 digital reverb, AMS DMX 15-80, (2) Yamaha REV7, Eventide 949 Harmonizer w/de-glitch, (2) Roland SDE-3000, Effectron II 1275 DDL, Eventide H3000 Ultra-Harmonizer. **Other Outboard Equipment:** UREI LA-2A, (2) UREI 1176 limiter, (2) dbx 160X limiter/compressor, Valley People 430, Valley People

—LISTING AND PHOTO/LOGO CONTINUED TOP OF NEXT COLUMN

MASTER CONTROL
Burbank, CA

Dyna-Mite limiter/gate, (2) CBS Audimax II RZ limiter, (2) API 560 graphics, Pultec EQP 1, Pultec EQP-1A, Pultec EQP-1S, Pultec EQH-2, Pultec MEQ-5, Pultec HLF-3C filter, Drawmer gates, Eventide Instant phaser, Klark-Teknik DN332 graphic EQ, Trident A Range input EQ module, UREI LA-3A, Inovonics 201 limiter, Aphex II exciter, dbx 902 de-esser, Massenburg EQ, Neve 12x14 tracking console w/1063 EQ. **Microphones:** AKG "The Tube", AKG 414/P48, AKG 451, Beyer M 160, Crown PZM, E-V 665, E-V 666, Neumann U87, Neumann U47, Neumann KM84, Neumann KM85, RCA 77-DX, Sennheiser 421, Shure SM77, Countryman, Westlake and Jensen DI boxes, Shure SM81. **Monitor Amplifiers:** Crown PSA-2, Eagle 2A, Studer A68, Crown 150, Crown 75, Hafler P-500, Hill 3000. **Monitor Speakers:** JBL 4311, Tannoy SRM12B, Yamaha NS-10M, Auratone 5C, Realistic Minimus 7, Westlake BBSM-4, George Augspurger custom w/TAD components **Musical Instruments:** Steinway C grand piano, Hammond B3 w/Leslie. **Video Equipment:** 26" SVT, NTSC, PAL, SECAM color monitor. **Rates:** $145/hr. Call for block bookings. **Specialization & Credits:** Credits include. Madonna, Loverboy, Cock Robin, REM, Bernie Taupin, Crystal Gayle, Stryper, Eddie Rabbitt, Kenny Rogers, Poison, Juice Newton, Sergio Mendes, Dream Syndicate, Reckless Sleepers, Hunters & Collectors, Devo, Robert Tepper, Eurythmics, Lords, Herbie Hancock, Bus Boys, Cheech Mann, Dream Academy, Alice Cooper.

[24+] M'BILA RECORDING STUDIO; 1800 N. Argyle Ave., Ste. 200; Hollywood, CA 90028; (213) 466-7613; FAX: (213) 466-1461. Owner: Clarence Taylor. **Manager:** Angela Bland.

MIDCOM REMOTE SERVICES
Irving, TX

[24+] MIDCOM REMOTE SERVICES; 3 Dallas Comm. Complex, Ste. 108; 6311 N. O'Connor Rd., LB-50; Irving, TX 75039; (214) 869-2144; FAX: (214) 869-0898. Owner: Mike Simpson. **Mixing Consoles:** Soundcraft TS 24 32-channel console w/custom, 8 stereo/16 mono submaster routing system 32x24x16x2x1, Amek/TAC Bullet 10x4x2. **Audio Recorders:** (2) Otari MTR-90 II 24-track, Studer A-810 2-track w/center-track time code, Panasonic SV-3500 R-DAT. **Cassette Recorders/Duplicators:** Nakamichi MR-1B Panasonic SV3500 DAT. **Noise Reduction Equipment:** TTM 24-channel frame noise reduction, accept Dolby, dbx, Telcom. **Synchronization Systems:** Cipher Digital Shadow II w/Shadowpad, Cipher Digital time code reader/generator. **Echo, Reverb & Delay Systems:** Lexicon 480L digital effects processor, Lexicon 224XL digital reverb, Lexicon 95 Prime Time II, Lexicon PCM70 digital effects processor, Eventide H910 Harmonizer, dbx 900 frame w/903 comp/limiter, 904 noise gate MICMIX dynafex/exciter cards. **Other Outboard Equipment:** (2) dbx 160X comp/limiter, Aphex Stereo Compellor. **Microphones:** (2) Neumann TLM170, Neumann U89, Neumann KM84, (4) AKG D-414EB,

—LISTING CONTINUED ON PAGE 173

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World Radio History

Southern California Hawaii • Southwest

24-track studios

—LISTING CONTINUED FROM PREVIOUS PAGE

Sennheiser MD-441, Sennheiser MD-421, Beyer M69,Beyer M88, Beyer MC734, Shure SM57, Shure SM81, Crown PZM GPB30, (2) Crown PZM 2LV, Vega R42 handheld & lavalier wireless available at extra charge, AKG C-414, Beyer M5000, Beyer M201,Shure SM58. **Monitor Amplifiers:** (2) Hafler P-505, Hafler P-230. **Monitor Speakers:** (2) JBL 4430 biradial bi-amped w/White 1/6-oct. EQ and crossover, (2) Westlake BBSM-6, (2) Auratone 5C, (2) Tannoy NFM-8, UREI 811B time-aligned, Digital Design. **Video Equipment:** Sony VO-5800 3/4" U-matic, Panasonic AG-6800 1/2" VHS Hi-fi, Sony CVM-1900 19" NTSC monitor/receiver, (3) Panasonic BMV-5 5" monitor, (2) Panasonic 12x1 routing switcher, (3) ADC Humbuckers. **Specialization & Credits:** Past projects include: the Cure 1989 "Prayer" tour, Marcus Roberts "Deep in the Shed" music video, *1989 Miss USA Pageant*, Mobile, AL, for CBS TV; *Aida*, *Nixon in China*, *The Aspern Papers*; Great Performances Series for PBS, *Dolly*ABC-TV prime time; "The Texas Debates" presidential debates for American Public Radio; live broadcast for Z-Rock Radio Network include: Metallica, Dio, King's X, Black Crowes, Nevada Black, Every Mother's Nightmare, Network, George Strait, MCA Home Video; 7th Van Cliburn Competion, American Public Radio; Benjamin Lees' *Memorial Candles* American Public Radio; score for *Texas*, Dramafex production at Palo Duro Canyon; *Fashion Hit Revue*, Sanger Harris live TV special; Mary Kay Cosmetics seminars 1985-1990, League of Women Voters, *1984 Democratic Presidential Candidates Debate*, PBS network special; Bob Banner Associates' *Face of the '80s* syndicated TV special; ACTS TV Network, *Country Crossroads*, two 13-week series; Bob Stivers Productions' *Stars Salute the U.S. Olympic Team*, NBC prime time special; Bugs Henderson live LP project; two live albums for The Vocal Majority; and more.

[24+] MIDILAND & PROMISE VIDEO POST; 1615 Rancho Ave.; Glendale, CA 91201; (818) 507-7982; FAX: (818) 507-7984. Owner: Chris Page. **Manager:** Chris Page.

[24+] THE MIXING LAB; *also REMOTE RECORDING*; **11542 Knott Ave., #9; Garden Grove, CA 92641; (714) 373-0141; FAX: (714) 660-3899. Owner:** F.M.G.. **Manager:** Thom Roy. **Dimensions:** Room 1: studio 20 x 30, control room 20 x 26. Room 2: studio 15 x 20, control room 15 x 22. **Mixing Consoles:** Trident Vector 48-inch, 32-bus, 48 monitor w/Diskmix 3G moving faders, Amek/Tac matchless 36x24. **Audio Recorders:** Otari MX80-24, MCI/Sony JH-24, Otari MTR-12, (6) Panasonic DAT 3500. **Synchronization Systems:** (2) Adams-Smith Zeta. **Echo, Reverb & Delay Systems:** (6) Kepex 2, (4) Symetrix Gates, (4) Aphex Gates, (2) Aphex dominator, (2) Aphex compellor, Yamaha D1500, (2) dbx 160X, (2) UREI LA3A, (2) UREI 1176, (2) dbx165A, AMS reverb, Lexicon 480L, Lexicon PCM70, Lexicon 200, Lexicon LXP-1, (2) Yamaha SPX-90, (2) Alesis XTC, Lexicon PCM42, Eventide H-3000SE. **Other Outboard Equipment:** (6) White EQ, Klark-Teknik 360 EQ, Yamaha digital EQ. **Microphones:** (4) AKG414, (2) Neumann TL170, (2) Neumann U87, (8) Sennheiser 421, (2) AKG460, AKG Tube, (10) Shure SM57, (2) Shure SM81, (2) KM56 tube, Sony C37, AKG C60. **Monitor Amplifiers:** (3) Crown 300, (2) Hafler Pro5000, (6) QSC 1500. **Monitor Speakers:** (4) Westlake BBSM-15, (2) Westlake BBSM-6, (6) Yamaha NS-10M. **Musical Instruments:** Yamaha C7 piano, E-mu Emax. **Other MIDI Equipment:** ADAP, Performer. **Video Equipment:** Mitsubishi 26" video monitors. **Other:** (2) IBM computer, (2) Atari computer, (2) Macintosh computer.

[24+] MUSIC ANIMALS AND ZOO STUDIOS; 3575 Cahuenga Blvd. W., Ste. 500; Los Angeles, CA 90068; (213) 969-9876; FAX: (213) 969-9477. Owner: Howard Pefer, John Bahler, Joe Lubinsky. **Manager:** Rick Perrotta. **Engineers:** Gary Joost, Hill Swimmer, Bob Burnham, Joel Stoner, Nick Els, Lea Jackson. **Dimensions:** Room 1: studio 33x21, control room 28x22. Room 2: studio 22x15, control room 23x22. Room 3: studio 16x11, control room 17x16. Room 4: studio 14x12, control room 16x14. Room 5: studio 15x13, control room 16x15. **Mixing Consoles:** (2) DDA 52-input automated console, (2) DDA 36-input automated console, DDA 24-input automated console. **Audio Recorders:** (3) Studer 827 24-track, Studer 820 4-track, Studer 820 2-track, Studer A80 1/2" 2-track, Otari MTR-10 4-track. **Cassette Recorders/Duplicators:** (7) Yamaha, (3) Panasonic DAT, (4) Sony DAT. **Noise Reduction Equipment:** (2) Dolby SR packages for multitrack recorders, (4) Dolby SR 363 for 2- and 4-track recorders. **Synchronization Systems:** (12) TimeLine w/KCU controller. **Echo, Reverb & Delay Systems:** (2) EMT 140 stereo plates,

—LISTING AND PHOTO/LOGO CONTINUED TOP OF NEXT COLUMN

MUSIC ANIMALS LOS ANGELES

MUSIC ANIMALS AND ZOO STUDIOS
Los Angeles, CA

(2) Lexicon 480L, (2) Lexicon 300, (5) Eventide Ultra-Harmonizer H3000SE, (8) Aphex gates/expanders, (8) dbx 166 & 165, (4) UREI 1176, (2) UREI LA-4A, (2) Neve limiter, (2) Inovonics, (4) Aphex aural exciter, (6) Lexicon PCM70, (6) Valley People Kepex & Gainbrains, (2) Sontec EQ, Q-Sound. **Microphones:** AKG, Neumann U47 tube, EV, Sennheiser, Sony, Neumann U87, Neumann TLM170, Neumann U67 (tube). **Monitor Amplifiers:** Crown, Bryston, Hafler, SAE. **Monitor Speakers:** UREI "Time Aligned," JBL, Radian, Yamaha, Auratone. **Video Equipment:** (6) Sony BVU-800 3/4", Sony BVH-2000 1", (3) Sony VHS 1/2." **Digital Workstations:** (5) Studer Dyaxis hard disc editor/workstation. **Specialization & Credits:** Music Animals is a five-room recording facility that offers its clients a wide range of recording services including music and voice-over recording, audio and video sweetening, recording to picture, offline video laydown and layback, audio and video duplication, Foley and sound design. Our studios feature digitally controlled DDA/DCM Series consoles with snapshot and fader automation. We use Studer tape machines and Studer Editech Dyaxis digital editors exclusively. Some of the extras available at Music Animals include 48-track lockup, Yamaha grand pianos and vintage tube microphones. Our digital editing suites and expansive sound effects library make Music Animals your complete one-stop recording and post-production facility. Our audio/video transfer department is ready to handle all of your anlaog, DAT and cassette needs. Our professional staff of audio engineers, highly trained assistants, as well as our creative digital editors are ready to serve you. Studio rates include an assistant engineer and one hour of set-up time. Additional set-up time is charged at half the hourly rate. Additional assistants are available at $15 per hour. One hour dinner break included per eight session hours. Please call for rates.

[24+] MUSIC GRINDER STUDIOS; 5540 Hollywood Blvd.; Los Angeles, CA 90028; (213) 957-2996; FAX: (213) 464-8770. Owner: Gary Skardina, Ron Filecia. **Manager:** Ron Filecia.

[24+] MUSIKWERKS WEST/MICHAEL BODDICKER INC.; 13601 Ventura Blvd; Sherman Oaks, CA 91423; (818) 981-1136; FAX: (818) 981-2520. Owner: Michael Boddicker Inc.. **Manager:** Don Mack.

[24+] NOVASTAR; 6430 Sunset Blvd., 14th Fl.; Hollywood, CA 90028; (213) 467-5021; FAX: (213) 465-8750. Owner: Greg Geddes, Bob Sky. **Manager:** Greg Geddes.

[24+] NRG RECORDING SERVICES; *also REMOTE RECORDING*; **3960 Laurel Canyon Blvd., Ste.106; Studio City, CA 91614; (818) 760-7841; FAX: (818) 760-7930. Owner:** Jay Baumgardner. **Manager:** Philip Reynolds.

[24+] OAKDALE POST AUDIO; 3329 S. Eastern Ave.; Las Vegas, NV 89109; (702) 734-3900; FAX: (702) 734-4824. Owner: Bill Ehmeyer, John Jacobson. **Manager:** John Jacobson. **Engineers:** Bill Ehmeyer, John Jacobson. **Dimensions:** Studio 13x24, control room 19x22. **Mixing Consoles:** DDA DMR-12 48x24 w/MIDI Mute package. **Audio Recorders:** Otari MX-80 24-track, Otari MX-55 1/2 track w/center-track time code, (3) Panasonic SV-3700 DAT machine, Otari MX-5050 MkIII 8-track, Otari MX-5050 1/2" 4-track, Otari MX-5050 1/4" 4-track, (2) Otari MX-5050 1/4" 2-track. **Cassette Recorders/Duplicators:** Tascam 122, (8) Yamaha KX300U. **Noise Reduction Equipment:** (6) dbx 150X. **Synchronization Systems:** Tektronix TS6 100 house sync generator, Adams-Smith 2600 w/(5) SY modules, character inserter. **Echo, Reverb & Delay Systems:** (2) Yamaha SPX900, Lexicon PCM60, Yamaha REV7, (2) Lexicon PCM42. **Other Outboard Equipment:** Aphex compellor, UREI 1176LN, Orban 422A compressor, Symetrix SLA single-ended noise reduction. **Microphones:** Neumann U87, Neumann U89, AKG 414, (4) AKG 452, (3) Sennheiser 421, Sennheiser 441, (3) Shure SM57, AKG D-12E. **Monitor Amplifiers:** BGW 250, (2) BGW 500, (2) BGW 350, BGW 200. **Monitor Speakers:** (2) UREI 813C, (2) Yamaha NS10, Auratone cube. **Musical Instruments:** (2) Digidesign 8 meg sample cell card, Korg M1-R, Roland D-550, Kurzweil PX module, Kurzweil GX module, Kurzweil HX module, Kurzweil SX module, Roland Super Jupiter module, Emulator II, Yamaha TX816 rack, Minimoog, Prophet S, Yamaha 5' 11" grand piano, Roland R-8M drum machine, Alesis HR-16 drum machine, Yamaha acoustic drum set. **Other MIDI Equipment:** Macintosh IIfx w/16 meg of RAM, Studio Vision software, Performer software, Galaxy editor librarian software, Sound Designer software. **Video Equipment:** JVC CR850U 3/4". **Digital Workstations:** Sound Tools w/PRO I/O, DAT I/O 650 meg hard disk, 1.5 Gigabyte Wang DAT back-up. **Rates:** Please call for rates.

[24+] OMEGA SOUND; *also REMOTE RECORDING*; **1112 Garrison; Fort Smith, AR 72901; (800) 336-0637; FAX: (501) 782-4795. Owner:** Randy McFarland. **Manager:** Terry Alldaffer.

OMEGA PRODUCTIONS
Dallas, TX

[24+] OMEGA PRODUCTIONS; *REMOTE RECORDING only*; **7027 Twin Hills Ave, Ste. #5; Dallas, TX 75231; (214) 891-9585; FAX: (214) 891-9623. Owner:** Paul Christensen, Charles Billings. **Manager:** Donna Christensen. **Engineers:** Steve Lowney. **Dimensions:** Control room 40x8. **Mixing Consoles:** API 32x32, Hill 16x16x8x4x2, Yamaha PM3000 40x16x2. **Audio Recorders:** (2) Otari MTR-90 24-track, (2) Sony 3324 24-track digital, (2)Mitsubishi X-880 32-track digital. **Cassette Recorders/Duplicators:** Technics M85. **Noise Reduction Equipment:** TTM Dolby A/dbx 24-channels, Dolby SR (24 channels). **Synchronization Systems:** BTX 4700 Shadow. **Echo, Reverb & Delay Systems:** (2) Yamaha SPX90II reverb, Lexicon 224XL reverb, MXR O/A reverb, (2) MIDIverb reverb. **Other Outboard Equipment:** (7) dbx 160 limiter, (2) UREI 1176LN, Teletronics LA-2A limiter, (2) dbx 162 limiter, dbx 165 limiter, Valley People Dyna-Mite limiter, (54) pair Transformer isolated stage split w/600' of cable. **Microphones:** (8) AKG 414, (4) Neumann U47, (7) Sennheiser 421, (5) Sennheiser 441, (3) EV RE20, (4) AKG 421, (4) Shure SM81, (6) Shure SM58, (6) Shure SM57, (6) Beyer M201, (4) Crown PZM. **Monitor Amplifiers:** (3) Yamaha PM2200. **Monitor Speakers:** (2) JBL 4430, (2) Yamaha NS-10. **Video Equipment:** Sony Triton monitor, JVC 6600U 3/4" recorder. **Rates:** Call for rates. **Specialization & Credits:** Omega has been supplying remote audio recording services to the record, film and video industries since 1973. Their 40-foot Kenworth diesel remote facility is specially equipped to travel coast to coast. Partial credits/awards: two platinum records, five gold records, two Ampex Golden Reel awards, Two RIAA gold video awards,three Grammy nominations, six Dove awards and one Silver Screen award. Artists: U2, REM, Lynyrd Skynyrd, B.B. King, Reba McIntyre, Ricky Van Shelton, Little Feat, Neville Brothers, Joe Walsh, Prince, Art Garfunkel, David Byrne, Dizzy Gillespie, Roy Orbison, Fats Domino, Ray Charles, Clint Black, Neil Young, Fabulous Thunderbirds, Ramsey Lewis, Molly Hatchett, Texas Tornados, David Bowie and Jerry Lee Lewis.

