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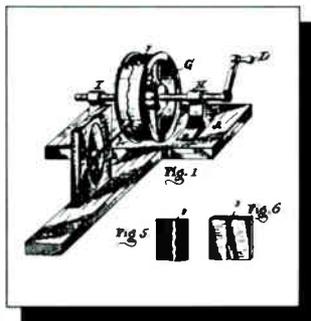
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As they say in the song, "Everything old is new again!" And so it is with *Mix* magazine, your old friend who this month turns 10 years old. On this auspicious occasion we weren't quite sure what to get ourselves. But then we figured, how about some new clothes? In fact, how about a whole new wardrobe?! And so, what you see before you, dear readers, is the old *Mix* in a brand new set of threads.

New cover, new logo, new typeface, new layouts; geez, you probably didn't even recognize us at first. But don't think we've sold out and gone to Tahiti on you. No, unfortunately, we're all still holed up here in Berkeley, trying to bring you all the best that we can find to write about each month.

Another reason for this new wardrobe is in honor of what *you* are doing. Ten years ago when we were in the crib, you were making demos and records, and a few jingles now and then. Today, you are into all kinds of things—television, home video, computers, sampling and on and on. You've changed, you've expanded, you've succeeded. Your needs are different.

To celebrate this first double digit, we've got a few more surprises for you—some great new authors and contributors; new information services from *Mix* that will quantify the industry to your various needs, whether for building your growth plan or for providing financial documentation. Also, there's a new version of the *Mix* Bookshelf which includes a comprehensive selection of computer software, as well as the industry's largest selection of reference tools.

So write in and let us know what you think of the changes. We may look a little different, but we're still The Recording Industry Magazine—and a whole lot more.

Keep reading.

David M. Schwartz
Editor/Publisher



CURRENT

AIM Announces Early CD-I Titles

American Interactive Media, Inc. (AIM) has been working with Parker Brothers, the Smithsonian Institute and Interactive Production Associates (IPA) to develop several new programs for CD-I systems.

Parker Brothers, best known for its family board games, and more recently for its innovative work with VCR games, has signed an agreement with AIM to explore development of games for use on CD-I systems, making it the first game company to participate in exploration of games for the new medium. CD-I systems for household use are expected to be introduced by Christmas 1988.

Parker Brothers also announced that, with AIM, it is exploring the possibility of converting titles for Compact Disc Video (CDV), which differs from CD-I in that it offers continuous action video, but not interaction.

Selected Smithsonian publications will soon be available to the public as CD-I programs under a new publishing agreement between AIM and the Smithsonian Institute. The first volume is scheduled to be available next year. Over time, AIM and the Smithsonian plan to build a CD-I program library of publications.

Interactive Production Associates (IPA), the Santa Monica-based producer of interactive videodisc programs, recently completed production of a compact disc for AIM. The CD is designed to demonstrate the audio characteristics of each of CD-I's four levels of encoding. The samples include seven languages, single musical instruments, full orchestration and a range of sound effects. Each piece can be played at all four levels for the purpose of compari-

son. The disc is targeted at audio industry professionals, and will be released later this year.

AMC Consumer Study

Reports on the results of adult consumer research, 1986 music industry statistics and publicity activities to promote and encourage active music-making highlighted the American Music Conference's (AMC) recent board of directors meeting in Chicago.

According to AMC's annual statistical review of the U.S. music industry, total retail value of traditional and electronic musical instruments and accessories, printed music and sound reinforcement equipment jumped 24% in 1986 to break the \$3 billion mark. The increase, the second largest percentage growth in

40 years of AMC statistical reporting, brought 1986's total retail value to nearly \$3.35 billion.

Shipments of electronics—keyboards, guitars, accessories and related equipment—exceeded \$1.5 billion in 1986, representing 46% of total manufacturer sales at retail value. Leading the field were portable keyboards, which more than doubled in dollars to \$526.5 million and rose 92% in units to 2.5 million.

Synthesizers (keyboard and drum-type combined) posted a nearly 60% increase in both dollars and units compared to the previous year. The electric piano/electronic keyboard category rose 40% to 84,000 units valued at \$134.4 million (a 29% increase).

—CONTINUED ON PAGE 222

Mix Industry Market Survey

On June 1, *Mix* completed an extensive market survey of the professional recording and sound production industry. The survey, conducted by Globe Research Corp. of Melville, NY, is the largest and most comprehensive study of pro audio magazine subscribers to be conducted by an independent research firm. According to Hillel Resner, *Mix* associate publisher, "The survey was conducted in accordance with strict research standards, and because of the large numbers of *Mix* readers in all areas of recording and audio/video production, we consider it to be both an accurate and significant market study."

The *Mix 1987 Recording and Production Industry Market Survey* covers three main areas: The People and Companies Involved; Capi-

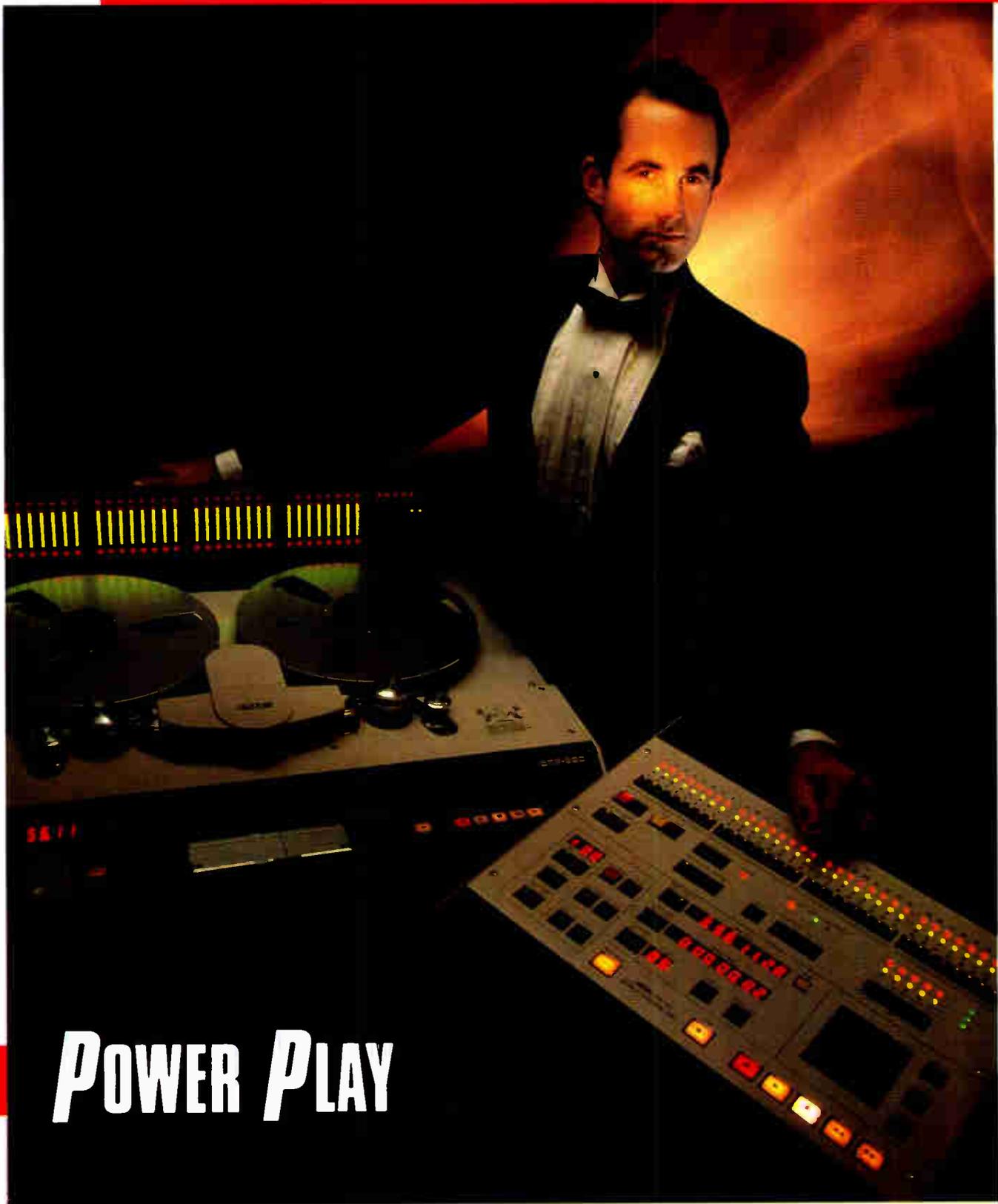
tal Expenditures/Product Usage; and Magazine Readership and Influence. Some of the more interesting highlights reveal the strength and diversity of the audio/video/music production marketplace.

Expenditures On The Rise

- Industry expenditures for equipment, supplies and services are at record levels. Nearly one-third of all companies (29.2%) spent more than \$50,000 in the past 12 months, and nearly 10% (9.20%) spent over \$250,000.

- One-third of all companies (33.5%) expect to spend more during the next year on equipment, supplies and services, and 45% expect to spend at least as much as last year.

—CONTINUED ON PAGE 8



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Equipment Ownership/ Purchasing Strong

• Analog tape recorders remain dominant: 87% of *Mix* subscribers and their companies own analog tape machines of various configurations, and 34.5% purchased analog recorders in the past 12 months.

• Eighty-three percent own mixing consoles, with 77.8% owning recording/production consoles and 30.3% owning mixers for sound reinforcement. (Figures add to more than 100% due to multiple ownership.) Twenty-three-and-a-half percent purchased consoles in the past 12 months.

• Ninety-one percent own "other audio equipment," with 86.3% owning microphones, 84.9% owning loudspeaker systems, 79.8% owning power amps, 52.7% owning digital reverbs and 48.1% owning noise reduction systems.

• During the past 12 months, 41.2% of subscribers and their companies purchased "other audio equipment." (Eighteen types of equipment were included in this category, and complete results, including average number of each type owned, are included in the survey report.)

Digital Ownership Growing

• Ownership of digital recorders is increasing: 19.4% of those surveyed currently own some type of digital recorder, including 9.9% owning "consumer grade recorder/processors," 8.2% owning digital 2-track and 2.4% owning digital multi-track machines.

• "Non-tape digital recording systems" are owned by 4.1% of those surveyed.

• In the past 12 months, 7.4% of subscribers' companies purchased digital recorders in one of these categories.

Audio/Video Merger Continues

• *Mix* subscribers and their companies have substantial investments in video production gear, with 42.2% owning some type of video/film equipment. This is both a clear indication of the growth of the audio-for-video market and the readership of *Mix* among video/film professionals.

• One-third (33.1%) of *Mix* subscribers' companies own ¾-inch

video recorders, 27.9% own video cameras and 34.9% own video monitors.

• One-inch video tape recorders are owned by 13.6% and video editing equipment by 21%.

• Among all companies, 10.6% purchased video equipment in the past 12 months, with 24.5% of video/film companies doing the same.

MIDI Well-Entrenched

• Currently, 36.4% of production facilities have music production or "MIDI" rooms, and 15.2% plan to open such rooms in the next year. Thus, more than half of all facilities will have such rooms in 1988.

• Thirty-two percent of subscribers own computers for musical applications.

• More than half of those surveyed (52.5%) own electronic keyboards or synthesizers.

• Sampling instruments are owned by 30% of those surveyed, and 45% own drum machines.

• Nearly one-third (29.3%) of subscribers purchased musical equipment during the past 12 months.

Company and Personal Income Healthy

• Both *Mix* subscribers and their companies present a strong income profile to match purchasing trends.

• While 53% of companies grossed under \$100,000, 24% had gross revenues of \$100,000 to \$999,000, and 23% grossed \$1,000,000 or more.

• The average audio/video professional who subscribes to *Mix* has a household income of \$53,200. He or she is 34.2 years old and has been involved in audio, video or music production for 10.7 years.

Diversity is the Name of the Game

• *Mix* subscribers and their companies span the entire spectrum of audio, video and music production. They average 2.3 business activities per company (a fact also verified by *Mix*'s BPA circulation audit).

• Fifty-three-and-a-half percent of companies are recording studios; 20% are in video/film post-production; 19.5% are in broadcasting; 19.9% are in sound reinforcement; 18.6% are in video/film production; and 13.6% are record/production

—CONTINUED ON PAGE 222

A LETTER FROM THE PUBLISHERS

Ten years ago this summer, a tabloid-size magazine called *The Mix* made its first appearance in recording studios in Northern California. Our fledgling effort was mainly a directory of recording services in the area, with a few articles offering helpful hints written by recording industry professionals. Today, *Mix* magazine is the most widely read pro audio publication in the world. *Mix* still contains the most detailed and up-to-date directories, but it has also grown to become the leading information source for the ever-changing audio and media production industries.

One reason that *Mix* has been so successful, we believe, is that we came to this endeavor not as magazine publishers, but as people involved in recording and sound who genuinely cared about the field and wanted to learn more about it. We constantly asked ourselves, "What kind of information would *we* like to read?" and we keep asking that question every day. This desire for knowledge has kept *Mix* vital and growing, and has also led us to a number of new enterprises: *Electronic Musician* magazine, *Mix* Bookshelf, the TEC (Technical Excellence & Creativity) Awards and the *Mix Annual Directory*.

In a real sense, our efforts over the past decade reflect the success of the industry we serve. The incredible growth and creativity evident in every aspect of audio and video production provides more than enough inspiration to keep the magazine evolving. So on our tenth anniversary, we wish to extend our sincere thanks to all of you for allowing us to grow with you—to the hundreds of companies which have supported us by advertising in the magazine; to the writers who have provided the flow of information for us to pass along; to the dozens of hard-working and genial people who have served on our staff over the last ten years; and especially our readers, who gave us a purpose. Without your support, encouragement and loyalty, this crazy adventure in journalism never would have made it past the first issue. Thank you for making our milestone possible.

The Publishers of *Mix*



Mix Bookshelf has become the industry's largest source of books, tapes and software dealing with all aspects of production.



Electronic Musician, edited by Craig Anderton, is the first magazine dedicated to electronic instruments and the applications of computers in music.



Mix magazine's TEC Awards is the industry-wide program to honor individuals, companies and products for technical and creative achievement.



The *Mix Annual Directory* is the compendium of *Mix*'s monthly directories with important market data and statistics.

INDUSTRY NOTES

The **Recording Industry of America, Inc.** announced the relocation of its headquarters to 1020 19th St., NW, Ste. 200, Washington, DC 20036, tel. (202) 775-0101. The RIAA also appointed **Jason Berman** as president . . . The **Andre Perry Group**, an international communications company whose holdings include **Le Studio** and **Premiere Television**, announced the acquisition of **Positive Video**, a teleproduction company with facilities in Orinda and San Carlos, CA. . . **NEOTEK Corporation** of Chicago announced the appointments of **Susan Gosstrom** and **David Ruttenberg** to the positions of sales manager and director of marketing, respectively. NEOTEK also appointed **Oliver Masciarotte** as its new production manager. Masciarotte has worked as a staff engineer at Criteria Recording Studios, lectured at the University of Miami School of Music (FL), and has been a regular contributor to *Mix* magazine. . . **Philips** and **Du Pont Optical Company** have opened their headquarters at 1251 Avenue of the Americas, New York, NY 10020. The office, headed by **Jack Kiernan**, will be concerned primarily with the marketing and sales of compact discs and compact disc videos. PDO is a 50-50 joint venture formed to develop, manufacture and market optical discs for all audio, video and data markets. . . **Curtis Chan** has joined **Centro Corp.**, of Salt Lake City, UT, as vice president of marketing and product development. Centro is a facilities builder of broadcast trucks, telecommunications complexes and production studios. . . **Valley International, Inc.** is the new name for Valley People, Inc., company president **Norman Baker** announced in introducing nine new products. The new name reflects the international market of the ten-year-old firm. . . **Jack Soma**, president of **Otari Corporation**, announced that the company has recommenced sales of

Otari's full line of video and audio tape loading, leadering and tailoring equipment in the U.S., following an agreement with **King Instruments** . . . **New England Digital Corporation**, manufacturers of the Synclavier system, plans to build a 60,000-square-foot national headquarters near Hartford, VT. When completed, the complex will house all the company's manufacturing, sales, marketing and administration functions, and employ some 300 people. The company also appointed **Franklin Sullivan** to the newly created position of vice president marketing and sales. . . Great Britain's **Soundtracs Plc** will expand their manufacturing facility in Surbiton, Surrey. . . A new manufacturers' representative company, **Repworks, Inc.**, has been formed by **Ted Curtin**, formerly of Piper Associates, and **Mary Jean Walter**, formerly of ASR Enterprises. The rep company, which will service the New England states, can be reached at (413) 533-0845. . . **Allied Broadcast Equipment** has formed a new division, Allied Broadcast Systems, which will provide engineering support, define user requirements and liaison with manufacturers. . . **Ampex Corporation** appointed **Charles Steinberg** as chairman of the board, succeeding **Arthur Hausman**, who is retiring after 27 years of service. . . **Bill Frazee** has been appointed VP of operations at **Editel/LA**. Editel/NY President **Dan Rosen** named **Rita Sitnick** VP/general manager and **Rod Soodalter** vice president, commercial sales. . . **Fairlight** has dispatched "technical ambassadors," service personnel trained at company headquarters in Sydney, Australia in all aspects of software design, hardware manufacture and service. **Greg Jones** has been sent to England, **Andrew Brent** to the New York office of Fairlight and **Chris Pearce** is newly stationed in Los Angeles at the U.S. head office. . .

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SESSIONS AND STUDIO NEWS

NORTH CENTRAL

At *Seller Sound Studio* in Sterling Hgts., MI, **Gary Spaniola** mixed a new single for the local group *Bitter Sweet Alley*. . . At *Sparrow Sound Design* in Chicago, **Rich Mendez & Backstreets** recorded two originals for a '45 release on Spectrum records. . . Recording activity at *Studio A*, Dearborn Heights, MI, included **Michael Brooks** and **Fred Hammond** of *Commissioned* producing an album on female gospel artists *Witness*, for Tyscot Records, with engineer **John Jaszcz**, assisted by **Peter Prout**. . . At *Barn Burner Studio* in Annawan, IL, **Dark Crystal** completed their original cassette project for Crystal Records with **Bill Fry** producing, **Harry Heath** engineering and **Michael Morrison** assisting. . . **Melanie Williams** and **Eric Gooden** of *No Sovereign* were in from London at *Chicago Trax* recording and mixing for their upcoming Geffen LP. **Jesse Saunders** was producing with **Ron Gresham** engineering. . . At *Brown & Brown Recording* in Kalamazoo, MI, *Total Control* completed mixdown of their 24-track masters for their self-titled EP. . . At *Seagrape* in Chicago, the hard rock band *Tempter* completed mixes on their four-song tape with **Mike Konopka** engineering. . . Legendary jazz vibist **Johnny Lytle** has been recording a new album at *Rainbow Recording* in Dayton, OH. Guitarist **Doug Simon** is producing and laying the guitar tracks. . . At *Metro Studios* in Minneapolis, **David "Z" Rivkin** has been engineering and producing several projects including *Nu Shooz* and **Germain Brooks** for Atlantic Records. . . At *Solid Sound* in Ann Arbor, MI, jazz artist **David Mann** completed his solo project for Antilles/Island records. **Pat Schneider** was en-

gineer on that project. . . At *Mus-I-Col Studios* in Columbus, OH, **Doug Edwards** engineered **Bernie Allen & The Solicitors'** 12-inch, produced by **Leon Robinson**. . . **The BoDeans** put finishing touches on their as of yet untitled second album at *Royal Recorders* in Lake Geneva, WI. Featuring the studio wizardry of producer **Jerry Harrison** (Talking Heads) the album was engineered by **Jay Mark**. . .

SOUTHEAST

Writer/producer/arranger **Ede** finished recording and mixing four songs at *Reel to Reel Studios* in Stockbridge, GA, for two new artists on the Fresh! label—**Kathy Hill** and **Terry Jenkins**. . . The critically acclaimed *Rainmakers* were in Memphis' *Ardent Studios* cutting tracks for their new PolyGram album. **Terry Manning** was producing and engineering. Also **Carl Perkins** was in working on an album project for B&S Music. . . *Strawberry Skys Recording Studios* in West Columbia, SC were pleased to work with noted producer, guitarist and writer **Steve Cropper** on sessions for *Family Ties* star **Justine Bateman**. Ron Hollins engineered the session. . . At *Criteria Recording Studios* in Miami, FL, jazz great **Eddy Higgins** was in cutting a live-to-2-track digital LP. Engineering was handled by **Mack Emerman**, assisted by **Kurk Berge**. . . At *South Lake Studios* in New Orleans, R&B queen **Irma Thomas** worked with producer **Scott Billington** and engineer **David Farrell** on sessions for her next Rounder Records LP. . . Producer **Jim Brock** was in *Reflection Sound* in Charlotte, NC with new age pianist **Linda James** cutting live-to-half-inch super analog with **Mark Williams** engineering. . . **Willie Nelson**

joined **Glen Campbell** at *Emerald Sound Studio* in Nashville for a duet on Glen's new MCA album, which is being recorded at Emerald. **Jimmy Bowen** is producing the album, with **Ron Treat** and **Tim Kish** engineering. . . At *Cotton Row Recording* in Memphis, **Nikos Lyras** is continuing work on the upcoming *Ella Brooks* LP for Quantum/MCA Records. **Eric Patrick** is assisting. . . Activity at *Southern Tracks Recording* in Atlanta included completion of tracks by the band *Atlanta* for an upcoming project, produced by **Doug Johnson**. . .

NORTHWEST

Warner Bros. recording artists **Michael McDonald** and **The Winans** were at *Avalanche Recording* in Northglenn, CO, cutting vocal tracks for The Winans' upcoming album. It was produced by **Bennie Madina** and engineered by **Craig Burbidge**, with **George Counnas** assisting. . . Musician and sound engineer **Carol Howell** at *Steve Lawson Productions* in Seattle has been selected to score the music for the docudrama *Choices*, which concerns juvenile runaways living on the streets. Howell, who operates the digital sampling MIDI Suite at SLP, is using the Kurzweil digital sampling keyboard extensively. . . At *Triad Studios* (Redmond, WA) Northwest recording artist **Michael Tomlinson** completed his second album project, his first for the Cypress label. M.T. and **Danny Deardorff** produced with **Lary Nefzger** engineering. . . Producer/engineer **Mitch Easter** was in at SF's *CD Studios* recording tracks for the next album by *Game Theory*. **Robert Geller** was the assistant engineer. . . At *Jobbeir 12 Studio* in Los Gatos, CA, **Colby Pollard** and **Bob Ray Creative Services** com-

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pleted production of four new commercials. . . At **Gate Five Studios** (Sausalito, CA) musician/composer **Cory Lerios** completed a series of original music soundtracks for *Max Headroom*, the nationally broadcast television program. **Moira Marquis** engineered. . . In Sausalito, CA **Huey Lewis & the News** were in **The Plant's** Studio B working on the music for their long-form video. Huey and the band produced; engineering was handled by **Robert Missbach** with assistance from **Rob Beaton**. . .

NORTHEAST

Calliope Productions in NYC had the rap group **Stetsasonic** in recording its second album for Tommy Boy Records, with **Ted Sabety** at the console. . . At **Balance Sound Studios** in Bethesda, MD, the **Roadducks** were recording rhythm tracks for their upcoming album. Engineering duties were handled by **John Biehl**, assisted by **Chris Murphy**. **Bill Culver** was producing. . . **Robert Fripp & His League of Crafty Guitarists** were in Philadelphia's **Studio 4** for a live radio broadcast on WMMR. The League consists of 30 musicians all playing exactly the same type Ovation acoustic guitar. . . At **Blank Tapes** in NYC **Timmy Regisford** was in mixing three songs on **Colonel Abrams'** new album, and cutting more basic tracks for MCA Records. **Joe Arlotta** was at the board, with **Mike Weisinger** assisting and overdubbing. Timmy also was in remixing the **Pointer Sisters** for RCA. . . Engineer **Mallory Earl** has been busy at his NY studio, **Duplex Sound**, recording and mixing MCA artist, **Brenda K. Starr**. Brenda cut two songs with **Deodato** producing. . . **Toni Smith** (drummer from Mahavishnu and Jeff Beck), **Yaron Fuchs** and **Gary Rottger** were all in NYC's **Digitel** producing three cuts for **Roberta Rocks**. . . The **Serial Killers** recently recorded their first album at **Mirror Sound Studios** in Cinnaminson, NJ, with producer **Larry Kay**. . . At **W. 55th Street** in NYC producer **Andrew Loog Oldham** prepared the **Rolling Stones Got Live If You Want It** and **More Hot Rocks** for compact disc digital release with **Steve Rosenthal** engineering and **Frank Garfi** assisting. . . At NYC's **Unique Recording** **David Bowie** recorded new material for his upcoming tour. Bowie also finished a Pepsi Cola commercial while at Unique. **Roey**

Shamir engineered. **Angela Piva** assisted. . . A&M recording artists **Squeeze** were captured live at the Ritz, NYC for a live reunion album by **Steven Remote** and his crew for Aura Sonic's **ASL Mobile Audio Unit**. . . **Howard Schwartz Recording** in NYC was called upon to provide synching and audio post on ten television programs recorded decades ago featuring the legendary conductor **Arturo Toscanini**. Engineer **Roy Latham** supervised the massive undertaking, which involved hours of damaged tapes and kinescopes. . .

SOUTHWEST

Activity at **Crystal Clear Sound** in Dallas has seen **Dennis Lee** finishing his second album, *Stages*, with **Tony Wilcox** producing and **Keith Rust** behind the board. . . CBS recording artist **Grover Washington Jr.** was in **Dallas Sound Lab's** Studio A recording his new single release, "Caught a Touch of Your Love" featuring the legendary bluesman B.B. King on vocals and guitar. Engineering the session was DSL's own **Tim Kimsey**. . . The **Otis Conner Companies**, Dallas, completed an original music ID/promotion package for KNX News/Talk Radio, Los Angeles. . . **L.A.W. Recording Studios** in Las Vegas had **B.B. King** back in Studio A to cut more tracks with engineers **Lee Watters** and **Holly Sharpe**. The sessions were co-produced by B.B. King and **Walter King**. . . **Surina & the Daves** worked on 12 songs at **Lone Star Recording** in Austin, TX. The sessions were produced by **Stan Coppinger** and engineered by **Mark Tester**. . .

SOUTHERN CAL

Warner Bros. artist **54-40** mixed their new record at **Post Logic** in Hollywood. **Dave Jerden** engineered, with **Jesse Peck** assisting. Jerden also mixed MCA artist **Will Sexton** at Post. . . Jazz keyboardist/producer **Dan Siegel** was in L.A.'s **Skip Saylor Recording** with **Vinnie Colatuta** and **Abe Laboriel** laying down tracks for Siegel's upcoming CBS/Epic album. **Tom McCauley** engineered with second **Joe Shay**. . . At **Larrabee Sound** in L.A., **Shep Pettibone** remixed **The Bros'** "I Owe You Nothing" on CBS International. **Steve Peck** engineered the project with the assistance of **Elmer Flores**. . . **Albert Lee** was in Hollywood's **Sunset Sound Factory** cutting tracks for a Masters Series album/MCA.

Jim Cox was producing, with **Mark Howlett** engineering. . . At **Craig Harris Music**, Studio City, **Bob Rutledge** and **Bob Newlan** were in doing special sound FX for the hit film *Witches of Eastwick*. . . At **Summa Music Group Studios** in West Hollywood, producer **Jellybean Benitez** recorded synthesizer overdubs on his solo album for Chrysalis and for the veteran R&B band **The Spinners'** cut for Mel Brooks' *Spaceballs* soundtrack. . . Recent activity at **Master Control**, in Burbank, included engineer **Ed Thacker** in mixing the new **Loverboy** album for CBS Records. Assistant for the project was **Dan Nebenzal**. . . At **Mad Dog Studio** in Venice, country roots singer **Rosie Flores** has been cutting her upcoming album for Warner-Reprise Nashville, with **Pete Anderson** producing. **Dusty Wakeman** is engineering with **Michael Dumas** and **Rickey Reynolds** assisting. . .

STUDIO NEWS

At **Presence Studios** in East Haven, CT, the big news is the installation of a new 56-input Solid State Logic 4000E with Total Recall. . . The 9-year-old **Sensa Studio** of Sunnyvale, CA has changed ownership. The new owners are **Doug Hopping** and **Scott Smith**. The new name is **The Recording Studio Inc.** New changes include an Amek Matchless board. . . **Stardust Recording** in upper Montclair, NJ, has installed a Trident Series 24 console. With its 36-input frame short-loaded to 28x24x24, this is the first series 24 installed in any studio in the U.S. . . **Mark Five Studios** and **Sandcastle Recording**, both in Greenville, SC, have merged to form **Mark Five/Sandcastle**, offering full service audio and video production/duplication. . . **Dreamland Recording** in Woodstock, NY has added a Steinway B, along with a Yamaha DX7 IIFD. . . **Sigma Sound** in Philadelphia has completed a major upgrade with a new 52-input Neve 8078 recording console. The console is one of only three of its type ever built. . . **South Coast Recording Studio** in Santa Ana, CA, has recently upgraded its 8-track facility to 16-track by installing the Fostex E-16 along with the Ramsa WR-T820 recording console. . . The pre-production room at Jim Gardiner's **Live Oak Studios** in Berkeley, CA, has gone 24-track, with the recent installation of the MCI-JH24 Recorder and the Sound Workshop 34C console. . .

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A. Designed by Steve Blake, with technical assistance from Boston's Lake Audio, Blackbeard Studios in Lincoln, Rhode Island, features a 50-input Sound Workshop 34C console and a Disk Mix automation system by Digital Creations. Other improvements at the one-time 24-track studio include UREI 813C monitors, powered by Bryston.

B. Forge Recording near Philadelphia has made an impressive upgrade, going from 8-track analog to 24-track digital with the addition of a Sony PCM-3324 recorder and a new NEOTEK 32 x 36 Elite console and Master Mix automation by Audio Kinetics. The 650-square-foot studio also has an Emulator II and other popular instruments and a full complement of outboard gear. The studio has been operating since 1971 and this represents their biggest expansion to date.



CLASS '87

C. This new studio is a 24-track video/post-mixing room located in the Westwood, CA production offices of Atlantic/Kushner-Locke, who are primary suppliers of animation for TV, as well as other syndicated programming. The design and installation, by Larson Technology of Burbank, was particularly challenging because the studio is located on the 24th floor of a high-rise. Featured equipment includes Otari multi-tracks, a Sound Workshop 34C 40-input console, JBL and Auratone monitors, Sony VO-5800 U-matic videocassette recorder and much more.

D. Normandy Sound, the successful Warren, Rhode Island, recording studio, has upgraded to a Solid State Logic SL-4000E/48 with Total Recall, a new Sony/MCI JH-24, and a Lynx SMPTE synchronizer. The studio also boasts on-site accommodations for up to six people.

—CONTINUED ON PAGE 20



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E. With considerable assistance from Manny's Pro Audio, Joe Greenbaum and the staff of Manhattan's Evergreen Recording put together their new Studio B MIDI Control Room. Equipment includes a plethora of keyboards, such as the Kurzweil MIDIboard, two Akai S900s, a Yamaha DX7, DX7IIFD, Yamaha TX816, Roland Super Jupiter/programmer, various drum machines and more. Computers include a Macintosh Plus with hard disk, IBM AT with hard disk, Roland MSQ 100 and 700 and lots of outboard gear. It's also equipped with video sync gear, a Soundcraft 600 console, Tascam, Otari, Sony and Ampex recorders, and an assortment of signal processing equipment.

F. The new MIDI room at Synchro International Studios in San Anselmo, CA, features the TAC Scorpion console and Fostex E16 recorder with 4050 locator, and Sony PCM 601-ES digital recording processor. Keyboards include an Emulator II+HD, units by Roland, Yamaha, Oberheim and Korg, and the studio utilizes a Macintosh computer with Mark of the Unicorn software (with Opcode Interface) for sequencing. Designer was Daniel Ryman.



H. Future Sound, a 24-track studio in San Diego, is the most recently completed project of Lakeside Associates (Irvine, CA). The studio features custom Lakeside/TAD monitoring, an API 40 x 16 x 24 custom console, and variable studio acoustics. The 1,250-square-foot studio has a bright, live sound that is adjustable using sliding mirrored wall panels which can expose up to 480 cubic feet of broadband trapping. This photo shows the performance room.



G. Soundwave, a facility in Washington, DC, recently underwent a major overhaul of its Studio C. Renovations were handled by Chips Davis LEDE Designs and included the installation of a new front shell covered with absorptive Armstrong Soundsoak 85, RPG Diffuser panels to the rear of the NEOTEK Series II console, UREI 809 monitors and Crown Micro-tech 1200 amplifiers. The 16-track studio is primarily used for video sweetening and soundtrack work.

I. Preferred Sound of Woodland Hills, CA, recently designed and built a studio called Pacific Sound in Chatsworth, CA. The spacious, 650-square-foot art deco control room was ergonomically designed for easy access to all outboard gear and accommodation of a multiple-synthesizer setup. The Monster Cable-wired room features a new Amek Angela console and Otari MTR-90 recorder. The room is also equipped with video equipment. The adjoining room is large and very live.



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World Radio History

by Ken Pohlmann

BRAVE NEW STUDIO

It's time for champagne corks and funny cigarettes—the occasion being the tenth anniversary of *Mix* magazine, the most beloved professional audio magazine in this sector of the galaxy except, of course, for *Xluzurb* magazine on Zrptoad, the seventh planet in the Tau Ceti system. The reason, of course, is that when you subscribe to *Xluzurb* you get a full-color holographic projection of the editor's private parts, at no extra cost to you. Besides, the "READ THIS MAGAZINE OR DIE!" law approved by the Zrptoad senate boosts *Xluzurb*'s circulation even more than *Mix*'s Mr. Bonzai. As incredible as that may seem.

Even less noticed, and not really cause for celebration at all, is Ken Pohlmann's fifth anniversary with *Mix*: Believe it or not, he has managed to eke out something for every one of the 60 months in between then and now. A lot of readers such as yourself ask, "Ken, how can you manage to come up with something fresh and original each month, not to mention material which is often funnier than that in the AES journal?"

The answer is easy. I use a 900 number to listen to the pre-recorded messages of Wilhelm Zlotz, the famous psychic and tangled string consultant. At a cost to me of only 50 cents per call, he provides unique insight into audio, as well as travelogues on his regular trips to the planet Zrptoad. Recently, in his June message to Virgos, Dr. Zlotz commented, "Virgos, music is the meaning of your life. Where would we be without music? Would there be life at all without music? I don't think so. There might be slugs, and things like that, but not real people like you and me. I mean, life is like a disco, and

everybody's dancing. Without music, there would still be the lights, and the clothes, and all the people, and haircuts, and everything, but only silence. Well, there would be people talking, and traffic noise, and talk shows on the radios, and accordions, and the voice of Omar, who comes to me in the night. You will take a trip. Thank you very much."

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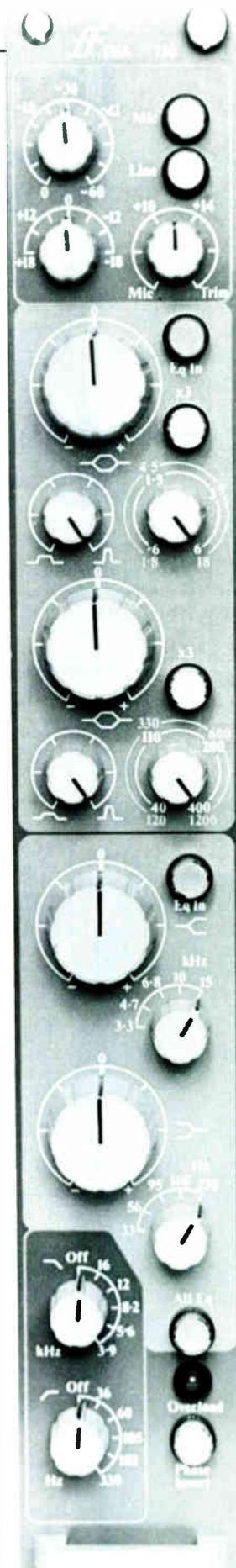
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Also, I steal a lot of my material from the *Congressional Record*. This is OK because ripping off contents of records is a fine American tradition, like drinking too much on your birthday and puking. Besides, few average citizens, such as yourself, realize just how witty, and moreover, filled with in-depth audio backgrounds, your elected poli-

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ticians really are. In fact, I am in close contact with many elected officials, who regularly send me letters such as this:

Dear Ken,

Although my bill proposing that "Digital-Ready" be inscribed on all U.S. coins died on the floor, I have stumbled across something even better for the nation. I have introduced legislation that all recordings have a wide band of frequencies notched out. This would "code" the recordings, making them

sound so bad that no one would be interested in copying them. This, I think, should totally eliminate the serious problem of the theft of Bon Jovi recordings and other intellectual property. Is this genius, or what?

P.S. If you know any more "actresses" in Miami, please send them up to my Georgetown townhouse. I find them most valuable in formulating my "campaign strategy."

Dear Senator,

I think this is a great idea—typical of the kind of thinking that pervades Washington. Not only would such a

law discourage copying, it would also kill off the entire American recording industry as well, the last export market we have left. This would open the floodgates to foreign, non-copy-coded recordings, such as Japanese *karaoke* records. While the beat isn't as good as Bon Jovi's, at least they're in tune sometimes. On the other hand, probably the more stuff CBS notches out of their recordings, the better they'll sound.

P.S. I am sending four "actresses," one for each member of the subcommittee supporting copy-coding. P.P.S. Thanks for all your support on the ERA amendment, you jerk.



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But even with brilliant ideas like copy-coding, it isn't easy coming up with new material each month. Even the editors don't appreciate how tough it is. As if they know what work really is. David Schwartz—he writes the little blurb next to the table of contents each month. Big deal, it probably takes him about eight minutes. Penny Jacob—all she does is give out TEC awards once a year. Hillel Resner—I don't know what the hell he does, in fact I'm pretty sure Hillel Resner is a place. The only guy pushing a pencil up there is George Petersen. George likes to talk about motorcycles. George is OK. Me, I do all the work. If *Mix* is like the sinus of the industry, then my column is like the mucus that holds it all together.

Well, if it wasn't 4 a.m. I probably could have thought of a better way of saying that. But my firm rule is that once something is typed in, it can't be changed. That explains why my writing style has managed to elude a Pulitzer Prize. Larry Oppenheimer calls his stuff "deathless prose"; I like to think of my stuff as "filler between the ads." That's the reality of the publishing business.

But because it's a tenth anniversary, we should be looking both forward and backward, just like you do when you walk to your car at 4 a.m., after a late session. The thing I remember most about the first issues of *Mix* is that after I finished reading an issue my hands were all black and smudged, from the cheap ink and paper they used. Now, after I finish reading a *Mix*, the magazine is all black and smudged, which shows just how far I've let my personal hygiene slide.

But that's not important. The point is that in another ten years *Mix* will

be beamed electronically into our homes and studios from lasers in space, where special hi-tech devices will scan each 500-page daily issue for information pertinent to your own interests and needs. Large voice-controlled video screens will display the information, and automatically log-on authors and advertisers for more detailed information. All of this will take place in "information/entertainment cocoons" installed in our homes and studios, complete with superconductivity loudspeakers. Of course, smaller "wrist publishers" will keep us informed wherever we go.

Right, sure. If you believe that you may be interested in buying my three-inch-wide tape analog multi-track. Actually in ten years everything will be pretty much the way it is now, only a little more modern. And everything except studio time will be a lot more expensive. However no one will really care because in ten years it will be only three years until the year 2000, and everybody will be busy getting ready for one incredible party. As you know, as part of the Tax Reform Bill of 1986, from now on all 1040 forms will

have a box you can check if you want \$1 to go to beer money for this party.

Meanwhile, concerned taxpayers such as yourself may well ask, "Ken, wouldn't government involvement in music recording, through copy-coding, violate the Bill of Rights?" I'd like to answer that important question in two ways, neither of them relevant. First, although the Constitution is apparently quite old as of this year (even older than *Mix*) I have no idea if notching is constitutional or not. That's why I elect politicians and other people who can't find work to interpret the laws for me. Instead, they're in their Georgetown townhouses discussing "campaign strategy" with "actresses" from Miami.

Secondly, after the federal government gets involved in music technology, I predict that only government subsidies will keep most studios open. Owners will get big bucks for not recording music and huge surpluses of heavy metal will be sold to the Soviet Union, as drought decimates Ukrainian bands.

On the other hand, I'll bet the recording engineers will get extremely high salaries, like almost 1/10 what a

congressman gets. You'll have to pay people a lot to engineer, to compensate them for having to listen to all that notched-out music. Of course, as a bonus, at least there'll be a notch of frequencies where middle-aged engineers aren't deaf.

That's another thing I've always liked about *Mix*—they don't go overboard with the deaf jokes. Deafness is no laughing matter. Engineers—next time a producer tells you to crank it up, put in your ear plugs, then let all hell break loose. Better his ears get fried than yours. I mean, yours are important in obtaining a good product. His—I don't know—are good for holding sunglasses on. I wish *Mix* had more editorials against producers who wear sunglasses inside the control room. This gives the industry a bad name. ■

Ken Pobtmann is an associate professor of music and heads the Music Engineering Program at the University of Miami in Coral Gables. He is author of Principles of Digital Audio and The Compact Disc Handbook, and a consultant to the digital audio industry.

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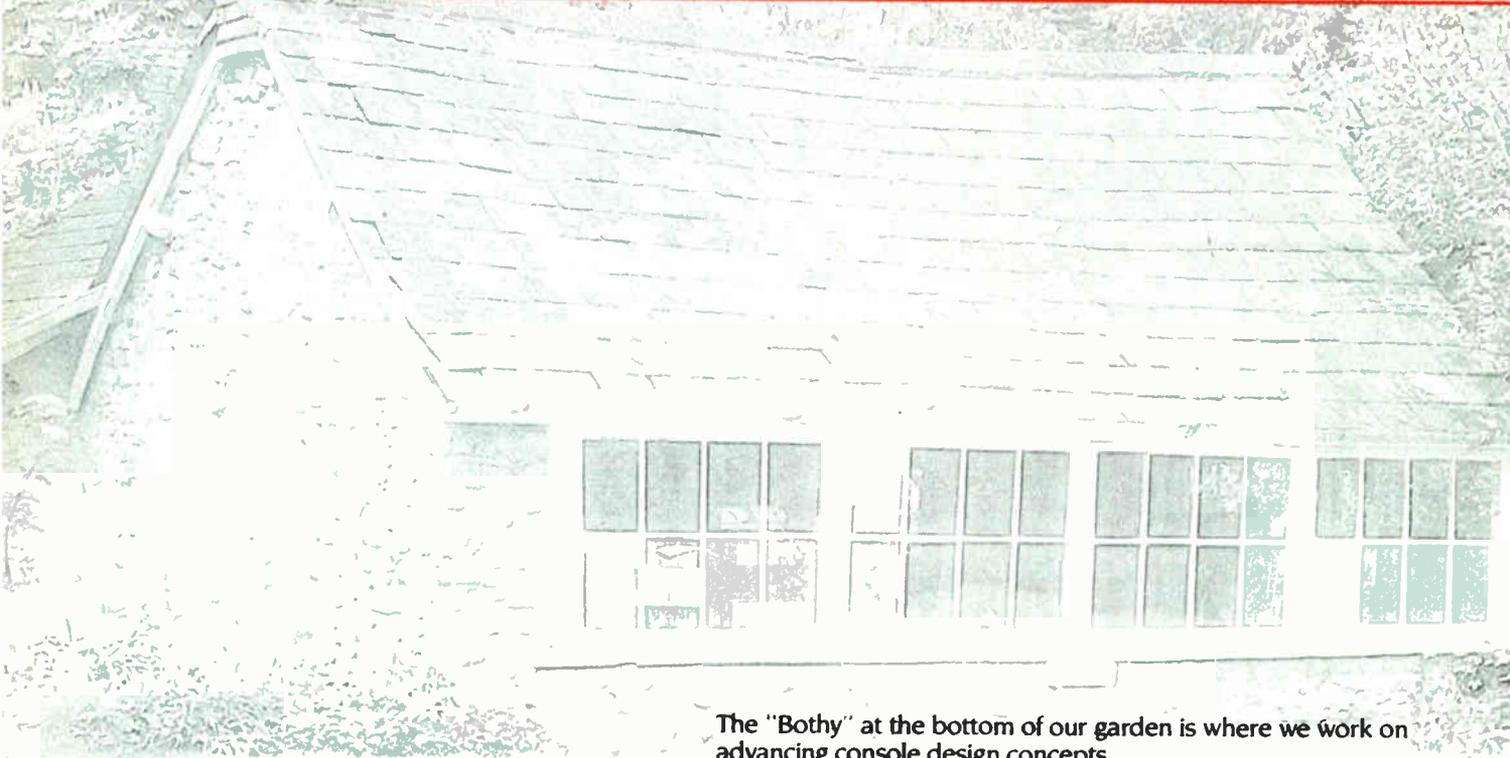
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It's just one example of the way we continue to enhance the sound of the SL 4000 E Series Master Studio System to keep ahead in the technology race. And if you already have an SL 4000 E Series you can stay ahead too, as the new EQ is easily retrofitted to all existing consoles.

There is also a new SSL Studio Computer, the G Series, which with its fast processors and vast data storage capacity enables processes that used to take minutes, to be carried out in seconds. The G Series too is fully retrofittable.

With these improvements, and more to come, shouldn't you be using the only totally integrated audio mixing system in the world?



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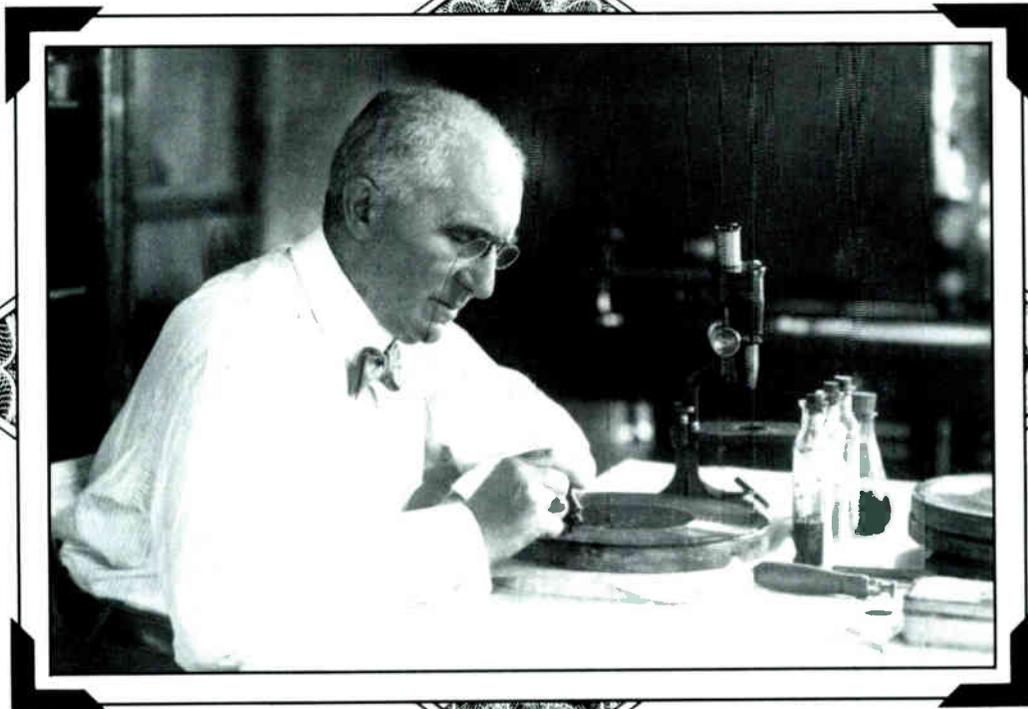
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THE BIRTH OF DISC RECORDING

A Modern Tale of Two Cities



by Oliver Berliner

A while ago, some German scientists and businessmen were sitting around discussing an innovation in recording technology that would ultimately rock the world. "You know, Emile, if this new-fangled kind of disc takes off, we can give up these *Bauercigarren* and begin smoking *Shabesnachtigarren*," the latter referring to cigars of such high price that if one is caught smoking on the Sabbath, at least he can consider that he transgressed with something well worth the consequences. Everyone laughed. "Let's see what the advantages are that your new recording medium offers."

"Well, I'd first like to say something about what one might call 'verity.' What I mean by that is making engineering so good it's inaudible. This new disc puts us well on the road towards our goal of sound without artificial coloration.

Emile Berliner in his Washington, D.C., laboratory examining an early 12-inch disc master.

And one thing we've achieved in this direction is a better signal-to-noise ratio, plus greater dynamic range — something we've found to be quite a limitation in the old system.

"Now we use a mass-production process that encompasses seven distinct steps: mastering, electro-forming, moulding, metallizing, laquering, punching and printing in order to make these funny little discs complete. Moreover, we start with a one-to-one transfer from an original master recording. You know, this whole process was more than ten years in coming about. And the master disc has a glass base."

"A glass base, Emile?"

"*Ach, ja, natürlich.* Of course, the material that gets into the consumer's

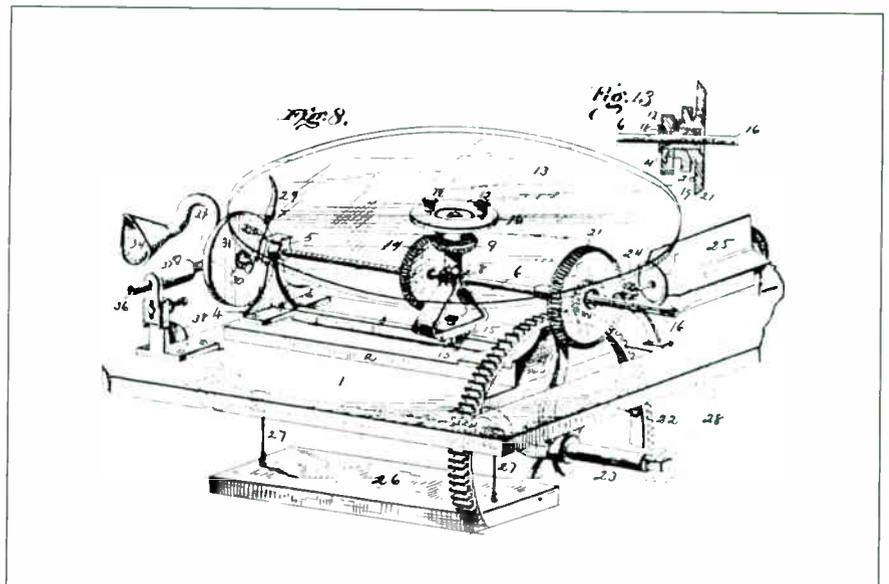
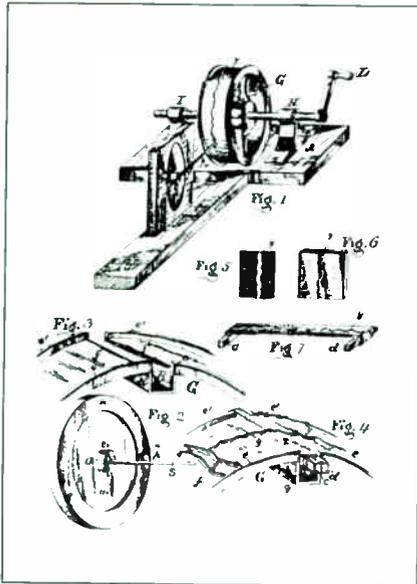
hands will be much less fragile."

"And you can label the production discs as the final step in the process, Emile?"

The inventor took a few puffs of his *el cheapo*, daydreaming perhaps that one day he'd be smoking a real Havana cigar instead. "Yes, the disc's ability to accept labeling is one of its best characteristics. Another attribute is storage. Even a large library of my tiny records takes very little space. And don't overlook the increased playing time for this system as compared to what we had before; all this on a more compact medium than we've seen heretofore."

"Now, am I correct in assuming, Emile, that disc and player production will originate in Germany?"

"Yes, that's right. It's the sentiment I still hold in my heart for the 'old country,' and particularly here in Hanover where I was born. I realize, too, that these instruments will initially be regarded as nothing more than toys. But



British and German patents, registered simultaneously with the American, duplicate the American process and claims and introduce a new element—the disc, as contrasted to the cylinder.

I'm confident they will soon come to be respected for what I intended—low cost, high quality home entertainment for all."

The Second City

At 19 years of age, Emile Berliner had migrated to Washington, D.C. after arriving in the new world via the steamship *Hammonia*. At age 25 with nothing more than a diploma from a Hanoverian Gymnasium, he'd attempted to build an improved telephone. He failed. The \$3-a-week drygoods clerk didn't create a better telephone. But what he did was to correct the flaw that had plagued Alexander Graham Bell's design from the start, and which had attracted the attention of the famous inventor Thomas Edison, as well. Emile Berliner's invention: the microphone, which surpassed the limits of scientific credibility at the time. My grandfather's creation, acquired by the fledgling Bell Telephone Company, paved the way for Bell's becoming the world's largest business, and the "loose-contact" principle became the cornerstone of all the world's telephones for the ensuing 100 years.

The Disc Record 1887-1987

Those readers familiar with the romance of today's compact disc will no doubt have recognized its characteristics from the conversation in Hanover, Germany that I've recounted here. But would you be surprised if I told you that that conversation took place a century ago and wasn't about

the CD at all? You see, Emile Berliner also invented the "acoustic" disc record that's celebrating its 100th anniversary this year.

On November 8, 1887 my grandfather patented simultaneously in Washington, Berlin and London the design of today's disc record and player (which he called the gramophone) that was to ultimately destroy Edison's then 10-year-old cylinder phonograph system. Included in his disc-record patents is not only a method of mass-producing cylinder recordings, but the lateral-cut groove (Edison's groove was vertically modulated—"hill and dale"), etching of the groove for permanency, electroplating a stamper that could be used to press unlimited copies of the master, as well as the creation of labeling the music's title and other information right on the disc (not possible on Edison's cylinders).

Yes, that conversation took place in the 19th century, as Emile Berliner's invention, made possible in part by the \$50,000 the once-penniless youth from the "wrong side of the tracks"

had received from the Bell System for his microphone in 1877, created the billion dollar disc records business of today. All the features I've attributed to the new compact discs were also characteristics of the Berliner gramophone, as contrasted to the cylinder record. The disc shaped the recorded music world for the next century.

And, yes, although Emile Berliner invented the disc record while in Washington, the world's first production gramophones and discs—three inches in diameter—were issued in his native Hanover as children's toys. How were these records pressed? Why, on a button-making machine, of course!

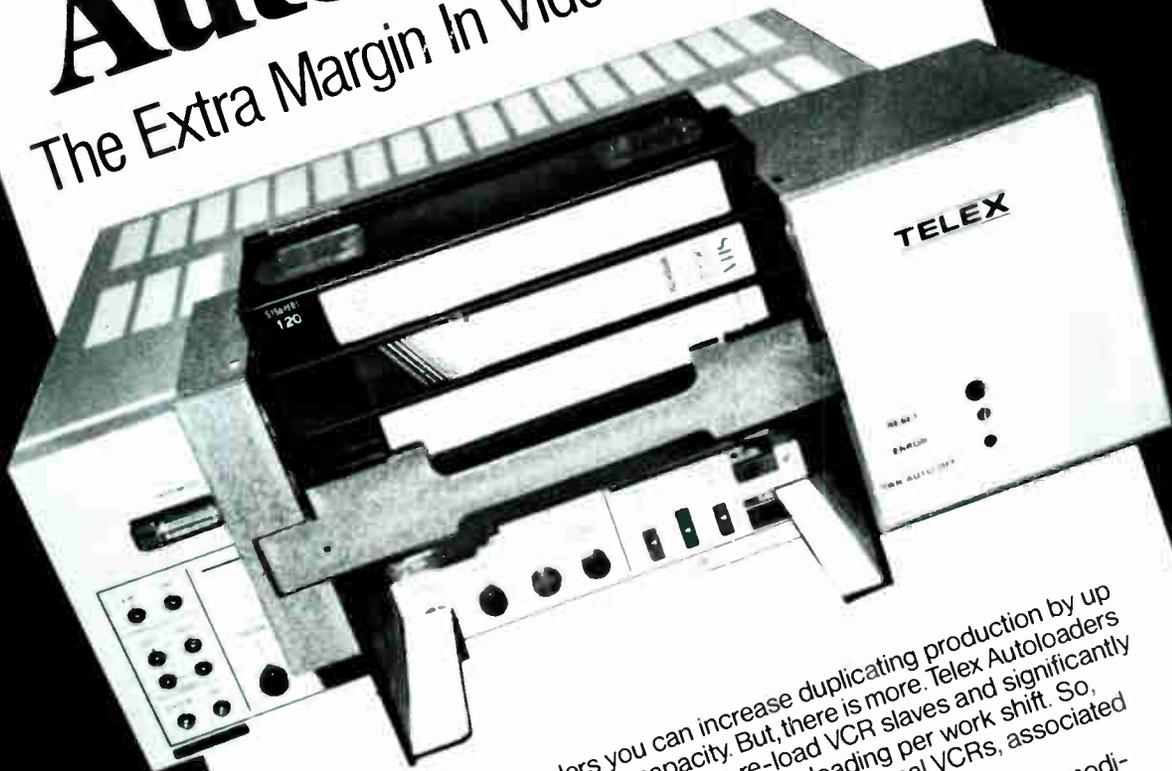
In 1898 my grandfather founded (with his brother Joseph) both Deutsche Grammophon Gesellschaft in Hanover (DGG is now a part of Polygram, creators of the compact disc) and London's The Gramophone Company Ltd. (now part of EMI, the world's largest recording organization). And in 1901 the newly formed Victor Talking Machine Co. in Camden, New Jersey (now RCA) acquired the patents of Emile Berliner and the assets of the tiny Berliner Gramophone Company of Philadelphia. ■

Emile Berliner's 1887 gramophone patents for disc records shaped the recorded music world for the next century.

Editor's note: The Berlin Phono-Akademie has established the Emile Berliner Foundation for deserving students in the study of audio. Also, visit the exhibit commemorating 100 years of disc records at the Smithsonian National Museum, September through October in Washington, D.C.

Telex Autoloader

The Extra Margin In Video Duplicating



With Telex Autoloaders you can increase duplicating production by up to 25%, depending on present capacity. But, there is more. Telex Autoloaders also reduce the manpower required to re-load VCR slaves and significantly reduce the total downtime for loading and unloading per work shift. So, production is up, costs are down. All without additional VCRs, associated electronics or racks.

To install Telex Autoloaders, you don't have to make any VCR modifications. In fact, you don't even need tools. The VCR controls and meters remain accessible. And, Autoloaders are so compact they fit the majority of aisles or change spacing between slaves. In most cases there's no need to widen the access Microprocessor controlled with built-in diagnostics, the Autoloaders operate off the VCR power supply and interface with the master command station via remote connectors on the VCR slaves. In other words, the operation of the system remains the same.

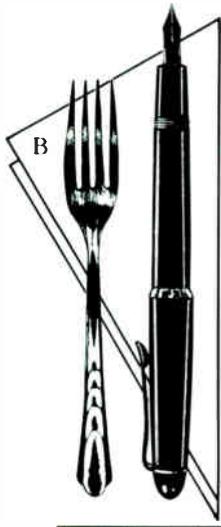
Telex Autoloader models are available for Panasonic models 6200, 6800 and 6810 or JVC model BR 7000UR video cassette recorders. For complete information, please contact Gary Bosacki, Pro-Audio Division, Telex Communications Inc., 9600 Aldrich Avenue South, Minneapolis, Minnesota 55420. Phone 612-884-4051.

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by Mr. Bonzai

TOP LUNCH

DAVID M. SCHWARTZ & PENNY RIKER JACOB


Ah! The years...the memories of countless (almost 60, but who's counting?) guests at this lunching table... and let's not forget the paychecks. It was a stroke of writer's luck to be named "editor-at-large" for *Mix*.

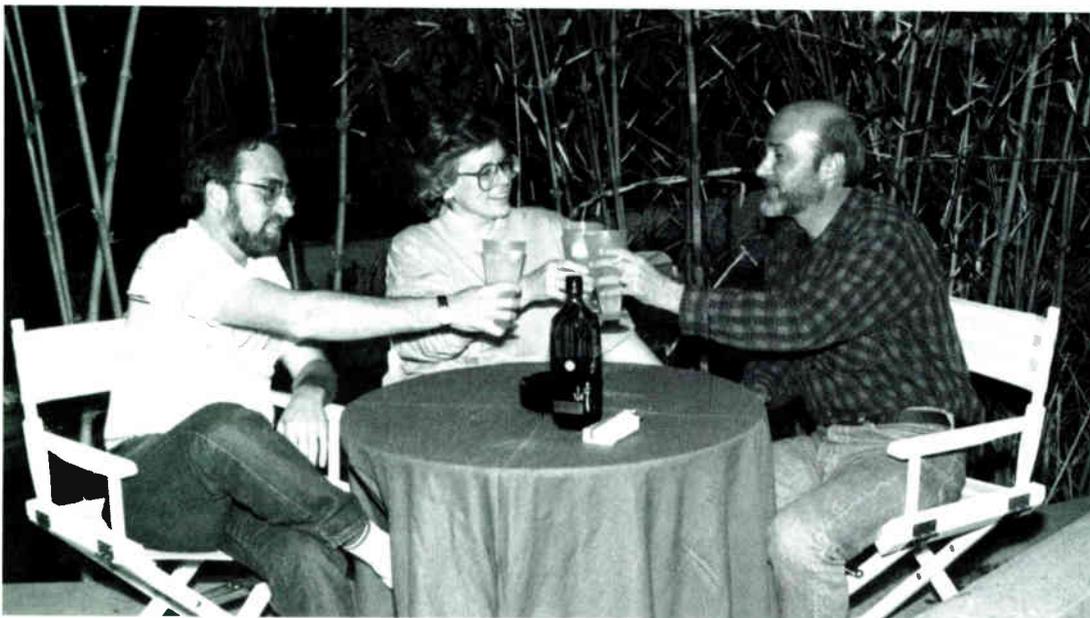
Instead of lunching this time with yet another stellar musician, noted oddball or obscure genius, let's pull out the stops and a big birthday cake for the founders of *Mix*, Penny Jacob and David Schwartz. I'll light the barbie while Mrs. Bonzai skewers some shishamo (dried smelt filled with eggs) from Hokkaido in northern Japan. Let's add some shish kebab, just in case devouring the heads, spines, eggs and tails of the shishamo proves too strong for a publisher's stomach.

Our guests have left their palatial hobbits in the Bay Area and are in L.A. for some AES meetings. They've taken a break from pounding the convention floor and pressing the public flesh to visit Cafe Bonzai, nestled quietly in the wild hills of Hollywood. A few

rounds of shochu (Japanese buckwheat vodka) are quaffed as we gaze out through the twilight smog on the downtown skyline.

David, with his musical heart and his MBA, is a sensitive soul and a mischievous entrepreneur. Once, he took a plane ride and read a ridiculous story about astral travel I had written to terrify frequent fliers. When he returned to his editor's desk, he found I had mailed a copy of the magazine and a suggestion that I take over some of the lighter chores for *Mix*. I happened to phone him just as my photo fell from the envelope. We took the coincidence as a divine goose and, shortly thereafter, I left my position as a studio manager and became a full-time writer.

Together, we conceptualized the "Studio Life" satire series, and "Lunching With Bonzai" (offered as nouvelle cuisine next to "My Dinner With Andre"). This writer/editor partnership is a rare blend of spirits, and gets refined and richer as it ages.



David Schwartz, Penny Jacob and Mr. Bonzai before the Tenth Anniversary "Lunching" was broken up by police in riot gear.

PHOTO MR. BONZAI

Rack Magic



The new Peavey PCS™ (Processor Controlled System) isn't magic, but the audio processing functions it performs, when taken together with the correct power amplifiers and speaker enclosures, can sound quite magical!

● Electronic Crossover

The PCS™ is a premium quality 3rd order (18dB per octave) electronic crossover. The PCS™ crossover function is selectable 2 or 3 way for use with a variety of Peavey speaker enclosures.

● "Sense Inputs" (Telemetry Ports)

The PCS™ utilizes "sense inputs" which are connected to the outputs of the system's power amplifiers.

● User variable loudness compensation

This function adds a predetermined amount of low end at low sound pressure levels. As system output rises, this compensation is incrementally removed until, at maximum power, the system is again flat. This technique provides the inverse of the way humans hear, and results in a system which sounds "impossibly" good at low levels, and very high in apparent headroom at high levels. This compensation is user adjustable to suit individual preferences.

● Subsonic Filtering

The PCS™ also utilizes extremely high order subsonic filtering to remove unwanted headroom wasting subsonic signals. This technique results in a very tight, punchy low end by maximizing available energy in the usable portion on the bass spectrum.

● Excursion Protection

In addition to the subsonic filtering the PCS™ also engages special excursion protection during extreme power events. This is accomplished by slightly raising the corner frequency of the high pass filtering. This further enhances the system's power handling, apparent headroom, and overall clarity.

● Thermal Protection

The PCS™ constantly monitors the outputs of the system's power amplifiers and when they reach the transducers' maximum power handling the PCS automatically engages limiting circuitry. The system's transducers are protected from unacceptable and destructive power amp clipping, and output sound pressure is maximized.

Use the Peavey PCS (Processor Controlled System) in it's 2-way mode with the Peavey SP-2™ or the new SP-4™ trapezoidal enclosure, or for bigger jobs use the PCS in its three way mode by adding a subwoofer to either enclosure.

The PCS™ from Peavey...no, it's not magic...but use it correctly and audiences just might think you are!



For a complete look at the entire Peavey line, write for our magazine the Monitor®. Please send \$1.50 to cover postage and handling.



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 2. Larry Oppenheimer
 3. Patsy Law-Messerer
 4. Blair Jackson
 5. Donna Burraston
 6. George Petersen
 7. Ron Tall
 8. Nick Clements
 9. Linda Dierking
 10. David Gans
 11. Neil McKamey
 12. Carol McMurray
 13. Harlon Firmin
 14. George Keres
 15. Brad Smith
 16. Jerry Ceillio
 17. Judy Acton
 18. Dave Marrs
 19. Karen Dunn
 20. Anne Letsch
 21. Connie Wiggins
 22. Kathy Marty
 23. Jane Byer
 24. Mark Gunther
 25. Kathy Badertscher
 26. Hillel Resner
 27. Rudy Hurwich
 28. Linda Jacobson
 29. Lauri Newman
 30. Lisa Jensen
 31. Cathy Boyum
 32. Camille Coyne
 33. Lea Lewis
 34. Linda Looper
 35. Rachel McBeth
 36. David Schwartz
 37. Penny Jacob
 38. Tim Gleason
 39. Josh Gressel

Inset top: In Mix's L.A. office—Randy Alberts (L) and Ken Rose. Right: Electronic Musician's Tim Tully, Craig Anderton, Vanessa Else, Barbara Garrison.



PHOTO TONY CARLSON

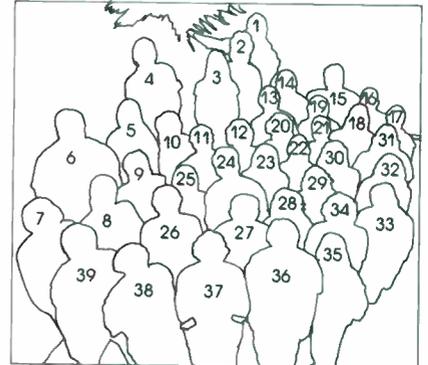


PHOTO PENNY JACOB

—LUNCHING WITH BONZAI

Penny Riker Jacob, the co-potentate on the *Mix* throne (or hot seat), combines feminine grace with an instinct for creative good business. David aptly introduced her at last year's TEC Awards as "The First Lady of *Mix* magazine." She speaks with a smoky voice and wields her scepter with an easy-going charm.

After sitting on the top of the masthead for these ten years (oooh, sounds kinda painful), David and Penny will now come down to reveal the true nature of the beast, this little engine that could, this global journal of tech-



The young and the restless: David and Penny in 1977 with first edition of *The Mix*.

Not pictured in group photo: Peter Hirschfeld, Jeffrey Turner, Athena Craig.

Behind Every Synclavier® There's a Success Story



Profile: **André Perry**

C.E.O. and Chairman of the Board of **The André Perry Group** and **Le Studio**

Visionary producer André Perry heads one of the most sophisticated music and video production facilities in the world. Located in a beautiful and secluded Québec setting, LE STUDIO and THE ANDRE PERRY GROUP have proven that, with the right personnel and equipment, a studio doesn't have to be in a major urban center to stay on top. With his facility constantly booked, it's clear that André's philosophy of total service has paid off. Recent projects range from network TV series to records and videos by such leading artists as Chicago, The Bee Gees, David Bowie, and The Police.

He comments on the success of his first Synclavier Digital Audio System and his future plans: "The Synclavier was so simple to learn and use that two weeks after installing the system we did the music and sound effects for a major network Movie of the Week. It's been so cost-effective that we're already ordering a second system for our new Washington, D.C. facility."

Circle #016 on Reader Service Card





Why your next console should be as difficult to hear as it is easy to operate.

The studio is more complex and less forgiving.

Electronic production techniques using MIDI and SMPTE sync require more control than a "wire with gain" can provide. But as functions and components accumulate, the console's signal path has grown more complex, and its audio performance has suffered. On analog recordings, higher levels of crosstalk, noise and intermodulation were an acceptable price for additional control. On digital multitrack, however, these flaws become glaringly obvious.

Crosstalk blurs the stereo image.

Now that digital recorders have virtually eliminated crosstalk, this is an especially annoying problem. *The AMR 24 matches the channel separation performance of digital multitracks* because it employs balanced buses that eliminate crosstalk the same way mic inputs do. This radical design approach takes full advantage of digital's more coherent stereo imaging.

Balanced buses also eliminate the intermodulation that plagues the sound of conventional "virtual ground" mix amps. *The AMR 24's noise floor is constant whether you route one input*

to a group, or thirty six. So you can concentrate on the music without distractions from the mixer, even on digital multitrack.

Features shouldn't degrade audio performance.

Automation widens creative possibilities — and narrows the margin for console error. For example, FET mute switches that are "silent" individually can produce audible glitches when grouped. The AMR 24's carefully controlled switching time constants eliminate this problem.

Every circuit in the AMR 24 has been calculated with equally close attention. Each stage has at least 22 dB of headroom; total dynamic range is over 100 dB. Even so, *unused stages are bypassed to produce the shortest effective signal path in every operating mode.*

Perhaps the AMR 24 is a product of extremist engineering. But as we see it, optimum audio performance, not simply a revised layout, is what makes a console automation- and digital-ready.

The feel is familiar, the functions are unprecedented.

The AMR 24 facilitates innovative production techniques within a classically

split configuration. Master Input Status switches select mic inputs or line returns on all input channels simultaneously. In its mixdown configuration, the AMR 24 will handle up to 60 tracks, because the 24 Track Select switch changes the monitor returns to line returns normalled to your second 24 track (or to synchronised "virtual tracks" from synthesisers and samplers). The monitor returns have aux buses, solo and mute, plus four bands of EQ and long throw faders, so this flexibility is achieved with no loss of audio quality. For additional effects returns, the Fader Reverse function creates an additional 24 patch points through the cue send faders.

Imaginative design and uncompromising construction give the AMR 24 flexibility and sonic transparency that represent clear achievements: especially clear on digital recordings. For all the facts on this innovative console, send your business card or letterhead to:

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AMR 24



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nology, this bold chronicle of our media evolution, this . . . magazine.

Bonzai: So it all started in an old back room in Berkeley?

Jacob: No, in Mill Valley [in Marin County], actually, in a class for recording arts.

Schwartz: We had a teacher, Norman Dayron, who had produced a number of albums for old blues artists in Chicago. He was a staff producer at Chess Records and he taught a course on record production. We had a small class, eight or ten people, and we'd get together for a lecture and then a session in a studio. At the time, I was changing careers and this class sounded interesting. We'd get together and listen to records and try to determine why they had become successful. Later, the class would rehearse a song as a "group" and then we would share producing and engineering chores.

Jacob: At this time I was writing and learning about recording in a little garage studio with a TEAC 3340. We started out making radio jingles.

Bonzai: How were you making your living at the time?

Jacob: I was making stained glass and selling it at antique shops, and also doing voiceover work for commercials.

Schwartz: Previous to this, I had worked for an acoustical consulting company, designing sound systems. The company closed their San Francisco office and I started writing for various magazines. Before all this, I had worked at Wally Heider studios in 1973.

Bonzai: Did that give you a taste for the excitement of the recording industry?

Schwartz: Oh yeah, that was during the whole rock and roll boom. It was a party throughout the whole year that I worked there, during the high point of the studio's existence. There were probably 15 albums being cut at the same time, when I started there, from The Pointer Sisters' first album, Jefferson Airplane, Santana, on and on.

Bonzai: Didn't you give Grace Slick a ride once when her white Rabbit broke down?

Schwartz: Actually, it was a Maserati, and I gave her a ride home to her place in Sea Cliff (a posh SF neighborhood).

I lived "down the hill" in the Richmond district. It was a great time, so much action going on, and all kinds of musical greats were there. I was like a sponge absorbing the whole thing. And then it all suddenly ended when the recession and oil crisis hit. Studios in San Francisco began to have trouble. Many of the artists had been coming up from L.A. with lavish budgets, but that all stopped.

Bonzai: It doesn't sound like the best of times to launch a recording industry magazine.

Schwartz: Well, a few years had passed—we started the magazine in 1977. Penny and I had met in the class during the summer of '76. We formed a studio group of writers, performers and technicians which evolved into the Tres Virgo studio team.

Jacob: It was an experimental stage for all of us. I was a singer, and I wanted the engineering experience. The first time I sat down behind a console I felt like I had discovered the reason I was born. The combination of being musicians and learning about the technology turned us all on at that point. It was an exciting time and as I look back on those years, I realize how much fun we had working and playing.

Schwartz: It was an important creative time for us, because we were songwriters and performers and took turns helping each other's projects. If we couldn't come up with a song, we'd turn it into a jingle.

Jacob: We did one of David's songs 413,000 times in different versions.

Schwartz: I had a platinum demo tape from that one.

Bonzai: Well, how did this all arrive at publishing?

Jacob: David had been writing a column for *BAM* magazine [a California music bi-weekly]. After class one night, he told me that he had a new idea for a magazine—one that would revolve around a directory of recording studios. There was nothing that specialized like this at the time, although *Billboard* had a studio listing section. We felt that it could be done in greater depth and that it would be valuable to people.

Schwartz: It was an outgrowth of our needs, because we were doing sessions at a number of studios in the Bay Area. Shopping around and finding the right studio for different projects was a

hit or miss process. We wanted a really comprehensive consumer's guide to recording services.

Jacob: We also had an ulterior motive—we were studio junkies. We loved being in studios and wanted to find out how other studios were operating. We started out doing a survey—

Schwartz: And the studios brought out the red carpet for us.

Jacob: In the early years, we visited more studios than anyone else around.

Schwartz: Neither of us had any publishing experience, so once we determined that there was a need for our concept, we planned how to best do it. My contact with *BAM* as a writer was the

"More than just a magazine, *Mix* started out as a research project to satisfy our needs and curiosity about the recording field, and that motivation still continues today."

most reasonable way to test the idea.

Jacob: We put together a business plan, conceptualized the project, and presented it to the publishers of *BAM*.

Schwartz: This was just a localized directory at the time and they liked the idea. It started out as a side project for us, and then grew until it took over all of our time. Bill Laski, one of the principals at *BAM*, took a special interest in our project. He was the advertising manager and brought to our project the ad sales expertise to make it work as a publication.

Jacob: He saw the potential and the timing was nearly perfect because the rapid growth of the independent recording operations was just starting.

Bonzai: For me, working at a new studio, it was great to find that first copy of *Mix*. It made me feel like there were other people trying to do the same thing.

Schwartz: There really wasn't an "industry"; there were a lot of facilities. I think that *Mix*, and a few other magazines, legitimized the industry. We pro-

vided a commentary on the growth and evolution, and exposed the personalities who were shaping things.

Jacob: And we saw the growth of a sense of community and camaraderie, beyond the developments of technology. When we were getting that first issue out, covering only Northern California, we asked people how many studios they thought there were in the area. Most people guessed there were only 19 or 20 studios. We researched and found 130. No one knew the size of the scene at the time.

Schwartz: This wasn't actually the first directory of studios. Another magazine called *Music Works* had done it, *Billboard* had been listing studios, and a book by Diane Rappaport had a listing. What we wanted to do was to quantify it in another way, to make it a practical consumer's guide. We stratified our findings, looking for common denominators, and grouped studios into meaningful categories.

Bonzai: How did you leap from a

local directory into a national publication?

Schwartz: There were many steps involved. After the first issue came out, some people from L.A. called and suggested that we do one for that region. *BAM* had an office in L.A., so we went down for a couple of weeks and called every facility we could find.

Jacob: We visited them and I took pictures—it was a very personal approach. We had also started visiting the various conventions and everyone kept asking us when we were going to do a directory for their area. It was a very organic process, with the industry urging us to do more.

Schwartz: Just before the third issue came out, we decided to separate from *BAM*. We realized that the direction we were going in was different from that of *BAM*. We were going for a national audience, and wanted to establish our own identity. It was a tough time for us all during the separation, but it worked out well, and we have always been on good terms with *BAM*.

Jacob: Each party went on to its own successes.

Bonzai: How did you move from a directory to a publication that serves the industry in so many ways?

Schwartz: After a few California directories, we did versions in Nashville and New York. Then we expanded and added more editorial, offering advice to people in the recording business. By 1979, we evolved into a national magazine, with regional directories. We changed format many times, always trying to improve the look of the magazine.

Jacob: We felt that it was very important to give the magazine a national look.

Bonzai: I remember when you made the move to a slicker newsprint format—didn't *Rolling Stone* pick up on that and alter their look?

Schwartz: We played around with different paper stocks, something that most publishers don't do. We found a glossier newsprint and a few months later got a call from *Rolling Stone*, curious about our stock. A few months later, it ended up that they decided to use it as well.

Jacob: It was complicated, because

OLVE CROSSOVER BLEMS



CONGRATULATIONS MIX!

The NEW "24" Series of crossover problem solvers from Furman Sound.

Three models for systems of every size:

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- TX-424 Stereo 3-Way / Mono 4 or 5 Way
- TX-524 Stereo 4-Way

24 dB/octave slopes on every crossover point give the ultimate in protection for fragile drivers. Each point tunes continuously over six octaves without need for range switches.

