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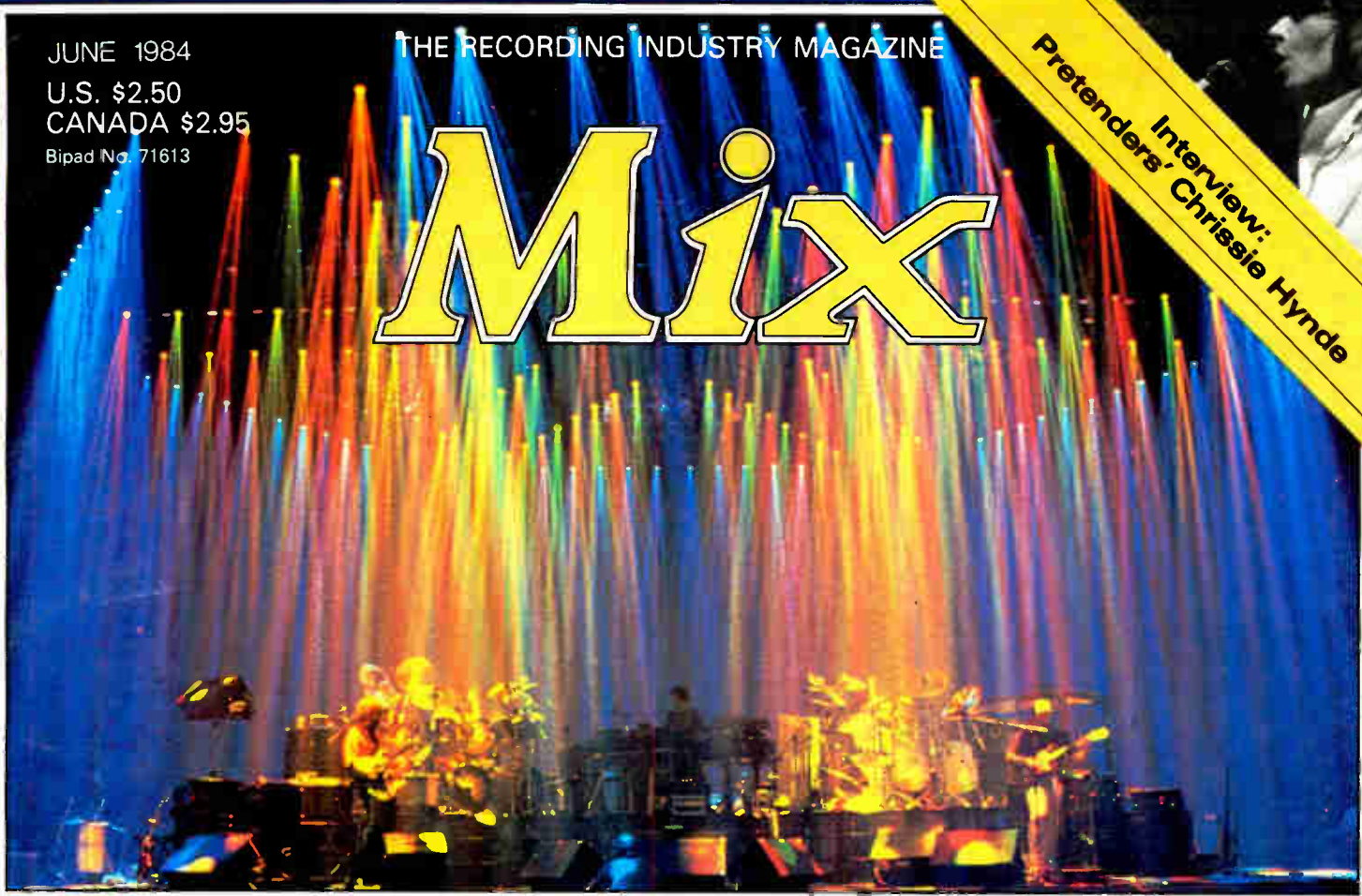
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THE RECORDING INDUSTRY MAGAZINE