[24+] PACIFIQUE RECORDING STUDIOS; 10616 Magnolia Blvd.; N. Hollywood, CA 91601; (818) 761-8042; FAX: (818) 761-9277. Owner: Vasken Inc. **Manager:** Joe Derantenasian. **Engineers:** Ken Derantenasian, Randy Long, Gary Dobbens, Jeff "Woody" Woodruff. **Dimensions:** Room 1: studio 35x30, control room 25x25. Room 2: studio 20x21, control room 25x25. **Mixing Consoles:** Neve VR72 72-input w/Flying Fader Automation, Trident 80B 32-input. **Audio Recorders:** (2) Studer A820 24-track, Studer A827 24-track, Studer A820 2-track 1/2", Otari MTR-12 2-track 1/2", Otari MTR-12 2-track 1/4". **Cassette Recorders/Duplicators:** (2) Nakamichi MR-1, Studer-Revox A721, Aiwa, (2) Panasonic SV-3500 DAT. **Noise Reduction Equipment:** Dolby SR 363. **Synchronization Systems:** (2) Studer TLS 4000 synchronizer. **Echo, Reverb & Delay Systems:** Lexicon 224XL, AMS RMX 16, AMS DMX 1580, (3) Eventide H3000, (2) TC Electronic 2290, (3) Lexicon PCM70, (2) Lexicon PCM42, (4) Roland SRV-2000, (2) Roland SDE-3000, (2) Yamaha SPX900, (2) Yamaha SPX90II, Yamaha REV7, Lexicon Prime Time II, Eventide 2016, Lexicon 480L. **Other Outboard Equipment:** (5) Kepex II noise gate, (8) Drawmer 201 noise gate, (6) dbx 160X, (4) UREI 1176, Teletronix LA-2A, Neve compressor, Summit Audio program

—LISTING CONTINUED ON NEXT PAGE

World Radio History

Southern California Hawaii ♦ Southwest 24-track studios

—LISTING CONTINUED FROM PREVIOUS PAGE
EQ, (6) API 550A EQ, (6) API pre amp., (4) Neve 1073 pre amp/EQ, (2) Focusrite pre amp/EQ, dbx 165A, TC Electronic 1210, (2) Aphex Aural Exciter, (4) dbx 902 de-esser, Inovonics 201 limiter, dbx 120 boom box. **Microphones:** (2) Neumann TLM170, (2) Neumann U87, Neumann U89, (2) Neumann KM84, (6) AKG 414, (4) AKG 460, (2) AKG D-12, AKG 224, (2) E-V RE20, (12) Sennheiser 421, (2) Sennheiser 441, (2) Shure SM81, (6) Shure SM56, (6) Shure SM57. **Monitor Amplifiers:** (2) Crown PSA-2, (3) Perreaux, (3) Audier-Forte, (2) Bryston. **Monitor Speakers:** (2) JBL 4435, (2) TAD custom, (4) Yamaha NS-10M, (2) Tannoy SGM-10.

[24+] PARAMOUNT RECORDING STUDIOS; 6245 Santa Monica; Hollywood, CA 90038; (213) 465-4000. Manager: Adam Beilenson, Mike Kerns. **Dimensions:** Room 1: studio 10x0, control room 20x22. Room 2: studio 12x15, control room 15x25. Room 3: studio 45x45, control room 25x20. Room 4: studio 12x12, control room 13x20. **Mixing Consoles:** SSL 4040EB, SSL 4040E w/E Series studio computer, Neve 8068 custom, MCI 528. **Audio Recorders:** (3) Ampex MM1200 24-track, Studer A80 MkIV, (2) Ampex ATR-102 2-track, Ampex ATR-104 4-track, (2) MCI JH-110 2-track, Panasonic 3500 DAT machine. **Cassette Recorders/Duplicators:** (4) Aiwa 750. **Noise Reduction Equipment:** Dolby SR. **Synchronization Systems:** TimeLine Lynx. **Echo, Reverb & Delay Systems:** AMS RMX 16 reverb, AMS 1580 delay, Lexicon 224XL, Eventide HD3000, TC Electronic 2290, Lexicon 200, (4) Lexicon PCM70, (2) Lexicon PCM60, (2) Lexicon Super Prime Time delay, (2) Lexicon Prime Time delay, (7) Yamaha REV7, (6) Yamaha SPX90, (3) Roland SDE-3500, (3) Roland SDE-2500, (3) Lexicon PCM41 delay. **Other Outboard Equipment:** (6) UREI 1176 comp, (5) UREI LA-4A comp, (2) UREI LA-2A comp, (4) dbx 160X comp, (3) dbx 165 comp, (6) Drawmer 501 gate, (12) Kepex gate, Lang PEQ2, UREI 545, (10) Neve 1054 3-band. **Microphones:** Telefunken Elam 251, AKG C-24, (6) Neumann U87, (2) Neumann U47 FET, (6) AKG 414, (6) AKG 451, (8) Sennheiser 421, (2) Sennheiser 441, (2) Electro-Voice RE20, (12) Shure SM57. **Monitor Amplifiers:** (4) QSC 1700, (4) Yamaha 2200, (4) BGW 750. **Monitor Speakers:** (2) UREI 813, UREI 815, (4) Yamaha NS-10M. **Musical Instruments:** Yamaha C7 grand piano, Roland D-50, (2) Roland Juno-1, (2) Yamaha DX7, (2) E-mu SP-12, drum machine, (2) Akai S900 sampler, (2) Macintosh Plus. **Other MIDI Equipment:** Performer sequencing software, Alchemy sampling software, DX7 patch librarian, D-50 patch librarian. **Video Equipment:** Sony BVU-800 3/4".

PLANET DALLAS STUDIOS
Dallas, TX

[24+] PLANET DALLAS STUDIOS; PO Box 191447; Dallas, TX 75219; (214) 521-2216. Owner: Planet Dallas Inc. **Manager:** Marian Ross. **Engineers:** Rick Rooney, Elon Bradford, Ben Yeager, Paul Middleton. **Dimensions:** Studio 40x45, control room 20x15. **Mixing Consoles:** MCI 528B 28x24 w/DiskMix automation. **Audio Recorders:** MCI JH-24 24-track, Sony JH-110 2-track, Tascam 42 2-track. **Cassette Recorders/Duplicators:** (2) Tascam 122 MK-2, (2) Tascam 122, (2) Panasonic SV-3500 DAT. **Noise Reduction Equipment:** Dolby SR/A 363. **Echo, Reverb & Delay Systems:** AKG ADR
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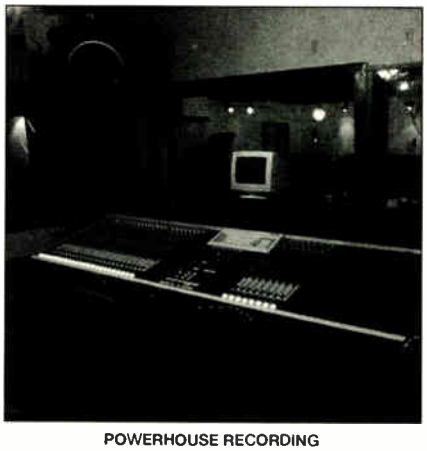
PLANET DALLAS STUDIOS
Dallas, TX

68K reverb processor, (2) Yamaha SPX 900, (2) Yamaha SPX 90, (2) Yamaha REV7, (2) Lexicon PCM-60 w/updates, MasterRoom XL-305 reverb, Lexicon Primetime delay, DeltaLab DL-4 delay. **Other Outboard Equipment:** Eventide H3000 UltraHarmonizer, BASE stereo spatial enhancer, (3) dbx 160X comp/lim, Brooke-Siren compressor/de-esser, (4) Valley People Dyna-Mite noise gates, (2) Aphex 612 expander/gates, (2) UREI 1176LN compressor/limiter, (2) BBE 822 sonic maximizers, (4) Orban 622B parametric equalizers, (2) Dietz stereo parametric equalizers, (2) Biamp stereo graphic EQ, (2) White Instruments 4400 graphic EQ. **Microphones:** Neumann U47, Neumann U87, (3) AKG 414, (2) AKG D-12E, (3) AKG C460B, (2) AKG C451E, (2) Sennheiser 441, (9) Sennheiser 421, (8) Shure SM57, (2) E-V DS35, Beyer 500, E-V RE20. **Monitor Amplifiers:** Yamaha P2250, Yamaha 2002 Pro Series PC, Crown D-150, Crown D-150A, Crown DC-300A, Crown D-75, Hafler Pro 230. **Monitor Speakers:** (2) Lakeside custom w/TAD components, (2) Yamaha NS-10, (2) Tannoy PBM-8, (2) Quadraflex 204L, (2) Auratone Cube. **Musical Instruments:** Yamaha Recording Series 8-piece drum kit, Yamaha B830 bass guitar, Oberheim DMX drum machine, Alesis HR-16 drum machine, Korg DDD-1 drum machine, Roland RD-300 digital piano w/88 weighted keys, Ensoniq ESQ-1, Kramer Pacer Series 6-string guitar. **Specialization & Credits:** M.C. 900 Foot Jesus w/DJ Zero (Nettwerk/IRS); Evan Johns & The H-Bombs (Rykodisc); The Shagnastys (Dragon Street); The Spin (Dragon Street); Russ Parr (Priority/Capitol); Nemisis (Profile); Kent Henry Ministries; Tracy-Locke agency; Anstaya (WWGS Records); Love, Survival & Drive (Global Records); George Gimarc's Rock & Roll alternative syndicated radio program w/The Smithereens; The Rainmakers; The BoDeans; Winter Hour; Michelle Shocked; Mojo Nixon; XTC; Devo X (YO! Records); The Uptown Girls (Oak Lawn Records); Gregory D & Manny Fresh (YO! Records); Bustdown (Luke Records); Capital Punishment (380 records); Royal Flush (YO! Records); Kirk Edens (Stillmeadow Productions); The New Originals (CRM Records); Mary XTC (Oak Lawn Records); Robin Stanly (Oak Lawn Records); Island Records; Warner-Chappel Pub.; Voodo Cowboys; Sarah Hickman; Unity 2 (Warner Bros.); consolidated (Nettwerk); Bang-Bang.

[24+] POWERHOUSE AUDIO/VIDEO STUDIOS; *also REMOTE RECORDING;* **19347 Londelius St.; Northridge, CA 91324; (818) 993-4778; FAX: (818) 993-3575. Owner:** Paul and Jeff Stillman. **Manager:** Chuck Hogan.



POWERHOUSE RECORDING
Las Vegas, NV

[24+] POWERHOUSE RECORDING; 3111 S. Valley View Blvd.; Las Vegas, NV 89102; (702) 871-6200. Owner: Paul Badia. **Manager:** Rulona Badia. **Engineers:** Paul Badia **Dimensions:** Studio 35x30, control room 18x22. **Mixing Consoles:** API 2488 32x16x24. **Audio Recorders:** Stephens 821 24-track, Scully 280B 2-track, Ampex 700 2-track. **Cassette Recorders/Duplicators:** (2) Nakamichi. **Synchronization Systems:** Adams-Smith Zeta-3. **Echo, Reverb & Delay Systems:** Scamp rack, Lexicon 93, Roland SDE-300, Korg SDD-2000, EMT 240 Gold Foil, Yamaha REV7, AKG 68K. **Other Outboard Equipment:** Eventide 910 Harmonizer, Scamp rack w/noise gates, auto pan, comp/lim, Fairchild and, Spectra Sonics comp/lims, API 550 and 560 EQs, Orban de-esser, Aphex Aural Exciter. **Microphones:** Neumann, AKG, Telefunken, RCA, Sennheiser, Crown PZM. **Monitor Amplifiers:** BGW, Crown. **Monitor Speakers:** Fostex LS-3, Auratone. **Musical Instruments:** Yamaha DX7, Kurzweil K-1000, Korg MS-20, Memorymoog. **Other MIDI Equipment:** IBM w/hard drive, Cakewalk 3.0 sequencer, MQX-32 MIDI interface. **Video Equipment:** Sony VO5850 3/4". **Specialization & Credits:** We are a full-service facility dedicated to the clients that serve. Our clientele includes, The Four Tops, Albert Hammond, B.B. King, Steve Dorff, Englebert Humperdink, ABC Television and all the ad agencies and production houses in our region.

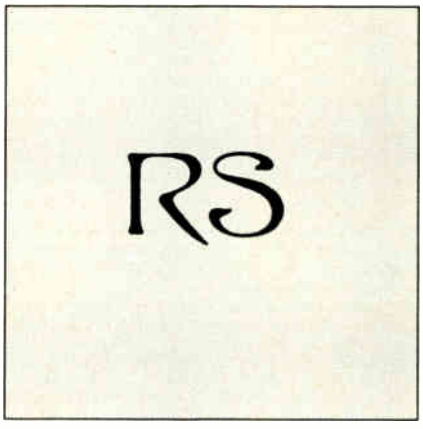
[24+] PRESENT TIME RECORDERS; 4029 W. Burbank Blvd.; Burbank, CA 91505; (818) 842-5506. Owner: Bob Wurster.

[24+] THE PRODUCTION BLOCK INC.; *also REMOTE RECORDING;* **906 E. Fifth St.; Austin, TX 78702; (512) 472-8975; FAX: (512) 476-5635. Owner:** Joel Block, Bill Harwell. **Manager:** Lainie Whiddon.

[24+] PUBLIC RECORDING; 1220 Pioneer, Ste. I; Brea, CA 92621; (714) 526-0323. Owner: David J. Longeuay.

[24+] PYRAMID TELEPRODUCTIONS; 6305 N. O'Connor LB6; Irving, TX 75039-3510; (214) 869-3330. Owner: Lee Martin, Bob Schiff. **Manager:** Bob Schiff.

[24+] RAIN RECORDING; PO Box 297; Mountain View, HI 96771; (808) 968-6346. Owner: Kenneth Chikasuye. **Manager:** Kenneth Chikasuye.



RAMPART STUDIOS
Houston, TX

[24+] RAMPART STUDIOS; *also REMOTE RECORDING;* **6105 Jessamine; Houston, TX 77081; (713) 772-6939. Owner:** Steve Ames. **Engineers:** Steve Ames, Dan Yeaney. **Dimensions:** Studio 40x24 (drum room, vocal booth, iso room), control room 12x18. **Mixing Consoles:** Soundcraft 1624 56-channel remix (automated). **Audio Recorders:** Sony JH-24 24-track, Sony 2-track (1/2" and 1/4"), Panasonic 3500 DAT. **Cassette Recorders/Duplicators:** Nakamichi. **Echo, Reverb & Delay Systems:** Lexicon 200 digital reverb, EMT 140 plate, Lexicon PCM41, Lexicon 91, Lexicon PCM60, Korg SDD-2000, (2) Yamaha SPX90. **Other Outboard Equipment:** Aphex Aural Exciter, Aphex CX-1, Aphex Expressor, UREI 1176 comp/lim, UREI comp/lim, Orban para EQ, Orban de-esser, dbx noise gate, GT-4 noise gate, Goldline RTA, Dyna-Mite exp/comp, Crown SL2 preamp, Sony CD player, Denon T.T. **Microphones:** Neumann U87, Neumann KM84, AKG 414, AKG 451, AKG Tube, Sennheiser 421, Sennheiser 441, EV RE20, Beyer 201, Sony 22P, RCA 77. **Monitor Amplifiers:** Crown. **Monitor Speakers:** JBL 4430, Yamaha NS-10M. **Musical Instruments:** Kawai grand piano, Yamaha DX7, Yamaha TX7, LinnDrum, Yamaha drums, Fender amps, percussion, etc. **Other MIDI Equipment:** Sonus software, Commodore SX64, Oberheim Prommer. **Video Equipment:** Scoring, sweetening, etc. **Specialization & Credits:** Rampart is a creative environment for both artists and producers, with an experienced, professional staff. Specialists in record, jingle and demo projects. Clients include ZZ Top, Kings X, the Judy's shake Russell, Megaforce, Metalblade, Galactic Cowboys, Atlantic, Geffen and Columbia Records.

[24+] RECORD PLANT; *also REMOTE RECORDING;* **1032 N. Sycamore Ave.; Hollywood, CA 90038; (213) 653-0240. Owner:** Rick Stevens. **Manager:** Rose Mann and Jewel Kumjian. **Engineers:** Jim Mitchell, Norm Dlugatch, chief tech. eng., Jim Champagne, Craig Brock, Chris Furman. **Dimensions:** Room 1: studio 40x35, control room 30x25. Room 2: studio
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14x22, control room 30x23. **Mixing Consoles:** SSL 4064 G Series, Neve V60, (2) API custom remote 44-input. **Audio Recorders:** (4) Studer A800 MkIII 24 track, (2) Otari MTR-90 24-track, (2) Studer A820 2-track 1/2" and 1/4", (4) ATR 102 2-track 1/2" and 1/4", (3) ATR 104 4-track. **Cassette Recorders/Duplicators:** (12) Sony C-700ES. **Noise Reduction Equipment:** (50) Dolby A, (30) Dolby SR. **Synchronization Systems:** (12) TimeLine Lynx. **Echo, Reverb & Delay Systems:** Lexicon 480, EMT 250, EMT 251, EMT 140, (4) Lexicon PCM70, (3) Eventide 2016, (3) Eventide 949, (2) Eventide 910, (4) AMS DMX 16 stereo sampling, (4) AMS RMX 15, (8) Yamaha SPX90, (4) Yamaha REV7. **Other Outboard Equipment:** (20) UREI 1176 compressor, (6) UREI LA-3, (4) UREI LA-4, (8) dbx 160, (4) Pultec EQP-1A, (8) Pultec EQP-1A3, (6) Pultec MEQ 5, (2) GML stereo EQ, (4) Focusrite EQ, A&D comp/lim, Aphex Compellor, (10) Drawmer 201 gate. **Microphones:** Neumann U47 tube, (12) Neumann U67, (4) Neumann SM69, (30) Neumann U87, (4) Neumann U47 FET, (12) Neumann TLM170, (3) AKG C-24, (10) AKG 414EB, (12) AKG 452, (3) AKG 224, (4) AKG D-12, (2) AKG D-112, (2) Sanken CU41, (20) Sennheiser 421, (6) Sennheiser 441, (6) Sennheiser 416, (2) Sennheiser 812, (3) Shure SM7, (30) Shure SM57, (4) Shure SM81, (4) RCA 44BX, (6) RCA 77DX, (4) RCA 10001, (6) E-V RE20, (6) E-V RE15. **Monitor Amplifiers:** (8) BGW 750, (8) Studer A68, (2) Phase Linear 700. **Monitor Speakers:** (6) Hidley Kivoshita TAD 2-way, (16) Yamaha NS-10M, (2) Tannoy SGM10. **Video Equipment:** Sony BVU-800 3/4", JVC 6650, (2) Sony VP-2030 monitor.