Field Select, a Furman exclusive, allows you to select Butterworth filters (constant power sum) for long throw applications, like most large concert halls, or Cauer filters (constant voltage sum) for near field uses, such as studio monitoring or wherever components are time or phase aligned.

An on-board hard limiter on each output provides a final degree of speaker protection. The threshold can be varied from -20 to +20 dBV.

Output Muting permits even inexperienced operators to power entire systems with one master switch, because it suppresses potentially damaging loud transients at the instant of turn-on or turn-off.

Ground Lift switch allows you the option of isolating the signal ground completely from the chassis, eliminating hum-causing ground loops without disturbing the AC safety ground.

There's more, too. Ultra-low distortion (.004% T.H.D.) and noise (-90 dBV E.I.N.). And all at a fraction of what you'd expect to pay. Call or write for more information on solving your crossover problem.

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we had the cover printed by one company, and the internal pages by another.

Bonzai: I'm sure a lot of people are unaware of the difficulties of the publishing world.

Schwartz: And they probably don't want to know. Distribution is another critical aspect of success. In the beginning, we gave the magazine away free, through the *BAM* distribution network. Later, this haunted us when we went to a controlled and paid circulation. We distributed the first issues ourselves by delivering bundles to studios—

Jacob: Driving station wagons loaded with copies.

Bonzai: How many people work for *Mix* now?

Jacob: We've got a staff of over 50 people now, but that includes the new magazine, *Electronic Musician*, and our book division, and the TEC Awards operation.

Bonzai: And how many limousines?

Schwartz: No limousines, because we keep pumping the profits back into the company. It's grown, and refined itself. We've just always kept a quality magazine as our goal.

Jacob: We have never compromised the quality of our product, and we've always tried to achieve better color, better reproduction. It's no secret that advertising is the lifeblood of a magazine, and the ads must look good.

Schwartz: We realized that we were in competition with some good publications and that we had to constantly improve and refine our image. We found that we were in the publishing business, and not just an arm of the recording industry.

Bonzai: How many people around the world read *Mix* today?

Schwartz: It's hard to determine exactly, but our last issue's circulation was nearly 47,000.

Jacob: A decent percentage of that goes overseas, and our readership figures are about 4½ people per copy, because the magazine sits in studios and when musicians take their breaks they pick it up.

Bonzai: I know that there are a lot of loyal *Mix* readers.

Jacob: It's nice at the trade shows when people come up and tell us that they have every copy we ever printed,

starting in 1977. We've always tried to put out a magazine that *we* would enjoy reading, with information that we want to know about and information that our contemporaries want to know about.

Schwartz: More than just a magazine, *Mix* started out as a research project to satisfy our needs and curiosity about the recording field, and that motivation still continues today.

Bonzai: Could we talk about the godfather of *Mix*, a man whose name doesn't appear in the magazine?

Jacob: It does now. We just started adding the different corporate titles in

the masthead.

Bonzai: Would you describe him as a godfather, or a wise—

Jacob: I think "angel" . . .

Schwartz: Or a team coach. If you were playing on a basketball team and you were out there on the floor putting your heart into it and every four or five minutes you came back to a huddle, there would be an all-knowing person there. He could reflect on what you had just been through and could advise you on where to go next and send you back into the action.

Jacob: It's not like he's there all the time, either, but his benevolence ex-

—CONTINUED ON PAGE 110

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1987 & BEYOND

The Future of Audio/Video Recording

by Robert N. Herman

The future of the information storage business is very bright. However, recent trends in new technology, specifically the trend from lower coercivity iron oxide media to higher coercivity advanced media, such as metal particle and barium ferrite, and the trend from analog to digital recording, have created both excitement and confusion. This article discusses the impact of this emerging technology and provides an overview of the future formats that will be vying for acceptance in the audio/video recording industry. In addition, the trends in recording hardware and media are addressed.

But before we take a look at the future, let's step back and review the past. Man has always had a need to store information. The first such storage device was the stone wall of a cave, where hieroglyphics recorded man's earliest thoughts. It was not the most efficient way to store information, but I must admit, it certainly was

hard to erase accidentally!

From that humble beginning we have seen the need for information storage grow beyond our wildest imaginations. Take for example just the last ten years. In 1977, many felt that the home VCR would never take off. Two-inch quadruplex video tape recorders were the standard of the broadcast industry, and many felt that "those narrower formats" would never replace good old quad. The word "Camcorder" was not even in our vocabulary. Digital referred only to computers, calculators and watches, and 8mm was a term that applied only to home movie film.

Some people back then suggested that magnetic recording tape would cease to exist some time in the not-too-distant future. The reasoning was that solid state memory or optical recording would be faster, easier and cheaper. That didn't happen. Those forecasters didn't predict the extreme drops in the price of magnetic media coupled by new systems that used higher densities, so that magnetic

media remained competitive.

Here it is 1987, and I'm happy to say that the future of magnetic recording continues to look bright, at least for the next decade or so. Now that I've established that magnetic media is here to stay for a while, let's talk about some of the emerging new formats.

U-Matic SP

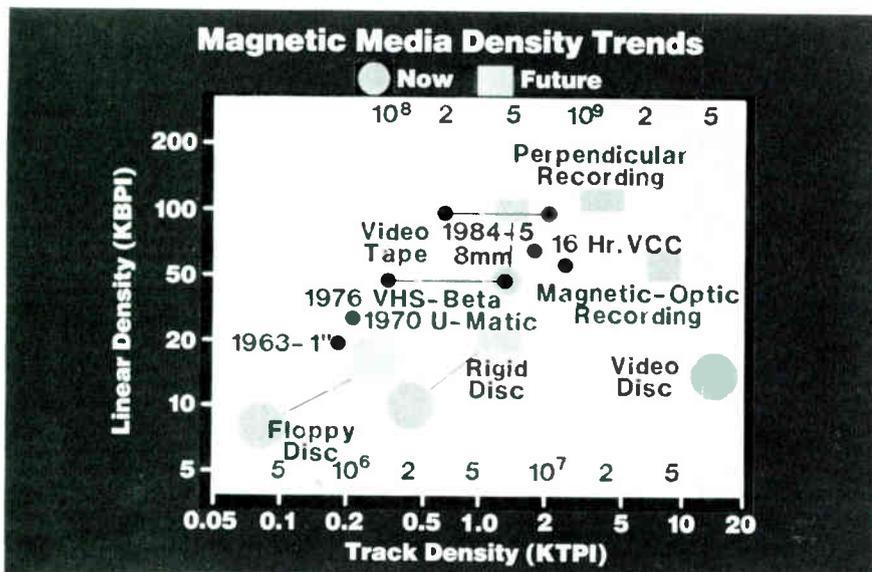
The U-Matic SP or Superior Performance format was developed by Sony Corporation to improve the audio and video quality of the U-Matic format. Sony publicly introduced the recorder in January 1986.

The major video improvements are an increase in luminance resolution from 260 to 300 lines, an increase in chrominance resolution, less ringing and, therefore, improved transient response. In layman's terms, the improvements give pictures of finer detail and allow multi-generation dubbing with less quality loss.

The major audio improvement is an improved signal-to-noise ratio by the addition of Dolby "C" noise reduction. The signal-to-noise ratio increases from 48 to 52 dB before Dolby and potentially 72 dB after Dolby.

The new SP system requires a new tape for full utilization of the performance increases. However, non-SP tape will work in the new machines. In fact, the tape and machines are designed to be interchangeable. That is, SP tape and machines can be used on non-SP machines and tape. However, there are two limitations. SP tapes recorded on an SP recorder must have the audio tracks decoded by a Dolby "C" decoder. This decoder can be added to any non-SP videocassette recorder. And secondly, you cannot edit an SP recorded tape on an unmodified non-SP recorder.

We at 3M believe that this new im-



In 1977, many people felt the home VCR would never take off....

provement will be accepted by some users and that it will help prolong the life of the U-Matic format. We plan to introduce our own SP U-Matic video-cassettes in the fall.

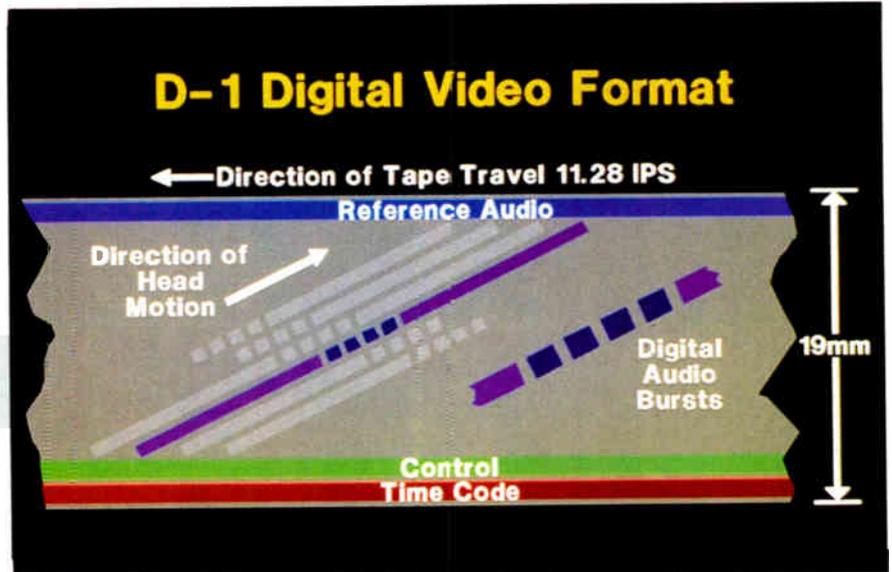
The next two formats I'd like to talk about are digital video formats. Digital video has been publicly discussed for over seven years and is now reality. There were two formats of digital video tape recorders on the show floor at NAB. The most publicized digital video tape recorder is the SMPTE type D-1 standard. The second was the composite digital video recorder utilizing metal particle tape.

D-1 Digital Video

The D-1 digital format is now a standard and an international one at that. It was the result of over two years' effort in the SMPTE digital VTR committee. The format that resulted was agreed to by the CCIR, which means the standard was adopted by Western and Eastern Bloc countries. This is a first and should help interchange programs between countries in the future. The magnetic imprint on the tape is independent of the television scanning format. More about that later.

The format designed uses 19mm tape, which is about 3/4-inch wide. The format has four channels of digital audio recorded in the center of the tape, a control track, a time code track and a spare analog track. (See Fig. 1)

This is a cassette system and there are three cassette sizes. The format uses tape at a rate of over 11 inches per second, or three times the speed of U-Matic. At this rate, a thin tape, half the thickness of U-Matic, is needed in order to get enough playing time. The maximum play time is 13.4, 41.5 and 94 minutes for the small, medium and large cassettes, respectively, with half mil tapes.



One interesting feature of this new format is the interchangeability between television standards. A recorded tape will have the same digital data whether its source was NTSC or PAL. Therefore, a tape recorded in Europe on a PAL D-1 digital recorder will play-back in the U.S. on an NTSC D-1 digital recorder.

Another interesting feature of the

new format is read-before-write and read-modify-write. Previously, when editing a scene on a video recorder, if you wanted to change the information recorded, you had to change it frame by frame. With the D-1 recorder, the editor will now have the ability to change only the elements in the scene that are to be changed. For example, a title could be added to a D-1 recorder



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using only one D-1 recorder and one character generator.

The first D-1 digital video recorder was shown publicly at the NAB Show in Dallas in 1986. Sony took orders for about 60 machines at the show and is now delivering the first of these units. Ampex and BTS are also planning to be among the first manufacturers of Digital D-1 recording equipment. 3M plans to introduce its own D-1 digital tape by the beginning of 1988.

Another advantage of the D-1 digital VTR is high quality video after multiple generations. The analog video tape recorder is currently the weakest link in the video chain from camera to TV set. Multiple generation dubbing exacerbates the problems, as each generation copy becomes noisier. With digital, you can make as many generations as you wish with no loss in quality. The 20th generation will be identical to first generation.

The D-1 DTTR has already received a lot of attention from users, but we don't expect a rapid conversion to this new format. One reason, it's so advanced that there is currently little equipment (camera, switchers, TV monitors) that can accept feeds directly to or from it, because all inputs must be digital component. Therefore, these DTTR's will initially be off by themselves in a video plant, in their own "digital island." That's why manufacturers will sell the D-1 DTTR with an analog interface initially.

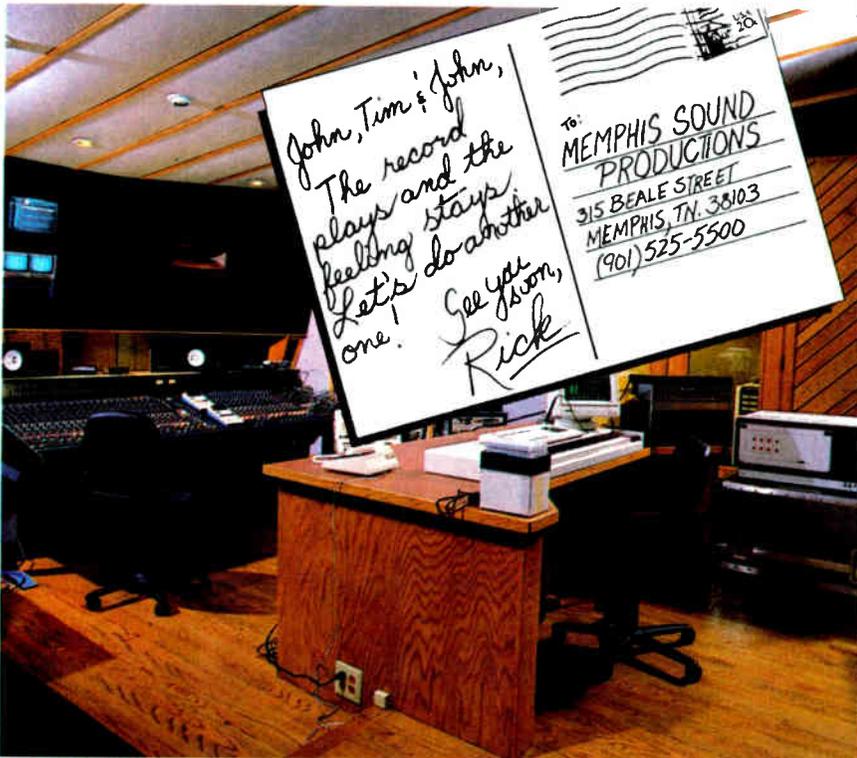
The D-1 digital video recorder is not the only digital video format to watch. Ampex showed their composite digital video "D-X" recorder, the ACR-225 at the NAB Show. This unit is primarily designed to replace the ACR-25 and TCR-100 quad cart machines in the field and to compete with the half-inch commercial spot players.

SMPTE has established a committee to develop a composite NTSC digital video recorder; the new format will be called D-2. The D-2 format will have four digital audio channels like the D-1 and also will use the small, medium and large D-1 cassette bodies. There will be studio recorders as well as automated cassette player/recorders.

Compared to D-1, the D-2 format will use metal particle media, have a different track layout and the linear speed will be lower, thereby increasing play times. Look for 31.6 minutes on the small cassette and 97.6 minutes on the medium cassette. The large cassette could be used, and if so, would

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have 220 minutes of maximum play time. 3M plans to market D-2 digital video MP tapes in late 1988.

Both digital video recorders, the composite and component, are essentially digital storage devices, therefore they may be used as mass storage devices for uses other than video.

8mm Videocassettes

The standard uses tape that is 8mm wide (about 1/3 of an inch) and can record for two hours at standard play speed and four hours at long play speed. The standard also calls for two PCM—or pulse coded modulation—digital audio tracks and one AFM, or Audio Frequency Modulation, audio track along with the video. If you don't want video at all, you can record six PCM stereo audio tracks. This gives the user the opportunity to record 24 hours of stereo audio on one cassette, approximately the size of an audio cassette.

Possible uses in the consumer field include a personal stereo with 24 hours of music playback, or a hand-held TV and VCR combination.

Initially, the 8mm professional market is made up of a few duplicators that have a small number of 8mm decks. There are also a few industrial networks that use 8mm for distribution. Some consumer video titles are now in 8mm, but that market is small and likely to remain so in the near future.

Because of the high density required, all 8mm media currently is metal powder tape coated on a very thin backing. This metal particle media has a coercivity of about 1,500 oersteds, or double that of one-inch professional video tape.

ADVANCED EFP/ENG FORMATS

Just when you thought it was safe to choose an EFP/ENG format, the choices become more difficult because of the proliferation of new formats. Two of these formats are gathering a lot of attention these days. They are M-II and Betacam SP, which got their roots from M Format and Betacam respectively. Both have two cassette sizes, use high-coercivity, metal-particle tape and utilize component recording.

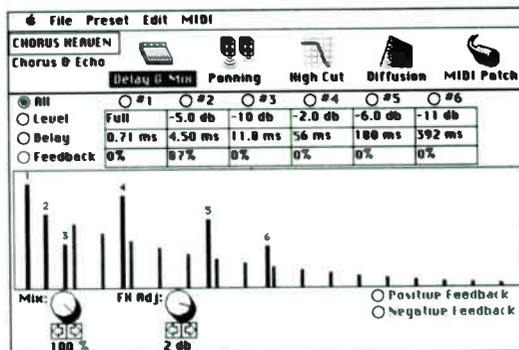
M-II Cassette

The M-II format is similar to the M-I, with three important differences. Tape speed is slower so the large cassette can play for 90 minutes, the tape media

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is high coercivity metal particle and there is an additional small cassette for in-camera use that plays for 20 minutes. The M-II format is not compatible with M-I. Chief advances over its predecessor are an improvement in video signal-to-noise and transients, plus improved audio.

The M-II cassettes are different from VHS and VHS-C. Both cassettes are larger than their consumer counterparts. There are good reasons for this. The manufacturers of the consumer gear don't want non-compatible cassettes to be allowed to load into their machines and give unsatisfactory performance. The users of M-II, likewise, don't want cassettes that could be used in consumer machines and subject to disappearing from their studios. Both HVC and Matsushita will manufacture the M-II equipment. 3M will introduce M-II tape to the market at the end of 1987.

Betacam SP

Sony has also developed a half-inch system using metal tape. Named Betacam SP, the small cassette is exactly the same size as a standard Betacam tape. The larger cassette is quite a bit larger. Both cassettes can contain either 720 oersted ferric oxide or 1,500 oersted metal particle tape.

Sense holes in the bottom of the cassette help the VCR to automatically determine which tape is in the machine. If it senses that metal tape is being used, the recorder switches to the SP mode. In the SP mode, the FM carrier for the Y and C signals are shifted upward 1.3 MHz and 0.5 MHz respectively. This is enough of a shift to improve picture quality, but not enough to prevent playback on older non-SP equipment.

Betacam SP will have downward compatibility with Betacam, that is a recording made on a Betacam SP recorder, either with metal or oxide, in the small cassette size, will playback on current Betacam equipment.

Compared to Betacam, Betacam SP has improved video frequency response, 3 dB better luminance S/N, and better transient response. The audio is improved both with the addition of two AFM channels and with the addition of Dolby noise reduction on the linear audio tracks.

There will be four suppliers of Betacam SP equipment: Sony, Ampex, Bosch and Tompson CSF. 3M will introduce Betacam L and Betacam SP

tape by the end of 1987.

8mm ENG

There has also been some talk about using the 8mm format as basis for an ENG format. Current consumer 8mm equipment is not acceptable for use in ENG, except for storage operations in hostile environments where throw-away equipment may be necessary. Some manufacturers have looked at modifying the 8mm format for ENG use with analog or digital recording. We are watching these developments, but I don't think you'll see a major drive toward 8mm ENG in the next year or two.

S-VHS

Super VHS improves the resolution of the playback picture from under 300 to over 400 lines of horizontal resolu-

tion. Linear tape speed is unchanged but frequencies of the luminance signal have shifted up 2.3 MHz. S-VHS recordings are not playable on earlier VHS machines. An improved tape with 900 oersted oxide is required.

The shell has a recognition hole on the bottom of the cassette to distinguish S-VHS tape from standard VHS tape. The VCR provides a higher degree of resolution. The recorder has separate Y and C inputs and outputs to take advantage of this higher degree of resolution. These connectors require new cameras or monitors to fully utilize the enhancements, although standard equipment also will see some improvements; the recorder will have standard NTSC inputs and outputs as well.

The S-VHS technology will be used first in consumer and then in the pro-

The Road Toward Disk-Based Recording

In any discussion of future technology, it is necessary to state the conditions upon which predictions are made. For this article, we look into the future of the tape recorder. In this future perspective, we must assume that the advancements in the power and speed of computer hardware will continue along the same curve that has been established in the last five years. We must also assume a similar curve in the reduction of the cost of hardware. After making this assumption of faith, we can now believe that our dream of the future may even be realized at a cost below the GNP of a Middle Eastern country.

Within this context, it becomes easy to imagine audio systems that integrate mixing, processing, recording, editing, synchronizing, etc., into a single system. All functions would be available to the operator from a central user interface console or workstation. We might even imagine that the work surface could change its controls and functions to suit the job under way at any moment. Faders would control level for mixing, but while in the processing mode, they could be equalization or reverberation

controls. As you can see, it isn't too difficult to imagine that recorders in future systems will actually become a subsystem of the master controller dealing with data storage and retrieval under its command. It is probable that this subsystem will become an inextricable part of the total studio system and, therefore, will no longer be a stand-alone device.

At this point, we need to consider the possibility of what might realistically be developed and manufactured within our lifetimes, and priced within the constraints of the professional recording, audio post-production and broadcast markets.

Reality—what a concept

Anyone who has written software or waited for software to be written (this probably includes at least 90% of us), should recognize that a system as described above represents an enormous undertaking. It seems likely that the evolution toward the ultimate studio must come in smaller and more manageable steps. With this thinking in mind and, of course, the necessity to meet schedule and price considerations, many manufacturers are looking to devel-

op the next generation of recording technology.

Reel-to-reel digital audio recorders may claim the title of "next generation" over the analog machines we all grew up with, or even the latest analog machines with their auto alignment capabilities might be seen as a new generation. These interim steps are all worthwhile since they are needed to create the environment in which further advancements will be recognized and desired by the users of recording devices. Both of these machine developments, the automatic analog and the digital reel-to-reel tape recorder, are, of course, essentially still the same device. The real advancement in speed and performance comes from a random access digital audio recording and editing device, and its ability to access the audio information instantly—no rewind time or search time to slow down the audio post-production process. By comparison, a one-inch VTR is tediously slow to rescue.

The disk recorder consists basically of a master CPU with a user interface, some analog-to-digital converters and a memory, typically Winchester disks. This architecture allows the control CPU access to virtually any point in the memory disk in a random fashion providing the designer of a digital audio recording device with some new possibilities. It also opens up applications in the areas of sound effects editing where large libraries of sound "files" can be stored and retrieved quickly at random. Further software development in the area of the user interface would allow the sound effects editor to search the file directory by the description of a particular type of effect. When asked to: "Find all door slams," the computer's display would show a list of all of the sound files that were labeled as door slams.

In the electronic music marketplace these recorders could also be used to store digital audio as a sample file and be accessed by the synth for performance. Also, the live tracks that are now recorded onto a separate tape machine and then synchronized with the synth sequencer could be recorded onto the same

device.

Radio broadcasters have been waiting for the replacement for the cartridge machine, and the disk recorder sounds like the ideal machine to provide spot library or even to store and retrieve the music play list for broadcast on-air. The program automation systems in the broadcast field have been very sophisticated for a long time and a disk recorder interfaced into an automation control system would eliminate many reel-to-reel and/or cart transports. It's easy to replace the contents of the play list to accept a new spot even a short time before air time and the memory space can be reused without replacement for extended periods of time.

Recording studios could use a disk recorder as a 2-track mixdown machine. It could edit the material for creative content or reorder the album with only a play list request.

What would a disk recorder look like? It would record and playback 1,2,3,4... etc., channels of audio depending on the number of I/O cards installed into the unit. The unit should be able to expand to more channels as the user requires them. Recording time would depend on the number of disk drives connected to the recorder and could be expanded. Maximum record time should only be limited by the current technology of the memory devices and not by the system design or software. Input and outputs could be analog, in which case they would be converted into 16-bit linear PCM; using the industry standard sampling frequencies, it could accept a serial digital input or it would output its audio as a serial data stream. There must be an intimate relationship in which all aspects of the recorder's operation will be linked to time code. The sound files would be capable of being stored or retrieved and played in sync to a master time code. This would eliminate the need of any external hardware to lock the audio and the picture in audio post-production applications. For the studio that does not use time code for picture sync, the time code could be used to reference the location of files and events within them, like an auto locator would do on the

traditional tape recorder.

Editing capabilities would be extensive whereas the sound could be manipulated in many ways that are not possible on tape, as well as mimicking the traditional editing style. It should be possible to play the audio data out of the disk in a different order than it was put in. Separate pieces of the audio data could then be linked together to create a continuous output. All of these functions are simple routines for a computer system but once applied they create very powerful, creative and time saving possibilities. Edits could be rehearsed to determine if they were correct and then recorded. If, at a later time, an edit needed to be undone, this would be a simple matter of changing back to the original.

The recorder, which would be based around a main CPU, could respond to external commands from a system controller via a serial interface such as RS422. Command protocols that would be supported include the AES/EBU ESbus, providing a simple and painless interface into the control systems that would already be in place. It should also be possible for more than one operator to access the memory at the same time. In studios, where the main unit is located in a machine room, the user consoles could be duplicated in each control room. One operator could be recording data while another could use the sound effects file in a sweetening session next door. This may take the form of two systems connected together which are capable of sharing data over some serial link.

Conclusion

What does this mean to the readers of this article? It is not likely that such a system would be available tomorrow, but there are units that are being sold now with some of these capabilities. It is also certain that many other companies would like to provide this type of system as soon as possible. The functional benefits and the creative freedom that a recording device like this will bring to our industry is a very exciting prospect to ponder.

—John Carey

—FROM PAGE 45, THE ROAD

fessional market. 3M will introduce their S-VHS cassette to the consumer market in the summer of 1987 and follow later with the professional version.

Digital Audio Tape (DAT)

The DAT (Digital Audio Tape) is smaller than an audio cassette, uses high coercivity metal particle or barium ferrite tape that is about 1/7th of an inch wide and can record at compact disc quality for a maximum record/play time of two hours.

The DAT recorder provides sound quality that is unmatched by analog audio formats. We expect DAT equipment to find its place in professional audio recording. Audio editors will have to get used to electronic editing, since cut and splice editing will not be possible.

Television Cart Recorders

Manufacturers of television cartridge recorders or commercial spot players will find receptive buyers for non-standardized formats. The old quad cartridge recorders are antiquated and due for replacement by many users.

Systems do not have to be standardized because tapes are not usually swapped between television plants on these formats. I mentioned the Sony Betacart and the Ampex Digital Cart Player earlier. There are others. Several manufacturers are making cart players out of the M-II and also the Betacam SP formats.

Sony showed a library management system at the NAB which has essentially a 1,200-cassette library with built-in player/recorders and this will be used with Betacam SP or the Ampex/Sony composite digital recorder formats.

HDTV

High definition television is another development that will have an impact on future video tape formats. HDTV represents a major step beyond today's television technology. It uses 1,125 lines of picture information at 30 pictures per second. The aspect ratio, or ratio of width to height, is approximately 5:3, which makes a wider screen picture, similar to the aspect ratio of a 70mm motion picture film.

This format will require all new equipment at the producing end, as

well as the home reception end. HDTV has met an impasse at the latest CCIR meeting in Dubrovnick, so attempts to develop one worldwide standard have not been successful, at least so far.

Right now, experimental HDTV professional video tape recorders have been shown. They all have been analog reel-to-reel systems similar in concept to a SMPTE Type CVTR, but we expect that digital, cassette-based HDTV recorders will be manufactured in the future and that a standard will develop. Several HDTV systems have been sold and some broadcast productions will be done on HDTV in 1987. HDTV will initially earn acceptance as an alternative media for 35mm motion picture production.

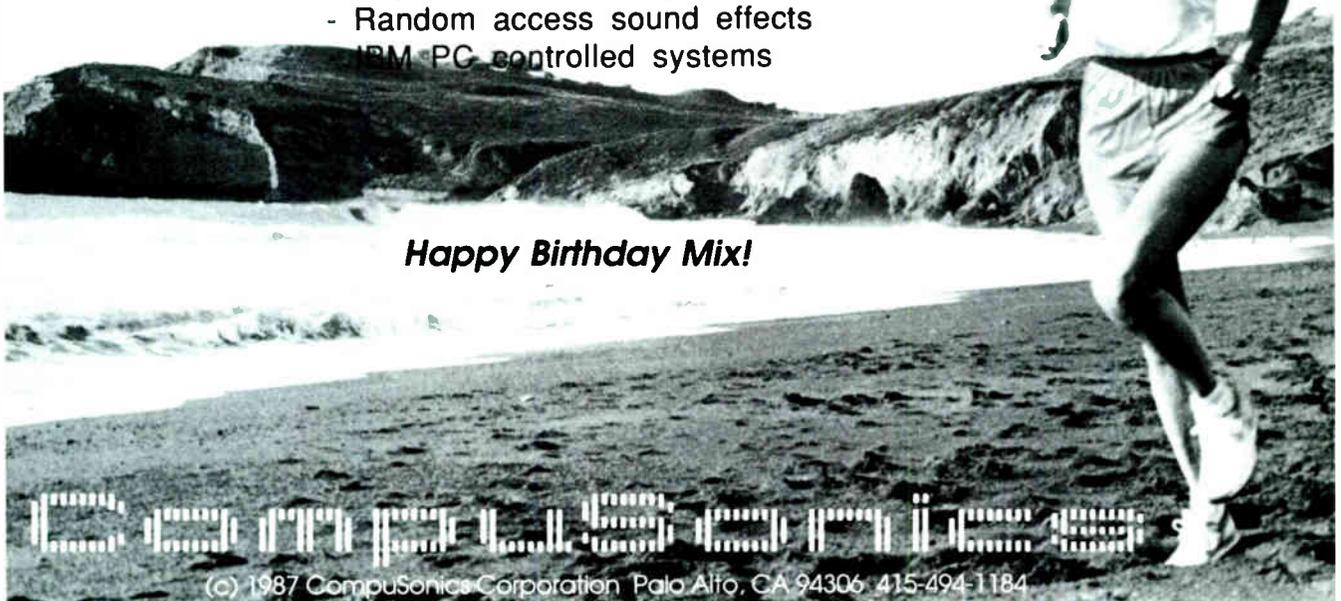
Eventually, a home HDTV VTR will need to be developed, but this won't happen for years. High-definition TV will certainly take a long time to evolve since the investment for new equipment is so great. However, it seems likely that distribution to the home will occur using satellite or video cassette in the beginning phase. We are watching HDTV developments, along with other advancements in the industry and plan to introduce products

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World Radio History

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when the market exists.

EDTV, or Enhanced Definition TV, has been a topic of technical discussions for some time now. There are many ways to improve the NTSC video picture without changing from 525 lines and 30 frames. High-definition TV competition will continue to keep the pressure on development of EDTV. Both S-VHS and Beta-ED are examples of EDTV video formats.

• • •

The industry as a whole is moving toward denser and denser formats. And one reason for this is the cost of storage media has continued to drop as the density has gone up.

There are three classifications for optical media: read only, write once and erasable. Audio compact disc and the optical video disc are examples of read only technology. Storage capacity ranges from 250 megabytes to 1.2 gigabytes. Read only media is manufactured by stamping and molding a disc from a laser-etched master recording. Write once media is being developed for data applications mostly and range in storage size from 280 to 1.2 gigabytes. For write once, the disc is recorded by a laser forming a pit in the upper layer of the video disc. Once written, the data cannot be erased, only added to. Machine software is

developed to ignore old data when revisions are required.

The most flexible of optical media is magneto optical or "MO." MO media is erasable and, therefore, reusable. The bits are set by utilizing a high powered laser that heats up the area around one bit, while an external field changes the bit polarity. The MO disk technology does not lend itself to easy editing at this time, but this may be worked out in the future. Still the MO disk could find some uses in audio and video recording.

The pressure is certainly on magnetic media to remain competitive with optical and this means higher and higher recording density, using thinner backing so that we can put more area of tape into the same package volume. The higher density will require high-coercivity advanced media, such as metal particle, metal evaporated, small particle oxide, and barium ferrite on thinner backings.

These technologies are still in their infancy, but hold the keys to the future in magnetic media.

All of the advanced media I will discuss now have the possibility of being used in high density applications. They are all different and have different advantages and disadvantages; all share one thing in common, and that is that we are doing advanced research in all of these areas.

Metal-particle is the media that is currently in use in 8mm video tape formats and will be used in Betacam SP, M-II and Digital Video Composite. The magnetic media is metal, rather than an oxide of metal. Coercivities for metal particle tape are 1,000 oersted and higher.

Metal-evaporated tape is much trickier to produce. Metal-evaporated tape is manufactured by putting a very thin film on the surface of a very thin backing. Eight millimeter was supposed to use metal evaporated tape as well as coated metal particle, but this hasn't happened yet because of difficulties in producing such a product and high costs.

Small-particle oxide tape is the closest of the advanced media to present technology. The tape can be produced on current manufacturing processes. However, it is getting increasingly difficult to produce higher and higher coercivities that will be required for advanced formats.

Barium Ferrite is one of the newer advanced media and it holds a lot of

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promise. It may be able to match the potential of metal particle media at substantially lower cost. Barium Ferrite will probably not have much impact in audio/video recording for several years.

For hardware, the recorders of the future will use more electronics and less mechanics. The trend will be toward extensive use of digital processing and control using VLSI. They will be less mechanical, smaller in size and lighter in weight. The recorders of the

The recorders of the future will use more electronics and fewer mechanics.

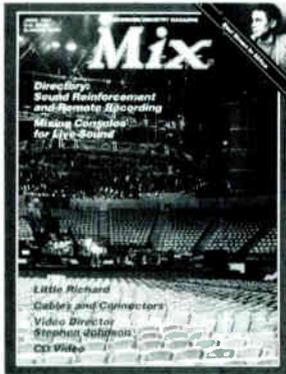
future will primarily be cassette-based, with narrower track widths and shorter wavelength recordings.

This means the magnetic media will need to be thinner, narrower, smoother, with a smaller amount of tape per package, higher incoercivity—up to 2,000 oersted—evaporated or sputtered thin film and vertical media pigments.

A lot is happening in this industry. In fact, I can't think of a period in the history of magnetic recording where users have been faced with more choices for recording. And this situation is going to be with us for a while. There are a couple of reasons for the great turmoil in the industry, and they are due to two technological changes. The first is the transition from analog recording to digital, and the second is the change from gamma ferric oxide magnetic media to metal-particle magnetic media. These two technological changes mean that the formats for magnetic recording are again up for grabs. ■

Robert N. Herman is product manager of professional video products at 3M in St. Paul, Minnesota. He is currently chairman of SMPTE's working group on the digital composite television tape recorder, setting standards for the D-2 format.

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BOB LUDWIG



MASTER OF THE TRADE

by Hank Bordowitz

"Mastering has evolved into a sort of executive engineering position," Bob Ludwig explains. "People work hard in the studios, doing the best job that they can, then they send their tapes to one of the famous mastering houses to get our opinion on what can be done better. The whole object is to get as much musicality out of the record as possible."

Look at any dozen records you have,

chances are two or three were mastered either by Bob Ludwig, or at his Masterdisk mastering lab in New York. This is a tribute to both his uncompromising ear and his inherent musicality. A graduate of the Eastman School of Music, at one time he made a living as a trumpet player in a symphony or chestra. He cut his teeth as an engineer with Phil Ramone at A&R.

"A&R was the first independent studio to have a Neumann computerized lathe," Ludwig recalls in the living

room-like setting of his main mastering studio. "No one knew how to use it, so Phil locked one of the maintenance engineers and me in a room for a month and said 'Figure this thing out.' All engineers learned how to cut at A&R back then. That was part of the routine of learning to become an engineer.

"At that time, The Band was making their *Music From Big Pink* record. They were doing this masterpiece of a record. I'd just sweat like crazy making these reference discs."

Yet when he got his copy of the record, he felt it was missing a lot of the depth of the reference discs he had made. When it was cut by Capitol, the bass had all but disappeared. "It didn't bear much of a resemblance to the master at all. After that, I cut all of The Band's records myself."

Ludwig has been at this awhile now, working on all sorts of music, from George Benson to Joan Jett, baroque to blues. He has to be on top of the technology involved in recording all styles of music, and aware of the limitations, both human and mechanical. "There are times, for instance, with classical music, where you are recording in excellent acoustics trying to duplicate something that already existed, using two or three \$4,000 microphones. Generally, those tapes we just listen to and say, yes, it sounds perfect, which is why many of the classical CDs are transferred straight across, without any equalization. But the last time I was working on a classical record, it needed manipulation, as per the producer's request. There was a percussion instrument that stuck out too far, so I selectively, using some very judiciously correct equalization, was able to actually rebalance the 2-track.

"Of the equalization and modification we do to a tape 99.9% is totally artistic," he continues. "In other words, if we use a filter of some kind, it's because the music sounds better through that filter. If we use compression, it's because that cut sounds better with compression. Except for that tenth of a percent, it's never just to 'fit it on the disc' or make it sound good on the cassette. We're trying to make it sound as good as possible. Given that, once

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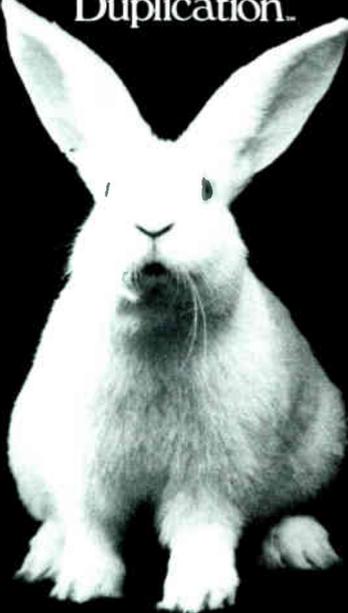
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we've determined what the final sound should be over the speakers, we cut a reference disc for the producer, usually dub a cassette and very often we make an F1, which is a home digital unit. So the producer has three different mediums to check it out on."

This, Ludwig asserts, is even more important with pop records. Given a project where the drummer and the artist might never meet, where everything is overdubbed, multi-tracked and almost nothing is recorded real time, an outside perspective is almost essential. "Most of the big budget records have been worked on for long periods of time. Huge amounts of money have been spent on them. Almost without exception, the producer and the artist have long ago lost all objectivity on the project. So they are really depending on us."

All of this is a long way from what mastering was two decades ago, when most record companies had their own mastering facilities, and more often than not a record would be cut the simplest possible way (as Ludwig cites with his tale of *Music From Big Pink*). While people come to Masterdisk to benefit from Ludwig's ears, the product that he is responsible for are masters; the sonics that the producer has given him in such a form that they are ready to be manufactured.

"Once we've decided on the artistic EQ," Ludwig concurs, "our main job is to make the actual master. Nowadays, we make a digital master of what comes off the console with the proper EQ, which is sent to a cassette duplicating plant. We make a master lacquer, either the normal way, which is with plastic, or with our direct metal lathe, where we actually cut a mother directly into copper. So we're even further along in the LP manufacturing chain than we were even a few months ago. For the compact disc we make a digital copy, which is then edited together in a very particular way for use by the compact disc plant. If everything is right in the world, they don't do anything to it except transfer it straight across, very mechanically. All the artistic input we've done goes right on the CD. We even determine the level of the compact disc here. When we make the compact disc, we make the digital Sony PCM 1630 tape, where we very carefully set the levels. If we are sloppy, and don't maximize the level, the CD cannot sound as impressive. Why would you not want to optimize the

dynamic range of the medium?"

With the much ballyhooed "death of analog disc" allegedly on its way, compact discs figure prominently into what Ludwig does. In fact, many of the projects that come across his console are compact disc-only, often older records that are about to be released for the first time on CD. "While there were (import) CDs out on some of Bruce Springsteen's old records, CBS wasn't happy with some of them, so they had me go back to the original masters and had me master his whole catalog," he says. "Any of the CDs that you buy that are made in the U.S. plant are made from those new masters. It's really been gratifying. I've done the whole Journey catalog, also.

"For most records, like Bruce's," he adds, "we went back to the original masters. It took us a while to find some of the tapes. They had none of the equalization that was done on the album masters. Most of the records were done long ago and mastering wasn't up to the state-of-the-art that it is now. There were no specialists in it back then. We were able to make quite a change. It's very involved and it's a case by case situation as to what is the best tape. In fact, mastering engineers are among the best people in the whole world to tell you what the best source for a CD is. With Bruce, clearly the original masters were far better than the EQ tapes that CBS had on their shelves. Oxide was falling off some of those tapes.

"With some other product, sometimes the tapes were not engineered well to begin with. They may have been engineered at extremely high levels and oversaturated. Through the years, those tapes have actually bulk erased themselves. Safety copies, that were made at more reasonable levels sound better than the originals did. You can't make a blanket rule. Generally, the best way to make a CD of something old is to get the original master tape, take it to the original facility that mastered it, get the best guy there now, have them use the producer's old notes, and then, just as they would today, take into account anything that might have been done just for the record and cassette transfer."

In a way, the death knell of the analog disc saddens Ludwig. He maintains they are exceedingly accurate. "They have a wider response than compact discs do. The response specification of the cutting system is within 1 db



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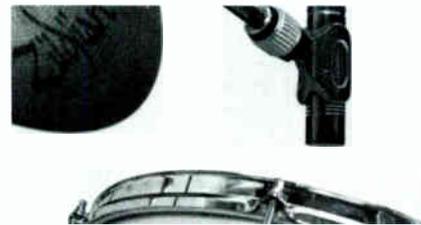
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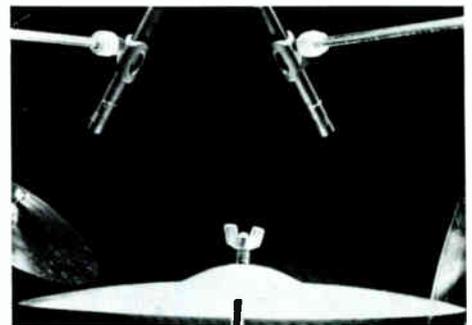
More than any other factor, it's what sets acoustic drums (and drummers) apart from the crowd. Beyer Percussion Mics like the



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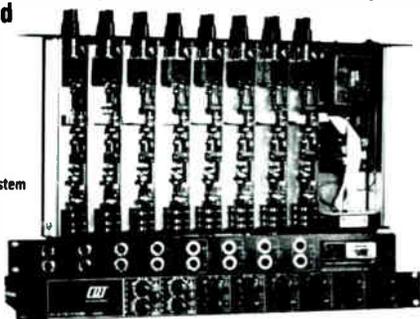
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from 10 Hz to 25,000 Hz. If you are playing it back with a calibrated cartridge on a good system, you will get that kind of accuracy. I mean, the most subtle changes, like the slightly higher resolution between a butterfly 2-track and an American 2-track is actually translatable to a disc, and can be discerned."

Ludwig is quick to point out that, despite this, both analog discs and cassettes require equalization; the RIAA curve on LPs and the NAB and IDC curve on cassettes. "There are two kinds of equalization. One's artistic, the other's a mechanical equalization curve, where, in the case of both tape and disc, the low frequency is cut in the record mode and the high frequency is greatly boosted in the record mode, just like Dolby, except that it's static. Just a constant high frequency boost. In the disc, it's roughly 20 dB of boost at 20,000 cycles. The bass is cut commensurately. If you didn't have the bass cut on the record, you wouldn't be able to fit any amount of time onto a disc. The grooves would be so extremely wide that it would just eat up tons and tons of room. If you didn't have the high frequency boost, the disc would be very noisy, because you're cutting into an inherently noisy material, plastic, or copper. The negative of that curve is in every playback system in the world.

"Unlike compact discs, cassettes and records both have high frequency saturation problems. It's true that the frequency response of a disc is flat at ten cycles to 25,000 cycles and the frequency response of the cassette is God-knows-what. A CD is generally equally flat at -60 dB to 0, full out. With a disc, you run into high frequency saturation problems where, once you've reached a certain level, you cannot put the same amount of high frequencies on as you can bass."

With the emphasis on high fidelity, and the growth of audio technology, Ludwig has become a very important link in the chain that pulls a record from the artist's head to the consumer's home stereo. He sees this as his art now. And besides, Ludwig laughingly points out, "This is where all the state-of-the-art equipment is!" ■

Hank Bordowitz is a NYC-based writer, editor, and critic who cut his teeth in 8-track recording studios. He writes for a multitude of mags, from Mix to High Fidelity, and currently is editing a new magazine, Rock Fever.

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WHAT A BUSINESS!

A Brief Compendium of Weird Studio Sessions

Compiled by Blair Jackson

Jimmy Miller (Producer—Rolling Stones, Traffic, Boomtown Rats, Jimmy Cliff, etc., now working with Buddy Guy, The Count, Matrix and others): When the Stones initially recorded “Sympathy for the Devil” [Olympic Studios in London, 1968] it was being filmed that night by Jean-Luc Godard, the French filmmaker, and consequently they had these lights all over for the film crew and they had masking paper so the light wouldn’t be so sharp and direct; it would diffuse the light to make it softer. At one point during the recording of the basic tracks I was in the control booth, which has a glass cut-out, so you can see the studio, but only a certain area of it. You can’t see the ceiling, for example, from where I sat. But I could see the Stones performing. Suddenly, in the middle of a take, Mick’s at the mic and next thing he’s running in one direction, Keith rips his guitar off, throws it down and runs in another direction, and I’m wondering what’s going on. Suddenly a sheet of burning material comes crashing to the floor. I walk out and it looks like the whole ceiling is on fire. [Apparently the hot lights ignited the masking paper.]

So there’s a big panic on. The film guys are the first ones to leave. Big heroes! Instead of filming it—“Let’s get all this and sell it to the network news”—they run; they’re the first ones out of the building. A few people ran to get fire extinguishers, but Olympic has a very high ceiling and the extinguishers only managed to go about a foot from the ceiling and then back

down. Eventually we gave up on that and flooded the studio. The next thing I know, people from the London Fire Brigade are arriving and I’m standing across the street thinking the studio is burning down. And I suddenly remember I had a whole Traffic album that I’d just finished mixing in the storage room. So I had to go in and retrieve that. The firemen are saying, “Sorry sir, you can’t go in there!” And I said “You want to bet?” I ended up standing across the street with the tapes in my arms.

Fred Catero (Independent engineer—Dylan, Dave Brubeck, Simon & Garfunkel, Leonard Cohen, etc.): When we were recording the first Chicago album—actually they were the Chicago Transit Authority then—in New York in the late ’60s, the guys in the band pulled a great trick on me. They said, “Fred, we want to record this next one in the dark. We want all the lights out, because we’re going for a certain mood and we really want to get into the music.” So I said, “Sure, why

not?” and I turned out the lights. They started playing and it sounded real good. The tune ran about three or four minutes; not a note was missed, everything was fine. So at the end of the tune I turned on the lights and looked into the studio and they were all completely naked! Somehow they had managed to remove all their clothing while they were playing, and to this day I have no idea how they did it. The drummer never missed a beat!

Stan Ross (Co-owner/engineer, Gold Star Studios, L.A.): Phil Spector always did a lot of his work at Gold Star, even through the ’70s. In about ’75 he was in producing Dion and I was there helping him out when [L.A. *Times* rock critic] Robert Hilburn brought Bruce Springsteen into the control room. This was at the height of Springsteen’s early popularity with *Born to Run*. He was everywhere. But Phil didn’t react at all. He was very busy, didn’t even look up. When he’s working he’s very animated. He motioned to Springsteen and said, “Here, sit next

The Studio Gets Hot

by Mr. Bonzai

When Ryan Recording made the cover of *Mix* magazine we knew we were headed for Fat City. The years of hard work had finally paid off. I arrived early at the studio, confident that we would be booked solid for years to come.

“Hi, Layla, any calls yet?” I asked cockily.

“Tons, Mr. Bonzai!” she answered enthusiastically.

“Great...run them by me.” I took out my notepad and started making a list of what kinds of cars the staff would want for Christmas.

“Well, let’s see,” she began, “Johnny Terrific wants to get back into

the studio to finish up his latest album. Oxxon Tape wants us to sign a 25K a year purchase order. The Mortician’s Union would like us to donate some time for their annual glee club album, Fuztek Labs wants to show us their new digital fuzz generator, and Orange Grove Junior College wants us to hire one of their students for free.”

It wasn’t the jackpot I had expected, but at least we would be working again.

“When does Terrific want to start recording?” I asked.

“Noon.”

“Noon! Okay, get Eddie out of the sack and tell him to tweak the multi-track for elevated levels... call the tape supplier, and order us a case of bulk tape. (Johnny always likes to do about 20 mixes per tune and then listen to them in his mo-

—CONTINUED ON PAGE 166

Reprinted from the book *Studio Life*, published by Mix Publications, Inc.

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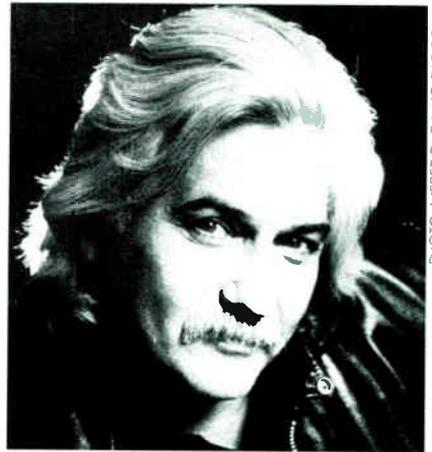


PHOTO: MEREDITH DAY/CLEAR POND

The sessions for "Sympathy for the Devil" were "hot" for producer Jimmy Miller.

to me." Didn't say another word for a few minutes. Then, in the middle of a take, he says, "Hold it, Hold it" and stops the music. He turns to Springsteen and says, "If you wanted my sound, why didn't you *ask* me?" I think he'd been waiting for that one for quite a while.

David Rubinson (Former engineer and producer—Santana, Herbie Hancock, Pointer Sisters, etc.): This story doesn't involve anyone famous, but it gives a good insight into the music business. When I was a young producer at CBS in New York, the custom was to work until you drop. One night we'd been working for many, many hours straight—I think it was on *Time Has Come Today* by the Chambers Brothers. We had worked until six or seven in the morning and I was wrecked. So rather than go home and then come back for a 10 a.m. session, I crashed in the studio. I lay down on the couch between the console and the window in the studio, wrapped myself in the blankets that were used to cover pianos, turned out the lights and fell asleep. I must've been asleep about 45 minutes when I started having this dream, and in this dream I was hearing somebody singing with a big orchestra. I opened one eye and noticed that all the lights were on, but nobody knows I'm there, because I'm completely covered. And there's Streisand's "People" coming out of the speakers, and there's the girl who books time for the control room with earphones on singing over Streisand's track! She had gone to the engineer and said, "Look, I'm a singer and I want to sing a song like that. We'll go in at 8 a.m., put the tapes up and no one will ever know!

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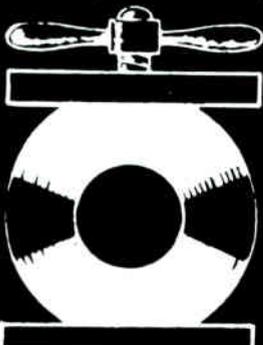
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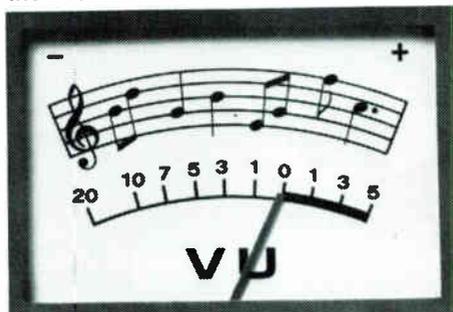
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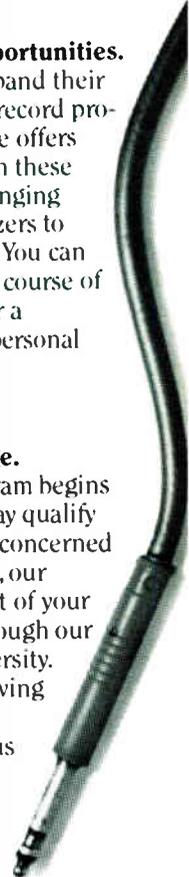
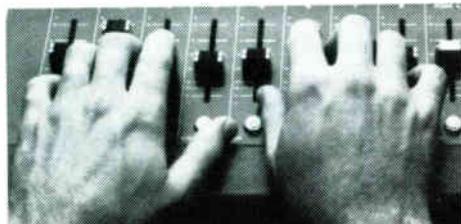
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And I'll have a tape of me singing 'People' with these incredible backings [which were the original masters, of course]." Unfortunately she was not a great singer, I'm afraid. I decided to stay under the blankets and never reveal myself. What this story showed me is that no matter what anybody's doing in show business, they probably would really like to be in *show business*.

George Martin (Producer—The Beatles, America, Jeff Beck, etc.): When we came to the middle section of [The Beatles' "Being for the Benefit of Mr. Kite"], we obviously had to go into waltz-time, and John [Lennon] said he

wanted the music to "swirl up and around" to give it a circus atmosphere. As usual, having written a great song, he said to me, "Do what you can with it," and walked away, leaving me to do it. [After trying several different methods, including various organs] I found the answer. I got together a lot of recordings of old Victorian steam organs—the type you hear playing on carousels at county fairs—playing all the traditional tunes, Sousa marches and so on. But I clearly couldn't use even a snatch of them that would be identifiable; so I dubbed a few of the records on tape, gave it to the engineer and told him, "I'll take half a

minute of that one, a minute and a half of that one," and so on.

"Then what do I do with them?" he asked.

"You cut them into sections about a foot long. Cut it up into little parcels and don't be too careful about the cuts." Clearly thinking I had lost my senses, he did, leaving me with a bunch of pieces of tape one foot long—about 60 in all. "Now what?"

"Fling them up in the air. Now pick them up in whatever order they come and stick them all together again."

After he had laboriously stuck them all together again, we played the tape and I said, "That piece there's a bit too much like the original. Turn it around the other way, backwards." We went on like that until the tape was a whole amalgam of carousel noises, but meaningless in musical terms because it was composed of fragments of tunes connected in a series of fractions of a second. It was an unreal hodgepodge of sound, but when it was added as a background "wash" to the organ and bass harmonica track we already had, it did give an overall impression of being a circus.

(Reprinted from Martin's *All You Need is Ears*, St. Martin's Press)

George Massenburg (Producer/engineer—Little Feat, Philip Glass, Linda Ronstadt, Emmylou Harris & Dolly Parton, etc.): [My most ridiculous session was] with David Franks sometime in the '60s. He was a poet and had written some songs about pig slaughter and we went to a slaughterhouse with a Nagra. We edited the sound into a "fat-back loop" that the musicians played along with. It's easy to do now, but back then it took a lot of editing and work. At the session, he showed up with handfuls of raw hamburger and threw it all over the studio to give us the right "ambience." That was fairly ridiculous.

(Reprinted from "Lunching With Bonzai," *Mix* Nov. '85)

Robert Missbach (Independent engineer—Huey Lewis, Santana, Journey, etc.): I can't mention any names here, but it was a pretty well known group. I had a session one evening that started off innocently enough. There was a LinnDrum part on tape and it was playing the right part, but it didn't have the right sound. This was back in the days before samplers. So the producer had the drummer go out in the studio with



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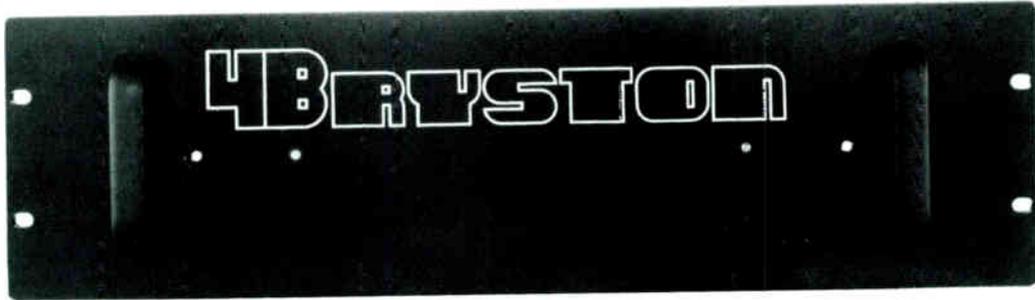
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1. Musical accuracy
2. Long term reliability
3. Product integrity

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a real bass drum and try to match, beat for beat, this LinnDrum. A real simple boom-pa-boom part, you know? It had to be perfectly on the beat, but this guy just could not get it quite right. This went on for several hours and on into the evening, past midnight. Around two in the morning, one of the producers and the engineer left. I was the second on this and so I was still there trying to punch this guy in. This is six hours later! We've gone down, we've done all the verse parts, then we go back and punch all the choruses and after that we decided we'd done the choruses better so we went back and tried the verses again. By the time we'd gone through that again and were going to start on the choruses again, we found that the tone of the drum had changed because it had been kicked so many times! The head had basically gone dead. So now it's four in the morning and I decided to take a cigarette break and I'm out in the hallway and then I finally come back in and the producer looks at me. The poor drummer is completely exhausted and he looks up at me and says, "This isn't working, is it?" And we scrubbed it, after working ten hours on it.

Then, about a month later, in the

mail, we received a LinnDrum chip with our names on it, which was a combination of the LinnDrum and the live drum that they finally used. They'd pulled it off tapes, made a copy of it, went to Linn with it and made a chip for it, and that represented all those hours. And frankly, the chip didn't sound very good, either.

Jim Gaines (Independent engineer/producer—Steve Miller, Huey Lewis, Van Morrison, Neville Brothers, etc.): One time, when we were working on Huey Lewis' *Picture This* album doing vocals at the Automatt's Studio C, Journey was cutting in Studio A, which was right across the hall. We'd had problems in Studio B there because [Journey guitarist] Neal Schon's amps were sort of stacked up against a wall adjoining our studio and were bleeding into our room. So we moved to C and started doing some vocals when all of a sudden we heard this ungodly sound out in the hallway. I go out there and they're shooting a damn shotgun in the hallway for sound effects. So we had to wait until they were done with that one before we could get back to our vocals because it sounded like cannonfire. It was like Journey was using

three studios at once.

Another weird one was my one Grateful Dead session in the early '70s. I was working at [Wally] Heider's [in SF] doing two or three sessions a day. The office gave me a setup of how the Dead wanted their guitars and mics and all and so I set up the room for them. When it comes time for the session, their road manager comes to me and says, "Take down all those microphones. The band's not coming today." So I took down the microphones, and in through the back door comes two giant tanks of nitrous oxide with about 12 spigots on them. He says, "Go get a record player," so I got one and my one Grateful Dead session became playing the Dead's last two records again and again into the studio while the road crew and their old ladies got high! That went on about six hours and cost them about \$600. It was their studio time, though.

Elliot Mazer (Producer—Janis Joplin, Neil Young, The Last Waltz, Dream Syndicate, etc.): This is about John Simon recording the song "Turtle Blues" for Big Brother's *Cheap Thrills* album [coproduced by Mazer]. For some reason, Simon thought the song lacked some emotion; there was something they couldn't get from guitar, voice and piano. So to make the song more exciting he decided to record the ambience of a bar. So Janis [Joplin] and [guitarist] James Gurley take a little portable cassette machine, which in 1968 was very rare—I think it was a Norelco probably—go to Barney's Beanery, and sit at the bar. Janis picks a fight with a patron at the bar and records the fight on the cassette machine. They leave intact, go back and put it on the 8-track, and it still doesn't sound quite right. Simon then goes and orders a bunch of cocktail glasses from the CBS commissary and then they smash them all on the studio floor and record that. And that's the record. Sounds pretty good, too.

(Producers! Engineers! Musicians! Do you have any strange anecdotes you'd like to share with *Mix's* readers? Write to *Mix/Weird Sessions*, 2608 Ninth St., Berkeley, CA 94710. ■

Mix managing editor Blair Jackson's strangest studio experience to date was interviewing Rick James at the old *Record Plant* in Sausalito. "Trust me. You had to be there."

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World Radio History
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(L to R) Charlie Sheen, Corey Glover, Chris Pedersen, Willem Dafoe, Forrest Whittaker and Keith David.



PLATOON

Oscar-winning Production Recordist Simon Kaye Talks About Capturing the Sounds of War

by Nicholas Pasquariello

More than a year ago British production recordist Simon Kaye got a call in London from an American production company he had never worked for before, Hemdale Productions, inquiring if he would be interested in working on a Vietnam war film called *Platoon*. "I was excited and thrilled by the call and asked 'Why me?'" says Kaye.

The call had come just a few weeks before production was to start. "I didn't get out to the Philippines until about four days before we were about to start shooting," Kaye says. "It was tighter than I would have liked." Perhaps the considerable challenge of the shoot was evident from the start. "One of the

biggest problems when I got there was that my equipment that came from England was held in bond in customs for rather a long time." So long that Kaye missed the first shot on *Platoon*.

Kaye was the only Englishman who headed a production department on the crew of *Platoon*, which may be part of the reason he was so surprised to get the unsolicited call to work from the States. The assignment, though, had a major hitch: he was not allowed to bring his own boom man—a regular part of any location recordist's team—probably because of the film's relatively modest budget (about \$10 million).

In 1962, Kaye was doing film sound work for the Rank Organization at Pinewood Studios outside of London. There followed assignments on two of

"On a war film, when you have people with webbing and packs rubbing together, it's impossible to put mics on the body. I used radio mics taped into helmets: that way you don't have body rustle."

PHOTO: RICKY FRANCISCO

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"Ghandi is one of my proudest soundtracks. The demands were enormous."

the better produced British TV series, *The Avengers* (40 episodes) and *Human Jungle*. Since then he has been location recordist for a good many of the major European and American directors currently producing theatrical features. His credits number no fewer than 31 theatrical films since 1967, four British Academy Award nominations, two American Academy Award nominations, two British Academy Awards and one American Academy Award. (Among his best-known films are *Lion in Winter*, Roman Polanski's *Macbeth*; *Sunday Bloody Sunday*, *The Three Musketeers*, *Royal Flash*, *Jesus of Nazareth*, *Reds*, *A Bridge Too Far*, *Gandhi* and *Indiana Jones and the Temple of Doom*.)

This interview was conducted the day before Kaye received his American Academy Award for Best Sound on *Platoon*. Asked what he thought his chances of winning were, he responded, "I'm always pessimistic about these things. It's my third attempt [at the American Academy Award]. But people say things go in threes."

Mix: What were the special requirements of recording location sounds for the movie *Platoon*?

Kaye: Because Oliver [Stone, director] was so desperate to have his film as natural as possible, he was insistent that explosions and gunfire and anything that was part of the scene, wherever possible, would actually be going on while we were shooting the dialog. From the point of view of performance, he felt it was necessary to the other actors that they knew what was going on offstage. I had to battle on those occasions, because if the actors were not in vision of the camera, I had to try to convince him that they should not be on the soundtrack. Of course, those occasions become slightly heated at times because there are two conflicting views there: you have the director's view and then you have the

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soundman's view. We managed to make it work because we had an arrangement: he trusted me, I trusted his requirements. And we then attempted to get the best of both worlds.

The film was quite difficult from the point of view of having to shoot live dialog and also have guns and explosions going on at the same time. And on those occasions I sometimes had to mix the mics that I was using because if I was able to pot down the condenser mic that I usually use for the dialog, I would then bring up a dynamic mic for the explosion. And then I was able to hold them. Otherwise, to try to record an explosion or gunfire—depending on its velocity—you may have a lot of problems with a condenser microphone.

Mix: Were you switching off from one mic to the other?

Kaye: I was mixing, yes. All of our actual effects were recorded on a stereo Nagra. My original dialog recording was all done on a monaural Nagra.

Mix: What mics were you using?

Kaye: AKG condenser mics for the dialog and AKG dynamics for the explosions.

Mix: What sounds did you record on location in the Philippines?

Kaye: Needless to say the jungle sounds were readily available. But there were also village sounds, sounds of children and general atmosphere for that sort of terrain. Those sorts of things are all needed ultimately. And then, of course, the major parts of the film, since it's a war picture: the movements through the jungle and whatever vehicles are available. I recorded as many soundtracks of those as I possibly could. I always shoot direct [sync] sound on everything, even if the soundtrack is going to be remade later. Purely from an editing point of

“I always shoot direct sync sound on everything, even if the soundtrack is going to be remade later.”

view, it's very boring not to have any sort of soundtrack to edit with.

And then as far as gunshots and the AK-47s and all the various armaments for the film, of course we were shooting with blanks when we were actually filming, but then I had someone brought over from England to go off for two weeks to record quite a lot of available live ammunition. Unfortunately, that didn't work out in its entirety. They only gave us permission to shoot on firing ranges, and inevitably while we were on the firing range, the local army was also there so we had a

certain amount of interference from extraneous noise that we didn't particularly want.

A war picture is not an easy picture to handle. Also, don't forget we had a lot of Filipinos on the crew, who were all marvelous, but there were certain language barriers. They don't have the Western energy, if you like, of American and British technicians. We work very long hours at a pretty high pace. The Eastern countries, I find, probably because of the heat, probably because there's “always *manana*,” don't have the same sort of attitude of being able

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to rush around in that sort of climate. The temperature was about 100 degrees plus about 90% humidity.

Mix: Did you communicate with the post-production crew before you began shooting?

Kaye: No, because those sort of people are not even on the payroll, they've not even been chosen at that point. Sometimes they are. Although in this case we knew who the [supervising] sound editor was going to be—Gordon Daniel. He was not available, and he was not engaged on the film until after we'd finished shooting. So he just had to deal with the material that I presented him with. I did have a conversation with him before we finished shooting because I decided that there was no way that I wanted to leave the Philippines with big gaps in the soundtrack, namely, explosives and gunfire. I also had numerous discussions with the picture editor, Claire Simpson, who was on location with us.

Strangely enough I think what tends to happen with some of us sound men is that we take on whatever sort of role

“The editors told me that there was absolutely no looping on the film. All my dialog production sound was used. All of the dialog tracks used in the final track were recorded live in sync on location.”

we decide we want to take on. My interest is the final soundtrack. And in some cases I know that some people are mainly conscious of what they have to do on each particular day and just fulfill that function.

Mix: But you tend to think of your role as wider than that?

Kaye: I tend to take full responsibility or like to take full responsibility.

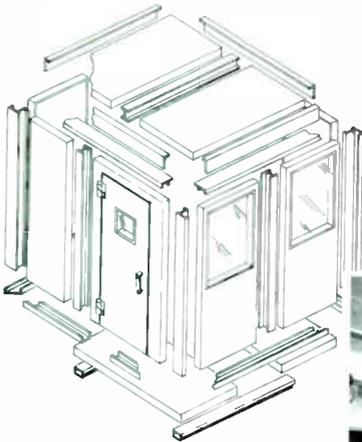
Mix: Have you a sense of how much of the final soundtrack was originally recorded on location versus added later in post-production?

Kaye: The editors told me that there was absolutely no looping on the film. All my dialog production sound was used. All of the dialog tracks used in the final track were recorded live in sync on location.

Mix: Some production recordists participate in various stages of the post-production process such as ADR. Did you?

Kaye: No, because in this particular instance we left the film in the Philip-

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piners, I went to London and they brought the film to L.A. And there was no way that I was available—other than by telephone—to be of assistance because I then immediately went on to the [Richard] Attenborough film [Making Trouble] and we then went on to Africa.

Mix: What was the most challenging aspect of doing location recording on *Platoon*?

Kaye: I suppose not having one's own crew initially is slightly more demanding, because however good they are, you always feel that perhaps you ought to be looking over their shoulder to make sure they are going about it in the right way. I feel when I have my own crew with me I'm able to relax so I can perhaps stroll away from the set and have a cup of coffee without being concerned about what's going on back on the set. In this case, once I realized that my boom man was absolutely marvelous, I didn't have those sort of worries.

In addition, there is a lot of dialog which is of paramount importance to get over as cleanly as possible. Trying on occasion to work when you sometimes have wide angle lenses obviously is a problem as far as getting the boom in the right position. I devised a system in 1976 when I was doing *A Bridge Too Far*, which was also a war film, to use radio mics I taped into the helmets, wired to a transmitter. And that way you don't have body rustle or movement. And of course on a war film, when you have people with webbing and packs that are all rubbing together, I find it's pretty impossible to put a mic on the body.

Mix: What kind of microphones were those?

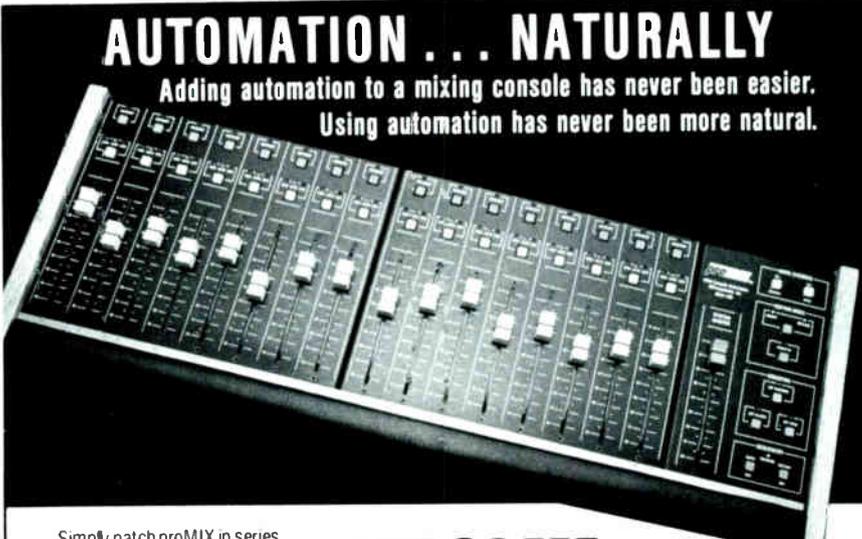
Kaye: They are the small electrets that we call "Trams."

Mix: Did you have any problems with them?

Kaye: The only problem occurs when the actor wants to take his helmet off. If you have someone in the middle of a scene who wants to take his helmet off and you can't wire him up then you have to think of an alternative. I must say, Tom Berringer [one of the film's stars] was absolutely marvelous. He loved the idea. All he did was hand us his helmet, we put his mic and cable into it, we put his transmitter into one

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of his backpacks and we never had to fiddle with him. I think one of the problems with radio mics is that you have to fiddle with the actors and it can become very distracting for them.

The beauty of putting the radio mic into a helmet is that when you swing your head from side to side you're actually taking the mic with you so you don't have any loss. What happens if you've got a microphone in a fixed position on the body and you swing your head from left to right is you go through the good pickup area and then out of it. So from that point of view you're able to keep a much more continuously acceptable soundtrack.

Mix: Did you have helmet mics on all of the main actors?

Kaye: Only as and when required. I evaluate scene by scene, I don't say, "Well, this is how we're going to shoot the film from the word go." I watch a rehearsal and decide how we can get the best possible soundtrack. The main reason for going into helmet mic mode in the first place is either because of heavy background noise or because the width of the camera lens won't enable the boom to be where you want it. In many cases, we were able to get into a reasonably good mic position and consequently avoided the necessity for the radio mics.

Mix: How much of the dialog was recorded using radio mics compared to a boom mic?

Kaye: Minimal. I tried desperately not to use radio mics. If I had to put a percentage on it I would save 5%. They will not help you a great deal if you've got someone firing guns and playing dialog at the same time. The mic is going to be on top of the gunfire, as is an open mic. So the only thing you can do is evaluate which mic is going to get you the best possible dialog pickup and go for it.

Mix: Were there instances when Stone was willing to sacrifice the background sounds for the dialog during sync recording?

Kaye: We were never so bold as to say we were going to "sacrifice." Even in recording the heavy rain sequences—which were extremely difficult to cope with in themselves—the major problems did not arise from recording the rain sounds themselves, but from the fact that the rain had to be pumped by

a fire engine, and for that you have to use heavy pumps, so you have mechanical noise to try to hide. What we tried to do in those instances was to get those pumps as far away from the set as possible, baffle them as much as possible and get the mic pickup as close to the dialog as we possibly could.

Although before we started shooting I was very concerned about the rain sequences a lot of them were finally done with sync sound.

Oliver never really said, "Let's sacrifice." On one or two occasions he said to me, "Look, I'd really like to bring a helicopter in the back of this shot; is it going to murder you?" And I said, "I don't think you should suffer. I think we should go for that because it's visually a very good effect. Let's go for it and we'll re-record the dialog." He gave me the option. I could have said, "No, let's go for this dialog and I'll put a soundtrack of a helicopter on stage." But it was much more agreeable pictorially to see the helicopter."

Mix: Is it fair to assume that there were occasions when you were not given an option?

Kaye: There were occasions when there was gunfire and explosions, some of which were in picture and some of which by necessity had to be offstage for effect. Some of those explosions gave us a visual effect as well: they either lighted up the sky or they lighted up the faces of the actors. And on those occasions we had to accept that they were going to interfere with the soundtrack.

Mix: What film has been your most challenging picture?

Kaye: Probably *Gandhi*, which is also one of my proudest soundtracks. The demands were enormous, mostly because of the extraneous noise, most of which we didn't want on the original soundtrack. It's very difficult when you're confronted with a question like that. I can go way back to *A Lion in Winter*, which we shot in 1968. We did not loop one word of dialog. I've done that a couple of times. We worked very, very hard. It was a period film: 11th or 12th century.

Mix: Where was it shot?

Kaye: We shot a lot of it in Ireland on a stage and on location and about 40% in monasteries in the south of France.

Mix: To what would you attribute such successful sync location recording?

Kaye: I think the actors to a great degree. They were so orchestrated in their dialog that even if we had to replace their soundtrack—and we did it immediately afterward—they were able to replay their scenes without any problems. The director [Anthony Harvey] also was adamant that we didn't loop.

Mix: I wonder if some of the credit might be attributed to the fact that you were often shooting in quiet monasteries.

Kaye: Well, no, because in those situations the echo was quite great. I did another film [*Abdication*] with the same director, again in those sorts of conditions in Italy: very high, very long, stone and marble rooms. The amount of echo was unbelievable to the degree that the actors literally could not pick up a cue from each other. And what I had to do was to devise a canopy, which had four extendable legs which I brought up and over the action. I also made a rolling

“Because Oliver [Stone] was so desperate to have his film as natural as possible, he was insistent that explosions and gunfire would actually be going on while we were shooting the dialog.”

baffle, which was 20 or 30 feet high, to reduce the length of the room. So we put that behind the actors. We got rid of a lot of echo by putting bulk into the room. The baffles that I usually use are made out of fiber egg trays. I have these stuck to two pieces of material that are eight feet by four feet; both faces are covered by egg trays that are shielded by chicken wire. And those

are brought into the set and used to baffle off extraneous noise, or in some cases to deaden the sound in a particularly live room. But this type of solution only works in situations where we are filming rather constrained action. ■

Nicholas Pasquariello is a freelance writer and filmmaker based in San Francisco.



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The Fine Art of NEGOTIATION

by Dr. Eugene L. Mendonsa

What do you and Ronald Reagan and Kareem Abdul Jabbar have in common? Whether you know it or not, you're all negotiators. You negotiate in both your personal and working life just about every day. And while you may not be negotiating for a unilateral reduction in ballistic missiles or a multi-million dollar two-year contract, you can still use some of the tactics and strategies common to professional negotiators.

"We use our price list as a starting point," says Chris Stone, president and founder of the highly successful Record Plant Studios based in Los Angeles. Since 1967, the Record Plant has grown continuously and has just recently added two new studios in the post-production area of Hollywood to work on records and film scoring. The company also uses two remote trucks that do some of the biggest live TV shows, like the Jerry Lewis Telethon, the Grammys and the Academy Awards. Stone has seen a little bit of everything in the past 20 years in the recording business, and says that negotiating a deal is a little bit like buying a car.

"It's kind of like the sticker price on a car. That's where you begin, but that's never what you pay," he says. "That will change depending on the kind of services you're providing and the client. Let's say Bruce Springsteen walks through the door and tells you he wants a day. Because it's Springsteen and because he spends months at a time in the studio you may just give him that day. On the other hand, if it's John Doe that walks in the door, he'll pay the sheet price."

David Porter is an aggressive studio entrepreneur and the owner of six Music Annex Studios in the San Francisco Bay Area. He basically agrees with Stone's ideas on negotiating. "Do I negotiate my card rates? I guess everybody does, but they probably won't admit it. A small two-hour session with an ad agency is not negotiable," says Porter. "They come in, do their work, and pay the card rate. But let's say it's a 25-hour project. We know what the competition is charging and we'll bid the job based on the number of hours, the times they're taking, the engineers I'm supplying, the room they want, all those factors.

"Let's say it's an album project. When the producer has pretty much decided that they want to record at your studios and work with you, then it becomes a matter of them beating on you for

Dr. Eugene L. Mendonsa



price. They might say, 'Well, look, I really want to do it at your studio, but XYZ studio is going to give it to us for less money.' This happens all the time."

Cottage Industries

There is a real diversity of individual businesses that are lumped together into the category of "the recording industry." According to Stone, "There are some people who only do radio jingles and some who only do sound for audio-visual presentations. There are some people who only do film mixing and some who only do records, etc., etc. Each little industry has its own deal. For example, in high speed tape duplication, which is sometimes done in a recording studio, it's contract work. You go out like any manufacturer and bid against your competition and get a contract to produce a minimum of so many cassettes per week."

Joe Chiccarelli is a Hollywood-based engineer and producer who has worked with people like Pat Benatar, Oingo Boingo, Stan Ridgway and Robert Pepper. As an independent contractor, Chiccarelli is usually given a certain budget to complete an album. "Let's say I decide that an album is going to take 450 hours to complete. I might figure that it's going to take 150 hours to do my mixing, 100 hours to do my tracking, and 200 hours to do my overdubbing. So then I'll work out a deal with one or more studios to fit that into my budget. I wouldn't just go to a studio for price, but certainly when you're talking about a low budget album, it's a prime consideration.

"If you're doing an album out of

Creatures of the Species

There are six general types of negotiators: Jungle Fighters, Dictators, Silhouettes, Guardians, Soothers and Win-Winners. Which one are you? Let's look at each one, and see what characteristics you can identify in yourself and in your opponents. How does your style interact with that of your counterparts? What adjustments must you make when facing different types of negotiators?

Jungle Fighters

Jungle Fighters are the most dangerous negotiators of all. They're a brassy, razzle-dazzle lot, enraptured with their own theatrics, flaunting a dress and manner that draws the attention they crave. They usually speak loudly and grandiosely. They thrive on conflict—if there is none, they will create it. Their creativity and talents are enlisted almost entirely in the service of their ambitions. They demean others into submission. They send double messages, use monologues and try to talk circles around you, or change their strategy from one second to the next—anything to catch you off guard or anesthetize your senses. They are the ultimate "con artists," promising the moon and delivering little.