Mix

Interview: **Chrissie Hynde**
Pretenders



Listings: Remote Recording
& Sound Reinforcement Companies

George Benson's
Maui Studio

Computer
Music
at Stanford

Audio Animation
Session Drummer
Bernard Purdie
Big Country



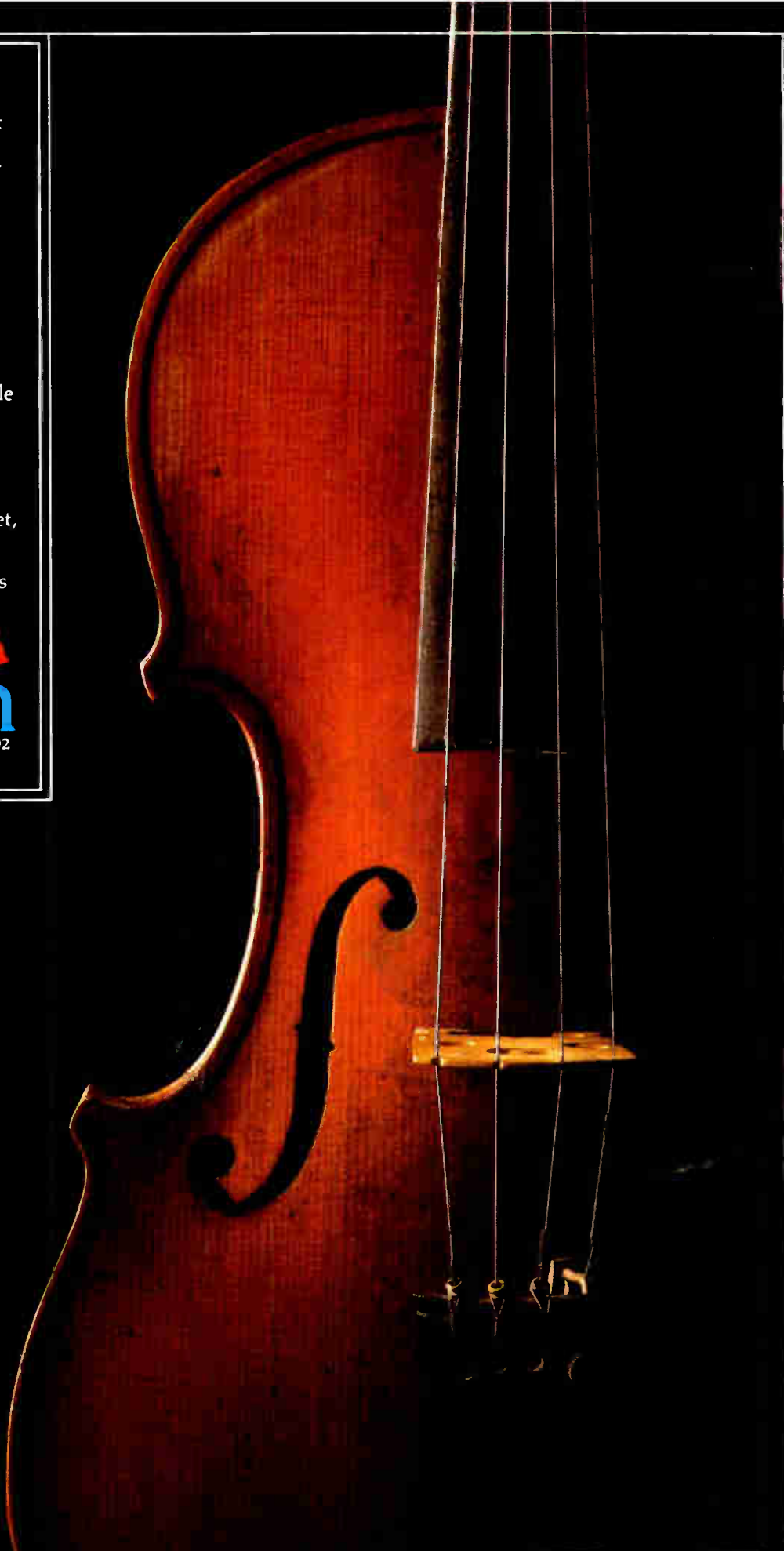
Three hundred years ago, it took the hand of a master craftsman to create a concert violin. It also took commitment—a commitment to producing the highest quality, purest possible sound.