[24+] REELSOUND RECORDING CO.; *REMOTE RECORDING only*; **2304 Sheri Oak Ln.; Austin, TX 78748; (512) 282-0713; (512) 472-3325; FAX: (512) 472-3325. Owner:** Malcolm H. Harper Jr **Manager:** Deborah Harper.

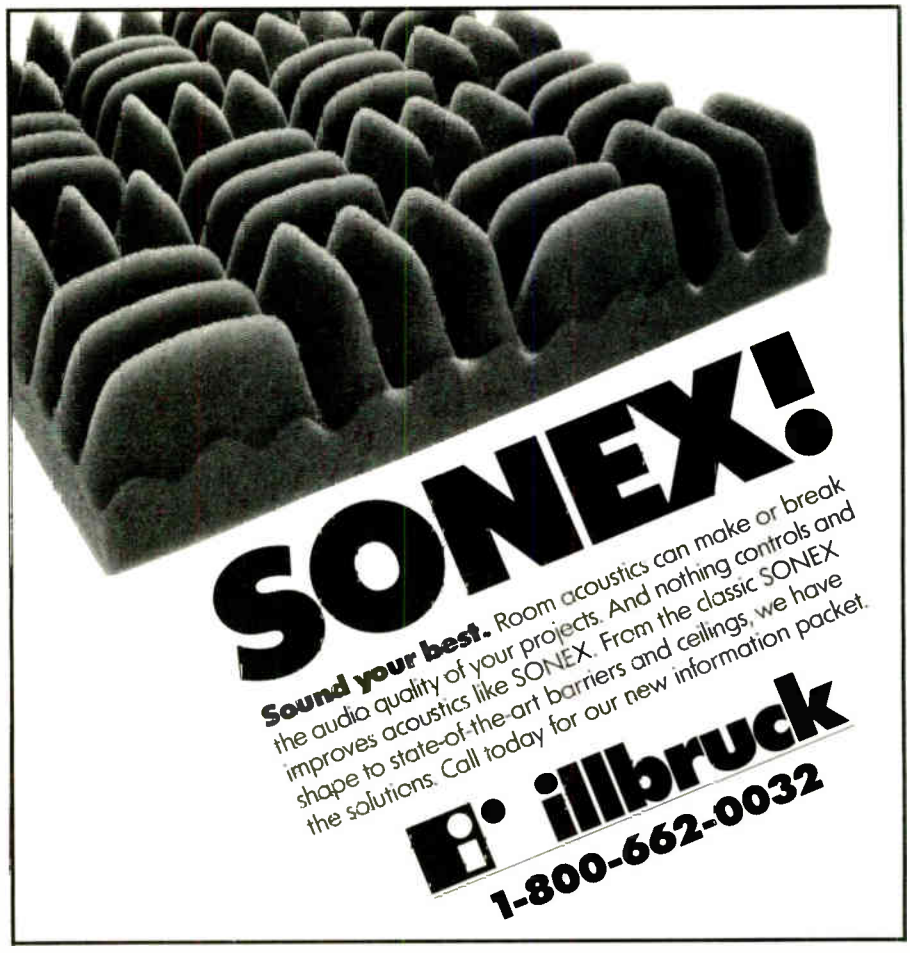
[24+] RENT-A-RECORDER; *REMOTE RECORDING only*; **Burbank, CA; (800) 287-2257. Owner:** Bill DeJonghe.

[24+] R.P.D. SOUND; *also REMOTE RECORDING*; **1842 Burleson Ave.; Thousand Oaks, CA 91360; (805) 496-2585. Owner:** Randy Dew. **Manager:** Randy Dew

[24+] THE RUBBER DUBBERS INC.; 626 Justin Ave.; Glendale, CA 91201; (818) 241-5600. Owner: Peter Smolian.

RUMBO RECORDERS
Canoga Park, CA

[24+] RUMBO RECORDERS; 20215 Saticoy; Canoga Park, CA 91306; (818) 709-8080; FAX: (818) 709-4072. Owner: Daryl Dragon, Toni Tennille. **Manager:** Vicky Camblin, Jim Mancuso. **Engineers:** Shawn Berman, Dick Kaneshiro, Pat Rodman, Tom Perez, Andy Udoff, Sam Dutton. **Dimensions:** Room 1: studio 58x38, control room 28x25. Room 2: studio 38x33, control room 26x22. Room 3: studio 25x20, control room 25x20. **Mixing Consoles:** Neve V Series 60-input w/ Flying Faders, Trident 80C 40-input, Trident Series 80 32-input. **Audio Recorders:** (2) Studer A800 24-track, (3) Otari MTR-90 24-track, Studer A820 2-track 1/2", Ampex ATR-102 2 track 1/2" or 1/4", (2) Ampex ATR-104 2/4-track 1/2" or 1/4". **Cassette Recorders/Duplicators:** Sony PCM-2500 DAT, Panasonic SV3500 DAT, Tascam DA-30 DAT, (2) Studer A721, (2) Tascam 122 MkII. **Synchronization Systems:** (2) TimeLine Lynx, Fostex 4030/4035. **Specialization & Credits:** Rumbo has always maintained a client base made up primarily of record companies working on album projects. With its huge main room and four oversized isolation booths, Studio A (Neve-Studer) is ideal for tracking. The Neve V-Series Console with Flying Faders Automation makes Studio A perfect for mixing as well. Studio B (Trident-Otari) remains a very popular recording room because of its great sound and reasonable lockout rate. With it's history of hit rock albums, Studio B has become well known in the music industry. The latest addition to Rumbo, Studio C (Trident-Otari), offers a comfortable solution for long term overdub projects. Recent artists include: Tom Petty, Roy Orbison, Ringo Starr, Joe Cocker, Smithereens, Guns N' Roses, Megadeth, Barry Manilow, Toni Tenille, Bruce Hornsby, Belinda Carlisle, Suicidal Tendencies, Smokey Robinson and many others.



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Southern California
Hawaii • Southwest
24-track studios

[24+] RUSK SOUND STUDIOS; 1556 N. La Brea Ave.; Hollywood, CA 90028; (213) 462-6477; FAX: (213) 462-5684. Manager: Elton Ahi.

SKIP SAYLOR RECORDING
Los Angeles, CA

[24+] SKIP SAYLOR RECORDING; 506 N. Larchmont Blvd.; Los Angeles, CA 90004; (213) 467-3515; FAX: (213) 467-4636. Owner: Skip Saylor. **Manager:** Monica Zierhut. **Engineers:** Gregg Hinnen—chief technician; Chris Puram, Aaron Miller, Louie Teran, Mats Blomberg. **Dimensions:** Studio A: control room 22x17, overdub booth 10x9. Studio B: control room 17x19, overdub booth 6x3, tracking room 16x21. **Mixing Consoles:** Studio A: SSL 4080G w/Total Recall 80 inputs with E & G Series Equalizers, G Series Computer. Real World Cue Matrix System for a total of ten echo sends per channel (six w/Total Recall, four computer controlled). Studio B: API 32x64 w/Necam moving fader automation. **Audio Recorders:** (3) Studer A800 24-track, (4) Ampex ATR-102 2-track 1/4" or 1/2", (2) Ampex ATR 2/4-track 1/2", digital 32- or 48-track machines available upon request. **Cassette Recorders/Duplicators:** (4) Nakamichi MR-1, Studer A-721, Sony PCM-2500 Pro DAT, Panasonic 3700 DAT. **Noise Reduction Equipment:** Dolby SR or A available for rental upon request. **Synchronization Systems:** (3) TimeLine Lynx. **Echo, Reverb & Delay Systems:** AMS RMX-16, Eventide SP-2016, Lexicon PCM60, (2) Lexicon LXP-1, Lexicon 480L, Lexicon 224XL, (4) Lexicon PCM70, Yamaha REV1, (3) Yamaha REV5, (2) Yamaha REV7, Yamaha SPX1000, Yamaha SPX900, (2) Yamaha SPX90, (2) Roland SRV-2000, Ibanez SRV-1000, Roland SDE-2000, Effectron III, AMS DMX-1580 (9.2 sec.), (3) TC Electronic 2290 (32 sec. stereo sampling), Lexicon Super Prime Time, (2) Lexicon Prime Time II, (3) Lexicon PCM42, (4) Roland SDE-3000, Forat F-16 (8-channel digital sampler w/hard disk full library), (2) EMT 140 plate. **Other Outboard Equipment:** (2) Studio Technologies AN-1, Roland Dimension D, Roland flanger, Roland phaser, (2) Eventide H3000 w/SE & VAI updates and stereo sampler, (2) Eventide 949, Eventide 910 Harmonizer, Drawmer M500, BBE 822, Aphex aural exciter, Studio Technologies AN-2, API 550A EQ, (6) Aphex parametric EQ, Orban stereo parametric EQ, UREI 565 filter set, GML 8200 parametric EQ, (10) Neve V-Series EQ, (4) Pultec EQP-1A, (2) Focusrite EQ, (11) API 550 EQ, (2) Valley People Maxi-Q, UREI LA-4, Summit Audio tube limiter, (2) dbx 903, Neve 33609 stereo limiter/compressor, (3) Teletronix LA-2A, (5) UREI 1176, (6) dbx 160x, (4) dbx 160, (6) dbx 904 gate, (4) Orban 526A de-esser, (4) Drawmer, Dynamite (stereo), (4) Kepex II, (6) dbx 902 dealers, Dynafex noise eliminator. **Microphones:** (5) AKG 414, AKG C-12, (2) AKG C-452, AKG D-12E, (2) AKG RE15, (3) Beyer MkII, Electro-Voice RE20, Electro-Voice 666, Neumann U87, Neumann U47 FET, Neumann TLM170, Neumann KM88, (4) Sennheiser 451, Sennheiser 441L, (5) Shure SM57. **Monitor Amplifiers:** Perreaux, Crown. **Monitor Speakers:** TAD, Yamaha NS-10, Auratone Soundcube. **Other:** Yamaha grand piano. **Specialization & Credits:** Clients include Guns N' Roses, Paula Abdul, Bell Biv DeVoe, Eddie Money, The Whispers, En Vogue, Thomas Dolby, Isley Brothers, The Replacements, D.J. Quick, Pebbles, Donny Osmond, Jeffrey Osborne, New Edition, Manhattan Transfer, Julian Lennon, Soul II Soul, Wendy & Lisa, Vanessa Williams, Vesta Williams, Angela Winbush, Bobby Brown, Philip Bailey, Peter Cetera, Natalie Cole, Bernadette Cooper, Morris Day, Roberta Flack, Kenny G., Ice Tea, Martika, The Pointer Sisters, Ralph Tresvant and many, many more.

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[24+] SCORE ONE RECORDING INC.; 5500 Cahuenga Blvd.; N. Hollywood, CA 91601; (818) 762-6902; FAX: (818) 762-2531. Manager: Al Johnson.

[24+] SCREAM STUDIOS; 11616 Ventura Blvd.; Studio City, CA 91604; (818) 505-0755; FAX: (818) 505-6405. Owner: Sensitive Human Beings. **Manager:** Craig Doubet. **Mixing Consoles:** SSL 4056 Total G Series w/Total Recall and 4 stereo faders. **Audio Recorders:** Mitsubishi digital 32-track w/Apogee filters, Mitsubishi digital 2-track w/Apogee filters, Studer 24-track analog, Studer 2-track analog, (2) Panasonic DAT. **Synchronization Systems:** Adams-Smith. **Echo, Reverb & Delay Systems:** Lexicon 480L, AMS reverb, AMS 1580S digital delay, (2) Lexicon PCM70, Eventide H3000SE Ultra-Harmonizer w/sampling, (2) Eventide 910 harmonizer, Lexicon Prime Time digital delay, (4) Roland SDE-3000 digital delay, (3) Yamaha REV7, (2) Yamaha SPX90 EFX, Roland SRV-2000 digital. **Other Outboard Equipment:** (2) Focusrite mic preamp and EQ, (4) GML parametric equalizer, UREI 535 2-channel graphic equalizer, (2) BBE #802 and #822, TC Electronic 1210 spatial expander, Russian Dragon, dbx 120x boom box, Neve 33609 2-channel compressor/limiter, (2) UREI 1176 limiter, (4) dbx 160x compressor, (2) Inovonics 201 compressor, LA-2A limiter, (2) Drawmer gate, (4) Kepex II gate, (3) dbx 902 de-esser, Marshall time modulator and flanger, (2) Wendell drum replacement systems, Forat 16-bit 8-channel drum sampler and editor w/44 meg hard drive, Maganavox CD player. **Monitor Speakers:** Customized UREI 813B, Yamaha NS-10M, Tannoy NFM8. **Other:** Vincent Van Haaff-designed control room. **Specialization & Credits:** Scream is extremely proud to have been involved with the following artists and records this past year: Janet Jackson's #1 platinum single "Black Cat" was partially recorded and mixed, Extreme's #1 platinum single "More Than Words" & double platinum album "Pornograffitti" were recorded and mixed, Faith No More's double plantinum album "The Real Thing" was mixed, Skid Row's double platinum album "Slave to the Grind" was mostly recorded and mixed, Queen's "Tie Your Mother Down" and "Somebody To Love" were mixed, as well as various records by Motley Crue, Ivan Neville, Ozzy Osbourne, Johnny Gill and Bell Biv Devoe. We are most fortunate to have some of the world's greatest producers and mixers like, Michael Wagener, Dave Leonard, Matt Wallace, Desmond Child, David Kershenbaum, Richard Perry and Randy Jackson, work here. We are a small, cozy and private studio located within a mile of 37 different restaurants—12 are within walking distance. We have a patio with a gas barbeque, Nintendo, and a purple pool table. Scream Studios is owned and operated by musicians.

[24+] 7TH STREET SOUND; *also REMOTE RECORDING*; **688 S. Santa Fe #105; Los Angeles, CA 90021; (213) 627-5392. Owner:** Ed Sanders. **Manager:** Ed Sanders.

SF AUDIO SOUND & RECORDING
Anaheim, CA

[24+] SF AUDIO SOUND & RECORDING; 5290 E. Hunter Ave.; Anaheim, CA 92807; (714) 779-6677. Owner: Steven W. Forster. **Manager:** Steven W. Forster. **Engineers:** S. Forster, independents. **Dimensions:** Room 1: studio 35x35, control room 12x35. Room 2: studio 12x15. **Mixing Consoles:** Ramsa WR-8428 32-input, 56-input for mix. **Audio Recorders:** Otari MX-70 16-track 1", Panasonic SV-3500 DAT, Tascam 42 2-track 1/4" w/dbx Type II. **Cassette Recorders/Duplicators:** Nakamichi MR-2, Nakamichi 480-2, Aiwa WX-220 duplicator. **Echo, Reverb & Delay Systems:** Lexicon PCM70, Lexicon LXP-1, Lexicon LXP5, Yamaha REV7, Alesis MIDIverb II, (3) Alesis Microverb II, DigiTech DSP-128+, Ibanez DM-2000 digital delay, Roland SDE-2500 digital delay, Aphex Aural Exciter Type B. **Other Outboard Equipment:** (6) dbx 166 comp/lim/noise gate, (6) Symetrix 544 noise gate. **Microphones:** (2) Neumann TLM170, (2) AKG D-112, (4) Sennheiser MD-421, (2) E-V PL20, (4) Audio-Technica ATM33R, Audio-Technica ATM63, (4) Shure SM58, Shure SM57, (2) Audio-Technica AM10; if we don't have it we can get it. **Monitor Amplifiers:** BGW 7000, Rane HC6 headphone amp. **Monitor Speakers:** Tannoy Little Gold, Tannoy PBM-6.5, EV Sentry 100A, Yamaha NS-10M, AKG, Sennheiser and Fostex headphones. **Musical Instruments:** Tama Artstar 5-pc. w/Zildjian platinum cymbals, Roland R-8 Human Rhythm Composer, Roland D-50, Ensoniq ESQ-1, Crate 150-watt stack, Marshall MOSFET half-stack, extensive array of guitars available. **Other MIDI Equipment:** Macintosh SE, J.L. Cooper Syncmaster, SMPTE/MIDI time code reader/writer, Lexicon MRC. **Rates:** Upon request. Call for color brochure, and look for a new SF facility this year!

[24+] SHERWOOD STUDIOS; 2899 Agoura Rd, Ste. 299; Westlake Village, CA 91361; (805) 379-4477. Owner: Bill Cobb. **Manager:** Sue Francisco.

[24+] SIDEWAYS RECORDING; 2931 W. Central #H; Santa Ana, CA 98704; (714) 545-9849. Owner: Jim Hahn. **Manager:** Jim Hahn. **Engineers:** Jim Hahn, Gary Druilhet, independents. **Dimensions:** Studio 23x20, control room 20x15. **Mixing Consoles:** Amek TAC Magnum 36x24 w/MICE automation. **Audio Recorders:** Otari MX-80, Tascam MS-16 w/dbx and autolocator, (2) Panasonic SV3500 DAT w/remote, Tascam 32 2-track 1/4" w/remote, (3) Aiwa F-780, Tascam 112. **Cassette Recorders/Duplicators:** Yamaha C300. **Synchronization Systems:** Adams-Smith Zeta 3B w/remote. **Echo, Reverb & Delay Systems:** (3) Lexicon PCM70, Lexicon PCM60, (4) Lexicon LXP-1 w/MRC remote, (2) Lexicon LXP-5, (2) Yamaha SPX50, Digitech IPS-33 harmonizer, DigiTech DSP-128+, DigiTech DSP-128, Roland SDE-100. **Other Outboard Equipment:** (2) Aphex Compellor, UREI 7110 compressor, Aphex 651 expressor, Yamaha GC-8080 comp, UREI 1776LN comp, (6) Audio Logic MT-44 quad gate, BBE mono sonic maximizer, BBE stereo sonic maximizer, (2) White Instruments 4400 1/3-octave EQ, TC Electronic stereo para EQ, Roland E-660 digital para EQ, stereo 12-band spectral display, Alesis MIDIverb II, Summit tube preamp, TPA-200, Orban de-esser. **Microphones:** (40) Neumann, AKG, Sennheiser, Shure. **Monitor Amplifiers:** (2) Hafler P-505, Rane HC-6 headphone amp. **Monitor Speakers:** Tannoy system 215 DMT, Tannoy PBM-6.5 near-field, Auratone Super Cube, Yamaha NS10M. **Musical Instruments:** Pearl MCX 9-piece w/custom rack and May EA miking, Kurzweil K-1000 keyboard, Roland D-1100 tone module, Roland U-110 tone module, Alesis HR16 drum machine, Alesis HR16B drum machine, Alesis SR16 drum machine, Roland PM16 trigger-to-MIDI converter, (20) assorted acoustic instruments. **Other MIDI Equipment:** Macintosh computer w/Sound Tools, (24) J.L. Cooper MIDI mutes, Sonus MacFace MIDI interface. **Other:** Performer software, Technics 12-disc CD changer w/infrared remote, SFX library, Mogami wiring throughout. **Rates:** Call for rates and updated equipment list (HARP member).

[24+] SIGNATURE SOUND; 5042 Ruffner St.; San Diego, CA 92111; (619) 268-0134; FAX: (619) 268-3137. Manager: Luis Arteaga.