Dictators

Dictators are also win-losers, like Jungle Fighters. They are obsessed with the acquisition and retention of control. But they almost never exercise their temper like a jungle fighter. Their explosions, when they do come, are controlled and for effect, but they usually use their intellect before they use their fists. They parry and thrust, but they rarely draw blood. They don't feel obliged to destroy you. On the contrary, they need you. What's a Dictator without subjects to rule? Dictators are low-key, restrained, spare and cool. Their uniform is the dress that is prescribed for success—whatever that may be. Their expressions are economical: a stare, a raised eyebrow, a set mouth, a small ripple of muscle in the cheek, and an almost

—CONTINUED ON PAGE 79

OUTPERFORMING THE REST

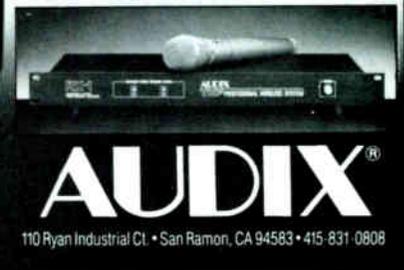
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—FROM PAGE 74, NEGOTIATION

town, a studio might say, 'Look, pay the full price and we'll put up the band for two weeks,' or something like that. I never sign a contract with the studio itself, but I'm always signing contracts with the record company or the production company or the group's manager. There would have to be a deal struck for my time, royalties, credits and everything else.

Adds Stone, "The key thing to remember about the music and film recording industry is that everything is done verbally. It's a very old-fashioned kind of negotiating. I'll get on the phone with a producer or a label, for

example, and we will cut a deal for X amount of time for an artist at Y price that includes Z equipment. It will all be done on the telephone and it will never be confirmed in writing. Yet each of us knows what the deal is and each of us has taken notes, and God help the man who doesn't live up to that agreement. You are definitely, positively a product of your reputation in this business.

It's Your Job

Regardless of what particular aspect of the recording industry you're involved with, there are a lot of things you can do to help make your next

negotiating session a successful one.

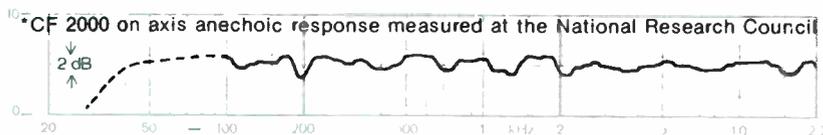
The next time someone tells you they're going to go to one of your competitors who is cheaper, ask yourself how much truth there is to it. If the buyer says it and you take it to be true, then he gains leverage on you. Rather, take it as a negotiating ploy—professional negotiators refer to it as using the competition to gain an advantage. It's a buyer's tactic that's as old as the hills. Remember, it's the buyer's job to make such remarks, and it's your job to not get taken in. Don't overreact, and most importantly, go slowly. Get out of the habit of trying to make snap decisions constantly, even when you don't have to. Snails are stars in the negotiating business.

Tell the buyer that you simply can't reduce the price. If he persists, tell him no again and again. Persistence is a good negotiating trait—good old stick-to-it-iveness. If the buyer continues to pressure you, tell him that you have to get clearance from an operating committee. If you don't have a committee, make one up. Anything to give you some time to rethink the situation and come up with some alternatives. If you absolutely must make a concession in price, tie a string to it. *Never, ever make a concession without asking for something in return.* You might say, "All right, we can lower the price if you'll work evenings or switch weeks with Springsteen."

Proper Timing, Setting and Physical Arrangements

A good negotiator knows himself. What's your biorhythm? Are you at your best in the morning, afternoon or late at night? Are you ready to go first thing Monday morning, or still revving your engine at 4 p.m. on Friday afternoon? Generally speaking, the other party will probably be less sharp on Monday and Friday during the late afternoon. If you know your own peak times and these general tendencies, you can strategically schedule the meetings to your advantage.

Deadlines are important, too. Research shows that most negotiators give away more as the deadline nears. This is the time when poor negotiators will "give away the farm," but even good negotiators will give up some concessions. Proper timing is important. Use deadlines to your advantage. Try to get the other person to tell you what their deadline is. Be the one who gives a little and gets a lot because of



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timing.

Don't rush things along. Americans are notorious around the world for being in too much of a hurry. Spend a lot of time creating goodwill and getting to know the needs of your opponent. Try to get to know the other person before you start bargaining. If you do the spadework in human relations first, you have the advantage during the give and take as deadline approaches.

Home Turf

Where should the bargaining be done? Holding it on their turf gives you the opportunity to see their operation first-hand, to penetrate their organization and possibly build relationships beyond the person you'll be bargaining with. It also allows you to limit your own authority since you can't discuss every detail with your own people. But try not to send the "big boss," as it's too easy for him to give away more than is necessary.

On the down side, you'll be away from your own work environment and routine, possibly even suffering from travel fatigue. You may even find yourself offered different kinds of foods, drinks and other exotica that you're not used to, which could have an adverse affect on your deal. And, while you're away, your other work goes down the tubes.

At home, you're in a normal routine and that gives you the psychological edge. Also, you've got all your resources at your fingertips. Of course, you've also got to deal with interruptions from your own people.

Creating the Right Pace and Mood

Pace yourself by starting at the right point slowly—avoid the urge to "get down to brass tacks" by discussing business right away. Start with the human side of the relationship before launching into the details of the business side. Find out as much as you can about the other person and his likes and dislikes. Ask a lot of questions *and then listen*. Listening is an art in itself, and most people are delighted to find someone who likes to listen. Entertain the other person. Delve into their opinions on seemingly unrelated matters. The more you know about the person, the easier it will be to come to an agreement.

Don't ever be belligerent or combative. Establish a spirit of cooperation

by asking how you can help the other person. What are his needs and problems? Is there any way you can help him deal with his own people? Sometimes, the person you are negotiating with is under a lot of pressure that he has no control over. There is power in such wooing, and anytime you try to help someone, they become more easily persuaded. Any time you raise the pride of your opponent it is easier to influence him.

On the other hand, enlist him in your cause. Ask for his help. Tell him your difficulties and let him come up with possible solutions. Now he's on your team—looking for ways to help

you. Out of such cooperative give and take comes a feeling of mutual trust. This is the stuff that long-term business relationships are made of.

Don't corner your opponent. Keep an open mind to his constructive ideas (as opposed to his smart remarks) and also give him a face-saving way to change those ideas. If you pin someone down too early, it may be harder for him to concede something later on. A proper atmosphere of mutual trust and cooperation provides a perfect setting for face-saving. If you're unduly competitive, you and your counterpart become polarized and agreement is much less likely.

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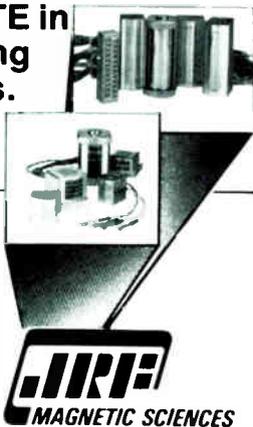
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Win-Winners

Win-winners are at ease with negotiating. They move with fluid ease, unaffected by stress or destructive emotions. They lean forward, offering a resolute handshake. Their voices are firm and clear, their sentences direct and spontaneous, and filled with words like, "we," "us," "our," "let's consider," "what are your thoughts," "how can we resolve this," "let's dis-

cuss," "discover," "share," "redefine," "negotiate." Oh, they make mistakes once in a while and get angry—they're not perfect. But there is one major characteristic that sets them apart from others—they care about people.

Win-winners take the long-term view of things. They have learned that survival depends on other people. They shun win-lose tactics, while still expecting to get more than a 50/50

Rate Your Negotiation Skills

Honestly answer the following statements with a number from 0 to 5. Zero would mean that the statement is "totally incorrect," while a 5 would mean that you think the statement is "totally correct." After you're done, total up the responses and see how good your negotiation skills really are.

- 1) Luck plays a big part in making a good deal. _____
 - 2) It's O.K. to get angry and express that anger to get the upper hand during a negotiation. _____
 - 3) I usually feel uncomfortable negotiating a deal with people of much higher status than myself. _____
 - 4) Normally, I don't ask questions that might cause embarrassment. _____
 - 5) Sometimes I have a problem thinking fast on my feet when the pressure gets intense. _____
 - 6) You don't want to get *too* friendly with your counterpart during a negotiation. _____
 - 7) I would feel uncomfortable making an extremely low offer for something that was probably worth a lot more. _____
 - 8) It is important for me to be liked by most of my rivals. _____
 - 9) I'd rather deal with a general manager than a record company president. _____
 - 10) Helping your opponent to "save face" is not particularly important. _____
 - 11) It doesn't really matter where you sit when negotiating a deal. _____
 - 12) The people that I negotiate deals with are usually honest. _____
 - 13) If you encounter rudeness or hostility, you shouldn't show your counterpart much courtesy. _____
 - 14) I feel uncomfortable getting into a confrontation while negotiating a deal. _____
 - 15) I'm more frank and open than tactful and discreet. _____
 - 16) I never haggle over prices in a department store. _____
 - 17) I feel uncomfortable with long silences when I'm talking with someone about a business deal. _____
 - 18) I would never get emotional or irritated during a negotiation unless provoked. _____
 - 19) I normally don't know anything about my counterpart until the actual negotiation starts. _____
 - 20) It usually isn't necessary for me to prepare for a negotiation in advance. _____
- Add up your score _____ (Total) _____

Rating

0 to 15 = Superstar

16 to 30 = A good, competent negotiator

31 to 45 = You're doing all right, but you've got a lot to learn.

46 plus = You're losing too much. Get some help.

—FROM PAGE 75, CREATURES

imperceptible thrust of the jaw. Talk is measured and calculated.

Silhouettes

Silhouettes are loners, fearing intimacy of any kind. They deal in an economy of scarcity—of money, enthusiasm and love. They are emotional tightwads, blank faces, stone walls, gray uptight people who are unresponsive to life. Their energies are concentrated on keeping others from penetrating their defenses. Business associates are unwelcome in their silent worlds. Silhouettes are typical lose-lose negotiators. They have a fear of conflict because of the fact that they are not effective communicators. Their classic response is to procrastinate or deny involvement. Great tension builds inside them in anticipation of conflict. They prefer to concede rather than endure the pain of differences.

Guardians

Guardians are win-lose negotia-

tors. They are obsessed with the acquisition and retention of control. They are devious. They rarely lose their temper in public. Guardians are dream merchants. Rather than dictate, they coach you into believing that your wishes can come true. They offer help, listen intensely and help you grow. They have fabulous stores of energy which they will dispense to anyone who'll take refuge under their wings. They are the most manipulative of any of the negotiators. They may seem to be working for you, but no project gets anywhere unless there are appreciable benefits to them. To a certain extent, their self-interest is normal, but they give it a special twist that puts them in a class by themselves. The moment you show the smallest sign of doubt that the Guardian knows what's best for you, all of the approval mechanisms go in reverse. However, they will communicate this disapproval by innuendo, tone of voice, what's left unsaid and body language.

Soothers

Soothers are anxious, evasive stylists who lose more often than any other negotiators. They perceive the maintenance of peace and harmony as their greatest contribution. They hold the illusion that they contribute these virtues by making things OK. But in order to nourish their illusions, they must engage in prodigious feats of denial; effectively, they must avoid responsibility as they would avoid the plague. They either turn their backs on conflict, or give in almost by reflex. In fact, their objective is to lose (usually subconsciously), lest they offend. They fear recognition, because being in the limelight might draw criticism. They hate making decisions or taking responsibility, so they cling to Guardians and Dictators.

Win-Winners

In brief, their characteristics are: assets—objective, specific, clear, open, non-judgemental, motivated, sensitive. Liabilities—ideally, none.

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split. They are not afraid to ask for concessions from the other side that would allow them to win by a margin of 55/45 or 60/40. But they always ask one crucial question: "How much will the loss affect the other person?" Obviously, you don't want to do anything that is going to rule out the possibility of any dealings in the future.

Win-winners assume an "economy of abundance." In their view, there is more than enough pie to go around. They intuitively know, or have learned through experience, that life is not a "zero-sum game"; that in every negotiation there is a better deal for both parties. They are willing to take the time to look for that better deal. They don't want to get theirs and run, burning their bridges behind them.

Given this assumption, they take care to consider the other person's perspectives, needs and desires. Their style is protective. They don't dump on you, humiliate you in public or luxuriate in emotionalism. And they're not afraid of change. Each negotiation is a new and exciting experience, a chance to participate in life's abundant riches. They understand what the Greek philosopher Heraclitus wrote 2,500 years ago: "It is not possible to step into the same river twice." They do not have rigid, preconceived ideas and categories by which to judge. They have assumptions, but they are ready to change, alter or discard them if that becomes necessary in the course of the negotiation.

Win-winners have a primary asset—and that is an empathy for others and a felt responsibility to explore the other person's point of view. They can do this while holding firm to their own requirements because they know that, with a little creativity and open communication, a better deal awaits both parties. They are not driven by fear of what they might lose, rather by an excitement at what they might discover.

Are you a win-winner? Do you believe that you can get what you want and still leave the other guy satisfied? Work on your negotiating skills. Put some effort into it, and you may find that you really enjoy the give and take of life. ■

Dr. Eugene L. Mendonsa is an internationally recognized author, negotiator, lecturer, educator and consultant, with more than 25 years of experience in all phases of negotiation in the United States and overseas.

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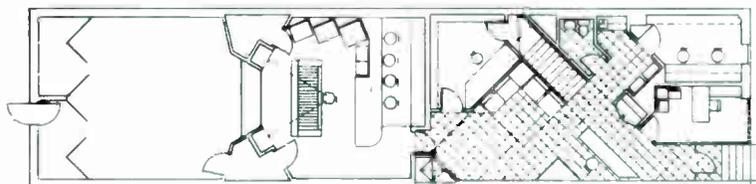
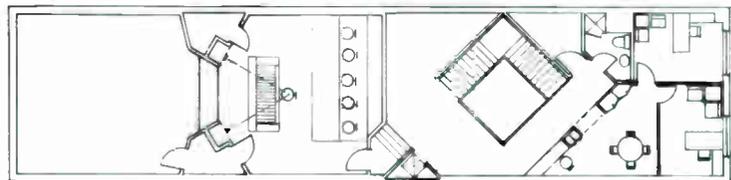
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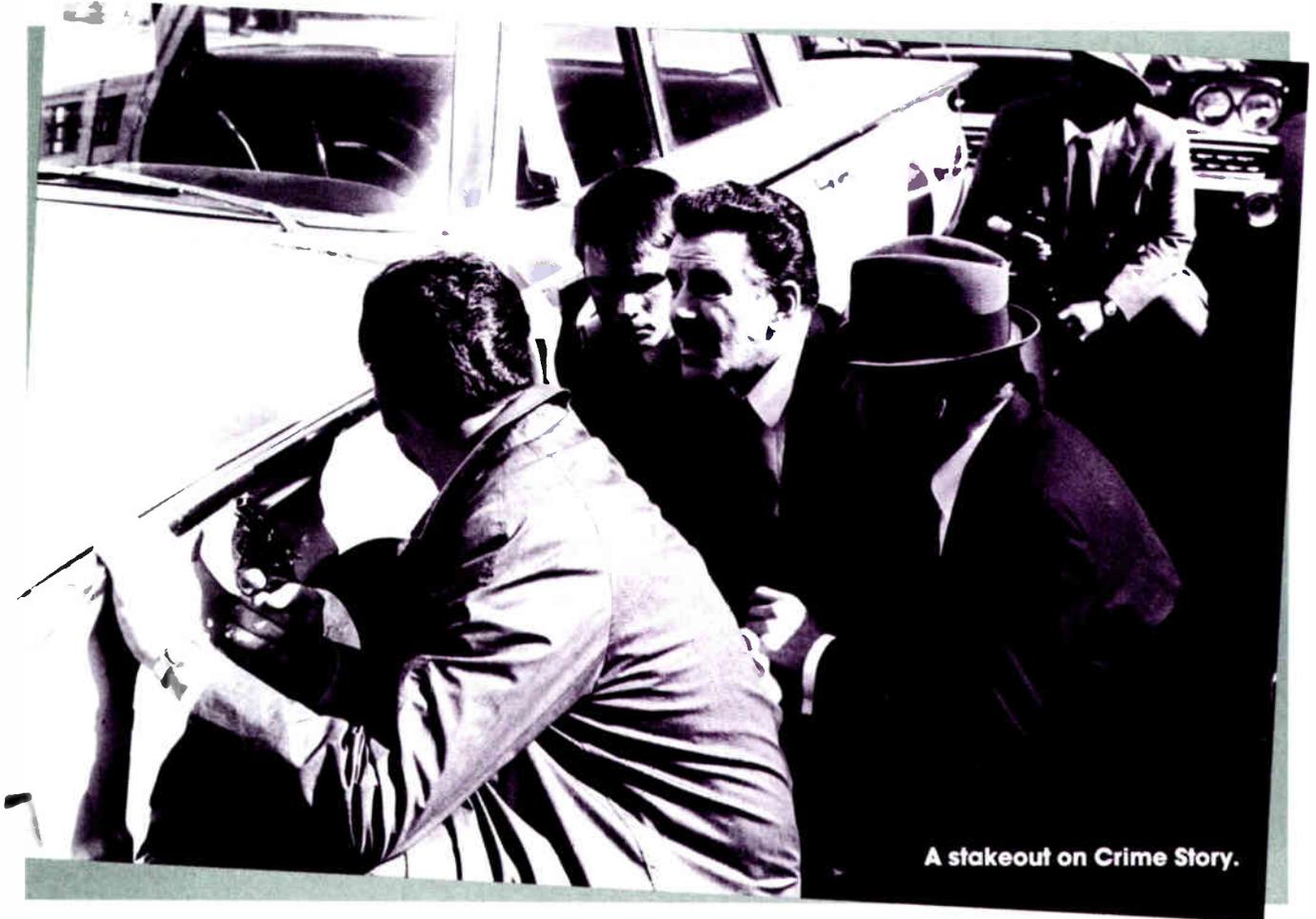
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AL KOOPER

*On Scoring CRIME STORY
& Other Manic Pursuits*



A stakeout on *Crime Story*.

by **Pauline B. Rogers**

They call it the Fulcher Avenue Annex. It's a little, windowless studio, in the back of the garage behind Amigo Recording Studios, one of the hottest studios in Los Angeles.

This is where the duo that calls themselves "Partners In Crime" holes up, practically seven days a week, scoring Michael Mann's stylish '60s cop show *Crime Story* (recently renewed by NBC for the fall television season).

It's a peculiar place for a scoring studio. But it's an even more peculiar pair behind the high-intensity music

that breathes so much life into this show.

Al Kooper, co-writer of Gary Lewis & the Playboys' 1965 hit "This Diamond Ring," creator of Blood, Sweat & Tears, The Blues Project and Super Session, and former head of A&R for both Columbia and PolyGram, is still sporting his '60s image—black leather boots, loud shirts, long straggling hair and the ever-present dark glasses. Somehow it is utterly believable when he tells you he doesn't own a car, and maybe not even a suit. His partner of some 20 years, Charles Calello, a quadruple threat arranger-producer-com-

poser-orchestrator for such artists as Juice Newton, Eddie Rabbitt, Streisand, Springsteen and Maniow, knocks about in Fila sneakers, coordinated designer jeans, shirts and sweaters and a salon haircut and has a brand new Jaguar carefully parked in his spot out front.

Opposites in image, maybe, but not in imagination. Here, they are perfect partners. While Calello is the technical expert, Kooper is the musical genius. Charlie knows what kind of sound has to go where and Al pulls it out of thin air.

They met more than two decades

A lot of important music history happened on Beale Street in Memphis, Tennessee. W.C. Handy became the "Father of the Blues" there. Musicians like B.B. King, Furry Lewis, Piano Red, and a kid named Elvis started their careers there. During the 60's and 70's the famous "Memphis Sound" was popularized by performers like Sam and Dave, Rufus Thomas, Booker T. and the M.G.'s and Isaac Hayes, all of whom were weaned on Beale Street.

Today Beale Street is the center of downtown Memphis' entertainment district, boasting not only some of the finest food and lodging to be found anywhere, but also a happening nightclub scene.

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Al Kooper at work on music for *Crime Story*.

ago and have fought with each other to create some of the hottest sounds on the air since. Al was a fan first. As he puts it, "Charlie owned New York." Kooper was just starting out and longed to work with master Calello. Then, after several spots with close friend Bob Dylan and hits of his own, Kooper became hot. "Half the fun of being hot," he says, "is that you can get almost anyone on the phone. I simply called Charlie and said, 'Let's work together.'" The call started the duo on a single for CBS; then Kooper's first solo album *I Stand Alone* cemented the duo rock-solid.

Watching the two score an episode of *Crime Story* is like watching a vaudeville act. Once you get out from under the gags and one-liners, the creative genius is quite evident. The sound is definitely like no other on the air today.

Mix caught up with Kooper in the middle of scoring episode 19 of their first 20-show season.

Mix: How did the man who created *Blood, Sweat & Tears* and *Super Session* get involved in scoring a television show?

Kooper: I'd scored a movie some years ago and really enjoyed the process, so a friend suggested me to Michael Mann. We met and talked music for an hour. Then he asked me to do episodes one and two. In three days. I gulped. I'm always up for a challenge. I think the first show is one of the best things I ever did in my life because it was my audition. We gave 'em the battles, the flags, the wounded soldiers and everything.

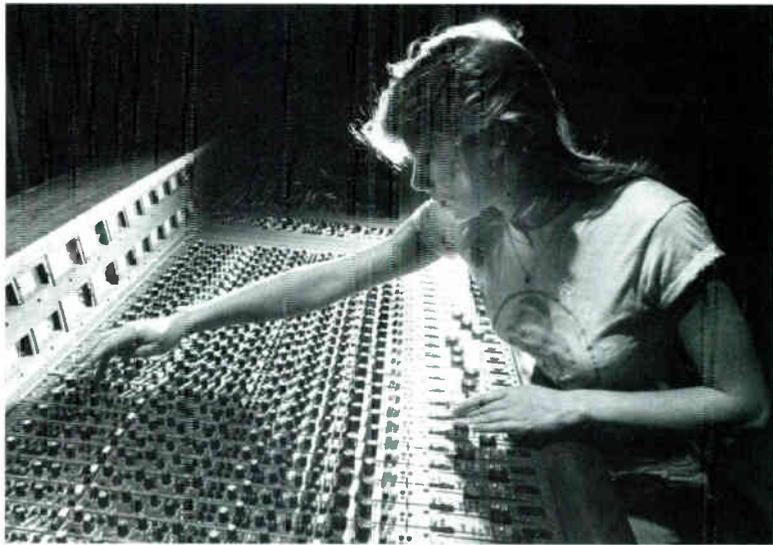
Mix: What is the difference between scoring Hal Ashby's *The Landlord* back in 1969 and *Crime Story* in 1987?

Kooper: There's no contest. It's a completely different animal. Now we do it all ourselves. I don't have to communicate anything to anyone else. We're a nice combo because we're both high in each other's deficiencies. Back then we wrote out the arrangements for the musicians to play on a soundstage. We even had to pay musicians. Supposedly there are shows like *Matlock* that are still scored that way. We're not adverse to doing that, but it just takes too long to tell everyone exactly what we want, especially when we're not sure ourselves. We're



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trying to do this in a real, non-hack way. We're trying to take music that maybe you've heard before but not in this context. There was a courtroom scene, for instance, where we played something like "A Child's March" on the first Toto album. Juxtaposition of music you've heard in places where you've never heard that kind of music before, that's it. Takes it out of the stereotyping.

Mix: How do you see your scores as different from other television shows?
Kooper: We're crusading to make it feature-type scoring. Hopefully I'll be able to retain that as time goes by.

Maybe other guys don't do it because of the pressure to deliver. Maybe we won't be able to keep it up. I don't know. I never watched television before I started this show. Now I'm watching to see what everyone else is doing. I don't know, it just seems like we're unlike everyone else. You know, it just hit me. I just finished scoring a TV show for an entire season. Before this I thought I'd done everything. After this I know I can.

Mix: How does this prepare you for doing other things?
Kooper: The time pressure is ridiculous. Every Monday we get the picture.

We look at it, we spot what we have to do, we laugh, because it's impossible to do it, and then we do it every week. This show's to the wire. We're only a week ahead. We deliver on a Sunday, they mix three days, and it's on the air.

Mix: How much do you have to do per episode?
Kooper: It's divided into two things. There's probably 14 minutes of music that we write. And, guys and gals, that's like making five singles a week. And then, separate from that, I pick the records that are played on the show. That's another full day's work.

Mix: I've been told you have a tremendous record library to pick from. How do you choose?
Kooper: It's big, and getting bigger. I'm now adding to it with CDs so the sound quality is better. Which is pretty funny because they then scratch it up so that it sounds like it's coming out of a radio!

Mix: It sounds like you have the most fun picking the records.
Kooper: Sure it's fun and another kind of pressure. 'Cause in picking the records I'm not picking the obvious kinds of records. I'm picking records in which the person watching the show goes, "God, I remember that!" And they didn't hear it on the radio yesterday, or even have it in their house. But it will trigger them to that era [early '60s].

Mix: That's really important to this show, isn't it? What are some of your favorites?
Kooper: First thing I had in show one was "Your Mama Said You Cried In Your Sleep Last Night" by Kenny Dino. And we played it over a multiple murder in a beauty salon. It was phenomenal. The other was "Ramrod" by Duane Eddy. It worked fabulously in the show—just for a bad guy walking down the street. Then we've done some things for Ted Levine, one of the bad guys. His character's name is Frank Holeman. He's a rockabilly singer. So we cut three songs with him. He sings them in the shows with a band backing him. But it's really our "garage band" behind him.

Mix: It's incredible that you can deliver 14 minutes in three days.
Kooper: We can't always. There are certain cues that we save in case we do



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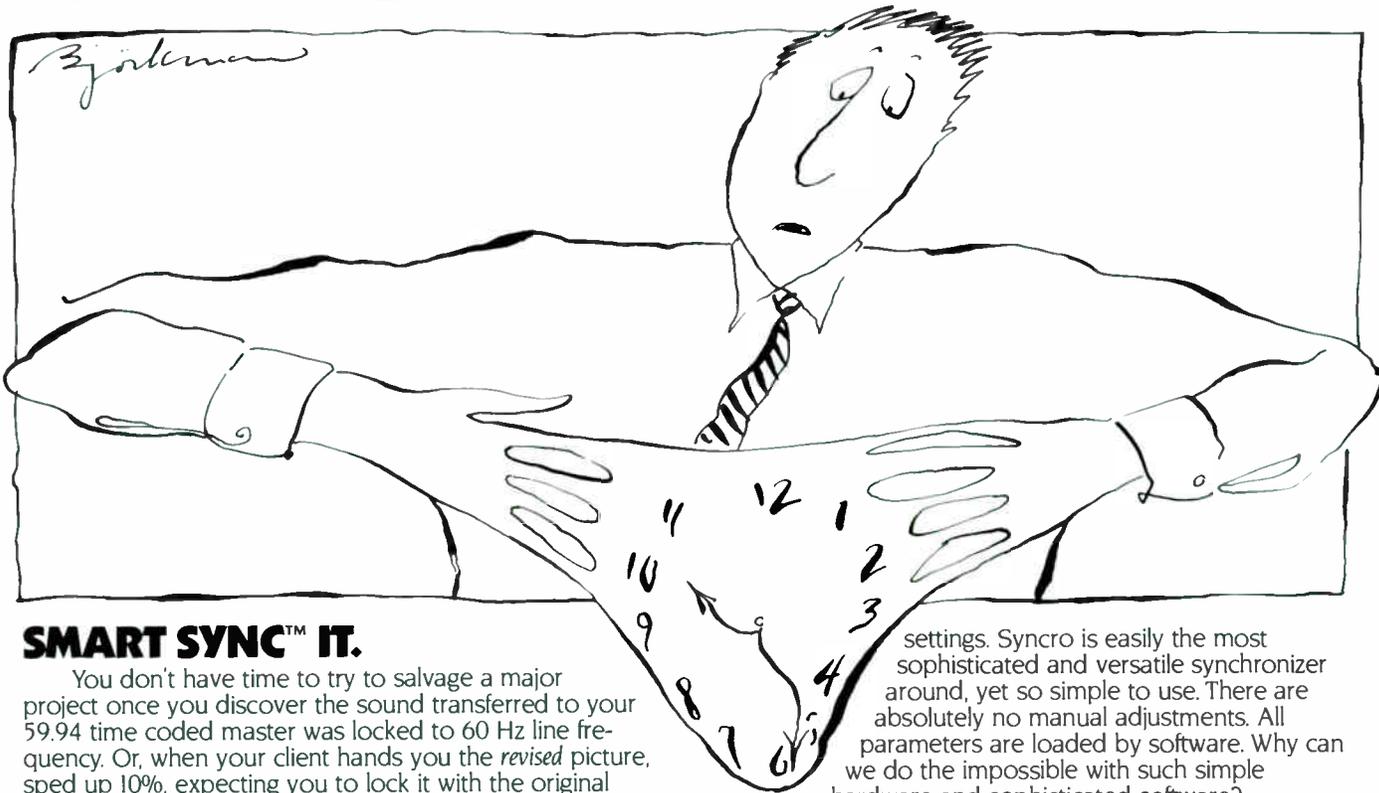
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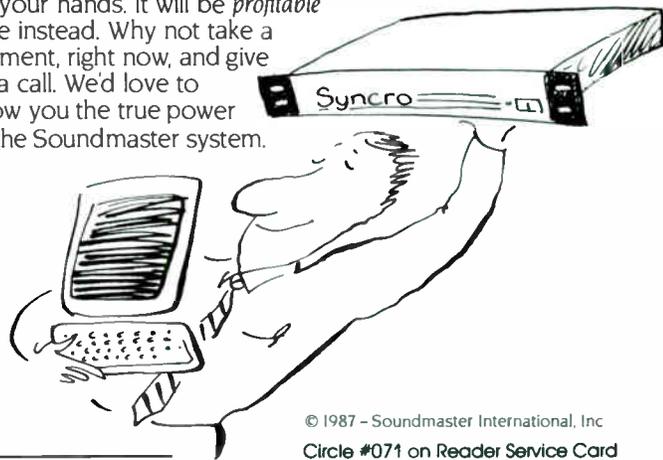
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PHOTO: PAULINE ROGERS

Charles Calello, Kooper's partner for two decades.

run out of time. They're called "wingers." We will do them right in the studio itself. I'll just put up a synthesizer or a guitar or something and make it up right there. One take, one time only. They've always been really successful.

Mix: Now that you've survived almost 20 episodes, what are you going to do during the hiatus?

Kooper: A week on Maui so that I'll feel human again. I'll tell you, the show has really brought my chops up. It's better than the live gigs like I've done with Dylan and Petty. Now I'm dying to go out on the road because I'm twice as good a guitar player as I was before I did this series. I'm doing all the guitar parts on the show. And the stuff that Charlie writes, it's way over my head. And I have to learn to really play. Also, I'm really inspired and annoyed at the same time that there's this blues resurrection happening. I think I'd better made a blues album and jump back into that, sort of make my seniority claim. I almost want to make a record that says "Hey, I've been doing this shit since before you were born." And I'd love to take this garage band on the road and perform live with it.

• • •

"The garage band"—an investment of

more than \$100,000 in equipment—that Al Kooper and Charles Calello have put together is probably one of a kind. They chose their equipment carefully, building around the Linn 9000 because Charlie feels it is the best sequencer and drum machine available.

Using the Linn as they brainstorm, they dub the soundtrack they receive from the film house to a stereo VCR (they use VHS instead of 1/4-inch because it's lighter and smaller), placing the SMPTE time code on the right track and the dialog on the left.

The SMPTE goes into a Garfield Electronics Masterbeat, which reads the code and tells the Linn 9000 when to start playing. This way they can write the cue and type in the start SMPTE code, so they can see cue against picture—what they call "instant gratification."

They have housed the equipment in such a way that it requires the least amount of setup time. A specially built unit with sliding drawers and covers breaks down so they can get to the studio or location quickly. Then, with a minimal amount of connectors on the back, they're able to integrate their system with any recording device they decide to work with.

Besides the Masterbeat and Linn 9000, their MIDI arsenal includes a

"Every Monday, we get the picture. We look at it, we spot what we have to do, we laugh because it's impossible to do it, and then we do it, every week."

MIDI selector box, JL Cooper 16/20, two Akai S900 samples, Roland MKS20 piano module, three Korg EX800s, two Yamaha TX7s with DX master keyboard modified to hold 16 banks of programs, Roland Jupiter 8, Oberheim OB-8 and every other effect and delay they need. Guitars are recorded direct with two Scholz Rockmans. Everything is then connected to a 56-input portable with two Hill and four Rane mixers.

If they have to, these two can record the entire show in their little room. "Let's face it, with tight schedules like we have, it's safer to know we can do it. We can compose, record and score ourselves. When we finish a cue it's finished and can go out on the air," says Calello. "We simply have to get it out of the system and on tape. It's conceivable that we could set up and be ready to go in half an hour. Conceivable, but we're not sure we'd actually like to try it!"

This fall, the show will be back on the air, and the grind begins again, but Kooper still dreams of taking their "garage band" on the road.

"I wouldn't take all this out without Charlie programming it," says Kooper. "Oh, yeah, we fight all the time because I think he's too slow. It gets pretty funny. The fact that we're still talking after almost 20 episodes is incredible. Now I feel like any project anyone put in front of us we could do with no problem. Doing a film would be like putting my feet up on a desk and looking out a window in Hawaii. So why not a one-man show with a 'garage band' for backup?" ■

Pauline Rogers is a television, film and magazine writer living in Los Angeles.

AMEK Angela



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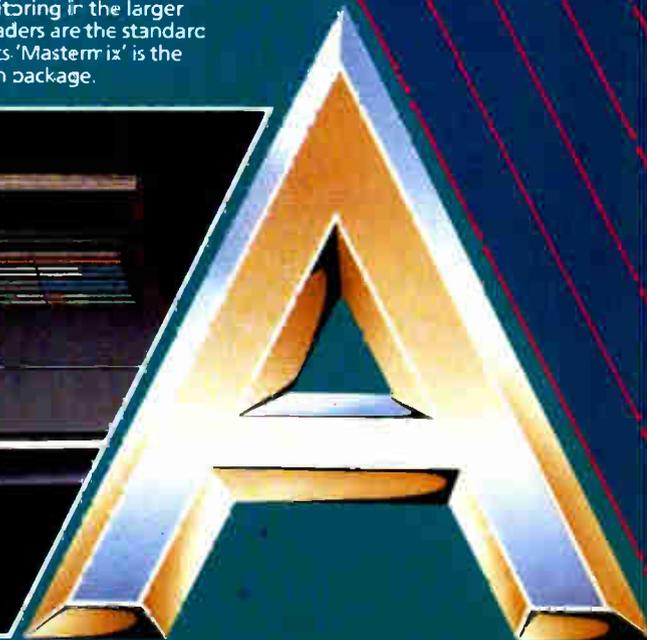
Today, the mid-range console market is crowded with manufacturers who want to fill the space in the middle of your control room with their console.

Each one of them has a marvellous claim about specifications, low-noise performance for digital, flexible signal path, strength of mechanical construction, equalization, price, ergonomics, multiple inputs, high-quality components, superior technology: and how they consulted a hundred top engineers before they set pen to paper.

Let them claim. We wish them well. Fashions come and go; our emphasis is on engineering. There are now over 180

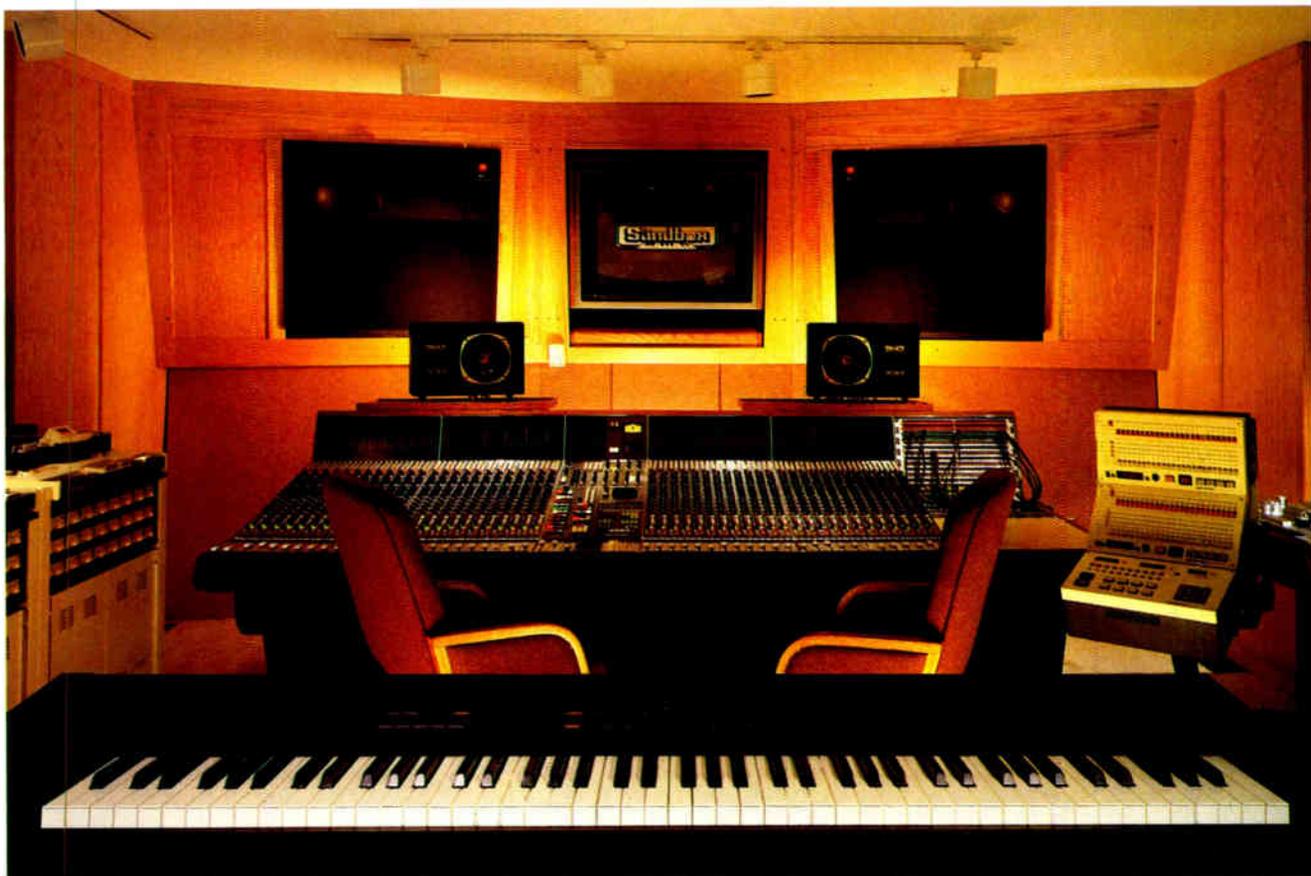
AMEK ANGELA installations worldwide. We set the standard in ergonomics, performance, specifications, equalization and build quality. Imitation is the sincerest form of flattery. Emulation is a little more difficult.

Actually, we admit one concession, but not to our competitors. The new 1987 ANGELA is now finished in grey, to harmonize with the rest of the AMEK product line. Otherwise, ANGELA is still available in 3 chassis sizes: each with onboard or external jackfields, giving 28 to 62 dual-channel i/o modules (ie. 56 to 124 inputs, plus returns) and a choice of either 24- or 48-track monitoring in the larger versions. Manual or VCA faders are the standard options, and Audio Kinetics 'Mastermix' is the recommended automation package.



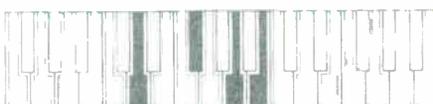
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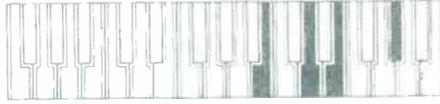
ENTER THE SANDBOX



sand-box \ 'san(d)-.baks \ n:

a box containing loose sand for children to play in, promoting imagination, spontaneity, and creativity. b: an automated 48 track recording studio in Fairfield County, Connecticut.





Spectral Music Corporation of New York City has opened its fully integrated MIDI studio in Fairfield County, Connecticut. The basic premise in the design of the studio was to create a 48 track facility in which

no compromise was allowed in integrating the systems. At THE SANDBOX all synthesizers, sequencers, drum machines, computers, samplers, tape machines, and the NEVE "V" SERIES console are interfaced at all times.

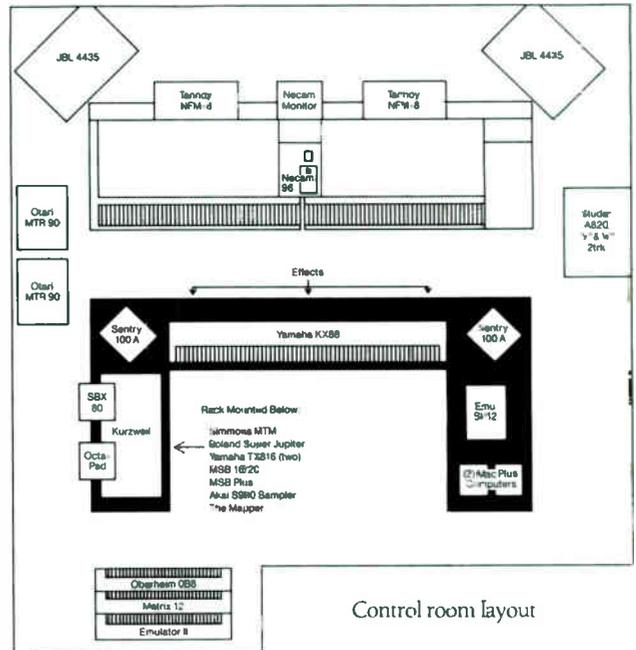
This allows for any complex, computer controlled MIDI configurations to be applied easily for an immediate response. Great care was taken to ensure that traditional recording techniques were addressed equally.

As the name indicates, the result is a beautiful working environment where spontaneity and creative freedom come together, the technical side of which is transparent to the client.

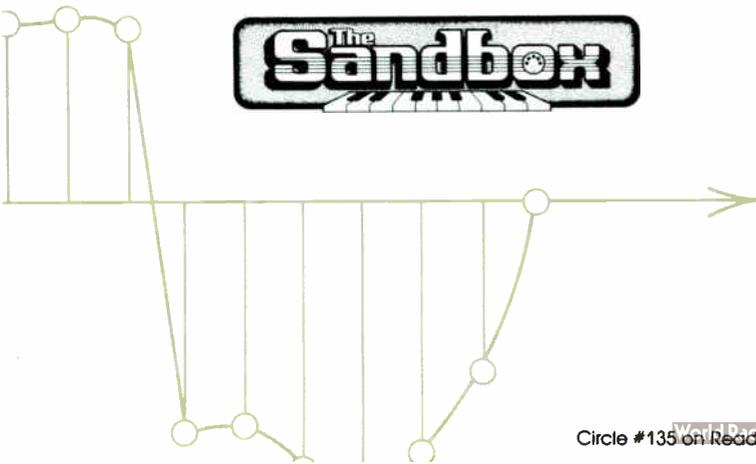
Although THE SANDBOX has been open for only six months, it's no surprise that "word-of-mouth" has already brought us such industry greats as Russ Titelman, Daryl Hall and John Oates, Gary Katz, Elliot Scheiner, Glenn Frey, Average White Band, Felix Cavaliere, Chris Jasper, and many more. Never has a new studio seen more acclaim or such extraordinary clientele so quickly.

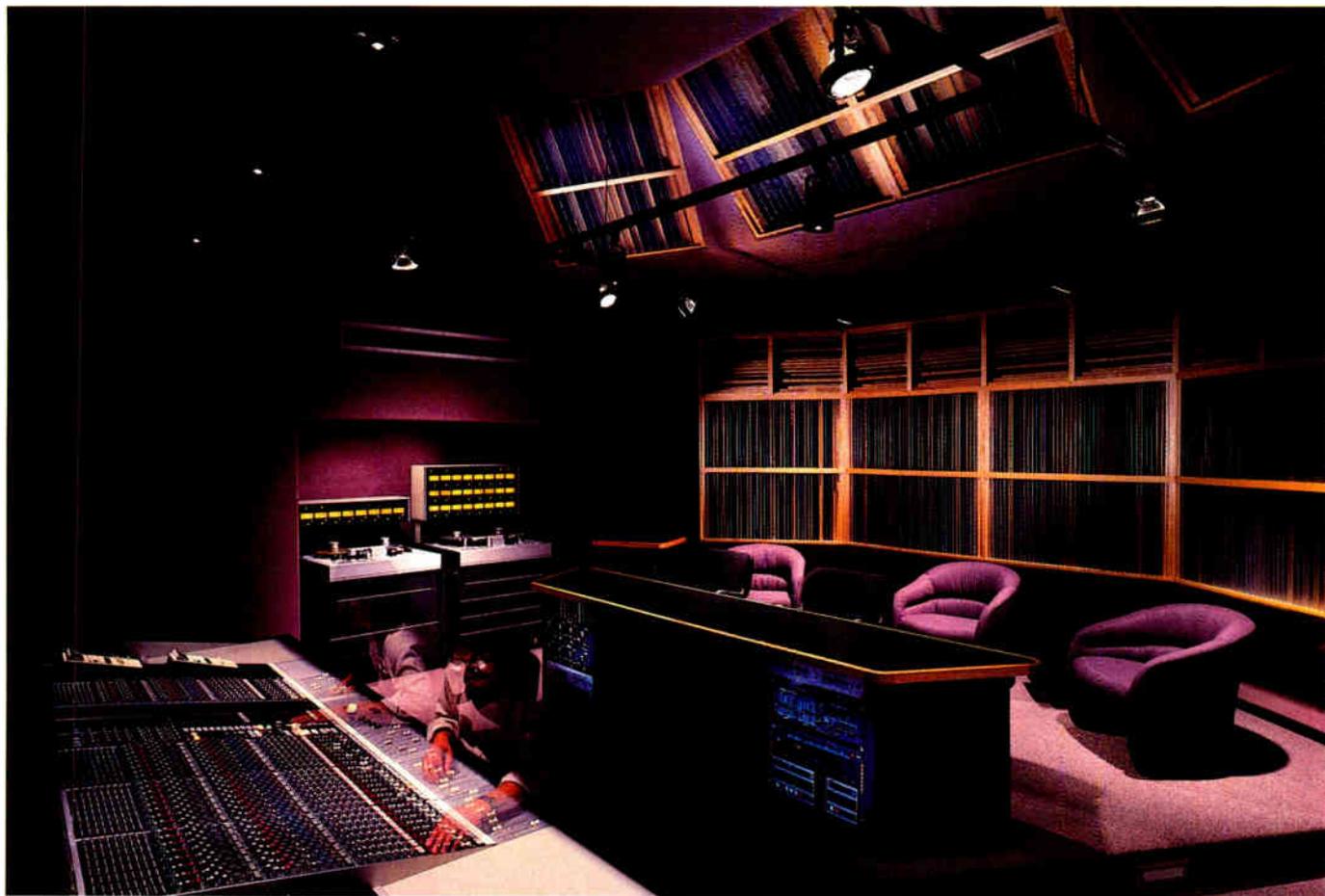
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Control room layout





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Tele-Image, Inc. in Dallas recently was confronted with this dilemma. The construction of their new studios in Las Colinas was the realization of a ten-year dream. They were seeking the perfect balance of audio and video quality to offer to their wide range of clients. Though they were willing to try some new ideas to expand the state of the art, they were also seeking the predictability which is so necessary in the recording industry. It was their goal to enjoin the current evolution of multi-track sound studios with one of the most advanced video facilities in the country.

There was one obvious concern. When you are investing the kind of money it takes to develop a studio of

this caliber, there is no room for error. You need the confidence that the design and construction is done right the first time. The Joiner-Rose Group, Inc., consultants in acoustics, blended sound scientific principles with a keen sense of practical application to render a design which was totally compatible with Tele-Image's unique philosophy. Their 25 years of experience in environmental noise control, architectural acoustics, video systems, electro-acoustics, vibration isolation, and facilitation provided Tele-Image with the quiet confidence which they were seeking.

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by Brooke Comer

REGGIE LUCAS

MAKING THE QUANTUM LEAP

W

hen Reggie Lucas started to produce, electronic and computerized equipment was not yet the name of the game. Back in those days, real musicians cut tracks live. Madonna's debut LP, *Madonna*, provided Lucas with his first opportunity to put a drum machine on vinyl. Lucas, a veteran at age 34, remembers producing as being pretty straightforward nine years ago.

"We didn't have a lot of tricks or toys, just good music, good performances and good engineering," he says. "When I used synthesizers, they were primarily as a sweetening tool to augment a string and horn arrangement, or to create an occasional Minimoog funk bass line. Now I feel as if we've come full circle, and can have the best of both worlds."

Yet from his traditional beginnings came a man who stands today at the forefront of digital technology. Quantum Sound, owned and painstakingly

built by Lucas himself, is among the most comprehensive studios in the tri-state area. The Jersey City, NJ, locale offers clients the option of working in a live, 20-foot by 30-foot SSL room or a mixing/overdub room featuring the Synclavier Digital Music System and extensive MIDI equipment.

When he left high school to go on the road with Miles Davis, Lucas probably never dreamed he'd wind up breaking one of the hottest stars to hit the pop charts and owning a high-tech, commercial studio. He was probably aiming more at a recording career, but after session gigs with the likes of Davis, Roberta Flack, and Gamble & Huff, Lucas' jump into production began to eat up all of his time. During the late '70s, Lucas was part of a wave of a new breed of pop/R&B producers that included Nile Rodgers, Narada Michael Walden, Mtume, and Bernard Edwards. It was during this



Producer Reggie Lucas at his Quantum Leap studio: "After seven years of producing records, I had begun to outgrow conventional commercial studios."

PHOTO LISA SEIFERT

period that Lucas made the leap to the other side of the glass.

After co-composing (with his former partner, James Mtume) the hit "The Closer I Get To You" for Roberta Flack and the late Donny Hathaway, Lucas made his transition into the production arena. This led to the composition and production of the Grammy winning "Never Knew Love Like This Before" by Stephanie Mills, and successful productions of many other artists, including The Spinners, the Four Tops,

Phyllis Hyman, The Models, Randy Crawford, Rebbie Jackson and Lou Rawls. He composed the song "Borderline" on Madonna's multi-platinum debut album, also a Lucas production.

"After seven years of producing records, I had begun to outgrow conventional commercial studios," he notes. "The production budgets from the record companies were becoming inadequate for the amount of time I wanted to spend creatively." At that point, in 1985, he first entertained the notion of building a home studio. "The idea of having the tools of my trade available to me at all times was extremely attractive,

both creatively and economically."

Lucas decided to put together a simple studio and work as much as possible at home. "These were the days when it was just becoming obvious to me to what extent I could take advantage of pre-production at home," says Lucas, who watched production expenses increase with the use of the new technologies.

Simplicity was the order of the day for Lucas when his initial plans for a home workspace crystallized. The studio was initially built in Lucas' basement, "where I squeezed equipment into every crevice I could find to keep the floors free to work on." Treatment of walls and ceilings was only partial, "because I didn't want to get involved in construction costs. I planned the home studio as a temporary move."

What became Quantum Sound found a new home fast. Lucas was sold the minute he found a still-active Hudson County dress factory, a building that offered plenty of room for expansion. "There were two or three rooms ready to move into when I found the place," says Lucas, who worked downstairs from the dress factory while awaiting a zoning variance, "and eventually, there would be more space upstairs. That excited me." Besides, the place had a special character, in part because of the elderly women who worked on antique sewing machines upstairs. "They didn't mind us at all," he insists, "In fact they'd come down on their lunch hour and listen to the music and smile."

Many artist/producers look to their friends' home studios for input during their own purchasing and construction, "but I didn't have any friends with home studios at that time," Lucas says. "I relied on friends like Matthew Weiner [Martin Audio], Al Firestein [Acoustilog], and engineer friends like Joe Ferla and Jim Dougherty [first Madonna LP] and common sense."

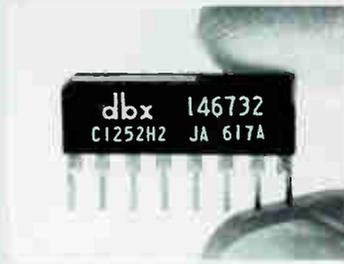
He listened to consoles for months before choosing the Sound Workshop Series 34 ("I like the transparency") for his basement operation. His motives for choosing a 24-track machine were equally clear—the 3M M79 that Lucas bought from Sigma Sound owner Joe Tarsia was the same one he'd cut Madonna's and Stephanie Mills' LPs on. "I'm not superstitious," he insists, "but that machine has made me smile more than once or twice." Studer A800s have also now joined the ranks at

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Quantum.

From his own production experience, Lucas knew the value of a warm, live room, so he and designer/construction manager Jeff Blenkinsopp set about designing his 20-foot by 30-foot area in order to maintain eye contact with vocalists and musicians. "You want to relax the artist to evoke the best possible performance," he says. "They should never feel distant or isolated. That's why I took the studio's overall ergonomics into account—how you are seated, the position, the general comfort factor in working with technical tools."

One way Lucas has made the working environment so efficient is by employing computers whenever possible. "I use IBM computers to do everything from sequencing to bookkeeping," he says. "The computer's music sequencing and synthesizer voice editing capabilities have just begun to show us what kind of advances technology can and will make." A member of the main music networks, PAN and ESI, Lucas can access information from manufacturers and colleagues around the world. "You can't have too many computers," he enthuses. "The more the better as far as I'm concerned." (Voyetra Technology's Sequencer Plus is another favorite of Lucas', "because you can read whatever you're playing via MIDI and edit visually." Lucas likes to create compositions, store them on disks, and interchange the tracks, a task that the Sequencer Plus makes both possible and pleasurable.)

Lucas isn't about to abandon older technology, however. His forte as a vocalist's producer makes him specially aware that his old AKG C-12s and equally historic Neumann M49s are exceptional. "I love to do lead vocals, and these vintage mics, despite their age, have proven to be fantastic over the years."

Lucas has been experimenting with nearfield monitors: "I've got the Kef line [of British origin] right now," he explains, "both at home and in the studio." Lucas uses the 101, 103.2, and 105 for both mixing and referencing in addition to UREI 813Cs and Yamaha NS10s.

All producers who open their own studios face the same dilemma—whether to service their own production clients first and foremost, or book com-

mercial time, and fit in the clients during odd hours. Lucas already has two rooms, and when upstairs expansion is completed, should have plenty of space for an active commercial venture and his own projects to co-exist. His goal—to set up a complete MIDI operation, as well as a live SSL room—was aimed at satisfying very diverse client needs.

"I wanted the MIDI control rooms in order to be able to concentrate on the Synclavier and keyboards, while I booked the bigger room for live dates," he explains. But of course the arrangement could work both ways. "I didn't want to be limited in my ability to service artists," he adds. "I wanted to have an electronic modular approach to recording, and also the traditional approach with a good sounding, live, large room."

"Doing two jobs [production and studio ownership] has forced me to learn more about both," he admits. "I've learned that technology can make music more fun to create, but it's not the sole determinant. As a producer, there's a need to support and supervise the artist from a distance, creating the mood for the best performance. But as an owner, I'm suddenly confronted with all the nuts and bolts that go into building an environment that will produce good music, from aesthetics to equipment purchases."

By trying to wear so many hats, professionally speaking, Lucas clearly has his work cut out for him. With Quantum in the final stages of completion, Lucas has been producing John Adams, the Weather Girls, Leslie Smith and Elisa Fiorello, as well as playing guitar on his own projects and scouting new talent. Despite a reputed preference for working with lead vocalists, Lucas also has empathy for guitarists ("we speak the same language") and keyboardists. "Even though I don't play keys, my familiarity with the technology makes me more adept at producing in that area," he says. "I like to know as much as I can about what I'm doing. It helps me communicate with artists, and creates a better end product."

What better reason could Lucas give for building his own studio? ■

Brooke Comer received her Master's degree from New York University and her bachelor's from UC Berkeley. She is involved in graphic arts and film making.

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THE SHAPE OF THINGS TO COME

The double glass doors open with a *whoosh*, and into the production center walks media engineer Elroy Jetson. He gazes fondly around the softly lit, 2,000-square-foot space, which is lined with sampsynth racks and can accommodate a dozen wave designers. Elroy leans against the sloping, U-shaped, wafer-thin surface of the command workstation and punches a button. He scans a display that tells him which audvid overdubs he finished the night before. If he chooses, punching that button again will activate the retrieval system in the computer center upstairs—he can immediately audition his latest handiwork on the 48-inch video panel and UREI 1013s. . . .

by Linda Jacobson

But Elroy doesn't have time; he must tune the performance quad. Any minute he expects the arrival of his client, the Goodtime Brass Quintet (whose discs won Grammy Awards in 1995 and '96!). Muses Elroy, "I must be the luckiest guy in the galaxy. I work in the most advanced media center around. I can uplink whenever I want. And I'm about to record the best horn players in town! If only Dad could see me now. . . ."



Since the late '70s, and especially in the last couple of years, the studio design scene has matured greatly. Acoustical research and the work of such pioneers as the late Dick Heyser, Don and Carolyn Davis and Peter D'Antonio have led to new tools and concepts: Time Delay Spectrometry, TEF analysis, Live-End-Dead-End (LEDE™) design, Reflection Phase Grating (RPG™) diffusion devices. SPARS and Syn-Aud-Con have raised overall design consciousness. Personal computers have enabled precise acoustical

measurements, increasing the speed and accuracy of design planning and drafting. Today, designers know how to aim for certain scientific/physical goals to achieve accurate sonic performance and to meet specific client needs. Clients, in turn, now seek a higher standard of accuracy in control room monitoring.

Meanwhile audio technology lunges forward. Digital gear provides greater control and improved specs. The proliferation of MIDI devices and direct-input instrumentation (not to mention the climbing costs of real estate) have caused facility owners to build smaller studios and ever-larger control rooms. Which means the studio designer's job has become easier *and* more difficult. The larger the control room, the better shot you have at making it sound better; but it's harder to keep construction costs down. Monitor speakers sound better than ever; but it's tougher than ever to isolate extraneous noise to meet the wider dynamic range that digital gear can handle.

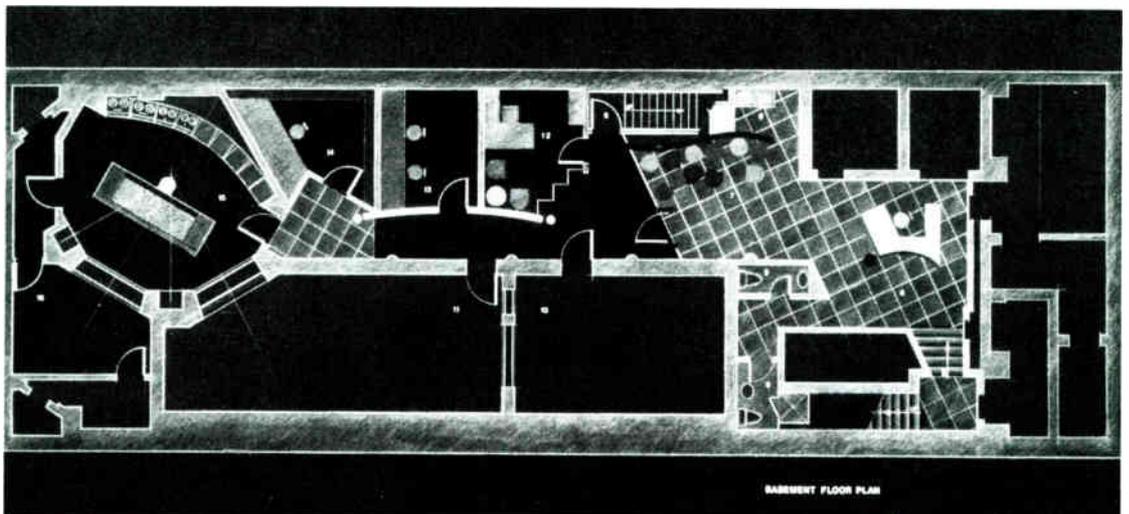
CH-CH-CH-CHANGES

As technology marches on, the laws of

physics remain the same. With this in mind, we queried several top designers to learn how their studio design philosophies have changed. There were more answers than there were answerers.

Murray Kunis is VP of marketing at the L.A.-based Lakeside Associates, whose designers have done studios all over the world. According to Kunis, "technical requirements [in design] have changed, especially because the studio has become a much more unified structure. It's no longer a room with some electrical and air conditioning and you drop equipment in. It's a synergistic complex; it all works together. The electrical, the A/C, the structural, the acoustical, the space requirements, must all be planned as one unit. Also, in the last two years, control rooms are up to 700 or 800 square feet, from 400 or 500. The studios used to be 2,000, 3,000 square feet; now you see studios that are 800 to 1,200 square feet. Another change, since 1981, is the need for lower noise floor and wider bandwidth requirements in monitoring systems. Now you can record 20 Hz on tape as easily as midrange frequencies. People may ask

Vin Glizzi's floor plan of a newly redesigned Greene Street Recording (Manhattan). At the far left is a new control room (1 of 2) with vocal booth. The project also included a new edit/programming room, maintenance shop, library and lounge.



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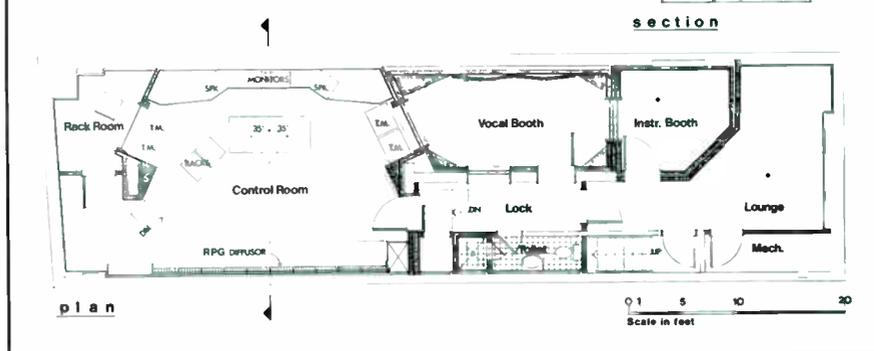


why you need big monitoring systems when no one has them at home, but engineers and producers want to know what's on tape and what they're dealing with."

Bob Todrank of Nashville's Valley Audio has been designing since 1974. He concurs with Kunis that "people pay much more attention to the control room's technical aspects. They're very concerned about where the equipment will be, how it will be wired, how much noise it will make. Ergonomic details are much more important, because people have more pieces of equipment. Layout and wiring have become an essential part of facility design. Ten years ago we relied on research done in the '20s and '30s in big churches and auditoriums. Now, with organizations like Syn-Aud-Con, and use of TEF measurement, we have scientific data on small room acoustics. Peter D'Antonio's work with diffusers has been a major thrust in that area. We can design on paper, with computers, and predict exactly how a control room will perform before a nail is driven. We used to design by the seat of our pants—lots of trial and error."

For the past two years, Todrank adds, "I've been doing joint design projects with a major London designer, Neal Grant [who's currently designing Peter Gabriel's new superstudio]. We send each other drawings, exchange ideas and comments; I get his European flair and he gets my U.S. flair. It helps both of us be better designers."

Floor plan and side section of producer Rick Rubin's Def Jam studio, designed by John Storyk. Located in the basement of a brick building in Manhattan, the facility boasts a sunken control room and black lacquer RPG Diffusers.



Steven Durr runs Steven Durr & Associates of Nashville, now in their 12th year of studio design. "We're trying to do things differently with designs," says Durr. "Facilities need a tremendous amount of flexibility so they can do videos, mix to video or film, do industrials, and of course records. LEDE and the TEF machine have been the greatest assets to design. Although I don't subscribe all the way to LEDE, most designers realize that LEDE is the best way to *look* at a control room, then you add your own ideas or personality."

Studio designer and ex-audio engineer Vin Gizzi, in the biz for two decades, formed his NYC-based Benchmark Associates in '82 (now Bench-

mark Associates/Downtown Design). He comments, "One of the problems we face now is noise generated by digital machines. So we've been using separate machine rooms with as much equipment as engineers let us put in there. That's particularly good with electronic editing, which doesn't require as much hands-on contact with your tape machines. Another machine room advantage is there are fewer control room surfaces providing early reflections. Digital equipment's signal-to-noise ratio does reveal flaws in program material and the room, so we're more meticulous about construction materials. There are some interesting new ones, such as a promising acoustical concrete in development. And



Above: Synclavier studio at Allen-Martin Productions.

FIRST TUBE TRAP STUDIO DEBUTS

Since their introduction several years ago, Tube Traps™ from Acoustic Sciences Corporation of Eugene, Oregon, have proven to be an effective solution for controlling excessive low frequency energy in the listening environment. A single 3-foot tube, 11 inches in diameter, can absorb over 15 sabines at 150 Hz, and is highly effective in the 40 to 400 Hz range. ASC manufactures Tube Traps in a variety of sizes, as well as half-round wall units providing both absorption and diffusion characteristics. Tube Traps are said to outperform standard bass traps 30 times their size, and while they have been successfully used in

—CONTINUED ON PAGE 109

we're trying out Peter D'Antonio's low frequency diffusor in a critical listening room we're building for Onkyo's U.S. headquarters. With acoustic design more predictable, and better large loudspeakers that eliminate the need for near-field monitoring, we have to be much more on our toes."

Alan Fierstein, another New Yorker, designed his first studio ten years ago. He says, "In the past two or three years, people have wanted more eye contact with each other in the studio, and want to get away from the old studio mentality. They've become sick of the standard wood and fabric everyone was using. They want exciting designs, with plenty of creature comforts for the clients. They want a lot of glass, and that means more acoustical treatment. Commercial studios face a lot of pressure from home studios—people feel comfortable in a home environment, so when a commercial studio has to compete and charge more per hour, they must provide something to wow the clients, or lull them into relaxing and thinking 'this feels like home.' The old studio with the heavy doors, small constricting windows, is passé. Also, MIDI technology has led to bigger control rooms, but people

are giving lip service towards live recording again. They do want large studios because they realize that interest in totally synthesized recording may bottom out. Good, large acoustical spaces offer more creative potential for engineers and artists to differentiate their music from everyone else's."

The first studio that architect John Storyk of New York City designed was Electric Lady Studio, in 1969. "The era of building large studios is over. There are enough of them around, and enough large video facilities with audio capabilities so if you need a large room you can go in there. There's a plethora of high end remote stuff, so anything can be a recording studio," says Storyk. "Nothing's changed radically in physical construction since I started, but room size, geometry and basic monitoring theories *have* changed. A few years ago I almost left the industry—I was bored. Then I went to a seminar and heard about LEDE. I fell in love with it, realizing a lot of the stuff I'd been doing was leaning towards that theory—I'd started to splay my ceilings upward, put complex resonators in the rear. Then I heard this scientific theory, an acoustic model, that put everything in order. I don't

agree with every aspect of it, but the way you implement it depends on the monitor you use and your tastes."

In Dallas, Russ Berger—a principal of the Joiner-Rose Group, and a designer for ten years—comments, "We've become more involved in coordinating the different aspects of a facility design or renovation. We generate a higher degree of detail in the construction drawings and specs, and act as a catalyst for other disciplines such as architectural, mechanical and electrical. We have to provide a full scope of services: perhaps evaluate the impact of environmental noise on a facility, set performance and design criteria, generate construction contract documents. The business skills of facility owners have dramatically improved — thank you, SPARS! Another change has come with computer-aided drafting. CAD has greatly helped presentation and design quality, but anyone who can afford a CAD system can have good-looking drawings — better visual quality of the presentation without increasing the validity and accuracy of its content can be very misleading. We get a lot of renovation business due to this. Also, video folks are having to catch up with audio folks. There's a whole new set of preconceived notions of how a room should be. Video folks are used to edit suites and their traditional layouts, and they don't like changes any more than anyone else does. We just can't tell them they're wrong; we have to find creative solutions to fit their particular needs. These days, facility needs are more divergent."

Studio designer (and former recording engineer) Doug Jones of EASI in Chicago is in his fifth year of design. Deeply involved in design research, his main interest lies in stereo imagery and human localization. "As a result of my research, I'm keenly aware of how much the control room environment affects our perception of stereo imagery," says Jones. "As stereo TV becomes more important to consumers, we have to pay more attention to that. Control rooms must be more reliable, so when you get some great stereo effect, you know that it's really there, not an artifact of the speakers or the room. Imagery is truly an illusion, and because of that, it's fragile. So an understanding of how the auditory system works is essential.

"For instance, we're now aware that the outer ear plays an important role

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“Diffuse It Or Lose It”

When Dr. Peter D'Antonio set out to build his Maryland-based testing lab and commercial studio, Underground Sound, he wanted to do it as scientifically as possible. So he followed the guidelines of LEDE,[™] the most sophisticated approach to design. He made the front of his control room absorbing, and used irregular surfaces to make the back wall diffusive—to scatter sound uniformly in every direction and over all the frequencies in the audio spectrum. He was not impressed by the result. It wasn't *truly* diffusive.

D'Antonio had been working in the field of crystallography, and it struck him that the glass diffraction grating used in optics for over a century could be important in acoustical design. So he constructed a wooden Reflection Phase Grating[™] (“RPG”), determining the depth of its “wells” according to mathematical number-theory sequences. “I'd

been involved with Time Delay Spectrometry using a TEF analyzer, and that instrument enabled the elucidation of the magical properties of these reflection phase gratings,” says D'Antonio. “My work with crystals helped me to develop the mathematical procedures to do this.”

D'Antonio built the first diffusor in his garage, installed it in his studio, and was delighted when TEF analysis revealed its incredible polar distribution. In 1984, he presented his ideas at the AES Convention. Designer Bob Todrank was the first to install the system, in the Oak Ridge Boys' new studio. The results impressed many. Thereafter, scientist became manufacturer. Today you'll find RPG diffusors in over 170 studios around the world.

Once he conquered the back of the room, D'Antonio moved to the front, and developed the Reflection-Free Zone[™] (“RFZ”). This led to the creation of the Abffusor[™], an Absorption Phase Grating that removes early reflections. D'Antonio explains his goals: “We tried to fig-

ure out a way to have the same stereo image, no matter where you are across the console. The RFZ and diffusors work together to make that happen, and that *had* to happen because consoles and control rooms are getting larger. The use of diffusors has followed the evolution of control room design.”

Next, he wanted something to vary room acoustics, and produced his three-sided Triffusor[™] (it's absorptive, reflective or diffusive, depending on which side you face outward). Because of the advent of synthesizers, control rooms must produce very low frequencies; thus RPG begat the Low Frequency Diffusor,[™] an acoustic “subwoofer.”

RPG Systems' newest releases are the “designer diffusor series”—available in African mahogany, glass, oak and colored lacquer. They've introduced ceiling systems, too: a series of diffusors that fit into a drop ceiling grid, a popular item in London.

D'Antonio comments, “Acoustics

—CONTINUED ON PAGE 236

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AUGUST 1987, MIX 103



(R) The Welk Music Group's Nashville studio, a 1,895-sq.-ft. 24-track facility designed in 1985 by Bob Todrank, within a \$375,000 budget. It contains four iso booths and a large control room. (L) Todrank implemented LEDE™ concepts and used RPG™ broadband and low frequency diffusors. The all-dome Boxer monitoring system was imported from London, installed along with the Neotek Elite console and Otari analog tape machines.

When asked to comment on the LEDE status quo, Davis says, "I really dislike the term 'LEDE' or saying 'soft stuff in the front and hard stuff in the back.' We need to go through an educational process. We're dealing with acoustics, dealing with things that cause problems. And if we have all the soft stuff in the world at the front to prevent early reflections and all the hard stuff on the back, OK, we've got this great room. Then Joe Blow says, 'I want to see this 25-inch video monitor' and sits it on top of the console, and then the speakers bounce off this thing. It gives him the same thing he had before, when he had a hard front room with an early reflection. So I give a lecture on every job so people can understand each piece of equipment and use that room more efficiently."

Studios Built Today for Tomorrow

We asked some of these top designers to discuss some of their premier designs, and explain why these facilities represent the "new studio mentality."

Bob Todrank speaks excitedly of the Welk Music Group in Nashville, saying it was an inexpensively built studio, intended as a publishing company's demo facility. "It incorporates all the latest in technology and design. It was built on a budget, but it maintains all characteristics that certainly will be useful in ten or 15 years." The Welk Music Group was, according to Todrank, the first place to incorporate the low frequency diffusors developed by RPG Systems.

John Storyk mentions three new studios that "reflect major trends. We

built them for three different kinds of recording industry people with totally different needs, budgets and ambitions—ironically, they all came up with similar rooms. They're bass-reinforced, modified LEDE-type rooms, all with RPG diffusors. These are New York-style studios, sheetrock construction, and inside existing buildings—rooms within rooms." One of them is Def Jam Studios (Manhattan), owned by Run-DMC producer Rick Rubin. Located in the basement of Rubin's five-story brick townhouse, it has two small iso/instrument booths, a large, sunken control room, and miking capability in every room of the house—including the bathroom. The entire design scheme is black (including black lacquer RPG diffusors) and the gear Rubin and Storyk chose includes "UREI 813s for semi-near-field monitoring, simple analog tape machines and a Trident 80 board. It's also video-ready."

Leading national jingle producer Sid Woloshin was used to working in big New York rooms, where he led 24-piece orchestras every day. His new Storyk-designed Avalon Studio, located in an office building, reflects an entire trend in the ad business—the shift from live music to synthesized. His facility, "a classic, small overdub studio with an instrument booth for four people," includes a complete rack of MIDI gear, near-field monitoring system, and 24-track analog machines. "He hasn't used any other studio since we finished it six months ago," says Storyk.

Steve Horlick's Oasis Music, in a midtown office building, is a "small, customized composition suite with a

large control room, small overdub booth, and no multi-track machine—just Fairlights, MIDI equipment, a couple of 2-tracks and near-field monitoring with JBLs; the room is not too involved, but heavily isolated." Adds Storyk, "All three ended up as relatively small facilities, with large control rooms that are composing rooms—completely MIDI-wired and set up for the future."

Vin Gizzi tells of two recent major projects: Greene Street Recording in Manhattan's Soho, and Power Play Studios in Long Island City. "Both are designed with extremely solid wall/floor/ceiling construction, not only for soundproofing, but for internal room performance. Nothing re-radiates sound, for an absolute minimum of harmonic distortion, for accurate monitoring at very high levels. All our rooms use RPG diffusors to provide a very broad and accurate listening area. All are architecturally designed, so they're not only operational, but spaces with a future, with aesthetic value. They all intend to be used for digital recording, with air conditioners engineered for the lowest possible NC level."

David Butler describes the new facility inhabited by Newbury Sound in Boston, in which he installed his moveable trap structures "and succeeded in damping down the reverb time quite a bit. That studio is expanding radically; we put in an Adams-Smith synchronizing system and a JVC video deck. They're doing some industrial video work, some advertising, and jazz players are coming there from New York as well."



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Randy Sparks recently completed work for the San Francisco Production Group, a video production firm moving into audio-for-video; specifically, rock music videos. SFPG's rooms have implemented all the new techniques—TEF analysis, RPG diffusors, and absorptive, fiber-covered fiberglass composition materials, developed by RLS Acoustics based on a concept originally put forth by Russ Berger. Sparks says, "We employed methods that have been manifested as an outgrowth of the TDS system research. We remodeled an existing room, which happened to be rectangular—typical for edit suites. Because of the constraints of the existing building, we couldn't implement the type of geometry typically associated with a reflection-free zone design. But we established a reflection-free zone through the appropriate use of absorptive, reflective and diffusive treatment, creating an accurate monitoring environment for a production suite's control room."

Endora Studios in Los Angeles is one of Lakeside Associates' latest projects. Says Murray Kunis, "it's a very large complex, being completely gutted, and it will be all digital, Neve/Mit-

subishi technology. There will be two control rooms and a machine room for the computers and amplifiers. We also did Lion Share here in Southern California in 1980, one of the first studios to have a motorized louver system in the ceiling. And we did Royal Recorders [in Wisconsin], which also has a motorized louver system. By calculating the width opening of the trap, you can say 'put in this many systems, this large, and this is how it will affect the sound—rather than putting them in randomly. With rooms getting smaller, they don't want the studios to have a dead, dry sound anymore. They want it as live and open as possible. The floor might be marble and all surfaces hardwood or glass; it's easy to use motorized louvers and sliding wall panels to deaden the sound. It's easier to take a live room and make it sound dead, than it is to take a dead room and make it sound live."

Dateline: 1997
(or: Speculation is Fun)
Ten years from now . . .

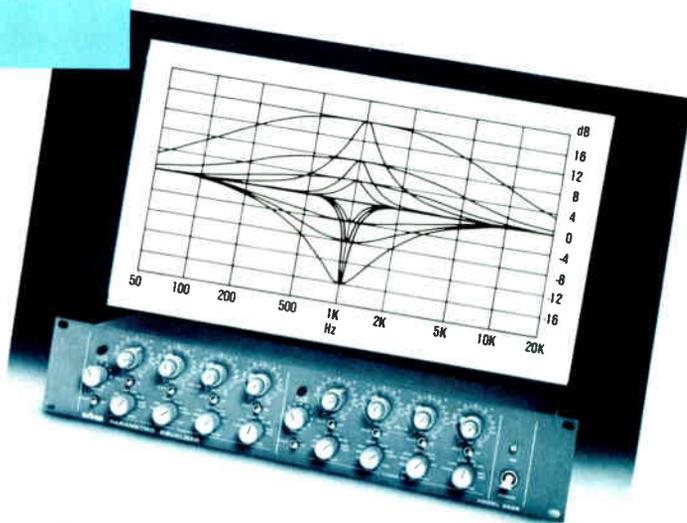
Murray Kunis: "We'll see separate machine rooms, because hard-disk, multi-track recording will be com-

mercially available by 1990. We'll see integration of the console and the recorder in one unit; the Trident Di-An is an intermediate step to that. You'll have the console control surface in the studio and all the electronics in a remote rack in the machine/computer room. There will be that much fewer machines to deal with, which is nice from an acoustical point of view."