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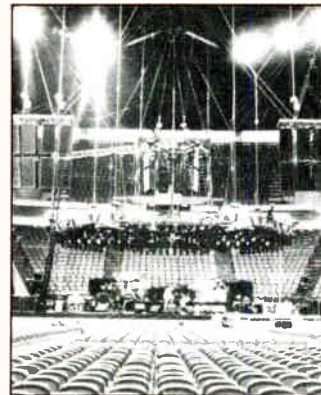


COMMITTED TO A SOUND FUTURE

Circle #001 on Reader Service Card



Cover:
Top: Genesis USA tour—sound and lights by Showco, of Dallas, Texas.
Photo: Lewis Lee; Courtesy of Wil N. Shiela
Bottom: Interior view of the Skyelabs' LEDE™ (Live-End-Dead-End) mobile control room. Story on page 68.
Photo: Cameron Davidson



Spurred on by rising record sales and a healthy economy, the summer concert season should be better than ever. Our *Sound Reinforcement Forum* on page 44 talks to a number of live sound companies about trends and new products of interest.

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Every musician dreams of having a studio, but when it's a world-class facility located in a Hawaiian paradise, you have an unbeatable combination for creativity and relaxation. Our Artist Studio feature on *George Benson's Lahaina Sound* starts on page 60.



Time was that if you wanted great recorded sound you had to travel to a studio. Now, of course, that studio can come to you. *Mix's* annual *update* on the booming field of *remote recording* begins on page 64.

They've survived the death of two key band members and countless other traumas that have sunk lesser groups. Beginning on page 152 Chrissie Hynde talks about *The Pretenders'* amazing comeback.



The MTR Series Recorders

WHY IT'S OTARI FOR MORE POST-PRODUCTION PROS.

Today's hot topic is audio post-production. At Otari, it was a hot topic years ago—and still is.

In 1979, we introduced the MTR 90 multi-track recorder, which featured our new synchronous tape drive system. It was quickly accepted as a superior performer under synchronous control—with faster search and lock-up for quicker editing sessions.

In 1980, we introduced the MTR 1012 16-inch and 19-inch machines—the industry's first with microprocessor-controlled transports.

In 1981, the Series I MTR 90 provided even faster, more accurate tape handling and was the first audio machine to offer

a serial port for computer control of the transport functions.

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Post Sound, Los Angeles

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Dear *Mix*:

I am writing in hopes of obtaining additional information regarding articles from two back issues.

The first was an article titled "Software for the Music Businessperson", and it appeared on page 137 in the September, 1983 issue of *Mix*. It concerned the Nashville-based company MetroGnome, Inc., and a variety of music business software they market.

The other article appeared in the February, 1984 issue, and was titled "Keyboard Artist Forum" (Problems and Solutions). The information I am seeking stems from the section on David Diamond. He stated that he bought an IBM PC and that a gentleman was working on some software compatible with a MIDI interface. I am interested in obtaining information regarding this software.

Please also forward any information regarding the MetroGnome software. I greatly appreciate your assistance and will be anxiously awaiting your reply. Keep up the *great Mix!*

Sincerely,
Wayne Florin
Fargo, North Dakota

Dear Wayne:

You can contact MetroGnome directly for information: MetroGnome, 602 W. Iris Drive, Nashville, TN 37204, (615) 298-4948.