[24+] SOUND AFFAIR RECORDING LTD.; 2727 Croddy Way, Ste. G; Santa Ana, CA 92704; (714) 540-0063. Owner: Ron J. Leeper. **Manager:** Andree E. Hoff.

SOUND ARTS
RECORDING STUDIO
Houston, TX

[24+] SOUND ARTS RECORDING STUDIO; *also REMOTE RECORDING*; **2036 Pasket Ln.; Houston, TX 77092; (713) 688-8067. Owner:** Jeff Wells. **Manager:** Joy Wyndham. **Mixing Consoles:** Trident Series 80B 30x24 for 54 channels in remix. **Audio Recorders:** Ampex MM1200 24-track, 3M 2-track, Sony 2-track DAT, Tascam ATR-8024 24-track. **Cassette Recorders/Duplicators:** Nakamichi MR-2, Yamaha C300. **Noise Reduction Equipment:** Symetrix 511A. **Echo, Reverb & Delay Systems:** Lexicon PCM70 digital reverb, (2) Alesis MIDIverb II, Alesis MIDIverb III, (2) Alesis Quadraverb, (3) Yamaha SPX90, MXR pitch shift doubler. **Other Outboard Equipment:** (2) UREI 1176 comp/lim, Symetrix 525 gated

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comp, Symetrix 501 comp, Audio Logic 8 channels noise gate, BBE 822 Sonic Maximizer, Alesis Micro gate, Alesis Micro compressor, Alesis Microverb. **Microphones:** Neumann U47 tube, Neumann M49 tube, (2) Neumann U87, (2) Neumann KM84, (3) AKG C-414, (3) AKG C-451EB, AKG D-12, AKG D-112, (3) Sennheiser MD-421, (3) Sennheiser MD-441, (2) E-V PL20, (5) Beyer M69, Beyer M500, Beyer M88, (3) AKG 501, (5) Shure SM57, (3) Shure SM58. **Monitor Amplifiers:** (3) Crown DC-300II. **Monitor Speakers:** Altec 604 8G system w/ stereo 31-band White EQ, Yamaha NS-10, JBL 4312. **Musical Instruments:** Yamaha 6' grand piano, Roland W-30 sampler, Roland D-50 synthesizer, Roland S-106, Roland MKS-50 synth, Roland MKS-70 Super JX synth, Yamaha TX-802 synth, LinnDrum w/J.L. Cooper MIDI, Roland S-550 sampler, Tama Superstar drum set, Fender Precision bass, Marshall amp. **Other MIDI Equipment:** Roland MC-500 MkII sequencer, Roland Octapad, Atari ST-1040 w/several MIDI software packages. **Video Equipment:** JVC Hi-fi stereo 1/2" VCR, Panasonic 1350 color monitor. **Other:** Rane 27-band real-time analyzer. **Rates:** Call for brochure and rates. **Specialization & Credits:** Sound Arts Recording Studio is conveniently located three blocks from the northwest corner of Houston's 610 Loop. We have new air-conditioned facilities with a new Trident 80B 54-channel console, complete with an arsenal of outboard equipment and MIDI synthesizers, and a Yamaha G3 6' grand piano. Also a fully equipped MIDI pre-production room at reduced rates. Relaxed, creative, professional atmosphere. In the midst of Houston's city life, we have created a beautiful outdoor garden setting with waterfall, pond and barbecue pits. Experienced engineers and producers to help you complete your project, on time and within budget. Composers, arrangers and studio musicians available upon request. Other services include BMI music publishing and recording engineering classes. We personally invite you to come visit us and listen to our quality productions. Recent project includes O.G. Style & Geto boys CD releases. Call (713) 688-8067 for brochure and affordable rates. Thanks.

[24+] SOUND CHAMBER RECORDERS; 5264 Blakeslee Ave.; N. Hollywood, CA 91602; (818) 752-8932. Owner: Richard McIlvery. **Engineers:** Rusty Striff, James McIlvery. **Dimensions:** Room 1: studio 45x38, control room 23x28. Room 2: studio 26x24, control room 20x24. Room 3: control room 16x19. **Mixing Consoles:** Solid State Logic 4056 E/G w/ Total Recall, Trident custom series 80B 36 inputs w/TSM EQ. **Audio Recorders:** (2) Studer A827 24-track, Ampex ATR-102 w/1/4" and 1/2", Panasonic 3500 DAT. **Cassette Recorders/ Duplicators:** (2) Yamaha C300. **Noise Reduction Equipment:** (2) Dolby A. **Synchronization Systems:** (2) Lynx Timeline. **Echo, Reverb & Delay Systems:** Lexicon 480L, (2) Lexicon PCM70, (2) Lexicon PCM42, Lexicon Prime Time II, AMS RMX 16, (2) Yamaha SPX900, Eventide 949 Harmonizer, Roland SVR-2000, (2) EMT 140 stereo plate reverb. **Other Outboard Equipment:** Laza compressor, (2) UREI 1176, (2) UREI LA-4, Drawmer DS-201 gates, Drawmer 320 dual noise reduction. **Microphones:** (2) Neumann U87 (Stephen Paul mods.), (2) Neumann KM84, (2) AKG C-414EB, (2) AKG C-60, (2) AKG C-452, (2) Sennheiser MD-421, (7) Shure SM57, Sony C-37. **Monitor Amplifiers:** HH Electronic X1200, (3) JBL 6630. **Monitor Speakers:** (2) UREI 813C, (2) Yamaha NS-10, (2) Auratone 5C, (2) JBL 4401. **Musical Instruments:** Yamaha C7 grand piano, Hammond B-3 w/Leslie. **Video Equipment:** JVC CR850 3/4" U-matic **Digital Workstations:** Dyaxis.

[24+] SOUND CITY INC.; 15456 Cabrito Rd.; Van Nuys, CA 91406; (818) 787-3722; (213) 873-2842. Owner: Joe Gottfried, Tom Skeeter. **Manager:** Joe Gottfried.

[24+] SOUND DESIGN; 33 W. Haley; Santa Barbara, CA 93101; (805) 965-3404; FAX: (805) 966-9525. Owner: Affiliated Concepts Corp. **Manager:** Dom Camardella.

[24+] SOUNDPLEX CREATIONS RECORDING STUDIOS; *also REMOTE RECORDING*; **PO Box 6033; 1509 Wood St.; Jonesboro, AR 72403; (501) 972-0080; FAX: (501) 933-8435. Owner:** Sonny Hunt. **Manager:** Erick Crews.

[24+] SOUNDWRITER STUDIO; 1116-A 8th St., Ste. 160; Manhattan Beach, CA 90266; (213) 379-7426. Owner: Leigh Genniss, Patricia Yarborough. **Manager:** Leigh Genniss. **Engineers:** Leigh Genniss, Patrick Yaraborough, independents. **Dimensions:** Studio 8x16, control room 1.9 & 1.4 room ratio. **Mixing Consoles:** Soundcraft 6000 52x24 w/auto and complete recall, onscreen EQ, mute levels, digital creations, assignment, noise gate every channel, printout of information and storage. **Audio Recorders:** Sony PCM-3324 24-track digital w/Apogee filters, Sony PCM-2500 2-track digital w/Apogee filters, Panasonic SV-250 2-track digital. **Cassette Recorders/Duplicators:** Nakamichi MR-1, TEAC CD 401 CD player w/edit for sound effects. **Echo, Reverb & Delay Systems:** IPS 33B GSP 21, Lexicon 480L, Eventide H3000, Roland 800, DSP 256, DSP 128, DigiTech 7.6 time machine. **Other Outboard Equipment:** LA-4A, (2) UREI JBL 7110 comp/lim, dbx comp/ lim, Simon Systems direct boxes, Innovative Audio tube direct box, Audio Logic stereo graphics, Audio Control SA 3050A. **Microphones:** Neumann, AKG, Shure. **Monitor Amplifiers:** JBL UREI 6260, JBL UREI 621 alternates. **Monitor Speakers:** UREI Time Align (newest revision), JBL 4412 alt., Auratone alt., Tannoy alt., Sony MDR V6 digital headphones. **Musical Instruments:** Korg T3 workstation w/cards TI update-10 disks, Akai-Lynn MPC 60 drums, Dean Jammer guitar w/Humbuckers, Steinberger bass. **Other MIDI Equipment:** Atari 1040ST total MIDI w/printout; 2 systems, 4 meg. **Other:** Crate G120C guitar amp w/stereo line in/line out, Trace Elliott bass amp 4/ 10 2/15, (2) Crate keyboard amp for stereo. **Specialization & Credits:** Clients include: AVC, Danny Rocca, Madrock, Mountaintop Tapes, Michael Taylor, The Ohio Players, Antron, Primordial Soup, Cindy Grant, Andrew Gordon, Kiet Bui, Rusty Vail and more.

[24+] TIM STANTON AUDIO; *also REMOTE RECORDING*; **1501 W. 5th, Ste. 103; Austin, TX 78703; (512) 477-5618; FAX: (512) 476-5044. Owner:** Tim Stanton. **Manager:** Phil Mezzetti.

[24+] STUDIO CITY; *also REMOTE RECORDING*; **12709 Kling St.; Studio City, CA 90601; (213) 371-5793; FAX: (213) 371-5686. Owner:** Geoff Emery. **Manager:** Jeff Alden. **Engineers:** Houston, Dave Ostenberg, Dave Shannon, Frank Garli, Craig Robinson, Earxl West. **Dimensions:** Room 1: studio 20x25, control room 24x27. Room 2: studio 10x10, control room 20x15. **Mixing Consoles:** Neve V60 Mark III, 60-input computer automated with Necam 96 moving fader automation control synchronization via Adams-Smith 2600 Series. This console contains a compressor limiter and noise gate in each module. Making 60 compressors, limiters and noise gates avaiable. In addition there are 60 additional returns available for mixdown for a total of 120 ch. **Audio Recorders:** Studer 820 24-track analog, Otari MX-80 24-track analog, Sony 3324 and 3348 digital, Misubishi 32-track, Panasonic 3700 DAT, Otari Mk III 2-track, ATR 102 2-track and 4-track. Nakamichi cassette. **Other Outboard Equipment:** Lexicon 224, Lexicon LXP-1, Eventide H3000 SE, BBE sonic enhancer, Yamaha SPX1000, AMS reverb, Lexicon LXP-5, TC Electronic 2290 DDL/sampler, Orban de-esser, Yamaha SPX90, Lexicon 200, Lexicon MIDI controller, Aphex aural exciter, Akai 1000S sampler. **Microphones:** Neumann U87, Neumann U47; EV RE20; Sennheiser 421, 441; Shure SM57, SM 58; Sony condenser, AKG Tube, AKG 414, & 451, D-12. **Monitor Speakers:** UREI 813, Yamaha NS-10, Tannoy 8, Power BGW, Hafler. **Other MIDI Equipment:** Macintosh Classic, Roland D-550, (2) Yamaha DX7, Kawai K5, Akai MPC-60, Sequential Profit 5 MIDI, Sequential Profit 10 MIDI.

STUDIO 56 PRODUCTIONS
Los Angeles, CA

[24+] STUDIO 56 PRODUCTIONS; 7000 Santa Monica Blvd.; Hollywood, CA 90038; (213) 464-7747; FAX: (213) 467-8579. Owner: Paul Schwartz. **Manager:** Claudia Lagan.

[24+] STUDIO MASTERS; 8312 Beverly Blvd.; Los Angeles, CA 90048; (213) 653-1988. Owner: Randy Wood. **Manager:** Larry Wood. **Engineers:** Wolfgang Aichholz, Tony Alvarez. **Dimensions:** Room 1: studio 30x40, control room 20x18. Room 2: studio 25x20, control room 20x18. **Mixing Consoles:** Neve 8128 48-input w/Necam 96 automation, Neve 8248 48-input. **Audio Recorders:** (2) Studer A820 24-track w/ Dolby SR on all channels, Studer A827 24-track. **Cassette Recorders/Duplicators:** (4) Nakamichi MR-1, Panasonic SV-3500 DAT, Panasonic SV-3700 DAT. **Noise Reduction Equipment:** Dolby SR, Dolby M-24, dbx. **Synchronization Systems:** Adams-Smith 2600. **Echo, Reverb & Delay Systems:** AMS RMX 16 reverb, AMS DMX 15-80S digital delay, Yamaha REV7, Eventide DDL, EMT Master Room, Yamaha SPX90, Yamaha SPX90II, Roland SRV-2000. **Other Outboard Equipment:** dbx 165A limiter, UREI 1176 limiter, dbx 160X limiter, Eventide Harmonizer, API 535 EQ, Lexicon PCM70 digital effects processor, Kepex noise gate, Drawmer noise gate. **Microphones:** Neumann U67 tube (Stephen Paul modified), Neumann U87, Neumann 414, Neumann KM84, Shure SM57, EV RE20 and others. **Monitor Amplifiers:** George Augspurger custom, HH Electronic V800, Hothouse S-400, Quicksilver tube, Crown 300A. **Monitor Speakers:** Yamaha NS-10, Auratone. **Video Equipment:** JVC CR-850U 3/4" recorder/player, 25" and 13" monitors, Sigma Master sync generator. **Rates:** Call for rates.

[24+] STUDIO ON WHEELS; *REMOTE RECORDING only*; **339 W. Windsor Rd., Ste. 6; Glendale, CA 91204; (818) 243-6165. Owner:** John Falzarano. **Manager:** John Falzarano.

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World Radio History

Southern California
Hawaii ♦ Southwest

24-track studios

STUDIO 101
Solana Beach, CA

[24+] STUDIO 101; 159 S. Highway 101; Solana Beach, CA 92075; (619) 481-2274; FAX: (619) 481-9005. Owner: Wintriss Enterprises. **Manager:** Marc Wintriss **Engineers:** Mark Wintriss, independents. **Dimensions:** Room 1: studio 15x20, control room 10x15. Room 2: studio 25x50, control room 10x15. Room 3: studio 8x10, control room 10x15. **Mixing Consoles:** Trident Series 24 w/Megamix VCA automation. **Audio Recorders:** Otari MX-80 24-track with Autolocator, Otari MX-55 1/4" 2-track 15/30 IPS with time code, Sony 7010 R-DAT with time code. **Cassette Recorders/Duplicators:** (3) Nakamichi MR 2B. **Noise Reduction Equipment:** Dolby XPSR 24-channels, Dolby 363 SR/A 2-channels. **Synchronization Systems:** Adams-Smith Zeta-3 w/remote. **Echo, Reverb & Delay Systems:** Yamaha REV5, Yamaha SPX1000, Lexicon PCM70, Eventide H3000 SE/B/V, TC Electronic 2290, Klark-Teknik DN780. **Other Outboard Equipment:** TC Electronic 2240 EQ, Klark-Teknik DN504B quad compressor/limiter, Klark-Teknik DN514B quad noise gate, Drawmer DS-201 dual noise gate, (2) UREI LA-4 compressor/limiter, Aphex 250/Type III aural exciter, Aphex 612 expander/gate, (2) Aphex 651 compressor/limiter, (2) Summit Audio TLA 100A tube levelling amplifier, Summit Audio TPA 200 stereo tube preamp, Summit Audio EQP 200 stereo tube EQ, Zeta VC220 MIDI violin controller, Stewart ADB direct system. **Microphones:** (2) Beyer Dynamic M88, (2) Shure SM58, (4) Shure SM57, Shure 55 SH II, Shure 520D, (2) Neumann TLM 170, (2) Neumann KM140, (2) AKG C-414 B/ULS, (2) AKG C-460 B/CK61, (2) AKG D-112, AKG The Tube, (2) AKG C1000S, (2) Crown PZM 30 RB, (2) Sennheiser 421, (2) Sennheiser 441, (2) EV RE20, (2) EV N/D 408, (2) Audio-Technica 4031, (2) Sony ECM 33F. **Monitor Amplifiers:** Hafler Pro 5000, Yamaha P2250, Carver PM-100. **Monitor Speakers:** (2) EV Sentry 500, (2) Tannoy System 12 DMT, (2) Yamaha NS-10M, (2) Auratone 5 Supercubes. **Musical Instruments:** Akai S1000HD sampler, Akai MPC60 drum machine and sequencer, Roland Rhodes MK80 controller keyboard, Oberheim Matrix 12 analog synthesizer, Kawai 7' grand piano. **Other MIDI Equipment:** Roland MKS20, Oberheim Matrix 1000, Yamaha TX816, Sound Ideas SFX library, Macintosh II running Soundtools, Performer, Composer. **Video Equipment:** Sony V0-9800 3/4" SP U-matic w/time code, Sony EVO-9800 HI 8 w/time code, Sony SVO 160 Hifi VHS, (2) Sony KV 19" color monitors. **Other:** Technics SL-P1300 CD player, Brasilia 2-group cappucino maker **Rates:** $50 per hour, special rates apply for block bookings.

[24+] STUDIO SOUND RECORDERS; 11337 Burbank Blvd.; N. Hollywood, CA 91601; (818) 506-4487. Owner: George Tobin. **Manager:** Chuck Hohn.

[24+] STUDIO TWO (II) (AFFILIATED W/INDIGO RANCH); *also REMOTE RECORDING*; **9729 Culver Blvd.; Culver City, CA 90230; (213) 558-8832; FAX: (213) 456-8474. Owner:** Studio Two Recording Inc. **Manager:** Michael Hoffman. **Engineers:** Richard Kaplan, Jason Wolchin, Chris Kupper, Chuck Jonson, and various others. **Mixing Consoles:** Jensen/Aengus 56 x 24 custom, plus (12) additional tube mic preamps, IBM PC custom controls programmable mute and mix. **Audio Recorders:** 3M 79 24-track 1/4" or 1/2" transformerless, Stephens 821A 4-track 1/2", digital audio recorders: all formats with advanced notice. **Synchronization Systems:** Full feature Q-Lock. **Echo, Reverb & Delay Systems:** Publison Infernal 90 stereo audio computer (stereo sampling or (2) digital reverb), AMS available, Lexicon 480, Lexicon 224 available, EMT 140 stereo plate, EMT 250, Yamaha REV7, Yamaha SPX90, Yamaha D1500, Roland DEP-3 digital processor, Roland DEP digital processor, Roland SRV-2000 digital processor, Roland SDE-3000 digital processor, Alesis XT digital reverb, MXR ART 01 digital reverb/DDL/flanger/pitch shift, Ursa Major Space Station, Ecoplate reverb, Master-Room reverb, Telefunken reverb, Eventide 1745A, Eventide 1745M dual DDL w/pitch change, Eventide H910 Harmonizer/instant phaser, Marshall Time Modulator, UREI Cooper Time Cube, Lexicon Prime Time, Loft 440 stereo flanger, Mutron stereo bi-phase, Bel DDL flanger/doubler. **Other Outboard Equipment:** Drawmer Electro Space spanner, EXR exciter, dbx 162 stereo limiter/boom box bass synthesizer, Teletronix LA-1 tube limiter, Teletronix LA-2A tube limiter, UREI 1178 stereo limiter, UREI 175 tube limiter, UREI 176 tube limiter, Eventide Omnipressor, Inovonics limiter, Altec 436C tube limiter, Altec 1193A limiter, RCA BA6A tube limiters, Orban de-esser, Aphex stereo Compeller, Pultec EQP-1A tube EQ, Pultec EQP-2 tube EQ, Pultec boosters, API equalizers, B&B equalizers, Aengus graphics, SAE graph equalizers, Collins and Cinema Engineering EQs w/Pultec boost, (10) Mitsubishi Westar equalizers in a rack, Drawmer Electro Space Straite gates, Symetrix gates, Valley People Kepex, Gain Brain, RM noise gate. **Microphones:** Large selection of new and vintage tube, Neumann U47, Neumann M49, Neumann U67, Neumann U87, Neumann SM69, Neumann M269, Neumann KM53, etc., Telefunken 250, Telefunken 2214 tube classics, AKG C-12, AKG C-28, AKG C-60, AKG C-61 tubes. **Monitor Amplifiers:** Technics 440W Class A to small speakers. **Monitor Speakers:** JBL 4-way custom, JBL Control Ones, JBL 4312, Yamaha NS-10. **Other MIDI Equipment:** IBM AT w/Roger Texture 3.1 sequencer software. **Video Equipment:** 26" monitor permanently installed for video lock, JVC 3/4" video and VHS. **Rates:** Please call.