David Butler: "There will be true tapeless studios, with mass storage units, not disk systems. Every device will have interior memory and anything that isn't prepared to go that way will become obsolete. I think analog is far from dead, and digitally controlled analog is a more appropriate use of technology. Many signals can stay in the analog domain, much further into the chain, and (so far) that gives better sonic qualities. We'll see much more specialization in studios, because you can't be all things to all people. Also, we'll see a return to more acoustic instrumentation; people will burn out on totally electronic sound. Studios will need variable acoustics because you will want to do some really pure acoustic recording and will want to accurately recreate a good

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—FROM PAGE 101, TUBE TRAP

a large number of studio installations throughout the world, until recently there have been no commercial installations relying solely on the Tube Trap concept for the acoustic treatment for an entire studio.

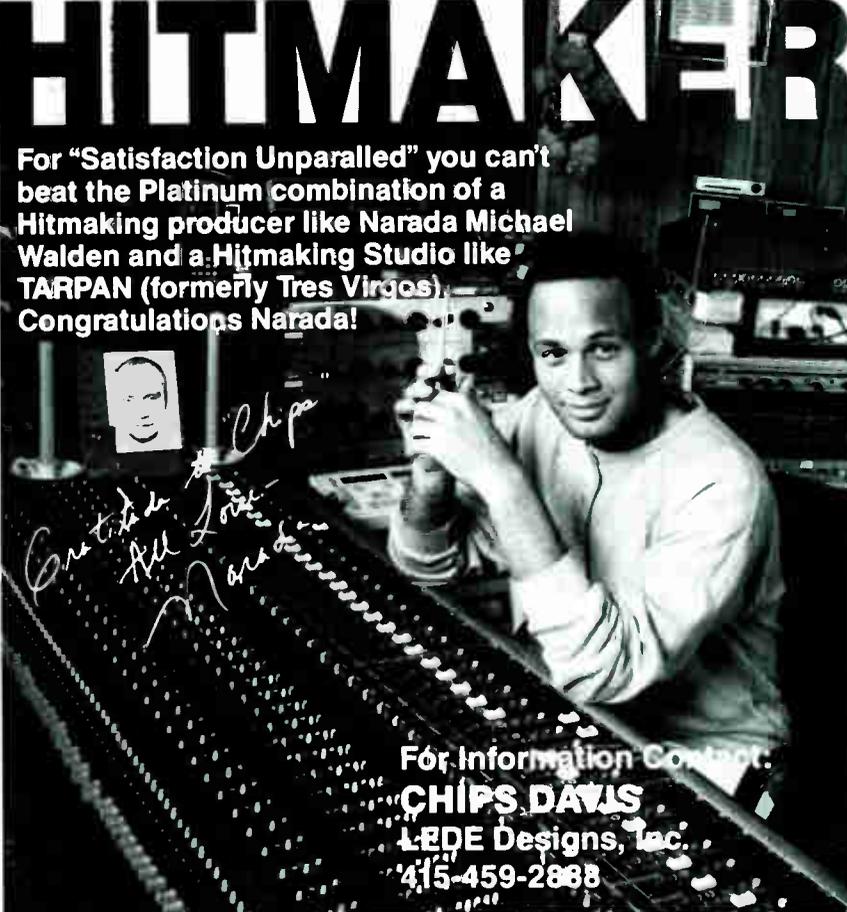
When Allen-Martin Productions of Louisville, Kentucky, decided to add a Synclavier studio to their already well-equipped facility consisting of a 24-track studio, two video post-production rooms, and a 30x30 foot insert shooting stage, they decided to employ the ASC technology rather than a traditional approach. Allen-Martin is an established production house offering not only audio and video work, but also jingle services to a variety of clients, both local and national, including such prestigious accounts as Nationwide Insurance, Hyatt-Regency, Wendy's and McDonalds, so they carefully researched the Tube Traps before giving the go-ahead on the project. "At the 1986 AES Convention in Los Angeles, I had the chance to hear a pretty good demonstration of the Tube Traps," notes company spokesperson Hardy Martin. "Before that, I was considering using some of them, but afterwards, I decided to lay the room out around them. I'm not an acoustician as such, but I know enough of the theories to get into trouble," he says with a laugh. Actually, Martin got a good deal of assistance from ASC engineer Art Noxon, who suggested a placement of 72 Tube Traps based on floor plans and a videotape of the room.

"We didn't have the luxury of building from scratch," Martin continues. "We had to build into an existing space, and planned to use the tubes from the start. The people at ASC were more than willing to provide as much help as they could. If we would have known the room would turn out this well, we would have done it sooner. We've had nothing but compliments from clients about the sound of the room. The word is getting out and we've picked up work from Indianapolis to Cincinnati. I'm surprised that more people aren't using the tubes."

—G.P.

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playing environment."

Chips Davis: "Mother Nature only works one way so we'll still deal with the same acoustical problems we deal with today. The studio itself will be very small, the control room's size dictated by the size of the production staff. We'll have control rooms where we can hear nuances, where we can do three-dimensional mixing; we'll mix front/back/left/right/up/down. We'll have much better speakers, because speaker technology still has a long way to go. Digital will be cleaned up, as will the entire electronics chain. Consoles will be much smaller—a 60-input console will sit in your lap. Everything is done on synthesizers now; maybe in ten years we won't be able to tell that strings are synthesized. I'm going to mourn the loss of true musicians, except for keyboard players. But unless government subsidizes the arts and musicians, I think we're going to lose them."

Steven Durr: "There will be two different kinds of studios: one that does music recording, and one that does everything else. I don't think control room design will radically change, although technology will, so control rooms will improve due to that. As long as people listen to music over loudspeakers and over TV sets, basic design concepts will pretty much remain the same. There will be better speakers, digital consoles, more computers, and I see people going back to making live music."

Randy Sparks: "The studio will be one large control room that's a performing space too, and you'll have a high degree of control over the acoustic makeup of the space. You'll be able to vary the acoustics, and in a steady-state mode, you'll have a very critical monitoring environment. I think more people will implement D'Antonio's low frequency diffusor design, and there will be more research into more efficient absorbing material. There *definitely* will be much more research into loudspeaker design."

Doug Jones: "One of my dreams is for console manufacturers to come up with something much smaller. The acoustical effects of this huge piece of furniture, stuck between you and the speakers, are really difficult to deal with. If we're going to make any real improvements in design, that console will have to go. Speakers will remain pretty much the same. I'm not a big fan

—CONTINUED ON PAGE 236

LUNCHING · WITH · BONZAI

—FROM PAGE 39

tends, and he kicks you in the butt when you really need it.

Bonzai: My first meeting gave me a feeling of trust. He's a man who knows the real world.

Schwartz: He's not with us every day, but his office is in the same building and he passes through a lot. He's a man of wisdom. Our organization is somewhat of a project for him.

Jacob: It's like a master and apprentice relationship.

Bonzai: And he's not unwilling to take a gamble now and then.

Jacob: True. He's taken chances and trusted us to make the decisions.

Bonzai: We might mention that he's taken a few chances on Mr. Bonzai through the years, something I'm indebted to him for. Shall we not mention his name?

Jacob: Let's just refer to him as the Chairman of the Board. And let's not forget Hillel, associate publisher and marketing director, a partner who came onboard eight years ago and has the same enthusiasm and camaraderie.

Schwartz: He's a bit of a cosmic guy. He and his brother ran the infamous Straight Theater during the height of the Haight-Ashbury days and at one point he was the astrologer for Carlos Santana, you know.

Jacob: He traveled with the band doing forecasts for the concerts.

Bonzai: Now let's look at some of the bright moments in the history of *Mix*. There must have been a few times when you felt a surge of power, knowing that it was working.

Jacob: I first felt that when we published our fifth anniversary issue. I saw a big step being made by the company at the time. We reached a point of legitimacy in the industry. Most magazines fail in the first year—they're easy to start, but there's a high death rate. Five years is substantial, and ten years is hard to believe.

Bonzai: I evaluate *Mix* on a personal level, and as each year goes by, my job gets easier. The magazine can really open doors now.

Schwartz: We were fortunate in finding something worthwhile to do,

something that people wanted, and having the opportunity.

Bonzai: How about some of the dark moments in *Mix* history?

Schwartz: Well, early on we realized that we had to run the magazine as a real business. From about our first year through our... eighth year [laughs], we found ourselves in some trouble spots. In our fourth year, we were really scraping bottom.

Jacob: We owed more money than we could imagine. We couldn't even think of the figures.

Bonzai: But you never missed one of my checks.

Jacob: I don't think we ever missed any paychecks.

Bonzai: And you know, that means a lot to the little guy.

Schwartz: There's a lot of loyalty at *Mix*, and it's the people that make it work so well.

Jacob: A lot of our team found us, rather than us finding them. They have a real affinity for what we're doing, and we all share the same vision.

Bonzai: Might I call it a professional commune?

Schwartz: You might... *you* might say we crack the whip lightly.

Jacob: And we like to have a nice place to work. We've all worked at places where we didn't like it. In addition, we have very talented people who like to think for themselves.

Bonzai: I remember one of my first visits to Berkeley and there was a barbecue on the steps outside the office. I didn't realize it was a surprise party for my birthday, just assumed this was part of the *Mix* style—barbecues on Friday afternoons.

Schwartz: It's not really a black tie type of office. Being in Berkeley, there's a certain attitude, as well.

Bonzai: I also remember the creative decor in the bathroom, papered with publicity stills ranging from whip-crazed-crazies to elderly fathers of the diode.

Schwartz: We try to be creative in all phases of the operation.

Jacob: I think one of the big strengths of the company is that David and I have a good partnership. After ten years, it's amazing to me that we still manage to get along so well. ■

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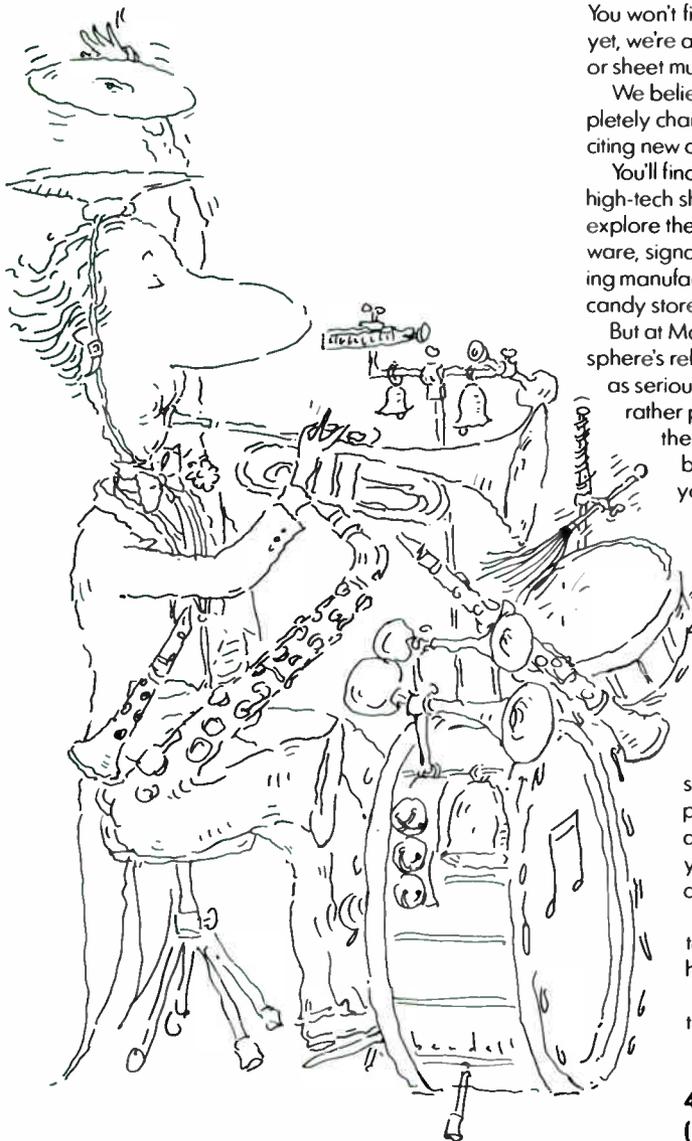
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We believe the very definition of a music store has completely changed today, thanks to microchips, MIDI and the exciting new directions of electronic instruments.

You'll find that kind of excitement in our handsome new high-tech showroom and MIDI demo studio. Here, you can explore the latest synthesizers, samplers, computers, software, signal processors and recording equipment from leading manufacturers. In fact, you may feel a bit like a kid in a candy store.

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Our service doesn't stop with the sale, either. Martin's Product Specialists are always available to tell you how to get the most out of your equipment. And should the equipment itself ever appear at fault, the expert technicians in our in-store Service Department will help set things right.

Martin even sponsors a continuing series of in-house seminars in Synthesis, Sampling, Signal Processing and Recording to help you keep up with the latest developments.

If all this sounds too good to be true, it's only because you haven't been here yet.

So come and see the music store that's not for everyone.

It's for you.



**423 WEST 55-STREET NEW YORK, N.Y. 10019-4490
(212) 541-5900/TLX971846**

Circle #086 on Reader Service Card

STUDIO DESIGNERS and SUPPLIERS

All of the information in the following directory is based on questionnaires mailed earlier this year. *Mix* does not take responsibility for the accuracy of the information supplied to us by the companies listed. We encourage other studio designers/suppliers and acoustical firms to contact us, to be included in our next directory.



At left is The Edison Recording Studio, a division of National Video Center Recording, in New York City. The studio, which went online in March, 1986, features a spacious 50 x 40 foot environment ideal for acoustic and orchestral recording and a Tom Hidley-designed control room with a 56-input Solid State Logic SL6000 console and 48-track recording. Past projects have included "The Pride is Back" jingle for Plymouth Motors and Kenny Rogers for Dole Pineapple. Photo: Bo Parker

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Mix listings procedure: Every month, *Mix* mails questionnaires to recording studios and/or other vital facilities and services for the recording, sound and video production industries. Basic listings (name, address, contact) are provided free of charge. Extended listings (equipment, credits, specialization), and photographs or company logos may be included at a nominal charge. If you would like to be listed in a *Mix* Directory, write or call the *Mix* Directories Department, 2608 Ninth Street, Berkeley, CA 94710, (415) 843-7901.

Upcoming Directory Deadlines:

North Central/Canadian Studios: **August 10, 1987**

Mastering, Pressing and Tape Duplication: **September 3, 1987**

Northwest Studios: **October 1, 1987**

STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation; MR: Maintenance/Repair Services; ER: Equipment Rentals

NORTHEAST

ACOUSTIC SPACES INC.

SD, AC, EI, MR
H.V.M. Box 6219
Kingston, NY 12401
(914) 331-1726
Owner: D. Vercelletto
Manager: Chris Wasserbach

ACOUSTILOG, INC.

SD, AC, SES, EI, MR, ER
19 Mercer St.
New York, NY 10013
(212) 925-1365

ADVANCE MUSIC CENTRE, INC.

SD, AC, SES, EI, MR, ER
Upstairs, 44 Church St.
Burlington, VT 05401
(802) 863-8652
Owner: Corporation
Manager: Peter B. Wilder

AMERICAN AUDIO

AC, EI, ER
512 N. 10th St.
Reading, PA 19604
(215) 373-8160
Owner: Christopher M. Kane

ANDREWS AUDIO CONSULTANTS

SD, AC, SES, EI, ER
347 W. 39th St.
New York, NY
(212) 736-9570
Owner: David M. Andrews

ANGEVINE ACOUSTICAL CONSULTANTS, INC.

AC
1021 Maple St., PO Box 725
East Aurora, NY 14052
(716) 652-0282

APPLIED AUDIO

SD, AC, SES, EI, MR, ER
PO Box 24799
Rochester, NY 14624
(716) 436-8475
Owner: Dan Sullivan
Manager: Seth Waltz

SAM ASH MUSIC STORES

SES, MR, ER
1669 E. 13th St.
Brooklyn, NY 11229
(718) 645-3886

SAM ASH MUSIC STORES

SES, MR, ER
113-25 Queens Blvd.
Forest Hills, NY 11375
(718) 793-7983

SAM ASH MUSIC STORES

SES, MR, ER
124 Fulton Ave.
Hempstead, NY 11550
(800) 472-6274
(718) 347-7757
(516) 485-2151

SAM ASH MUSIC STORES

SES, MR, ER
447 Rte. 110
Huntington Station, NY 11747
(516) 421-9333

SAM ASH MUSIC STORES

SES, MR, ER
160 N. 48th St.
New York, NY 10036
(212) 719-2299

SAM ASH MUSIC STORES

SES, MR, ER
E. 50 Rte. #4
Paramus, NJ 07652
(201) 843-0119

SAM ASH MUSIC STORES

SES, MR, ER
178 Mamaroneck Ave.
White Plains, NY 10601
(914) 949-8448

ASTRA SERVICES

SES, EI, MR, ER
422 Rte. 206 S., Ste. 188
Somerville, NJ 08876
(201) 359-6014
Owner: Andrew Strauber

A/T SCHARFF RENTALS

ER
1619 Broadway
New York, NY 10019
(212) 582-7360
Owner: Peter Scharff, Josh Weisberg

AUDIO ENTERPRISE

SD, AC, EI, MR
R.D. #1, Box 314, Galen Hall Rd.
Reinholds, PA 17569
(215) 670-2688
Owner: Bill Thompson

AUDIO INNOVATORS DBA PRO COM SYSTEMS

SD, AC, SES, EI, MR, ER
5001 Baum Blvd.
Pittsburgh, PA 15213
(412) 621-1950
Owner: Norman J. Cleary
Manager: Tim Benedict

AUDIO INTERNATIONAL

SD, AC, SES, EI, MR, ER
424 Grant Ave.
Scotch Plains, NJ 07076
(201) 322-4466
Owner: Warren C. Slaten

AUDIOFORCE INC.

ER
37 W. 20th St.
New York, NY 11731
(212) 741-0919
(800) 847-4123
Owner: Sid Zimet

AUDIOTECHNIQUES

SD, AC, SES, EI
1619 Broadway
New York, NY 10019
(212) 586-5989
Owner: Bob Berliner
Manager: Peggy Palombo

AURA SONIC LTD.

SD, SES, EI, ER
PO Box 791
Flushing, NY 11352
(718) 886-6500
Owner: Aura Sonic Ltd.
Manager: Steven Remote

AUTERI ASSOCIATES, INC.

9 Heneary Dr.
Miller Place, NY 11764
(516) 331-5022
Owner: Robert P. Auteri
Manager: Nannette M. D'Angelo

AVTEC INDUSTRIES INC.

SES, EI
5 Audrey Pl.
Fairfield, NJ 07006
(201) 882-9460
Owner: James Gore

AVTECS

MR, ER
619 Hungerford Dr.
Rockville, MD 20895
(301) 279-2500
Owner: Jim Priskell
Manager: George Weber

BENCHMARK ASSOCIATES WITH DOWNTOWN DESIGN

SD, AC
425 E. 63rd St.
New York, NY 10021
(212) 688-6262
Owner: Vin Gizzi
Services/Specialization: Architectural and acoustic design for the recording industry. Complete planning and project design; room acoustic design—computer-assisted optimization of room geometry and proportions, diffuser and absorber design, monitor alignment, specifications for isolation systems and all construction materials; certified LEDE™ design; preparation of all construction drawings and specifications—architectural, acoustic and mechanical; interior design and furnishings. Technical facilities design: conceptual planning; electro-acoustic systems design and engineering; video systems design and engineering. Consulting services: acoustic testing and measurement— isolation, reverberation time, TEF®, analysis and solution of noise problems—air conditioning systems, noise control; computer-assisted room acoustics design. Typical projects: recording studios and control rooms; digital audio facilities; audio-for-video facilities; video production stages and control rooms; video editing facilities; radio and television studios.

ECHO TIMES

AMPEX

ams

An Agreement has been reached between AMS and Ampex to share expertise and jointly develop an interface for the AMS AudioFile which permits simultaneous cutting of audio whilst cutting picture. The potential of incorporating AudioFile into an on-line video editing suite has been under investigation by the two companies since initial discussions in August of last year. Earlier in 1987, Ampex supplied several customers in the United States with AudioFile in order to attract comments and suggestions for the implementation of the control of AudioFile by the Ampex ACE video editor. Response to date to the approach has been very positive and both

AMS and Ampex will be showing the benefits and savings attributed to the technique for the first time at the Montreux Television Symposium this June.

Major attractions of the technique mean that any video edit will automatically produce an audio edit and all audio segments will be recorded on AudioFile's hard disc with pre- and post-roll prior to the in point and after the out point. Should a video edit produce an unacceptable audio edit, 'slop' at the beginning and end of all audio segments can easily be slipped, at the time, until an acceptable audio edit is established. Although the ACE video editor will have complete control of the AudioFile during the video edit, the video editor does not even need to be aware that he is assembling audio edits. The nature of access to the hard disc system means it does not slow down the video editing processes at all and, of course, the audio quality is preserved to the

highest standard. AudioFile may then be employed by the same facility for audio sweetening, or the audio edits can be digitally data dumped onto a video cassette and, along with an edit decision list, transferred for re-loading onto another AudioFile at any other specialist sweetening facility.

Ampex will be supplying the AudioFile system along with the specialist interface to the ACE video editor and have recently appointed Mr. Steve Krampf to head the project. Steve Krampf is well known to many members of the professional audio community in the USA, as he was Vice President, Sales and Marketing for Otari tape recorders for seven years.

For any further information on video editor interface to AudioFile please contact John Emmas at the AMS head office or, alternatively, Steve Krampf at Ampex in Redwood City, CA on (415) 367-4140.



THE AMS STUDIO COMPUTER

The acquisition of Calrec by AMS promised many advantages for both companies right from the start. The majority of the immediate advantages were described in Echo Times number 9. The first commercially available product will be on display at the forthcoming APRS exhibition in London - THE AMS STUDIO COMPUTER.

TASC has been designed as both a console automation system for the UA 8000 and a

A UA 8000 Featuring the new A.M.S. Studio Computer. machine management system for both audio and video recorders.

The UA 8000 has continued to grow in reputation following the purchase of the console by some of the world's leading recording studios. Although many have been left in no doubt concerning the features, facilities and audio quality of the UA 8000, the console automation options open to a prospective purchaser have not matched the calibre of the console itself. Nothing currently in the marketplace could turn the UA 8000 music recording console into a music recording system. Hence TASC.

TASC was designed using certain proven computer hardware and software already developed at AMS, along with invaluable input from Calrec and freelance users, with a view to building a studio computer system which when combined with the UA 8000 would provide a very attractive option for any studio.

Some of the features of TASC are briefly describe below:

- ★ Up to 8 M Bytes of battery supported RAM can hold a large number of mixes that are not lost on powerdown and are available rapidly for comparison and manipulation.
- ★ Highly intelligent automation allows mix updates to be inserted on any channel 'on the fly' without creating multiple mixes.
- ★ Mixes can be saved on inexpensive 3.5" ¼ M Byte floppy discs.
- ★ Tape Machine Automation.
- ★ Snapshot mixes.
- ★ High resolution monitor.
- ★ Cuts are accurate to 1/10th. of a frame.
- ★ 80 channel capability.
- ★ Very flexible fader grouping completely under software control with any fader being available for grouping to two levels with clear status display on a monitor. Fader grouping can also be set on the channel strips.
- ★ Mixes can be run from a timecode-only reference.

AMS would like to take this opportunity of thanking a number of companies for their help during the development of TASC: - Audio FX, Hilton Sound, FWO Bauch, Otari and certain individuals who prefer to remain anonymous all freely contributed their knowledge and experience.



GETS CUT-AND-SPLICE

Cut-and-Splice editing is now available for AMS AudioFile.

This feature is the latest software addition to AMS AudioFile and provides the capability of editing the spoken word or music in a way that parallels the editing of documents by a word processor.

Not only can 'ums' and 'ers' rapidly be removed from dialogue but gaps between words can be inserted or lengthened, or complete new words or sentences can be introduced.

During April, thirteen people, all AudioFile users with a vested interest in CD mastering, visited AMS to try for themselves a version of Cut-and-Splice stereo editing. The AudioFile owners with experience of the system were very impressed with the editing page presented to them for their criticism and were confident that this approach would produce better results more quickly and with greater flexibility than conventional digital tape based techniques.

As well as the operational advantages that were identified, an AudioFile package can also cost less than equipping a studio with a tape based dub editing package.

As is normally the case with such developments, refinements and enhancements will continue to be made. The software package will be on general release following its introduction at the APRS exhibition in London during June.

LONDON CUTTING ROOMS GO FOR AUDIOFILE

The new Cut-and-Splice page for AudioFile has attracted several of London's leading mastering facilities to purchase AudioFile for CD mastering.

As well as offering a fast and accurate method of editing audio, AudioFile also has digital interfaces available which will cope with the majority of digital masters delivered to any cutting room.

Tape One, reputedly one of the world's leading mastering facilities, is intent on becoming the world's first totally digital hard disc mastering facility. To this end an AudioFile system is being combined with a new Neve DTC digital console.

Mr. Bill Foster and Mr. Barry Ainsworth of Tape One stated: 'Tape One were faced with several options once the decision had been made to take advantage of an all digital approach to mastering incorporating hard disc technology. Choosing the AMS/Neve route will permit two products, that have been individually proved, to come together as a system - both products already having enjoyed the benefits of considerable user feedback.'

Among four other customers who have

examined the Cut-and-Splice page of AudioFile in London and made decisions to purchase is Mr. Adam Skeaping of The Digital Editing Company Ltd., Adam summed up his decision as follows: 'I have always been convinced that digital audio editing should be electronic based on hard disc technology and not dub editing on magnetic tape. I have carefully watched the progress of many companies in this direction and at the end of 1986 I became sufficiently convinced of the capabilities of the AMS AudioFile that I decided to build a facility round one.'

AMS are delighted to add this latest group of customers to their user lists and feel that this calibre of customer will continue to make a positive contribution to the development of new pages like Cut-and-Splice which will be available to all AudioFile owners.

AUDIOFILE NOW RENTS

AMS AudioFile is now available for rental from two of London's major and best known rental companies, AUDIO FX and HILTON SOUND.

Recent enhancements and new features have made AudioFile an attractive proposition for project work and for those not in a position to purchase, the option of renting is now available.

Both Audio FX and Hilton Sound will have the ability to offer 701 data dump with AudioFile which permits a master copy of all AudioFile hard disc recordings to be archived on video tape.

The AudioFiles for rent will always feature the latest and most up-to-date software and hardware and can be supplied to perform any of the current applications already being undertaken by AudioFiles in the field.

Audio FX 01-482-1440
Hilton Sound 01-708-0483

UA 8000
APRS

London's 1987 Association of Professional Recording Studios (APRS) exhibition will be the premiere showing of the 'Calrec by AMS' UA 8000 music recording console and automation system.

Although the console has already been installed in a handful of the world's most prestigious locations, the UA 8000 has never been displayed to the recording industry at a professional convention before.

The console's stature is underlined when you consider that no-one who has tested the audio performance of the console has found fault with the statement that 'The UA 8000 is the world's best sounding music recording console.'

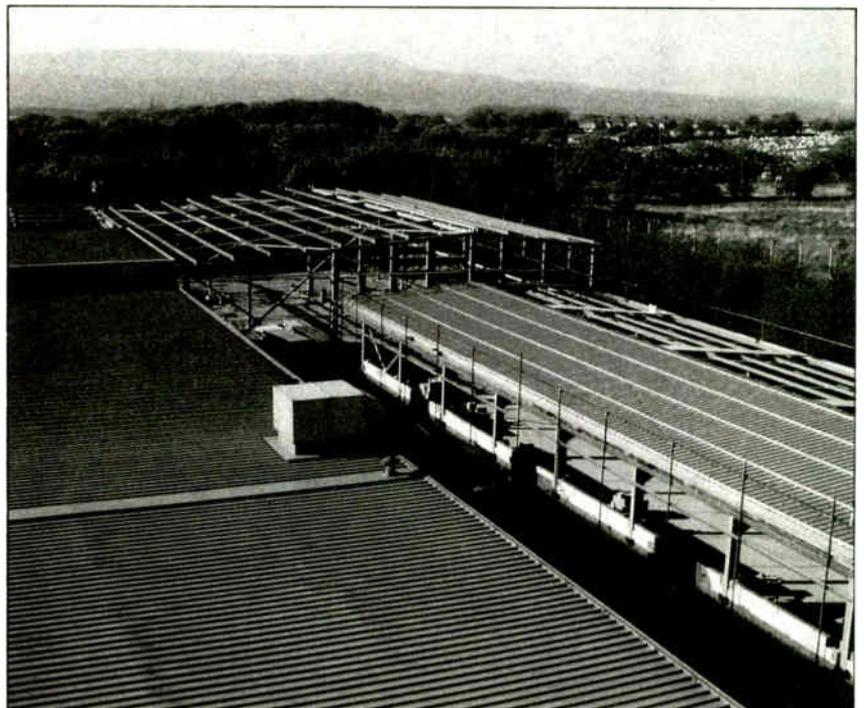
The UA 8000 that will be exhibited is a 64 channel console and will feature TASC, The AMS Studio Computer.

Interest in the UA 8000 has been steadily growing over the past 12 months and now, with the addition of TASC, an integrated studio system is available which has resulted in an unprecedented number of serious purchase enquiries.

Although confident that many of these enquiries should translate into firm orders, an already very full order book for broadcast consoles and other products means only a few production slots remain in 1987. This factor alone will ensure that for the time being the UA 8000 recording system will remain an exclusive item available to only a small section of our industry.

The move for Calrec from Hebden Bridge to the AMS headquarters in Burnley is on schedule for late summer. The relocation will provide 22,000 square feet of additional engineering and manufacturing area.

The 22,000 square foot extension on schedule for late summer to accommodate the Calrec Manufacturing Section.



BBC OB WITH 112 INPUT CALREC CONSOLE GOES INTO SERVICE



The BBC's MSCV outside the A.M.S. Headquarters.

The BBC's latest and most prestigious Outside Broadcast vehicle went into service for the first time with the recent production of the Humanitarian Awards programme. Before being tried out at the Country Music Festival held at London's Wembley Arena, the vehicle, which houses a 112 input Calrec digitally assignable console, had been undergoing acceptance tests by the BBC at Calrec's Hebden Bridge factory. The vehicle is the BBC's Master Sound Control Vehicle and it is intended to be used on all outside broadcast applications, ranging from Royal weddings to concerts at the Royal Albert Hall, where audio takes a high profile.

The console has been supplied with Total Instant Reset and no less than 30 complete console set-ups can be recalled at the push of a button allowing just one console and one operator to do work which would previously have demanded several mixing consoles and several operators.

As well as offering Total Instant Reset, the console also offers significant space saving when compared with conventional mixing consoles allowing it to be mounted across the width of the vehicle with all 112 input channels easily accessible from the operator's chair.

This is the second digitally assignable console supplied by Calrec, the first being an 84 channel system delivered at the end of 1986 to Thames Television in London.

THE POD

The Pod is a newly introduced work station for housing the AMS AudioFile control surface and is available in three forms. Firstly, the Pod can be supplied as a workstation incorporating an author's desk for documents or scripts.

In the Sub Mix Pod the author's desk section is replaced by an 8 into 2 submixer complete with two channels of selectable mic/line input - all channels incorporating pan and solo controls.

Finally, a full Mini Mixer Pod is available incorporating the very successful Calrec Mini Mixer offering full equalisation capability.

Specifications and dimensions are available from AMS upon request.



The Sub Mix Pod, one of three new workstations for AudioFile.

Interview

THE BRIDGE

The Bridge is undoubtedly London's newest studio complex featuring a catalogue of equipment and personnel that is, to say the very least, extremely impressive.

The concept has been turned into reality by a seasoned campaigner who still describes himself as 'always having been a sound man' - Mr Robbie Weston. Robbie's history includes spells at Radio Luxembourg, Capital Radio and Molinaire before, along with a couple of partners, starting his own facility of Silk Sound in 1978.

Interview

The same partnership, which continues to successfully run Silk Sound, decided some two years ago to develop the concept of what they describe as 'the ultimate facility'. This facility would be a complex of two studios, no more no less, designed in the most thorough engineering terms, entertaining no compromises at any level and being based on the very best equipment available in the form of working and proven technology.

Adopting this philosophy entailed equipping two rooms with Solid State Logic mixing consoles and computer systems alongside the new and highly praised Studer A820 multitrack recorders. The

Interview

choice so far would raise no eyebrows. To include in the heart of this formula two AMS AudioFile hard disc systems may well call for a little explanation!

A.M.S.: Silk Sound were among the first wave of London studios to buy and explore the potential of the AMS AudioFile hard disc system (see Echo Times number 7) - Was that a simple decision to make?

Robbie Weston: The decision was neither hard nor simple, it was a logical one. If you examine how the industry has developed you can see it was a logical choice. Although my life has revolved around audio, I always knew when Silk Sound was



The Bridge, featuring two AudioFiles and two SSL Consoles.

started that we would move into video post production, and even from the beginning planned and worked on a sound effects library for that purpose.

I also always believed that one day technology would put a stop to the solution of synchronizing sound with picture by employing rooms full of looped mag machines nursed by hoards of people beavering away in back rooms. The first glimpse of light at the end of that tunnel came with the Audio Kinetics "Q Lock" system. In the early days there was Silk, CTCV and Molinaire working with a synchroniser, a 24 track tape recorder and video - and very few others that I recall.

A.M.S.: So you consider the synchroniser/multitrack/video recorder route as the first step in synchronizing sound to video picture?

R.W.: Yes I do. You have to be careful though, because the professional approach requires investment in 1" video, every form of Nagra pulsing, multi-standard timecode operation etc, etc, so a client can bring you anything and go away with a result he is happy with.

A.M.S.: And the next step?

R.W.: The one big disadvantage that has plagued audio post production for video using synchronisers and multitracks has been that there is no easy way to slip audio tracks on a multitrack recorder.

You can't just advance or retard by 5 frames quickly. If someone wanted to advance two or three spoken words in a paragraph by 5 frames it was a nightmare and that is where film people could always say - aha - that could be done in a few seconds on film. That is why AudioFile is so attractive and represents the missing link in the process as slipping tracks and even bouncing tracks is something that AudioFile can do so very easily.

A.M.S.: You say AudioFile, but did you consider any of the other hard disc based systems that are being heavily promoted currently?

R.W.: We looked at all sorts of documentation and took in demonstrations whenever possible. In one presentation of a certain system the first thing that was

shown was how the system could take a selection of vowels and consonants from spoken word and after a period of manipulation the system could synthesise the word ERIC! That sort of thing is so far from the mark of what we needed it was unbelievable and all for 3 times the price of AudioFile!

Since we started looking for a hard disc audio system no other company has even proposed a unit that looks as if it can perform the fundamentals of AudioFile - let alone demonstrate it. Many of the companies looking at hard disc based systems today seem to have difficulty defining exactly what it is they are wanting their system to do for the person who buys it.

With AudioFile it is different. A one minute demonstration can capture your imagination and shows you immediately just what a workhorse AudioFile can be, whether preparing material for radio or in conjunction with pictures.

A one minute demonstration should make you realise how cumbersome and hit and miss a process working with an events controller, carts, turntables and tape machine is.

A.M.S.: Surely you still see a place in your studio for tape machines though?

R.W.: Oh yes, but a lot of them can be replaced. The key to getting involved with AudioFile is that not only can it do a better job than anything we have had before, but it also costs less.

A.M.S.: Can you explain that?

R.W.: The sums show that the money that was needed to equip with cart players is about the same, if not slightly more, than equipping with AudioFile. So, forgetting all the other benefits of AudioFile my cart machine budget has literally bought me a better solution.

I worked out that I would have needed two triple stack cart players, noise reduction for both, an ITC 99 to give reasonable cart recording, noise reduction on that, a couple of 1/4" machines for playing in other tapes, ideally these machines should be synchronized, and so it goes on!

A.M.S.: So how do you answer the question when someone comes into the Bridge and sees AudioFiles mounted in the centre of Solid State Logic consoles and says to you - "You told me you would have the ultimate facility based around tried and proven technology?"

R.W.: I'd tell him that is exactly what he is looking at. AudioFile holds no magic for us. Don't forget we have had experience of one for almost twelve months now and we have had the opportunity to see the system grow in potential and capability. AudioFile performs a set of specific functions very very well, it also does certain things that are almost impossible with other equipment. Anyone who starts by considering replacing a cart stack, as we did, will soon see the host of additional benefits the system offers beyond simple triggering of effects - and of course the system's functions continue to expand - which is a hidden bonus. We considered the two AudioFiles we bought as actually less of a novel and unpredictable choice than some of the cassette machines we looked at!

Stop Press

TERRY MacDONALD
MacDonald Recording Co.
Seattle, Washington

"I am a true believer! We installed Audiofile in my little 8-track studio, and it has been everything I dreamed it would be... we have been using Audiofile for radio commercials, pre-production TV audio, video sweetening, industrial film sync work, in short—for everything in sound. And if a small studio like mine can see this system pay off, it has real potential for any studio in the world. Audiofile is paying off and knocking producers off their chairs."

BILL MARINO, KEN HAHN, Sync Sound
New York, NY

"Sync Sound has recently taken delivery of the city's first Audiofile. A four hour system, it is the largest ordered in the U.S. so far. Bill expects his clients familiar with film techniques to be comfortable with Audiofile immediately. He expects the speed and flexibility of Audiofile to impress people in the mix as well. Audiofile is fairly intuitive. The system really works! I have maybe six hours experience and I could get the job done now."

SPOKESPERSON, Chicago Recording Co.
Chicago, Illinois

"We have been using the Audiofile for all forms of audio and TV. For TV in particular, it has dramatically sped up the time it took to get the job done. It made our video post-production much more efficient than a tape based system. We believe that the end product in time saved and quality is superior over a film mix. It's a great product—I wish every room had one."

JOHN BENDER, Editel
Chicago, Illinois

(Editel was the very first Audiofile buyer in the U.S.) "It does save time in a session. Clients can't believe how fast it is. It gives them more creative license. Timing and flexibility is a big thing. Sound editors, agency people love the Audiofile. They can try so many things so quickly with it. The best thing about it is that it is faster than traditional methods and you don't have to sacrifice anything, you will only gain in quality."

Distributors

U.S.A.: AMS — Harris Sound Inc., 6640 Sunset Blvd., Suite 110, Hollywood, CA 90028. Tel. (213) 469-3500; E-mail IMC 714.

U.S.A.: Calrec by AMS — Calrec by AMS, P.O. Box 31864, Seattle, WA 98103 - 1864
Tel: (206) 633 1956. CONTACT: Nigel Branwell.

Canada: Manta Electronics Group, 204 King Street East, Toronto, Ontario, M5A 1J7. Tel: (416) 868 0513. Telex: 06218665. CONTACT: Marshall Freund.



Advanced Music Systems,
AMS Industries plc, Burnley, Lancs.
BB11 5ES. Tel: (0282) 57011.
Telex: 63108 AMS-G. Fax: (0282) 39542.



1984 1985 1986
The Queen's Award for Export Achievement
to Edendock Ltd. 1984/85 and AMS Industries plc 1986.
In July 1985 Edendock Ltd. became AMS Industries plc.



BENCHMARK ASSOCIATES WITH DOWNTOWN DESIGN
New York, NY

STEVE BLAKE DESIGN

SD, AC
6 Bird Lane
Sharon, MA 02067
(617) 784-2543

Owner: Steve Blake

Services/Specialization: Acoustical consulting, LEDE™ control room design, TEF® analysis, LEDR™ stereo imagery analysis, MIDI/audio/video synchronization and system design. Macintosh-aided design, plans and consultation can be transmitted by modem. Clients include: Long View Farm, North Brookfield, MA; Megaphone, Portland, ME; Celebration Sounds, Pawtucket, RI; Kevin Tracey Productions, Manchester, NH; Hoyt & Walker, Little Rock, AK; Video One, Boston; Chedd/Angier Productions, Watertown, MA; Natural Sound, Leominster, MA; In House Productions, Cambridge, MA; Polymedia, Boston; Estabrook Hall, Clark University; Audio Matrix, Cambridge, MA; Studio Tracks, Wayland, MA; Newbury Sound, Boston.

BRIAN GUITARS MUSIC CENTER

SES
61 Amity Rd.
New Haven, CT 06525
(203) 387-4492
Owner: Brian Cohen

BURLINGTON AUDIO TAPES

SES
106 Mott St.
Oceanside, NY 11572
(516) 678-4414
Owner: Ruth Schwartz

C & C STUDIOS... AUDIO/VIDEO SPECIALTIES

SD
RD #1, Box 581-A
Glassboro, NJ 08028
(609) 881-7645
Owner: Ed Candelora, Jr.
Manager: Terri Candelora

CAPE COD AUDIO

SD, AC, SES, EI, MR, ER
80 Enterprise Rd.
Hyannis, MA 02601
(617) 775-1710
Owner: Chip Davis

CAPRON INCORPORATED

AC, MR, ER
278 West St.
Needham, MA 02194
(617) 444-8850
Owner: James L. Warwick

JA CARPENTER (CINE)

SES
PO Box 1321
Meadville, PA 16335

CAVANAUGH TOCCI ASSOCIATES, INC.

AC
327 F Boston Post Rd.
Sudbury, MA 01776
(617) 443-7871
Manager: Tony Hoover

COLOR LEASING STUDIOS

SD, SES, EI, ER
330 Rt. 46
Fairfield, NJ 07006
(201) 575-1118
Manager: Jack Berberian

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SES, EI, MR
15 Andover Dr.
West Hartford, CT 06110
(203) 527-9104
Manager: Albert Czapinski, David L. Isabell

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SD, AC, EI, MR
669 Beahan Rd.
Rochester, NY 14624
(716) 328-1152
Owner: Carl Cornell

CREATIVE VIDEO ENGINEERING, INC.

SD, EI, MR
47 Crystal Cove Ave.
Winthrop, MA 02152
(617) 846-7899
Owner: Jeff Gerow

CSE AUDIO

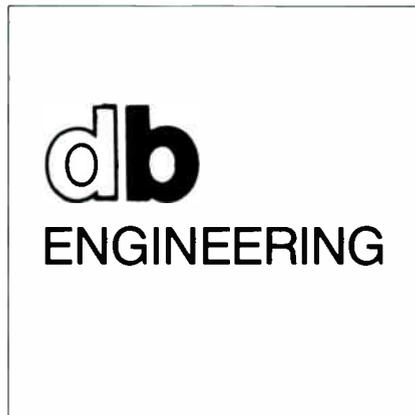
SD, AC, SES, EI, MR, ER
1200 A Scottsville Rd., Ste. 370
Rochester, NY 14624
(716) 436-9830
Owner: Craig Fennessy
Manager: Ethan Porter

CYNC CORP.

SD, AC, SES, EI, MR
1482 Beacon St.
Brookline, MA 02146
(617) 277-4317
Owner: Alan Lery
Manager: Robert Lamm

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Boston, MA 02118
(617) 423-9565

Owner: Rob Rosati

Services/Specialization: Contact: Rob Rosati, Joe Cuneo, Michael Corbett. E.A.R.S. is a full service company for the audio and video fields. A firm of experienced professionals in all areas of audio, we specialize in the design of control rooms, studios, post-production facilities, theaters and sound reinforcement systems. The electronics division offers equipment design, maintenance, modification and installation, including power and grounding schemes. Computer Aided Design techniques are used extensively in our acoustics division to provide complete facility planning or modifications. E.A.R.S. manufactures a variable acoustic wall system (VARA-WALL™), acoustical panels, control room monitoring system (3BI-EARS™), and custom electronic devices. We are also a distributor of an extensive line of audio electronic equipment and acoustical materials. Credits: Blackbeard Studios, Bon Jovi, Boston, Club New England, Downtown Recorders, Full Sail Center for the Recording Arts, Barry Goudreau Studios, Judas Priest, Majestic Theatre, Musitech Productions, Newbury Sound, Soundscape Productions, Spyro Gyra, Starke Lake Studios, Top of the Hub Discotheque, Pat Travers, etcetera.

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(201) 669-0707
Owner: Paul Fowlie

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Bryn Mawr, PA 19010
(215) 525-3605
Owner: Christopher D. Gately
Manager: F.D. Katz

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Natick, MA 01760
(617) 655-1180

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(212) 243-8600
Owner: P.J. George

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SD, AC, SES, EI, MR, ER
196 Pinehurst Ave.
New York, NY 10033
(212) 795-2771
Owner: Cliff Govier
Manager: Peter Dahlstrom
Services/Specialization: Audio and video studio services include: 1-Complete turnkey packages for new facilities 2-Expansion, modification, troubleshooting and documentation for existing systems. 3-CAD/CAM design and documentation. 4-Systems maintenance and repairs 5- Service contracts. 6-Acoustical and architectural design and consultation available 7-Custom fabrications in cabinetry and metal work 8-H.V.A.C installation and maintenance 9-Mobile, RV and yacht specialists

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(212) 213-0085
Owner: Igor Hilbert

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335 W. 76th St., Ste. 4A
New York, NY 10023
(212) 580-2325
Owner: Vander Hilst
Manager: Robert Vander Hilst

NORTHEAST STUDIO DESIGNERS & SUPPLIERS

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HOT HOUSE PRODUCTIONS
SD, AC, SES, EI
RD. 1, Box 362A
Highland, NY 12528
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Owner: Richard Rose

Services/Specialization: We are a small organization specializing in close personal client relations. Our product line is characterized by equipment we have found to be the most functional, cost-effective and reliable. In addition to the broad range of products offered, we provide system design, installation and maintenance for the pro and semi-pro recording studio, disco, sound reinforcement, electronic musician and home audiophile. Our recording studio/demonstration facility is available for equipment evaluation by appointment only. TANNON/KIMBER KABLE/PERREAUX/FM Acoustics/TETRA STAND/ASC TUBE TRAP/ANEOCHOA ABSORBER custom state-of-the-art studio monitor systems. ADA, Adams-Smith, AKG, Alessi, Allen & Heath, Aphex, Astatic, Audio Logic, BBE, Beyer, Brooke-Siren, Celestion, Crown, dbx, DDA, Digitech, DNR, Drew Y-Expressor, EAW, Emilar, Eventide, EXR, Fane, Fostex, Gatex, Goldline, GT Electronics, Hartley, Hill, HME, JBL, Klark-Teknik, Kyoocera, Lexicon, LoTech, Marshall Elec-



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(301) 744-4077
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Bala Cynwyd, PA 19004
(215) 668-0714
Manager: Sandy Martin

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Worcester, MA 01605
(617) 791-3366
Owner: Gerard Kopoyan

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MR
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Boston, MA 02115
(617) 536-5285
(617) 262-0155
Owner: Michael Larnelza

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SD, AC, SES, EI, MR, ER
177 Mill Ln.
Mountainside, NJ 07092
(201) 654-3800
Owner: Bob Sneed
Manager: Joseph Vangieri

KEILYN ENGINEERING
SD, AC, EI, MR, ER
RD #8, Box 132
Somerset, PA 15501
(814) 445-7143
(814) 893-5179
Owner: Kevin Custer
Manager: Brian Fritz

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3549 Rt. 22
Somerville, NJ 08876
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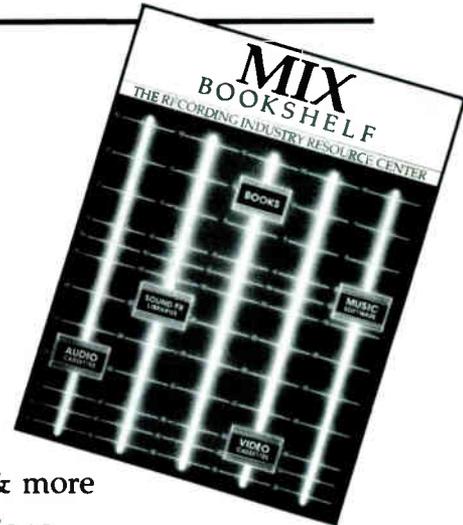
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Manager: Paul T. Calvi

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156 W. 48th St.
New York, NY 10036
(212) 819-0576
Manager: Stuart Manny, Ian Manny, Doug Cook

MARCOUSTIC ENGINEERING CO.
SD, AC, Et, MR
170 Duckpond Dr. N
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(516) 781-7015
Owner: Marc Aspesi

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ER
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(617) 354-1282
Owner: Steven M. Greene

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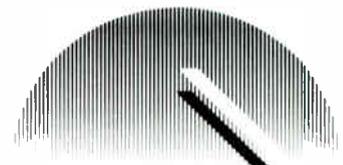
SES, ER
1041 Lancaster Ave.
Bryn Mawr, PA 19010
(215) 527-3090
Owner: G. Rosenbloom
Manager: Glenn Carly



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 Manager: Tina Hanson
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including Intraclean professional cleaning fluids. Our large in-house demonstration studio and control room are ideal for "hands-on" testing of new products such as the latest addition to our product line, the new "original" Scully LJ-12 recorders. Services offered include Precision Motor Works, a division of MDI which specializes in fully guaranteed motor repair and rebuilding for MCI and Mincom. Informational services include The Professional Seminar Series, special programs in the MDI demonstration facility, hosted by leading individuals in business and recording technology.

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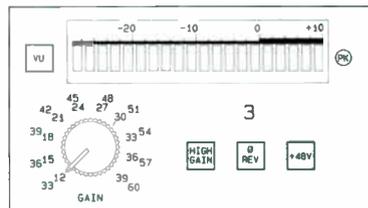


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Boston, MA 02115
(617) 897-8459
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Manhasset, NY 11030
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Pittsburgh, PA 15213
(412) 621-1950
Owner: Norman J. Cleary
Manager: Tim Benedict

PROFESSIONAL MUSIC AUDIO

AC, EI, MR, ER
2600 Commercial Dr.
No. Providence, RI 02904
(401) 353-6221
Owner: Peter M. Archambault

PROMIX INC.

SES, EI, ER
111 Cedar St.
New Rochelle, NY 10801
(914) 633-3233
Owner: Corporation
Manager: Robert Rendon

PUOPOLO CONSULTING INC.

SES, EI, MR
37 Martin St.
Rehoboth, MA 02769
(617) 252-6540
Owner: Dana J. Puopolo

DANIEL QUEEN ASSOCIATES

AC
239 W. 23rd St.
New York, NY 10011
(212) 243-6661
Services/Specialization: Daniel Queen Associates is an acoustical consulting firm founded in 1970 in Chicago. It moved its main office and laboratory to New York City in 1983. A member of the National Council of Acoustical Consultants, the firm maintains a laboratory and mainframe computer for electroacoustic, acoustic, audio and video measurement and analysis. Mr. Queen is a fellow of the Audio Engineering Society and its Technical Council Chairman. The firm specializes in solutions to difficult acoustical, audio, and noise control problems, such as duplicating in small rooms the acoustics of large performance spaces, matching monitoring facilities, and exorcising acoustical gremlins. Clients include architects, manufacturers, studios and other consultants.

RAND SYSTEMS

AC
3 Gardiner St.
Richmond, ME 04357
(207) 737-8015
Owner: Robert W. Rand

RARA AVIS PRODUCTIONS
 SD, AC
 1687 Farmington Ave.
 Unionville, CT 06085
 (203) 673-7564
 Owner: Alexander H. Cushman

RELIANCE A/V CORP.
 SD, AC, SES, EI, MR, ER
 623 W. 51st St.
 New York, NY 10019
 (212) 586-5000
 Owner: Sanford Schlitt
 Manager: Brian Turner

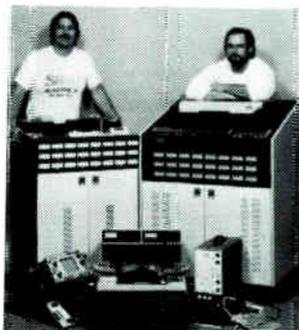
RIEDEL AUDIO SERVICES
 SD, AC, SES, EI, MR
 109 Commack Rd.
 Islip, NY 11751
 (516) 277-9418
 Owner: Rich Riedel
 Manager: Rich Riedel

ROR AUDIO RESEARCH
 SD, AC, SES, EI, MR, ER
 161-14 Union Turnpike
 Flushing, NY 11366
 (718) 969-3660
 (718) 969-3792

Owner: Shimon Ron
 Manager: Shimon Ron
 Services/Specialization: ROR has been designing, manufacturing and servicing multi-track consoles, parametric EQs, monitor systems and other electronic and acoustic innovations since 1972. A representative list of professional users and clients would include: recording studios: (International) Fonovision Internacional, Bogota, Colombia; Hljodriti Studios, Reykjavik, Iceland; Studio Katy, Brussels, Belgium; Pink Floyd's Britannia Row, London, England; Marcus Musik, London, England; Le Studio, Montreal, Canada; Noah, Tokyo, Japan (New York) Record Plant, A&R, Bearsville, Power Station, Electric Lady, Editel, Sorcerer Sound, RPM, Sigma, MSP, Blue Rock, Celestial Sound, Skyline, Howard Schwartz, Regent, Don Casale, Mike Mantler's and Carla Bley's Watt Works, Staten Sound (Los Angeles); Record Plant (Connecticut); Ace Frehley (KISS) Studio; Mastering rooms (New York) Sterling Sound, Frankford Wayne Clubs and restaurants: (New York) The Sporting Club, World Yacht's Dinner Cruise Ships, America, Pig Heaven, Jerry's, Water Club, River Cafe, Central Falls, Cafe Pacifico, Be-Bop Cafe, Fiorucci (clothing store), John Dellaria (beauty salon), etc.

ROSNER CUSTOM SOUND, INC.
 SES, EI, MR
 11-38 31 Ave.
 L.I. City, NY 11106
 (718) 726-5600
 Owner: Alex Rosner

TED ROTHSTEIN
 SD, AC, SES, EI, MR
 186 Benguefield Dr. N.
 East Williston, NY 11596
 (516) 742-0711
 (212) 847-1950
 Owner: Ted Rothstein
 Services/Specialization: Ted Rothstein (formerly of ROR Audio) has been designing, manufacturing and servicing multi-track consoles, parametric equalizers, monitor systems and other electronic and acoustic innovations since 1970. A representative list of clients and professional users of Ted Rothstein's designs would include: Recording studios: London, England: Pink Floyd's Britannia Row, Marcus Musik, Roger Water's studio, Bogota, Colombia; Fonovision International, Reykjavik, Iceland; Hljodriti Studios; Brussels, Belgium: Studio Katy, Montreal, Canada, Le Studio, Tokyo, Japan: Noah, New York: Record Plant, A&R, Bearsville, Power Station, Electric Lady, Editel, Sorcerer Sound, RPM, Sigma, MSP, Blue Rock, Celestial Sound, Skyline, Howard Schwartz, Regent, Don Casale, Mike Mantler's and Carla Bley's Watt Works, Bill Horwitz Studio; Los Angeles: Record Plant, Connecticut: Ace Frehley (KISS) Studio, Mastering Rooms; New York: Sterling Sound, Frankford Wayne, Discos, Clubs and Restaurants, Bangkok: NASA, Spaceadrome; Los Angeles: L.A. Stock Exchange, New York: The Sporting Club, World Yacht's Dinner Cruise Ships, America, Pig Heaven, Water Club, River Cafe, Central Falls, Cafe Pacifico, Be-Bop Cafe, Fiorucci (clothing store), John Dellaria (beauty salon), etc.



J. L. Hartley Pro-Audio Support
 44831 Fremont Blvd, Fremont CA
 (415) 490-0818

QUALITY MOTOR REFRUBISHING

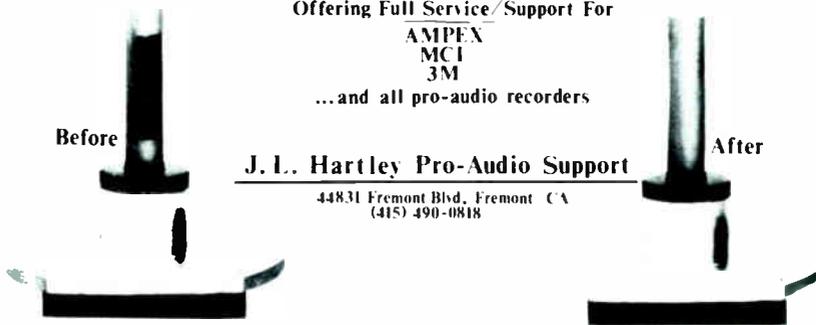
J.L. Hartley Pro-Audio Support Group offers "ultra precision" machining for specialty on-hand custom modification demands. Our motor refurbishing is an involved process, assuring a new long motor life for your recorder. Your motor rebuilding will entail complete motor disassembly, magnet fluxivity check (charging, if necessary), shaft TIR checked, capstan shafts blasted for fresh tape surface. New high grade bearings are used in accordance with original manufacturing specifications. The rotor/pancake is chemically cleaned and treated. Your motor is always precision handled and reassembled. All prices include parts and labor for a standard motor refurb.

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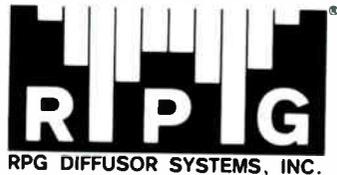
Call or write for more details.

The Audio Silicon Specialists™



2076B Walsh Avenue, Santa Clara, CA 95050 U.S.A.

(408) 727-0917 Telex 171189



RPG DIFFUSOR SYSTEMS, INC.
Largo, MD

RPG DIFFUSOR SYSTEMS, INC.
AC, SES
12003 Wimbleton St.
Largo, MD 20772
(301) 249-5647

Services/Specialization: The RPG Diffusor System is the first unified modular approach to architectural acoustic design utilizing all of the three basic building blocks of diffusion, absorption and reflection, with a unique approach for providing variable acoustics. The RPG Diffusor System offers a coordinated line of products which are complementary in both function and aesthetics. The RPG Diffusor System consists of the first commercially available broad-bandwidth wide-angle sound diffusor, the QRD™ Diffusor™, a broad-bandwidth sound absorber, the Abifusor™ and a rotatable triangular variable acoustics module consisting of a diffusive, absorptive and reflective side, the Trifusor™. Applications: recording/broadcast/post-mastering facilities, audio/video and teleconferencing rooms, music rehearsal rooms, acoustical shells, worship spaces, auditoriums, performing arts facilities, audiophile listening rooms and schools. Installations: Peter Gabriel Real World Studios, Box, UK; John Mellencamp, Nashville, TN;

NORTHEAST STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation; MR: Maintenance/Repair Services; ER: Equipment Rentals

Sound Stage Backstage, Nashville; Limeight Video, Miami; BBC Maida Vale 4, London; Master Sound Astoria, NY, NBC-TV, Burbank, NY & Brooklyn.

SIDE TRACK PRODUCTIONS/ATC ACOUSTICS
SD, AC, SES, EI
409 Sunrise Terr.
Springfield, MA
(413) 782-5471
(413) 781-2327
Owner: David L. Isabelle, Tony Caliento
Manager: Sandra J. Isabelle

SOUND CONTROL
SD, AC, ER
1528 80 St.
Brooklyn, NY 11228
(718) 837-6237
Owner: Dan Prosseda

CHARLIE SPATARO'S A.V. WORKSHOP, INC.
SES, MR, ER
333 W. 52nd St.
New York, NY 10019
(212) 397-5020
Owner: Charlie Spataro

SPECIALIZED AUDIO-VISUAL INC.
ER
RD #5, Rt. 50 & Hutchins Rd.
Saratoga Springs, NY 12866
(518) 885-8966
Owner: Michael J. Cusick
Manager: Jay D. Cusick

STAGE STRUCK PROJECTION SERVICE INC.
SD, AC, SES, EI, MR, ER
105 Babylon Turnpike
Roosevelt, NY 11575
(516) 378-5267
Owner: Daniel M. Beyer
Manager: J. Charles Beyer

STAGER SOUND SYSTEMS
AC, EI, MR, ER
16 W. 22 St.
New York, NY 10010
(212) 675-6000
Owner: Marc Stager
Manager: Marc Stager

John M. Storyk Associates, Inc.

ARCHITECTURAL & ACOUSTICAL DESIGN

31 UNION SQUARE WEST
NEW YORK, N.Y. 10003
(212) 675-1166

John M. Storyk
President

JOHN M. STORYK ASSOCIATES, INC.
New York, NY

JOHN M. STORYK ASSOCIATES, INC.
SD, AC
31 Union Sq. W.
New York, NY
(212) 675-1166
Owner: John Storyk

Services/Specialization: John M. Storyk, Inc. and its principal, John Storyk, have been responsible for the design of well over 200 media facilities since Mr. Storyk's debut project in 1970, Jimi Hendrix's Electric Lady Studio in New York. Mr. Storyk's portfolio includes acoustical and architectural design for studio facilities in New York, Los Angeles, Trinidad, Belgium, England, Colombia and Iceland; in addition to facilities for Leon Russell, Ace Frehley and The Cars. In recent years, Mr. Storyk's projects have included Todd Rundgren's Utopia Video Complex in Bearsville, New York; Public Broadcasting System radio facilities in Cincinnati and New York City. In 1986-87, Mr. Storyk completed Studio One in Detroit, studios and offices for M.J.I. Broadcasting in New York City, designs for public broadcasting's most technologically advanced complex in Charleston, West Virginia and a unique studio facility for Rick Rubin's Def Jam Records in Manhattan. With these projects, John M. Storyk, Inc. continues its position as an active leader in communications facility design.

STUDIO CONSULTANTS, INC.
SD, AC, SES, ER
321 W. 44th St.
New York, NY 10036
(212) 586-7376
Owner: Doug Simon

STUDIO DESIGN
SD, AC
PO Box 321
Princeton Junction, NJ 08550
(609) 799-8697
Owner: Douglas F. Miller
Manager: Harry Putone

ATTENTION!

North Central U.S. Studios Canadian Studios

The yearly Mix Directory of North Central U.S. and Canadian Studios will be published in November 1987. Don't miss this **free** opportunity to reach over 100,000 professionals in the audio/video field! To receive a questionnaire or more information, call the Directories Dept. at (415) 843-7901.

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DEADLINE TO SUBMIT QUESTIONNAIRE: August 12

SYSTEMS DEVELOPMENT GROUP
 SD, AC
 18601 Darnestown Rd.
 Poolesville, MD 20837
 (301) 972-7355
 Owner: Systems Development Group
 Manager: Cheri Looney



TEKCOM CORP.
 Philadelphia, PA

TEKCOM CORP.
 SD, AC, SES, EI, MR, ER
 1020 N. Delaware Ave.
 Philadelphia, PA 19125
 (215) 426-6700
 Owner: Lou Maresca, L. Richard Feld
 Manager: Rob Forman
 Services/Specialization: Exclusive mid-Atlantic distributor for: Otari MTR-90, DTR-700 and DTR-900 tape recorders; Amek, NEOTEK and Trident mixing consoles; Dolby noise reduction and SR processing systems; AMS, Eventide and Lexicon Advanced products; Audio Kinetics and TimeLine synchronizers, Kurzweil music systems, Neumann and B&K studio condenser microphones. We also offer expert factory trained tape recorder and loudspeaker repair.



TLM ELECTRONICS INC.
 Pleasantville, NY

TLM ELECTRONICS INC.
 SD, SES, EI, MR, ER
 343 Manville Rd., #6B
 Pleasantville, NY 10570
 (914) 769-6423
 Owner: Tony Marra
 Services/Specialization: TLM Electronics Inc. is a technical service company which provides warranty and non-warranty services to the recording and sound reinforcement industries. With our extensive inventory of audio test equipment we offer both in-house and field service. Our computer automated test equipment supplies hard copy test results with each repair so you can verify the performance of your equipment. Although we repair anything audio, we particularly specialize in mixing console modifications. Our Soundcraft grounding modifications have proven to be as much as 6dB quieter than a new factory console. And our Soundcraft 200B independent routing modification is now a recording studio standard. If you have something that you wish your console could do—give us a call. We are not only factory-trained by Soundcraft, Trident, Neve, etc. but we are factory authorized and recommended by them. In addition we offer warranty service for both Soundcraft and Trident.

TOTAL MUSIC INC.
 SD, AC, EI
 300 W. 55th St., #3M
 New York, NY 10019
 (212) 265-1067
 Owner: P. Wagner
 Services/Specialization: Custom console interfaces, wiring design, 8- to 48-track digital audio, MIDI Credits: Soundworks, NY; Saturn Sound, NY, LA; Somerville Sound, NY.



TOY SPECIALISTS
 New York, NY

TOY SPECIALISTS
 SES, ER
 240 W. 55th St.
 New York, NY 10019
 (212) 333-2206
 Manager: Rita Leone, Bill Tesar
 Services/Specialization: The Toy Specialists is a fast growing company specializing in pro-audio and musical instrument rentals. By combining personal expedient service with expert technical assistance, the company has developed an enviable status in the NYC area. Complicated synchronizing tasks and

elaborate MIDI setups are a few of the many services offered. The Toy Specialists carry all the latest in digital records, outboard gear and musical instruments by such companies as: Publison, AMS, Quantec, Yamaha, Roland, E-mu, Drawmer, Garfield, Linn, Simmons, Mitsubishi, Sony, Lexicon, Korg, Friend-Chip, J.L. Cooper and many more. Some of our most recent clients include: Mick Jagger, Whitney Houston, Julian Lennon, Hall & Oates, Miles Davis, George Benson, Kool & the Gang, Air Supply.

VERCELLETTO CONSULTING
 SD, AC, EI, MR
 PO Box 6219
 Kingston, NY 12401
 (914) 331-1726
 Owner: David Vercelletto
 Manager: Chris Wasserbach

VICTOR'S HOUSE OF MUSIC/VICTOR'S PRO AUDIO
 SD, AC, SES, EI, MR, ER
 235 Franklin Ave.
 Ridgewood, NJ 07450
 (201) 652-5802

Services/Specialization: Victor's is one of the NY metropolitan area's most well equipped sources for major audio, video, musical and production needs. Professional sales and service, an ever expanding inventory and roster of manufacturers, plus a concerned and congenial sales staff have kept Victor's up on top of things from coast to coast for years. AKG, ART, Amek, BBE, Countryman, Crown, dbx, Drawmer, E.V., Eventide, Fostex, Hill, JBL, Klark-Teknik, Lexicon, Loftech, MRL, Neumann, Orban, Otari, Roland, Shure, Soundcraft, T.C., Tannoy, Tascam, Trident, UREI, Valley, White, just to name a few! If it's used for performing or recording, we probably sell it and have it available—same day if needed! Sales-Service-Rentals-Design-Concern-Victor's.

VIDEO COMMUNICATION SERVICES
 ER
 208 Linden Ave.
 Riverton, NJ 08077
 (609) 786-1775
 Owner: Frank Siegel

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VISUAL MUSIC TECHNICAL SERVICES

SD, SES, EI, MR, ER
235 E. 13th St., #3-D
New York, NY 10003
(212) 505-9281
Owner: Visual Music
Manager: Theresa Hunter

GEORGE WEBER

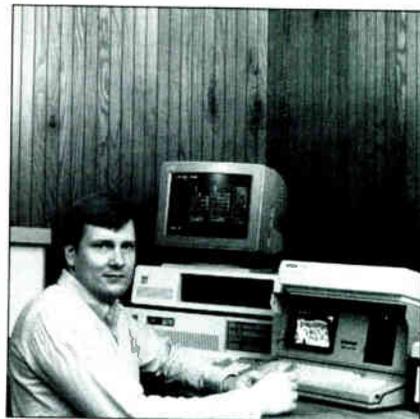
MR
10225 Kensington Pkwy.
Kensington, MD 20895
(301) 933-0669

WMRG STUDIOS INC.

SD, AC, EI, ER
PO Box 73
Cheltenham, PA 19012
(215) 635-4815
Owner: Bill Gellhaus
Manager: Paul Keller

SOUTHEAST
STUDIO
DESIGNERS
& SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation; MR: Maintenance/Repair Services; ER: Equipment Rentals



ACOUSTICAL PHYSICS LABORATORIES
Doraville, GA

ACOUSTICAL PHYSICS LABORATORIES

SD, AC, SES, EI, MR
3877 Foxford Dr.
Doraville, GA 30340
(404) 934-9217

Owner: Bill Morrison

Services/Specialization: Acoustical Physics Laboratories specializes in the accurate reproduction of music including the design, analysis and installation of control rooms, studios and monitoring systems. Through the use of TEF computer analysis, dual-channel FFT measurements, CADD acoustical models and frequency scaled acoustical models, high accuracy designs are developed, installed and performance certified. Control rooms and monitoring systems are designed for first arrival frequency and time domain accuracy. Later acoustical arrivals are controlled through the use of spectrally accurate absorption and diffusion. Acoustical Physics Laboratories designs monitoring systems which incorporate cone and soft dome drivers in time corrected alignments. This approach to monitor system design results in the highest levels of time and frequency domain accuracy combined with the lowest levels of distortion and coloration. Hard copy TEF computer and CADD plots document all stages of design work from the initial model testing through the final installation. Installations include recording studios, video & film production/post-production facilities, theaters, auditoriums, concert halls and churches.

ALPHA AUDIO
AC, SES, EI, MR
2049 W. Broad St.
Richmond, VA 23220
(804) 358-3852

AMERICAN AUDIO, INC.
AC, SES, EI, MR
PO Box 1719
Ruston, LA 71273
(318) 251-0290
Owner: James F. Young

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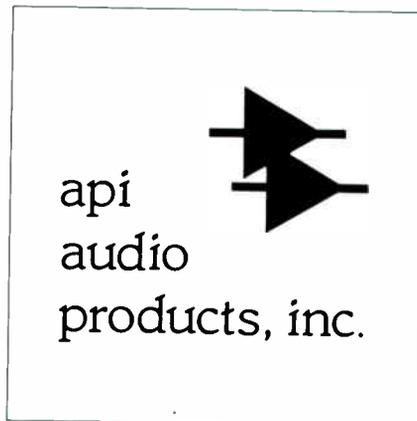
If you're upgrading for better sound, be sure to include Gauss coaxial monitors in your plans. Your choice of 12" or 15". Remember, if you can't hear the mistakes, they end up in your finished product. Let your speakers be the strongest link!

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9130 Glenoaks Blvd., Sun Valley, CA 91352
213/875-1900 Telex: 194989



API AUDIO PRODUCTS, INC.
Springfield, VA

API AUDIO PRODUCTS, INC.
SES, EI, MR, ER
7951 Twist Lane
Springfield, VA 22153

Circle #097 on Reader Service Card

(703) 455-8188
(510) 600-1898 (Telex)
Owner: Paul Wolff

Manager: Jim Wallace
Services/Specialization: API console repair, refurbishing; new and used API modules/equalizers; complete stock of old API parts; new API type all discrete consoles; used API broker; on location repair of API consoles; specializing in ground problems, etc. References available upon request.

AUDIO DESIGN GROUP
SD, AC, SES, EI, MR, ER
4317 Pinebark Ave.
Orlando, FL 32811
(305) 297-6635
(305) 256-6207 (cellular)
(305) 894-0067
Owner: H. Melven

AUDIO INTERFACE
SES, EI, MR
16323 Redington Dr.
Redington Beach, FL 33708
(813) 391-5249
Owner: Peter Kehoe

AUDIO-VIDEO CONTRACTING, INC.
SD, AC, SES, EI, MR, ER
301 Natchez Ct.
Nashville, TN 37211
(615) 833-5332
Owner: John Spencer

AUDIO WOODWORKS
SD, SES, EI
504 Wilkinson Ln.
White House, TN 37188
(615) 672-0277
Owner: Gary D. Backman, Jr.

B.A.E. (BLEVINS AUDIO EXCHANGE)
SES
1717 Elm Hill Pike, Ste. B-9
Nashville, TN 37210
(615) 361-8429
Manager: Randy Blevins

BALDWIN & CLARK
SD, AC
1086 Janes Ln.
Atlanta, GA 30324
(404) 982-0050
Owner: Steve Clark, Worth Baldwin

M.A. BENINGTON INC.
SES, EI
2459 Cuchura Dr.
Birmingham, AL 35244
(205) 988-0707
Owner: Mike Benington
Manager: Mike Benington
Services/Specialization: Custom equipment enclosures and casework for the audio and video industries. Studio and control room interior finishes.

BRANTLEY SOUND ASSOC. INC.
SES, EI, MR, ER
724 Vanoke Dr.
Madison, TN 37115
(615) 859-9568
Owner: Leland P. Brantley
Manager: Lee Brantley

CAMMER ACOUSTICS
SD, AC
PO Box 1405
Norcross, GA 30092
(404) 242-0495
Owner: J.P. Deegan

CATES MUSIC CENTER
AC, EI, MR
305 W. Walnut St.
Johnson City, TN 37601
(615) 928-8821
Owner: Carl W. Cates
Manager: Jeff Cates

COTTRELL ELECTRONICS CORP.
EI
1 S. Fifth St.
Richmond, VA 23219
(804) 648-8338
Owner: Stock

CREATIVE PRODUCTION SERVICES
AC, SES, EI, MR, ER
PO Box 1107
North Wilkesboro, NC 28659
(919) 667-1552
Owner: Jay L. Cummings
Manager: Tony Mancusi

CUSTOM RECORDING AND SOUND, INC.
SD, AC, SES, EI, MR, ER
1225 Pendleton St., PO Box 7647
Greenville, SC 29610
(803) 269-5018
Owner: Bob Edwards
Manager: Jere Davis

ELECTRO-ACOUSTICS LABORATORIES
SD, AC, EI, MR
7494 Covington Hwy.
Lithonia, GA 30038
(404) 482-4838

HALEY'S LIGHTNING SOUND STUDIO
AC, SES, EI, MR, ER
2200 N. "W" St.
Pensacola, FL 32506
(904) 432-2076
(904) 438-1011
Owner: Harry T. Haley
Manager: Barry Chandler, Tim Lechner

JT COMMUNICATIONS
MR
579 NE 44th Ave.
Ocala, FL 32671
(904) 236-0744
Owner: Jim Trapani

MELLOTONE ACOUSTICAL FABRICS
SES
PO Box 145
Blacksburg, SC 29702
(803) 839-6341
Owner: A.H. Silverman
Manager: Sherrie Traub
Services/Specialization: Mellotone—the most widely accepted acoustical fabric for over 40 years. It is completely sound transparent, does not absorb moisture or dirt and has a zero flame spread rating. When backed with a sound absorbent panel, Mellotone fabrics allow the sound to pass through to be absorbed by the backing material. Mellotone has been specified by architects and designers and used in virtually thousands of structures worldwide. All fabrics are inventoried and available for immediate shipment. Please call or write for samples and information.

MEMPHIS COMMUNICATIONS CORP.
SD, AC, SES, EI, MR, ER
1381 Madison Ave.
Memphis, TN 38104
(901) 725-9271
Owner: Tom Bryan Jr.

MIDWEST COMMUNICATIONS CORP.
SD, AC, SES, EI, MR, ER
2730 Ayliff Rd.
Norfolk, VA 23513
(804) 853-2600

MUSICIAN'S WORKSHOP, INC.
SES, EI, MR
319 Merrimon Ave.
Asheville, NC 28801
(704) 252-1249
Owner: J.F. Dosier

NATIONAL AUDIO TECHNOLOGY & ELECTRONICS CO.
SD, AC, SES, EI
PO Box 1327
Holly Hill, FL 32071
(904) 255-2240
Owner: Nate Mudge

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9505 Lakewater Ct
Richmond, VA 23229
(804) 321-4506
Owner: Sam Straus

PRECISION SYSTEMS DESIGN
SD, AC, SES, EI, MR
2817 Tremont Ave.
Savannah, GA 31405
(912) 236-4407
Owner: Ferman Tyler
Manager: Tim Kilmer

PROFESSIONAL AUDIO SALES & SERVICE, INC.
SD, AC, SES, EI, MR, ER
7906 Wrenwood Blvd., Ste. C
Baton Rouge, LA 70809
(504) 928-4757
Owner: Darrel W Hayes
Manager: Arthur M. Hoover

PROFESSIONAL SOUND ADVICE
SD, SES, EI, MR, ER
105 39th St. N.
Birmingham, AL 35222
(800) 826-6552
(205) 592-4555
Manager: Noah L. White, Barry Bailey

PROLINE AUDIO INC.
SES, EI, MR, ER
PO Box 799
Chalmette, LA 70044
(504) 279-1124
Owner: Ray Garofalo Jr

RADIO ACTIVE AUDIO
AC, ER
9 W. Grace St.
Richmond, VA
(804) 643-2022
Owner: Victor T Benschoff
Manager: Victor T Benschoff

SOUTHEAST STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer, AC: Acoustical Consulting, SES: Studio Equipment Supply, EI: Equipment Installation, MR: Maintenance/Repair Services, ER: Equipment Rentals

RANGE ELECTRONICS
SES, EI, MR, ER
PO Box 84
Versailles, KY 40383
(606) 277-9044
Owner: John Range

RASICCI MUSIC SERVICES
SD, AC, EI
118 E. Kingwood, Ste. E-12
Murfreesboro, TN 37130
(615) 890-9975
Owner: Michael V Rasicci
Manager: Timothy E Rasicci

REDGRAVE AUDIO
SES, MR, ER
2453 Keystone Rd.
Tarpon Springs, FL 33589
(813) 937-5987
Owner: Brian Redgrave

REELPEOPLE RECORDING SERVICES & CONSULTANTS
MR
3210 Gary Ct.
Falls Church, VA 22042
(703) 532-7335
Owner: Remy David

RELIABLE MUSIC
SD, AC, SES, EI, MR, ER
650 E. Stonewall St.
Charlotte, NC 28202
(704) 375-8662
Owner: David Bustle, Bill Evans
Manager: David Bustle

JOHN LYNN SANFORD ARCHITECT
SD, AC, MR
PO Box 120975
Nashville, TN 37212
(615) 320-0904
Owner: John Lynn Sanford

S.C.M.S.
SD, AC, SES, EI, MR, ER
10201 Rodney St.
Pineville, NC 28134
(800) 438-6040
(800) 221-7267
(704) 889-4508
Owner: Cal Walker
Services/Specialization: Audio production studio design and outfitting. Literally hundreds of lines carried and stocked in 14,000 sq ft facility. Complete installation, construction and design services offered. Audio is our business, and we are completely devoted to it! We are the largest volume broadcast and audio supply dealer in the Southeast. Over 30 years experience in the audio and broadcast business. See our ad in this magazine.

SHOWCASE AUDIO/VIDEO SYSTEMS
SES, EI, MR
2323 Cheshire Bridge Rd.
Atlanta, GA 30324
(800) 241-9738
(404) 325-7676
Services/Specialization: Showcase Audio/Video Systems is the Southeast's leading dealer for Amek/TAC consoles, Neumann microphones and Nakamichi Professional cassette decks. We are an award-winning Lexicon Advanced Products dealer, as well as a nationally recognized supplier for Studer/Revox, Cipher Digital and Fostex Professional products. Working closely with the Nashville design firm of Steven Durr and Associates, Showcase delivers competitive studio packages with a full range of installation and maintenance services. Our innovative demonstration and warranty programs have set new standards for studio support. Along with our associated video and computer division, Showcase Audio offers our clients a truly full service dealership. Our emphasis on systems and service, combined with unique insights into the requirements of a rapidly changing marketplace, will put your studio one step ahead.