The IBM PC software mentioned in the *Mix* interview with David Diamond is still in the development stage, and is not available publicly at present. We will keep you posted on further developments in music software in future issues of *Mix*.

Dear *Mix*,

"Wireless Microphones: Cutting the Cord" (March, 1984) provided

an excellent overview of an important area of contemporary sound engineering. One technical point, however, requires elaboration, and I would like also to add correct information about the pricing of our systems.

In comparing the UHF and VHF bands, it's important to note that UHF is subject to a greater number of drop-out areas. However, this does not make UHF "more susceptible to the effects of multipath cancellation," as writer George Petersen suggests. VHF drop-outs, though fewer, are much larger. In net effect, UHF has the advantage; tests show field strength is, on average, 10dB higher in this band.

With regard to pricing, please be advised that Sony's WRT-57/WRR-27 transmitter/receiver combination is available at a suggested retail of \$2,695. The full diversity UHF system (WRT-57/WRR-37) is \$5,895 suggested list.

Sincerely,
Jim Guthrie
National Product Manager,
Sony Professional
Audio Division

Dear *Mix*:

Congratulations on your April, 1984 Video Focus Special Issue! I found the issue very informative as well as entertaining. Unfortunately, I also found that Starfax's address was listed incorrectly. Perhaps you could correct this error somehow?

Once again, I thank you for remembering to include Starfax in your special Video Focus issue.

Best regards,
Belinda S. Merritt
Account/Marketing
Representative
Starfax, Inc.
8157 Lankershim Blvd.
N. Hollywood, CA 91605

CURRENT

3M/Sony Videodisk Agreement

An agreement to provide 3M Optical Recording Project mastering and replication services for laser videodisks compatible with Sony manufactured videodisk equipment has been signed by 3M and the Sony Corporation of America. The agreement was made public at the annual convention of the National Association of Broadcasters (NAB) held in Las Vegas from April 29 to May 2, 1984.

Under the terms of the agreement, which only covers disks for NTSC, 3M will produce videodisks to the precise specifications and furnish them to Sony on a private label basis.

"3M is a leader in the mastering and replication of high quality disks for all laser videodisk player manufacturers. The current industrial market includes education and training materials, point of purchase display units, archival, simulation, electronic publishing, and others," said Frank M. Price, sales and marketing manager for 3M's Optical Recording Project. "We are in a position to support Sony videodisk player sales in the United States with not only an exceptional level of disk quality, but also with the speed and consistency of service required in a market which is projected to more than double in 1984."

According to John Hartigan, national marketing manager, Sony Video Communications, they will continue to service large volume replication customers at its disk pressing facilities in Atsugi, Japan. The new agreement, however, will permit Sony to offer special situation disk replication turnaround times of one day and three days in limited quantities for levels I and III disks through 3M's Menomonie, Wisconsin plant. ★

PHOTO JOHN WOHAM



Chris Stone

Stone Launches Audio Intervisual Design

Audio Intervisual Design, a new Los Angeles company headed by L.A. Record Plant president Chris Stone, has been named as manufacturer's representative for Sony Digital

Audio products and as an OEM of Sony product for the film and video industries.

"We formed this company to act as systems facilitators," says Stone. "Because of my involvement in the record, video and film industries I saw a critical need to synthesize systems which integrate the very latest equipment."

The new company, located at 8474 West Third St., Los Angeles, CA 90048, intends to put together innovative packages for film scoring to be done with Sony video-based systems.

Audio Education Scholarships

In the fall of 1984, the Audio Engineering Society Educational Foundation plans to start funding outstanding graduate students for further studies in audio engineering. The board of the foundation has voted funding of \$1,500 for three awardees in the academic year 1984-85. The Society thanks the generosity of the original contributors and encourages others to enhance the Foundation's efforts with their own contributions to it.

For more complete details on the Foundation, including an application for consideration by the Foundation, students are advised to contact the Foundation Secretary, Donald J. Plunkett at 60 East 42nd Street, Room 2520, New York, NY 10165.