[24+] STUDIO 2810; 2810 S. Maryland Pkwy.; Las Vegas, NV 89109; (702) 792-9211; FAX: (702) 792-9256. Owner: Sam J. Baris. **Manager:** Scott Baris.

[24+] STUDIO ULTIMO; 1900 S. Sepulveda Blvd.; West Los Angeles, CA 90025; (213) 479-6010. Owner: Private Music Studio Inc. **Manager:** Angele Hayashi. **Engineers:** Mitch Zelezny, Tom Biener, Gabe Moffat, Mara Bernard. **Dimensions:** Studio 49x35, control room 29x30. **Mixing Consoles:** Neve 8108 48x32 (modified) w/Necam automation and w/40 additional mix inputs. **Audio Recorders:** (2) Ampex ATR-124 24-track modified, Ampex ATR-104 4-track 1/2", (2) Ampex ATR-102 2-track 1/4", Ampex ATR 1/2" head assembly. **Cassette Recorders/Duplicators:** (4) Aiwa. **Noise Reduction Equipment:** Available. **Synchronization Systems:** (2) TimeLine Lynx. **Echo, Reverb & Delay Systems:** AMS RMX 16, AMS DMX 15 sampling stereo processor, EMT 251 w/250 program, Eventide 949 Harmonizer, Lexicon 480L, Lexicon PCM70, Lexicon 200, Lexicon Prime Time II, Roland SDE-3000, Yamaha REV7, Yamaha SPX90. **Other Outboard Equipment:** ADR Vocal Stresser, (4) dbx 160, (2) dbx 165, (2) Drawmer stereo gate, Neve stereo compressor/limiter, (2) Summit Audio stereo EQP-200, Teletronix LA-2A, (2) UREI 1176LN, (2) Valley People Gain Brain II, (6) Valley People Kepex II, (2) Valley International DSP de-esser. **Microphones:** AKG C-12, (4) AKG 414, (4) AKG 451, (2) AKG D-12, (2) Electro-Voice RE20, (5) Sennheiser 421, (5) Shure SM57, Shure SM81, Neumann U47 tube, Neumann U47 FET, Neumann M49, Neumann U67, (2) Neumann U87, Neumann U89, (2) Neumann TLM170, Crown PZM. **Monitor Amplifiers:** (4) Bryston 4B, BGW. **Monitor Speakers:** (3) Custom 3 channels 3-way design using TAD components, (2) Yamaha NS-10, Electro-Voice Sentry 100, Auratones. **Musical Instruments:** Yamaha C7 grand piano w/MIDI. **Video Equipment:** Sony VO-5800 U matic, Sony XBR 25" mounted monitor, RCA 31" studio monitor, (2) TimeLine Lynx synchronizer. **Specialization & Credits:** Located in West Los Angeles, Studio Ultimo caters to the needs of the TV, film and record industries. We've been able to offer our clients a luxurious environment with the personal and private services expected from a one-room studio without compromising the technical support and maintenance usually found only at larger facilities. Our control room, perhaps the largest in the world, is spacious enough for large synthesizer setups or when comfortable seating is required for many, and is equipped with three-channel monitoring and video lockup capabilities to necessitate mixing for film. Our studio's variable acoustic design and three large isolation booths provide an environment flexible enough to accommodate almost any production situation. Please call for rate and policy information or if you have any questions regarding our facility and services.

[24+] STUDIO WEST; 15523 Barbarossa; Houston, TX 77083; (713) 530-1179. Owner: Tom Tena, J.R. Kuzniar, Mike Teague. **Manager:** J.R. Kuzniar.

[24+] SUGAR HILL RECORDING STUDIOS; *also REMOTE RECORDING*; **5626 Brock St.; Houston, TX 77023; (713) 926-4431; FAX: (713) 926-2253. Owner:** David Lummis. **Manager:** Maria Garcia, Andy Branley.

[24+] SUMET SOUND STUDIOS; 7027 Twin Hills Ave.; Dallas, TX 75231; (214) 691-1740; FAX: (214) 691-6616. Owner: Ed Bernet. **Manager:** Bobby Dennis.

SUMMA MUSIC GROUP

SUMMA MUSIC GROUP
W. Hollywood, CA

[24+] SUMMA MUSIC GROUP; 8507 Sunset Blvd.; W. Hollywood, CA 90069; (213) 854-6300. Owner: Rick Stevens. **Manager:** Jewell Kumjian. **Engineers:** Jim Wright—head technician, Kyle Bess, Sean Young, independents. **Dimensions:** Room 1: studio 12x21, control room 16x28. Room 2: control room 18x18. **Mixing Consoles:** SSL SL4000 G Series 64-input Total Recall board and computer, API/De Medio custom 36-input w/original API 550A EQs. **Audio Recorders:** Studer A820 24-track, (2) Studer A800 24-track, (2) ATR-102 2-track 1/2" or 1/4". **Cassette Recorders/Duplicators:** (3) Nakamichi MR-1, Sony DTC-1000ES DAT, Panasonic SV-3500 Pro-DAT, Yamaha K2000. **Noise Reduction Equipment:** (3) Drawmer DS-201 dual gate, (4) Valley People Kepex II gate, (2) Valley People Dyna-Mite gate/de-esser. **Synchronization Systems:** (2) TimeLine Lynx. **Echo, Reverb & Delay Systems:** EMT 140 tube plate reverb, (3) Roland SDE-3000 delay, (2) TC Electronic 2290 dynamic delay w/32 sec. sampling, Eventide H3000 Ultra-Harmonizer, TC Electronic 1210 Spatial Expander/stereo chorus/flanger, (2) AMS RMX 16 reverb, (2) Lexicon PCM70 V 3.0, AMS DMX 15-80S, (2) Yamaha SPX90II, Yamaha SPX90, Yamaha REV5, Lexicon 480L digital processor, Eventide H949 Harmonizer, Eventide H910 Harmonizer. **Other Outboard Equipment:** (4) dbx 160X compressor, dbx 165A compressor, (2) dbx 160 compressor, UREI 1176 comp, (2) UREI 1178 stereo compressor, (2) Teletronix LA-2A lim/comp, (2) Teletronix LA-3A lim/comp, (3) Pultec EQP-1A EQ, Pultec MEQ-5 EQ, (2) API 550B 4-band EQ, (2) API 560B graphic EQ, (2) API 525 comp, (2) Focusrite 15A 115HD EQ, (2) BBE 802 EQ, GML 8200 parametric EQ. **Microphones:** Neumann U87 (modified by German Masterworks), (2) AKG 421, (2) AKG 414, (2) Sennheiser 451, (2) Shure SM57. **Monitor Amplifiers:** (2) Perreaux 9000B, Perreaux 5000B, Boulder 500, (6) JBL 6260, BGW 250D, Crown DC-300A, Hafler P-225. **Monitor Speakers:** (4) George Augspurger custom main, (4) Yamaha NS-10M, (2) Yamaha NS-10 Studio, (4) Auratone Super Sound Cube, (2) Tannoy Super Gold 10B. **Musical Instruments:** Yamaha DX7, LinnDrum. **Video Equipment:** Quasar Hi-fi audio HD VCR, Sony TV monitor. **Rates:** Please call for rates. **Specialization & Credits:** Summa's Studio A/SSL room is a world-class mixing/tracking studio that in the last year has attracted such clients as Heart, XTC, Pebbles, Babyface, Adam Ant. Studio A features a 64-input Solid State Logic SL4000 G Series Master studio system, SSL's newest model console and computer system. A custom main monitor system designed by George Augspurger, the finest Mogami and Monster cabling, two industry-standard Studer A800 analog multitracks, classic ART-102 2-track and a top-level array of outboard gear is available. This room includes a specially soundproofed one-way window looking onto Sunset Boulevard and the L.A. basin, because we know that the environment is important, too. Summa's Studio B/API room is a world-class overdub and MIDI studio that features a 36-input custom De-Medio API console and a Studer A820 multitrack. Original API 550A EQs, 321-5 mic preamps and P&G faders are available on all channels.

[24+] SUNBURST RECORDING; 10313 W. Jefferson Blvd.; Culver City, CA 90230; (213) 204-2222.

[24+] SUNSET SOUND; 6650 Sunset Blvd.; Hollywood, CA 90028; (213) 469-1186; FAX: (213) 465-5579. Engineers: Mike Kloster, Brian Soucy, Neal Avron, Tom Nellen, Mike Piersante, Chris Littell. **Dimensions:** Room 1: studio 22x36, control room 19x20. Room 2: studio 30x40, control room 16x23. Room 3: studio 20x50, control room 18x21. **Mixing Consoles:** Sunset Industries custom 56x56 w/GML automation, Amek APC1000 64x64 w/GML automation, Sunset Industries custom 32x24, 8/12-channel consolette. **Audio Recorders:** Studer A820 24-track multitrack, (3) Studer A800 MkIII 24-track, Studer A827 24-track, Ampex MM-1200 8/16/24-track headstacks, (7) Ampex ATR-100 2-track, Ampex ATR-104 4-track. **Cassette Recorders/Duplicators:** Panasonic SV-3500 Pro-DAT, (2) Sony DTC-300ES DAT, (6) Aiwa F-780, (6) Aiwa F-660 (float). **Noise Reduction Equipment:** (72) Dolby 361-A Type, (49) Dolby XP-24 SR. **Synchronization Systems:** (6) TimeLine Lynx. **Echo, Reverb & Delay Systems:** EMT 250

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reverb, (3) AMS RMX 16 reverb, (3) AMS DMX 15-80S delay, Quantec QRS room simulator, (2) Publison IM-90 audio computer, (3) Yamaha REV5 reverb, (3) Lexicon PCM70, (5) Roland SDE-3000, (3) Eventide H3000SE, (3) Yamaha SPX90II, Yamaha SPX1000, (3) live echo chamber, (4) EMT 140 plate w/ TimeLord amp, Lexicon 48L reverb. **Other Outboard Equipment:** (3) Drawmer DS-201 gate, (3) Aphex 612 stereo gate, Drawmer 1960 tube limiter, (16) Pultec EQ (various models), (5) Teletronix/UREI LA-2A limiter, GML 8200 EQ, Neve 33609 comp/lim. **Microphones:** (3) Telefunken 251 tube, (6) Neumann U47 tube, (7) Neumann U87 mic, (3) Neumann U67 tube, (2) AKG D-112, (2) B & K 4011, Klaus Heyne-refurbished tube mics, over 150 mics in all. **Monitor Amplifiers:** (6) HH Electronic, (9) BGW, (5) Crown. **Monitor Speakers:** JBL/TAD 3-way bi-amp system w/surround, (2) JBL 3-way bi-amp system, (10) Yamaha NS-10 near-field, (4) Auratone T6. **Musical Instruments:** (3) Steinway B-7 concert grand piano, (2) Steinway B-7 forte-MIDI. **Video Equipment:** Sony BVU-850SP 3/4" recorder/editor, (8) Sony/Toshiba high-resolution monitor, Sony 9850SP 3/4" recorder/editor, (3) Sony 2030 Pro Monitor, (2) Toshiba VHS VCR. **Other:** Monster Cable wiring: mic panels, tape machines, monitors, (3) Kenwood 7010 CD player. **Rates:** Elevated, but sensible, yet lower than they should be. **Specialization & Credits:** Sunset Sound is ready for the 1990s! We have a new look, both inside and out! Our crack maintenance staff customized and enhanced the Amek APC1000 dynamics modules. We have a sharp new traffic manager, Nicole Terry. New office tenants include jinglemeister Richard (Dick) Marx Sr., and producer/composer Rick Neigher. Hanging about and making a name for himself is C.J. Vanston. We even have Barry Manilow as our next-door neighbor. What can we say? And wait 'til you see the new decor! Yes, that's still our building at the corner of Sunset and Cherokee in Hollywood! We still have the huge parking lot. We still give great BBQs, basketball and ping-pong. And, above all, we still have the finest engineering staff in town...maybe the country! The best studios never change, they just get better and better.

[24+] SUNSET SOUND FACTORY; 6357 Selma Ave.; Hollywood, CA 90028; (213) 467-2500; FAX: (213) 467-3103. Owner: Paul Camarata. **Manager:** Philip MacConnell. **Engineers:** Jeff Bork, Neal Avron, Mike Kloster, Brian Soucy, Tom Nellen, Mike Piersante. **Dimensions:** Room 1: studio 26x16, control room 19x13, iso booth #1 20x13, iso booth #2 14x9. Room 2: studio 22x20, control room 18x16, iso room #1 9.5x6.5. **Mixing Consoles:** API 36x16x33 custom w/programmable master mute system, API custom 40x16x40 w/ Necam II automation. **Audio Recorders:** Otari DTR-900 32-track digital, (2) Studer A827 24-track, Studer A80 MkIV 24-track, Ampex MM1200 24-track w/16-/8-track heads, Ampex ATR-104 4-track, (3) Ampex ATR-102 2-track 1/4" or 1/2" heads, (2) Aiwa XD-001 DAT. **Cassette Recorders/Duplicators:** (3) Aiwa F770, (2) Aiwa F780, (2) Aiwa F660. **Noise Reduction Equipment:** (32) Dolby A (SR cards available). **Synchronization Systems:** (2) TimeLine Lynx. **Echo, Reverb & Delay Systems:** (4) EMT 140 stereo plate, EMT 251 digital reverb w/250 program, Lexicon 224XL digital reverb, (2) Lexicon PCM70, (2) Lexicon Prime Time II, (2) Eventide 949 Harmonizer, (2) Eventide H3000 SE Ultra-Harmonizer, (4) Roland SDE-3000 digital delay, (2) J.L. Cooper time cube, Publison Infernal 90 machine. **Other Outboard Equipment:** (16) Valley People Kepex II, (4) Drawmer DS-201 noise gate, (6) Lang PEQ-2, (2) Pultec EQP-1A, ITI MEP-230 PEQ, Sontec PEQ, (4) dbx 160X, (2) Teletronix LA-2A, (8) UREI LA-3A, (4) UREI 1176LN, (4) dbx 902, (4) dbx 903, (6) dbx 904, Dytronics CS 5 chorus, Drawmer 1960 stereo tube limiter, Langevin 259A EQ (high/low filter), UREI 962 digital metronome, (2) Pioneer PD-6300 CD player, Denon DP-30L II turntable. **Microphones:** (7) Neumann U67, (6) Neumann U87, (3) Neumann V47 FET, Neumann U47 VF-14, (2) Neumann M49, (3) Neumann KM84, (4) Neumann KM86, Neumann KM88, (3) Telefunken Elam 251, (6) AKG C-12A, (6) AKG 452EB, (4) AKG 414EB, (3) Sennheiser 441, (5) Sennheiser 421, (7) Shure SM57, (4) Shure SM53, (4) Sony C-37A, (3) EV RE20. **Monitor Amplifiers:** (5) Hill DX-1000A, (2) Phase Linear 700B, (2) McIntosh MC2105. **Monitor Speakers:** (4) Altec 604E w/Mastering Lab crossover, (4) Yamaha NS-10, (2) Auratone TC, (4) Auratone 5C. **Musical Instruments:** (2) Steinway B grand piano, Hammond B-3 organ w/Leslie speaker.

[24+] SUTTON SOUND STUDIO; 8390 Curbaril Ave.; Atascadero, CA 93422; (805) 466-1833. Owner: Rick Sutton.

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THAT STUDIO RECORDING SERVICES
N. Hollywood, CA

[24+] THAT STUDIO RECORDING SERVICES; *also REMOTE RECORDING;* **PO Box 958; N. Hollywood, CA 91603; (818) 764-1421. Owner:** That Studio Inc. **Manager:** Richard Holbrook, Shannon Holbrook.

[24+] 38-FRESH RECORDING; 7940 W. 3rd St.; Los Angeles, CA 90048; (213) 383-7374. Owner: Mike Greene.

[24+] TOPANGA SKYLINE RECORDING; 1402 Old Topanga Cyn. Rd.; Topanga Park, CA 90290; (213) 455-2044. Owner: Britt Bacon, John Eden. **Dimensions:** Room 1: studio 25x30, control room 22x20, iso booth 16x20. **Mixing Consoles:** Neve V III 60 input automated. **Audio Recorders:** Studer A820 24-track, Ampex ATR-100 2 track 1/4", Otari MTR-100 2-track 1/2", MCI JH-110 1/4", Sony 2500 Pro-DAT. **Cassette Recorders/Duplicators:** (2) Denon HR-44 3-head. **Synchronization Systems:** Adams Smith 2600, Adams-Smith Zeta 3, Roland SBX-80. **Echo, Reverb & Delay Systems:** Lexicon 480L w/LARC, Lexicon 224, Lexicon PCM70, Lexicon PCM60, Eventide H3000 with SE and 11 sec. sample update, (2) Eventide H910, AMS 1580 w/loop edit 1.6 sec., EMT 140 stereo valve plate, (4) SPX 90, (2) Teletronix LA2A vacuum tube, Drawmer 1960 vacuum tube (stereo), Drawmer DL221 (stereo), (2) Drawmer DS201 dual gates, (4) UREI 1176LN, Dyna-Mite gates, Audio & Design F760x-RS (stereo), (2) Gain Brain II, (2) Kepex II, dbx 162 (stereo), (2) dbx 160, (2) dbx 160x, (2) dbx 161, Gemini Focusrite ISA115HD (stereo), UREI 545, Valley 415 de-esser (stereo), Orban dynamic sibilance 526A controller. **Microphones:** (12) Neumann, (10) AKG, (2) B&K, (8) Electro-Voice, (11) Sennheiser, (5) Beyer, (16) Shure. **Monitor Amplifiers:** (2) FM1000, Quad 405, (2) Quad 306, (2) BGW 50, BGW 250, (2) BGW 750A. **Monitor Speakers:** (2) UREI 815 Time Align (Steve Brandon tuned), (2) Yamaha NS-10M, (2) Yamaha NS-10M-S, (2) Auratone Cube, (2) Linn Kans, (2) B&W DM1200, (2) David 9000, (2) JBL 4311. **Musical Instruments:** Kawai 7'6" grand piano, Fender Jazz Master, Ibanez bass, Washburn acoustic, Roland D-50, Roland MSQ-700, Roland TR-505, Atari 1040ST C-Lab software. **Video Equipment:** Sony 5800 U matic NTSC, Sony 5630 PAW/SECAM U-matic, Sony Trinitron 27" monitor, Mitsubishi 35" PAL monitor.