SHREVEPORT MUSIC CO.
SES
3019 Highland
Shreveport, LA 71104
(318) 227-2733
Owner: Don Teach

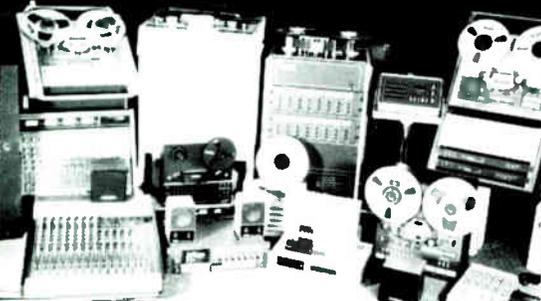
CHUCK SMITH AUDIO SERVICES
EI, MR
Rte. 1, Box 590
Windsor, VA 23487
(804) 242-6667

SONICS ASSOCIATES, INC.
SES, EI
237 Oxmoor Circle
Birmingham, AL 35209
(205) 942-9631

SOUND AND COMMUNICATIONS, INC.
AC, SES, EI, MR, ER
5830 N. State St.
Jackson, MS 39206
(601) 957-5830

SOUND STAGE
SD, AC, SES, EI, MR, ER
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Orlando, FL 32804
(305) 849-9767
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Manager: Dan Franklin

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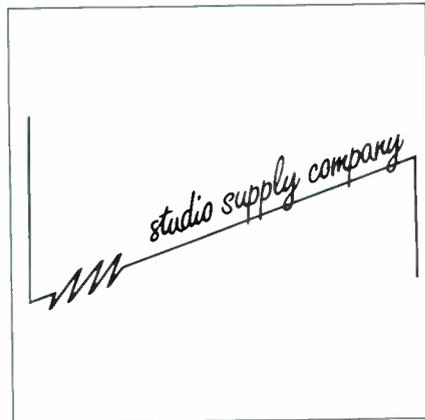
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SOUTHERN OAK MUSIC
EI, MR
PO Box 1681
Meridian, MS 39301
(601) 655-8447
Owner: Brad Lee
Manager: Brad Lee



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Nashville, TN

STUDIO SUPPLY COMPANY, INC.
SD, AC, SES, EI, MR, ER
1717 Elm Hill Pike, Ste. B-9
Nashville, TN 37210
(615) 366-1890
Manager: John Alderson, Linda Buchanan

STUDIOWORKS
SD, AC, SES, EI, MR
1018 Central Ave.
Charlotte, NC 28204
(704) 375-1053
(800) 438-5921
Manager: Chip Garrett
Services/Specialization: Studioworks is the team with working experience in recording and pro audio. Studioworks is closely associated with Reflection Sound Studios, which means you can talk with the people that have actual session experience with the equipment they sell, and real-world experience in studio acoustics (both design and construction). Studioworks has supplied dozens of Sony/MCI 24-track machines to recording companies all over the country, and has been a leader in sales of consoles and full turnkey systems. In fact, over 60 sessions-proven lines of equipment and supplies are available. In addition to complete consultation about systems for recording film sound, broadcast theater sound and sound contracting, Studioworks is very interested in helping the "Artist Studio" get a good start as well as building the multi-machine 24-track complexes. Begin a long-term relationship with experience.

SYNERGETIC SERVICES, INC.
SD, AC, MR
1926 NE 151 St.
N. Miami Beach, FL 33162
(305) 947-7372
Owner: Ross & Eileen Alexander



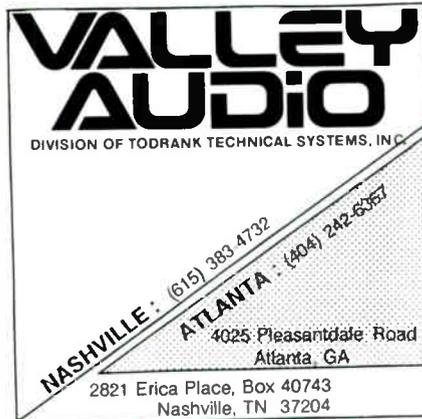
TECHNICAL AUDIO SYSTEMS
Atlanta, GA

TECHNICAL AUDIO SYSTEMS
SD, AC, SES, EI, MR, ER
3095-H Presidential Dr.
Atlanta, GA 30340
(404) 457-0988
Owner: Ron Montgomery
Manager: Steve Starnes
Services/Specialization: Recording studio equipment, broadcast audio equipment, ENG/EFP equipment, video equipment, noise control, design/consultation, most major lines, leasing available, production experienced staff

TECHNICAL INDUSTRIES, INC. OF GA
SD, SES, EI, MR, ER
6000 Peachtree Rd.
Atlanta, GA 30341
(404) 455-7610
Owner: Ed Matthews

TRACKSIDE ENGINEERING
SD, AC, SES, EI, MR
2652-C S. Cobb Dr.
Smyrna, GA 30080
(404) 436-3024
Owner: Les Duncan

N.B. TAYLOR & ASSOCIATES
AC
6467 Renoir Ave.
Baton Rouge, LA 70806
(504) 925-1236
Owner: Niel B. Taylor, Jr



VALLEY AUDIO
Nashville, TN

VALLEY AUDIO
2821 Erica Place, PO Box 40743
Nashville, TN 37204
(615) 383-4732
Services/Specialization: The latest in acoustical and electronics systems design services: Reflection Free Zones, RPG, LFD Diffusion, custom monitoring systems. Joint projects with Neil Grant of Harris/Grant Associates, London, England. Exclusive importer/BOXER all soft dome control room monitors. Valley's acoustical designer, consultant, Robert L. Todrank. Equip. Tecron TEF-10 analyzer, B&K, IVE, etc. Dealers for NEOTEK, Sound Workshop, Trident, Harrison consoles, Otari's full line of professional recorders incl. new DTR-900 digital multi-track. We offer complete equip. installation, maintenance and servicing of all professional audio equip. Valley specializes in "turnkey" facilities. Current projects: The Welk Music Group, Middle Tennessee State University, F.B.I., Washington.



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SD, AC
59 Franklin St.
Canal Winchester, OH 43110
(614) 837-1936
Owner: Chet Hall

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McConnelsville, OH 43756
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Owner: Atmosound
Manager: Rick Shrver

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Naperville, IL 60540
(312) 355-1404
Owner: Mark Gardner
Manager: Steve Jacula

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AC, SES, EI, ER
1406 1st Ave. S.
Minneapolis, MN 55403
(612) 871-6016
Owner: Christopher Eng

OWL MAINTENANCE
EI, MR
29 E. First St.
Hinsdale, IL 60521
(312) 325-1221
Owner: James W. Glass

PASCO SOUND
SES, EI, MR, ER
1019 Hill Pl.
Jackson, MI 49202
(517) 596-2573
(517) 787-0058
Owner: Calvin L. Williams

PI AUDIO
SES
2121 Brookpark Rd.
Cleveland, OH 44134
(216) 741-1400
Owner: David Yost

PRO-TECH SERVICES
SD, AC, EI, MR
1922 Fargo
Des Plaines, IL 60018
(312) 699-8937
Owner: David A. Jack
Manager: David A. Jack

NORTH CENTRAL STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation; MR: Maintenance/Repair Services; ER: Equipment Rentals

PROFESSIONAL AUDIO DESIGNS INC.
SD, SES, EI, MR, ER
8550 W. National Ave.
West Allis, WI
(414) 327-5330
Owner: Scott Leonard

PYRAMID AUDIO INC.
SD, AC, SES, EI, MR, ER
450 W. Taft Dr.
South Holland, IL 60473
(312) 339-8014
Owner: Rob Vukelich
Manager: Rob Vukelich

QUALITY SOUND ENGINEERING/CONSTRUCTION
SD, AC, SES, EI
620 Glen Cove
Lake St. Louis, MO 63367
(314) 625-3730
Owner: Gerard M. Quinn
Manager: Gary Manuel

Services/Specialization: Quality Sound has been influential in creating world class acoustical environments for over a decade, specializing in design and construction of state-of-the-art video and audio recording studios, soundstages & pro listing rooms. Our work has taken us across the country, renovating older facilities and constructing new ones. We have designed and constructed such projects as "United Press International's World Headquarters" in Washington, DC and "Jimmy Swaggert's World Headquarters" in Baton Rouge, Louisiana. We have built surroundings that workers find aesthetically pleasing and conducive to work, without losing sight of the needs of the building owner. We provide quality working space to meet everyone's needs. Quality Sound is interested in working directly with the studio owner in designing new state-of-the-art audio/video complexes or remodeling your existing facility. So if you're looking for the most qualified acoustical contractor, give us a try. See why the professionals have.

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Manager: Paul Jonas

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ER
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Elmwood Park, IL 60635
(312) 452-5594
Owner: Chris Kirby
Manager: Sherrie Kirby

RONDINELLI MUSIC/AUDIO
SES, ER
3250 Dodge
Dubuque, IA 52001
(319) 583-8271
Owner: George Rondinelli

SHURIKEN SOUND STUDIO
SD, AC, SES, EI, MR
512 N. Sherman
Liberal, KS 67901
(316) 624-1472
Owner: Brent E. Broadfoot

SOUND COM CORPORATION
SD, SES, EI, MR, ER
227 Depot St.
Berea, OH 44017
(216) 234-2604
Owner: Bill Fussner
Manager: Bill Murray

SOUND CORE MUSIC
SES, EI, ER
715 S. University
Carbondale, IL 62901
(618) 457-5641
Owner: Joe Castrejon
Manager: Dan Shingle

SOUND SOLUTIONS
SES, EI, MR, ER
5701 Canton Center Rd.
Canton, MI 48187
(313) 455-5557
Owner: John Williams

SOUND TRAX+
SD, AC, SES, EI, ER
1000 W. 17th St.
Bloomington, IN 47401
(812) 332-7475
Owner: Joseph T. Wilson
Manager: Joseph T. Wilson

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SD, AC, SES, EI, MR, ER
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(317) 849-2844
Owner: Charles S. Ballard



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Cincinnati, OH

J.M. STITT & ASSOCIATES, INC.
SD, AC
PO Box 14585
Cincinnati, OH 45214
(513) 621-9292

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Services/Specialization: Award-winning custom studio and facility design services, including architectural, acoustical, electrical, lighting, mechanical/HVAC, interior aesthetic and ergonomic designs and construction management. We specialize in the latest state-of-the-art LEDE rooms, new or refurbished, tailored to your budget. Serving the recording, broadcast and AV teleproduction industries. Acoustic and technical consultation including innovative systems design, impartial equipment selection, computer-aided design and room analyses and Techron TEF and other audio measurements. Our design team, each with 15-plus years experience in their respective fields of expertise, possess a unique sensitivity and ability to combine the diverse needs of the owner, client, producer, musician and engineer into a harmonious, successful facility.

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16638, 40, 44 E. Warren Ave.
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(313) 884-1790
(313) 881-5167
Owner: Ken M. Snyder
Manager: Chris Best

TECH SERVICES
EI, MR
3617 Elliot Ln.
Madison, WI 53704
(608) 249-5681
Owner: Dan Swadley
Manager: Dan Swadley

THOMPSON ELECTRONICS COMPANY
AC, SES, ER
905 S. Bosch Rd.
Peoria, IL 61607
(309) 697-2277
Owner: Craig A. Thompson

WORLD OF SOUND & LIGHT
EI
615 W. Jefferson St.
Plymouth, IN
(219) 936-5558
Owner: Larry Truman

SOUTHWEST

ERIC NEIL ANGEVINE, P.E.
AC
910 Lakeridge Dr.

Stillwater, OK 74075
(405) 372-3949
(405) 624-6043
Owner: Eric Neil Angevine, PE

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3830 N. 7th St.
Phoenix, AZ
(602) 277-4723
Owner: Floyd Ramsey
Manager: Ozzie Oslund

AV PRO, INC.
SES, EI, MR
2353 Santa Anna, #23
Dallas, TX 75228
(214) 327-0453
Owner: Tom Fowlston

D.P. AYYAPPAN, CONSULTANTS IN ACOUSTICS
1908 University Dr.
Richardson, TX 75081
(214) 644-2130
Owner: D.P. Ayyappan

DEAN BAILEY
SD, EI, MR
3422 Beech St.
Rowlett, TX 75088
(214) 475-9796
Owner: Dean Bailey
Manager: Dean Bailey

BRASSWIND RECORDING STUDIO, LTD.
SD, SES, EI, ER
2551 Texas Ave.
Shiloh Pl., Ste. F
College Station, TX 77840
(409) 693-5514
Owner: David O. Cooper
Manager: David O. Cooper

CAMPBELL CONSULTANTS
EI, MR
7010 Hickory Ridge
Converse, TX
(512) 653-9322
Owner: Brad Campbell
Manager: Kevin Martin

C.E.I.E. SPECS.
AC
PO Box 19756
Houston, TX 77224
(713) 747-6753
Owner: S.K. Hayre
Manager: H.S. Hayre

CHILES PLAY
EI
3743 La Joya
Dallas, TX 75220
(214) 351-1550
Owner: Chuck Chiles

CORE SYSTEMS INC.
SES, EI, MR, ER
10440 Westpark
Houston, TX 77042
(713) 977-9500
Owner: David Dalzell, Grif Palmer

CORNERSTONE AUDIO
AC, EI
Box 306
Clinton, OK 73601
(405) 323-7694
Owner: Michael J. Bingenheimer

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SD, AC, SES, EI
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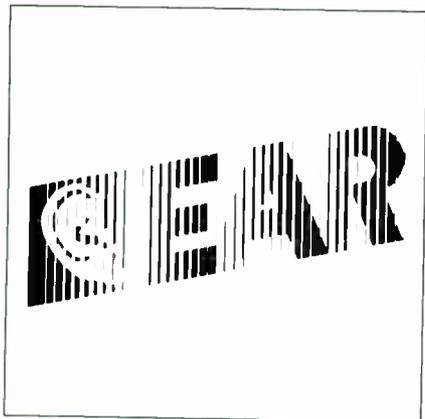
Sure we represent all the major manufacturers, but equipment *alone* isn't enough. What *is* important is dealing with a sales staff of experts who know the gear and how it can best work for you. It's important to know the equipment you purchase will be installed quickly and efficiently by responsible professionals and serviced by factory-trained repair technicians who pride themselves on quick turnaround. At L.D. Systems, it's the people that make the difference.

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Phoenix, AZ

E.A.R. PROFESSIONAL AUDIO/VIDEO
SD, SES, EI, MR

2641 E. McDowell Rd.
Phoenix, AZ 85008
(602) 267-0600

Owner: John Gibson, Tim Delaney

Services/Specialization: Service of audio and video equipment for recording, production and sound reinforcement. Major console and tape machine lines include Otari, Trident, Soundcraft, NEOTEK, Amek, Yamaha, Tascam, Sony, JVC and many more. Support services include full systems design, installation and maintenance of production facilities from 64-track audio/video post-production studios, artist's home studios, to concert touring systems. An experienced and knowledgeable sales and technical staff along with the finest selec-

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Owner: Jim Ford
Manager: Bryan Burdick

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SD, SES, EI, MR, ER
833 W. Main St.
Mesa, AZ 85201
(602) 969-8663

Owner: Brent Gabrielsen



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Ft. Worth, TX

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SES, MR

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Ft. Worth, TX 76112
(817) 429-9761

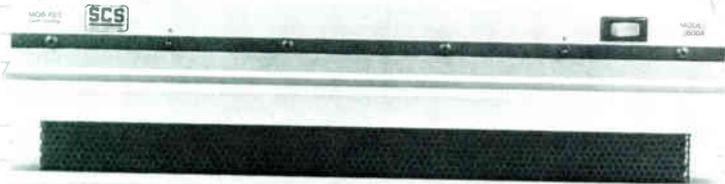
Owner: Larry Bell

Services/Specialization: Hardin is a full service pro-audio dealer serving the recording and reinforcement markets. We stock several grades of Ampex tape in 2", 1", 1/2" and 1/4" sizes with special pricing based on studio size. We also are the headquarters for studio supplies such as reels, boxes, splicing kits, etc., and move cassettes by the piece or the 100-lot case. Product lines include: microphones by AKG, Audio-Technica, Beyer-Dynamic, Crown, E-V, Fostex, Sennheiser, Shure and Tascam; mixing consoles by Soundcraft, Studio-master, Fostex, Tascam and Yamaha; Akai, Tascam, Revox and Yamaha recorders; speakers by Auratone, E-V, EAW, JBL and Yamaha; signal processing by (among others) Aphex, dbx, DeltaLab, DOD, Eventide, ART, UREI, Valley People and Yamaha; and power amps from Crown, Hafler and Yamaha. We also supply raw cables and connectors in bulk (Switchcraft and Neutrik distributor) with snakes and cables by Conquest, Pro-Co, Wireworks and Whirlwind. Hardin is also the largest Apple computer dealer in North Texas with a variety of MIDI interfaces and software available.



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(713) 667-8265
Owner: Bill Holford
Manager: Bill Holford



**The Joiner-Rose
Group, Inc.**

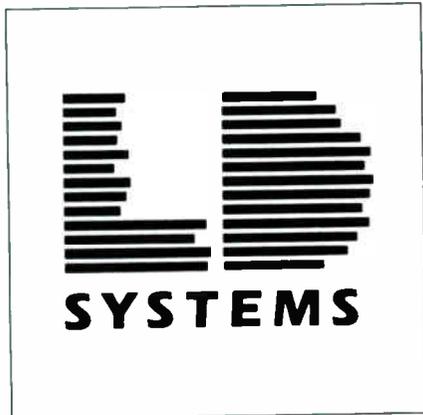
THE JOINER-ROSE GROUP, INC.
Dallas, TX

THE JOINER-ROSE GROUP, INC.
SD, AC
4125 Centurion Way
Dallas, TX 75244
(214) 392-7800

Services/Specialization: Russ Berger leads the Joiner-Rose Group studio design team, a group of engineers, scientists and musicians who combine experience in the recording industry and an understanding of studio operations with a broad base of technical skills in acoustical design. Whether in new construction or renovation, Russ employs the latest

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acoustical insights and practical construction techniques to provide predictable and cost-effective results. From initial space planning through design, construction, inspection and operation, state-of-the-art technology is tailored to the studio owner's needs, budget and clientele. As a principal of The Joiner-Rose Group, Russ is a vital part of one of the oldest and largest full-service acoustical consulting firms in the country. The Joiner-Rose Group maintains a full array of instrumentation, including a TEF® measurement system. We also offer design services, problem solving and testing in noise control, architectural acoustics, vibration analysis, video systems design, sound systems and environmental acoustics.



L.D. SYSTEMS
Houston, TX

L.D. SYSTEMS
AC, SES, EI, MR, ER
467 W. 38th St.
Houston, TX 77018
(713) 695-9400

Owner: Rob McKinley
Services/Specialization: Full line equipment and services offered. Professional products include Otari MTR-10/9011, Amek, Tascam, Adams-Smith and others. Complete and functional showroom facility for all products as well as on location demonstration if desired. Total service support for all products represented. Design and consulting services are available.

LIGHTNING MUSIC & SOUND PROFESSIONAL PROD. DIV.
SD, SES, EI
7801 N. Lamar
Austin, TX 78752
(512) 451-6535

MIDCOM, INC.
6311 N. O'Connor, LB 50
Irving, TX 75039
(214) 869-2144
Manager: Mike Simpson, Jeff Jones
Services/Specialization: Midcom, Inc. exists in three divisions. First, Midcom provides sales, engineering and service for the finest lines of audio available, including the Otari MTR series, DDA, Amek and Lexicon. Midcom also maintains a large rental inventory to service any requirement. Our stock includes wireless microphones, two-way "walkie-talkies," Lexicon PCM70, 480L and 224XL, RTS, Clear-Cor and RTAs. The third division of Midcom incorporates our 48-track audio remote truck. This mobile facility is available for production, post-production and remote recording throughout the Southwest.

MILANO MUSIC
SES, EI, ER
1733 W. Bell Rd.
Phoenix, AZ 85023
(602) 863-2900
Owner: Frank Milano

RECORDING SYSTEMS LTD.
AC, EI, MR, ER
5301 Victor St.
Dallas, TX 75214
(214) 826-0337
Owner: Ron S. Lagerlof

Recording Systems Ltd.

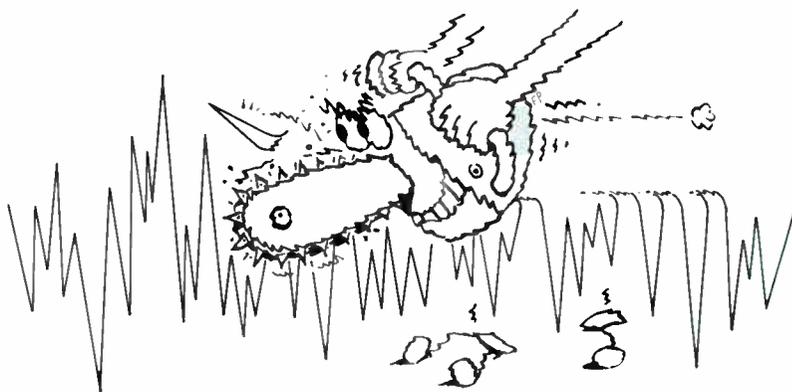
Interface Consulting/
Engineering Company

RECORDING SYSTEMS LTD.
Dallas, TX

ROCK STUDIO SUPPLY
SES
Box 5997
Norman, OK 73070
(405) 329-8431
Manager: David Moore

ROCKIN' ROBIN GUITARS & MUSIC
SD, SES, EI, MR
3619 S. Shepherd
Houston, TX 77098
(713) 529-5442
Owner: Bart
Manager: Dan

ROMULO ROMO GROUP
SD
3224 Modella Ave.
Dallas, TX 75229
(214) 241-9005
Owner: Romulo Romo
Manager: Pilar Saiffe



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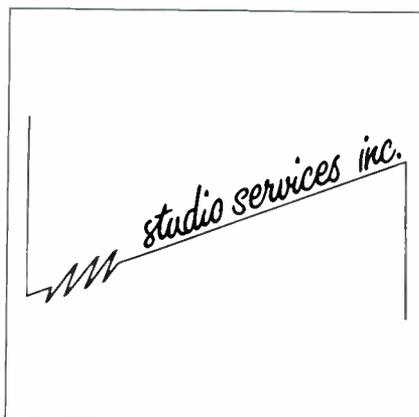
SOUTHWEST

STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; Et: Equipment Installation; MR: Maintenance/Repair Services; ER: Equipment Rentals

SOUND DESIGNS CO.
AC, SES, Et, MR, ER
1601 Westpark Dr., Ste. 4C
Little Rock, AR 72204
(501) 663-3808
Owner: Daniel A Smith

SOUND IDEA PRODUCTIONS
Et, MR, ER
1620 W. Surrey Ave.
Phoenix, AZ 85029
(602) 942-7363
Owner: James Larson
Manager: James Larson



STUDIO SERVICES INC./SSI DALLAS
Ft. Worth, TX

STUDIO SERVICES INC./SSI DALLAS
SD, AC, SES, Et, MR
PO Box 37005
Ft. Worth, TX 76117
(817) 429-0764
Owner: John Alderson
Manager: Leland Burns
Services/Specialization: We are a full-service professional audio organization staffed by top-flight recording engineers, studio consultants and equipment designers dedicated to serving the Texas, Oklahoma and Louisiana area and offering state-of-the-art pro audio equipment, system installation and maintenance. SSI is a sister company of Studio Supply, Nashville and is not affiliated with any studio or sound production company. We have no other interest than to provide the best in service and equipment. Our product line includes but is not limited to: Akai, Audio & Design, Hafler, Harrison, Sanken, Sierra Audio, Sony Pro Audio, Sony digital tape, Studiomaster, Ursa Major and Valley People. Studio services manager Leland Burns is highly experienced in sound production and knows what clients go through to maintain high-caliber work. His love and attitude towards good studios insure SSI does its part to see they are successful. Microphone to mixer to monitors, analog and digital, radio or records, plus audio-for-video—Studio Services Inc. is ready to serve.

TANDEN PRODUCTIONS
SES, Et, MR
PO Box 382
Gainesville, TX 76240

(817) 665-6756
Owner: Bobby Dennis

G.R. THURMOND AND ASSOCIATES
SD, AC
4709 Shoalwood
Austin, TX 78756
(512) 453-4173
Owner: Bob Thurmond
Services/Specialization: Studio, control room and monitor system design, with special services and rates for smaller facilities. Many design services available via mail and telephone. Special expertise in loudspeaker-room interfaces. Custom and conventional instrumentation available for detailed time and frequency-analysis of real situations. Custom equalizer circuitry, including multi-band parametrics, used for gentle correction of monitor system response deficiencies. Continuing research, especially in loudspeaker and circuitry technologies, with ensuing development of new instrumentation and equalizer devices. All jobs receive the personal attention of Bob Thurmond, who has had more than 20 years experience. Call him for more information

UP WITH PEOPLE
ER
3103 N. Campbell Ave.
Tucson, AZ 85719
(602) 327-7351

SO. CALIF./HAWAII

ACOUSTIC SCIENCES OF CALIF.
AC
6709 Ethel Ave.
N. Hollywood, CA 91606
(818) 763-9587
Owner: Richard Lomax

ADVANCE RECORDING PRODUCTS
SES
7190 Clairemont Mesa Blvd.
San Diego, CA 92111
(619) 277-2540
(800) 858-1061 (in CA)
(800) 854-1061 (outside CA)
Owner: Rosie Anand
Manager: Joyce Wozniak

ALCORN MCBRIDE & ASSOCIATES
SD
2660 Townsgate Rd., Bldg. 280
Westlake Village, CA 91361
(805) 494-3506
Owner: Steven C. Alcorn

DAN ALEXANDER AUDIO
SES, ER
1523 N. Gordon
Hollywood, CA 90028
(213) 466-0477
Owner: Dan Alexander
Manager: Joel M. Kohn

AMEK CONSOLES INC.
SES, Et
10815 Burbank Blvd.
North Hollywood, CA 91601
(818) 508-9788

AUDIBLE SYSTEMS
ER
1631 Maria St.
Burbank, CA 91504
(818) 843-2121
Owner: Richard Castleberry
Manager: Andy Chappel

AUDIO CONSULTANTS OF SANTA BARBARA
Et, MR
3413 Keeshen Dr.
Los Angeles, CA 90066

AUDIO GRAPHIC SYSTEMS
SES, Et, MR, ER
15207 Marquardt Ave.

Santa Fe Springs, CA 90670
(213) 921-0707
Owner: Ted & Jackie DeGroot

BBN LABS
SD, AC
21120 Vanowen St.
Canoga Park, CA 91303
(818) 347-8360

Manager: Paul Jensen, Colin Gordon
Services/Specialization: We offer design services for recording studios and control rooms, radio and television studios, scoring stages, Foley stages, film and video post-production facilities including acoustics, noise control, space planning and electronic systems. We will provide acoustic and electronic testing and evaluation of existing and new facilities including reverberation time, sound distribution, time-delay spectrometry, sound isolation, HVAC noise, electronic noise and distortion. We offer independent laboratory evaluation and certification of acoustic and electronic performance of equipment. Recent projects include: remodeling of scoring stage and control room for Walt Disney Productions, Burbank; studios for KOIN-TV, Portland; audio-visual studios for National Geographic Society, Washington; Dallas Communications Complex, Irving, Texas. BBN is the world's largest acoustical firm with offices and laboratories in Los Angeles and Boston.

BELCAN CORPORATION
SD, AC, EI
1756 Flower St.
Glendale, CA 91201
(818) 409-0827
Owner: Ralph G. Anderson
Manager: John T. Brenkman

THE BERTECH ORGANIZATION
SES
14447 Califa St.
Van Nuys, CA 91401
(818) 909-0262
Owner: Lee Berman

CALIFORNIA COMPACT DISC GROUP
SES, EI
955 W. 19th St., #A205

Costa Mesa, CA 92627
(714) 646-3326
Owner: Larry Marks

CLEARTRONICS
SD, SES, EI, MR
16019 Londelius St.
Sepulveda, CA 91343
(818) 894-2999
Owner: Jeffery Marcus, Charles Ducat



JEFF COOPER ARCHITECTS A.I.A.
Calabasas, CA

JEFF COOPER ARCHITECTS A.I.A.
SD, AC
4766 Park Granada, Ste 106
Calabasas, CA 91302
(818) 887-9100
Services/Specialization: Architects and builders for the entertainment industry. Specializing in: recording studios, film studios, video studios, theaters. Clients include: Steven Spielberg, George Lucas, Cannon Film Corporation, Walt Disney

Studios, Warner/Hollywood Studios, MCA, others. Services: architectural design, acoustic consulting, engineering, interior design, construction, management. The new 1986 edition of *Building A Recording Studio* by Jeff Cooper is available through this office.



CHIPS DAVIS LEDE DESIGNS, INC.
San Rafael, CA

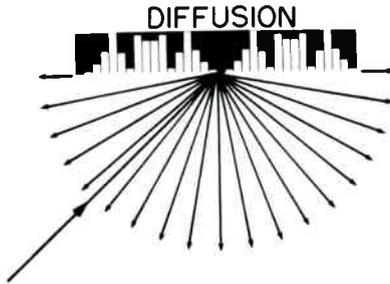
CHIPS DAVIS LEDE DESIGNS, INC.
SD, AC
3364 Clandara, Las Vegas, NV 89121
(702) 731-1917
2169 Francisco Blvd., J-1
San Rafael, CA 94901
(415) 459-2888
Owner: Chips Davis, Jerry Jacob
Services/Specialization: Chips Davis designed and built the first LEDE control room in 1978 in Las Vegas, NV. Since then, Davis has defined and set the standards for LEDE and LEDE-type monitoring environments. Davis' research and continued commitment to the scientific principles involved have made

—CONTINUED ON NEXT PAGE

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Blue Jay Studios, Carlisle



Red Bus, London

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Limelight Video, Miami
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NFL Films, Mt. Laurel
Radio New Zealand
San Francisco Production Group
Sound Stage Studios, Nashville
Swaggart Ministries, Baton Rouge
Teleimage, Dallas
WFMT, Chicago & Philadelphia
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RPG Diffusor Systems, Inc. 12003 Wimpleton St., Largo, MD 20772 Phone 301-249-5647 Telex 5106004126 RPG
RPG Europe — Phone 01-900-0355 Telex 935847 CETECA G RPG Far East — Phone 3-746189 Telex 393097 POSOD HX

Patent Pending

him the acknowledged expert in the field. Among Chips Davis-designed facilities you might wish to visit are: Tarpan Studio (Tres Virgos), San Rafael, CA; Crescendo Audio Production, San Juan, PR; Radio-TV Caracas, Caracas, Venezuela; Audio Archives, Syracuse University, Syracuse, NY; NBC Training Center, NY; ABC, NY; Sounds Interchange, Toronto, Ont., Canada; MBC Center, Winnipeg, Manitoba, Canada; NBC PPS 1, CRs 1, 2, 3, 4 and 9 (Carson, Jeopardy, Wheel) Brooklyn 2, Brooklyn, NY (Bill Cosby Show); National Public Radio, Soundwave, Washington, DC; JBL, Columbia Academy, Phoenix Studio, Vancouver, BC, Canada; Granny's House, Reno, NV; Starstudio, Hamburg, W. Germany. Services offered: design, consultation, seminars and training, TDS™ measurements, electronic and product design consultation, marketing and management services as well as on-site supervision and turnkey services

WALT DAVIS ENTERPRISES
SD, SES, EI, MR, ER
3439 Cahuenga Blvd. W.
Hollywood, CA 90068
(213) 876-6400
Owner: David Rozzen

DESIGN FX AUDIO
ER
PO Box 491087
Los Angeles, CA 90049
(213) 838-6555
(800) 441-4415
Owner: Gary Ladinsky

Services/Specialization: Design FX Audio is a digital audio rental company. We specialize in state-of-the-art effects and digital recording equipment including Sony and Mitsubishi digital multi-track machines. Our staff is comprised of music professionals able to help access equipment needs and to answer technical questions. Design FX Audio provides fast, efficient 24-hour service at competitive prices. We cater to the recording, film and video fields. Contact: David, Rick or Gary.

ROBERT FERRA
EI, MR
6550 Wilkinson Ave.
N. Hollywood, CA 91606
(818) 761-8305
Owner: Bob Ferra

FISHER FACILITIES DESIGN
SD, EI, MR
2874 Nandina Dr.
Palmdale, CA 93550
(805) 947-9665
Owner: Dave Fisher

GEFEN SYSTEMS
SD, SES, MR
5068 San Feliciano Dr.
Woodland Hills, CA 91367
(818) 884-6294
Owner: Hagai Gefen

HI-TECH MUSICAL SERVICES
SD, SES, EI, MR
2800 S. Washington Blvd.
Marina Del Rey, CA 90292
(213) 822-1983
Owner: Tim Myer
Manager: Tim Myer

HOLLYWOOD VAULTS, INC./FILM & TAPE STORAGE CENTER
SES, ER
742 N. Seward St.
Hollywood, CA 91608
(213) 461-6464
Owner: David Wexler

HUGHES SOUND ENGINEERING
SES, EI, MR
3533 Old Conejo Rd., Ste. 125
Newbury Park, CA 91320
(805) 499-7744

CHRISTOPHER HUSTON
SD, AC
5933 Graciosa Dr.
Hollywood, CA 90068
(213) 467-2969

SO. CALIFORNIA STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation; MR: Maintenance/Repair Services; ER: Equipment Rentals

INTERNATIONAL BROADCAST
SD, SES, EI
4415 Hamilton, PO Box 16103
San Diego, CA 92116
(619) 692-1778
Owner: Patrick Espinoza

JIM'S MUSIC CENTERS
SES, EI, ER
1854 N. Placentia Ave.
Placentia, CA 92670
(714) 528-3370
Owner: Robert Joly
Manager: R. Werner

JIM'S MUSIC CENTERS
SES, EI, ER
14120 Culver Dr., Ste. H
Irvine, CA 92714
(714) 552-4280
Owner: Robert Joly
Manager: R. Werner

MCMANUS ENTERPRISES
EI, MR
PO Box 6530
San Diego, CA 92107
(619) 223-1730
Owner: Paul McManus

KENNETH R. MEADES
SD, AC
PO Box 71098
Los Angeles, CA 90071
(213) 666-9570
Owner: Kenneth R. Meades
Manager: Kenneth R. Meades

MUSICIANS REPAIR SERVICE
SD, AC, SES, EI, MR
3089 54th St.
San Diego, CA 92105
(619) 583-7851
Owner: M. Krewitsky
Manager: R. Conrad
Services/Specialization: MIDI studio system design and maintenance, MIDI updates, retrofits, recording systems, design maintenance, speaker reconing. Musical electronics calibrations and modifications. Factory warranty service for more than 100 brands. All major lines for MIDI studio, recording and live performance. Microphone speaker specialists.

NONSTOP PRODUCTIONS INC.
SD, AC, SES, EI, MR
3320 E. Century Blvd.
Lynwood, CA 90262
(213) 774-0931
Owner: Arthur G. Wright
Manager: L. Marlene Wright

PARAGON SOUND
SD, SES, EI
PO Box 8400
Universal City, CA 91608
(213) 462-4432
Owner: Kurt E. Albershardt



PERCEPTION INC.
Los Angeles, CA

PERCEPTION INC.
SD, AC
PO Box 39536
Los Angeles, CA 90039
(213) 857-4912

Manager: G.L. Augspurger
Services/Specialization: This consulting group is headed by well-known acoustician and studio design expert, George L. Augspurger. His wide experience with commercially successful TV, film and recording studios covers every major record label as well as the most prestigious independent studios. Projects currently underway include four major recording complexes, a number of studio remodeling designs, acoustical consultation for auditoriums and film sound stages, two TV sweetening room designs and acoustical corrections in three existing studios. Perception Inc. provides professional consulting and design services to architects, builders and studio owners; it has no association with any contractor or equipment supplier. In addition to studio design services and acoustical consultation, the company provides extensive acoustics testing capabilities. Mr. Augspurger is a member of the Audio Engineering Society, Acoustical Society of America, U.S. Institute for Theatre Technology, American Theatre-Association and National Council of Acoustical Consultants.

POSITIVE MEDIA
ER
5422A Fair Ave.
N. Hollywood, CA 91601
(818) 761-5192
Owner: Paul Holman
Manager: Corrine Power



PROFESSIONAL SOUND SYSTEMS
Monrovia, CA

PROFESSIONAL SOUND SYSTEMS
SD, AC, EI, MR
2527 Treelane Ave.
Monrovia, CA 91016
(818) 359-1373
Owner: William C. Wysock
Manager: Lynn C. Wysock
Services/Specialization: Professional Sound Systems specializes in custom monitor system design, construction and integration for personal use facilities. Specialized ancillary equip-

—CONTINUED ON NEXT PAGE

Midiopolis

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SPECIALISTS

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Los Angeles, CA 90036

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SCOTT PUTNAM
SD
7345 Cantaloupe Ave.
Van Nuys, CA 91405
(818) 786-8288
Owner: Scott Putnam
Manager: Scott Putnam

SAFARI VIDEO & INTERCOM ELECTRONICS
EI
6309 Eleanor
Los Angeles, CA
(213) 856-9845
Owner: Sandy Cupples

SANTA BARBARA SCENIC
SD, SES, EI, ER
1164 Crestline Dr.
Santa Barbara, CA 93105
(805) 962-4179
Owner: Stephen Epstein, Theodore Dolas

SIDEREAL AKUSTIC AUDIO SYSTEMS, INC.
SES
1969 Outrigger Way
Oceanside, CA 92054
(619) 722-7707
Owner: Richard A. Smith

DOC SIEGEL AUDIO SERVICES
SES, MR, ER
5755 Corteen Pl.
N. Hollywood, CA 91607
(213) 877-2300
Owner: Doc Siegel

SMITH, FAUSE & ASSOCIATES, INC.
AC
5601 W. Slauson Ave., Ste. 201
Culver City, CA 90230
(213) 568-8555

SOUND ADVICE LTD.
EI, MR
4844 Lankershim Blvd.
N. Hollywood, CA 91601
(818) 761-8393
Owner: Ralph D. Skellon

SOUND CHAMBER, INC.
SES, EI, MR
5400 Cahuenga Blvd.
N. Hollywood, CA
(818) 985-1376
Owner: Jerry Laidman
Manager: Peter Loughnane

THE SOUND SOURCE
ER
PO Box 1495
Hollywood, CA 90028
(213) 876-2400

THE SOUND STAGE
SES, EI, MR, ER
1615 N. Blackstone
Fresno, CA 93703
(209) 233-6531
Owner: Matt Spitzer
Manager: Jerry Liles, Rocky Giannetta

SOUND TECHNIQUES
SES, EI, ER
PO Box 648
North Hollywood, CA 91603
(818) 764-3355
Owner: Denny McLane

SO. CALIFORNIA STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer, AC: Acoustical Consulting, SES: Studio Equipment Supply, EI: Equipment Installation, MR: Maintenance/Repair Services, ER: Equipment Rentals

SPECIALIZED SOUND SERVICES
SD, AC, SES, EI, MR, ER
15911 Acre St.
Sepulveda, CA 91343
(818) 892-9810
(213) 856-4533

Services/Specialization: A full service company specializing in studio design, sales and installation. From conception, layout and planning consultation to facility completion; personal attention is given to tailor each system to meet the client's individual needs. We maintain a full staff of qualified technicians for maintenance and repair of audio and video facilities. East and West Coast recording studios with full SMPTE interlock. Both equipped with Synclavier. Synclavier rentals with programmer available.

SPRAGUE MAGNETICS, INC.
SES, MR, ER
15720 Stagg St.
Van Nuys, CA 91406
(800) 553-8712
(800) 325-4243 (CA)
Owner: D. Sprague
Manager: John M. Austin

SSL INDUSTRIES, INC.
AC, SES, EI, MR
PO Box 3410
Camarillo, CA 93011
(805) 482-9884
Owner: John C. Russ

STAGING TECHNIQUES
ER
1921 Wilcox Ave.
Hollywood, CA 90028
(213) 874-5106
Owner: Randy Will
Manager: John Bromberg

STUDIO SPECTRUM, INC.
SD, SES, EI, MR, ER
1056 N. Lake St.
Burbank, CA 91502
(818) 845-7000
Owner: Ken Buckowski

STUDIOBUILDERS
SD, AC, SES, EI, MR, ER
919 N. Victory Blvd.
Burbank, CA 91502
(818) 842-9526
Owner: George Johnson
Manager: George Johnson

SUPERSOUND STUDIO
SD, EI, MR
8946 Ellis Ave.
Los Angeles, CA 90034
(213) 836-4028
Owner: Morris D. Golodner
Manager: Morris D. Golodner

TAYLOR-MAID
SD, AC, EI
PO Box 3937
Palm Desert, CA 92261
(619) 340-2312

TRITRONICS INC.
ER
733 N. Victory Blvd.
Burbank, CA 91502
(818) 569-4000
Owner: Kenneth Kaylor
Manager: Robert Sofia

VIDEO ENGINEERING, INC.
SD, AC, EI, MR
225 N. Nimitz Hwy., 2nd Floor
Honolulu, HI 96817
(808) 524-1888

VJ ELECTRONICS, INC.
EI, ER
22127 S. Vermont Ave.
Torrance, CA 90502
(213) 533-5980
Owner: Gary L. Ford
Manager: Evan Landrum

WAVELENGTH SYSTEMS DESIGN, INC.
AC, EI, MR
214 A Standard St.
El Segundo, CA 90245
(213) 322-9075
Owner: Cheryl Kronfeld
Manager: Greg Dunn

WEST COAST STUDIO SERVICES
SES, EI, MR
11684 Ventura Blvd., Ste. 302
Studio City, CA 91604
(818) 787-3966
Owner: Scott Hasson
Manager: Wiley Galbraith

WESTLAKE AUDIO, INC.
SD, AC, SES, EI, MR, ER
7265 Santa Monica Blvd.
Los Angeles, CA 90046
(213) 851-9800
Owner: Glenn Phoenix
Manager: Debbie Jenkins, Chris Carey

WIZARDZ SOUND AND LIGHTING SYSTEMS
SES, EI, MR, ER
620 W. Santa Anita St.
San Gabriel, CA 91776
(818) 284-2124
Owner: Mark Cruz
Services/Specialization: Wizardz is a franchised dealership for Eastern Acoustic Works' SCD 6000 Reference Monitors, as well as the full Eastern Acoustic Works line. Also available are the unsurpassed Hill Audio Amplifiers with 100 to 3,000 watts of clean, dependable power. Included in the Hill line are the Multi-Mix rack mount mixer and J Series Modular Recording Consoles. From Kimber Kable to Mogami to Biamp to Hill to you!! Wizardz provides some of the world's best equipment.

NORTHWEST

AATRONICS INC
SES, EI, MR, ER
5903 Franklin Rd.
Boise, ID 83709
(208) 343-0900
Owner: Paul Orlovich
Manager: Bill Donnelly

ACOUSTIC SCIENCES CORPORATION
PO Box 11156
Eugene, OR 97440
(800) 272-8823
(503) 343-9727
Owner: Arthur Noxon
Manager: Arthur Noxon

DAVID L. ADAMS ASSOCIATES, INC.
SD, AC
1701 Boulder St.
Denver, CO 80211
(303) 455-1900
Owner: David L. Adams

ADVANCED VIDEO SYSTEMS
SD, AC, EI, MR
1479A Folsom St.

San Francisco, CA 94103
(415) 863-6767
Owner: John Preston, Gary Kimball
Manager: Molly Reynolds

DAN ALEXANDER AUDIO

SES, ER
245 Hyde St.
San Francisco, CA 94102
(415) 474-1625
Owner: Dan Alexander
Manager: Joel M. Kohn
Services/Specialization: In the recording business since 1976, providing audio esoterica as well as the industry standards to the major recording facilities in the U.S. Thousands of clients include Ocean Way, Sunset Sound, Criteria, A&M, Unique, all three Record Plant Studios, Fantasy, Tolo, Prince, The Jacksons, Michael McDonald, Van Halen, Merle Haggard, etc. Dan Alexander Audio has sold more Pultec and Lang equalizers, more La2a and Fairchild limiters, more Neumann and AKG tube microphones, more API consoles and more Telefunken 251s than any other used audio dealer on the planet! We buy, sell and trade used audio equipment of all types: recorders, consoles, outboard gear and everything else. We can get you almost anything you want—and we can save you money! We have just opened a retail store and rental company in Hollywood. You can still reach our San Francisco office. Make us an offer we can't understand, please!

AMERICAN AUDIO

AC, EI, MR, ER
10529-D Lakeview Ave. SW
Tacoma, WA 98499
(206) 863-6655
Owner: Dennis Livingston, Jr.
Manager: Shane Kean Livingston

ARTISTS' ENGINEERING

SD, EI, MR
14444 Skyline Blvd.
Woodside, CA 94062
(415) 851-0388
Owner: Harry Sitam
Manager: Harry Sitam
Services/Specialization: A full range of technical services for recording studios and related pro audio facilities (except acoustical or computer work). Both shop and field services are available by appointment. Owner/operator was employed at Wally Heider's San Francisco maintenance department 1970-76; provides technical services for Neil Young's studio 1971-present; established Artists' Engineering in 1976 to provide service for various Northern California studios; factory trained at 3M and Ampex. Specialization: 1) installation and modification of recording systems; 2) custom design and fabrication of sub-systems and interface assemblies for recording systems; 3) tape recorder service; experienced on most brands and models; facilities for complete overhaul.

BANANAS AT LARGE

SES, ER
802 Fourth St.
San Rafael, CA 94901
(415) 457-7600
Owner: J.D. Sharp

BLACK BOXES, INC.

AC, SES, EI, ER
1570 Davidson Ave.
San Francisco, CA 94124
(415) 695-9555
Owner: BBI
Manager: Mike Joseph

CALIBRATION STANDARD INSTRUMENTS

SES
PO Box 2727
Oakland, CA 94602
(415) 531-8725
Owner: Edward M. Long

COLORADO SOUND N' LIGHT INC.

EI
7301 N. Broadway
Denver, CO 80221
(303) 429-9111
Owner: James E. Baxter
Manager: Howard Hamilton

CONNECTRONICS CORPORATION

SES
652 Glenbrook Rd.
Stamford, CT 06906
(203) 324-2889
Owner: Richard Chivers

COZIAR ENGINEERING CO.

AC, SES, EI
PO Box 8076
Incline Village, NV 89450
(702) 831-5671
Owner: Bob Coziar

FUTURE MUSIC

SES
Box 1090
Reno, NV 89504
(800) 367-6434
Manager: Tom White

FUTURE SALES

SES
Box 2077
Redmond, WA 98073
(206) 868-5577
Owner: John Caporale

GLOVE PRODUCTIONS

SD, AC
1128 Alder, Ste. C
Eugene, OR 97403
(503) 344-4570
Owner: Michael K. Pfohl
Manager: Michael R. Denning

GUITAR SHOWCASE/SHOWCASE AUDIO

SD, AC, SES, EI, MR, ER
3090 S. Bascorn Ave.
San Jose, CA 95044
(408) 377-5864
Owner: Guitar Showcase Inc.

HAIGHT ASHBURY MUSIC CENTER

SES, MR, ER
1540 Haight St.
San Francisco, CA 94117
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Owner: Massoud Badakhshan
Manager: Dean Leto

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Berkeley, CA

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SD, AC

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(415) 528-1505

Services/Specialization: FHA offers a unique blend of experience, skill and instrumentation for the design and testing of all types of studios, performance spaces and listening rooms. We are a professional partnership of consultants in acoustics, vibration and sound system design with no products to sell and no rigid design philosophy. Our partners have backgrounds in recording, electronics, video, live performance audio, music, structural and mechanical engineering and the construction industry. We also have experience as professional musicians and recording artists. FHA's laboratory has the finest instrumentation from Bruel and Kjaer So, whether your project is large or small, complex or "no frills," you should consider our services: design, design review, HVAC noise control, noise and vibration control, room acoustics, site evaluation, sound systems, specification and testing. Previous clients include: The Record Plant, Bill Graham Presents, FM Productions, Jefferson Starship, Alice Cooper and The Autormat

KB SOUND, INC.

AC, SES, EI, MR
1825 Suffolk Ct.
Fort Collins, CO 80526
(303) 493-5933
Owner: Kathleen Hutchison

KIMBER KABLE

SES
2675 Industrial Dr.
Ogden, UT 84401
(801) 621-5530
Owner: Ray Kimber
Manager: Jeff Young

LAKE AUDIO LTD.

SD, AC, EI, MR
60 Montezuma St., #5
San Francisco, CA 94110
(415) 821-9110
Owner: Gilles Virtel

LAKE ELECTRONIC CONTRACTORS, INC.

EI, MR
15800 SW Boones Ferry Rd., Ste. 202
PO Box 1225
Lake Oswego, OR 97034
(503) 636-7210
Owner: Thomas P Bull
Manager: James T Bull

LEFT MINUS RIGHT AUDIO CONSULTANTS

SD, EI, MR
510 B S. Murphy Ave.
Sunnyvale, CA 94086
(408) 773-9793
(415) 960-4260
Owner: Marty Preece

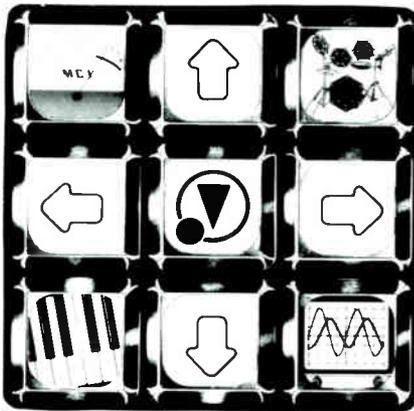
LEO'S AUDIO AND MUSIC TECHNOLOGIES

SD, AC, SES, EI, MR
5447 Telegraph Ave.
Oakland, CA 94609
(415) 652-1553
Owner: Bob Ulius

NORTHWEST

STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation; MR: Maintenance/Repair Services; ER: Equipment Rentals



LEO'S AUDIO AND MUSIC TECHNOLOGIES
Oakland, CA

Manager: Ron Webb

Services/Specialization: Sales, service and installation of Sony/MCI professional audio equipment and virtually every major brand of professional recording, broadcast and sound reinforcement equipment. Extensive inventory of keyboards, synthesizers, computers and software for studio and stage use including the new and highly innovative Kurzweil 250. Leo's maintains four showrooms including a working 24-track control room and is uniquely able to demonstrate the complete product lines of over 120 manufacturers. Our sales staff is particularly attuned to the marriage of multi-track audio, computers and keyboards. Factory trained service available on most major lines.

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AC
4107 Oakmore Rd.
Oakland, CA 94602
(415) 531-8725
Owner: Edward M Long

STEVEN LORENTE PRODUCTIONS

EI, MR, ER
5806 Porto Alegre Dr.
San Jose, CA 95120
(408) 268-4344
Owner: Steven Lorente
Manager: Suzanne Lorente

LUDE BROADCAST ENGR.

SD, EI, MR, ER
458 Brannan St.
San Francisco, CA 94107
(415) 543-1300
Owner: Pete Lude*

RICHARD MARKELL

MR
17755 Cherokee Trail
Los Gatos, CA 95030
(408) 353-3811
Owner: Richard Markell

ML MARSH ASSOCIATES

SD, SES, EI, MR
4438 SW Hewett
Portland, OR 97208
(800) 274-7150
Owner: M.L. Marsh

MICROAUDIO

SES
4438 SW Hewett
Portland, OR 97221
Owner: Gene Rimkeit



MIRROMERE AUDIO
Wheatridge, CO

MIRROMERE AUDIO

SD, AC, SES, EI, MR, ER
7150 W. 38th Ave.
Wheatridge, CO 80033
(303) 431-2348
Owner: Ron Oren

Services/Specialization: Full line professional audio sales, service and installation. Complete acoustical design and consultation services from blueprint to hard copy analysis for recording studios, broadcast, multi-use facilities and touring reinforcement. Standard line and custom panel manufacturers. Installation hardware manufacturers and suppliers. High quality loudspeaker cabinetry manufacturing of proprietary systems or industry standards. Studio furniture systems for recording, broadcast and touring packages. Complete maintenance, modification and reconfig facility with factory trained technicians. Supplier of magnetic tape 1/4" to 2", analog or digital. Analysis equipment featuring Bruel & Kjaer, Crown, IVE, Neutrik and Sound Technology. Audio production and test equipment rentals available. Innovative approach to the implementation of audio systems with 20 years of practical application.

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AC, SES, EI, MR, ER
2004 196th SW, #2
Lynnwood, WA 98036
(206) 771-7257
Owner: Charles & Susan Morgan

Manager: Charles & Susan Morgan
Services/Specialization: Morgan Sound offers system design, equipment supply, installation, acoustic design and electronic analysis. Along with a full-service repair facility, we are TEF™ equipped and have a trained technician to supply and interpret TDS™ documentation (Technon and Syn-Aud-Con). The latest computer software is available to aid in efficient placement of AUL (AcousTech), Sonex and other effective acoustic treatments. Specializing in studio equipment and electroacoustic interfacing, our staff is available to meet your design requests. Besides our retail facility, Morgan Sound carries a complete inventory of outboard processors, mics and auxiliary equipment for rental and lease to studios and production houses. Call for answers to your audio and audio/video needs. Product lines we represent include: Sony/MCI, Sony Digital, Adams-Smith, JBL/UREI, Lexicon, Klark-Teknik, Eventide and over 70 other carefully selected lines. Clients include SRO Theatres, Steve Lawson Studios, McDonald Recording and Milltree Productions of Seattle, WA.

MUSIC 6000

6000 Pacific Ave.
Lacey, WA 98503
(206) 491-2222
Owner: Steve Lewis

OMEGA CONSULTANTS, INC.
AC
PO Box 612
Olympia, WA 98507
(206) 754-7205
Owner: Shannon L. Ericsson

PAOLETTI/LEWITZ/ASSOCIATES, INC.

SD, AC
40 Gold St.
San Francisco, CA 94133
(415) 391-7610
Services/Specialization: Acoustical consulting/studio design services available: TEF (Techron System 10) analysis of rooms and monitoring equipment; studio/control room acoustical design and treatment including: specification and design of absorptive treatment, design of low frequency absorbers/diffusers, placement and design of diffusive elements (including QRD's—Quadratic Residue Diffusers); sound isolation design and treatments; HVAC system noise and vibration control; environmental acoustics site survey.

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SES, EI, MR, ER
2358 S. Main St.
Salt Lake City, UT 84115
(801) 466-3196
Manager: Klay Anderson

PRO MEDIA

SD, AC, SES, EI, MR, ER
Two China Basin Bldg., Ste. 358
San Francisco, CA
(415) 957-1383
Manager: David Angress

PROSOUND CORPORATION

AC, SES, EI, MR, ER
1638 Pearl St.
Boulder, CO 80302
(303) 444-1731

R & M PRO AUDIO

SES
1080 Pacheco St.

San Francisco, CA 94116
(415) 665-8480
Owner: Roy & Maureen Chen
Manager: Roy & Maureen Chen



RLS ACOUSTICS
San Francisco, CA

RLS ACOUSTICS
SD, AC
650 Fifth St., Ste. 301
San Francisco, CA 94107
(415) 541-0818

Owner: Randy Sparks
Services/Specialization: At RLS Acoustics, we provide quality design, engineering and consulting services. Whether you're expanding existing facilities, or starting a new organization, we'll work directly with you in the development of your concept. Reinforcing your ideas with solid engineering principles and innovative design solutions we can build a strong foundation for your successful venture. Our experience in the design and use of technical facilities can help you avoid costly mistakes. Proprietary engineering software, along with our CAD system, enables our personnel to arrive at design solutions

quickly—and save you money in the process. If you're interested in creating a state-of-the-art audio control room, designing a recording studio with a variable acoustic environment, incorporating accurate stereo audio into your video production suite, installing an audio-for-video synchronization system, or anything in between, call us and we'll help develop your ideas and turn them into reality. Recent projects include: Edit 3 for San Francisco Production Group, audio and video suites for Chevron USA, 24-track studio for OTR Studios, Studio C for Robert Berke Sound, L.A. conference facilities for Blue Shield of California, and an audio suite & on-line video control room for Hawaii Public Television

CHARLES M. SALTER ASSOCIATES, INC.

AC
930 Montgomery, #101
San Francisco, CA 94530
(415) 397-0442

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2000 Broadway, Ste. 119
San Francisco, CA 94115
(415) 922-3827
Owner: Deno Kannes

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4717 Aurora N.
Seattle, WA 98103
(206) 632-3717
Owner: R.J. Pappas

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Rohnert Park, CA 94928
(707) 792-1813
Owner: Donald Setaro

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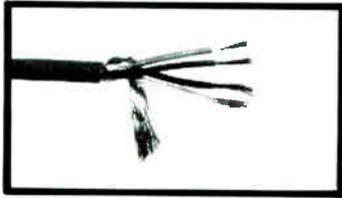
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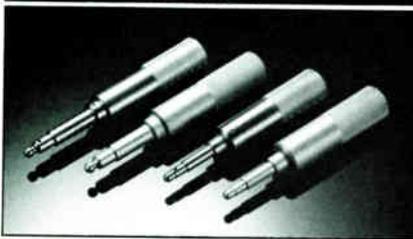
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Installation; MR: Maintenance/Repair Services; ER:
Equipment Rentals

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Seattle, WA 98125
(206) 361-0394

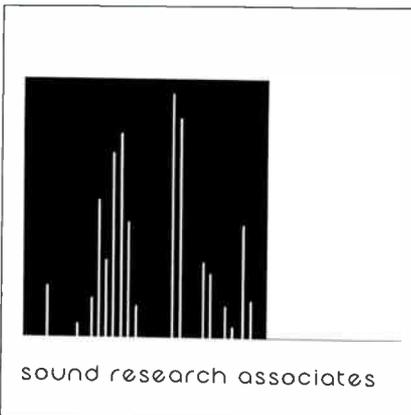
Owner: Spring M. Selby

SOUND ADVICE INC.

SD, AC

PO Box 278
Cazadero, CA 95421
(707) 632-5911

Owner: Tom Kraus



sound research associates

SOUND RESEARCH ASSOCIATES
Cupertino, CA

SOUND RESEARCH ASSOCIATES

SD, AC, EI, MR

10469 Mary Ave.
Cupertino, CA 95014

(408) 438-6040

Owner: Tom Paddock

Services/Specialization: SRA offers a wide range of services
for the recording, broadcast and performance industries, in-
cluding "turn-key" acoustical, mechanical, electronic, ground-
ing and power systems design. SRA specializes in innovative
and cost-effective engineering ideas and our experience and
expertise in the fields of acoustics and electronics is your
assurance that your design will be accurate as well as aesthet-
ically pleasing. SRA features CAD generated, fully document-
ed project construction drawings and specifications. SRA is
experienced in the latest LEDE™ contr of room design and we
offer computer-designed diffuser and absorber systems, as
well as TEF™ analysis. SRA consulting services include site
evaluation, video systems design, HVAC, etc. We would like to
acknowledge our clients for their support and confidence in
our services: Huey Lewis and the News, The Grateful Dead,
George Winston, The Tubes/Todd Rundgren, Different Fur,

Joan Baez, Windham Hill, Bob Weir, E-mu Systems, Mickey
Hart, Stanford University, CBS (*Twilight Zone*), and One Pass
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1450 Monument Blvd.
Concord, CA
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Manager: Graham Cooper, Rick Baker

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SES, EI, MR

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Hayward, CA 94541
(415) 582-5905

Owner: Matt Spitzer

Manager: Matt Spitzer

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SES, EI, MR

928 Van Ness
San Francisco, CA
(415) 775-1316

Owner: Matt Spitzer

Manager: Tadj Galleran

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Renton, WA 98057
(206) 255-0972

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AC, SES, MR

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Sun Valley, ID 83353

(208) 726-3476

Owner: Amos Galpin

Manager: Amos Galpin

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SD, AC, SES

2561 S. 1560 W.
Woods Cross, UT 84087
(801) 298-3280

Owner: Jeff Ostler

Manager: Jeff Ostler

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915 Fee Dr.
Sacramento, CA 95815

(916) 924-9911

Owner: Walter Horsting

Manager: Mike Rogers

WARREN ASSOCIATES

SES

2338 Calle Del Mundo
Santa Clara, CA 95054
(408) 988-7762

Owner: Don & Brad Warren

Manager: Allan F. Cravaltto

WESTERN OREGON SOUND & RECORDING

SD, AC, SES, EI, MR, ER

3430 48th NE
Salem, OR 97305

(503) 370-7906

Owner: Duane Sheets

Manager: James Elgin

WILSON, IHRIG & ASSOCIATES, INC.

AC

5776 Broadway
Oakland, CA 94618
(415) 658-6719

Owner: George Paul Wilson

Services/Specialization: Wilson, Ihrig & Associates, Inc. (WIA)
is one of the nation's leading acoustical consulting firms with
over 20 years experience in the acoustical design of all types
of recording and performance facilities. Our services include
the measurement, evaluation, and control of noise and vibra-
tion, HVAC noise control, sound systems, site evaluation, room
acoustics, specification and testing. WIA maintains an exten-
sive array of precision measurement and laboratory analysis
equipment for performing all types of acoustical and vibration
measurements. WIA is dedicated to practical, cost-effective
solutions and offers services ranging from a few hours of
consultation to extensive project participation.

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Owner: John Loubser

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Vancouver, BC, V6Z 1Z7 Canada
(604) 669-5525

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33 Mayer St., Ste. 308
St. Therese, Quebec, J7E 4T3 Canada
(514) 430-1994
Owner: Daniel Seguin

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Newmarket, Suffolk, U.K.
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Toronto, Ontario,

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SD, AC
4 Budget Terr.
Toronto, Ontario, M6S 1B4 Canada
(416) 762-5452
Owner: Terry Medwedek

Services/Specialization: Acoustic design and consultation services for the audio, video and film industries. Projects range from broadcast production rooms to multi-studio facilities and have included a wide variety of room designs. All designs are tailored to the client's requirements, site conditions, budget, etc., to provide innovative, functional, acoustical spaces. Services for new or renovation projects include: initial site inspection for structural and acoustical suitability, facility

planning from the conceptual stage to working drawings: specifications and design for appropriate sound isolation, room geometry and construction, acoustic treatments; mechanical specifications, acoustic analysis and tuning services. Client's include: Phase One Studios, Masters Workshop (four studios), The Room Studios, The Media Centre (three studios), Ocean Sound, River Audio, Soundtrek Studios in Edmonton (two studios), private studios for Geddy Lee and Alex Lifeson of Rush, Redmond Communications (four studios), Telemedia Inc. (five studios).

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Manager: Lucio Zoccolillo

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St. Thomas, O0801 V1
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Owner: Milton L. Wuischpard

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(416) 298-3835
Owner: Neil A. Muncy
Manager: Neil A. Muncy
Services/Specialization: Design of recording and broadcasting facilities including acoustical, electrical/electronic and functional aspects. Analysis and troubleshooting of technical problems. Electrical, acoustical and TEF™ measurements. Technical seminars and workshops.

OPUS 555 INC.
SES, EI, ER
555 Blvd. Charest Est.
Quebec City, Canada
(418) 523-3828
Owner: Jean Robert De Ro

SOUND CONTROL
AC, SES, EI, MR, ER
46, Dargan Crescent, Duncrue Rd.
* Belfast, BT3 9JP N. Ireland
(44) 232-772491
Owner: John Connolly

STATE OF THE ART ELECTRONIK, INC.
43-1010 Polytek St.
Ottawa, Ontario, K1J 8Z2 Canada
(613) 744-1003
Owner: Claude Fortier
Manager: Claude Fortier
Services/Specialization: State of the Art Electronik specializes in the acoustic design of control rooms and studios, room acoustics, acoustic performance testing and verification, music facility design, as well as video edit suite and post-production facility design. We also manufacture a range of patented acoustic align studio monitors and associated electronic crossovers that can be custom designed or adapted to obtain the maximum acoustic performance from your space. By integrating studio design with our Acoustic Align Monitors we can achieve a state-of-the-art analytical monitoring environment. We have a wide array of acoustic (Bruel & Kjaer) and electronic test and measurement equipment and the expertise to use it. Recent clients: Telemage, Dallas; Master-Mix, Nashville; Starmusik-produktion, Hamburg; KPL Corp., New York; Sounds Interchange, Toronto; Solar Audio, Halifax; Marc Productions, Ottawa

T.D.S. TECNICHE DEL SUONO S.R.L.
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Otari TC-50

The first product in Otari's new OtariTech line for the broadcast and recording markets is the TC-50 center channel time code/FM processor. The TC-50 adds center-track time code to Otari MX-5050 2-track

machines as well as other 4-head-position tape recorders. The unit allows 1/4-inch 2-track machines to be synchronized to video tape or film with stereo audio. Its front panel LEDs indicate time code level at the input and output. Also

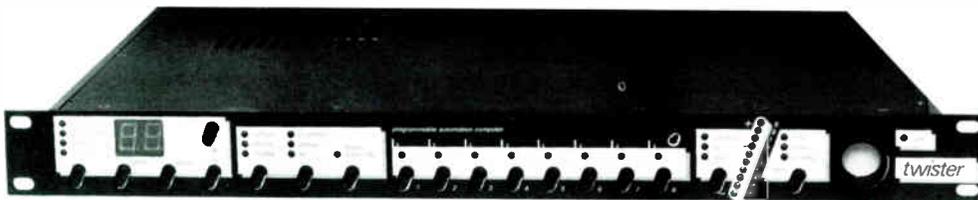
included is an FM pilot signal demodulated output, compatible with Nagrasync™. The TC-50 weighs under five pounds and measures 17 inches wide, 7 inches deep and 1.75 inches high.

Circle #201 on Reader Service Card

Soundfold Absorptive Panels

Soundfold International (Dayton, OH) has developed Ultra 2000 panels for controlling echo and reverberation. The Ultra 2000's patented fluted design allows multi-directional sound-absorbing capabilities over a wide range of frequencies. Available in a wide choice of fabrics, over 80 colors, and in full panel or "applique" versions, Ultra 2000 panels are held in place by an aluminum track system and can be installed by any professional carpenter. The economical, flame-retardant, dual-density fiberglass units can cover any height and width requirements.

Circle #202 on Reader Service Card

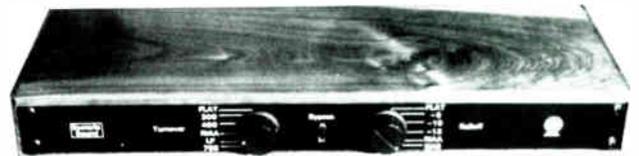


Twister Mixer Automation

Twister Engineering of Denmark debuts their programmable, 8-channel, MIDI-based mixing system for studio and live use. Dubbed the "PAC," it allows dynamic control of signal levels, computer reading of input audio level (ideal in real time sampling applications), and status communications using MIDI data. Compati-

ble with all MIDI sequencers, PAC operates via front panel control, external MIDI control, or with the Atari ST. Features include 100 memories, 64 groups per memory, 95 dB S/N, expandable to 64 channels, universal 8-in/8-out design and easy operation. It's available for \$1,599 through Promise Productions (Glendale, CA).

Circle #203 on Reader Service Card



Esoteric Re-Equalizer

Esoteric Sound (Downers Grove, IL) presents their Re-Equalizer for "restoration" of vintage recordings. This dedicated device compensates the pre-amp

output for recordings mastered before RIAA adopted a standard phono reproduction curve; basically, it's an active unity-gain box that gives any modern amplifier the EQ switching facilities used before the 1960s. Controls include an In/Bypass switch ("In" parallels stereo inputs to mono; "Bypass" allows playing modern-day material) and two 6-position switches for bass and treble EQ. Mounted on a 19-inch rack panel, the Re-Equalizer is also available in an optional walnut case. Suggested retail price is \$225.

Circle #205 on Reader Service Card



Sound & Vision Tape Controller

From Thousand Oaks, California, comes Sound & Vision's new Micro 1 tape controller, a hand-held unit that works with all reel-to-reel decks dating back to Ampex AG 440s, Otari 5050s, and Tascam 80-8s. Features include direct search-to-cue (no

swing, no overshoot), auto punch in/out, tape and record loop with pre-roll, rehearse mode with pre-roll and cue tone output, shuttle speed, digital display, full transport controls, and trigger-out. Units may be ordered factory-direct for a limited time at the introductory price of \$249.

Circle #204 on Reader Service Card

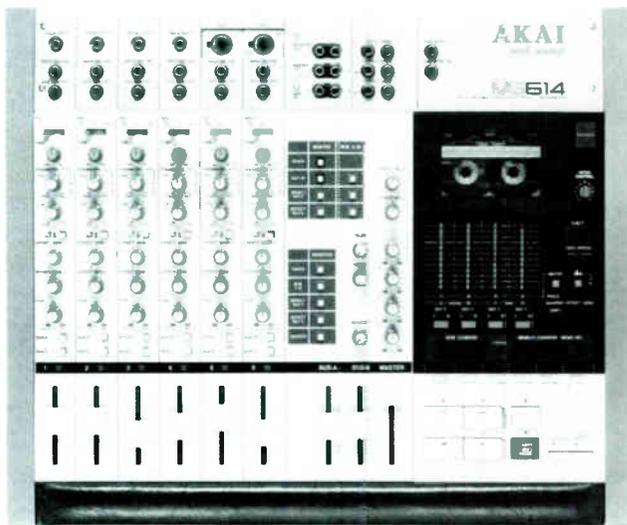
Denecke Time Code Slate

Deneck (N. Hollywood, CA) has introduced the DCODE™ TS Grande Time Code Concert Slate, which reads and displays SMPTE/EBU time code and drop frame status with bright, 6½-inch high LED digits. Designed for multi-camera productions, the slate features variable intensity LEDs, readable in sunlight. Time code is displayed in hours and minutes on the top line, seconds and frames on the



bottom, from 1/10 to 10x speed. Priced at \$2,980, the DCODE runs on a 12V battery or AC power.

Circle #206 on Reader Service Card



Akai 4-Track + Sync

The Akai Professional MG614 features a precedent in multi-track cassette recorder/mixers: the ability to use all four tracks for audio, but still have synchronizing capability. Track 1 records the audio signal *and* a sync tone (modulated out of the audio range), so it can contain music and simultaneously control sequencers and drum machines. Mixer features include six input channels, with balanced XLR inputs on channels 5

and 6. Each channel has 2-band, sweepable EQ and two effects sends with stereo returns. Other features include noise-free switching, dbx Type 1 NR, two tape counters, and an autolocator with three memory locations and a user-selectable "capture" location for quick access and easy, automatic punches and outs. Available in the U.S. through IMC (Fort Worth, TX), the MG614 retails for \$1,799.95.

Circle #207 on Reader Service Card

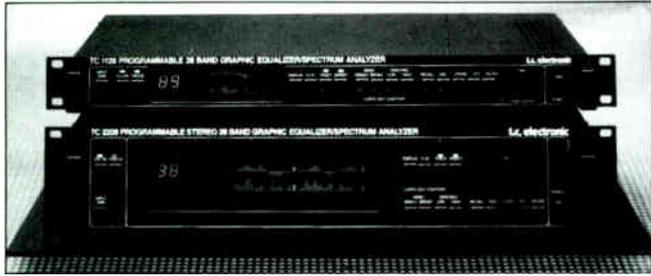


Klipsch KP Loudspeakers

Klipsch & Associates of Hope, Arkansas, has brought out a new professional loudspeaker line, the KP Series, which consists of four speakers and a support stand. The high-output KP-450 features 104 dB SPL sensitivity and 129 dB SPL maximum output at 300-watt maximum continuous power handling. It's a 3-driver, 2-way system with two 15-inch woofers, separate LF and HF cabinets with an interlocking device, and casters, all

for \$1,995 suggested retail. The 3-way KP-301 holds a 15-inch woofer in a ported enclosure along with horn-loaded tweeter and mid-range driver (101 dB SPL sensitivity, 123 dB SPL max. output, 200W max. continuous power). Klipsch's new compact speakers are the high-output, 3-way KP-201 and its more rugged and powerful partner, the KP-250. They each feature a recessed socket for mounting on the new Klipsch KP-200TS support stand (and other stands).

Circle #208 on Reader Service Card



TC Electronics EQ/Spectrum Analyzers

The Denmark-based manufacturer, TC Electronics, announces the debut of their programmable 28-band, 1/3-octave graphic equalizer/spectrum analyzers. Featuring a 110 dB dynamic range, the units provide 100 user presets, visual editing, add and sweep functions, dynamic MIDI handling and automatic feedback suppression. Equalization is high- and low-frequency

shelving, and software-based, allowing future upgrades. The TC 1128 has a 140-character alphanumeric/7,500 dot-per-inch graphic display, while the TC 2228 display is 280 characters, 15,000 dpi. Both are 19-inch rack mount units; the TC 1128 is one rack high, the 2228 is two. A MIDI patchbay is standard, and one of several options includes SMPTE control.

Circle #209 on Reader Service Card

Rane Remote Power Supply

To help eliminate the magnetic hum and distortion generated by internal DC power supplies, the Rane Corporation (Mountlake Terrace, WA) has developed the RS 10 external remote power supply. It can power up to ten devices simultaneously. The company designed the unit with standard hardware for compatibility with most electronic gear, using a 6-pin female Mod plug (commonly found in telephone and telecommunications systems) as a DC input jack. The plug provides the redundancy of two contacts each for positive DC, negative DC and ground. For optimum product performance, Rane is urging other manufacturers to offer external DC inputs

and power supplies, and is proposing the Mod plug as a standard for external power supply connections.

Circle #210 on Reader Service Card

Micro-Circuits Shielding Paint

Micro-Circuits (New Buffalo, MI) introduces Ground Surround™ Room Shielding paint to combat the EMI that impedes audio/video system performance. Almost every wire in audio and video gear can act as an EMI antenna—this coating lets you simply, quickly and inexpensively shield a room or an entire building. Two coats of Ground Surround plus optional shielding steps described in the instructions can reduce EMI by over 50 dB.

Circle #211 on Reader Service Card

JVC Peripherals For DAS-900

JVC's Professional Video division now offers a full line of peripherals for their DAS 900 digital audio recording/editing/mastering system. The line includes the DS-DA900 digital tape checker, which automatically checks and measures master tape conditions prior to the digital mastering process. It features auto start/stop times, hard-copy printout and output measurements via an RS-232C port. The DS-CS900 PQ subcode information control system allows one-disk storage of both PQ subcodes and information, along with automated data from JVC's 4-channel digital audio mixer, the DS-DM900. The third peripheral, also an option for the DS-DM900, is the DS-BU-902 AES/EBU standard digital I/O board.

This board enables data transfer between the JVC 900 Series and other digital systems. For info call JVC toll-free at 800-JVC-5825. Circle #212 on Reader Service Card

Crest 8001 Power Amp

Model 8001 is Crest Audio's (Hawthorne, NJ) latest power amplifier. Occupying three rack spaces, the unit will swing 90 volts RMS per channel into any load above 2 ohms, providing peak power of 2,000 watts/channel into 4 ohms, and 4,000 watts/channel into 2 ohms. Circuitry includes a discrete front end, "auto-mute" signal ramp, IGM impedance sensing and an RMS clip limiter. The 8001 features internal rear-to-front forced air cooling and complete modularity.

Circle #213 on Reader Service Card



FM Acoustics Balanced Line Driver

FM Acoustics of Switzerland has unveiled the FM 214 Precision Balanced Line Driver, which guarantees that -10dBv signals remain pure when amplified to +4dBv, +6dBv and +8dBv levels. This two-channel system resolves any audio level and impedance mismatch between consumer, semi-pro, and professional equipment. The front panel includes

recessed gain controls for level adjustment from -70dBv to +14dBv. Input impedance is 50k ohms. As an option, the factory will install infra- and ultrasonic filters, settable to any frequency between 1 and 100 Hz and between 10 and 100 kHz. Also optional is a 19-inch rack mount adaptor that mounts up to three units in a single rack space. The FM 214 is priced at \$600.

Circle #214 on Reader Service Card

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Emerald Studios, Nashville, TN

Rob
Parsons Records, Nashville, TN

Michael Koreiba
Bulet Recording Studio, Nashville, TN

Steve
Carmy/Hood Band
Carol Barker

Charles Baker Music, Cincinnati, OH

Steve Moller
Radio Theater Group, Cincinnati, OH

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Greatest Post Productions, Atlanta, GA

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Rytt Hirschberg
Atlantic Recording Studios, New York, NY

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MJI Broadcasting, New York, NY

John
Video Play, New York, NY
Roey Shamir
Unique Recorders, New York, NY

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Sensational, Los Angeles, CA
Dave Dubow
Studio 55, Los Angeles, CA

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Video Post, Los Angeles, CA
David Plank
Different Fur, Ltd., San Francisco, CA

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SABO, Los Angeles, CA

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The Studio Center, Miami, FL

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Keith Jacks
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by Chris Formato

MILAB VIP-50 MICROPHONE

The flagship offering from the Swedish company Milab (pronounced my-lab) is the VIP-50 condenser microphone. In the past, Milab products have been distributed under the name Pearl. U.S. distribution of Milab products is now handled exclusively by EXP Inc. of Studio City, California.

The VIP-50 is a transformerless output design, built within a sturdy rectangular aluminum case. The four side plates are held together with eight Phillips head screws. The capsule is located at the top of the microphone body, protected by coarse mesh screening on all four sides. Judging by the size of the mesh, I would definitely recommend the use of a wind screen in vocal applications. Like the case that houses it, the capsule is rectangular in shape, and is of the dual diaphragm Braunmuhl-Weber variety. The base plate of the mic body holds the familiar XLR connector and also is threaded to allow mounting to Milab's stand adapter or shock mount (more on these later).

Three rotary select switches enable the user to choose pattern, filters, or pads. Available patterns include omni, figure-eight, hypercardioid, cardioid, and "wide cardioid," which resembles the usual cardioid shape, but without the rear indentation. There is also an unmarked mystery setting at the 12 o'clock position on the selector. This turns out to be the result of using a six-position part when there were no suitable five-way switches available. The VIP-50 passes signal at this setting, because it is wired to be the same as the omni. Two high-pass filters can be switched in, if desired, rolling off the low end at either 200 or 500 Hz. Finally, the mic can be set to 10 or 20 dB of

attenuation, or none at all. Each position is detented and all except the "mystery pattern" are marked in white, which makes for easy reading against the matte black finish of the body. Below the three selector switches is a green LED which glows once the mic is plugged in to let the user know that the required 48-volt phantom power is indeed reaching it.

I found Milab's mounting system to be at once clever and cumbersome.