Notes

Dolby Laboratories and *General Instrument* have developed a digital audio system designed for cable TV, satellite-delivered programming and DBS (Direct Broadcast Satellite). The encode/decode system, based on Adaptive Delta-Modulation, is said by Dolby to have comparable technical specifications to the Compact Disc. . . .

Donald F. Bogue has been promoted to general manager of *Ampex Corporation's* Magnetic Tape Division. . . . *John E. Ziemba* has been appointed National Sales Director for *BASF*. . . . *Syn-Aud-Con* is presenting a workshop on Loudspeaker Array & Sound System Design June 19-21, in Nashville. 714-496-9599 for details. . . .

Mr. James Camacho has been appointed President of *Trident U.S.A., Inc.* . . . *Laura Foti*, former Video Editor of *Billboard Magazine*, has

been appointed Manager of Marketing and Public Relations at *RCA Records'* newly formed subsidiary, *RCA Video Productions, Inc.* . . .

David Crist has been named marketing communications supervisor for *3M's* Magnetic Audio/Video Products Division. . . . *Ken Perry* has joined *Kdisc Mastering*, in Hollywood, as Senior Cutting Engineer. . . . *Pat Metheny* will be presenting clinics on the *Synclavier* Computer Music System in eight U.S. cities during mid-June. . . .

The *Music Shoals Music Association* 1984 Records and Producers Seminar will be held July 12-24. 205/381-1442. . . .

Rockamerica is presenting its Second Annual Video/Music Seminar August 10, in New York City. 212/475-5791. . . . *Soundcraft Electronics* has recently named *Westlake Audio*, of

Hollywood, Number One Dealer, and *Audio Engineering Associates*, of Pasadena, Most Dedicated Dealer for 1983. . . . *Frank Cinquino*

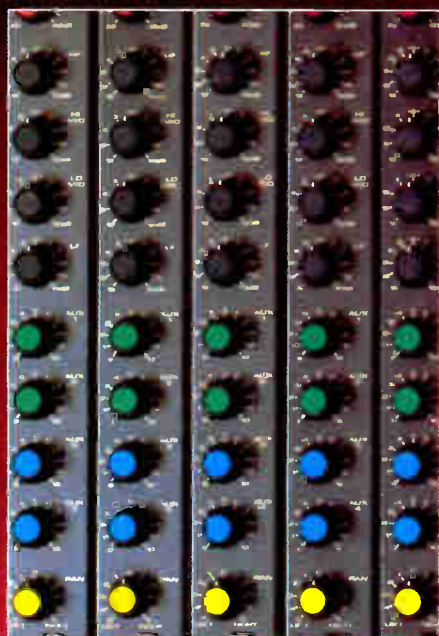
has been named National Service Manager of *Unicord*. . . . *Cerwin-Vega Inc.* has acquired the product line of *Acoustic Control, Inc.* . . .

AVC Systems, Inc. has opened a new facility at the former site of *Sound 80 Recording Studios*, 2709 E. 25th St., Minneapolis, MN 55406. . . .

JLR Magnetic Sciences has expanded its Land- ing, New Jersey facilities to make room for a laboratory and engineering department. . . . *Joe Poimboeuf* has joined the pro audio staff of *Lake Systems Corp.* in Newton, MA. . . .

Chuck Fredrick has joined the Chicago staff of *Northwest Teleproductions* as Account Representative.

It carries the features that are a cut above the competition.



EQ and Q sends



Tape returns 1-8



Long throw faders



Peak indicator solo, mute, substation

It carries a price that's a cut below.

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The Series 200 represents a complete redefinition of what you can expect from a four buss mixer. And where you can expect to use it. Post production editing, video sweetening, club installations or on location. So revolutionary that it is suited to more applications than any other portable system. And perhaps most impressive, it's priced to suit the tightest budget.