[24+] TOTAL ACCESS RECORDING; 612 Meyer Ln. #18; Redondo Beach, CA 90278; (213) 376-0404. Owner: Allan W. Davis, Allan H. Juckes. **Manager:** Leslie Berman. **Engineers:** Eddie Ashworth, Wyn Davis, Melissa Sewell. **Dimensions:** Studio 25x30, control room 25x20, live chamber 25x32x16. **Mixing Consoles:** Amek G2520 58x48x104 w/automation. **Audio Recorders:** (2) Ampex ATR-124 analog, Sony multitrack digital, Mitsubishi multitrack digital, Ampex ATR-102/4, Sony 3402 2-track digital, Sony 2500 DAT, Panasonic SV-3700 DAT, Turtle Beach 56k hard disk digital editing. **Cassette Recorders/Duplicators:** Nakamichi M-2. **Noise Reduction Equipment:** Drawmer 10-ch. audio gates, Aphex CX-1. **Synchronization Systems:** Lynx. **Echo, Reverb & Delay Systems:** Lexicon 480L w/sampling option, Lexicon 224XL, Klark-Teknik DN-780, AMS 15-80S, Yamaha REV7, Yamaha SPX90, Roland SRV-2000, Lexicon 95, Lexicon 93, Lexicon PCM70, EMT 240 Gold Foil, AKG BX 20, Roland SDE-3000, Eventide H3000. **Other Outboard Equipment:** Forat F-16, GML para EQ, dbx 165A, dbx 160, UREI 1176, UREI LA-3A, Teletronix LA-2A, ADR Vocal Stresser, Lang tube EQ, (12) Boulder mic preamp, (4) Jensen/Hardy mic preamp, UREI EQ, Orban EQ, Summit comp/limiter. **Microphones:** AKG C-12, AKG 414, AKG 451, Schoeps, Neumann U87, Neumann KM86, Neumann KM88 and others, Shure SM57, Shure SM58, Beyer, Crown PZM, many more. **Monitor Amplifiers:** (3) Boulder 500, Crown, BGW, Phase Linear, (2) Perreaux. **Monitor Speakers:** Tannoy FMV, UREI 813, Canton, Yamaha, E.V., JBL, Auratone, Infinity, NHT. **Musical Instruments:** LinnDrum 9000, Yamaha grand w/MIDI, Fender Strat, Gibson Les Paul, Roland synth, superb collection of vintage acoustic guitars including Guild, Gibson, Martin and others. **Video Equipment:** Beta and VHS 1/2", Sony 3/4", JVC 3/4", Sony monitor. **Rates:** Hourly and lockout rates are negotiable. Please call. **Specialization & Credits:** Total Access provides technically advanced recording systems coupled with a warm atmosphere and skilled staff.

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World Radio History

Southern California Hawaii • Southwest

24-track studios

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We can arrange for accommodations and anything else needed to accomplish any project. We are located one mile from the Pacific Ocean in beautiful Redondo Beach. Worldwide clientele includes Guns N' Roses, Ken Scott, Dokken, Gary Wright, Michael Wagener, Great White, Tears for Fears, White Lion, Alice Cooper, Will and the Kill, Terry Bozzio and many others. Labels include Capitol, Geffen, Enigma, Elektra, Cypress/A&M, Atlantic, MCA, IRS.

[24+] TRACK RECORD INC.; 5102 Vineland Ave.; N. Hollywood, CA 91601; (818) 761-0511. Owner: Tom Murphy. **Manager:** Alan Morphew. **Engineers:** Tom Murphy, John Carter, Ken Paulakovich, Pete Magdaleno, Danan Sananaja, Brian Virtue, Richard Presley, Che Laird, Dan Sagudang, Greg Geinzenauer. **Dimensions:** Room 1: studio 40x40, control room 20x20. Room 2: studio 30x30, control room 20x20. Room 3: studio 8x8, control room 15x20. Room 4: control room 12x20. **Mixing Consoles:** Neve V3 60-input, Neve 8232 32-input. **Audio Recorders:** Studer 820 24-track, Studer 827 24-track, Sony JH-24 24-track, Ampex ATR-102 2-track, Ampex ATR-104 2/4-track, Otari MTR-12 2-track, Panasonic S3500 DAT, Tascam DA-30 DAT. **Cassette Recorders/Duplicators:** (2) Aiwa AD-F780, Aiwa AD-F400, Nakamichi MR-1. **Synchronization Systems:** Audio Kinetics Q.Lock 3.10. **Echo, Reverb & Delay Systems:** Lexicon 224XL (w/8.3 software and LARC), Lexicon 224, Yamaha REV5, Yamaha SPX900, (3) Yamaha SPX90, (2) Roland SRV-2000, (2) Ecoplate I and II, DeltaLab DL-2, (2) Roland SDE-3000, Bel BD80 delay w/8-sec. sampling. Lexicon Prime Time, Eventide H910, Roland Dimension "D" chorus. **Other Outboard Equipment:** (4) Teletronix LA-2A, (5) UREI 1176LN, (4) dbx 160X, dbx 165A, Trident limiter 2-channel, Altec 436C limiter, RCA limiter, Valley People Dyna-Mite 430 stereo comp/expander, Drawmer dual gate 6 channels, Kepex II gate 6 channels, (2) Pultec EQ-H2 tube EQ, Pultec MEQ-5 tube EQ, (2) Trident CB9066 parametric EQ, UREI 535 dual graphic EQ, dbx 902 de-esser, BBE 802. **Microphones:** (3) AKG C-12 tube, AKG "The Tube," (5) AKG C-12A tube, Telefunken U47, Neumann M49 tube, (2) Neumann KM64 tube, (5) AKG 414 (EB, EB P48, B-ULS TL), (4) AKG 451, (5) AKG 452, (3) Electro-Voice RE20, (5) Neumann U87 (incl. 1 w/Stephen Paul mod.), (2) Neumann U47 FET, (4) Neumann KM84, (13) Sennheiser 421, (2) Shure SM81, (12) Shure SM56/57, Shure SM7, (2) RCA 77 ribbon, (2) Sennheiser 441. **Monitor Speakers:** TAD system (South studio also equipped w/motion picture Dolby stereo), Yamaha NS-10M. **Musical Instruments:** Kawai 7' grand piano, Yamaha C7 grand piano, complete MIDI room w/Kurzweil 250, E-mu E-III, Digidesign, Sound Tools, DX-7. **Video Equipment:** Complete video package incl. JVC CR6650U 3/4" VCR and (2) Panasonic video monitor. **Other:** Roland CPE-800 15-channel SMPTE-based automation, Technics SL-P370 CD player.

[24+] THE 25TH TRACK; *also REMOTE RECORDING*; **309 E. Vicksburg; Broken Arrow, OK 74011; (918) 455-2459. Owner:** Walt Bowers. **Manager:** Walt Bowers.

[24+] VALLEY CENTER STUDIOS; 5928 Van Nuys Blvd.; Van Nuys, CA 91401; (818) 989-0866. Owner: Mark Antaky. **Manager:** Mark Antaky.

[24+] VINTAGE RECORDERS; 4831 N. 11 St., PO Box 17010; Phoenix, AZ 85011; (602) 241-0667. Owner: Billy Moss. **Manager:** Billy Moss. **Engineers:** Paula Wolak, Clarke Rigsby, Billy Moss, Bob Henke. **Dimensions:** Room 1: studio 15x18, control room 18x26. Room 2: studio 30x22, control room 18x21. Room 3: studio 10x12, control room 12x14. **Mixing Consoles:** SSL 4040G, Trident B Range Console, Studer 189-080. **Audio Recorders:** Sony 3324 24-track digital w/remote, Studer A827, Tascam 85-16, Ampex ATR-104, Studer A810 center-track time code, Ampex ATR 700, Sony 2500 DAT, Sony PCM-701ES, Yamaha C300, Studer B-215. **Synchronization Systems:** Studer TLS4000. **Echo, Reverb & Delay Systems:** Yamaha REV1, Yamaha REV7, (2) Yamaha SPX90II, EMT 140 tube, 240 Gold Foil, Lexicon 200, Lexicon PCM70, Lexicon Prime Time, (3) Eventide 910 Harmonizer, UREI Cooper time cube, Alesis MIDIverb II, AMS 1580 Harmonizer. **Other Outboard Equipment:** (2) Pultec EQP-1, (2) EQH-2, (2) ITI ME-230, UREI 530 parametric, (2) Aengus graphic, Klein & Hummel UE-1000, (2) dbx 160, (4) dbx 165, (2) API 525, (4) Aphex CX-1, (2) Teletronix LA-2A, (5) Neve stereo comp/limiter, (2) Valley-People stereo Dyna-Mite, Drawmer DS-201, Studer CD player, Phillips twin computer-controlled CD player. **Microphones:** (4) Neumann M496, (2) Neumann U67, Neumann U47 FET, (6) Neumann KM64, (2) Neumann U87, (2) Neumann U89, Telefunken ELAM-250, U47, VF14, (3) AKG C-12, (2) AKG 414, (2) AKG 451, (2) AKG 452, (2) RCA 44-BX, (2) RCA 77-DX, (2) RCA 77A, Sennheiser 441, (6) Sennheiser 442, (4) Sony C-37A. **Monitor Amplifiers:** Perreaux, UREI, BGW, Crown, Belles, White EQs. **Monitor Speakers:** Custom Augspurger, Meyer Sound Labs 833, Westlake BBSM6, Klein-Hummel, Yamaha NS-10, PB-6.5. **Musical Instruments:** Yamaha C7V 7'4" grand piano (ivory keys), Hammond B-3 w/Leslie 122, Roland Jupiter 8 synth, E-mu SP-12 drum machine, Simmons SDS-5 druns, Gretsch large drum set, Fender 1955 Stratocaster, (5) Fender pre-CBS Precision basses, Rickenbacker 1964 12-string, Marshall 1/2-stack 100-watt, Ludwig copper tympani, Fender 1964 Esquire, Fender tweed Champ. **Video Equipment:** Sony VO-2600 3/4" U-matic, Sony Beta. **Specialization & Credits:** Current albums include Fleetwood Mac *Behind the Mask*, Beach Boys *Still Cruisin*, Lynch Mob *Wicked Sensation*, Bob Dylan *Down in the Grove*, Stevie Nicks-Joey DeFranceso *Part III* and *Part IV*.

[24+] VOICEOVER L.A.; 1717 N. Highland Ave., Ste. 620; Hollywood, CA 90028; (213) 463-8652; FAX: (213) 463-5443. Owner: Evelyn Williams. **Manager:** Patrick Torres. **Engineers:** Pat Torres, Lacey Kendall, Wesley Craft. **Dimensions:** Room 1: studio 15x14, control room 15x12. Room 2: studio 8x12, control room 13x12. **Mixing Consoles:** Soundcraft 1600 24x8x2, TAC Scorpion 16x8x2. **Audio Recorders:** Otari MTR-90 24-track, Otari MTR-10 2-track w/center track tc, MCI JH-110 2-track, (2) Tascam DA-30 DAT, (4) Otari MX-5050 2-track, Otari MX-5050 8-track, Otari MX-5050 4-track. **Cassette Recorders/Duplicators:** (10) Nakamichi MRII. **Synchronization Systems:** Alpha Audio Boss 2 w/Lynx modules. **Echo, Reverb & Delay Systems:** Eventide H3000 Harmonizer, Lexicon PCM70, Lexicon PCM60 digital reverb, Korg SDD-3000 digital delay. **Other Outboard Equipment:** Aphex comp/lim, (2) Symetrix T1-101 telephone interface, dbx 166 comp/lim. **Microphones:** (2) Sennheiser MKH-416, (2) AKG 414B, (2) Schoeps CMC-411. **Monitor Amplifiers:** (3) Hafler P-225, (5) Symetrix A-220. **Monitor Speakers:** (2) Yamaha NS-10M, (2) JBL 441, (2) Auratone. **Video Equipment:** Ampex VPR-80 1", JVC CR-850V 3/4", JVC CR-8250 3/4", (4) Sony KX-1901A 20" color monitor, Toshiba 27" color monitor, (2) Sony reference monitor, Sigma CSG-355A color synch generator. **Other:** (2) Technics SL-P1300 CD player, FSE ES-255 SMPTE time code window generator.

[24+] JOHN WAGNER RECORDING STUDIOS INC.; 12000 Candelaria NE, Ste. E; Albuquerque, NM 87112; (505) 296-2766; FAX: (505) 296-9374. Owner: John Wagner, Laurie Zachery. **Manager:** John Wagner. **Specialization & Credits:** John Wagner Recording Studios is the only full-service 24-track recording studio in New Mexico capable of sophisticated SMPTE-interlocked audio-for-video. We use the Adams-Smith SMPTE synchronizing system with compact controller along with a 32-channel, 16-bit Yamaha digital automated mixing console. Our 3,200-sq.-ft. facility has two control rooms, two large voiceover booths and a large (30x20) studio. We have over 25 years' experience in all aspects of audio recording, including recording products for RCA, Capitol, MCA, Motown, CMH; creating numerous award-winning jingle campaigns; and recording two Grammy-nominated albums. Recent clients include Saatchi & Saatchi, Desperado Films, Republic Pictures, Katsin/Loeb, J. Wilson & Associates, Strascina & Partners, Rick Johnson Company, Institute of American Indian Arts.

[24+] WESTBEACH RECORDERS; 6035 Hollywood Blvd.; Hollywood, CA 90028-5411; (213) 461-6959; FAX: (213) 461-9690. Owner: Donnell Cameron, Brett Gurewitz. **Manager:** Donnell Cameron.

WESTLAKE AUDIO
Los Angeles, CA

[24+] WESTLAKE AUDIO; *also REMOTE RECORDING*; **7265 Santa Monica Blvd.; Los Angeles, CA 90046; (213) 851-9800. Owner:** Glenn Phoenix. **Manager:** Steve Burdick. **Engineers:** Darryl Dobson, Craig Johnson, Steve Harrison, Bill Malina, John Fundingsland, Brad Aldredge, Mark Hagen, Chris Fogel, Kevin Howe, Doug Mountain. **Dimensions:** Room 1: studio 25x48, control room 25x20. Room 2: studio 20x35, control room 21x19. Room 3: studio 27x38, control room 23x19. Room 4: studio 30x50, control room 25x25. **Mixing Consoles:** (2) Neve V Series 60x48, Harrison/GLW Series 88x32, Trident 80C 72x24, Neve VR-72 72x48. **Audio Recorders:** Mitsubishi X-850 (Apogee) (rental item), Sony 3324 (Apogee) (rental item), (6) Sony APR 24-track, Studer A800 24-track, (1) Sony JH-24 24-track, Ampex ATR 2/4-track, MCI JH-110 4-track. **Cassette Recorders/Duplicators:** (4) Panasonic 3500 DAT, (2) Nakamichi MR-1B, (6) Yamaha C300, (2) Aiwa 770. **Noise Reduction Equipment:** (2) Dolby SR-XP Frame 24 (rental item), Dolby A. **Synchronization Systems:** TimeLine Lynx, Adams-Smith, Cipher Digital. **Echo, Reverb & Delay Systems:** Quantec QRS-XL (rental item), AMS DMX, AMS RMX 16, Publison 90, TC Electronic 2290, Eventide H3000 SE, Eventide 949/969, Eventide 2016, Lexicon 480L, Lexicon 224, Lexicon PCM70 V 3.0, Lexicon 200, Lexicon Prime Time II, Lexicon 300, Lexicon Super Prime Time, Yamaha REV5, Yamaha REV7, Yamaha SPX1000, Yamaha SPX90II, Roland SDE-3000B, EMT 250/251/252/240/150. **Other Outboard Equipment:** dbx 165A/162/160/160X/902, Drawmer gates, Valley gates, Inovonics 201, UREI 1176, UREI LA-3, UREI LA-4, Teletronix LA-2A, GML comp, GML EQ, Sontec comp, Sontec EQ, Pultec EQP-1A. **Microphones:** Full selection. **Monitor Speakers:** Westlake HR-1, Westlake SM-1, full selection of near-field. **Musical Instruments:** Yamaha pianos (MIDI), Synclavier 9600 system. **Video Equipment:** Sony 5850, Sony BVU-800, Sony BVH-3100 1" video machine, Adams-Smith AV-2600 audio/video editor. **Other:** Large-screen projectors. **Specialization & Credits:** Westlake Audio has now moved into Post-Production for Film and Television. We have remodeled our Studio "E" to exceed the requirements of a spectacular audio post suite. We have added the Synclavier 9600 Music Workstation to the room, and a large sound effects library has been implemented. 3/4" and 1" video are available, as well as 24/48 track analog or digital recording. Please see our ad in this issue!! Westlake Audio and AMT Systems present a complete MIDI pre-production room equipped with a Macintosh-based direct-to-disc recording and editing system. The finest synthesizers, sampler, editors, sequencing and scoring software programs are available. This room offers many aspects of audio recording from record production to post production sweetening. A MIDI programmer and engineer are also available for the room.

[24+] WESTWORLD RECORDERS; 16760 Stage St.; Van Nuys, CA 91406; (818) 782-8449. Owner: Robert Schreiner. **Manager:** Jerry Pearson.

[24+] THE WILD SIDE VIDEO/AUDIO; *also REMOTE RECORDING*; **10945 Camarillo; N. Hollywood, CA 91602; (818) 506-8838. Owner:** Guido Folino. **Manager:** Alphonse LaRue.

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The Reader Service numbers have a new and improved address! To order more information on a product or service advertised in *Mix*, please refer to the Advertiser Index near the back of each issue. As usual, when you circle these numbers on the Reader Service card, you'll receive the details you're looking for on the ads that interest you. It's one more easy way to keep track of the latest in pro audio!

MIX

See Page 184 for Reader Service

World Radio History

Southern California Hawaii ♦ Southwest

12- & 16-track studios

[16] ACROSS THE TRACKS; *also REMOTE RECORDING*; **PO Box 2612; Garden Grove, CA 92640; (714) 636-3780. Owner:** Brad/Jodi Clark. **Manager:** Jodi Clark.

[16] ALISO CREEK PRODUCTIONS INC.; PO Box 8174; Van Nuys, CA 91409; (818) 787-3203. Owner: William Williams.

[16] ARCA (AUDIO RECORDING CORPORATION OF ARKANSAS INC.); 100 N. Rodney Parham Rd., Stes. 1A & 1B; (PO Box 5686, Little Rock, AR 72215-5686); Little Rock, AR 72205; (501) 224-1111; FAX: (501) 224-3329. Owner: Dick Marendt, Clyde Snider. **Manager:** Clyde Snider.