Their stand adapter consists of two pieces of flat, narrow metal, which are hinged together at their ends. One piece is L-shaped to wrap around the bottom and one side of the mic body. A threaded hole through the short end facilitates attachment to the mic's bottom plate by means of a knurled screw. The stand adapter allowed flexible placement and with the tension properly adjusted, did not slip.

Also supplied with our sample was a pair of Milab's shock mounts. In this assembly, two cages are connected at their eight corners by tubular bands. The base of the inner cage has an attachment screw and a hole for the XLR to pass through. Felt pads and smaller bands of rubber provide a snug fit and little metal-to-metal contact at other points of the inner cage. My main complaint with this shock mount is that the bands between the two cages are not very tight, in fact some of the bands fell off altogether. With the mic in place, there was no tension from the bottom bands at all, due to the stretching of the top bands. The result is that the inner cage flopped around a little more than it should. If Milab was trying

to put the resonant frequency of the mount below the audio range, I would certainly say they succeeded. Although taping the mic cable to its stand is good shock mount practice, I had to be extra careful with how I oriented the cable. Perhaps tighter bands and a better method of attachment are in order here. (*Editor's note: Milab is currently developing improved bands for the shock mount. In the meantime, they suggest putting several twists in the bottom bands to increase tension.*)

The supplied ball joint swivel adapter can pivot up to 90 degrees to allow exact mic positioning and locks in place with a quarter turn of a small lever. Once locked, it really stays in place.

Once you get past its mounting problems, the VIP-50 proves to be quite a microphone. Its frequency response is rated from 40 to 20,000 Hz. Before leaving the factory, each mic is individually tested and then is shipped with its own response graph. The literature we received with the mics went even further, showing the polar response of each pattern at 100 and 500 Hz, and at 1, 2, 5, and 10 kHz. It was interesting to note that all of the patterns held true to within an amazing 5 dB over most of the upper frequency

range; it wasn't until 100 Hz before any significant deviation took place in all patterns. This is most likely due to the fact that the rectangular diaphragm assembly, while having a large surface area for sensitivity, is relatively narrow in the horizontal plane.

Other specs included a maximum SPL for .5% THD at 1 kHz of 123 dB and an A-weighted noise level of 18 dB. Sensitivity is quoted by the manufacturer at 14mV/Pa at 1 kHz driving its minimum load impedance of 1 kohm. Output impedance is 180 ohms.

Of course the best test for any piece of audio gear is in real applications. I used the VIP-50 in a variety of settings: in pairs to record classical recitals and a jazz guitar ensemble, and singly in multi-track sessions to mic individual instruments and instrument amplifiers. In all cases the Milab mic performed quite well with a good tonal balance, although it was not the most transparent microphone I've ever heard when it comes to the high end. In particular, I noticed a slight haze that kept the highs from shimmering through with crystal clarity, a sort of velvet fog if you will, which just might turn out to be advantageous for that strident vocalist or screeching violin. I also heard confirmation of the mic's excellent polar response, which was most evident on applause during live concerts. Many microphones will turn this complex signal full of transients into mush, but the Milab did a fine job of keeping things distinguishable.

Price for the VIP-50 is \$1,295, including a handsome plastic carrying case, foam-lined and compartmentalized. It appears as if it could easily hold two mics and their stand adapters, instead of just one. Its large size must certainly offer good protection to the on-location recordist. The matching shock mounts list for \$195.

Although this is their top of the line, Milab also is offering several other models, which you may also want to investigate. If you're in the market for a new high-end mic, the VIP-50 deserves your careful evaluation. In light of the cost per pair (probably the way most of these mics will be purchased), some serious audition time will be needed to find out if this is the mic for you, and the people at EXP will be more than happy to help you in that regard. They can be reached at 11288 Ventura Blvd., Suite 304, Studio City, CA 91604 (818) 843-1830. ■

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This special feature of the September *Mix* spotlights the Hawaiian Islands, home to several of the best-equipped recording studios west of Los Angeles. Find out everything you need to know about Hawaii's production facilities, places to stay, tourist attractions and services for musicians.

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by George Petersen

IBANEZ SDR1000+

Does the world really need another digital reverb? Maybe yes, maybe no, depending on your attitudes and needs. But nonetheless, Ibanez created quite a stir last year when they introduced their SDR1000, an under-\$900, 16-bit digital reverberator incorporating parallel processing for true stereo and split mode effects. As the most sophisticated and best sounding device ever built by Ibanez, the unit represented quite an accomplishment, yet the company has managed to outdo this feat by unveiling their SDR1000+, available as a \$100 (plus dealer installation) software update for SDR1000 owners, or as a complete unit for \$945.

Besides providing 100 highly useful factory programs and space for storing another 100 user presets, the SDR1000+ offers a programmable four-band equalizer, MIDI control over effect level and preset selection, versatile rear panel connections, and easy editing of effect parameters to suit individual tastes.

The front panel is simply laid out, with power-on and effect bypass switches, concentric input level controls for each channel with two LED meters, eight-digital multifunctional fluorescent display of presets/operating status/editing data, and combination function select/numeric entry keys. The rear panel includes both ¼-inch and RCA-type phono jacks for both inputs and outputs (with a -20/+4 dB switch for selecting instrument or line level signals), MIDI in and thru jacks, a port

for connecting the optional Ibanez IFC60 intelligent foot controller, and four footswitch jacks for memory up/down, effect on/off and effect hold. The latter all utilize standard ¼-inch mono, momentary footswitches, which are readily available or can easily be fabricated.

The 100 factory programs are

Overall, the quality of the factory patches is excellent: studio pros Jan Hammer, Ian Eales, Jeff Hendrickson and Ed Thacker contributed various settings.

grouped in ten "modes" of ten presets each—for example, Mode 2 refers to various plate reverb sounds numbered from 20 to 29. Other modes include Hall, Room, Gate, Reverse, Dual Reverb, Dual Delay, Panning Delay, Reverb/Gate, and Reverb/Delay. The latter two are new modes (on the SDR-1000+ only) allowing the use of either



INTRODUCING THE MC-500 THE FIRST COMPUTER DEDICATED TO THE

The Goal: Total MIDI Control/We'd like you to spend a few minutes reading this ad. Because what we have to tell you takes a little time—but your time will be well spent. Because no matter what kind of music you play, you could play it better with the help of the amazing new MC-500

MicroComposer. The advent of MIDI has made incredible progress possible for all kinds of musicians—giving them power they never had

before. But in order to harness that power, musicians need the proper tools. The MC-500 was created to fill that need—to harness the power of MIDI and give all musicians the power to control and use MIDI to their best advantage. In recent years, there have been various alternatives to controlling MIDI music systems. Some people have used personal computers equipped with MIDI software and interfaces. Some have turned to dedicated sequencers. Each has had its disadvantages. For all the power they offer, PC's are built for the businessman's environment, not the musician's, and as such they don't take well to life on the road. Also, they can be quite slow in performing MIDI functions, and as we all know, interfacing a computer to a MIDI system is often clumsy at best. Dedicated music sequencers are built for the musician's environment, but usually lack the features and flexibility of personal computers. Simply put, they can't be upgraded with new software, which means they can become obsolete before you've finished paying for them.

The MC-500: A Computer with MIDI Jacks/To solve this dilemma, Roland's engineers have created an engineering masterpiece—a powerful personal computer, with more memory capacity than the average PC, that is designed inside and out (from the front panel controls to the back panel jacks) for the MIDI musician. Like a computer, the MC-500 MicroComposer has no functions of its own—it's functions are loaded off a software disk via its disk drive. In this way, depending on the software you load into it, the MC-500 MicroComposer can become almost any type of MIDI control device you require: a sequencer, a sound librarian, a live performance system controller, and a MIDI interface system—all in one compact, roadworthy unit.

In the Creative Process/The benefits of this type of engineering become apparent almost immediately, as the MC-500 MicroComposer allows you to create and control music with seemingly effortless keystroke commands. In many ways it's more like working with tape recording than computer sequencing, because the

MC-500 MicroComposer is laid out in much the same logical manner as an advanced digital tape recording system. The beautiful ergonomics of the MC-500 MicroComposer make it apparent that you are working with an instrument that was designed for musicians,

from such easily-understood controls as Record/Load, Pause, Play, Stop, to the Alpha dial which speeds you through tasks which might otherwise slow down your creativity, to the speedy 3.5" disk drive, to the back panel—full of MIDI and tape interfaces, as well as footswitch

jacks for those tasks too important to tie up your hands. **MRC-500 Software/**The MRC-500 Software Disk is the first in a series of software products for the MC-500

MC-500 BACK PANEL



Roland **MC-500**
MICRO COMPOSER



MC-500 MICROCOMPOSER

ULTIMATE IN MUSICAL PERFORMANCE

MicroComposer. It offers the ability to perform highly advanced MIDI sequencing, editing, disk storage of programs, as well as system exclusive control over patching and assigning your MIDI instruments. Simply load the MRC-500 Software Disk into the MC-500 and you're ready to create music exactly as you've imagined it. The MC-500 can hold performance data for roughly 25,000 notes — up to eight songs — in its internal memory, with additional storage of up to 100,000 notes on the Disk. The MRC-500 allows musical data to be entered from either your MIDI instruments, the ten-key keypad or the alpha-dial, which are then played back through your MIDI set-up. Songs can be named, and linked together, while the 40-character LCD prompts your next command. The accuracy with which the

MC-500 records your performance nuance is simply breathtaking. No glitches, no weird or unnatural error-correction, just simply what you've played. The faithful re-creation of your performance is truly one of the hallmarks of this amazing tool. In fact, so good is the quality of the recording, that you'll probably notice aspects of your technique that you never noticed before.

Recording Tracks/At first glance, you will see that the MC-500 MicroComposer has four polyphonic recording tracks plus a rhythm track. But, as is the case with most of the MC-500, there is a lot more

SOFTWARE DISK



here than meets the eye. A special Merge function allows you to combine the information on one track with the information on another (similar to "bouncing" tracks on a multitrack recorder). Using this function you can record up to 256 musical parts (16 MIDI channels times 16 voices) and MIDI channel information is retained for each merged track. Later, if you desire, you can un-merge tracks using another function called Extract. The MC-500 allows you to merge and un-merge as many times as you like, and because it is all digital information, none of your performance is ever lost.

The Rhythm Track/The rhythm track gives you the programming power of the most advanced rhythm machines, by creating individual rhythm patterns and then organizing them onto a track. In this way you can control sound sources such as Roland Rhythm Composers, Digital Samplers and Drum Modules, as well as most other MIDI-equipped drum machines. Up to ninety different Rhythm patterns can be created in step time, and then combined at will by using the MC-500's Copy, Insert and Delete functions. And, for the first time, you can not only create, but store your rhythm tracks along with the rest of your performance data — all on the convenient disk drive. No more separate loading of rhythm and program data.

Tempo Control/The MC-500 MicroComposer allows you to modify freely the tempo of any recorded performance. Using the alpha dial it is easy to change in real time, the tempo of the entire piece (which is displayed in beats per minute). But the MC-500 MicroComposer also contains a separate Tempo Track, which is capable of altering the tempo over the course of the piece. In this way, it is possible to create continuous tempo changes such as accelerando (a gradual increase in speed) ritardando (a gradual decrease) or even immediate abrupt tempo changes.



Recording a Performance/The MRC-500 Software allows a performance to be recorded in Real time or in Step time. Overdubs on additional tracks can be made within a few keystrokes of recording the original track, so you can never lose the feel for the music due to complex record set-up. If you make a mistake, the Punch In/Out feature can fix it with minimal fuss (just like on tape) but faster and more reliably than on any tape machine. For

sequenced parts or others that are hard to play in Real time, the MC-500 allows Step programming — and since Roland invented this method of programming, you can be sure that it is done here in a manner that is both easy and precise.

Precision Editing/The distinction between a good and a great

program comes in the attention to detail, and it is in the editing process where the MC-500's detail shines clearly through. Any performance, whether recorded in Real or Step time can be fully edited down to the most precise detail. (Figure 1) An exclusive feature built into the MC-500's controls is the Microscope function. By entering the Microscope, you can then manually walk through your performance (event by event, forward or backward) simply by turning the alpha-dial.

Microscope can be used to isolate any unwanted notes or MIDI events, and then they can be easily deleted, corrected or re-written.

Advanced MIDI Implementation/In its MIDI implementation, the MC-500 is perhaps the most advanced MIDI control device ever made. It can receive or send MIDI messages on any or all of the 16 channels, and can receive or filter polyphonic aftertouch, pitch

bend, channel aftertouch and system exclusive (even for instruments not made by Roland). (Figure 2) The MC-500's system exclusive features alone could save you hundreds of dollars in the cost of memory cartridges.

In the Studio/On the Road/The MC-500 is designed to be at the heart of any MIDI system, and as such it is

equally at home in the studio as well as on the road. Because of its flexibility, edits can be made to stored programs with breathtaking ease. Does the producer want you to change your song to drop one verse and add another chorus? It only takes a second. For film work there has never been anything in this class before. By synchronizing the MC-500 to Roland's SBX-80 Sync Box, SMPTE sync is perfect. Plus, the ability of the

MC-500 to allow parameter editing in real time means that you can change parameters while you are watching your performance. On the road, the MC-500 can handle as many keyboards as you can throw at it. Need to change programs and parameters on all your instruments eight times for eight different

songs? With the MC-500's Chain play ability, you can string eight different songs together for access in three keystrokes. And with the speed of the MC-500's disk access, you won't ever wait long for new material.

The Result: Total MIDI Control/If you need to control a MIDI system, there is no better choice than the MC-500 MicroComposer. For not only will it fill your needs today, but it will fill your needs in the future through software updates and new uses. Plus, at only \$1395.00* the MC-500 must also rank as one of the

world's greatest computer bargains, especially when compared to the cost of a

personal computer, software and interfaces. If you think it's time you mastered MIDI, rather than the other way around, the best way to do that is with the incredibly versatile, amazingly affordable MC-500 MicroComposer. The MIDI Computer. Roland Corp US, 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685 5141.

FIGURE 1 EDIT FUNCTION CHART

Performance Editing	Track Editing	Merge	Micro-Scope Function	Disk Editing	Rename	
		Extract			Delete	
		MIDI Channel Reassignment			Transfer	
	Measure Editing	Transpose		MIDI Message Editing	Note	Micro-Scope Functions
		Change Velocity			Polyphonic After-Touch	
		Quantize			Control Change	
		Erase			Program Change	
		Delete			Channel After-Touch	
		Insert			Pitch Bender	
		Copy			Exclusive	
	Note Editing	Note Name		Micro-Scope Function	Tune Request	
		Note Strength				
		Note Length (Gate Time)				
		Delete				
		Insert				
	Timing (CPT)					

FIGURE 2 MIDI MESSAGE TRANSMISSION CHART

Setting of Output Assign	Both MIDI Out connectors transmit MIDI messages on all MIDI channels			MIDI channels can be assigned individually for each MIDI Out connector			MIDI Out 1 connector transmits MIDI messages on all MIDI channels and MIDI Out 2 connector transmits only MIDI clock message		
Functions	Timing Clock	Exclusive	Soft-Thru	Timing Clock	Exclusive	Soft-Thru	Timing Clock	Exclusive	Soft-Thru
MIDI Out 1 Connector	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off
MIDI Out 2 Connector	On/Off	On/Off	On/Off	Off	Off	On/Off	On	Off	Off

L to R: (bottom) Jeremy Koch, Elisha Birnbaum, Reilly Steele; (top) Paul Coombe, Lee Dichter, Tommy Fleischman, Peter Waggoner, Michael Barry

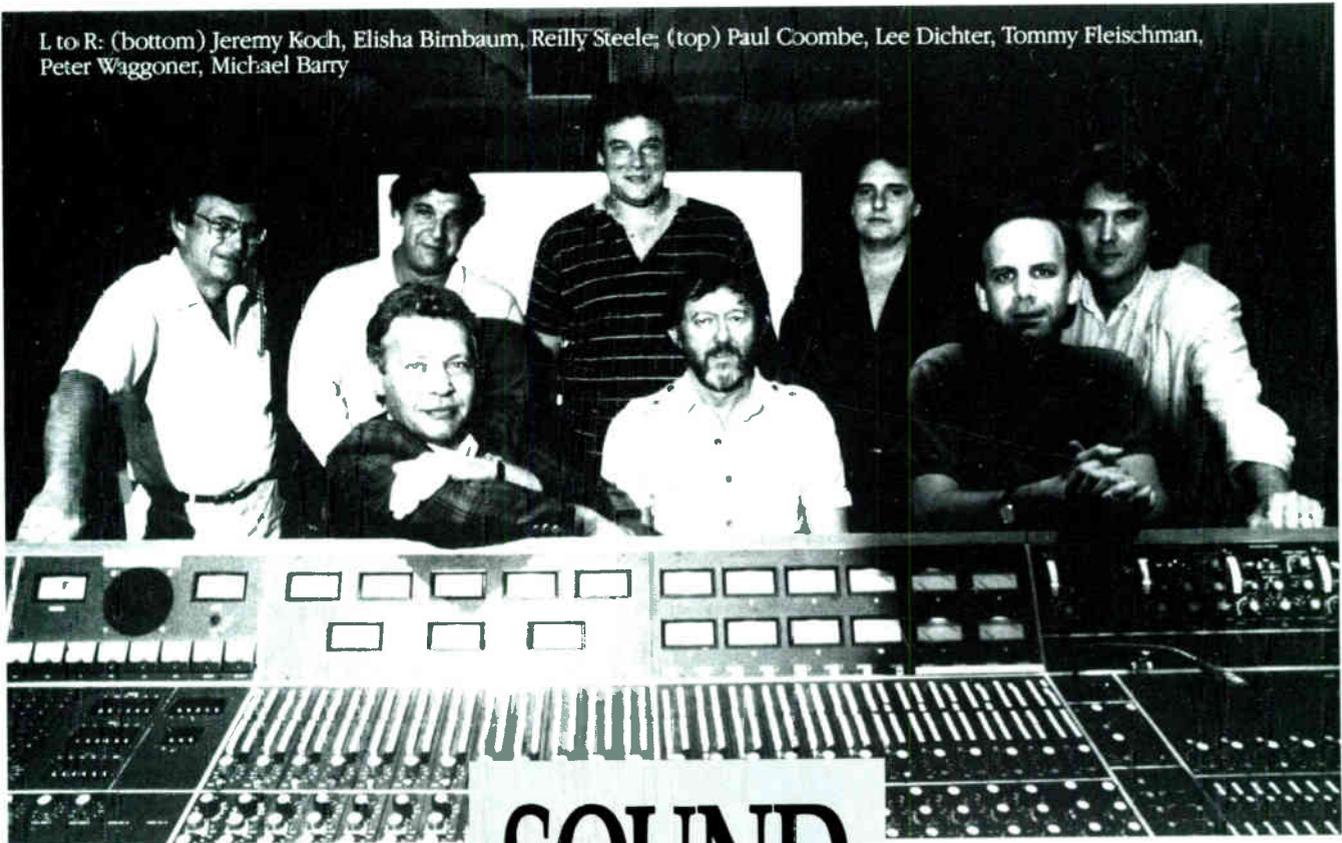


PHOTO: MARVIN MOORE

SOUND ONE

UP FROM THE ASHES

BY NEAL WEINSTOCK

“**T**here was an article in *Newsweek*, with a shot of the Brill Building,” says Jeremy Koch, general manager of Sound One. “It was called, ‘Up From The Ashes,’ and it was about how the Brill Building [once the hub of New York’s songwriting community] has gone from semi-decay to a major entity again. Now it’s probably about to be landmarked—there’s a strong claim on it by the Landmarks Commission. Paul Simon is in the building with his offices. Broadway Video and Lorne Michaels are in the building. Regent Sound. It’s a tremendous place to be. I’ve been asking for more space for a long time, because in this business the building and the area are pivotal.”

Sound One came up from the ashes along with its address. The company was created in 1968 by four partners, each of whom had his own one-room operation. Two of those founding fathers, Elisha Birnbaum and Guy Spera, are still with Sound One. Spera is vice president in charge of editorial. Birnbaum is and was a “gifted genius in the Foley room” (in Koch’s words), and is the company’s vice president and technical manager. After a couple of the partners dropped out, the current chairman, financial wizard Robert Schulman joined the team. Sound One

went public, eventually built a small mixing/ADR studio (Studio B) and opened up its Sound Mixers subsidiary to do a hefty amount of record industry work. “They had one terrific year,” says Koch, “then the bottom fell out of the record business.”

Koch had little experience with film or sound before coming to Sound One, but he was an experienced manager (he’d helmed a construction company, and worked in advertising, manufacturing and “corporate retail”), and perhaps just as germane, he was used to the sort of bohemian craziness one encounters in the movie business. “In 1966 I’d decided I was going to retire in five years, and was right on schedule into the second year of that plan,” he says. “My idea of paradise was having a fancy place near Oaxaca, Mexico, and I’d own four or five shops in town, and I’d have a woman in each one.” Instead, Koch suddenly realized he “didn’t want to be a dropout and an exploiter in a third world country,” gave up the construction company and became a schoolteacher. That lasted through most of the ‘70s, till he became very ill and, all else failed, retreated to a Trappist monastery; “meditating on dying.” He overcame the crisis, throughout which Elisha Birnbaum was a loving friend. Birnbaum persuaded him that he could make a new life managing Sound One’s crisis.

That was six years ago. Sound One had two small studios and was minimally equipped. Sound Mixers (and thus Sound One) was losing \$100,000 a month; neither were grossing enough

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in a year to service their debt. At one point Koch says the state gave them 36 hours to pay back taxes or shut down. Somehow, they did neither.

Birnbaum and Koch knew the only way to climb out of the hole was to build like crazy. They went to Schulman and told him the recovery could get started for \$24,000. ("You couldn't carpet one studio room for \$24,000!" says Koch.) Schulman said he'd put up \$12,000 if Koch would put up \$12,000. "And for \$24,000 we put up a million-and-a-half dollar studio."

Over six years revenues have gone up 500%, according to Koch, and the company's debt is less than it was then. Sound Mixers was liquidated, but Sound One has gone from two studios to six, with a 50,000-square-foot plant full of new equipment in the Brill Building, about 60 editing rooms and five transfer rooms. The company does more feature post-production sound work than any place in the U.S. outside of California (over 90% of Sound One's work is on features), and probably houses more picture editing work, too.

Studio B, long helmed by engineer Mel Zelnicker (a leading ADR man and mixer of such films as *Exterminator*, *Raising Arizona* and *Blood Simple*) was completely revamped into a high-tech and comfortable mixing and looping room. A few of the hits to emerge from it have been *Blood Simple*, *The Equalizer* TV series, scores of independent features and looping for films by Sidney Lumet, Woody Allen, Arthur Penn and other biggies.

For the first new studio he built, Studio C, Koch asked Paul Coombe, who had been working in Canada, to take charge. Backed up by a complement of 34 Magnatech dubbers, "C" has since been the mixing scene for, among other impressive jobs, *Kiss of the Spider Woman*, and *Muppets Take Manhattan*. "Once we got C built, we went right into building a bigger, better room," says Koch. "Having Paul Coombe and Studio C allowed us to get a base in this business and build credibility."

So much credibility that the company was able to entice Lee Dichter to come and take charge of a new, bigger, fancier room, Studio D. Says Koch, "When Lee, whom I believe to be the best mixer in America, joined our staff, it was the catapult to making Sound One what it is today." In "D," Dichter has mixed *Hannah & Her Sisters*, *Power*, *Manhattan Project*, *Making Mr.*

Right, Ishtar, Radio Days, Dead of Winter and Cotton Club.

To have a complete support system for the new room, another combination ADR and Foley room was needed. Studio E was built simultaneously with "D." Peter Wagonner (who mixes *The Equalizer*), Reilly Steele and Michael Barry run the looping rooms and also engineer, and are up-and-coming mixers.

Next came Academy Award nominee (for *Reds*) engineer Tommy Fleischman and yet another new studio, Studio F. "When we got Tommy, the scenario was complete," says Koch. The line-up of filmmakers working at Sound One at the time of our latest visit included Francis Coppola (two films), Martin Scorsese, Woody Allen,

Birnbaum and Koch knew the only way to climb out of the hole was to build like crazy.

Jonathan Demme, Elaine May, Arthur Penn and Paul Schrader.

Is there a secret to attracting this sort of star-power? "You give them what they want," says Koch. "They know they can get first-class service at all times. We stand behind everything we do, or we'll eat it. You make a little less money that way, but it's the only way to get to be Number One. And don't think that when you get to be Number One you don't have to do it anymore. You know, we have no salesmen. Our clients are our salesmen and the high standard of our work is the only publicity we do. I repeatedly scream at the staff, 'I am not the boss, Elisha's not the boss. The clients are the boss.'"

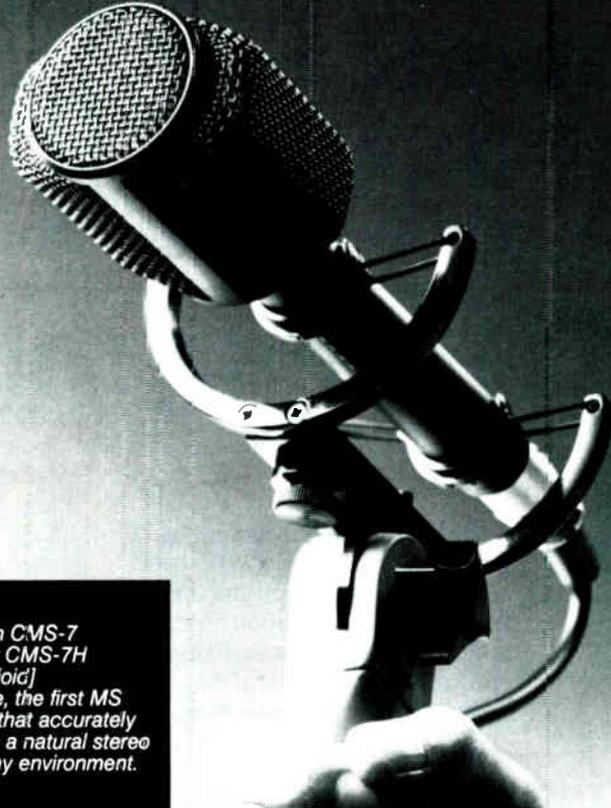
Sounds easy. ■

Neal Weinstock is editor of Educational & Industrial TV magazine and an author whose most recent book is Computer Animation (Addison Wesley).

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Figure 2

—FROM PAGE 160, POST SCRIPT

Within multi-transport production using a control type synchronizer, all calculations and control as to tape position, speed adjust, offset adjust and transport functions are made within the synchronizer's mainframe. In an equivalent production system using ESBUS, a central control unit (CCU) is designed to communicate over a single binary digital communications bus line (Fig. 1) to any or all possible link combinations between involved ATRs and VTRs, each being equipped with their own internal time code reader/synchronizer. Such an ATR or VTR is said to have an intelligent transport.

The basic dual purpose of each transport synchronizer is: to maintain a synchronous lock with the designated master transport; and to maintain total control over transport address location. As each tape or film transport

has its own dedicated synchronizer, control over each "local" synchronizer may be optimized to the physical and electronic characteristics of each individual machine. Through the distribution of an ESBUS binary encoded signal, which is distributed system wide over a single dedicated TTL line, the central control unit is able to: 1) distribute appropriate time code addresses, be they auto-locate (go-to) or synchronize (designated master) addresses; and 2) provide remote control over all designated transports and event-related devices.

Since the CCU acts as an information distribution device and is not required to provide actual location, related calculations; device interconnections and user operation are greatly simplified.

One such system in current operation is the TLS-4000 from Studer/Revox America, Inc. (Fig. 2), which in-

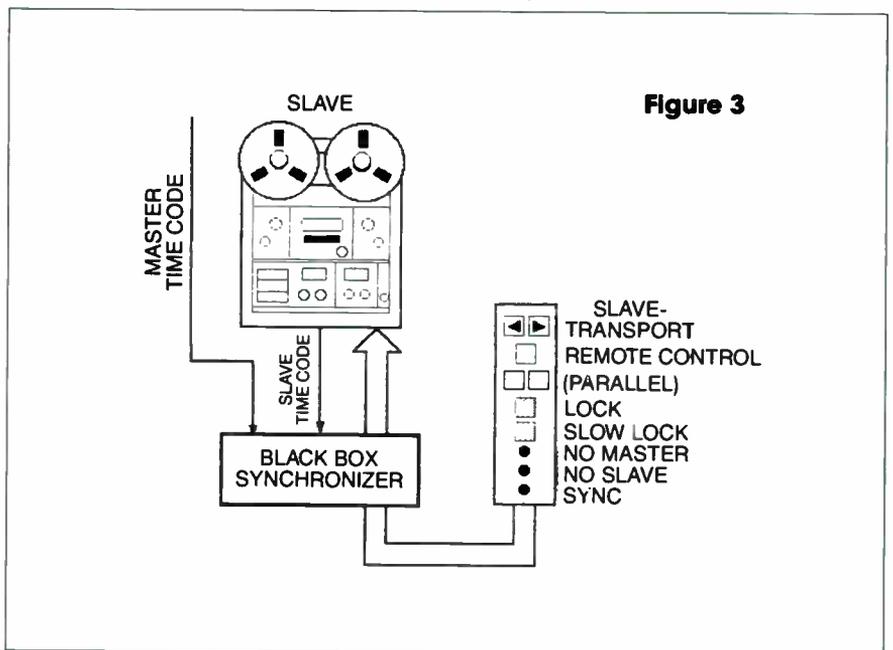
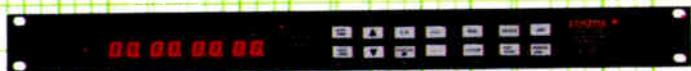


Figure 3

Fostex Presents a Series of Timely Investments:



4010



4030



4035



4050

4010 SMPTE Time Code Generator/Reader has all the functions you'll ever need because it's completely software based. As in all high tech digital electronics today, there's a switching power supply. And socketed EPROMs mean your hardware will never be obsolete. Plus, the 4010 has a serial data port on the rear panel which allows communication with (and control by) computers.

4030 Synchronizer with switching power supply

and **4035** Controller for all major brands and models of tape recorders—both audio and video. Control up to one master and three slaves, or slave as many transports as you wish, just by adding a 4030 for each slave. A serial interface port allows communication with personal computers to run F.A.M.E., Fostex Automated Media Editing. SMPTE time code based, it works with 24, 25, 30 fps and drop frame, and features resolution to 1/100 of a frame, selectable pre-roll up to 99 seconds, 10 position auto-locate and **programmable, automatic punch in/out with rehearse function.**

4050 Auto Locator is a full function remote control unit for Fostex Models 80, 20 and all E-Series recorders. In addition to tempo control, you can locate to the measure bar and beat, thus the 4050 is the first autolocator to think musically. Up to ten cue points can be programmed and you can punch in and out automatically. The 4050 is also a MIDI Synchronizer, featuring a SMPTE/EBU Time Code generator/reader—all four formats. Any MIDI instrument can be synchronized to this most accurate timing reference. You can also simulate the running of the recorder in order to have the SMPTE/EBU code run MIDI instruments only. There's even a serial communication port which lets you use a personal computer.

Merging Technologies

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Although varying in performance and complexity, most Eq. designs have followed either of two classic principles:

parametric: or more usually 'semi-parametric equalisers are almost universally used on console input channels. Normally comprising four filters, two (or sometimes four) of the filters can be 'swept' up or down the audio band to centre on the exact frequency needing attention. Proven to work very well, semi-parametric eq's have two major disadvantages:

1. A tendency for audible phase shift 'ringing'
 2. A limited ability to control the entire audio band at one time
- For example: having used the 'high mid' to suppress the 'edge' on a singer's voice, there is no facility left to boost the critical 'presence' frequencies that lie either side of the unwanted frequencies that have just been cut.

graphic: normally used for system and room equalisation, graphic equalisers use multiple, fixed frequency, fixed bandwidth filters, to generate gentle, essentially phase-free control over the entire audio band.

The graphic principle has one major disadvantage:

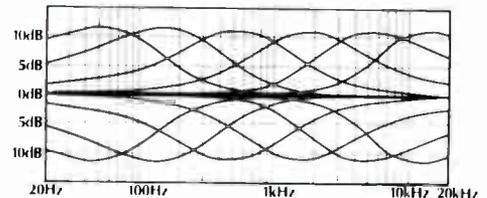
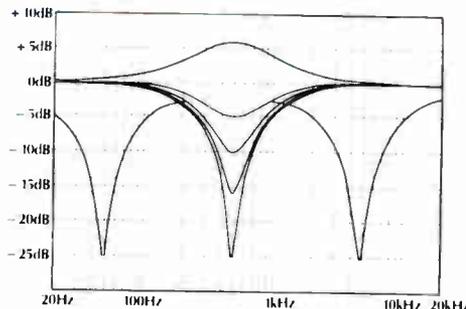
1. A limited ability to control narrow band problems.
- For example: although frequencies in the 'presence' band can be easily and cleanly boosted, that annoying 'edge' to the singer's voice gets boosted as well.

Up until now Hill Audio has uniquely offered the graphic solution on their consoles, believing the ability to keep good control over the entire audio band is preferable to having greater control over just part of it.

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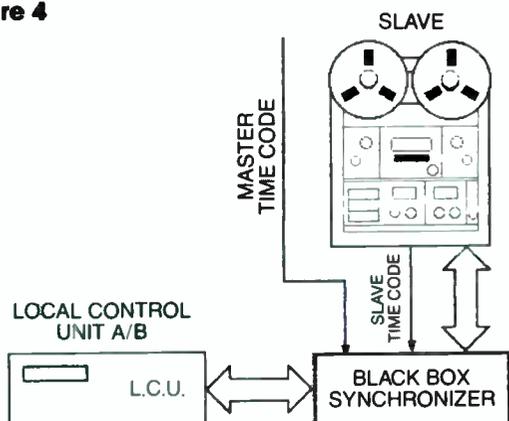
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Figure 4



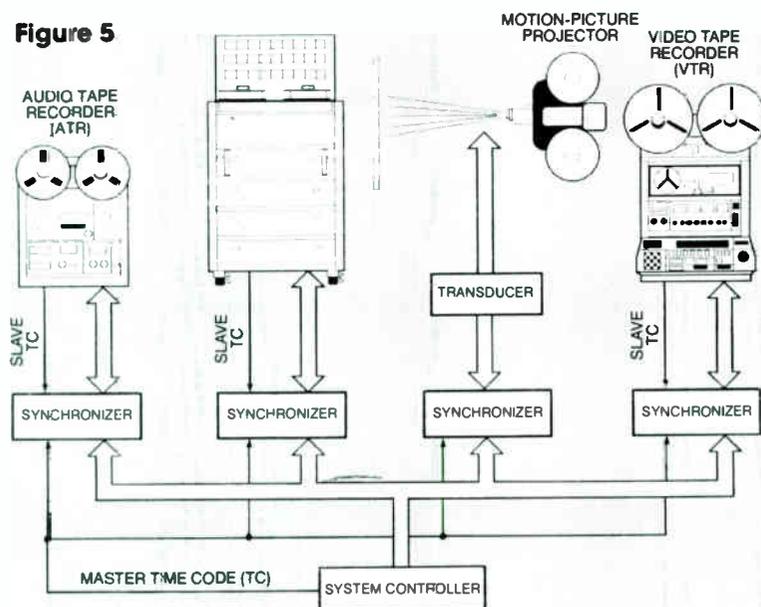
incorporates an expandable "building block" approach to synchronization. The most basic stage of the TLS-4000 system utilizes the "Black Box" synchronizer which functions as a simple parallel control interface between two transports (**Fig. 3**). With the addition of the system's "local control unit" a greater degree of control may be exercised over single or multiple transports in a limited control type fashion (**Fig. 4**). With the incorporation of the SC-4000 series system controller (CCU), up to 16 transport units (through individual "Black Box" interface) may be operated under tandem ESBUS control (**Fig. 5**).

Although the structure of the ESBUS

system is still in the formation stage, the potential for such a system is readily visible. For example, an ESBUS CCU may be designed into the audio production console and directly tied into its communications structure, along with console automation and signal routing. Thus, with future systems incorporating compatible ESBUS related data structure, every aspect of an audio-for-video post-production mix may be stored within the set-up memory of a console. ■

Engineer, author and educator David Huber studied audio at the University of Indiana and at the University of Surrey's Tonmeister program.

Figure 5



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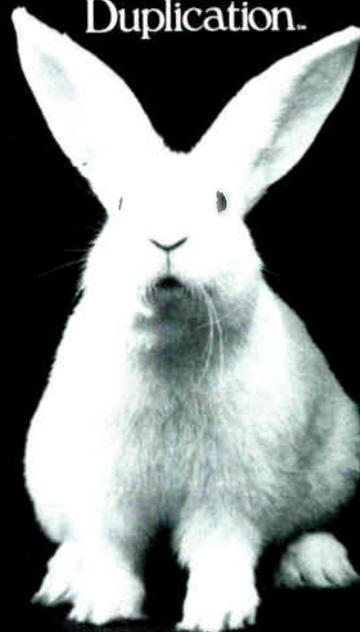
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*Before I could put myself between the firemen and the wall,
the axes were flying.*

bile sauna. Progress had been slow on this, his first album since Woodstock, but Johnny is “unrelentless” in his pursuit of perfection.) Tell Cart to cancel his fishing trip and get the K-87’s out of the shop. (Johnny likes to have at least nine Neuhesser mics on the drums.) And let’s give Orange Grove College a call and try out that free student.”

An hour later the college sent over their top student just in time to get set up for our big session.

“Hi, I’m Garfield,” he introduced himself. “I’ve got a 3.8 grade point in Electronics.”

“That’s great, Garf,” I complimented him. “Why don’t you start by washing the control room window?” We’d keep him busy in the background until he got the hang of high pressure session work.

Garf had the window cleaned, the carpet vacuumed, and our car

stereos repaired by the time Terrific and his crew arrived four hours late. As they hauled in their truckload of gear, I made introductions.

“Johnny Terrific! What a thrill,” gushed Garf. “I thought you O.D.’d when I was in the sixth grade.”

“No, kid,” he responded, “I was just re-mixing.”

Cart and Eddie began setting drum levels and hooking up the bank of Terrific synthesizers while I put up Johnny’s master tape to check his levels. To my horror, the tape backing began to peel off. I switched off the recorder and slowly rushed into the drum booth for a little engineering conference.

“Eddie,” I pleaded hoarsely, “I need some help. The master is falling apart.”

“Hmmm,” he said, “that happened to the Zeppelin once when they left their tape in an open con-

vertible for a few weeks. The only thing we can do is massage the pinch roller with some Q-tips and head cleaner and hope the tape holds up ‘til we finish these tracks.”

I strolled back to the control room and put Garf on pinch roller duties as Layla burst in with exciting news.

“Mr. Bonzai, Kent Kornkooper just called! He saw our studio on the cover of *Mix* and wants to come by to check out our sound.”

“Who’s Kent Kornkooper?” inquired Garf.

“Kent Kornkooper is the president of Expressly Everything. He is the most influential studio designer in the world. He built The Buffalo Ranch up at Lake Narrowhead, he designed ‘Le Tape’ for Andre Peneur in Canada, and he just completed Airloom Studios in Bora Bora for The Binges.”

“Oh,” said Garf, stopping to take notes.

Six hours later we were reasonably rolling. Kent Kornkooper walked in just as Terrific was laying down some flashy synthesizer riffs. We were looking good and my hope was that Kornkooper would pass the word along to some industry heavyweights. I invited him to have a seat and listen to the session.

Our new control room had an incredibly good sound with no external EQ. The time analysis sheets may look like a mass murderer’s EEG, but we had the sound that people like Johnny Terrific responded to.

“Very nice sound, Mr. Bonzai,” Kornkooper remarked. “I especially like the inner-tube clouds you’ve suspended over the reflective area above the console. How is the internal wall structure composed?”

“Oh, the usual sandwich layering with a little improvising here and there,” I informed him. I really didn’t know exactly what Modzilla had put in the walls, since they had kept it a secret.

“Hey, it really stinks in here,” yelled Garf. “Look—there’s smoke coming out of the ducts!”

I tried to hid my panic. “Just keep recording, Johnny. . . no problem . . . must have blown a fuse.”

“Sure, man, I don’t want to stop now. I’ll be cookin’ soon.”

Cookin’ was right. If the air con-

ditioner failed, the studio would hit 150° in minutes. I put Garf in charge of running the tape machine and grabbed Eddie and Cart for rooftop reconnaissance.

Up on top of the studio, we found the fan belts flapping and screaming, the ventilation motor bouncing on its grommets, and smoke pouring into the sky. We yanked the filter panel off and found a black, caked mess of dirt, dead bugs, and solidified fiberglass. We began beating the filter panels and immediately looked like three stooges in black-face.

When we got back to the control room, Kornkooper and Terrific were semi-comatose; Garf was fanning them with a record jacket. I heard the sound of sirens outside as a troop of firemen marched in with axes and huge hoses.

"OK, men, hit the walls, the ceiling, this electronic stuff," the Chief ordered.

"Hold it...stop...it's OK!" I screamed. "No water!"

"All right, but this smoking wall has to be opened up."

Before I could put myself between the firemen and the wall, the axes were flying. The smoke subsided just as they tore down a 9 x 12 foot section.

As the walls crumbled before us, out tumbled slabs of school blackboards. Next came a layer of sawed-up surfboards, a pile of crushed styrofoam cups and egg cartons, a few sheets of Astroturf, and several mohair sofa cushions.

"That's just amazing...you learn something everyday," the bleary-eyed Kornkooper raved. "I'm gonna mention this in my report at the next RES Convention. I like the idea of the small studio improvising when they pack their walls."

Johnny Terrific revived and started to leave with his band.

"Wait, Johnny," I called after him. "Every studio has a little down time..."

"Hey, man," he said, "no problem. We're just going next door to grab a bite to eat. If Kornkooper says this is a happening studio, that's good enough for me."

"Thanks, Johnny," I said nonchalantly. "Uh...could you give us about an hour to put the wall back?" ■

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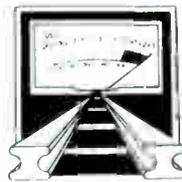
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by Robyn Flans

KYLE LEHNING

TEARING DOWN BOUNDARIES

If Kyle Lehning's production philosophy was to be inscribed on his tombstone, it would consist of only two words: "whatever works."

That became obvious, watching his activities over the span of a week. First, in L.A., he mixed Baillie & the Boys, a new RCA country-on-the-edge-of-rock act. The next day he overdubbed guitarist Steve Lukather for a ballad Lukather and Randy Goodrum wrote for Ronnie Milsap. A few days later, in Nashville, Lehning was busy overseeing horn overdubs for "Tonight We're Gonna Tear Down The Walls," a Dixieland tune for traditionalist Randy Travis. (Lehning joked that he might be

run out of town for putting horns on a Travis record.)

"Doing whatever works means risking and going past the boundaries and having enough guts to go back inside them if you've gone too far," Lehning says. "I think you always have to risk going outside them, though. One of the boundaries of making records with people is the question of whose record is it? Is it my record or is it their record? As far as I'm concerned, it's their record and I'm here to help them make their record. If I do something that I feel is really right for the record and the artist feels it's wrong, if I can't convince him otherwise, it is no longer on the record. That is the boundary, as far as I'm concerned."

Travis thought the horns sounded great on the demo, but he wasn't sure he could justify them on one of his records.

"I loved the song and Kyle liked the horns on the demo so much that he thought about putting it on the record," Travis recalls. "I said, 'Well, I'm not positive.' But he said he'd put it on and we'd listen to it and see what it sounded like. I really liked it when I heard what he did with it. I trust his judgement very much."

It's a wonder Travis trusts him at all, since Lehning's background doesn't include a lot of traditional country work or knowledge.

"It's kind of a joke between us," Travis continues. "But I said something about Lefty [Frizzell] one day and he said, 'Lefty who?' I wondered to start with, to tell you the truth: 'He just don't know too much about country



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music, how's he going to produce this? After working with him, I saw how good he was. After you work with somebody, it don't take too long to figure out whether you *can* trust somebody or not."

The trust is well-founded, considering Lehning co-produced country music Song of the Year "On The Other Hand" for Travis, which initially stopped on the charts at a whopping #63. Lehning was one of the few people who suggested the song be re-released after 1982's "success."

"The challenge of making records with Randy is what *not* to put on the record. Sometimes I have to go from Hendersonville [Tenn., outside Nashville] to China to figure out what doesn't work and to come up with the really neat little thing that does. I've got enough empty tracks on the first album to do the next album. We could cut it on the same piece of multi-track tape. Very little is necessary for him. I have a C-24, which is a stereo of a C-12 AKG tube microphone. I stick it in front of his mouth, put a little wind thing around it, sometimes I use a

little limiting and sometimes I don't, and that's it. He has a great voice, so it's really a minimal type approach to working with him."

On the other extreme is Lehning's production of Dan Seals' "Bop," one of 1986's biggest crossover records. It has everything *including* the kitchen sink on it, "and the Synclavier," Lehning laughs. "Paul Davis, who wrote

ny felt comfortable standing on stage singing."

"When I first heard 'Bop,' I thought it was a great song, but I didn't think it was country," Seals says. "If you listened to the synthesizers on the demo, he used a real avant-garde track for a country song. The only thing country about the song was the lyrics. Of course, it ended up being a #1, but I didn't think there was a country thing to it. I wanted a guitar sound in there, something to bring it into more of what I was doing, so it wouldn't be a sore thumb on the album. We wanted to have more of a guitar song and less of a synthesizer song, but what ultimately ended up was both, and we ended up doing the synthesizer just the way Paul Davis did on the Synclavier. I was getting off the road with the band, we had a vocal date and it was getting to be the 11th hour on the album. I just walked in and sang it and that was the end of it. I wasn't there when Jim Horn put the saxophone on it. I didn't hear a saxophone on it, but Kyle did. He said, 'I'd like to try it,' and I said, 'Go for it.' Obviously it was a winner."

Seals has had a lot of years to build

"I've never been shy about voicing my opinion about something."

'Bop,' is one of the real pop geniuses, in my opinion. His demo was spectacular, however it was all synthesizers and a drum machine. I didn't feel like we could completely get away with that. The record company felt the demo was pushing it a little for what they could do, so my challenge was to stay true to the tune in the spirit of the demo and make it something that Dan-

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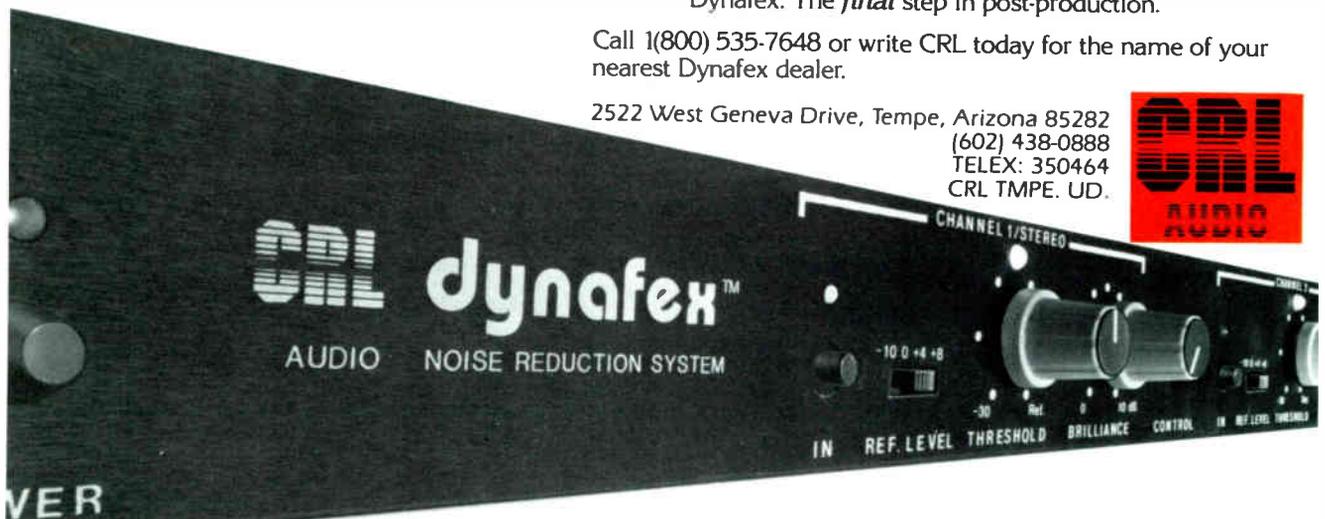
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his confidence in Lehning, since England Dan & John Ford Coley's "I'd Really Love to See You Tonight" (1976), which was Lehning's first solo production outing. He started as a player in southern Illinois, whose band went to Paducah, Kentucky to make a demo tape. Lehning, then 17, immediately fell in love with the record-making process. A friend of the family's set up an appointment with two record producers in Nashville, Felton Jarvis and Billy Sherrill. Jarvis suggested they get a female singer to front the band. They found Vicki, who Kyle married three years later. Vicki was the receptionist at Glaser Sound Studios, owned by Tompall & the Glaser Brothers, and Lehning "literally started by sweeping floors and cleaning the place up, hanging around, trying to make myself indispensable." Claude Hill, the chief engineer, took him under his wing, and in 1972, the Lehnings moved to Jackson, Mississippi so Kyle could work at Alpha Sound.

"There was a fellow and his wife living in a school bus behind Alpha Sound. His name was Parker McGee and Parker and I became very good friends. He was writing some songs and I was trying to learn how to produce. He was complaining about my sound and I was complaining about his lyrics and we sort of coerced each other into getting better at what we did. After three months, I found out the studio wasn't going to happen and a job opened up at Glaser's in Nashville, so I went back there."

Eventually McGee wrote "I'd Really Love to See You Tonight," which Lehning helped demo. England Dan & John Ford Coley's manager, Susan Joseph, grabbed the song and the duo demoed it. She pitched it to every label in L.A. and everyone turned it down.

"But one day, they were playing it for some people at Atlantic Records, and Doug Morris, who was the president of Big Tree Records at the time, heard it through the wall, went in and said, 'I like that. I'd like to put that out on my label.' Meantime, Susan said, 'I don't think this version is as good as what Kyle might be able to do.' I was a completely unknown and unheard of production entity, but Danny and John, bless their hearts, decided to give it a shot and they came to Nashville. We cut the thing in a friend's basement where he had a 24-track studio and it

sold over a million records."

A string of hits followed, and eight years ago, Lehning and Seals' manager, Tony Gottlieb, built an 8-track studio out in Hendersonville. About five years ago, Morning Star became a 24-track studio with a Sound Workshop 1600 console (although Lehning says now they're shopping for a new console).

"The singer sings in the bathroom and I like that for a couple of reasons. It's got a nice ambience about it and it also teaches humility, which I think most singers desperately need more of," Lehning says, tongue well in cheek. "The studio is a very cozy place. It's about 13 feet wide and about 22 feet long. We have a 7-foot Bosendorfer grand piano, which, when you get Larrie Londin in here, doesn't leave a lot room for anybody else," he says affectionately about the session drummer. "Although, I must say, the equipment is getting bigger and Larrie's getting smaller. Tracking is a pain, but we cut Dan's tracks to 'Everything that Glitters is Not Gold' and 'My Old Yellow Car,' and a lot of 'Bop' was done here too. None of Randy's tracking has ever been done here and I doubt it ever will because he needs too big of a band to be comfortable."

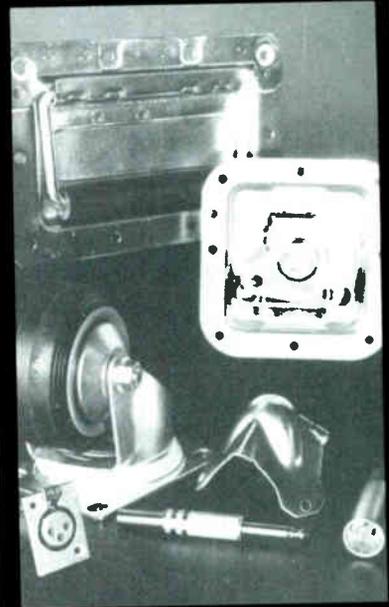
On Milsap's projects, they usually work at Milsap's own Ground Star Sound Laboratory. Although this is the first album Lehning is producing (with Rob Galbraith), he has engineered Milsap's records for the past five years.

"As a producer, the main difference is song input," Lehning says. "Ronnie is one of those artists who is very strong. Any record you make with Ronnie, you're co-producing with him. He's very sure of what he wants to do and he's very matter-of-fact with what's in his brain. I respect that. And Ronnie has always been real open to trying things out. I've never been shy about voicing my opinion about something. The good thing about being the engineer is that I can give my opinion without having to worry about whether it's right or wrong. The producer has to decide whether or not to take that input and make it something that is going to be on the record for the rest of its life." ■

Robyn Flans is a Los Angeles-based freelance writer who contributes to Mix, Modern Drummer, Pulse, Word & Music and other publications. She's also conducted interviews for radio and TV, and has authored three rock books.

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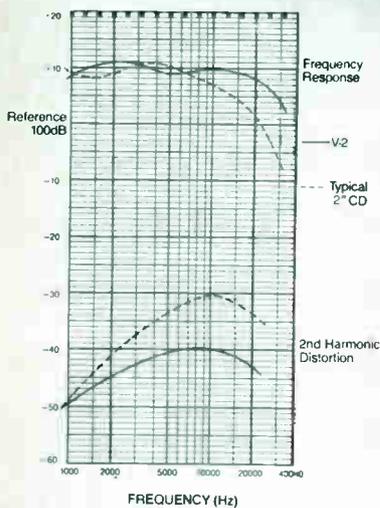
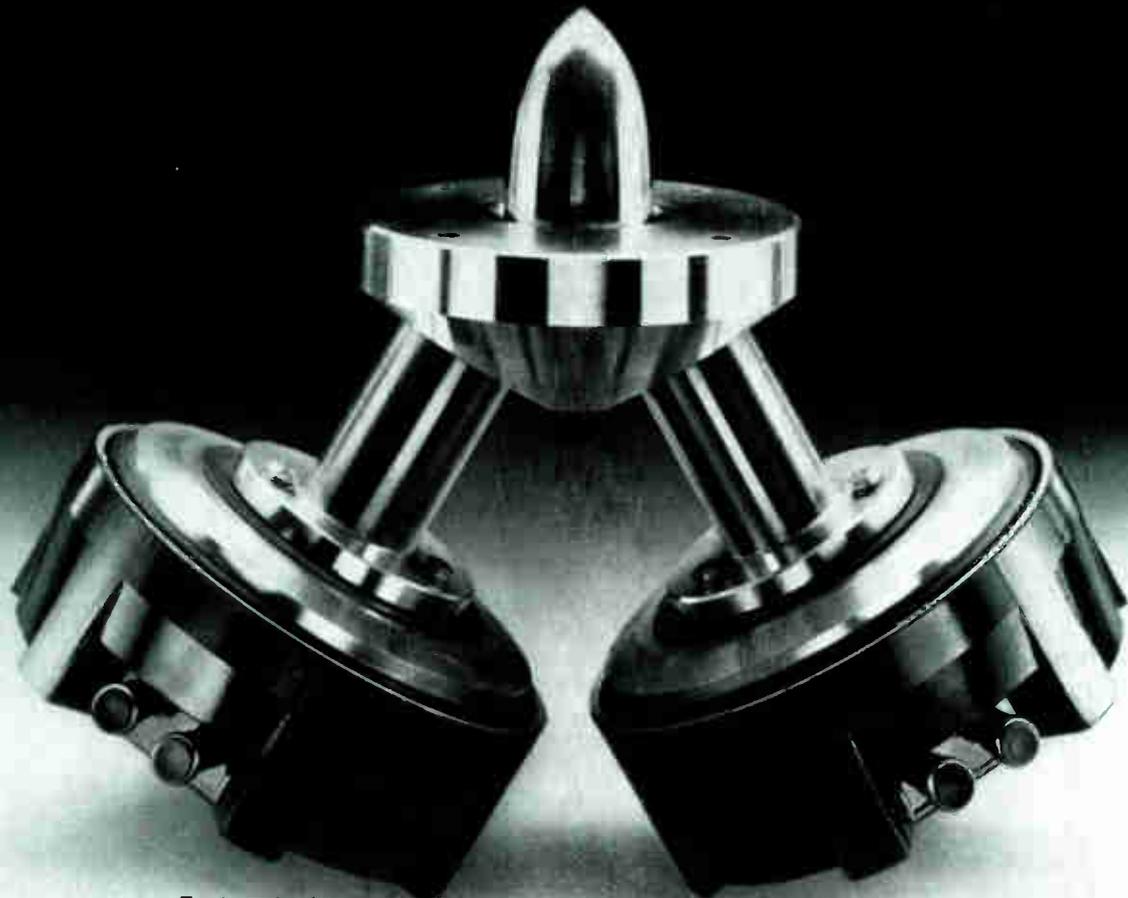
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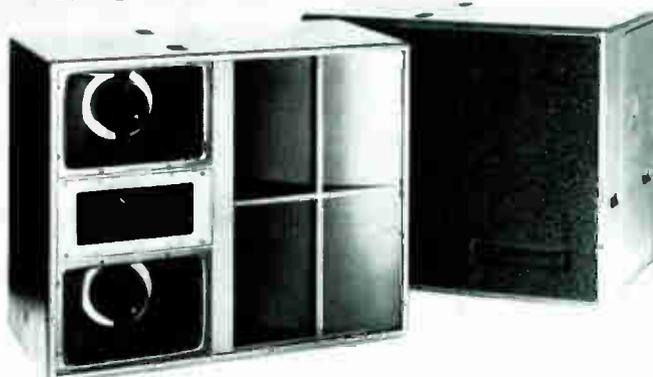
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THE AMERICAN FEDERATION of MUSICIANS

A Study in Contrasts

by Rosanne Soifer

Describing the Musicians Union is a difficult task, because there are so many different perspectives on it. Some musicians who work infrequently and at low paying gigs consider it a necessity and a savior. Yet others who constantly do top work (financially speaking) sometimes consider it an intrusion, a nuisance or worse. Unlike the other performers' unions such as S.A.G. (Screen Actors Guild), AFTRA (American Federation of Television and Radio Artists) and Actors Equity, whose names usually evoke a modicum of affection in their members and signify at least a certain prestige and caliber of work, the A.F. of M. stands for no such thing.

This article doesn't purport to develop a complete history of musicians' unions and performers' unions in general. The information presented here is by no means conclusive, and in some areas, because of inter-union and local/Federation politics and policies (as well as ongoing national contracts negotiations) may appear somewhat incomplete.

Nevertheless, Union meetings, policies and gossip appear to take up a lot of musicians' time and energy. Staff positions are highly sought. *Mix* spoke with A.F. of M. officials, Local officers and members at large to get an idea of how the A.F. of M. functions, where it

succeeds and where it falls short.

The purpose of the A.F. of M., as propounded by Article II of the Bylaws, is "to unite all Local Unions of musicians, and regardless of race, creed or national origin the individual musicians who form such Local Unions of the American Federation of Musicians, into one grand organization for the purpose of general protection and advancement of their interests and for the purpose of enforcing good faith and fair dealing, as well as consistency with union principles, in all cases involving or of interest to members and Local Unions or the Federation."

Local unions and the International Union together comprise the A.F. of M. of the U.S. and Canada, AFL-CIO, CLC.

Faced with declining memberships and technological changes, musicians' unions struggle to define their role in the '80s.

Each union has its own officers and governing board, elected by the local's membership. Each local also selects delegates to the A.F. of M.'s International Convention. These delegates elect all International officers and members of the International Executive Board, which administers the A.F. of M. between conventions.

To the working musician, the Musicians Union hopefully functions for the reasons the other performers unions were founded: to set wage scales, working conditions and for collective bargaining. Yearly membership dues are levied, as is a work tax on all contracted jobs (usually from 2½% to 4% of the gross). This money makes up each Local's basic source of revenue.

The A.F. of M. was begun in 1896 (when the number one tune was "Sweet Rosie O'Grady" and John Philip Sousa was just hitting the big time), although attempts at organizing were begun in Europe and Norman England as early as the 12th century by street musicians. Known as *jongleurs* or minstrels, they played popular music, danced, told stories and occasionally presented animal acts. They formed loosely knit guilds for mutual aid and social protection. In this country, the first musicians unions were organized during the latter half of the 19th century. Like their early European counterparts, they were formed not to alleviate adverse economic conditions, but as

social clubs. For many years, their primary concern for their members' social welfare consisted mainly of setting up a death benefits program. Only late in the century were attempts made to enforce wages.

Though Baltimore and Chicago had musicians unions as early as 1857, the first organization that clearly took on characteristics of a trade union was formed in New York City in 1863.

Attempts at a national organization first began in Philadelphia in 1871, in order to deal with matters of common interest to musicians and to tackle the problems caused by inter-local competition arising from traveling musicians and road shows. Called the National Musical Association, it lasted less than ten years. By 1886 another attempt was made as the National League of Musicians. Through affiliation with the American Federation of Labor, the NLM eventually merged with the American Federation of Musicians (begun in 1896) in 1904.

Most of the "better" music jobs are under Union jurisdiction: all major label recording, commercials, films, the classier club dates (also called single engagements or casuals), hotel gigs,

Broadway shows, Equity dinner theater and some nightclubs. In a city like Nashville, road musicians working for name acts are also included. In addition, many traveling acts that pass through a city for a brief engagement (usually in a unionized house or theater) are required to file a contract with that particular local. Thus, if a musician doesn't get paid, and there is a contract on file, the Union will help him fight for his money, through arbitration if necessary. The Federation also maintains a nationwide defaulters list—people, clubs, agents, etc., who have breached agreements or in some way cheated musicians out of money.

Yet peculiarities unique to the field have often led to irregular—some might say frustrating—hiring practices where the Union is either circumvented or ignored entirely. The ultimate "end users" of the musicians' product is often not the person who does the hiring. Independent agents, hotel food and beverage managers, and contractors (who are often other musicians and may indeed function as "employees" on another job) function as middlemen between the musician and the client or purchaser of music.

The Union is strongest where an actual *employer* can be defined—such as theater, movies, TV, symphonies, jingles and major label recordings—and thus negotiated with. Also, says A.F. of M. president Victor W. Fuentelba, "The Union is strongest when we are able to utilize the labor laws of the United States. We're hampered by both the Taft-Hartley Act and the right-to-work laws."

Labor laws such as the Wagner Act, Landrum-Griffin Act and the Lea Act are administered by the NLRB (National Labor Relations Board). Their very complex histories, utilization and repercussions are outside the scope of this article. Very briefly, however, the 1946 Lea Act (also known as the anti-Petrillo Act and aimed at the then-powerful Union president James Caesar Petrillo) made it unlawful for broadcasters to employ or pay more for musicians and/or musical services than needed, in an attempt to do away with minimums or "phantoms." The Wagner Act (1935) outlawed unfair labor practices on the part of the employer. Landrum-Griffin (1959) created safeguards for union members against possible abuse by their union. Restrictions

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were also placed on organizational and recognitional picketing.

However, it is the 1947 Taft-Hartley Act (also known as the Labor Management Relations Act) that is described by one Local 802 business agent as a "multi-clause nightmare." The Act is probably one of the many reasons the Union (and unions in general) have lost much of their power and prestige over the last several decades. Taft-Hartley (later strengthened by Landrum-Griffin) clamped down on several kinds of union conduct, such as intimidation of employees and engaging in certain types of strikes and picketing.

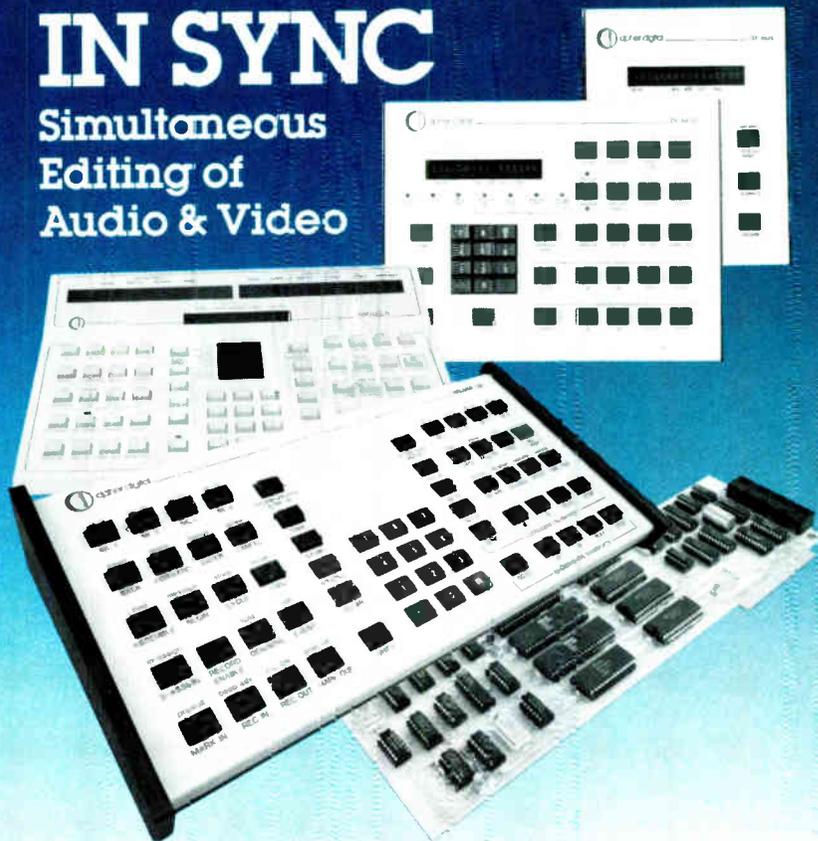
"What this all means," says President Fuentealba from Federation headquarters in New York City, "is that according to the right-to-work laws, no worker has to join a union and no workplace can be a closed union shop. Since 1947, as the Taft-Hartley Act has been interpreted, this has resulted in venues such as hotels and nightclubs that regularly use musicians to say 'I'm not the employer' and thus avoid having to bargain or pay union wages and benefits." Fuentealba adds, "This has led to horrible problems with band leaders and booking agents who said 'why bother to join the Union'—and a lot of younger players didn't. Then in the Caribe Hilton decision [a San Juan hotel], the courts ruled on appeal that the band leader, not the hotel, is the musicians' employer, and we're fighting it. It's very important to get this law changed."

In addition, many employers also tend to view musicians, even those who work for them steadily, as independent contractors, and pay them accordingly, taking out no taxes from their paychecks. Many clubs, hotels, single engagement booking offices and restaurants that employ musicians also balk at paying into the Union pension and welfare funds. (And, of course, a "union" of independent contractors is a contradiction in terms.)

President Fuentealba, in the previous paragraphs, touched on another Union problem—reaching the younger (read "rock") players. He notes, "Most rock agents and managers discourage Union affiliation, except if they're part of a big signatory record company, name act, or talent agency. There are so many musicians in this field that supply definitely exceeds demand. Many are in debt for equipment, so they tend to take any kind of gig at all to help make payments."

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An example that tellingly illustrates this problem occurs within New York's Local 802, the largest local in the world, with approximately 16,000 members. Local 802 territory covers the Broadway theaters, lucrative jingle and record sessions, TV and the recently rejuvenated New York movie business. All these areas pay well, but the work is done by a very small pool of players. Also included in 802's jurisdiction are numerous showcase clubs (where a band sometimes leaves with as little as \$20 to split among its members and must sometimes even pay the club for the "privilege" of performing). New York City and its environs are also home to numerous independent record labels where spec work is all too common, and money for the side musicians (as well as engineers and everybody else involved with the particular project) is almost never forthcoming at the completion of the job. For many young players, lack of organization, the independent nature that seems to come with anybody seriously performing rock and roll, as well as unfamiliarity with other areas of music and other types of musicians, have led to these deteriorating conditions.

In 1983, spurred on by a letter written by member Russell Alexander, Local 802 formed the Rock/R&B Committee to run music business seminars and (hopefully) open up a dialog with rock club owners. The dialog was largely ineffective, although one showcase club was picketed and eventually closed (for better or worse). The committee is now mostly inactive, possibly because of the state of the New York music scene itself—there are very few live music clubs to "organize," as the number of viable venues of all kinds continues to diminish.

Los Angeles Local 47, from all reports, maintains an excellent rapport with its rock musician members. It regularly covers the activities of local rock musicians (many of whom are celebrities) in *Overture*, its monthly publication. Local 47's pamphlet for new and prospective members is emblazoned with the names of many prominent rock musicians who are members—Linda Ronstadt, Devo, Quincy Jones and Frank Zappa, to name just a few. Unlike New York's 802, Local 47 has its own building with a club room and rehearsal hall available. (Low cost practice and rehearsal space in New York City is at a very high premium.) And also unlike New York, L.A.'s club scene

appears alive and well.

Other locals have also attempted to reach out to younger, disaffected players. Local 7 in Orange County, California, maintains a videotape library of area bands, as does Local 257 in Nashville. Says Local 257 business agent Otto Bash, the project co-ordinator, "Our video filing system has more than paid for itself as a service to our members in terms of jobs and goodwill."

Kelly Castleberry II, the Federation's secretary-treasurer, says, "We've also instituted the President's Service Program, which includes public relations brochures and outreach programs.

We've implemented a successful Young Sounds program (lecture-demonstration programs by well known musicians—usually jazz players—in the schools) in areas like Detroit and Phoenix.

"... nothing will destroy the usefulness of an organization surer than to set its face against progress no matter how unfavorable we may at present consider same to our interests"

Joseph Nicholas Weber
(A.F. of M. president 1900-1940)

Weber's warning notwithstanding, the A.F. of M. as an organization has

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been fighting mechanical devices that replace live music for many, many years. When Wurlitzer came out with the Mechanical Sideman 30 years ago it was just the beginning. The Union has even sought restrictions on the use of synthesizers where they have been used to "replace" live musicians. Yet on many contemporary recordings, there's a good chance that the piano isn't a piano, and a better chance that the drums aren't drums. It therefore seems that the Union and technology are on a collision course, again. The technological and, more importantly, *economic* ramifications of MIDI, synthesizers and automated music in general, have yet to be consistently addressed and dealt with, particularly in the field of recording.

Although the A.F. of M. has no hard and fast policy on synths et al., Budd Arthur, the Federation's Chicago-based PR counselor says, "Digital sampling seems to be a matter of individual policy, and most synth players are or were pianists, so they join the union. No one wants an out-and-out condemnation of synths; after all, we learned with talkies that you can't stop technology. As far as 'synthetic' vs 'real' sounds, there's a place for it all. It's just that displacement of live music and acoustic instruments is becoming a serious problem."

Adds 802 President John Glasel, "We feel better when synths are used to enhance rather than replace."

To many "independent" musicians who work off the books, or in areas not largely covered by the Union, or who do sessions on spec (since it's the only kind they may be able to get) all this may sound like irrelevant quibbling. For every music booking office, independent agent, production house, record label or musician that ally themselves with the Union, there are several more who do not, and continue to function without either help or interference from it. Consider the following: Cal Hart (not his real name) plays in a unionized Midwest orchestra. The conservatory he attended, like many others, set up a "gig hotline" (totally independent of the musicians union in the area) that placed musicians in jobs. Anyone planning a party, wedding, brunch, etc. could call the hotline if they wanted to hire music. The hotline co-ordinator informed the client that monetary negotiations were between them and the musician, but frequently made suggestions to the cli-

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ent about prices that were way below union scale. The conservatory was located in a fairly well-to-do area, and Hart says in retrospect, "The clients definitely took advantage of the very low student rates. What's galling is that many clients had enough money to hire a whole damn orchestra if they wanted to. I was sometimes caught in an untenable position since I became a union member during my last year at school—and was able to get union scale doing the same kind of work that I got through the hotline. To my knowledge, neither the union nor the gig hotline contacted the other about the situation." (A pamphlet put out by the Federation titled "The Music Code of Ethics: An agreement defining the jurisdiction of professional musicians and school musicians" attempts to address these problems.)

Says Virginia West (also a pseudonym), until recently a union member active in the hotel and club date fields, "The industry as a whole isn't there to support the Union. And if you're not working steadily, the pension and welfare benefits don't really add up to anything in the end. I'd just prefer a fatter paycheck at the end of the night."

For many such as West, who led her own hotel band, trying to fit into the Union's concept of a hotel employee is often neither professionally nor financially feasible (usually for tax reasons). Also, if freelance musicians' work suddenly drops off, their health benefits may be in jeopardy. Many prefer to acquire health and/or pension plans independently, or find they can obtain much more comprehensive coverage through family or a working spouse.

Some steadily working hotel musicians simply see the Union as an advocate regarding wages and benefits. Yet one member, an entertainment lawyer as well as a working musician, remarked, "No matter what any Union says, nothing is ever black or white. Enforcement procedures, particularly in an area as spread out as Local 802, with so many different kinds of work, are usually ineffective. The Union doesn't have the resources to do the job properly or effectively."

Many musicians who only play part-time don't hesitate to drop out of the Union if they can receive benefits and health coverage through their day jobs. Membership in most locals is continu-

ally dropping, and locals with small memberships are merging with increasing frequency. Yet there are still many musicians who consider the Union's existence a vital part of their personal and professional lives. The MPTF (Music Performance Trust Fund) provides many members with employment via a system of matching funds with sponsors like hospitals, parks and schools. Legal and personal counseling, a 24-hour hotline, the Emergency Relief Fund and instrument insurance are some of the features that remain in constant use by union members. Yet the personalities that guide the A.F. of M. and use of the Union's power will ultimately determine how well it can cope with the unprecedented technological and economic changes that are now altering the face of the music industry. Clearly, the Union is at a critical crossroad. ■

Editor's note: In late June, A.F. of M. president Fuentealba was voted out of office for his consistent anti-strike stances. He claims he'll be back, however.

Rosanne Soifer, a freelance journalist and professional musician, is an 802 member and former 802 business agent.

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World Radio History

by Lou CasaBianca

AIM/MIX CONFERENCE

THE VILLAGE RECORDER; L.A.; PART 2

In the November '86 issue of *Mix*, we presented a comprehensive sneak preview of Compact Disc-Interactive (CD-I). Scheduled for release at the Spring 1988 Consumer Electronics Show (CES), interactive CD players will be delivered to consumers in the fall/ winter of '88. If you are familiar with CD-I, you know that the format presents an extremely interesting challenge to both developers and consumers as a gateway into true interactivity and the recent technologies of the 1990s.

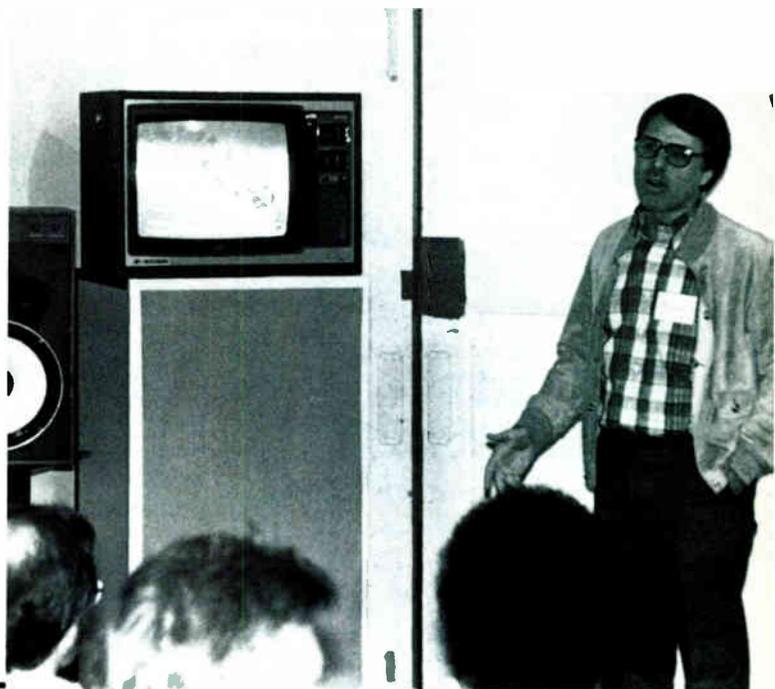
CD-I Workstations

After its conception by Philips, in Eindhoven, Holland, the first phase in the evolution of CD-I, based on the negotiated unanimous consent of the participating manufacturers, was the formation of manufacturing and operating standards—the Green Book. The next phase, the development of the authoring systems and software, has proceeded on both corporate and market-driven levels. On the corporate level Philips has contracted with Sunn Computers, in Silicon Valley, to develop the authoring workstation for the development and production of CD-I software and programming. Sunn, along with Apollo, DEC, Hewlett Packard and Silicon Graphics, is one of the major providers of scientific and graphics workstations. A team of Sunn developers, led by Steven MacKay, will work with Philips and the developer community to forge standards that will form the basis of the creative and intelligent workstation environment for CD-I development.

Authoring Systems

At the On-Line CD-I Conference and CD-I Network/SIG Meeting in San Francisco last May, a number of market-driven solutions to CD-I authoring and workstation design were announced and/or previewed. Marc Canter, president of Macromind, out of Chicago, demonstrated "Video Works II," an interactive authoring program that runs on the Apple Macintosh computer. When running on the Mac II, with its sound chip sampling capability, color, and video card for video display and signal export, the Macintosh becomes a relatively inexpensive and powerful developer's, workstation. Electronic Arts CD-I Director, Greg Riker (see Interactivity, *Mix* April 1987) demon-

Mark Dillon, AIM vice-president of technical and creative services discusses the new technology.



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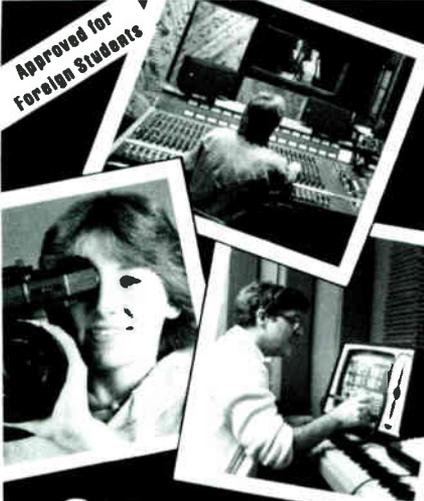
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strated interactive storyboarding on an Amiga. Using off-the-shelf digitizing hardware and custom-developed software by Electronic Arts, he "walked through" a CD-I authoring approach and simulated a CD-I game concept.

Other manufacturers, such as Activision and Optical Media International, have also announced software and workstation configurations. Clearly the first market for CD-I will be for the interactive authoring systems and workstations used to design and develop the software.