Available in an 8 input rack mount or 16 and 24 channel sizes, it is as versatile as you are talented. When used in 8 track recording, the separate monitor section allows you to monitor all 8 returns individually in creating your mix. With 4 auxiliary sends (2 pre and 2 post) it has twice the capacity of comparable consoles making it ideal for small clubs, PA and broadcast requirements.

Unlike semi-pro mixers that have a -10dB nominal



operating level, the Series 200 at +4dB conforms to industry standards when interfacing with VTR's and multi-tracks, for post production and a variety of other demanding professional applications. Additional sound improvements include a 1kHz oscillator for external alignments, electronically balanced mic and line inputs and long throw faders.

As with all Soundcraft consoles, the Series 200 is distinguished by 4 band EQ's so musical it sets the industry on its ear. However, for all the sonic breakthroughs, there is one sound you'll be pleased not to hear. Contamination caused by distortion and limited headroom. And, an out-board power supply eliminates any transformer hum.

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World Radio History

SESSIONS

Mix welcomes your press releases for inclusion in our Sessions and Studios News columns. Send your releases to Sessions Editor, *Mix* Magazine, 2608 Ninth Street, Berkeley, CA 94710.

NORTHEAST

At *Air Craft Communications*, in Pittsburgh, PA, **Toby Beau** (No. 1 hit "My Angel Baby") recorded some new material with Air Craft's production team of **Gary Hohman** and **Barney Lee**. . . . *Digital by Dickinson* of Bloomfield, NJ, prepared **Joe Jackson's Body & Soul** for mastering by **Bernie Grundman**. The DBD 3M pure digital album was recorded at Vanguard's Masonic Temple, NYC, **Rik Pekkanen**, engineer, **David Kershenbaum**, producer. . . . Tracks for *The Earons'* new album on Island Records were recorded at *Power Play Studios*. **Tony Arti** engineered. . . . Recent projects at *Sorcerer Sound* in NYC included **Craig Bishop** mixing a *Go Agami* album for Nippon Columbia, **Lenny Kaye** producing; and **Tom Verlaine** producing his own album with **Mario Salvatti** engineering. . . . **Gladys** and **Edward Flower** recorded three songs at RBY in Southbury, CT. *Sinister Wisdom* also was in working on a new 45. . . . At NYC's *Unique Recording*, producer **Larry Blackman**, finished mixing *Cameo's She Strange* album for Polygram Records. **Steve Jerome** engineered and **Tracy Melvin** assisted. . . . Recent activity at *Spectrum Recorders* in Lanesborough, MA, included **Rod Manjarrez** continuing to put more tracks in the can for an album for South American release in the late summer. . . . *Le Mobile* rolled into Madison Square Garden recently to record *Duran Duran* concerts for DIR Broadcasting. The second show was broadcast live via satellite around the world, over the ABC Rock Radio Network. Both shows were engineered and mixed on location by **Guy Charbonneau**. . . . *Kampo Cultural Center* in downtown Manhattan recorded *Bugsy's Constanthrob*, featuring **Hiram Bullcock** and various sidemen from *The David Letterman Show*. **Ornette Coleman** rehearsed with **Mari Okubo** in the downstairs space. . . . Recent work at *Quandrasonic Sound* in NYC included *Pumpkin* recording and mixing a new 12" single for Profile Records. **Dave Ogrin** was at the board. The *ASL Mobile Audio* unit was outside the Ritz, NYC, for a live afternoon broadcast on WNEW-FM. **Steven Remote** mixed and engineered the live broadcast and recording of EMI recording artist **Dwight Twilley**. . . . At *Evergreen Recording* in New York, **Bill Laswell** produced the new *Herbie Hancock* album for CBS Records, with **Rob Stevens** engineering. Also at Evergreen, **Lottie Golden** and **Richard Scher** did the remix on "Zarah," **Nina Hagen's** new 12". . . . at *Unique Recording* in NYC, producer **Jack Douglas** put synthesizers and finishing touches on *Zebra's* new album for Atlantic Records. **Bob Rosa** engineered and **Roey Shamir** assisted. . . . At *Celestial Sounds*, in NYC, **Nancy**