[16] BLINDFOLD STUDIOS; *also REMOTE RECORDING*; **PO Box 253; Poway, CA 92074; (619) 486-4734. Owner:** Gregg Brandalise. **Manager:** Gregg Brandalise.

[16] BPL'S BANJO BRASS STUDIO; *also REMOTE RECORDING*; **8088 N. 15th Ave.; Phoenix, AZ 85021; (602) 870-0351. Owner:** Bruce P. Leland. **Manager:** Shirley Leland.

[16] CARUMBO RECORDING; *also REMOTE RECORDING*; **1301 Magnolia St.; Norman, OK 73072; (405) 329-1765. Owner:** Michael McCarty. **Manager:** Michael McCarty.

[16] CREATIVE MEDIA RECORDING; 11105 Knott Ave., Ste. G; Cypress, CA 90630; (714) 892-9469. Owner: Tim Keenan. **Manager:** Linda Keenan. **Specialization & Credits:** Creative Media has been providing professional media recording for over 21 years. Our specialty is voice recording and the production involved in audio-for-video. AV soundtracks and spots. Our facility features two control rooms, audio sweetening for video and a comfortable yet productive work environment. We provide production music and sound effects, assistance in casting voice talent, multilingual narrations, dialog replacement and the talent behind the board to bring your script to life. We serve as a sound-support service for independent producers and corporate staff producers throughout Southern California. Extras include FAX and photocopier, phone-patch capability and duplication in any analog tape format. Clients include Taco Bell Corporate, Hughes Aircraft, TRW, Disneyland, Allergan, Pacificare Health Systems. Engineers: Ed Berger & Dan Pavelin.

DIGITAL IMAGE RECORDING STUDIO
San Antonio, TX

[12] DIGITAL IMAGE RECORDING STUDIO; 555 Cicero; San Antonio, TX 78218; (512) 656-1382. Owner: Jim Waller. **Manager:** Suzell Waller

[16] DOC PRODUCTIONS; PO Box 562; Los Angeles, CA 90290; (213) 455-2921. **Owner:** John W. Cornett. **Manager:** Judy Ecker.

[16] FRONTIER RECORDING; 26 Parkwood; Laguna Hills, CA 92656; (714) 770-4528. Owner: Paul Bourassa. **Manager:** Paul Bourassa.

[16] GRANDVIEW STUDIOS; *also REMOTE RECORDING*; **5321 E. Grandview Rd.; Scottsdale, AZ 85254; (602) 992-6106; FAX: (602) 992-6106. Owner:** Sound Designs of Arizona. **Manager:** Gregory Zdaniak.

[16] BOB GREEN PRODUCTIONS INC.; *also REMOTE RECORDING*; **7950 Westglen; Houston, TX 77063; (713) 977-1334; FAX: (713) 977-1305. Owner:** Bob Green. **Manager:** Emily McGowan. **Specialization & Credits:** Since our beginning in 1973, we have produced many thousands of commercials and ad presentations for advertising agencies, corporations and independent producers nationwide. We are constantly upgrading to state of the art, but the technology we offer is only as good as our people make it. In our case, we are known for our talented engineer/producers; people with both acumen and judgment. Combining our staff, a superb creative working environment, the largest music and sound effects library in America, and a stable of top male and female voice-over talent, we have much to offer you. Send for our free brochure and demo tapes. There are exciting new things to hear from Houston, the city that brought you the Moon.

[16] PATRICK MCGUIRE RECORDING; 1402 Rockdale; Arlington, TX 76018; (817) 467-1852. Owner: Patrick A. McGuire. **Manager:** Patrick A. McGuire. **Engineers:** Patrick McGuire, David Morgan. **Dimensions:** Studio 20x22, control room 10x12. **Mixing Consoles:** D&R 4000 Series 24-channel, inline, w/patch bay. **Audio Recorders:** Mitsubishi X-400 digital open-reel 16-track, Sony PCM 2500 ProDAT, Otari 5050B-II analog 1/4" 2-track. **Cassette Recorders/Duplicators:** Yamaha C-300 master cassette. **Echo, Reverb & Delay Systems:** Eventide H3000 Ultra-Harmonizer, Yamaha REV5, Yamaha SPX90-II, Alesis Quadraverb, ART 01A. **Other Outboard Equipment:** (2) Aphex 612 dual gate, (2) Symetrix 501 comp./limiter, (2) Symetrix 528 mike processor, Rane GE27 graphic equalizer, Rane RA27 analyzer/equalizer. **Microphones:** Neumann U87A, AKG D-12E, AKG D-112, (3) Shure SM57, (2) Audio-Technica ATM63, Audio-Technica ATM11R, (2) Crown PZM-30 GP, Beyer M422, Sennheiser MD-431, (2) Sony C-535P, Yamaha MZ204. **Monitor Amplifiers:** Crown DC-300A-II, Crown D-150A, Rane HC6 headphone amp. **Monitor Speakers:** (2) Tannoy LGM 12" dual concentric, (2) Auratone 5C. **Musical Instruments:** Yamaha G-3 6' grand piano, Yamaha DX7-II FD, Yamaha RX5 drum machine, Steinberger bass, Yamaha BB3000S bass, Yamaha FG335E acoustic/electric guitar, Fender Thinline Telecaster. **Digital Workstations:** Digidesign Sound Tools system running on Mac IIci and one gigabyte of hard disk space. **Rates:** One of the most cost-effective, all-digital studios in the Southwest. Call for rates. Block rates available.

[16] MELODY LINE PRODUCTIONS AND RECORDING STUDIO; *also REMOTE RECORDING*; **2662 Kalialani Circle; Pukalani, Maui, HI 96788; (808) 572-7152. Owner:** Tom Hall. **Manager:** Tom Hall.

[16] DEF NAYBOR AUDIO; 5620 Old Bullard Rd., Ste. 117C; Tyler, TX 75703; (903) 581-6118; FAX: (903) 581-5498. Owner: Aubrey Robertson. **Manager:** Aubrey Robertson.

[16] NEW AGE RECORDING; 8607 Wurzbach Rd., U-105; San Antonio, TX 78240; (512) 641-9818. Owner: Richard Veliz/Keith Harter. **Engineers:** Richard Veliz, Keith Harter. **Dimensions:** Room 1: studio 10x12, control room 20x18. Room 2: studio 10x8, control room 10x16. **Mixing Consoles:** TAC Scorpion 24x16, Yamaha DMP7, Soundtracs MIDI PC 24x16x4x2. **Audio Recorders:** Otari MX-70, Sony APR-5003, Fostex 20, Sony TCD-D10 PRO, Ampex ATR-104, Tascam Ms16, 92) Panasonic SV-3700. **Cassette Recorders/Duplicators:** (2) Tascam 122B, (4) Tascam 32 2-track, TEAC 2-7000. **Synchronization Systems:** (2) Adams-Smith Zeta-3 w/Zeta remote. **Echo, Reverb & Delay Systems:** Eventide H3000, (3) Yamaha SPX90, Roland SDE-3000, Lexicon PCM60, Yamaha REV7, Alesis MIDIverb. **Other Outboard Equipment:** dbx 160X, dbx 166, (2) Orban 536A, (2) Aphex Type C Exciter, (2) Ashly Audio SC-33 noise gate, Burwen noise filter, (2) White Instruments 4400 EQ, Sansui PCX11 PCM, Technics SV100 portable PCM, (2) Ashly Audio SC-50, Technics SL1200 CD player, Rockman stereo chorus delay/sustainer. **Microphones:** (2) AKG 460 ULS, (2) AKG C-414EB, Neumann U87, Neumann U47, (6) Shure SM57, (6) Shure SM58, Sony ECM-MS5, Sony DC-MS5. **Monitor Amplifiers:** Hafler XL-600, Hafler XL-280, (2) Rane HC-6, Yamaha P2201. **Monitor Speakers:** (4) Yamaha NS-10M, (4) Electro-Voice Sentry 500, (2) Auratone. **Musical Instruments:** Kurzweil 250 Sound Blocks ABCD, (2) Korg M1R EX, Korg M3R, E-mu Proteus XR, Roland D50, Roland U220, (2) Yamaha TX802, Yamaha TX316, Roland R-8, Yamaha PMC1 MIDI drum kit, Alesis HR-16 drum machine, Akai S900, (2) Roland MKS-20, (2) Roland MKS-30, MIRAGE rack-mount sampler, Korg A3 signal processor. **Other MIDI Equipment:** Mac PLUS w/Performer 3.42, Mac II, Mark of the Unicorn MIDI time piece, (3) Sound Tools, Pro I/O, DAT I/O 660mg hard drive. **Video Equipment:** (2) Panasonic TR-930 monitors, Sony VO5800 3/4", Panasonic BTS-1900N color monitor, (2) Panasonic AG-1950 1/2". **Other:** Sound Ideas CD Library 1000-4000.

[16] NEW VISION STUDIOS; *also REMOTE RECORDING*; **14360 Sylvan Field; Houston, TX 77014; (713) 820-6564. Owner:** Dan Yeaney, Victor Cardenas. **Manager:** Dan Yeaney.

[16] POWER HOUSE SOUND STUDIO; *also REMOTE RECORDING*; **1906 Overbrook Circle; Missouri City, TX 77459; (713) 437-9420. Owner:** Lloyd Hughes. **Manager:** Anthony Rodgers.

[16] PROMECAST; Minatitlan No. 8-1; Col. San Jeronimo Lidice; 10200 Mexico D.F., Mexico; (011525) 652 05 93; FAX: (011525) 652 24 08. Owner: Eugenio Castillo C.. **Manager:** Rossana Fernandez.

[16] QUINCY STREET SOUND INC.; 130 Quincy St. NE; Albuquerque, NM 87108; (505) 265-5689; FAX: (505) 256-9345. Owner: April L. La Monte. **Manager:** Daryl Piper.

[16] RCM PRODUCTIONS; 12478 Washington Blvd. **#5503;** Los Angeles, CA 90066; (213) 390-5573. **Owner:** Bob McNabb. **Dimensions:** Studio 12x20, control room 10x12. **Mixing Consoles:** Ramsa WR-T820 20x8, Roland M-160 16x2. **Audio Recorders:** Tascam ATR-60-16 16-track 1" w/dbx, 15/30 ips, MCI JH-110A 2-track 1/4", Sony PCM 2500 DAT, Fostex E-2 1/4" time code. **Cassette Recorders/Duplicators:** (2) Tascam 122B. **Synchronization Systems:** (2) Adams-Smith Zeta-3 audio/video/MIDI with remote autolocator. **Echo, Reverb & Delay Systems:** Roland SRV-2000, Roland SDE-3000, Roland DEP-5, MICMIX Super C reverb. **Other Outboard Equipment:** Orban 622B parametric EQ, (2) UREI LA-4 compressor/limiter, Orban 245F stereo synthesizer.

—LISTING CONTINUED ON NEXT PAGE

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World Radio History

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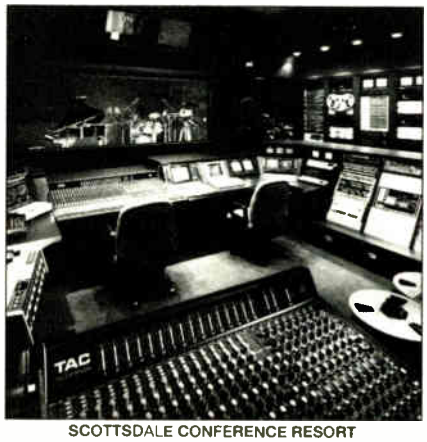
Microphones: AKG C-414EB, AKG C-33 stereo, (2) AKG C-451, AKG D 202, (2) Sennheiser MD-421, E-V RE20, Shure SM57, Shure SM58, Neumann U47. **Monitor Amplifiers:** BGW 250C. **Monitor Speakers:** JBL 4312, Auratones. **Musical Instruments:** Vintage guitars, various synthesizers available. **Other MIDI Equipment:** Epson Equity w Roland MIDI interface, Sequencer Plus. **Video Equipment:** JVC CR 8250 3/4" editor, JVC CR 6650 3/4" source recorder, JVC RM-86 edit controller, JVC BR-8600 VHS editor, JVC BR-6400 VHS source recorder, (2) Sony CVM 1270/1271 monitor, Fast Forward F-200 time code generator/charactor inserter, ICM VC 2000P Proc. amp, Sony DXC-1800 camera. **Other:** Full CD sound effects library and production music library.

[16] RISING STAR RECORDING; *also REMOTE RECORDING*; **655 N. Berry, Ste. I; Brea, CA 92621; (714) 671-7815. Owner:** Rudy Ising.

[16] ROLLTOP STUDIO; PO Box 17203; San Diego, CA 92177; (619) 571-5031. Owner: Tim Coffman **Manager:** Tim Coffman

[16] ROTUND RASCAL RECORDING; 5654 Natick Ave.; Van Nuys, CA 91411; (818) 901-9636. Owner: Dave Pearlman. **Manager:** Dave Pearlman



SCOTTSDALE CONFERENCE RESORT
Scottsdale, AZ

[16] SCOTTSDALE CONFERENCE RESORT; *also REMOTE RECORDING*. **7700 E. McCormick Pkwy.; Scottsdale, AZ 85258; (602) 991-9000. Owner:** Scottsdale Conference Resort. **Manager:** Brian Court **Engineers:** Brian Court, John Haro, Mike Floor, Martin Dempsey, Terry Baker. **Dimensions:** Studio 21x26, control room 20x18 **Mixing Consoles:** TAC Scorpion 24x16, TAC Scorpion 16x8, Soundcraft 600 16x8, Tascam M5 8x4. **Audio Recorders:** Otari MX 70 16 track, Otari MTR-12 2-track w/center track time code, Otari 5050 MkIII 2-track, Otari 5050B 4-track, (2) TEAC 3440 4-track. **Cassette Recorders/Duplicators:** (2) Tascam 122, Nakamichi MR-1, Tascam 234 4-track, Tascam 133 3-track. **Noise Reduction Equipment:** (8) dbx 150X Type I. **Synchronization Systems:** (2)Adams-Smith 2600 synchronizer, Adams Smith LTC writer, Adams-Smith reader **Echo, Reverb & Delay Systems:** Lexicon PCM42, Yamaha REV7, Eventide H949, (3) Yamaha SPX90, Lexicon 200 **Other Outboard Equipment:** (3) Gatex noise gate, (3) dbx 166 compressor/limiter, Symetrix 522, Scamp rack, Aphex II Aural Exciter, Studio Technologies AN-Z stereo simulator, (20) dbx 903 compressor/limiter, (3) Klark-Teknik DN360 graphic equalizer, (4) dbx 904 parametric equalizer, dbx 902 de-esser, (3) Rane 10-band equalizer. **Monitor Amplifiers:** (6) Crest 3000 **Monitor Speakers:** (2) JBL 4430, (2) Tannoy SRM-12B, (8) JBL 4401, (2) Auratone SC. **Musical Instruments:** (2) Steinway 6'6" grand piano. **Video Equipment:** Grass Valley 16001L switcher, Grass Valley DPM-100 digital effects processor, Grass Valley model 100 switcher, Convergence 204 editor, Sony BVU-950 recorder, Sony BVU-920 DT recorder, (3) JVC CR-850U recorder, (3) Sony 5850 recorder, Quantafont QC6-500 graphics, Ikegami HL 79 OAL camera, Ikegami ITC-730 camera, (3) Sony DXC M7 camera. **Other:** (30) multi-image projections, 7 watt Argon laser system, complete darkroom. **Specialization & Credits:** Specializing in original music composition, commercial production, audio/visual soundtracks, post-production audio-for-video and voice-over production. Also complete video production and industrial multi-image staging. Located in luxurious resort setting with golf, tennis, complete health spa and fitness center and easy access to Sunbelt activities.

[16] SOUND FACTORY; *also REMOTE RECORDING*; **1807 Post Oak Ln.; Carrollton, TX 75007; (214) 394-4515. Owner:** Steve Garrett. **Manager:** Steve Garrett.

[16] SOUNDGRAPHICS; PO Box 91133; Long Beach, CA 90809; (213) 498-9135. Owner: David Eastly. **Manager:** David Eastly.

[16] SPECTRUM STUDIO; *also REMOTE RECORDING*; **664 Camino Campana; Santa Barbara, CA 93111; (805) 967-9494. Owner:** Don Ollis.

THETA SOUND STUDIO
Burbank, CA

[16] THETA SOUND STUDIO; *also REMOTE RECORDING*. **Burbank, CA 91506; (818) 955-5888. Owner:** Randy Tobin. **Manager:** Cyndie Tobin. **Engineers:** Randy Tobin, Jim Latham. **Dimensions:** Studio 20x20, control room 16x16. **Mixing Consoles:** Ramsa 80x16x2. **Audio Recorders:** Tascam MS-16 16-track w/autolocator, Tascam TSR-8 8-track, Tascam 44 4-track, Technics 1520 2-track, (2) Aiwa Excelia XD001 DAT, Sony PCM-501ES digital processor, Sony SLHF-900 Beta Hi-fi VCR, JVC HD750 VHS Hi-fi VCR. **Cassette Recorders/Duplicators:** Aiwa 660, Aiwa 770, Aiwa 990. **Noise Reduction Equipment:** dbx 28 channels. **Synchronization Systems:** Fostex 4030/4035 SMPTE, Hybid Arts SMPTE Track II. **Echo, Reverb & Delay Systems:** Lexicon PCM70, Roland SRV 2000, Yamaha REV7, Yamaha SPX90, Lexicon LXP-5, Alesis Quadraverb, Korg and MXR digital delays. **Other Outboard Equipment:** dbx, MXR, Symetrix, Valley People Dyna-Mite limiters, Aural Exciter, Mesa Boogie studio pre-amp for guitars. **Microphones:** AKG tube, AKG 414, Countryman Isomax, Shure SM57, Electro-Voice RE20. **Monitor Amplifiers:** Kenwood high-speed DC, Rane HC6 headphones. **Monitor Speakers:** JBL 4301B, Yamaha NS-10M, Auratone C5, Sennheiser HD-414, Fostex headphones. **Musical Instruments:** Roland R-8 drum machine, Yamaha C5 grand piano w/Forte MIDI module, Roland S-50, Roland S-550, Ensoniq Mirage sampler systems w/extensive library, Roland D-50, Roland Jupiter-8, Yamaha DX7, Casio CZ-101, Roland MKS-20 piano module, Korg M3R module, Casio CZ101, Roland 505, Slingerland drum set w/Camco snare, Tama hardware, Zildjian and Paiste cymbals, assorted percussion. **Other MIDI Equipment:** Atari mega 2 ST w/Hybrid Arts SmpteTrack II Gold software, 16x24 MIDI patch matrix. **Video Equipment:** JVC 850 3/4" editing recorder, JVC 600 3/4" recorder, JVC RM86U editor, JVC TM9U monitors, Sansui VX-99 special effects generator **Rates:** Call for rates. **Specialization & Credits:** Services: 16/8/4/2-track recording; 2-track digital recording/mastering; MIDI sequencing/recording; SMPTE lock-to-video/audio, tape editing; reel-to-reel and cassette duplication; engineering, mixing/sweetening; vocal elimination process; studio musicians; complete arrangement and production. Art department: Professional typeset cassette labels; typesetting and graphic design for cassette J-card inserts, cassette plates, compact disc packaging, album cover and sleeves, resumes and lyric sheets. Live and mobile: Live sound systems for 50 to 5,000 people; remote recording on 2- to 24-track. Classes and consultation: Understanding recording for singers and musicians; synthesizers, drum machines and MIDI private consultation and locacation engineering. Recent Talent: Dick DeBenedictis, Dale Gonyea, White Collar Boyz, Charlie Fleischer, Patrik Shooting Star, Harvey Kubernik, Rodney Dangerfield, Yve Evans, VIACOM television, Capitol Records, Mary Jo Catlett, ESPN, Playboy, Val Kilmer. Motto: An environment where you can do your best.