The Record Group

At the same time, in line with the classic "chicken-and-egg" syndrome, The Record Group and AIM (American Interactive Media) both affiliated with Philips and PolyGram, have been developing and awarding contracts for the production of CD-I software programs. Led by former Warner Brothers Records creative wizard, Stan Cornyn, The Record Group previewed their "Time Machine" program at the AES Music and Digital Technology Conference in Los Angeles last May. A modern-day version of Mr. Peabody's "way-back machine," the program allows you to pick a moment in history and, through the miracle of interactive optical technology, travel to that place and time. You can browse in prehistoric through modern times, asking about the arts, politics, economics, fashion, etc., and record segments of interest to a peripheral VCR. The Record Group "looks and feels" like a record company and is bringing the music business approach to the development of CD-I entertainment and informational programming.

American Interactive Media

The AIM organization is taking the electronic publishers approach to developing associations with "content providers" such as Time-Life and Smithsonian in bringing their vast libraries of print, film and video to the CD-I arena. AIM also is developing games and entertainment-based projects such as "elastic music," which uses the audio functions of CD-I to present new and exciting creative possibilities with interactive music.

The Ultimate Off-Line Workstation

As a powerful random access information delivery vehicle, the CD-I format

offers new opportunities for learning and creativity. What has not emerged, however, is the message that, like the extremely powerful technology required to author and produce CD-I software, the CD-I home machine in and off itself will be a powerful workstation. Multi-track digital audio (read only), keying graphics over video, video paintbox effects and video digital effects will be accessible to the consumer/operator through a user-friendly Macintosh look-alike interface. Once a sequence has been created, it can be sent to an audio cassette recorder or VCR. The CD-I player could become the production core of the home entertainment center, adding video production, computer graphics and interactive software capabilities to the multi-timbral, MIDI, porta-studio home studio.

CD-I Network

The CD-I Network has been formed in San Francisco, and is linking up with other CD-I special interest groups to help developers and manufacturers keep in touch with the emerging CD-I scene. For information, contact John Kalb at the CD-I Network, 4565-A 18th Street, San Francisco, CA 94114.

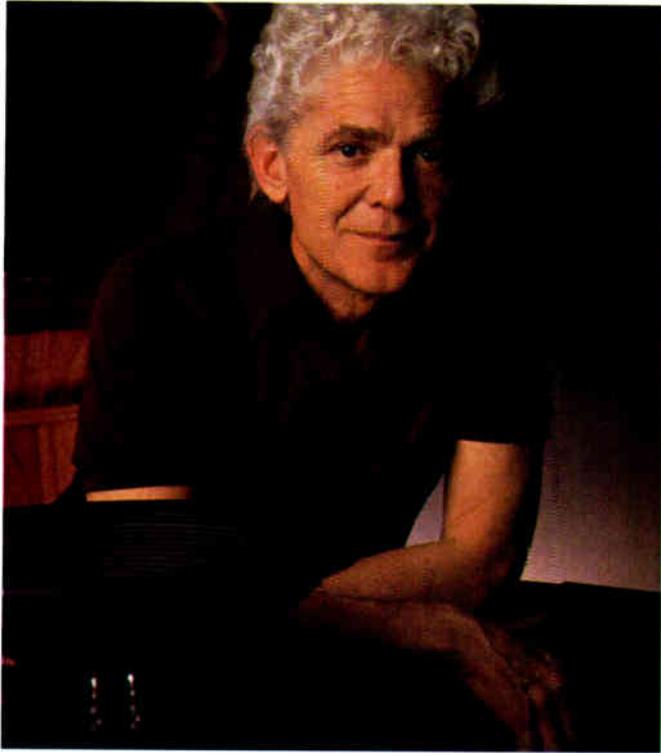
Audio/Music For CD-I

American Interactive Media and *Mix* magazine recently co-sponsored a conference, hosted by The Village Studios, specifically to introduce the CD-I technology to the audio recording and music community in Los Angeles. The speakers for AIM at the meeting were Marc Fine, VP of Business Development (i.e., A&R), and Mark Dillon, VP of Technical and Creative Services.

One of our objectives in bringing you the detailed highlights of this meeting is to help provide a clearer understanding of the audio implications of CD-I technology, and in general to help define the ways in which interactive technology will impact music and audio recording. The following comments made by Mark Dillon of AIM are from that conference and are part two of a series of articles that are being presented in "Interactivity," dealing with audio and music production for CD-I.

Mark Dillon: "You may have seen interactive video which is essentially video tape, motion and menu. You make a choice and you see more motion. When you take a piece of video

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than passing interest to you, since you want the speaker components you use to be the best.

And on the subject of "best," Tom has some very definite opinions about TAD. "They are the most state-of-the-art, consistent quality products today. Nothing touches their performance, honesty, stability and transient response."

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"TAD MAKES THE BEST SOUNDING COMPONENTS I'VE EVER HEARD."

But for Tom, that's all frosting on the cake. "At the end of the day," he says, "it's what comes out of that speaker that determines success or failure. No matter what it measures, it all comes down to what it sounds like. TAD makes the best sounding components I've ever heard."

If you're in the market for professional speaker components, for yourself or a client, we hope you'll seriously consider what Tom Hidley has to say about TAD.

And thanks for listening.

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tape and put menus in front of it, that's 'interruptive' video, not interactive video. Interactive video takes an experience down to its very small level. Twenty seconds of motion can illustrate four minutes of material. As you move through the material, you are constantly involved, moving along at a rate that is appropriate to you, a phenomenon called 'user-defined motion.' It doesn't seem boring or still-frame-like, yet most of a given four-minute section may be only 10% motion."

CD-I Overview

"CD-I is fundamentally an audio-based medium. What does a CD-I player provide us? It provides us with cheap players, cheap lasers, A-to-D converters; it does the whole hardware part of CD-Is already in place. In fact, in the Magnavox CD-I audio player, there's a port in the back that will connect you to a separate computer you'll be able to buy, that will turn your CD audio player into a CD-I player. One of the things that makes CD-I is that it's based on CD audio. The other thing about it is that the data structure is audio. In other words, when you create for CD-I,

you have to think you're dealing with a CD audio player where the optical laser drops down in a groove and sucks up data at 175 bytes a second.

"It's not like a hard disc where you can jump all over the place and pick up data pretty quickly. It's got the same kind of mechanism as your audio player, which means you can only pick it up at a fairly slow rate; 175K is not very fast compared to some magnetic means—in fact it's very slow. Access times are slow by hard disc standards, it's about a second search. So a lot of CD-I's challenge is coming up with specific ways to work within those constraints. We've had to find ways to make pictures smaller. If you have only 175K of data, to get more pictures, you make the picture files smaller by encoding them. How do you encode them? You come up with algorithms that work in hardware and firmware to compress them. That's what a good portion of the CD-I is about—taking audio and video and making them smaller in terms of the data stream so you can do more."

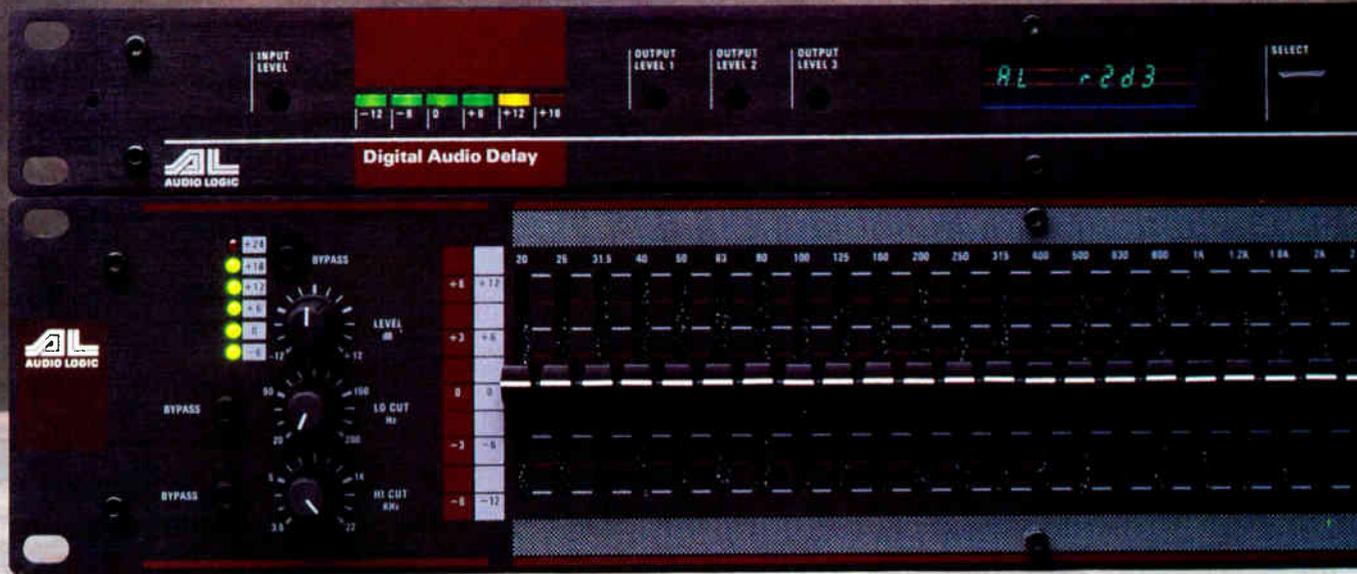
The CD Galaxy

"In 1982 the Red Book, CD digital

audio standard, was set. CD-ROM is the Yellow Book. In this case it still has between 550 and 600 megabytes of data, but it is text. CD-ROM has been used basically to store numbers, that's all."

CD-ROM: The Yellow Book

"To get the appropriate form for a CD-ROM, you can take your data, put it on a 9-track tape, send it to one of the service bureaus and they'll send you a disc. Plug it into the computer and throw away all those floppies, tapes and things you were storing data on. CD-ROM is permanent; it's a good archive medium. The only trouble is that to store data it has to be perfect. You don't want a single zero or decimal point to be missing from your data, so error detection and correction techniques don't make it very good for audio. The two extremes are red and yellow. Red allows you to have some errors in the audio. You can degrade music gracefully to compensate for the errors and cover them. That can't be done with data, so there are two entirely different ways of putting information on what looks like the same disc. One is for audio, one is for data.



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"CD-Interactive, the green standard, is an effort to use the same CD technology so that at any one time you can have text, computer programs and data (just like CD-ROM), along with music just like the red disc *and* pictures, because pictures can degrade in the same way as audio. CD-I is interactive, because it is this medium combining two approaches that are already free-standing."

CD-I: The Green Book And The Base Case

"All CD audio discs play on CD-I discs. One of the rules is that all CD-I discs will play on all CD-I players. With CD-I you don't have the Beta vs. VHS vs. 8 mm problem. In theory, you're going to be able to take any CD-I disc and put it in any CD-I player, any place in the world and it will read it. The same disc you do in the States will be good in Europe, Japan or even France.

"The CD-I as a base case comes with no hard discs, no MIDI, no floppy discs, no keyboard, no extras, but you'll be able to connect those things to a CD-I if you want. There's a computer keyboard port in the back. You can even turn this thing into a computer. I

would be shocked if we won't be able to plug peripherals into a CD-I player and greatly expand its capabilities very soon. However, to begin with, all CD-I titles have to play just on the base case configuration; they can't require a MIDI interface. You can add things on to it that will make it better, faster, more fun, but it's got to play on that base case configuration."

Mode II

"Let me talk about standards and compromises. A standard *is* a compromise. CD-I is a tremendous compromise, because there's always a better way to do it, if you want to pull toward a specific solution. But if you want audio, video and sound for computer program interactivity, a standard has to be agreed on. Take, for example, the way data is treated to give you some idea of the compromises that were made. CD-I will play red audio or the compact audio, it will also play part of the data that is available in CD-ROM. In CD-ROM you've got two modes you can use to encode your data, Mode 1 or Mode 2. If you're making a CD-ROM and you use Mode 1, it will not play on a CD-I player. If you use Mode 2 it will,

and it will play in the red audio."

Error Detection-Error Correction

"Remember, there are two ways you can encode data. This one has EDECC (error detection-error correction circuit), for use when we want to have text and data in the CD-I player. Form 2 is used when pictures and audio don't need to have the same error correction. The advantage of Mode 2 instead of 1 is that we get about 250 more bytes, which means more information for pictures and sound.

"A block is the smallest discrete unit on a CD-I player. It starts with a header and a subheader. It tells the player where it is and what it's got there, and whether audio, video or text data is coming off. It takes data off the disc and recognizes it because the header describes whether it's audio data, video data or ordinary data. It has a 68000 processor which recognizes each different step, and essentially does a juggling act."

Interleaving

"The fun and really creative part of CD-I is creating these record structures, called 'real time record struc-



time value. Or you can input the distance in feet and the R2D3 will calculate the rest.

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tures.' It allows the player to take compressed data, decompress it and play it back in what appears to be real time to the viewer. If you want to sound like an expert in CD-I, remember one word besides CD-I—"interleaving." Interleaving is taking your audio, data and video in little slices and designing them to work elegantly and efficiently. That's the whole trick of CD-I."

CD Audio: The Red Book

"The CD audio disc, the Red Book, fills up all the channel with data just to make the audio data strip. We take the audio and find a different way to encode it, and free up some of the bandwidth for the pictures and text. CD digital audio takes 100% of the data strip. CD-I stereo hi-fi, which is top grade green audio, takes up half the data that the red audio takes, using a different encoding scheme, ADPCM (Adaptive Delta Pulse Code Modulation). You immediately get about 75 or 80K bytes per second for the pictures and text."

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To be continued: in next month's "Interactivity," we'll review the OS-9 operating system, video for CD-I and some of the key questions about producing music and audio for the CD-I standard.

(Note: if you would like to pursue more technical data on the subject, you may want to pick up CD-I and Interactive Videodisc Technology, edited by Steve Lambert and Jane Sallis, published by Howard W. Sams & Co., available at most good technical bookstores and from the Mix Bookshelf.)

Lou CasaBianca's primary interests lie in the areas of advanced music, motion picture and television production, with emphasis in interactive authoring and visual design, and the application of computer systems in media production.

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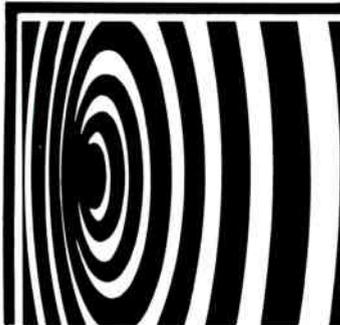
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WENDY CARLOS

**Carlos has thrown
off the tuning and
timbre restraints
that have shackled
most composers
since the 17th
century and has
created stimulating
new forms. She
has changed the
way we all make
and hear
electronic music.**



by **Bill Milkowski**

The old Moog stands dormant in one corner of her studio, like a museum piece gathering dust. Its myriad of patch chords and chunky construction recalls a bygone era, like the Edsels and Model Ts you might find at an antique auto gallery.

In the "active" corner of her studio there's an arsenal of digital gear, though she humbly offers, "There's really less here than meets the eye. The GDS and the two Synergies are very strong tools that allow me to get into so many sounds that I really haven't had the need for getting a whole lot of peripheral gear. I still stand by the old philosophy: learn what you've got and get as much out of it as possible instead of just running out and getting more. Once you've got a few basic tools, learn how to use

those first. Squeeze every drop of juice out of them."

Wendy Carlos has done exactly that on her latest opus, *Beauty In The Beast*, a fascinating aural journey into the realms of new tunings, timbres and timing, jointly inspired by the traditional sounds of Bali, Africa, India and other exotic locales where they have no use for the Western tempered scale. She has squeezed every drop of juice out of her Synergy digital synthesizers (with some help from various sound processors and particularly the custom-made gadget designed for her that throws her Synergy synthesizers into the scale of her choice at the press of a key) and has come up with some startling new breakthroughs in her ongoing exploration of electronic music. Like *Switched-On Bach* ('68), *The Well-Tempered Synthesizer* ('69), *A Clockwork Orange* ('71), *Sonic Seasonings*

('72), *Tron* ('83) and *Digital Moonscapes* ('84) before it, *Beauty In The Beast* takes us on a trip through uncharted musical terrain. Always the innovator, constantly searching for new paths, laying the groundwork for others to follow... Carlos has done it again with her remarkable debut on the new Audion label.

As Audion head Larry Fast puts it: "The compositions on *Beauty In The Beast* will likely be seen, looking back a hundred years from now, as a pivotal point in music of the late 20th century. This is not disposable electronic pop, but important and lasting music that may just be the true beginning of 21st century composition. Wendy Carlos has thrown off the tuning and timbre restraints that have shackled most composers since the 17th century and has created stimulating new forms. This album has made me re-evaluate my own concepts of tonality and composition. She has changed the way we all make and hear electronic music."

Though Carlos does build replicas of Eastern and Middle Eastern instruments on her GDS digital synthesizer

In a brave new world of digital sampling gear, Carlos is more than content to stick with her GDS and Synergy keyboards.

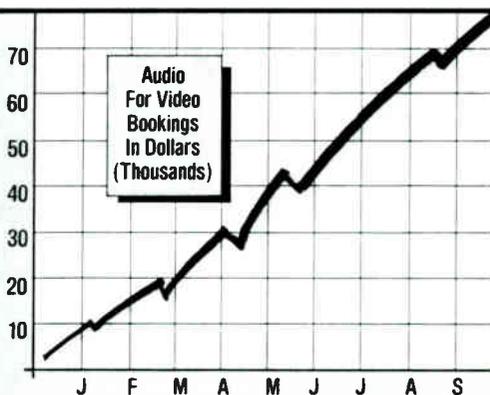
(a whole gamelan orchestra on "Poem For Bali," a tambura and dilruba from India on "A Woman's Song," an African percussion ensemble on "C'est Afrique"), she explains that the compositions on *Beauty In The Beast* are merely her own impressions and extrapolations on various ethnic themes.

"The album is not, by and large, an ethnic record, as it appears to be sometimes. My imitations, my replicas of the spirit of some of these things are very much through the eyes of a Westerner. There are some occasional moments in it where I consciously said, 'All right, let's make this sound very,

very much like the music of such and such a country.' But the form is very different from what they would do. The playing is much more like what a Western jazz musician would do.

"The piece 'Poem For Bali,' for instance, isn't really authentic gamelan music. Balinese musicians do not improvise, as I did on the second half of that one. They play terraced, which is to say, flat. Then they go up to faster tempos or louder or softer, all on strict cues. But mine darts around and it's syncopated in a way that a Western musician would play. I think if Balinese musicians would hear it they'd say, 'Oh, this is done with an accent,' like a foreigner coming to the States and speaking our language. Well, I'm not a native-born Balinese musician. My interpretation is not authentic. It's more polluted, if you will. More Westernized. And I think that's fine.

"I mean, hell, we're in a global society now. Why not have all kinds of interactions and feedback? Who needs to be authentic any longer? With the technology available today... modems, etc... it's very, very global. I'm



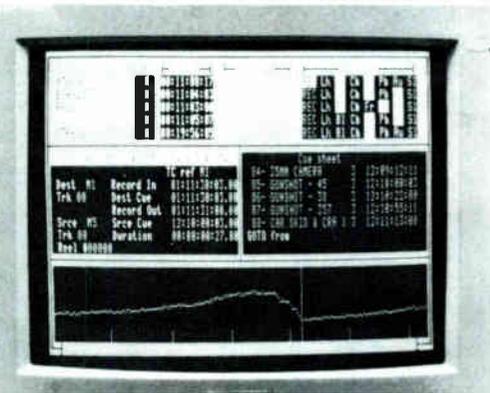
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talking about technology now making big inroads on changing the way we express our art, our music. My things . . . the special tunings, timbres and such . . . are easily transmitted over telephone links. The live overdub session that Sony recently sponsored with Stevie Wonder and Herbie Hancock on the West Coast playing with singers on the East Coast . . . that's a good example of how technology is making it global. I mean, today you can go to the middle of Africa and see a Colonel Sanders fried chicken. If you want to call that pollution or international feedback . . . whatever, it's gonna happen with the music and with the arts, if it hasn't already.

"And to me, it means that we now have the ability to take all of the world's

richness . . . the whole tradition . . . and go much further. Like in the last 50 years, people had access to recordings of music from all over the planet, and so they composed music differently from 100 years prior to that when you only knew a very limited amount of music in your life. But 50 years ago, people could listen to recordings made in Japan or Java and get influenced by that. Well, now our influences are much more immediate. So if the music doesn't bend to reflect the changes in our lifestyles, it's not reflecting the realities of the world. It has to change, I think. And the technology is going to bring about a gross alteration of the way we make our music. I think my *Beauty In The Beast*, for instance, would never have been possible con-

ceptually at all just two, three years ago. It's a child of the times. And it's a tip of an iceberg of something very, very new. It's a terribly exciting time for music, I think. It's like the old Chinese curse says: 'May you live in interesting times.' So I believe we are truly living under a curse right now. It's a very interesting time. Everything is changing, nothing is stable. And if you're open to these things, it's like adrenalin all the time. You don't know how to turn it off."

You can feel Carlos' excitement as she talks about her new equipment, the new tunings, the new sounds and the tedious process by which she came upon them. Her speech speeds up, trying to keep pace with her racing thoughts, as she describes her relentless search for new sounds, the endless late-night sessions in her studio, burning the midnight oil over her GDS computer, piecing together sounds by ear (not unlike an equally obsessed Thomas Alva Edison during his zen-search for just the right filament for his light bulb).

"It was tedium," she admits, "but it's like a Sherlock Holmes kind of tedium. There's a detective story involved here that can be a joy. It can be fun! You become immersed in this process and you forget to eat or sleep, because this stuff is so exciting in and of itself. It takes a lot of time, so you have to be patient and very obstinate. You become consumed by this search, but it's great, great fun."

These late night hunting sessions have been a Carlos custom since her days as a Masters student at the Columbia University Electronic Music Center. From 1962 to 1965, Carlos had access to the Center's massive (and now archaic) RCA Mark II synthesizer.

"I was one of the few students who was really interested in it," she recalls. "And the only time they had open to work with it was from 11 p.m. 'til 8 a.m. So I got the chance to work there all night long during my three years at Columbia, and that's where I picked up my bad habit of sleeping all day and working all night."

She fondly remembers the RCA Mark II as "a nice, interesting gadget. The first one was built in '55, and by the late '50s they had built a second model. It was the world's first attempt to put all of the steps necessary to make sound into one spot, all tied together. And the term they used for this gadget was *synthesizer*, taking the idea from



Wendy Carlos Equipment List

Her mixing console is a custom-made Tempa Mark II, which she originally built in 1970 and generally modifies every two years. It has 18 ins and 6 outs. The cards inside were made by Spectra-Sound, the first company to manufacture 27 decibel signal-to-noise-ratio cards. She uses Toa power amps. Stacked on top of the console is a Synton Syntovox SPX-216 vocoder (which she used for Tibetan chanting effects on "Incantations" from *Beauty In The Beast*), a Lexicon PC-42 digital delay, an AMS digital delay and two Symetrics 511 noise reduction

systems. Nearby is another rack: two ITI parametric equalizers, a UREI digital metronome, a Bode 6551 Frequency Shifter (created by electronic music pioneer, the late Harold Bode) and two Lang program equalizers. On the floor near her Synergy digital synthesizers is a TC Electronics chorus/flanger box, an Aphex Aural Exciter Type B, a Phase Linear 1000 Autocorrelator noise reduction system, a TC Electronics parametric equalizer, a Fairlight Voicetracker. Several 4-track and 8-track recorders are scattered about the room. A 3M 16-track stands in one corner. Nearby is the Sony F-1 digital recorder she used to record *Digital Moonscapes* and the Sony 701 Beta deck she used for *Beauty In The Beast*. Rounding out the sprawling arsenal of hardware are the Kurzweil MIDI keyboard, the Macintosh computer with a Roland RS-232 port, her old 16-bit Hewlett-Packard computer, the GDS digital synthesizer and a Poly-Moog, which she used for the *Tron* score. It's all here. She needn't leave her home to make any albums, except for transcoding the music onto a Sony 1630 digital 2-track (which she did at Sterling Sound in New York for the *Beauty* project). She doesn't plan to acquire any new tools for the moment. "I'm just trying to catch up now," she says. "I've got like ten different things here that are all totally new to me and I'm learning the best about them right now."

RANDOM SAMPLING

Volume I

Notes and News from Kurzweil Music Systems

Issue No. 2

NOW HEAR THIS... Kurzweil 250 Sound Libraries 5 and 6 will be available soon! Percussion, human voices, guitar strums, and more! So hang in there. **THEY DON'T COME EASY...** We invested almost \$25,000 just to sample pizzicato from the Boston Pops string section for our Sound Block C. **MAKE IT QUICK...** with the Kurzweil 250's built-in QLSTM, our "Quick Load System" interface for the MacintoshTM computer. QLS lets you project a complete menu-driven sequence editor, keyboard editor or instrument editor on one screen, making the Kurzweil 250 even easier to use! Haven't checked out QLS? See your authorized Kurzweil 250 dealer. **GOT A ROBOT IN YOUR FUTURE?...** See "Robots and Beyond: The Age of Intelligent Machines." Produced by the Boston Museum of Science and sponsored by Digital Equipment Corporation in cooperation with the Kurzweil Foundation, the exhibit takes the mystery out of robotics and artificial intelligence...and features a Kurzweil 250 on display with a computer—the system plays computer-generated compositions on a continuing basis. It just finished in Boston and will be at the Franklin Institute in Philadelphia through September 1. Then it's on to Charlotte, NC. More next month. **BLAST OFF!...** with Concerto for Astronauts on New Frontier Records. Composed by Emile Sichkin, Russian emigre and graduate of the Moscow Conservatory of Music. It's "a tribute to the heroes who go up in space and especially to the crew of the Challenger," says Alex Ayzin, founder and president of New Frontier. "About 50% is performed on the Kurzweil 250." This one can put a tear in your eye. **A 150FS IN CHURCH AND ON TV?...** Yep, the First Baptist Church of Spar-

tanburg, SC, which broadcasts live to 100,000 homes every Sunday on CBS-affiliate WSPA. According to Minister of Music Ron Wells, "We use the Kurzweil throughout our program." Why a 150FS? Tuning ease and accuracy. Good choice. **MORE 150FS...** It's easy to see why Ron Wells is so pleased with the 150FS—a true multi-timbral instrument with full sound layering, programmable graphic 8-band EQ, chorusing, velocity mapping...and that's only the beginning! Wait 'til you try the new additive synthesis **Sound Modeling ProgramTM!** **NEW 2.2 SOFTWARE...** for the Kurzweil MIDI-BOARD! Version 2.2 adds **Parameter #45-Velocity Maps**, and **#46-Pressure Maps**, doubles the pressure update transmission rate to 50 per second, and provides even more MIDI enhancements. See your Kurzweil dealer. **NEW KURZWEIL 250 USER'S GUIDE...** Hot off the presses. Written by David Mash, Chairman of the Music Synthesis Department at Berklee College of Music, the 200-page Guide comes from the musician's point of view. "We're continuing to support all our products and our users," stated Bob Moog, Kurzweil Vice President of New Product Research. Ask your Kurzweil dealer. **KURZWEIL 250 IN RUSSIA...** with Lyle Mays and The Pat Metheny Group. Europe is next and then back to America. Watch for their new album "Still Life (Talking)" due out in July. Should be great! **REPRISE...** Kurzweil owners, let us know who you are so we can send you bulletins and updates. And tell us what you think about Random Sampling. Write to: Kurzweil Music Systems, Inc., 411 Waverley Oaks Road, Waltham, MA 02154. Maybe we'll print your letter. See you later!

chemistry, where you can make artificial fibers by the process of synthesis. The RCA was bulky. It used vacuum tubes. It actually went three-quarters around the room in racks from floor to ceiling. And lots and lots of modules. There were binary circuits in it, so I guess you could call it an analog computer, but it was not primarily a computer. It was the thing that gave Bob Moog some ideas for incorporating with his wonderful group of miniature modules. It was really a godsend when it came along. It gave him the idea, I think, of putting it all together in one place, in one box that could speak interchangeably together. Because prior to Bob's Moog, we had equipment that did not communicate with one another very easily. They were cranky. They were meant for laboratories. They were never meant for making music."

Carlos began collaborating with Moog around 1966, "hoping to develop an electronic sound producer that could validly be termed a musical instrument."

The resulting album, 1968's *Switched-On Bach*, revolutionized the field and stands as a manifesto for electronic music. But as Carlos explains, her



PHOTO ALDO VAURO

In her home recording environment.

teachers at Columbia had some reservations about Moog's new contraption.

"Vladimir Ussachevsky warned Bob that when he put that keyboard on the synthesizer it would attract a lot of

pianists and organists who really were not sophisticated enough to use the gear and would probably give electronic music a whole different approach from what it should, perhaps, be taking. Well, he was right. It really did attract a lot of people who really don't have a temperament for being in the field, who used it more as a fancy organ than a device to create new sounds. But at the same time it did make it very convenient for people who were both very technical and musical and who wanted to get into it but also wanted the convenience of a keyboard."

Carlos herself has always been in that limbo realm of being both a scientist and a musician, yet being ostracized from both camps.

"At Columbia, we were looked upon as being a group of crazies," she recalls. "This synthesizer stuff was considered very far-fringed. It's funny, because I've always considered myself to be sort of centrist, but here I was mixed up with a group of people that was way on the edge. . . . past being avant garde and all of that. Actually, the avant garde thumbed their noses at us because they thought we were too technical to be considered musicians. And the technical people had their prejudices too. We were sort of pigeonholed off into one corner and forgotten."

"All my life I felt cursed because I was a scientist of sorts and I was a musician of sorts, and I wanted to put the two together. But it was never considered possible. It was really frustrating. For the longest time I felt very isolated, very insulated. But now it's not only possible to combine the disciplines of music and science, it's trendy, it's hip. Now I have a lot of friends who I talk to about new music and the new technology. But that positive feeling is more recent. I guess it's an idea whose time has come."

In a brave new world of Fairlights and Synclaviers and various other kinds of digital sampling gear, Carlos is more than content to stick with her GDS and her Synergy, thank you. It's not that she has any moral, ethical objection to sampling. She just doesn't consider these new pieces of hardware useful for her purposes.

"The Fairlight and the Synclavier are good for manipulating pre-existing materials. They are very good *musique concrete* devices but they're not very good synthesizers. There was a French school in the '40s which had the idea of manipulating existing sound. And

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In somewhat colorful comparative terms, Peter Mengozzi of **GUITAR WORLD** wrote, "The ESQ-1's sound combines the flexibility and analog warmth of the Oberheim Matrix-6, the crisp ringing tones of a DX-7, the realism of a sampler, the lushness of a Korg DW-8000 and polytimbral capacity of the Casio CZ-1".

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MUSIC TECHNOLOGY's Paul Wiffen had a great time mixing colors with the ESQ-1's 32 on-board waveforms and 3 oscillators per voice. "After a few minutes of twiddling, you can discover that, for example, an analog waveform can make the piano waveform sound more authentic, or that a sampled bass waveform can be the basis for a great synth sound. Fascinating stuff!"

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then there was the German school that had the idea of, 'No, we will build oscillators and devices that will make brand new sounds.' I guess I come more from that second camp. My prejudice is definitely toward that idea of making sounds from scratch."

Though she acknowledges that the Synclavier and Fairlight do allow the user to create sounds by altering timbres, she points out, "Those machines do that only on a very primitive level. I'm a snob on this. I'm very into it. It's like if you spent an awful lot of time becoming a fine oil painter, you'd probably be a little impatient with people who show you pencil sketches. The level of awareness you get tends to spoil you for the simpler things in life. I saw the Fairlight early on, when it was still called a Quasar. I read a lot of the literature, communicated with the people. Syd Alonso [of New England Digital] always wanted me to become one of his people, but I just am not interested that much in technopop things where you do sampling of existing sounds. Those are fine tools on some levels. The Synclavier prints out music beautifully, it stores and retrieves performances and lets you edit and change things. It's a very large, deluxe engine.

"When I first saw the Fairlight I was struck by what a great learning tool it is. Probably its best value, I think, is to put it into schools and music conservatories for students to sit down and analyze sounds. But neither one of these deluxe engines really has any useful synthesizing ability, for me. They're very primitive in that respect. But the first instrument to come along that I thought would do the job was the GDS digital synthesizer. And I took to it like a duck to water."

Carlos met the creator of the GDS, Hal Alles, back in 1977 when he was working at Bell Laboratories. "I had gone out there to meet him with Rachel Elkind, who was my partner for a great many years, and we saw his first big machine he made, which was later given to Oberlin College. It was a wire-wrapped affair, strictly a laboratory instrument, not really meant to be durable. It was actually the first of six synthesizers that Hal would create. As he used to say, 'The first one is always horrible. The second one is only bad. The third one is mediocre....' So each one was an improvement over the previous one, and by the time he got to number six he thought he knew

what he was doing. That's when he decided it might be something to approach a manufacturer about. So he eventually sold the idea to a small company based on Long Island called Music Technology, Inc., which has since gone belly-up. That first synthesizer was the GDS and later on they did the Synergy, which is more performance-oriented. Both have the Hal Alles-styled oscillator card which lets you do an awful lot of things, more than anything else commercially available right now. But I guess I'm about the only person who wanted to stick with it because it's a hard-to-use instrument. Learning the GDS and the Synergy is like starting to learn to play the violin. Eventually you can do very well with it, but you have to stick with it."

She adds, "The GDS was just perfect for me because I had wanted just this kind of an instrument ever since the '60s, when I was a student. If I had this instrument then I don't think I would've done *Switched-On Bach*. I don't think the whole path that I took, interpreting the classics, would've been necessary. I probably would've gone off and started doing my own music right away. But this tool only came to be in the late '70s, early '80s."

What Carlos particularly likes about the GDS is its open access to the "guts" of the computer. "The DX7, for instance, is a computer, but in designing it they hid the computer. The Synergy is a computer, too, but the computer is hidden. For the GDS, they didn't hide the computer. They just let it all sit out there in front of you. It allows you to play with... everything. You can manipulate each overtone, make one a little sharp, another a little flat, make one a little louder another a little softer. You can do any form of complex FM phase modulation, amplitude modulation, several wave forms. It's very elaborate. And it doesn't have the arrogance that most machines have today. You ask most synthesizers, 'Hey, can you do so and so?' and the implied answer is, 'No, you don't need that.' That's what most manufacturers seem to be telling us today. And I hate that. I'd rather have somebody say, 'We put an awful lot of stuff in here and I don't think half of it is ever going to be useful, but tell me what you think.' That's great. The GDS is like that. It's overbuilt like crazy. And that's really great when you don't know quite what you're doing, when you're throwing darts at a wall in the dark, hoping that

some will stick. I mean, you might as well put more than you need into the machine than to inadvertently say, 'You don't need that,' sort of dogmatically. And that's why so many of the synthesizer people are coming out with the same sort of sounds, because there's not enough variability in it. It's because the manufacturers drew the line and said, 'No, we won't make that open to you.' The DX7 is like that. How could they have designed an instrument and not made it open architecture? Let the user learn how to find patches, or change them, or add 128 patches. That's why I stick with my devices. Everything's open for trial and error."

The GDS is similar in some respects to the old Moog that stands in one corner of Carlos' studio, in that the user has control over the patches. But as Carlos is quick to point out, "The GDS is at least two orders of magnitude more complicated than the Moog. With that you might change 15 things at a time, at most. Whereas, with the GDS, very often you're changing as many as 1,500. That's a lot more. That's why the voices take a lot of time to build, but it's also why they sound so realistic. It's because you've got a very sharp pencil point, so to speak. If you had a housepainter's brush, could you do a portrait of somebody? Probably only vaguely. But if you had a very, very sharp-pointed brush you could do a very fine rendering right down to individual pores and hairs. That's what the GDS is like for me."

Carlos first began working with the GDS on the *Tron* soundtrack. For that project she blended real orchestral instruments with her GDS replicas of orchestral instruments. For *Digital Moonscapes* she built an entire replicant orchestra on the GDS and played the sounds on her two Synergy digital synthesizers. That process of accurately replicating the richness of acoustic instruments was, as she explains, an exhaustive effort.

"Starting with *Tron*, I began trying to find out why the best sounds in acoustic instruments sounded like they did. Why is a Stradivarius such a great sound? How about Steinway pianos or the best Verne clarinets and oboes? It makes you very, very motivated to go in and start performing brain surgery, so to speak, just tinkering with these things and taking them apart and trying to put together something that emulates or replicates what they sound like. So if you can come up

with that, you have the same thing that the acoustic instrument does, in computer terms, or in electronic terms. That process of learning to replicate acoustic instruments took me three years. It's like . . . what do they call it? Woodshedding? I studied textbooks that showed me the basic models of things that people had done in the past. I used that as a starting point. And then by sitting down and being very obstinate, I worked through note by note, trying to get the sounds to match what I remembered of the instruments. I went out and found a few records that had recordings of the instruments of the orchestra, and I trained my ear to remember those sounds. And I'd compare my sounds to them, by ear. In some cases I was very, very close, and in other cases I was quite far. It was a question of making a drawing by looking out at a scenery. I think you learn that kind of thing by sitting down and doing it a lot. If you really spend a lot of hours with your charcoals and pencils and watercolors, trying to duplicate what you see by eye, it becomes pretty clear after some passing months or years when you are finally starting to get a grasp on how this is done.

Then you read about a few other people and how they've done it and you learn from their mistakes. You stand on the shoulders of giants. In my case it was people like Herman Helmholtz, whose book *On The Sensations Of Tone* is a classic in the field. So in the search, you become part of a continuum. You try to get further and deeper only because you come later in time and you have the access to all of the information that came before you, not to mention the better tools, like the GDS."

After replicating the orchestral sounds on *Tron* and *Digital Moonscapes* with great success, Carlos decided to extrapolate from there on her next project, *Beauty In The Beast*.

"I was able to build some very convincing replicas on *Digital Moonscapes*. Just as *Switched-On Bach* was proof that electronic music was indeed music and not just noise, *Moonscapes* was proof that digital synthesis was very sophisticated as a musical instrument, finally. So after that project I thought, 'All right, the next record is going to be the payoff.' And what I did for *Beauty In The Beast* then was to take the basic sounds of the orchestra and begin ex-

trapolating into things like the woodwind glockenspiel, the bowed tympani, the percussive clarinet, the clarolin, which is an instrument that sounds like a clarinet and a bass violin, or the Enca, which sounds like a cross between an English horn and a harmonica. And these are hybrid instruments. They have the properties of both. So the sounds on *Beauty* grew out of the traditionally rich sounds of the past. I wanted to take a step in which all the sounds were different and yet based on what had come before. So it was a learning step of making new timbres that had never been heard before."

Around the time that she was conceiving the project, Carlos got the gadget from engineer Stoney Stockell that allowed her access to the frequency tables in the Synergy synthesizer. Through more trial-and-error, she began writing some computer programs to retune the instruments to literally any scale—some that existed, others she invented.

"It was another detective story," she explains. "More of an adventure story for me as a composer and a musician. I just dug in, became very intuitive once

—CONTINUED ON PAGE 223



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by Craig Anderton

IBM:

WILL THE "M" STAND FOR MUSIC?

At the recent 5th International Conference on Music and Digital Technology sponsored by the AES in Los Angeles, the president of a company that enjoys an excellent reputation for their IBM PC software asked me, with a bit of despair in his voice, what it would take to get the IBM PC established as a popular computer for music applications. I didn't really have an answer at the time, but his question stuck in my mind. Several recent developments, though, indicate that the PC may soon become a bigger part of the musical world.

In prehistoric times (about ten years ago), the Apple II was the computer of choice for music. When the Macintosh came along, not only did it attract a significant number of existing Apple II fans, but its friendly point-and-click, mouse-oriented interface deflated computerphobia in even the most right-brain oriented musicians. For several years now, the Mac has been probably the most popular computer for mid- to high-end music applications.

The low end of the market has been pretty much the province of the Commodore 64, and here lies an interesting lesson for fans of the PC. The C-64 made an impact because of low cost, sheer numbers (there are about five million C-64s out there—quite an attractive user base for software developers), and the coup de grace: a built-in synthesizer. Sure, it's not a DX7 or anything, but with the C-64's SID chip it's possible to make music, even three-part harmonies, without MIDI interfaces or other peripherals.

When the PC came out, it had three main features going for it—the letters I-B-M. Technologically, it didn't really offer anything that hadn't already been offered in computers made by other companies. Economically, it was not any more cost-effective than a number

of other machines that existed at the time. A lot of people didn't like the keyboard, nor the low-capacity disks. And music? Well, without outboard gear, you couldn't do much more than make sound effects suitable for a Space Invaders game.

When Roland introduced the MPU-401 for the PC, music software started

Now, in a surprise move, IBM itself has decided to put its clout behind the PC as a music machine with the introduction of their Music Feature.

to pick up momentum. And when Voyetra introduced Sequencer Plus, one of the first truly pro-level sequencers, it was just in time to catch the first tentative wave of IBM-compatible machines. Still, musicians were waiting for a computer that felt artistic and fun rather than business-like, and when the Mac arrived, it answered those needs. It didn't take long for the Mac to become firmly entrenched as the "artist's computer."

Meanwhile, the PC was all but entrenched as *the* engineering and business computer. Then a funny thing happened: these PC users heard about some new music standard called MIDI, and became intrigued with the idea of using their computers for something other than spreadsheets, word processors, and databases. And when the wave of inexpensive IBM clones started hitting the country in full force, musicians suddenly had the option to buy a computer that was less costly than a Mac but had decent music software support and could run a zillion

other programs to boot. Still, it seemed that the average musician just didn't associate "IBM" with "music."

Now, in a surprise move, IBM itself has decided to put its clout behind the PC as a music machine with the introduction of their Music Feature. Basically an FB01 on a card with a MIDI interface, preamp, headphone outputs, and some other bells and whistles, this option delivers a lot of musical power for under \$500 list. While some pros would not consider this sufficient motivation to buy a PC, consider that this is conceptually very much like adding

a super-SID chip to what is, at present, a relatively inexpensive machine. The result might well be that the Music Feature will indeed bring "MIDI to the masses." For about the same cost as an inexpensive synthesizer, an IBM PC owner can get into computerized music, FM synthesis, sequencing, and all those other computer music applications. (It's also worth noting that Yamaha's association with IBM gives Big Blue the music product expertise they would otherwise lack.) Thankfully (some would say miraculously) IBM went with the existing MIDI specification rather than come up with their own, proprietary standard. However,

their card is not MPU-401 compatible—a regrettable move, considering the amount of MPU-401 compatible software that has already been written for the PC.

So the PC now has several things going for it: sheer numbers, price (clones are a bargain these days), and an easy-to-add, surprisingly capable music option. Several companies (Yamaha, Passport, Electronic Arts, Electronic Courseware Systems, Dr. T's, and Magnetic Music among others) have already committed to providing software for the Music Feature, which presumably will have been announced at the summer NAMM show by the time you read this.

Who are the winners and losers in all of this? Apple will lose little if anything. The Mac has its niche, and developers are already salivating at the prospect of writing software for the Mac II. But the Atari ST and Amiga 500 now face some serious musical competition. The ST has always offered low price coupled with power as its main attraction; but IBM clones offer an equally low price and a huge choice of software and peripherals, with the only tradeoff being the lack of a graphics-oriented interface and the power associated with 68000-based machines. (Granted this isn't a trivial tradeoff, but it's mostly of academic interest to those who regard their computers more as appliances for doing spreadsheets and such—ever tried to process words with a mouse-dependent software package?) The Amiga 500 is positioned squarely against the ST and is subject to the same competitive pressures.

Which brings us full circle to the question, "What will it take to make the IBM PC a desirable choice in the mind of the musician looking for a computer?" The answer is price and numbers. The clones have taken care of the price, and the Music Feature will make it easy for all those PC owners to get involved with MIDified music. If this spurs software companies to support the PC in ever-increasing numbers, we can similarly expect an increasing number of musicians to think of the PC as a musician's computer. ■

Craig Anderton is the editor of our sister publication Electronic Musician, and is guitarist/keyboardist for the synth band Transmitter, as well as author of numerous books and articles for MIDI users.

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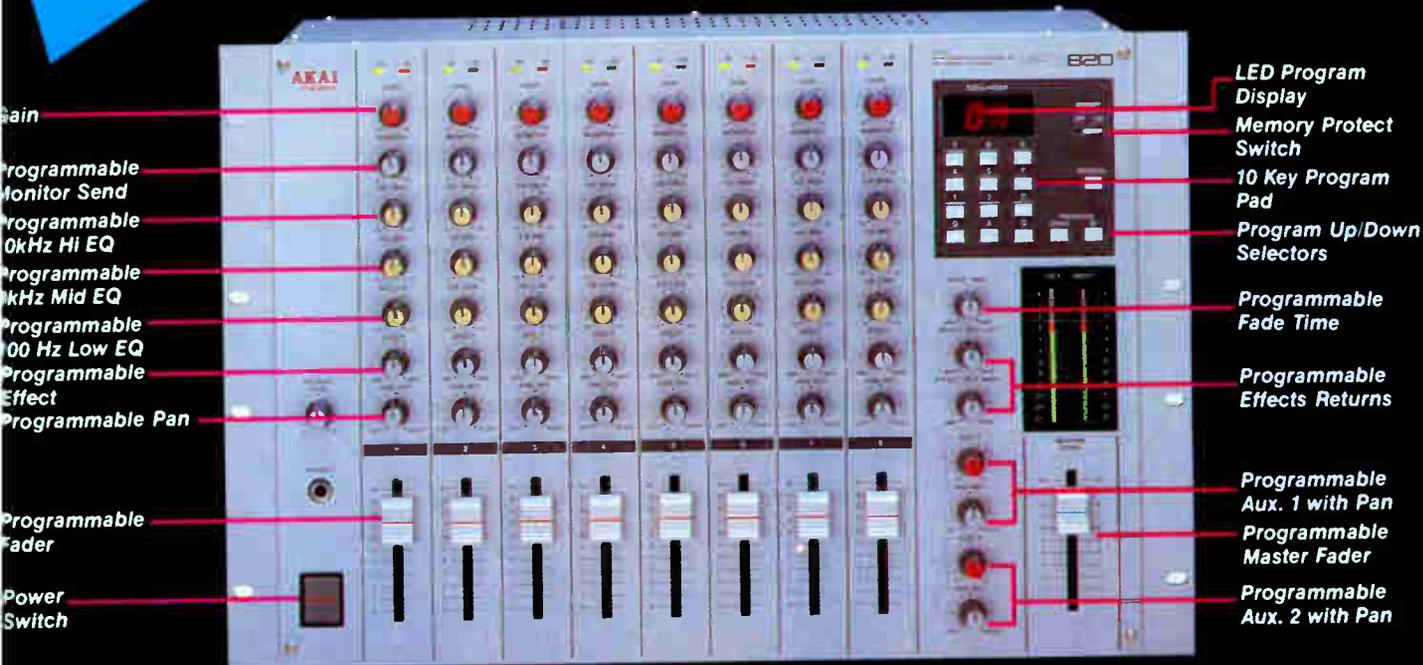
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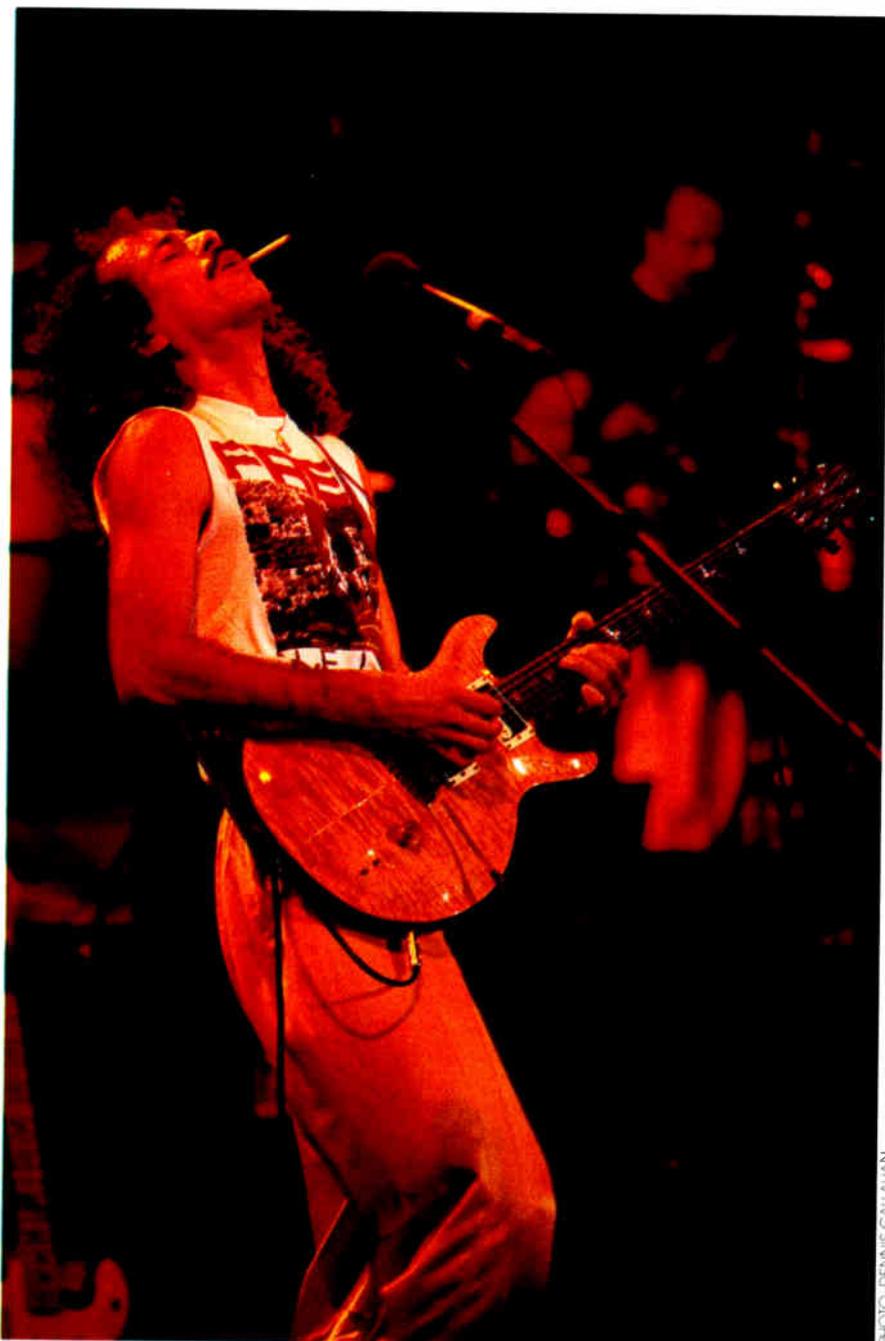
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SANTANA

TWO DECADES ON TOUR

BY IAIN BLAIR



The Iron Curtain—It's 3 a.m. as the Santana tour bus pulls up at some God-forsaken checkpoint on the Hungarian border. Still recovering from a show in Graz, Austria, a few hours earlier, everyone is rudely awakened by the Soviet-style guards who clump on board, guns at the ready, to check visas and passports.

Their breath visible in the chilly night air, these young, grim-faced soldiers look even more wiped out than the musicians, as they suspiciously examine papers. Suddenly it dawns on one of the youngest soldiers that far from carrying another load of curious tourists, the bus is temporary home to one of rock's most famous guitarists.

"Carlos Santana!" he beams. "Ze rock and roll!" And a second later, in a perfect display of *glasnost*, the guard is back out on the tarmac and moonwalking better than Michael Jackson. It's a truly surreal moment, captured on video by the band as we all applaud wildly and drive off into the night towards the next gig in Budapest.

"Man, that was something," smiles Carlos Santana. "You see the power of music?"

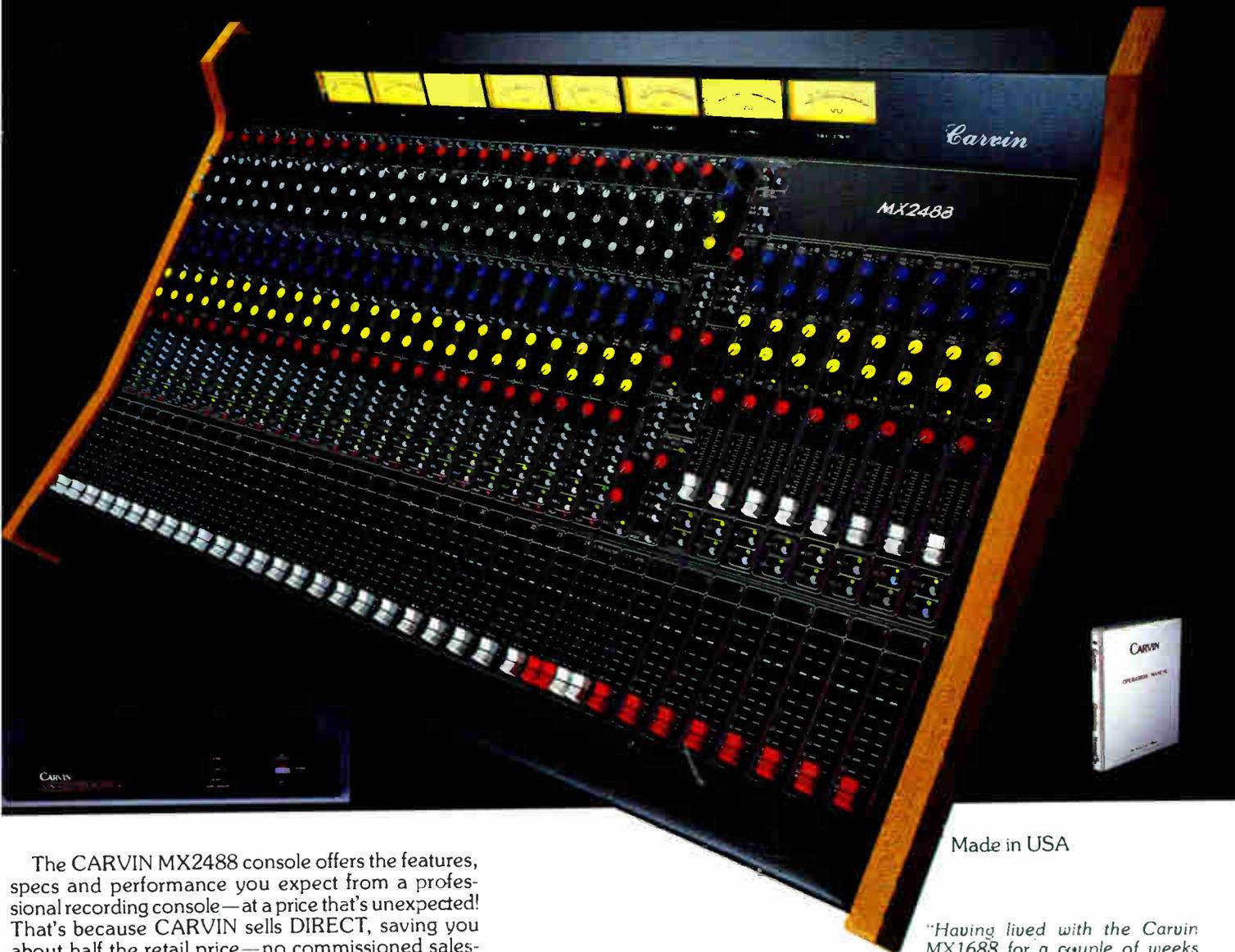
The following night's show at the giant MTK Stadium is even more extraordinary. A capacity crowd of 35,000 rock-starved fans stand in the icy rain as Santana leads his band through a three-hour set that mixes such classic cuts as "Oye Como Va" and "Black Magic Woman" with "Vera Cruz," the first single from the group's latest album, *Freedom*.

The aptly named LP—Santana's 21st—is also the title for this, the group's tenth international tour, that is winding up its European and Mid-Eastern legs after taking in such diverse locales as Helsinki, Jerusalem, East Berlin and

PHOTO: DENNIS CALZAJAN

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now Budapest, before attacking the U.S. this summer.

In fact, after 20 years together, Santana has sold more records and concert tickets internationally than any other band. And with a current lineup that boasts a wide range of nationalities and ages, it's no wonder that Carlos Santana proudly introduces his musicians as "The World Band from the Americas."

Back in the warmth of his dressing room after the Budapest concert the guitarist ponders life on the road after two decades, and the problems involved in getting the famous Santana sound across to audiences around the world. Additional insights are provided by the band's chief sound engineer, Kevin Sims.

Mix: What have been the tour highlights so far?

Santana: Definitely the Iron Curtain countries, East Germany and Hungary, where fans will stand in snow if necessary to hear a concert.

Mix: Any problems in those places?

Santana: None at all. We were invited by the governments, and they've been

"I never identified with personalities like Elvis. I always identified with musicians, like B.B. King and Miles Davis."

very cooperative. The only restriction was "Don't smoke on stage." Otherwise they've been very open.

Mix: What was the idea behind the "Freedom" title?

Santana: Freedom from all categories and politics. For instance, my parents, who're Mexican, are very nationalistic, but I'm not. I have no allegiance to flags or countries. It's really about music being above all such considerations.

Mix: Back in America, you seem equally aloof from trends or local scenes.

Santana: You're right. For a long time I never felt part of the "San Francisco thing," and I didn't get along with other bands like the Grateful Dead. I never

saw myself as part of that scene. But it's changing. Perhaps I'm mellowing out in my old age.

Mix: When you started the band, did you ever think you'd still be playing and touring some 20 years later?

Santana: Sure, 'cause I never identified with *personalities* like Elvis. I always identified with *musicians*, like B.B. King or Miles Davis. And when you're a musician, it doesn't matter *where* you are, as long as you can play. You don't have to always headline Madison Square Garden or whatever.

Mix: How has the music business changed since the mid-'60s?

Santana: It was always a tug-of-war between art and commerce, but it's become much more *business* now. Musically, there's probably more variety now, but there's still a big percentage of shit out there. Hey, Night Ranger and Bon Jovi couldn't swing their way out of a paper bag.

Mix: What about radio?

Santana: Well, we don't really get airplay in the U.S. and that's 'cause we can't be categorized. There's Latin,

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there's jazz, there's rock, there's blues—but radio can't handle all that in one group. They want it neatly packaged. Radio's very different in Europe, though. In Hungary, you hear classical music followed by Prince. And in Britain, you hear *all* types of formats on the same station, so there's far more cross-fertilization. It's a lot healthier to me.

Mix: The *Freedom* LP was delayed quite a while. Why?

Santana: Basically because we had a few problems with CBS, so we had to re-cut several tracks, as they couldn't "hear the hits." [He makes a face.] So they blocked it. Man, I told 'em, "I can't believe *we're* the midgets and radio directors are the giants now!"

Mix: Over the years, the band has had over 30 different lineups.

Santana: Yeah, and it's been a blessing to have that revolving door. It allows Santana to keep evolving.

Mix: The current nine-man lineup is certainly more compact than some incarnations of the band, but it must still present considerable sound problems, both live and in the studio.

Santana: You're not kidding! Like you say, this version is relatively streamlined. In the past, we've had as many as 18 players, and it can get too crowded—there's just too much going on, especially when you have, say, three keyboards, which we used a couple of years ago. With all the MIDI technology, one guy like Chester Thompson can do it all today. But Santana has always had a core of players, both young and old, which I feel is also unique. And there's all nationalities represented too. Conga player Armando Peraza is 73 now, Cuban, and has been with me since 1972. On the other hand, Raul Rekow who also plays congas, is only 30, and has been with me for 11 years. The group inspires a lot of loyalty. Buddy Miles, who I worked with back in '72, has now joined, and Alex Ligertwood is back again—he's Scottish. Then we have an English drummer, Graham Lear, and an American bassist, Alphonso Johnson, who's played with everyone from Weather Report to Woody Herman. It's pretty eclectic, and I'm very proud of that fact.

Mix: How do you go about capturing the live impact of the band on record?

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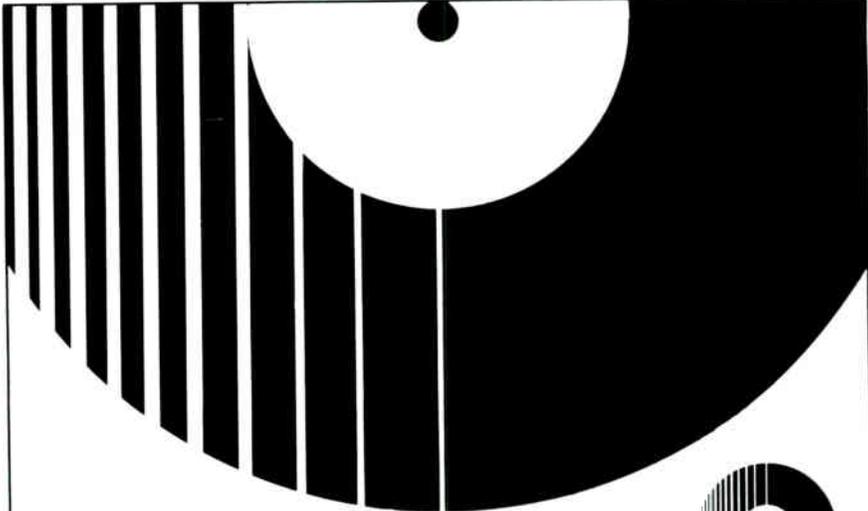
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The Sound Heard 'Round the World

A very wet and cold Kevin Sims, Santana's sound engineer, explained some of the audio problems facing him and his crew at the other end of the venues.

Mix: What are the major considerations facing you every time you arrive at a fresh gig on the road?

Sims: Well, right off the top, no matter what venue you're setting up at, you've got to deal with the fact that Santana isn't your typical four-piece rock and roll outfit. If anything, it's primarily a *conga* band, with heavy Latin and African influences. Then on top of that structure, you've got all the other types of music that have been added over the years—everything from jazz to blues, R&B and rock. So you've got a lot of performers up there on stage, each with his own definite style and sound, and a big

percussion line that all need to be heard individually *and* together. There are *always* problems keeping Armando's congas separate from Raul's, and their sound separate from the bass, etc. The single most important thing in doing Santana's sound is the need to always keep the big picture, the overall spread, clean and crisp.

Mix: What about the difference in venues? How do you go about getting the best results when sometimes there's not even enough time for a proper soundcheck?

Sims: Good question! It's really a matter of balancing judgement and experience with a certain amount of sheer guesswork. There are simply so many variables involved, from the weather, if it's an outdoor gig, to the type of hall and size of audience. For instance, we played the show in Graz, Austria, in an ice-hockey stadium which was incredibly loud and full of reverb. So I had to hold back *all* of the lower end. In the crossovers themselves,

I reduced everything from 200 cycles down and cut it all out. Consequently, the drum sound probably suffered slightly, but there wasn't a lot else you could do.

Mix: Does it take a while for the sound to settle down?

Sims: Sure. The first two or three numbers are always tricky. But then there are also songs like "Oye Como Va" and "Gypsy Queen" which have certain points you can always cling to, because they always sound the same in terms of the arrangement. They're like life rafts in the really tough situations! In Graz, because of the echo of the rink, I also had to reduce the entire mid frequencies from 200 to 1,600 cycles, and even with a full house, the audience didn't soak up all the delay.

Mix: At least that was indoors and dry. What about Budapest?

Sims: Horrendous, from the point of sound. We had no time for a sound check, and it was also very windy in addition to the rain, which

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Santana: One thing I really like to do is just get everyone in the studio and play the tracks live, man. That way, if it's cooking, you keep the feel. But you really need an engineer who knows the band and the music well. For the *Freedom* album, I wanted to work with Jim Gaines again, but Steve Perry kept hogging him for about a year, so I could only get him in between those sessions. Then there was all the touring that we were doing, so that's another reason it took so long to complete. Plus the fact that we actually ended up cutting over 20 tracks—and most of them were done in one take. What uses up all the time with this band is overdubbing all the extras, like percussion. That's very tricky. Anyway, we used Jim Gaines, who really knows my sound and how to get it quickly, along with some other engineers, Jim Scott, Bib Missbach and Maureen Droney.

Mix: Where was the album recorded?

Santana: It was all cut and mixed at The Plant Studios in Sausalito. And we used Studio B primarily, with some stuff being cut in C, and two songs, "Victim of Circumstance" and "Man-

caused even more problems, both on stage and out in the stadium trying to monitor the sound. Everything was covered in plastic, even on stage, and Kevin Chisholm, who's in charge of the stage monitors, was also reduced to peering through a little slit to see what was happening.

Mix: Do you always use all your own P.A. system?

Sims: No, and that made the Budapest show even more difficult. Because of the size of the stadium, we were also using half of a system, brought in specially, that we'd never seen before. As it turned out, it was a Martin design that's been around for quite a while. It's horn-loaded, very efficient and fairly compact, with a lot of "throw" which is great for outdoor venues. But many bands, Santana included, are now going for more hi-fi systems such as Clair Brothers, Audio Analysts and Showco. So we then had the problem of mixing an old Martin-design rental system with our Showco sys-

tem. You must remember, of course, that all musicians are also used to a certain sound, so what I've been doing is placing the rental P.A. cabinets outside our own equipment. For instance, in Budapest, our Showco equipment probably covered 60% of the stadium, while the rental took care of the rest. But although there were terrible problems with the weather and thus no soundcheck, the Budapest stadium had great acoustics for an outside venue, with no slap coming back and a very direct sound. And many times you have phasing problems when combining your own P.A. with rental systems, but not this time.

For most of the tour, we've been able to just use our own system, because generally our touring P.A. equipment can handle up to a 14,000-seat gig, indoors or outdoors. But above that figure it's really pushing it a little, so we augmented where necessary. For instance, the Paris gigs were over 18,000, so we combined the Showco with a rented Audio Analysts system we

got locally. We basically added a center cluster, and it worked out great.

Mix: What was the most problematic venue in terms of sound?

Sims: I'd have to say Jerusalem, without a doubt. In fact, the sound sucked, but there was really nothing you could do about it at all. For a start, we didn't have *any* of our own P.A. system there, just the band gear. That's because import costs are so prohibitive, and there are a lot of hassles involved. It's the same thing if you play in Latin America or Russia. Anyhow, the promoters told us that we'd be using some original Pink Floyd P.A. equipment that they'd allegedly left there—very peculiar. Basically, the results were awful. Very loud, but awful. That show was really the low-point of the entire tour for me.

Mix: What have been the high points so far?

Sims: All the shows at the London Hammersmith, the ones in Munich,

dela," in D. It was then mastered by Bob Ludwig at Masterdisk in New York.

Mix: How do you go about getting the raw material organized?

Santana: Well, Chester, who co-produced with me, and I initially bounced ideas off each other, and then we'd tape the jams, take the cassette to the studio, and start working on arrangements with the rest of the band. And I'd either get the whole group in and play for the dynamics, or I'd get the basic track down first and then start overdubbing. It all depends on the song and what suits it.

Mix: Have your recording methods changed much over the years?

Santana: Yeah. I've experimented quite a lot with sounds and new equipment, and I gradually assimilate and use what works best for me. Sometimes I'll put down a sequencer track first and build from that, and then add Graham on real drums. It all depends.

Mix: Do you think of yourself as a tech-head?

Santana: Not really. I'm really more of an instinctive, straight-ahead musician



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and Versay stadium in Paris. Each one had really excellent sound. Really, anywhere in the civilized world like that you're going to get great sound. But once you hit some of these out-of-the-way places in the Mid-East or South America, you're going to get big problems. It's the nature of the beast.

Mix: Finally, does Carlos dictate pretty much what he wants to get across, or do you have a fairly free hand in designing the sound?

Sims: Well, Carlos has his unique sound, and naturally that's what he wants to hear—and it's what people come to hear. But it's remarkably straight-ahead, with very few effects and tricks. The man just gets up there and plays. Really, he gives me a free hand with effects, and I can just experiment. If he doesn't like it he'll tell me, and then I'll modify it or whatever. But basically he just leaves me alone to try out ideas and get on with the job at hand. It's a great arrangement.

—by Iain Blair

"I try to keep it simple, so I use very few effects and pedals."

and producer. To be honest, I like as little make-up as possible—nothing to clutter the sound. My basic aim is to always get that unique sound that can be recognized even after hearing just three notes. And it ain't easy!

Mix: So how do you get your distinctive sound? What's your secret?

Santana: No secrets, man. Like I said, I try and keep it simple, so I use very few effects or pedals, either live or in the studio. I use two BOSS choruses and two BOSS digital delay units, and apart from some occasional use of the Mutron wah-wah and my Yamaha octave divider, that's it.

Mix: What's your live equipment setup?

Santana: I basically use three Paul Reid Smith guitars which I play with these big picks shaped like tortilla chips. I've actually got about 25 to 30 guitars, but these are the ones I use live, along with a Yamaha. The first thing I ever do when I get any new guitar is to change all the pickups, but old guitars I never alter.

Mix: What about amps?

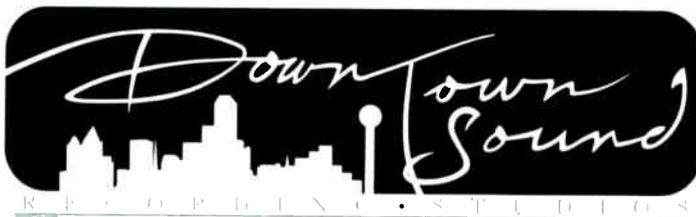
Santana: To get my sound, I use Boogie amps, with most settings around 7. I rarely open 'em all the way up, although it depends on the size of the venue. Specifically, I use an old '73 Boogie Mk I with a single 12-inch miked cabinet for that stinging lead sound, and a '73 Boogie 300 with E-V speakers for that clear, clean sound. And when I want the real rock and roll crunch sound on heavy chording, I switch to a Marshall JCM 800 stack with an extension cabinet. The rest is in the playing.

Mix: In terms of other guitarists, who do you like?

Santana: I love anyone with a distinctive sound, guys like Andy Summers and Robert Fripp. Even though they get copied a lot, they still sound unique to me. I also like Sammy Hagar's sound, believe it or not, and Hiram Bullock, although he's beginning to sound a bit samey to me these days. And I still love Eric Clapton. Man, I went to see him recently, and he just blew me away. He's playing better than ever, although he went through a kind of rough patch a few years back. The thing is, he's willing to take chances, which most players aren't. They all want to play it safe and sound like every other player around.

I mean, look at a player like Neal Schon, who was in one of the early versions of the band. He's a great guitarist, but now he's got this huge rack of effects and he's sounding exactly like every other session player with the same setup. That's the great problem for every player—how to find your own sound and voice, and step away from all the influences and ideas that have shaped you and say it in your *own* language. I always remember what Miles Davis used to say to John McLaughlin—"You gotta play guitar like you don't know how, every time." And he's right. It's a matter of shedding your skins. After ten, 20 minutes, you stop sounding a bit like B.B., or Eric, or whoever, and you find yourself.

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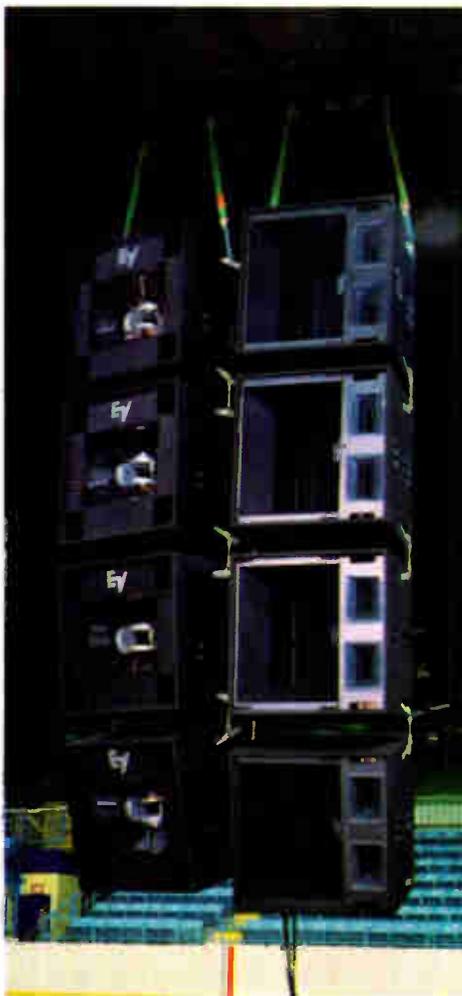
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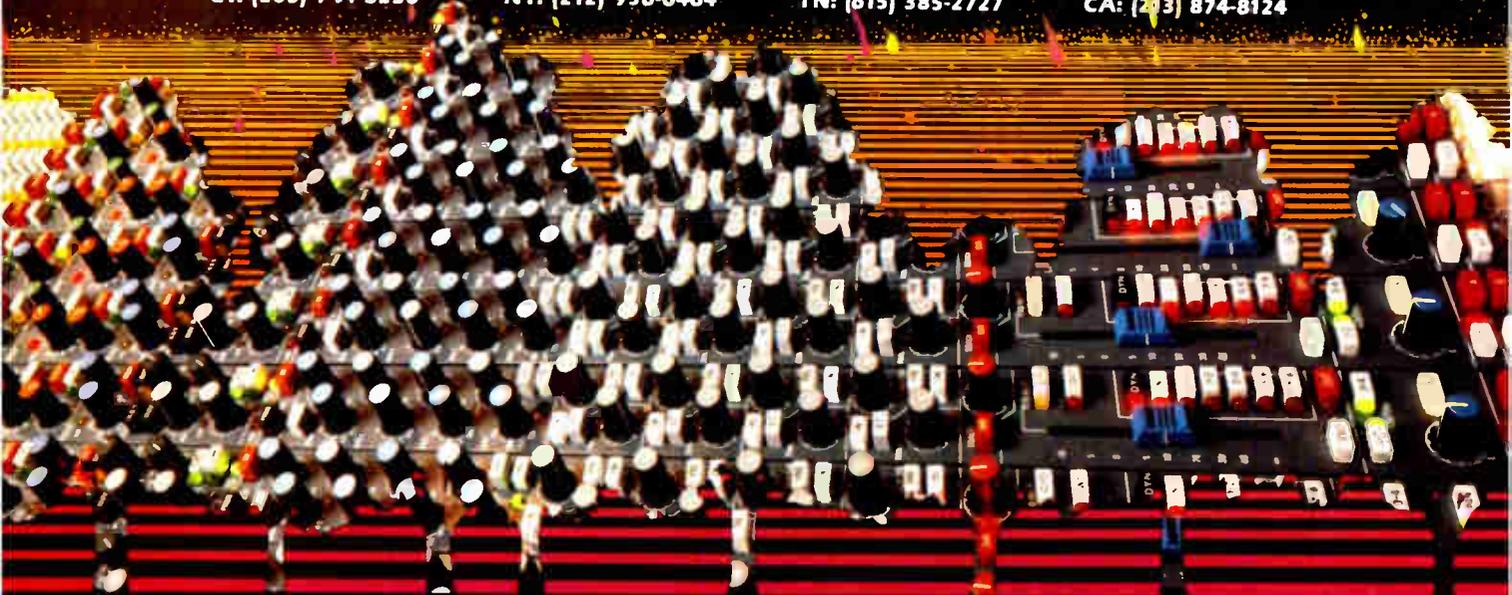
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Mix: Who do you listen to these days?
Santana: Miles, Coltrane, Otis Rush, Prince—really anyone with a vision.

Mix: What about producers and engineers. Who do you like?

Santana: Well, I love Bill Szymczyk, who worked with The Eagles, and I like Keith Olson. I actually did a whole album with Keith around '81, but it never came out. It just sounded too white, too mid-American for me. [He laughs.] But the guy's good. Overall, I think Jim Gaines is still my number one choice, though. He's fast and he gets my sound. He produced the new Neville Brothers album, *Uptown*, and he called me up to guest solo on this track, "Forever." So I went in, got my sound, and told the engineer to keep the studio door open to get all the tones and the highs and lows of the overtones. We did the whole thing in under 20 minutes. That's how I like to work with Santana—keep it fast, keep it moving.

Mix: It's your band. Are you a dictator?

Santana: Not at all. It's a team, and I don't need to hog the limelight. In fact, I've *never* fired anyone. By the time I decide, they've already quit or disappeared. The truth is, the only person who ever got fired from the band was me.

Mix: What happened?

Santana: It was just after the third album. There was a really bad scene surrounding the band in those days, man. A lot of drugs, a lot of pimps. I wanted to fire our manager at the time and there were big arguments. In the end, they fired *me*. But after three days, they called up, and we re-organized.

Mix: After your early success, you kept a pretty low profile for most of the '70s, at least in terms of press.

Santana: Yeah, I didn't talk much 'cause after my involvement with Sri Chinmoy the press got very cynical towards me—you know, I had no sex or drug scandals. But I guess I also got a little weird and humorless around that time too. That's a danger of getting too spiritual, maybe.

Mix: After following the guru for a decade, you left him in 1981.

Santana: Yeah, I got very disillusioned in the end. He certainly helped me a lot in certain ways, but it's all a power trip, just like the PTL thing today. Gurus

love to convince their disciples that if you leave them, you'll drown in a sea of ignorance. But it's just not true. It took me a while to find out, though.

Mix: During that period you released several album collaborations, such as *Illuminations* with Alice Coltrane and *Love Devotion and Surrender* with John McLaughlin. Any more solo plans?

Santana: I'd love to do something with Jimmy Page. We talked about it, but nothing's happened so far. I'd also like to work with Stewart Copeland and Jimmy Cliff. And Paul McCartney. We'd work well together, I feel. I'd get him back to his street roots.

Mix: You've also worked on the soundtrack for the upcoming film about Ritchie Valens, *La Bamba*.

Santana: I don't usually get involved in "Hollywood"—type phoney-baloney stuff, but my wife forced me to read the script and I couldn't put it down, so I thought "Why not?" It's a great story, and I really think if Valens had lived, he'd have been the father of a lot of the punk and heavy metal stuff that happened later. I'm pretty happy with the results, and I think [director] Taylor Hackford has done a great job. I'm looking forward to seeing it.

Mix: What else is in the future for you? Any unfulfilled ambitions?

Santana: I'd love to go back and play Mexico, except that the last time I was there, in '85, I was really attacked by the press for becoming an American citizen and "selling out." But they're still musically so locked up in the '60s. They need to open up. And the last time I *played* there was back in 1973, 'cause your equipment always get stolen. Don't get me wrong, man, I *love* the people, but not the promoters. You can't find an honest one.

Mix: This 20th anniversary tour will last almost six months. Any plans to ever retire from touring?

Santana: No man. Look at Eubie Blake in a wheelchair. I feel the same way. As long as you can wheel me out there, I don't care. I'll just keep playing. ■

"Count" Iain Blair, British writer, musician, and author, was an original cast member of the Rocky Horror Show and the film version for 20th Century Fox. He's currently writing screenplays in Los Angeles.

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NANCI GRIFFITH: COUNTRY-FOLK THE HARD WAY

by Holly Gleason

Armed with a high, pure voice and an acoustic guitar, Nanci Griffith could well be the perfect prairie home companion. Her songs, intricate miniatures of everyday life, have all the charm of a Currier and Ives print.