Black cut tracks for Island Records with **Hubert Eaves** and **Francois Kevorkian** producing. **Ron Banks** engineered with **Larry Decarmine**. *Our Daughter's Wedding* completed tracks for an upcoming release at *Park South Studios* in NYC. Producing with the band was **Steve Rosen**. Engineer was **Chris Tergeesen**, assisted by **Don Peterkofsky**. . . . *GBH Productions'* mobile audio facility, Unit 4, was on the road this spring for DIR Broadcasting recording concerts by England's *Echo & the Bunnymen* and Australian band *Midnight Oil* for the King Biscuit Flower Hour Radio Series. . . . At *Greene Street Recording*, NYC, **Don Was** produced **David Lasley** for EMI Records, **Rod Hui** engineering, **Joe Arnold** assisting. . . . At *Trod Nossel studios* in Wallingford, CT, **Nick Apollo Forte**, star of Broadway *Danny Rose*, cut a new song. **Nick** cut several albums there in the past; one of which was discovered by **Woody Allen's** talent scouts and led to his motion picture debut.

SOUTHEAST

"Southern Wave" rockers **Will Rambeau & the Delta Hurricanes** recorded their first EP at *Treasure Isle Recorders* in Nashville. **Sam Borgerson** and **Kenny Greenberg** co-produced the project, with **Tom Harding** engineering. . . . Wrapping up the final mixing stage of his solo album at *Criteria Recording Studios* in Miami was **Robin Gibb**. The album, which was co-produced by **Maurice** and **Robin Gibb**, will be released on *Mirage Records*. Engineering the project was **Dennis Hetzendorfer** assisted by **Richard Achor**. . . . At the *Music Hall* in Nashville, producer **Harold Shedd** cut new tracks on *Sheddhouse Music* writer, **Donny Lowery**. **Jim Cotton**, **Joe Scafe** engineering. **Shedd** also did overdubs and mixes on artists **Price Mitchell**, **Roger Miller**, and **Merle Kilgore**. . . . Activity at *Music City Music Hall* in Nashville included **Charly McClain** working on a new CBS album with her producer **Norro Wilson** and engineer **Bill Harris**. . . . **Ronnie Milsap** was in at *Bullet Recording* in Nashville cutting strings for a new RCA LP with co-producer **Rob Galbreath**. **Scott Hendricks** engineering. . . . At *Morrisound Recording* in Tampa, FL, the **Steve Morse Band** finished recording tracks for their upcoming album. . . . *Mobile Audio's* 60 ft. tractor trailer remote truck was busy in the mid-south with **Al Craig** and **Kevin Burgart** doing final mixes for *Bareback*, and radio simulcast of *Jason & the Scorchers*. . . . At *Bias Recording* in Springfield, VA, ace axeman **Nils Lofgren** finished a new set of song demos with **Bob Dawson** engineering. . . . At *Web IV Studio* in Atlanta, **Rebecca deMorney** (of *Risky Business*) and **Loudon Wainwright III** were in the studio recording vocals for the Columbia Pictures soundtrack of *The Slugger's Wife*. The soundtrack is a **Quincy Jones/Tom Jhler** production. . . . **Mylon LeFebre &**