[16] WAVETECH RECORDING; *also REMOTE RECORDING*. **2727 Skyway Dr.; Santa Maria, CA 93455; (805) 925-4244; FAX: (805) 922-6933. Owner:** Rob Ibsen.

[16] WEST L.A. SWEAT SHOP; PO Box 91392-2200; Sylmar, CA 91392; (818) 367-8642. Owner: Bob Saldan. **Manager:** Bob Saldan.

World Radio History

See Page 184 for Reader Service

Southern California Hawaii ♦ Southwest

2-, 4- & 8-track studios

[8] AFTERHOURS RECORDING CO.; *also REMOTE RECORDING;* **1616 Victory Blvd., Ste. 104; Glendale, CA 91201; (818) 246-6583; FAX: (818) 240-1286. Owner:** William Berkuta. **Manager:** William Berkuta. **Engineers:** Bill Berkuta. **Dimensions:** Room 1: studio 13x15x24, control room 12x12. Room 2: studio 12x12 1/2, control room 9 1/2x10 1/2. **Mixing Consoles:** (2) Tascam Model III 8x4x2, OpAmp Labs ARC II 4x4x2. **Audio Recorders:** Tascam 80 8-track, Tascam 38 8-track, TEAC A-2340-SX 4-track, Otari MX-5050 BII 2-track, Ampex 300 3- & 4-track 1/2" and 2-track editing 1/4". Ampex 350 2-track editing. **Cassette Recorders/Duplicators:** (11) TEAC R505 real-time dup., TEAC V515X w/Dolby B and dbx, Technics M222, Technics SV-DA10 DAT. **Noise Reduction Equipment:** Tascam/dbx DX-8, (2) Tascam DX4D. **Echo, Reverb & Delay Systems:** DeltaLab Effectron II ADM 1024 digital delay, Lexicon PCM60 digital reverb. **Other Outboard Equipment:** dbx 166 compressor/limiter/gate, 12-band stereo EQ, 10-band stereo EQ. **Microphones:** (2) Neumann KM84, (3) Sennheiser MD-421U5, (2) Crown PZM, (2) AKG D-190E, (2) AKG D-1000E, Shure 300 bi-directional ribbon, Sennheiser KZU shotgun. **Monitor Amplifiers:** (2) Crown Power Line One. **Monitor Speakers:** (2) Tannoy, (2) JBL 4310. **Musical Instruments:** Casio RZ-1 drum machine, Casiotone 202 synth, Crumar Performer, Estey upright grand piano, Ibanez "Les Paul" copy 6-string, Yamaha clarinet, violin. **Specialization & Credits:** Music demo recording; theatrical sound design and consultation; commercial voice tape production, radio drama production, radio and film voice-over production, audio cassette mastering. Flexibility, effectiveness and cooperation are the key elements at Afterhours, where resident producers are available to help you realize your project.

[8] AMBIENT SOUND PRODUCTIONS; 2733 NW 12th St.; Oklahoma City, OK 73107; (405) 949-1602. Owner: Doug Matthews. **Manager:** Doug Matthews.

[2] AUDIO CASSETTE DUPLICATOR CO.; 12426 1/2 Ventura Blvd.; Studio City, CA 91604; (818) 762-2232; FAX: (818) 508-8077. Owner: Steve Katz/Steve Mitchell. **Audio Recorders:** Ampex ATR 100 2-track, TEAC 7030 2-track. **Cassette Recorders/Duplicators:** (24) Yamaha K-2000, (2) Sony 2500 DAT, Panasonic 3700 DAT, Sony PCM 1610 Digital, Sony PCM F-1, (2) Sony hi-speed 'in-cassette.' **Noise Reduction Equipment:** Dolby A, dbx Type 1. **Monitor Amplifiers:** Hafler. **Monitor Speakers:** (2) JBL 4311. **Other:** Computerized labels.

[8] AUDIO VIDEO RECORDERS OF ARIZONA INC.; *also REMOTE RECORDING;* **3830 N. 7th St.; Phoenix, AZ 85014; (602) 277-4723; FAX: (602) 274-7416. Owner:** Mark Temen. **Manager:** Tim Ramsey.

[8] BARZO PRODUCTIONS; *also REMOTE RECORDING;* **PO Box 4872; Albuquerque, NM 87196; (505) 255-3225. Owner:** Renzo Giromini. **Manager:** Barbara Sue Rosen.

[8] BROWN SPOTS INC.; 1703 Main; North Little Rock, AR 72114; (501) 791-2111; FAX: (501) 791-2329. Owner: Bob Brown. **Manager:** Brad Sweeney.

[8] CAL-MEX MUSIC; 328 N. Newport Blvd., Ste. 479; Newport Beach, CA 92663; (714) 631-2067; FAX: (714) 631-2067. Owner: William & Paige Price. **Manager:** Tito.

[8] CARDINAL RECORDING; *also REMOTE RECORDING;* **623 Calle Tulipan; Thousand Oaks, CA 91360; (805) 493-2718. Owner:** Tom Boyce, Matt Schaffer. **Manager:** Tom Boyce, Matt Schaffer.

[8] CREATIVE PRODUCTION STUDIOS; 7744 Aura Ave.; Reseda, CA 91335; (818) 993-4643. Owner: Kevin E. McGettigan. **Manager:** Kevin E. McGettigan.

[8] CRYSTAL RECORDING STUDIOS; 2307 Brandon Rd.; Bryant, AR 72015; (501) 847-8215. Owner: Ray and Karen Brooks. **Manager:** Ray Brooks.

[2] DIGIPREP (DIGITAL MASTERING); 1425 N. Cole Pl.; Hollywood, CA 90028; (213) 461-1709; FAX: (213) 461-8890. Owner: Dan Hersch/Warren Salyer

[8] GILLETTE RECORDING SERVICES; *also REMOTE RECORDING.* **255 N. El Cielo Rd., Ste. 466; Palm Springs, CA 92262; (619) 323-6073. Owner:** Richard Brown Jr. **Manager:** Richard Brown Jr.

[8] JAGS ENTERTAINMENT; *also REMOTE RECORDING* **PO Box 935; Captain Cook, HI 96704; (808) 323-3315. Owner:** Eric Jaeger. **Manager:** Eric Jaeger

[8] J.A.M. STUDIO & MUSIC; *also REMOTE RECORDING.* **221 N. Main; Elk City, OK 73644; (405) 225-5530. Owner:** Curtis Morgan. **Manager:** Curtis Morgan.

[8] MUDSHARK RECORDING STUDIO; Rte. 4, Box 882-B; (near) Flagstaff, AZ 86001; (602) 774-7533. Owner: Phil Gall **Manager:** Phil Gall.

[8] RAPA SOUND; *also REMOTE RECORDING;* **Box 1017; Jerome, AZ 86331; (602) 634-9607; FAX: (602) 634-2518. Owner:** Walter Rapaport. **Manager:** Walter Rapaport

[8] STUDIO M PRODUCTIONS; 8715 Waikiki Station; Honolulu, HI 96830; (808) 734-3345; FAX: (808) 734-3299. Owner: Mike Michaels C.A.S. **Manager:** Hugo Buehrig.

[8] TEMPEST RECORDING; PO Box 1007; Tempe, AZ 85281; (602) 968-9506. Owner: Clarke Rigsby, Andy Baade

[4] TRICKS AUDIO/VIDEO PRODUCTIONS; PO Box 822732; Dallas, TX 75382-2732; (214) 380-7418. Owner: Edd Bonner.

[8] UNREEL SOUND; *also REMOTE RECORDING.* **PO Box 426, Rt. 1 Box 156; Decatur, TX 76234; (817) 62-SOUND; FAX: (817) 627-1004. Owner:** Barry Eaton, Kenneth Wilson **Manager:** Barry Eaton.

[8] XANDOR RECORDING—WEST; *REMOTE RECORDING only,* **2554 Booth Rd.; Honolulu, HI 96813; (808) 533-6095. Owner:** James Weyeneth. **Manager:** Jim.

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MIX

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World Radio History

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01. ☐Recording Studio (including Remote Trucks)
02. ☐Independent Audio Recording or Production
03. ☐Sound Reinforcement
04. ☐Video/Film Production
05. ☐Video/Film Post-Production
06. ☐Broadcast/Radio/Television
07. ☐Record Co.
08. ☐Record/Tape/CD Mastering and/or Mfg.
09. ☐Equipment Mfg. (including rep. firm)
10. ☐Equipment Retail/Rental
11. ☐Contractor/Installer
12. ☐Facility Design/Acoustics
13. ☐Educational
14. ☐Institutional/Other (please specify)

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2 Please check the ONE category that best describes your job title or position:

15. ☐**Management**-President, owner, other manager, etc.
16. ☐**Technical & Engineering**-Engineer, editor, design engineer, etc.
17. ☐**Production & Direction**-Producer, director, etc.
18. ☐**Sales & Administration**-Sales representative, account executive, etc.
19. ☐**Artist/Performer**-Recording artist, musician, composer, and other creative functions
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3 Please check the statement below that best describes your role in the purchasing of audio, video and musical equipment, supplies and/or services:

21. ☐Recommend the purchasing of a product or service
22. ☐Specify makes, models or services to be purchased
23. ☐Make the final decision or give approval for purchase
24. ☐Have no involvement in purchasing decisions

4 What is your company's annual budget for equipment, supplies and services? (check one)

25. ☐Less than $50,000
26. ☐$50,000-$149,999
27. ☐$150,000-$249,999
28. ☐$250,000-$499,999
29. ☐$500,000 or more

5 This inquiry is for: (check one)

30. ☐Immediate purchase
31. ☐Files/future purchase

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33. ☐Recording studio/Production facility
34. ☐Audio/Video retailer
35. ☐Newsstand
36. ☐From a friend or associate

7 In which of the following locations does your audio/video production take place? (check all that apply)

37. ☐Commercial (Public) Production Facility
38. ☐Private (Personal) Production Facility
39. ☐Corporate or Institutional Facility

001	031	061	091	121	151	181	211	241	271
002	032	062	092	122	152	182	212	242	272
003	033	063	093	123	153	183	213	243	273
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005	035	065	095	125	155	185	215	245	275
006	036	066	096	126	156	186	216	246	276
007	037	067	097	127	157	187	217	247	277
008	038	068	098	128	158	188	218	248	278
009	039	069	099	129	159	189	219	249	279
010	040	070	100	130	160	190	220	250	280
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014	044	074	104	134	164	194	224	254	284
015	045	075	105	135	165	195	225	255	285
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017	047	077	107	137	167	197	227	257	287
018	048	078	108	138	168	198	228	258	288
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007	037	067	097	127	157	187	217	247	277
008	038	068	098	128	158	188	218	248	278
009	039	069	099	129	159	189	219	249	279
010	040	070	100	130	160	190	220	250	280
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012	042	072	102	132	162	192	222	252	282
013	043	073	103	133	163	193	223	253	283
014	044	074	104	134	164	194	224	254	284
015	045	075	105	135	165	195	225	255	285
016	046	076	106	136	166	196	226	256	286
017	047	077	107	137	167	197	227	257	287
018	048	078	108	138	168	198	228	258	288
019	049	079	109	139	169	199	229	259	289
020	050	080	110	140	170	200	230	260	290
021	051	081	111	141	171	201	231	261	291
022	052	082	112	142	172	202	232	262	292
023	053	083	113	143	173	203	233	263	293
024	054	084	114	144	174	204	234	264	294
025	055	085	115	145	175	205	235	265	295
026	056	086	116	146	176	206	236	266	296
027	057	087	117	147	177	207	237	267	297
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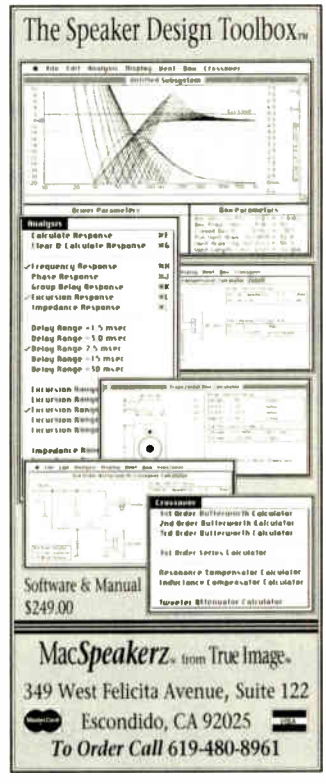

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World Radio History

FEEDBACK

Another Rave For the A/D 64X

I very much enjoyed the "Field Test" (May '91) of the five A/D converters. The article confirmed what I had found by experience—the A/D 64X by Singular Solutions is a very fine unit at a remarkable price. I have used it for more than a year as the front end of a NeXT computer editing system, working on projects ranging from modern classical music to spirituals to Dixieland jazz, and have been quite pleased with the sound quality. In fact, the collection of sacred harp vocal music we edited on the system has recently been named as one of the 30 best folk recordings of the year by the Library of Congress.

Barry Hufker
Hufker Recording
Florissant, MO

Hearing Is Believing (Maybe)

I find that "Five Outboard A/D Converters," in the May 1991 issue, sheds a lot of indirect light on the golden-eared audiophiles of the "Absolute Sound" school who have been such contentious critics of digital audio since its inception. First, let me acknowledge their substantial contribution to digital audio. To engineers touting the theoretical perfection of digital audio by showing spec sheets that seemed to prove that near-perfection had been achieved in practice, they countered by saying, "But it sounds bad," and they were often right. There are many, many potential flaws in digital audio systems that can cause them to fall short of their theoretical high quality, and it's beneficial to keep looking for these and eliminating or reducing them. But, at times, the golden-eared Absolute Soundies have become prima donnas, issuing unverifiable pronouncements based on their subjective evaluations.

The most revealing part of your article is in the box entitled "The Question of Digital Transfers" (page 85). In that box, Bob Hodas states that he and Paul Stubblebine noticed that after digitally copying their digital recordings from the Dyaxis workstation to a PCM-1630 and back, sonic degradation had occurred: "...some of the life and air was gone and the stereo soundstage had collapsed a bit."

I find this extremely hard to accept. What could cause this? I think that the authors are simply imagining this phenomenon; it's all in their minds. All of us in audio have had the experience of "hearing" something that really wasn't there: a little hum or distortion or a wrong note or imbalance that, upon sufficient re-listening, turns out *not* to be actually present.

There is a good way to resolve this issue: for those who claim they can hear the difference between generations of digitally copied sound data to participate in a blind test, administered by a neutral third party. The test would consist of playing, 100 times or so, an original and a restored sound file, selected randomly each time, and asking the participants to say if the file is the original or the copy. I'd like to see any one of the participants make the correct identification a statistically significant portion of the time.

Dean Wallraff
Burbank, CA

Looking For a Good Reproducer?

I applaud your DAT listening test ("Multiple DAT Copies" by Jim Paul, March 1991), which asks the basic question all of us have been asking for our entire careers: "How good is this reproducer?"

Regarding digital audio, only in recent times have we allowed ourselves as an industry to admit (after the marketing stops) that digital is not perfect, first generation or cloned twentieth (as was previously claimed). We know that D-to-D copies are affected by dropouts, misread numbers, conversion errors, and even circuit stability, just to name a few. And it was not too long ago that some very important expounders of digital were telling engineers that the reason their tapes (in mastering) sounded harsh and dry was because the engineers never really heard what the mix actually sounded like.

While I find current digital machines to have too much distortion, phase shift, and unacceptable low-level retrieval, digital is the future and it's not without its merits (as a concept). We all *have* to use it as an end-product, and demanding better quality far exceeds mere complaining or boycotting the medium.

Your test is a step in the right direction, but I would like to suggest that its basic formula could be improved. You seemed surprised at the results, results which were probably predictable. Getting back to the basic question of how good is the reproducer, the test left out the most important element—the original source.

Michael Verdick
Monday to Sunday Studios
Burbank, CA

[In the next issue of Mix, *we will present an objective study by Dr. Toby Mountain of digital-to-digital copies. Stay tuned. —Ed.]*

Corrections

The "International Update" section of our July issue reported on the installation of a Neve VRP-60 console, but unfortunately listed the wrong studio. The VRP-60 is actually in Hong Kong's Media Sound Studio, owned by Media Business Services, Ltd.

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See Page 184 for Reader Service

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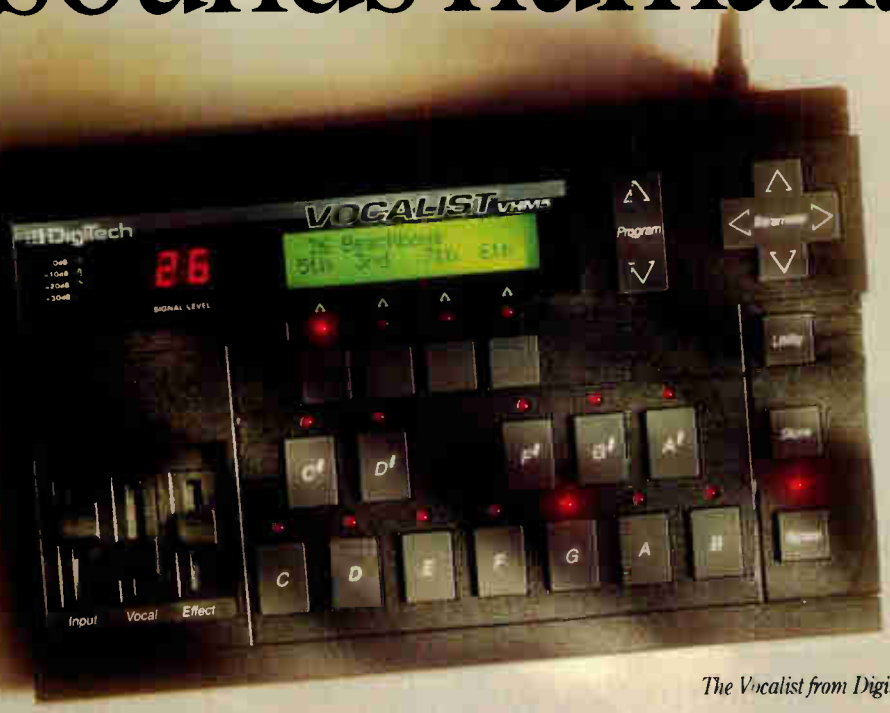

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