"I'm just terribly infatuated with the middle class," Griffith explains in a soft Texas drawl. "I think their lives, just common family lives and the normal simplicity of everyday life, are so complex. They're lovely people as well and

to me, each individual walking around is a small novel."

Griffith is a product of folk music's journeyman tradition. Having released four independent albums—*Poet in My Window*, *There's a Light Beyond These Woods*, *Once in a Very Blue Moon* and *Last of the True Believers* (the latter earning Griffith a Grammy nomination in this year's new Contemporary Folk category)—she honed her craft on the coffee-house-and-folk-festival circuit and the occasional honky-tonk.

With *Lone Star State of Mind*, Griffith's debut for MCA Nashville, the sweet-singing songwriter ups the ante considerably as she makes a more directed play for those honky-tonk dwellers. Though it's rare



PHOTO: McCURE

for country and folk music to share anything more than roots, Griffith may be the exception to the rule; after all, her tastes never have been mutually exclusive.

"I'm a country-folk singer," she says flatly and firmly. "When I look in the mirror I see someone who's a borderline country performer and someone who's a borderline folk performer. For me, the two have always complemented each other."

No doubt because Griffith cut her performing teeth in a series of Lone Star barrooms at the tender age of 14, parents by her side. These two disparate elements—strong family support and the thrill of life's wild side—combine to lend Griffith's songs a pungent sense of reality to temper their strong sense of values.

"Love at the Five and

Nanci Griffith: "Each individual walking around is a small novel!"

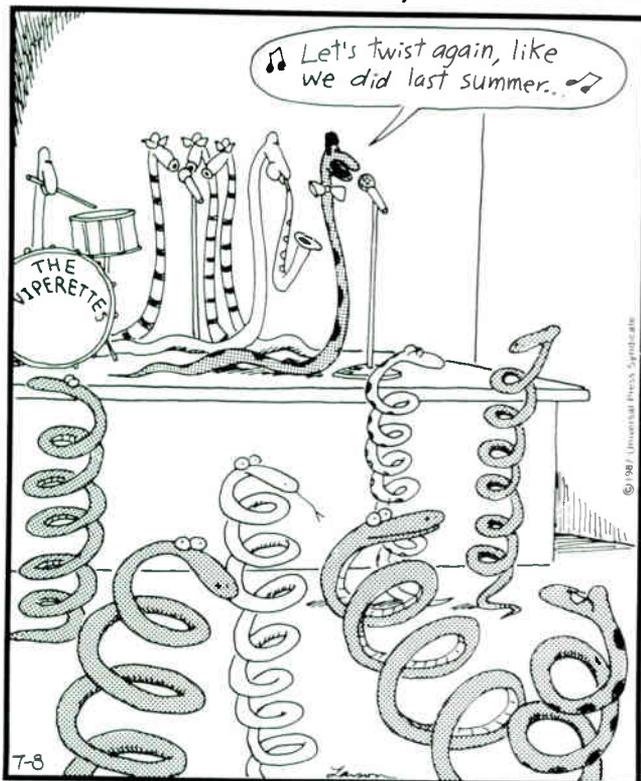
Dime," a Griffith-penned Top 5 country single for Kathy Mattea, deals with infidelity and late-night barrooms, but is more a tender tale of love conquering all. Indeed, Griffith's songs are populated with a varying cast of characters, ranging from the middle-class black couple who have their pride and each other in "Mary and Omie" (from *Very Blue Moon*), the streetwise lady of the night in "Lookin' For The Time (Working Girl)" (from *True Believers*) and the industrious mother who shakes off a husband to build a far better life in "Ford Econoline" (*Lone Star*).

And along the way, Griffith has developed the vocal characteristics to

—CONTINUED ON PAGE 214

THE FAR SIDE

By GARY LARSON



K. D. LANG FILLS A VOID IN COUNTRY

by Holly Gleason

"If someone had told me I was listening to country music I'd've told them, 'I'm not!'" says K.D. Lang. "I loved 'Silver Threads and Golden Needles' by Linda Ronstadt—I just didn't think of it as country. To me, country music was Tammy Wynette and George Jones. I just didn't understand the distinction."

Though Lang's music is most certainly country, her debut album, *Angel with a Lariat*, already has her tagged as country's answer

to Cyndi Lauper. But Lang is no kewpie doll; she's a big-voiced 25-year-old intent upon finding a place in country music that she can call her own.

The question remains, though, whether country music is ready for K.D. Lang — especially given the chilly reception radio

K.D. Lang



PHOTO: VICTORIA PEARSON

gave to her first single, a remake of Lynn Anderson's "Rose Garden."

"I knew it wasn't going to be easy for me in terms of straight-ahead country music," Lang allows. "My goal isn't making country music to sell only to a

—CONTINUED ON PAGE 215

LOU GRAMM'S FOREIGNER RELATIONS

by Roy Trakin

Lou Gramm is not a happy chappy. After more than a decade as lead singer in the mega-successful, platinum supergroup Foreigner under the thumb of band founder Mick Jones, the 34-year-old Rochester, NY, native has declared his independence with a solo LP, *Ready or Not*, and the hit single "Midnight Blue." His success has fueled speculation the hard-rocking vocalist is ready to spurn the group for his own solo career, though Foreigner management now insists Gramm and Jones have agreed to keep the group together—at least for the time being.

—CONTINUED ON PAGE 216



phone, pipe organ, and full orchestra for which he composed and conducted. His most recent recording, *Spirits*, contains almost no piano, but lots of flutes,

recorders, tablas and percussion, all played by Jarrett.

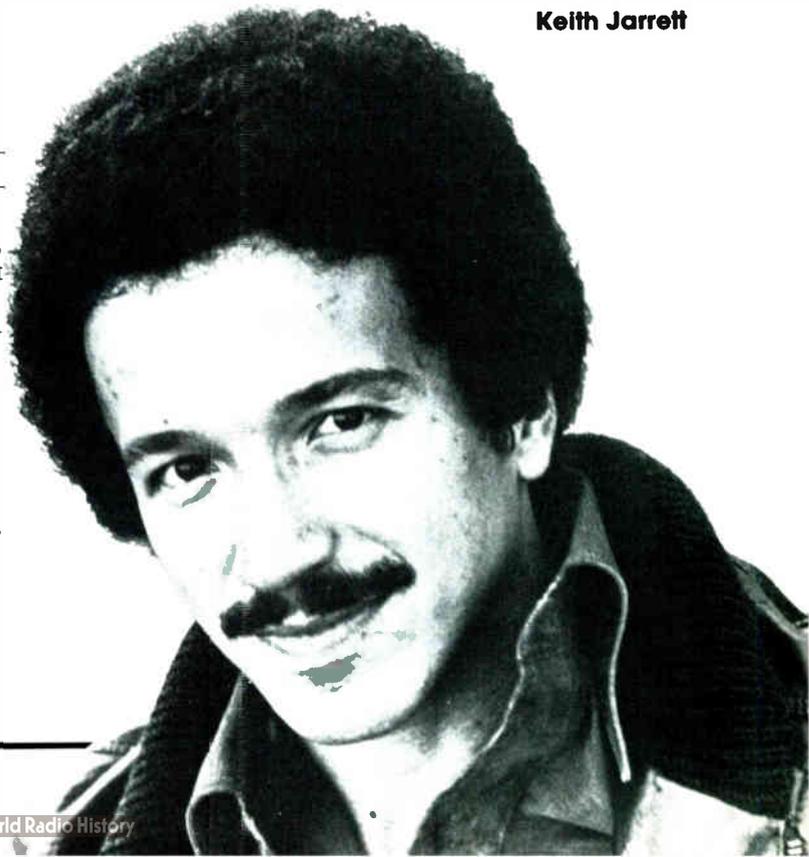
Above all else, Jarrett is an explorer, channeling —CONTINUED ON PAGE 219

THE SPIRITS OF KEITH JARRETT

by John Diliberto

As I pulled into the driveway in Oxford, New Jersey, the sounds of a cornet drifted out through the wooded yard of pianist Keith Jarrett. This might seem surprising to most of us who think of Keith Jarrett as the virtuoso solo pianist and jazz artist who almost single-handedly launched the solo piano craze of the 1980s with *The Koln Concert* and *Solo Concerts: Bremen & Lausanne*. But Jarrett's recording and performing career has also included soprano saxo-

Keith Jarrett



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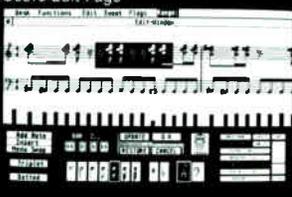
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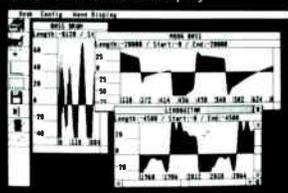
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—FROM PAGE 212, GRIFFITH

make each of her character songs believable, be it soft and sweet ("Love at the Five and Dime"), feisty and guttural ("Ford Econoline," "Working Girl") or hushed ("More Than A Whisper" from *True Believers*). As she says, "It comes from having to be able to communicate in crowded bars, knowing people aren't going to hear all the words. You've got to put a lot across in your tones and the rhythms of your phrasing. It's something I learned from necessity."

Griffith managed to overwhelm MCA's senior vice president of A&R Tony Brown. As the man who'd become her co-producer recalled of first seeing the cotton dress and anklet-sporting songstress, "When I went to see her, I was just star struck. It was like the first time I saw Dolly or Emmylou. Her music just engulfed me—it was so-o-o good! It took me three times seeing her before I finally realized what an incredible performer and writer she is."

But can Nanci Griffith find happiness in the far more produced world of country music? Granted her folk albums boasted players like Everly Brothers veteran guitarist Philip Donnelly and superpickers like Mark O'Connor (fiddle/mandolin/mandola), Roy Huskey Jr. (upright bass) and Bela Fleck (banjo); but what happens when the major label gets involved?

"Working with Tony was just as wonderful as working with Jim Rooney as co-producer," Griffith enthuses about her major-label relationship. "I like to record together as a band—getting everybody's input and energy, just going wild with that energy in the studio. In that respect, there were no changes.

"We added Russ Kunkel on drums and John Jarvis on keyboards which was very nice. But we were all in there recording together with very few overdubs. And for me, vocal overdubs are absolutely taboo—I'd rather sing live, even if I miss something a little bit and have that feel and emotion and phrasing, looking from band member to band member, smiling."

While Griffith may not be the die-cast female country singer, she thinks she's got something to offer just being herself. "Ultimately I'd like to be able to make a living doing my music and

writing my prose (she's finished *Two of a Kind Heart*, a novel) for a long time to come.

"There's a simplicity to what I do, and I think a lot of people hear my music, hear a character and it's them! When I sit down to write a song, I don't consciously think 'Is this a country song or a folk song?' I just write my music, and anyone can respond to it however they see fit. . . ."

Preconceptions and misconceptions are something that Griffith has had to fight, but she's weathered well. Recalling the folk scene's initial reaction, she laughs, "I was always the kid that fell off the turnip truck! I certainly don't eat granola; I'm not a vegetarian. I like to drink a beer or have a glass of wine now and then, so I'm a real wild child, you know?"

But it's forced Griffith to pursue music in her own fashion, to do what she feels is right for her music and herself. She's confident it will pay off in the long run.

"I've *always* done things the hard way: taking my music out on the road instead of bringing it to Nashville was a decision I made eight years ago. I didn't think my music was commercially accessible, so I took it to America itself rather than change it and turn it into something I didn't believe in—that's what all my heroes had done, people like Carolyn Hester in the '50s, Woody Guthrie and Hank Williams Senior.

"It may have been the long way, but my audience is there and they know that I'm not just some voice on the radio, someone manufactured by the industry. Because I've always been there for them in person, I think they'll always be there for me. That's all I could ever want, really."

—FROM PAGE 212, LANG

straight-ahead country market. I'd like to go beyond that, to the people who look at country music the way I did."

There is "a certain void" in country music which Lang doesn't want to define but would like to fill. "I don't think I have to overcome the fact that country music isn't hip, because it *is*. It's all in the attitude, and I think there are extremes. It's either very hip or very comy!"

Having Dave Edmunds as producer and Sire Records as label certainly hedges all bets as regards hipness, but *Angel with a Lariat* sells itself on its

musical merits. Lang describes the record as "One wing-ding daddy-o of a good time," with foot-stomping workouts like "Tune Into My Wave," "I Got the Bull By the Horns" and "Watch Your Step Polka" (the latter threatening to change the face of square dancing forever), plus weepers like Lang's yearning "Diet of Strange Places" and Patsy Cline's vintage "Three Cigarettes in an Ash Tray."

There's a definite kinship between Sire head Seymour Stein and the plucky Canadian who once sent Anne Murray a set of lyrics written in purple felt-tip

with a note that said, "You have my permission to write music for these lyrics."

"I was playing at the Bottom Line and I'd been talking to a bunch of record companies," Lang recalls. "After the show, Seymour came backstage and said, 'Do you know "Ballad of a Teenage Queen" by Johnny Cash and "She's No Angel" by Kitty Wells? It was love at first sight!"

Professing a belief that she'd be making records from the time she was two has something to do with the confidence Lang exudes on vinyl. There is

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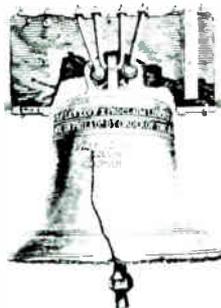
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MUSIC · NOTES

nothing tentative about her live performances, either—something she credits to having grown up in a small (650 people) town on the plains of Alberta.

"I have a theory about small towns," Lang explains. "Everyone is eccentric, and since you're in a small town you know everyone and you also know all their idiosyncrasies—so you tend not to notice them or worry about them. Then you can just go on doing what you're doing without having to worry about what other people are thinking."

Onstage, "I'm very energetic, but I'm worried that people will think I'm cow-punk. What people see onstage is completely natural. It's just the way I react to my music."

—FROM PAGE 213, LOU GRAMM

Of course, that wasn't quite the impression I was left with after an earnest tete-a-tete. In fact, Gramm was quite frank about where he stood after I compared the brouhaha to the skirmish between David Lee Roth and Eddie Van Halen which tore that band apart.

"I don't think it's a feud," he offered. "It's actually been more like a cold war. Since my record's come out, there's been noncommunication as well as misinterpreted motives. We're intending to resolve this thing one way or another, either reconcile or sever."

Gramm went on to place the blame for the chill directly on the shoulders of manager Bud Prager, whom he accused of "making ridiculous ultimatums.

"I don't think Mick and the rest of the guys want me out," insisted Gramm. "Nor would I think Mr. Prager does, either, but he has been making statements that there'd be a new lead singer in Foreigner if I didn't cooperate.

"It's disruptive and sad and I honestly don't know what's going to happen," he continued. "It all revolves around them being able to deal with the fact that I have a solo career and it has to take priority in my life right now."

In fact, Gramm's LP had put a cramp in Foreigner's recording plans. The band had studio time booked for March and was already starting to rehearse six new songs. Everything was put on hold when Gramm's record began to happen.

"That doesn't mean I can't find the time, nor am I unwilling to continue

with Foreigner," claimed Gramm, "as long as they can accept my participation on a limited basis. After all, it is Mick's band. He directs it, he initiates the songs; I play a secondary, supporting role. Why would I make a secondary role my priority as opposed to something I can nurture and grow with, like a solo career? If they can accept that, then I think we've still got a band."

For those familiar with Mick Jones' control of the group, Gramm's frustration is easily understood. "My ideas don't have the same clout," he complained. "There's not much room for Lou Gramm to grow as a writer and musician. Over the years, I'd hoped it would loosen up a little, but it hasn't. I find myself losing interest because I'm not allowed a situation in which I could evolve. If my ideas can't find a home on a Foreigner album, what's my alternative?"

"My songs don't seem to strictly adhere to the parameters of what Foreigner should sound like. If I want to expand those boundaries, it's too threatening. I needed to make a statement on my own, and I hoped there'd be room to do that within Foreigner. But there wasn't. Making a solo album might not have even been necessary if I was allowed the space within the band starting five or six years ago, so this has been building."

Among Gramm's complaints was the middle-of-the-road direction his old group seemed to be taking with ballads like "I Want To Know What Love Is," the Top Ten hit from Foreigner's last album, *Agent Provocateur*.

"I've always felt our toughness could be even tougher," he admitted. "With the last LP, the sound seemed to be going noticeably to a place I'm not thrilled with. I don't want Foreigner to be known as a ballad band. Given the fact we don't come out with albums regularly, there's a whole new audience of kids who don't know 'Hot Blooded,' 'Urgent' or 'Double Vision.' As far as a rock audience goes, we're slipping. Career-wise, I wasn't pleased, knowing I had some good, tough rockers that could have gone on that last album."

Gramm was freed to pursue a solo project when his Foreigner contract expired at the end of 1984. He toured with the band the following year, and since then the relationship has been on good faith. It was Foreigner's rela-

tive inactivity which prompted Gramm to begin work on his own record.

"I just like things to happen a little quicker," he asserted. "A good product, a short but effective tour, a little time to rest, then back into the studio. The last few years for Foreigner have been a series of excesses—an excessive amount of time in the studio, an excessive amount of time on the road, and then a year and a half of nothing. It burns you out. Inactivity breeds boredom and frustration."

And, in Lou Gramm's case, the seeds to do his own thing. Gathering bassist Ben Turgon, whom he played with in an early upstate NY band called Black Sheep, keyboardist Philip Ashley, his brother Ben on drums and E Street guitarist Nils Lofgren, Gramm entered Bear Tracks Recording Studio in Suffern, NY. This time, the powerful lead singer did things *his* way. . . .

"The hours and tedium involved in recording with Foreigner were excruciating. For my album, we started at 10 every morning and ended at 8 at night, no matter what we were doing. Foreigner sessions would just go on and on until we were so exhausted we couldn't do any more. Unfortunately, I'm not particularly creative or at my best in the late evening or early morning. I like to work when the sun's out, actually see daylight. At the studio we worked in, there were actually windows. The group wasn't over-rehearsed to the point of knowing the songs inside out.

"I had the lyrics finished before rehearsals started. The guys in the group knew what the attitude of each song was, the swagger that should be involved. We didn't beat each song into the ground. If we didn't get something after 45 minutes or four takes, we'd move on to something else. I can remember Foreigner playing a song all day and deciding to use, take 26 or something. . . I mean what could you be listening to at that point? For me, the recklessness is an essential element. . . ."

To that end, Gramm and company performed many of the tracks live in the studio. "The rhythm tracks were all done live. We even used bits of the reference vocal, which turned out better than when I laid down the 'real' vocals later. So, we interspersed them."

The first single, "Midnight Blue," was not named after the public access

—CONTINUED ON PAGE 218

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Jimmy Page jams with Les Paul at Les' birthday bash.

HAPPY BIRTHDAY LES!

by Dan Daley

Not that they need to prove it anymore, but Isaac Tigrett and his crew at the New York edition of the Hard Rock Cafe proved that they can put on a flawless party when the occasion warrants it. June 9, the occasion was guitar legend Les Paul's 72nd birthday.

On the bandstand, directly beneath the statue of Madonna and Child on Tigrett's "God Wall," the

festivities were launched with the presentation to Paul of a marble and onyx Les Paul guitar by Gibson president Henry Juskiwicz. After gamely extinguishing all the candles on a Les Paul guitar-shaped birthday cake, the legendary axeman ran through a couple of numbers with a band that included Paul Shaffer and drummer Anton Fig, both from David Letterman's house band, and some members of Les Paul's own band that gigs Mondays at the jazz club Fat Tuesday's. Paul's fingers retain their magic after all these years, and he still displays his penchant for lots of reverb on his

twisty arpeggios.

Paul was joined onstage by his contemporary, Tony Bennett, who belted out "On The Sunny Side Of The Street." A leaner-looking Jimmy Page then appeared, less flesh-and-blood rock star than a representative of a generation that built a tradition around both Les Paul's playing techniques and the recording technologies he pioneered. Page joined Paul for a slow blues jam and he was later augmented by guitarists Nile Rodgers, Al DiMeola and the ever-young John Sebastian on harmonica.

Robbie Krieger of The Doors, looking a bit lost,

came up and handled vocals and guitar on a Doors tune, augmented by Morris from the Psychedelic Furs and Rick Derringer, who later had the whole house as backup on "Hang On Sloopy." The evening's coda was a brief set by Seymour Duncan.

The big question mark was Jeff Beck, who lurked in a corner seat all night. Though the crowd chanted, "Jeff, Jeff," he remained in the wings. His reluctance to play was ascribed by one who shared his corner to the fact that the guitars available to players that evening were out of tune. Jeff, we hardly knew ye.

—FROM PAGE 217, LOU GRAMM

porno cable show, claimed Gramm, but came from the self-confessed "terrible guitar player" idly strumming a few chords.

"I was basically doing a bad imitation of Dylan," he laughed. "I played it back on the tape and got a really good laugh about it, but the lyrical thread

really said something to me. It all survived, though I had to get Bruce [Tur-gon] to tell me what chords I was playing. We just toughened it up with a beat."

Ready Or Not deals mostly with the trials and tribulations of romantic relationships, narratives Gramm insisted come from his own life. "They derive

from real events. It's not just, let's write another 'my baby left me' song. Basically, I think my songs are a little more optimistic. They deal with problems, but persevering and surviving in spite of them.

"For example, 'Time' has to do with young people growing up and the oppressive feeling of the world they live

in today, which just might cause them to give up on life. It subtly refers to the recent epidemic of teenage suicides that've been happening. It suggests that kids deal with life's problems by not giving up and, in time, they'll find out life is worth living. I was careful not to sound too preachy. I've got two kids myself, so I'm real worried about the world we live in, too."

The last track on the album, "Lover Come Back," is a quiet song—not a lush Foreigner ballad with a catchy anthemic chorus, but a no-frills statement from the heart.

"It's a personal plea," nodded Gramm. "I wanted it to be very stark, just a rhythm bed and piano. Simple. It sounds like it's coming from the back of a long, empty hallway. That was the final song I wrote for the record and it almost didn't make it because the tune scared me. I didn't know whether I wanted to leave people with that impression. But I decided to leave it on, because I had made my mainstream statement and that song showed I'm not afraid to move on and do something else. It was a little hint as to what you might find more of next time."

Despite the alleged reconciliation with Foreigner, Gramm is ready to take his band out on the road and establish his image apart from his old group.

"I think I've executed what I set out to do, at least musically," he said. "I think people are finding out a lot about how I feel about music. It's exciting to be able to notch my own image without the shadow of Foreigner and Mick looming in front of me."

—FROM PAGE 213, KEITH JARRETT

his musical expression wherever "spirits" lead him. Whether it's into his recording studio to overdub primitive instruments, concert halls with symphony orchestras, gothic churches with pipe organs, playing standards with a jazz trio, or towards the clavichord and hapsichord, that's where Jarrett goes.

He didn't plan on making a record on overdubbed cassettes. In fact, it was a polar leap from the classical concert situation he had been performing in for the past few years. "Well," explains Jarrett ruefully, "I had been doing classical recitals and concerts, and I had seen that world of music that I would call musical frustration. Even at its best, that's one of the qualities it

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exhibits. So I was at home after some concerts and one day I just got up and came in the studio and picked up a recorder, which I hadn't been playing for a while because I was playing classical piano things. And I realized I had been missing something. Like if you hadn't prayed for a long time. I don't know how to explain it any other way. I came in the studio and used that little recorder to get in that state. And something started happening that was so strong that I would have been a fool not to turn on some kind of tape recorder."

One thing led to another, and Jarrett found himself overdubbing one instrument after another, improvising a contemplative, introspective sound that was part ritual and part diary. Pakistani flutes and classical recorders weave winsome melodies over gurgling tablas. Sometimes just a lone flute echoes in loneliness or a drum beat recalls some Indian dance.

Jarrett describes it as a music of the moment. "Well, there was almost no thinking going on," he admits. "You can sort of eliminate thinking. It would be immediate, no time to think, immediately knowing what I was going to do next."

That's not to say it's aimless rambling. Remember that Jarrett is nothing if not a gifted, intuitive improviser. "Well, most people that improvise are fooling around, and that's what makes it confusing," he cautions. "But real improvising is getting to the center of things quicker than any other thing you can do—which is the reverse of fooling around."

Each piece was composed of first takes. Occasionally, he'd improvise a line, sketch it out on paper so he could improvise another line with some knowledge of where it was headed. "For example," Jarrett explains, "The first cut on side four ["Spirits 20"] is special because of how it happened. Because I played the piano part, which I didn't realize was a piano part—I was just playing the piano. And I came back and listened and realized that I had created a sort of form. So I quickly sketched down the scales so I wouldn't have to listen to it too much. I went back with those sketches and got the flutes out and just tried to fill the right places with sound and then the horn. Actually, the horn came first, I guess,

but it was the first take and there couldn't be a better take. I probably could never play the horn that well for that length of time, again."

Jarrett found himself in the unusual position of engineer and musician, something that's commonplace for many in this technological era but not for an artist who has played exclusively acoustic and largely improvisational music for the last 17 years or so, and recorded it on ECM Records, a label that has defined the state-of-the-art in recording. Recording on stereo cassette decks with some digital reverb is not quite state-of-the-art, yet Jarrett has obtained an intimate, resonant sound with an enveloping sense of spatial depth.

"Most of the time when people do overdubs, they're either doing something that's called for and decided upon or they're adding something that's missing," says Jarrett. "But these overdubs weren't so much overdubs, since they were improvised. I was creating the right placement of the sound by moving back from the mics so I was hearing what was happening at the same time it was happening. So what you sometimes hear is that moving back and forth."

If you're wondering what happened to Keith Jarrett's solo piano performances, he did emerge this past March and April for his first solo concerts in years, but he's reluctant to return to the format that brought his biggest success and climaxed in the solo piano orgy of the 10-record *Sun Bear Concerts* in 1977.

As I note the glut of George Winston-style solo piano records, Jarrett laughs. "Yeah, all pianists thought then that they should do something solo, whether or not they had the vaguest notion that to play solo is different than playing without a rhythm section, which is what so many of them sounded like. And now so many of them sound like the *Koln Concert* has permanently lobotomized something."

So don't expect any solo piano recordings soon. Jarrett recently claimed that the piano was not a primitive enough instrument on which one could be really expressive. That's one reason why *Spirits* has so much percussion, and his next recording, tentatively titled *The Book Of Ways*, will be a set of double clavichord improvisations. "It's so expressive," enthuses Jarrett. "It's the most expressive keyboard instrument. More so than piano."

Jarrett's approach to the instrument is not strictly classical, but makes use of the pitch bend capacity that makes it sound more like a koto than something from the Baroque era. "I was asked to do the music to a documentary about an ancient Japanese drama discipline," recalls Jarrett. "They said we want you to do, you know, piano. I said, 'well let me think about it.' And I came back to my clavichord here which I've had for years, instinctively thinking this sound is between the East and the West, and I thought this would be a very nice way for a western musician to come to this subject matter. So I got this pressure from the time I said I would do it but I'd do it on clavichord. I kept getting these messages—'Some piano,' 'But can you do it on piano?' And I was in the studio and they were still saying that. They had two clavichords there and the producer's still saying, 'Please, we would like some piano.' And I said, 'No! No piano! You'll agree with me when we get this thing going. You'll see why it should be clavichord.' Which did happen."

Jarrett is keeping even his most ardent supporters guessing. After *The Book of Ways*, his next record will be solo piano, but he'll be performing Bach's "Well-Tempered Clavier."

Keith Jarrett is a complex artist who refuses to get trapped by the expectations of others or even himself. He admits that his classical works like *The Celestial Hawk* might not be up to the standards of those who influenced him, yet he is compelled to express himself in this medium, and many others. He is often criticized for his perfectionism and the sense of himself as an artist. But Jarrett sees in his movements a sense of inevitability and rightness. His music is compelled rather than calculated, like the familiar vocal grunts and whines that often accompany his piano playing. "When I do trio recordings, I'm making these funny noises," says Jarrett with a sense of helplessness, "and people keep thinking that this is extraneous or separate from what's going on. Like it can be eliminated. Like why do they have to have that on there? The answer is that there would be *nothing*, otherwise."

It's difficult to conceive of contemporary jazz with a void where there should be a Keith Jarrett, grunting, whining, playing the classical artiste, and bestowing on us his moments of inspiration. ■



A Session with Ted and Shelly

Chicago-based TMK Elias is one of the busiest and best-equipped music production facilities in the country. Founded five years ago by musicians Ted Kay and Shelly Elias, the studio's work encompasses commercial jingles, music for industrials, and scoring for TV programs. Clients range from America's top ad agencies to such Fortune 100 companies as General Motors, Anheuser-Busch, Kellogg's, and Amoco. Here are some worthwhile thoughts from a recent interview with Ted & Shelly.

First in a Series

On competition

Ted: "Over the last few years, we've seen more music composers like ourselves go in-house with production facilities. The result has been more competition than ever before."

On client expectations

Shelly: "When Ted and I started out, there were about a dozen music houses in Chicago. Now I think there are about 60."

Shelly: "We're finding that clients have become much more discriminating in their evaluation of what good sound quality is. Not only does the creative product have to be excellent, but the sound quality has to match it."

Ted: "If you don't have professional state-of-the-art equipment to keep your product at the highest level, you're going to be working at competitive disadvantage."

On technology

Ted: "Technology has obviously played a big role in the production business and some facilities have certain pieces of equipment that can do things that competitors' equipment can't do. For example, we have the Synclavier system, which is a digital synthesizer and sampler."

Shelly: "1987 music is very different from 1980 music and you've got to stay current to compete successfully."

On choosing a supplier

Shelly: "When you're trying to maintain a quality music production company, you need a supplier you can depend on."

Ted: "We're a supplier to our clients and they depend on us. So we need someone we can count on."

Shelly: "A good supplier has to have a complete grasp and understanding of today's technology. We also want them to be around for a long time so we can grow together."

On working with audioline

Ted: "We started working with AudioLine about three years ago because they deliver a very excellent product and they're good guys to work with. I think that's important."

Shelly: "They're very professional and they understand what we're talking about -- our problems and our needs. They also bend over backwards to help us out when we need help."

On comparing equipment

Shelly: "We field-test a lot of equipment and that helps us decide if we want to get involved with it. When we were looking for a new console, AudioLine helped us have a Battle of the Boards so we could compare one with another."

Ted: "The one we ultimately agreed on, the Neotek Elite, turned out to be the console AudioLine recommended. Our senior engineer, Joe Ott, was impressed with the sonic quality of the Neotek over the English boards we listened to."

On quality vs. price

Ted: "We're very quality-oriented but we also have to think of the bottom line. That's why we look for equipment that can best serve our purposes. And then we try to get it at a price we can afford."

Shelly: "AudioLine can take care of most of our equipment needs, as well as the servicing and supplies. And as long as they do a good job, and we're getting what we were told we would get, and the equipment delivers what we were promised it would deliver, we're happy."

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—FROM PAGE 8, MARKET SURVEY

companies. Record/tape manufacturing, studio design and other allied fields are also heavily represented.

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- Nearly one-third (30.8%) of subscribers attended an AES Convention during the past two years; 20.5% attended a NAIMM Convention; 17.5% attended NAB; and 14.5% attended SMPTE.

Other Purchasing Data

- Other sections of the *Mix Recording and Production Industry Market Survey* provide interesting and useful data about numerous aspects of the industry. For example:

- *Mix* subscribers are heavy pur-

chasers of services as well as equipment: music/recording services are purchased from other companies by 26.2% of subscribers; voiceover/production recording is purchased by 20.2%; video production services are purchased by 18%; and video/film editing services by 15.7%.

- Record/tape manufacturing services are heavily used: 24.8% of subscribers buy record mastering services; 24.2% purchase record pressing; and 35% purchase tape duplication services.

- *Mix* subscribers rent equipment at a heavy clip: 51.5% rent equipment at an average of 9.2 times per year.

- Facilities are continuing to expand and to make improvements. In the past 12 months, one-half of all facilities (50.9%) undertook construction or made other improvements, and 57.3% plan to do so in the next year.

For copies of the complete *Mix 1987 Recording and Production Industry Market Survey*, write to *Mix* magazine, 2608 Ninth Street, Berkeley, CA 94710, or call (415) 843-7901. ■

—FROM PAGE 6, CURRENT

While electronics led the way, healthy increases were also reported in almost all other categories of traditional instruments, printed music and accessories, including acoustic pianos, which, for the first time since 1978, rose in units (up 10%) while dollars grew 29% to nearly \$620 million.

These and other statistics are included in *Music USA '87*, AMC's annual statistical review of the U.S. music industry. To order, send \$2.50/AMC, NAIMM members, or \$35/non-members to NAIMM, 5140 Avenida Encinas, Carlsbad, CA 92008; (619) 438-8001.

NAB Convention Set For September

More than 6,000 broadcasters are expected to attend Radio '87, the National Association of Broadcasters' (NAB) Radio Management, Programming, Sales & Engineering Convention September 9 through 12 at the Anaheim Convention Center in Anaheim, CA.

Session topics include: AM Success Stories and Innovations, How to Choose and Use a Programming Consultant, New AM and FM Technology and AM Stations' Successful Sales Strategies. Special seminars include: AM Directional Antenna Seminar; NRSC Seminar; and RF Radiation Seminar.

For registration information, contact Radio '87 Registration, NAB, 1771 N Street, NW, Washington, DC 20036; (202) 429-5420.

Video Expo New York

The 17th annual Video Expo, co-sponsored by *Mix* magazine, will be held September 29 through October 1 at the Jacob K. Javits Convention Center in New York City.

The Video Expo—which expects about 10,000 people to attend—will feature audio equipment displays backed by a series of audio seminars to assist video managers in better understanding the audio options available to them. Among the scheduled seminars are: Basic Audio for Video, Advanced Audio Techniques and Audio for Video Post-Production.

Booth space is now available. For reservations or more information, contact Barbara Stockwell at (914) 328-9157 or (800) 248-5474, outside New York.

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—FROM PAGE 198, WENDY

again and went at it with the attitude of, 'Well, let's see what kind of music we get from this.' And I started to hack away at it, as a composer would."

The Balinese-Middle Eastern-African inspiration came about on an impulse after the project had begun.

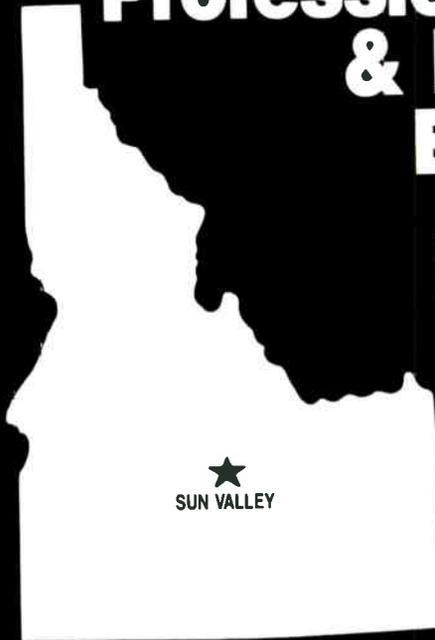
"I had been to Bali and fell in love with the country, the people and their culture. I found in Bali it was as though the people themselves spoke art and breathed art. I have only the perspective of somebody who was only there for a week, but I had the chance to hear a lot of gamelan music, fell in love with that and filed it away for future reference. I did record some music there on a small portable cassette recorder. And we bought some cassettes in the hotel, just like any tourist would. And I played those tapes a lot when I returned home, but then I forgot about them for a few years... until these new tools came along. When I got the ability to experiment with alternate tunings, I thought, 'Gee, one of the things I ought to play on this record is a little bit of gamelan stuff.' Then I started playing around with a great many kinds of music. I started going to Tower Records and buying music from Africa, India, the Middle East, and it all began to seep into my consciousness. And I could've continued going on and on and on, but once I had an hour of music, I stopped."

She adds, "The process of creating the new timbres and tunings for *Beauty In The Beast* was so slow that the album really took well over a year to finish. But the music didn't have any trouble at all. There was no constipation about it artistically. It just flowed very well. It was spontaneous, it was free, it was fun, it was very healthy for me. And I think that atmosphere shows on the final product. I hope it does, anyway."

Since recording *Beauty In The Beast*, Carlos has acquired a Kurzweil MIDI keyboard with the Kurzweil slave processor, a Macintosh computer with some new software (Jam Factory, M, Composer, Performer) and a Roland SDX-80 sync box. "I'm very, very gung-ho about this new equipment right now. They'll undoubtedly appear on my next album."

But before then, another Carlos album will be released by CBS Masterworks (her last for that label). Called *Secrets Of Synthesis*, it's a survey of all the albums in Carlos' career with in-

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formative explanations of how they were done. Scripted by Ann Marie Franklin and narrated by Carlos herself, this how-to documentary recording is a must for any electronic musician. In the recording, Carlos very clearly explains the different voicings and layerings used in her many landmark works such as *Switched-On Bach* and the *Well-Tempered Synthesizer*.

Other future projects may include a digital updating of her classic *Sonic Seasonings* album from 1972. That two-record set, which blended *musique concrete* with live nature sounds into a soothing ambient mix, was one of the seminal works in the now-burgeoning field of new age music. Says Carlos, "That record was greeted with an immense amount of silence back in 1972. The record just went right into a black hole, except in England and a few spots in Europe, where people loved it. Certainly there are so many records out on the market today that are sort of stepchildren of that type of concept, and these records sell very well. But mine came out before this sort of music became palatable to the American taste. I think some people back then were just a little uptight and they didn't know where to classify *Sonic Seasonings*. You know, a lot of people like to have little pigeonholes for everything, and if they can't have a pigeonhole the thing ceases to exist in some ways."

There are no pigeonholes for *Beauty In The Beast* either. But it's a safe bet that this remarkable album will not fall into a black hole, as *Sonic Seasonings* did 15 years ago. Had that album been released today, it might have sold alongside the likes of George Winston, Andreas Vollenweider and all the other new age stepchildren who have followed in the wake of *Sonic Seasonings*. But that's just like Carlos. Always ahead of her time. Hopefully, the rest of the world will catch up to her long enough to enjoy *Beauty In The Beast*. But she won't stop there. Already she's hard at work in her home studio, burning the midnight oil, playing that same old detective game, searching for sounds that we've never heard before—and enjoying every tedious step along the way. ■

Bill Milkowski lives in Manhattan, plays guitar and bass in several bands, and contributes regularly to Mix, downbeat, Guitar World, and a number of Japanese publications.

by Dan Daley

WHALES SING A SEA-NOTE

PAUL WINTER JOINS FORCES WITH WHALES FOR HIS NEW LP

Question: *What kind of microphone does a 75-ton humpback whale sing into?*

Answer: *Any kind he wants.*

Q This questionable attempt at cetaceous humor aside, years of scientific research have concluded that while whales rarely choose the proper types of microphones, they aren't devoid of musical talent: they're rather accomplished singers and have been for a couple of

dozen millenia.

The audience for these warbling leviathans had been limited to ocean-going fish (and when's the last time you saw a bluefish at the opera?) and a few adventurous research marine biologists. Among the latter is Dr. Roger Payne, who through his work with the World Wildlife Fund and at the Long Term Research Institute (LTRI) in Boston, has been recording whales for over 20 years. His entire career has

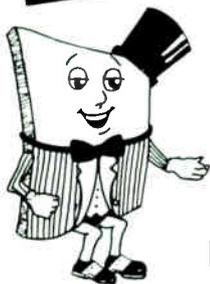


L-R: Roger Payne, Leonard Nimoy, Paul Winter during the recording of *Whales Alive*

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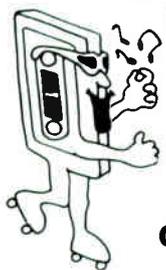
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PLAYBACK

been centered on acoustically active fauna, like bats and owls, who use sound to detect prey. Payne also recorded the 1970 seminal nature LP, *Songs of the Humpback Whale*, which went on to become the most successful natural history recording ever made. So it wasn't too surprising that he got a call back in February 1985 from Leonard Nimoy, who was then directing *Star Trek IV: The Voyage Home*.

Nimoy, known to millions of Trekkies as Mr. Spock, the starship Enterprise's *sang froid* first officer, gave whales co-billing in the movie, which had an overtly conservationist message intertwined with the usual whiz-bang stuff and the high camp. Payne supplied the recordings of the whales used in that movie.

For a benefit premiere showing of *Star Trek IV* at LTRI last year, Payne asked his old friend, jazz saxophonist Paul Winter, to host the affair. Winter's passionate concern for preserving wildlife is no secret—he's harmonized with wolves and birds in a career that has spanned 25 years—and on that night Winter and Payne conceived *Whales Alive!* (Living Music Records LM-0013), a record that crosses biological boundaries by having Winter and organist Paul Halley harmonize and counterpoint songs created—*composed*, stresses Payne—by whales.

"When I say that whales sing, I mean that most whales sing in the sense of what the word 'song' means—they string together repeated patterns," says Payne. Of course, so do birds, but Payne explains that whales are more sophisticated composers; their songs range in length from six to 30 minutes and the songs themselves change over time, the whales adding variations on themes so that after a cycle of about five years, they're singing a completely new song, which gives them a decided advantage over Huey Lewis. Humpback whales are the only creatures besides man to change their tunes.

The record was laid out in steps: Payne culled his vast collection (possibly the world's largest) of whale recordings. At the Living Music Studio in Winter's Litchfield, Connecticut, home, he edited the tapes for length. "Some whales get so hung up on a phrase they'll sing it 20 or 30 times," he says. "It can get a little tedious." But the sequences of the patterns were

strictly adhered to, Payne maintains, to preserve the integrity of the songs.

The biologist then took his cello in hand and transcribed the songs, which incidentally are all sung by humpback whales, the vocal stars of the sea-going vertebrate bunch. "There are a lot of whale species that sing, but most of them sing very dull songs," deadpans Payne, suddenly the oceanographic critic. "Usually a couple of tones that are repeated endlessly. But humpback whales are unique for their incredible arias. There's no other species of whale that even comes close."

Paul Halley, organist in residence at the Cathedral of St. John the Divine (where Winter is artist-in-residence) then devised layers of chords and harmonic passages around the songs. Finally last January, Halley, Winter and a few members of Winter's group, the Paul Winter Consort, began making the record in the cathedral itself in a

**Sound pressure
levels of whale
songs have been
measured at up to
155 dB and can
travel several
hundred miles.**

series of all-night sessions, using the services of Randy Ezratty's Otari-equipped, 24-track, Effanel mobile recording unit. Winter listened to Halley's improvisations and the songs of the whales and developed new melodic variations on his soprano sax.

Prior to these sessions, though, Leonard Nimoy had recorded several poems and passages from *Moby Dick* that were to become part of the record, which were taken directly onto a Sony F-1 digital 2-track at Manhattan Recording Company. All these aspects were mixed together during a marathon four-day session at Living Music Studio, with engineers Glen Kolotkin and Chris Brown at the MCI console.

The overall effect, says Payne, was that "suddenly the whale songs became vastly more understandable to the human mind. The beautiful thing, the real message, is that this is a record *composed* by humpback whales.

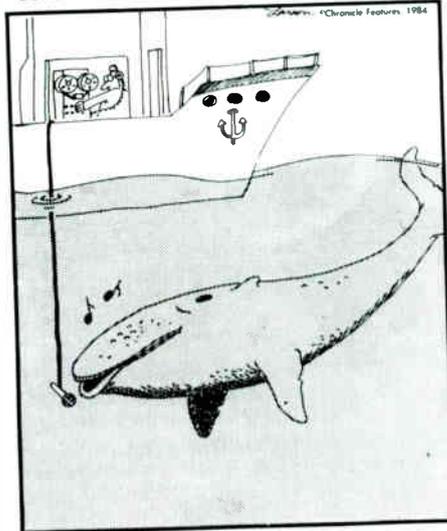
Humpbacks have been singing for several million years longer than human beings have existed, so the fossil evidence [the ears of whales, in this case] suggests they have a longer musical tradition than ours. It's my feeling that they employ the same sort of musical tricks human music uses, like repetition, and that I think that at least partly accounts for the intense emotional reaction many people have to their songs."

Primal Melodies

Payne has seen people literally weep upon hearing whales sing for the first time, a response that suggests a psycho-acoustic link between the branches of mammals. "The brains of humans and whales have evolved separately over millions of years to the point where there is no chance of any cross-fertilization," Payne explains, "yet the humpbacks have developed a music that appeals to a vertebrate brain, whether it's in a human head or a whale's. That indicates and reinforces to me the idea that in this whole process of putting together this record, we were not the composers; we were the arrangers. We arranged the whale's songs in a style

THE FAR SIDE

By GARY LARSON



"A Louie, Louie ... wewooooo ... We gotta go now ..."

that contemporized them with the last 600 years of human tradition and modernized it with the more recent jazz tradition. The end result is that we understand it better. You get it better than just by listening to the whales alone; we put it into a human musical

context."

In getting the whales on tape in the first place, Roger Payne concedes he has learned audio engineering by jumping feet first into an area of audio technology that is quite primitive when compared to land-lubber studios. "The first people who ever heard humpback whales underwater were research scientists involved in military work back in the early 1950s," Payne says, "But under favorable environmental circumstances, the old whalers could hear them right through the hulls of their wooden ships."

(Payne points out that the navy deploys arrays of sonar listening devices on the ocean floors—such as the SOSUS line across the Greenland-Iceland-U.K. gap—and can identify various ships' acoustical "signatures" and course and bearing data by changing the phase relationships of the sound detectors. Interestingly enough, that's not too different from certain guitar amp miking techniques.)

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underwater recordings. "You could take any microphone and put it in a plastic bag and drop it in the ocean and if it didn't leak and ruin your microphone then you'd be able to hear what's going on down there," says Payne. "A hydrophone is just a fancy version of that. Sound travels through the ocean just the way it does through the air only it travels a lot faster because water is denser, but it doesn't change your perception of the sound source itself.

"One type of mic we use is called a magneto-strictive hydrophone, and there's also a barium-titanate type, which is actually a piezo-electric crystal whose voltage fluctuates in response to fluctuating pressure."

When Payne records whales, the hydrophone he uses is fed to a small pre-amp, which uses the same type of roll-off equalization usually found on guitar amps. From there it goes directly into a tape recorder. In storm swells, he has found that rolling off low end helps filter out the acoustical churning of the sea. Payne hopes to get hold of a parametric EQ soon. "Up till now the stuff is primitive compared to recording studios," he says.

How do you get a take out of a whale? You don't, says Payne. You wait till it's ready. "There's absolutely nothing you can do; it's like a hunter seeking prey; you have to wait. If the whale becomes aware of you it immediately shuts up." Others have tried coaxing them, but whales are apparently lousy at taking direction. Some researchers have played music for whales made by other species of whales. "We found out that right whales could care less about humpbacks. But they immediately turn around and come to the loudspeaker if you play other right whale sounds." Payne adds that when human music was played for whales (the selection chosen—ironically—was Handel's "Water Music") the reaction was apparent disinterest.

"Usually, though, it's pretty simple," Payne continues. "If you get anywhere near a group of humpback whales in the winter or spring, you'll hear them." He says whales can be heard through air if the listener is very close, very quiet and right over a singer. You can also hear them with your ears in the water if you're within a mile of the whales. "If you're right near them it can make your teeth rattle." Payne says

dB levels of certain species, like blue whales, have been measured up to 155 dB. "It would cause you permanent damage if you were up close except that the frequency a blue whale sings at [in the 20 to 30 Hz range] is so low it's hard to hear." The blue whale makes the loudest sound of any animal on earth (it's also the heaviest to ever live). Its low-frequency moan can travel several hundred miles due to the exceptional transmission characteristics of water as opposed to air. As Payne explains, "Sound travels in water inversely in proportion to the distance of the source, not inversely proportional to the square of the distance, so you save an entire order of magnitude."

One analogy to more terrestrial recording techniques is in ambience. Depending upon how you position your boat in relationship to the whales and depending upon the depth of the water you're in, Payne says you can color the sound with some fairly spectacular echo effects, especially if you're near a sea shelf or a sea canyon. For absolute clarity, shallow water is better, although that produces effects similar to digital delays and early reflection-types of settings on a digital

reverb.

Another analog becomes clear if you've ever had to deal with an RF problem that wouldn't go away. "The ocean is a very noisy place because of ship traffic these days," Payne complains. "Before propeller ships, blue whales could hear each other over entire oceans."

Why whales sing is still a mystery; probably for communication purposes, Payne theorizes. Apparently only mature males sing and then only during mating season. Curiously, they sing mainly at night (a fairly spooky similarity to most musicians). Payne also observes that when they sing, they breathe in much the same way as human singers, in between phrases. But contrary to optimistic theories and claims made by some researchers, he feels that interaction on an intellectual level is not taking place between cetaceans and man. Flipper can do a killer taikstand but he still can't play chess.

However, while the purpose of the primal melodies of whales cannot be readily discerned, Payne reasons nonetheless that a linkage on emotional levels does exist based on his observations of the responses of humans to

the songs, as though certain pitches or combinations of notes or chords can activate some ancient dendril in the darker, more primitive reaches of mammalian cortexes. That perhaps music on this most basic of levels functions as an ethereal *corpus callosum* bridging two halves of a brain stem that split eons ago between the land and the sea.

Whales Alive! works. It manages to sidestep being a novelty outing because it takes itself seriously enough to avoid the anthropomorphic aspects of man's relationship with animals (c.f. David Letterman's "record company weasels"), and yet it refuses to take itself so seriously as to become a preacher's pulpit. Instead, *Whales Alive!* takes the best of both worlds and builds on mutual respect. And before you write off whales as simply giant Hoovers for plankton control, you should know that the Moslem religion says that only ten animals will ever enter Paradise. One of them is the whale that swallowed Jonah. ■

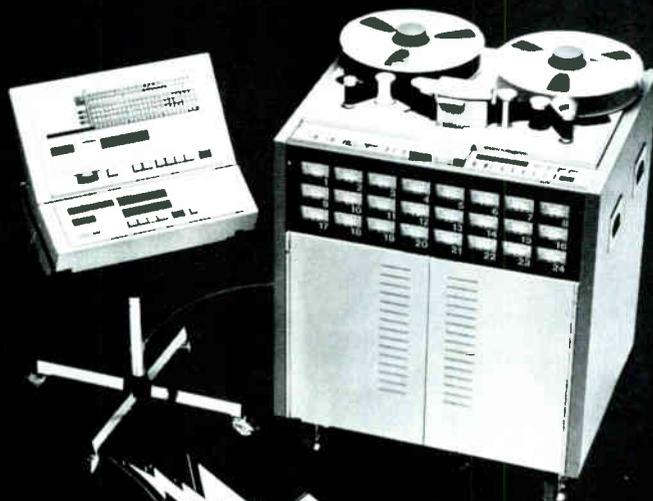
Dan Daley is a contributing editor of Mix. "But you can call me Ishmael," he says.

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by Philip De Lancie

PERSONICS

A HOME TAPING ALTERNATIVE

Few issues in the music industry have become as politicized and controversial as home taping. The dollar value of home taping's diversion of revenues from record companies, songwriters, artists and publishers has been hotly debated. Those who profit from the practice, the manufacturers of home recorders and blank tape, are inclined to believe that home taping actually helps the record industry by stimulating demand for product. But the industry itself, as represented by the Recording Industry Association of America (RIAA) and other organizations, claims to have established that it is being

deprived of billions of dollars annually in retail sales. This sales displacement, which actually exceeds the retail value of 1986 prerecorded music product shipments in the U.S., is viewed by the RIAA as an unsustainable hemorrhage of industry resources.

To stop the bleeding, the RIAA has for years lobbied for help from the U.S. Congress. Home tapers are also potential voters, however, and attempts to recover "royalties" on the sale of blank tape and recording devices have never made it through the legislative process. It is still too early to tell whether another approach, the mandated inclusion of "copy-code scanners" in DAT and perhaps eventually all audio recorders, will survive on Capitol Hill. But in continuing to focus on politically imposed remedies, the record industry may be overlooking the possibility that home taping presents an opportunity as well as a threat.

"Find a need and fill it" is a tried and true recipe for success in the world of business. If home taping is viewed as a sign of a need, then a great opportunity could exist in filling that need for the home taper. Enter Charles Garvin and his Menlo Park, California-based Personics Corporation. Garvin is a

Personics VP Tom Sharples:
"We give people the chance to get the single songs they want, without having to borrow records from their friends and taping them."

Essentially an optical disc jukebox linked to a high-speed cassette deck, the Personics system could allow a record store employee to create a customized tape by entering a customer's order from a catalog of 15,000 titles.



former business consultant who feels that home tapers are primarily motivated by a desire to own personalized cassettes of their favorite tunes. Familiar with the fantastic information storage capacity and efficiency of optical discs, Garvin developed the idea of harnessing this technology to offer consumers customized cassettes while fully respecting the rights of copyright holders.

One of the first steps taken to bring Garvin's idea to life was to test his assumptions about why people tape at home. Boston Consulting Group was hired to conduct market research, including 550 exit interviews of customers at urban and suburban record stores in five major metropolitan areas. According to Personics, the leading reason given by respondents for home taping, at 33%, was the ability to personally choose selections. Getting more music per cassette was also an important factor (23%), as were better sound quality (15%) and access to material not currently available at most retail outlets (8%). Less than 22% identified cost as their primary reason. Thus, more than 75% expressed needs that could conceivably be met by some

sort of customized taping system.

What Garvin and his associates developed to meet those needs is a music archive and duplication system for placement in record stores. It is essentially an optical disc juke box linked to a high-speed cassette deck and directed by a specialized control and accounting computer. It will allow a record store employee to create a customized cassette on the spot by entering a customer's choice of songs from a catalog of up to 15,000 selections. And it will also allow the owners of the chosen songs/performances to be paid royalties for each recording made. "Our goal," says Garvin, "is to recapture for the industry a large chunk of the revenues being lost to home taping."

Naturally, it is important for Garvin to position himself as a champion of record industry interests, because Personics will depend on cooperative record labels from which to license material. For the same reason, the company has positioned its product to allay any concerns that the introduction of the service, scheduled for full national roll-out in early 1988, will have a negative effect on the sales of complete albums. The consumer's cost for the

custom cassettes, according to company literature, is "likely to exceed the price of an album. The slightly higher pricing allows regular albums to remain fully competitive. The Personics System will draw more customers into record stores, and while they are waiting for their tape to be made, they will be browsing—and hopefully buying—other music on display."

With arguments like these, Garvin apparently hopes to convince the record industry that Personics is not another new threat but rather a blessing. And at least two major international players in the music business have evidently been intrigued by the system's possibilities. In late 1985, Thorn-EMI led a \$3 million funding consortium which allowed Garvin to pull together his management and design team, and more recently, the Warner/Elektra/Atlantic group have announced their participation. Crucial among those who have since labored to realize Garvin's initial idea is Tom Sharples, vice president for engineering. Sharples was reached at Personics for the following interview:

Mix: Where does the musical material



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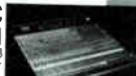


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used come from, and in what form do you receive it?

Tom Sharples: We obtain our material on a variety of source formats. Naturally, we prefer to get PCM 1610/1630 masters. We can also use analog reel-to-reel or CDs. Most of the places that we get our music from are set up with 1610, and have been able to give us direct dubs off of 1610 safety masters. When requested, we will actually send our pre-mastering engineer to the record company in question to supervise dubbing. QC is done on site as the material gets transferred because we want to make sure we get the best possible master we can.

Mix: The present day production process usually means that the producer is involved in sonic enhancement and modification all the way through mastering. Thus, the EQ'd masters made at the mastering session often represent the final version of how the material is supposed to sound. Do you work from EQ'd or flat versions of the master?

Sharples: We work from non-EQ'd masters as much as possible. We will do a very minimal amount of EQ if it turns out to be necessary. We don't do a great deal of processing or limiting or things of that sort to the incoming music. Generally, unless it is extreme, our cassettes can handle it in its original form. So we try to pass it through as unprocessed as possible. We don't have the luxury of having the producer here when we do the pre-mastering, so we are very cautious about doing any processing. A couple of times we have taken EQ'd masters, and we have been happy with them, but generally we try to avoid getting the ones that have been EQ'd for mass-produced cassettes specifically, because those often have greater restrictions on frequency response and dynamic range than is necessary for our process.

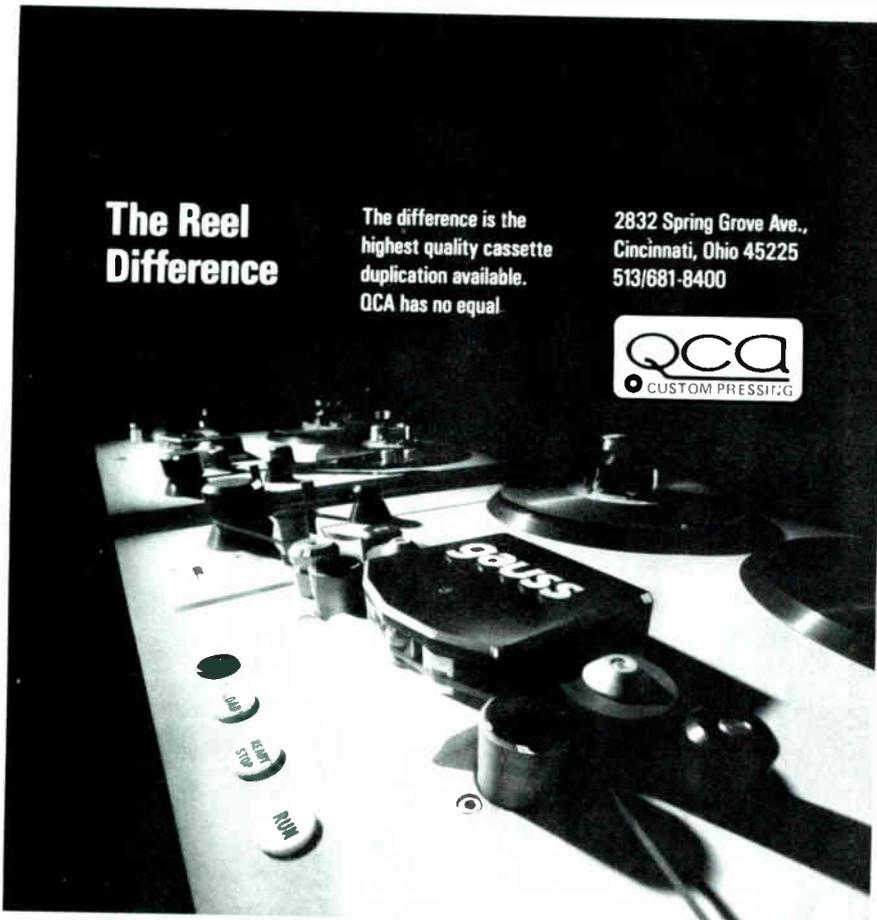
Mix: What happens when you get the material back to your pre-mastering facility?

Sharples: First we Dolby B-encode the signal, since our destination is cassette. Then we run through a special digital encoder that we codesigned with Dolby Labs, which gives us greater sampling efficiency than conventional 16-bit pulse code modulation. It allows us to record several times as much

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music for a given amount of data storage capacity. We run the output of our digital encoder into a specially designed computer system which contains about a gigabyte of Winchester disk drive storage. The computer has software that we've written for editing, random access and other functions of that sort. It allows us to organize the data for at least 60 or 70 songs in terms of how it will appear on a particular optical disc. This ends up being digitally transmitted from the computer over to a modified 1610 digital recorder. Then the 1610 tape gets sent out of house to be turned into one of our special optical discs.

Mix: The special digital encoder you refer to is described in your literature as "an adaptation of Dolby's Adaptive Delta Modulation (ADM) System." Describe the characteristics of ADM in greater detail.

Sharples: The ADM system has a major advantage over conventional delta modulation, because it has two side chains of data which appear at the decoder 10 milliseconds before the main data stream. This allows the decoder to get set up for the information

that is about to appear. This means that you don't have overshoot, pumping, breathing or other oddball effects that you can get with conventional delta modulation. It is a system which is the equal of PCM in every respect except that the dynamic range is only 80-odd dB rather than 92 dB. That is fine for cassette tape. It has full frequency response from 20Hz to 18.5kHz. And, in fact, the dynamic range of ADM could be increased to that of PCM by giving up more data space. The advantage of ADM is that it takes less memory space for a given amount of music.

Mix: Describe the discs that you are having manufactured for use in the system.

Sharples: They are injection-molded discs similar to CD-ROM, except that the data format is completely different. Each one contains all the music data along with all the catalog information.

Mix: What components make up the in-store duplication system, and how will it operate?

Sharples: It contains the archival optical disc playback system, which is a

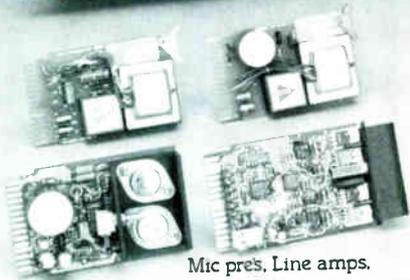
disc jukebox, a specially designed control computer, a de-multiplexer/de-formatter board, which takes data from the discs and converts it back into the ADM format, a high-speed D/A decoder, and a Nakamichi-designed high-speed single cassette recorder.

The tape is recorded in the shell, without direct operator-loading of the tape into the cassette drive. The machine has a loader/flipper mechanism which does that for you. We are currently using Mark 10 shells with TDK-SA tape. We are very happy with the results.

Mix: At what speed are the cassettes actually recorded?

Sharples: We can currently do an album length of music in about five minutes. That's not a hard limitation, but there is a soft limitation, so to speak, in terms of the cassette deck and in terms of the D/A conversion. We are very, very comfortable with the way the product is coming out at the speed we are currently using. We don't feel as comfortable yet at higher speeds in terms of product consistency. But we expect to be able to increase the speed in the future.

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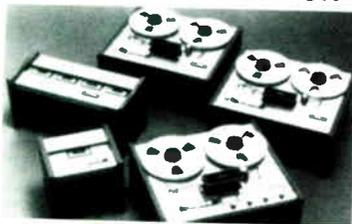
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Mix: What are the speed relationships occurring at the various stages of the process?

Sharples: The music is being encoded into our pre-mastering computer in real time. The transfer of data to the tape that will be used by the disc manufacturer does not have to occur in real time. On the playback side, we have the equipment set up so the data rate coming into the D/A converter is appropriate to the higher multiples of speed at which we are running the cassette.

Mix: Accurate high-speed D/A conversion seems to have presented a formidable challenge to those who have sought to bring digital masters into the high-speed cassette duplication process. How does the Personics System deal with this problem?

Sharples: First of all, we're not using PCM. With ADM, the amount of data that has to be transferred for a given amount of music is less. We're several times as efficient as PCM, so we don't have to move as many bytes. Secondly, we're not running at as high a speed. We're not running at 64:1.

Mix: How do royalties from the sales get properly attributed to the licensors of the material?

Sharples: We have a full accounting system which allows us to track each and every tape that we make on an individual basis. Each tape has an assigned serial number which gets printed on it by a laser printer. So, for example, a record company executive could go to a store and buy a tape, and then check his report at the end of the month and be sure that we had actually paid him for it. We have a central system which is essentially a data multiplexer which is set up to call every system in the field and download all the sales information. We can also keep track of the trends of which songs are selling and things of that sort.

Mix: What sort of printed materials does the customer get to go along with the cassette?

Sharples: The laser printer is used to make multi-colored J-cards and high resolution labels for the cassette. If the user wants, he can even personalize the tape to the extent of putting his

own name on the label.

Mix: The projected capacity of the system is 15,000 songs. Who will choose the songs that are to be made available to the customer, and what criteria will be used?

Sharples: Initially what we are doing is concentrating on a selection of the top 2,000 songs of the last 20 years and newer material chosen by the participating labels. By the time we are done pre-mastering those, we expect to have an A&R person whose job it will be to make those types of decisions. We hope to have a good cross-selection of not only top hits and oldies but also interesting material from independent labels and regional music as well. Initially all the outlets will be provided with the same material, but then we expect to expand and give the outlets more individual material.

Mix: Will the outlets actually be able to request that certain material be placed in the system?

Sharples: I think, eventually, yes. We have not thought about that a great deal because we are still involved with the initial selection of songs right now. We have to go through a fairly involved process to get approval from record companies and publishers to put a song on the system. It's a pretty horrendous negotiating task to get the rights to all this music. But we have one real advantage, which is that the cost to put any particular song on the system is relatively low. It costs record companies a lot less to put a song with uncertain sales potential onto our system than to use a conventional distribution technique.

Mix: How will you ensure that new releases are available when they are hot?

Sharples: We propose to update our selection biweekly. That's about our turnaround time for an optical disc with new material. We expect to have a few thousand songs which will always sit there and that we won't have to change very often. Then there will be current material which will rotate in and out of the system depending on the wishes of the record companies. We will have some material that is not available for compilation, but that is available for the "cassingle"—two to four songs on a short tape at a reduced price.

Mix: What effect would you expect to see on the sales of complete albums, whether in LP, cassette or CD form, if Personics really takes off?

Sharples: We don't expect to see a negative effect. The bulk of the material is going to be older than six months or a year, when the album sales have already peaked. We give people a chance to get the single songs that they want without having to borrow records from their friends and make tapes at home. It is not to anyone's advantage to cannibalize record sales. In all likelihood the record companies are going to give us brand new material only for a single song off an album at any one time, or after the album sales have peaked.

Mix: Has consideration been given to the possibility of developing a version of Personics that will create DAT tapes?

Sharples: We have considered it, and for the time being we have decided not to do it. One of the advantages offered by Personics is the ability to have the tape made much faster than if you were doing a real-time recording. We do not think it is going to be practical to electronically record DAT at multiples of real time. Sprinter type systems use electromechanical [contact print] rather than electronic techniques. So even if it were practical to have a Sprinter in every record store, there is no way you could have the master material for 15,000 or even 100 selections available for Sprinter type duplication. However, we are not turning our backs on digital output media, although I can't say any more than that.

Mix: In how many outlets are you hoping to place Personics Systems within the first year or so after introduction?

Sharples: There are well over 10,000 record stores in the U.S., but we don't propose to be in every one of them. They are not all appropriate places for us to be. There are something on the order of 3,500 that are appropriate targets for our system in the first several years, and we intend to hit a significant percentage of them. We have already had successful negotiations and signed contracts with two of the major chains. ■

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

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—FROM PAGE 110, SHAPE OF THINGS

of digital, but eventually it'll take over. We all need a lot more education about it, because it's not fair to discuss digital in analog terms. The control room should be like a single-lens reflex camera — when you look through the lens, your eye sees the same thing that the film will see. You can put whatever distortion lens you want on it, and what you see is what you get. That's what I want to do with control rooms."

John Storyk: "We'll be building remix rooms, customized recording rooms, 'the MIDI room,' with more playing in the control room and a much

smaller studio. We'll have to redefine the control room. There's some indication now that there will be panelized acoustical materials, pre-fabricated stuff. Variable acoustics won't make much sense in small rooms, with so much direct and electronic work. I don't think you'll see tape machines; there's no reason to have them as soon as there's some kind of standardization in disk recording. There's no reason to have the tape moving. We'll edit electronically, with stuff digital from start to finish."

Alan Fierstein: "It's questionable whether people will continue to use

designers and have customized installation of materials in a room, or will try to design by using 'do-it-yourself' canned acoustics, packaged acoustical units like absorbers and reflectors, made by specialized manufacturers. Consoles and outboard equipment might be smaller, and external EQs, gates, effects processors, etc., will be remotely controlled from the listening position with a control box that can access every device individually—it will be to auxiliary equipment what MIDI is to synthesizers. We'll have digitally assignable analog equipment. I don't think control rooms will get larger, because it won't be possible to have large loudspeakers that sound accurate in more than one or two locations in a large room. We'll see a return to live recording. Manufacturers will try to produce equipment that emulates live recording, as ludicrous as it sounds."

Vin Gizzi: "The control room won't be any larger—that's a question of real estate more than anything else. As long as studios stay in the major cities, they'll fight to keep size to a minimum. However, useable space in the control room will be larger as more equipment is housed outside, in less expensive real estate that doesn't need to be acoustically isolated. There will be less need for all that gear to be in the room, because you'll control all the parameters from a small digital console; no more big console bouncing early reflections into the mixer's ears. There's no question that tapeless studios, digital storage and random access editing is the way we'll go."

Russ Berger: "We'll see a shift in facility activity from the major markets to a more regional level. The studio that will last will combine an appropriate facility with marketing, business, and engineering skills, and provide a talented, personable staff. The TEF measuring technique affords us a wonderfully detailed view of our acoustical world. Its full impact on the audio industry is yet to be felt, and I'm excited that there's still so much left to discover." ■

Mix assistant editor Linda Jacobson runs a technical writing service based in San Francisco, and holds a BS in journalism from Boston University. But she still lapses into Brooklynese when tired, and when interviewing New Yorkers.

—FROM PAGE 103, DIFFUSE IT

has taken a back seat to electronics. Even acoustical consultants have been tempted by the black box mentality. Churches use electroacoustic systems that artificially generate reverberance. But there's no substitute for an acoustical solution to an acoustical problem, and people are starting to realize that the rooms can act *for* us.

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"I think the flirtation with electronic aids will continue," adds D'Antonio. "Yet it's like using marital aids—if you don't have a good relationship, it's not gonna work. Some devices will be successful, but more so when coupled with acous-

tical treatment."

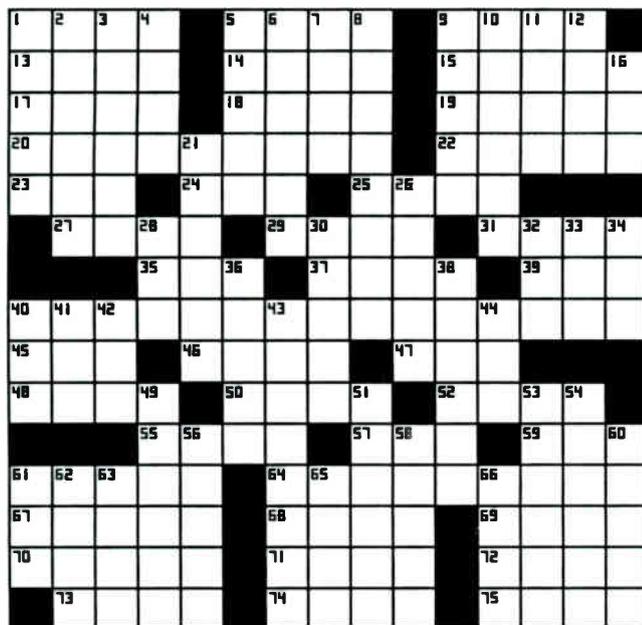
Today, D'Antonio seeks to improve acoustics in the studio. One thing he's trying is a wall of diffusers as a natural reverb chamber. "The advent of digital recording pushed the studios back to their early state, when the studio had its own acoustics that you tried to use in the recording. Plus, many things are starting to get recorded in stereo again. Ambience and spaciousness have really come back into consciousness, instead of having the studio be really isolated and dead. And, with digital recording especially, you need to do as much as you can while the sound is being emitted, rather than worrying about it later on.

"Right now I'm doing basic research. We're developing procedures to measure things, such as reverb and speech intelligibility. We also want to find new products to strengthen our relationship with the acoustical consulting community, and provide them with a methodology so they can do their jobs better." —Linda Jacobson

Some RPG systems—on the floor (L to R) are two 2x2 Abffusers, a Triffusor (mounted on a lazy Susan), an oakwood 1925W GRD Diffusor, and a 2x2 Diffusor.



Mix Words



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TILT AN EAR

ACROSS

1. "True ____"
5. ____ Iron
9. Villain or angel
13. Descartes
14. European river
15. Summer TV fare
17. Thomas ____ Edison
18. Exchange premium
19. Ms. Post
20. Sound circuit board
22. Turn ____
23. Corrode
24. Certain pol.
25. Western Indians
27. Editor's mark
29. Such, to Hans
31. Bitter vetch
35. Physician's grp.
37. "I ____ future
bright and clear"

39. See 32D

40. Old recording co.
slogan

45. A Gershwin
46. Very, in Essen
47. Poetic time of day
48. Russian planes
50. Metric measures
52. Anger
55. Pro foe
57. N'est ____?
59. Winnebagos
61. Chile con ____
64. Dynamic mic part
67. Home
68. ____ way (not at all)
69. Tatting result
70. Controversial air
defense system
71. Approach

72. ____-bellum

73. Congers
74. Storm
75. Attention getter

DOWN

1. Serious
2. Rare firing squad
order
3. Beckon
4. Tape recorder co.
5. Camp David goal
6. Singer Leslie
7. Golda
8. Session VIP
9. High ridge
10. Improve a schooner
11. Baby's turf
12. Boat body
16. Comedian Louie
21. Swellings
26. Pronoun
28. On the ____
30. River to N. Sea
32. With 39A, phrase
of friendship
33. Fabled bird
34. Compass pt.
36. Take ____
38. Not into
40. "I Will Follow ____"
41. Rainbow prefix
42. Actor's grp.
43. Healthy and active
44. Stop ____ dime
49. Footwear
51. "____ Tap"
53. Pun responses
54. Toss a tenant
56. Has to have
58. Form ____ group
60. Icy rain
61. Jerk
62. Rose's love
63. Wander
65. Top rating
66. Applaud

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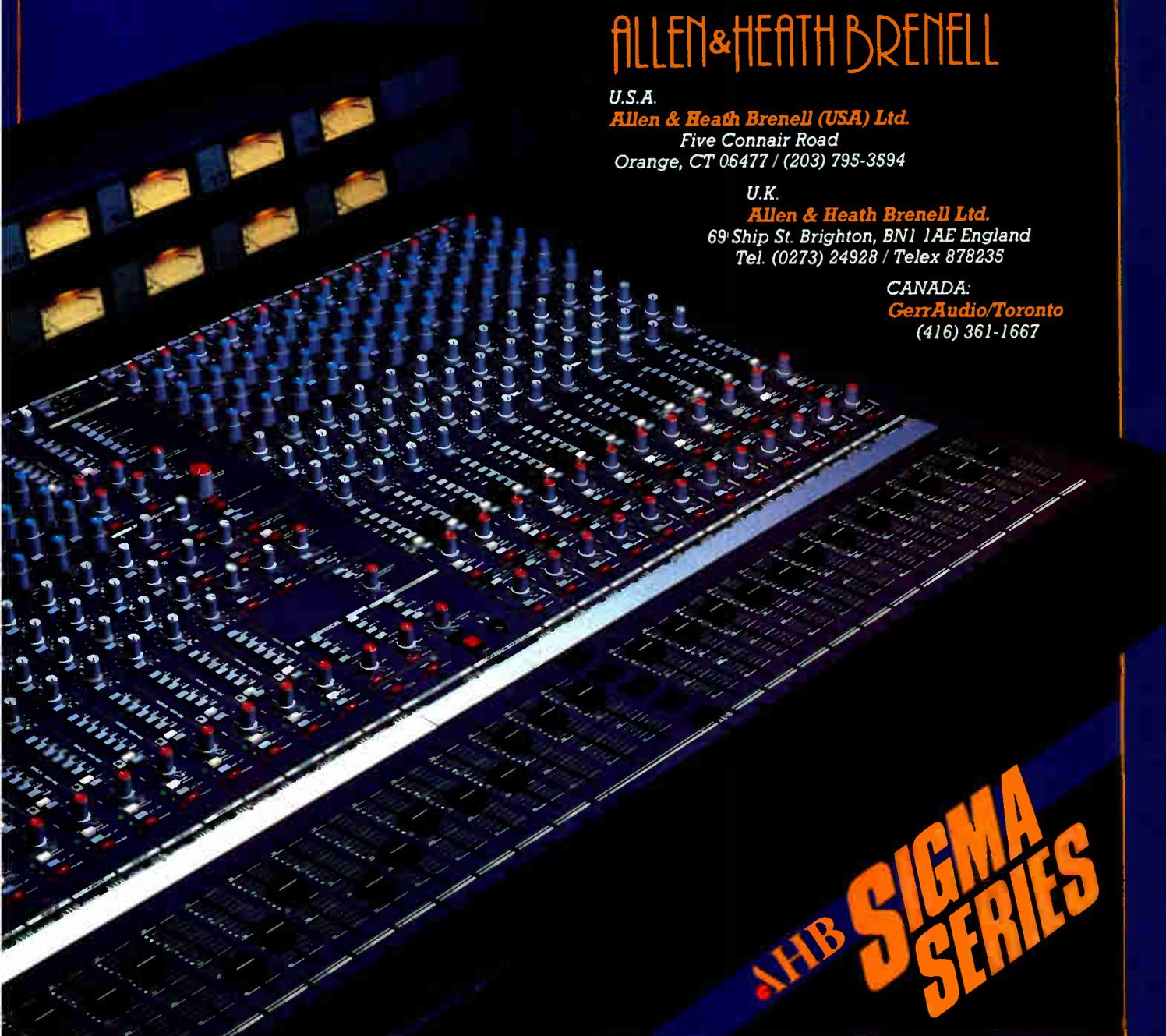
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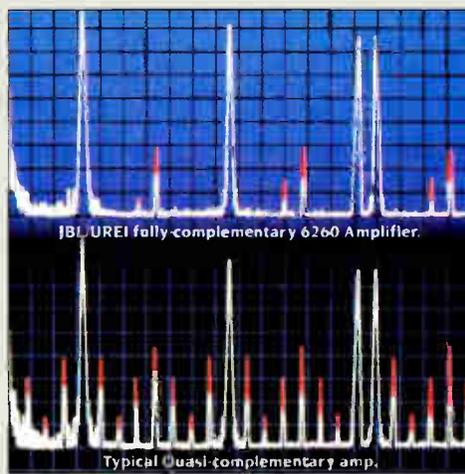
When it comes to evaluating amplified sound, seeing is believing.

In fact, when engineers judge the sound quality of an amplifier, they often rely on *two* precision instruments: the human ear, and the industry-standard Transient Intermodulation Distortion Test, because when measuring sound with T.I.M. what you see is what you get.

And what you see can be eye-opening. Amplifiers that seem to square off evenly spec. for spec., often perform very differently under the scrutiny of T.I.M. Pushed to their limits, many produce brittle, edgy or distorted sound especially during high frequency passages and sharp transients.

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When we built our new JBL/UREI Amplifiers, we committed ourselves to designing the industry's purest-



Red spikes in the TIM Spectrum reveal the dramatic differences in distortion output.

sounding amps that would not only score highest marks on the T.I.M. Test, but deliver the truest amplified sound ever heard.

Instead of sloppily force-feeding massive amounts of

output signal back into input stages, and congesting it all into one circuit loop, we've established operating points at *each* gain stage. This allows signal purity to be maintained along the entire circuit. And permits optimized use of the type and amount of feedback for each individual gain stage.

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