Broken Heart began cutting tracks for another Christian LP at *Ardent Recordings* in Memphis. The album consists of rock ballads. Release will be on World Records in October. **Le Fevre** and **Joe Hardy** are producing, with **Hardy** at the board. . . . Recording at *Island's Compass Point Studios* in Nassau, The Bahamas, recently were **Roxy Music**, **Iron Maiden** and **The Velds**. . . . Studio activity in the Muscle Shoals area: **Julian Lennon**, son of **John Lennon**, was in at *Muscle Shoals Sound Studios* working on some sides with **Phil Ramone** producing and **Pete Greene** engineering; **Glenn Frey** was at *MSS* producing his own session with **Alan Blazek** assisting him and with **Blazek** and **Lee Daley** on the boards; at *Broadway Sound Studio*, **Travis Wammach** and **David Johnson** worked with a new artist, **Julie Jenkins**, with **Johnson** doing the engineering; **Rick Hall** mixed an album for **Larry Gatlin & the Gatlin Brothers** at *Fame Recording Studios* with **Johnny Sandlin** engineering and **Alan Schluman** and **Walt Aldridge** assisting; and *The Impressions* were in at *Wishbone, Inc.*, doing an album for *Private Eye/CBX Records* with **Terry Woodford** producing and **Hershey Reeves** engineering. . . . At *db Recording Studio* in North Miami Beach, **Stephen Stills** cut tracks for Atlantic. **Ron & Howard Albert** were producing for *Fat Albert Productions*. The Alberts engineered with **Bruce Hensal**.

SO. CALIFORNIA

Producers **Bill Osborne** and **Zane Giles** were in at *Skip Saylor Recording* in LA mixing tracks on **Sam Cooke's** daughter, **Samana Cooke**, for *Ferrari Productions*. **Jan Gass** engineered. . . . At *Group IV Recording* in Hollywood, composer **Lalo Schifrin** scored the telemovie *Command Five* with engineer **Dennis Sands**, assisted by **Andy D'Addario**, for *Paramount Pictures*. . . . Engineer/producer **Dennis MacKay** was in at *Gopher Baroque Studio* (Westminster, CA) producing tracks for *Private I*. Also, **Otha Young**, producer/guitarist for *Juice Newton* was in the studio recording his own material with **Michael Mikulka** engineering. . . . At *Manterey Studios* in Glendale, **Albert Marx** produced **Bob Magnessum** and **Hubert Laws** on flute, for *Trend Records*. Engineering the jazz live tracking session was **Arne Frager** with assistant **Phil Brown**. . . . A *Universal Entertainment* project called *Max Maven's Mind Games*, produced by **John Blizak** and **Bruce Green**, recently used *EFFX Systems* of Burbank for all audio post. The music for the program was composed by **Joel Goldsmith** and engineered by **Darwin Foye**. . . . *Warner Bros.* recording artist **Rickie Lee Jones** was at *Evergreen Recording* in Burbank sweetening tracks with producer **James Newton Howard**. . . . At *Image Recording* in Hollywood, producer **Jack White** and engineer **Juergen Koppers** recorded and mixed the soundtrack for the new *Pia Zadora* movie,

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Voyage of the Rock Aliens. Featured artists include *Jermaine Jackson* and *Jimmy & the Mustangs*. . . . A&M artists, the *Bros. Johnson* worked at *Sunset Sound* in Hollywood, mixing their upcoming LP, with *Jack Puig* engineering with *Bros. Johnson* producing. *Stuart Furusho* and *Bill Jackson* assisted. . . . Recording activity at *Larabee Sound* in LA included producer *Reggie Calloway* mixing a new *Midnight Star* single with engineer *Taavi Mote*, assisted by *Sabrina Buchanek*, and *O'Bryan* finishing up his new album for Capitol with producer *Don Cornelius*, engineer *Barry Rudolph*, assisted by *Toni Green*. . . . At *Sound City Studios* in Van Nuys, former Journey keyboardist, *Gregg Rolie* worked on a solo LP for CBS with producer/engineer *Kevin Beamish* and *Bruce Barris* in Studio A. . . . Sessions at *Quad Teck Studios* in LA included the Oklahoma-based band, *The Notions*, finishing up an LP for producer *Craig Talkington* with *Bob Brown* engineering and *Ken Gordon* assisting. . . .

NORTHWEST

At *Fantasy Studios* in Berkeley, CA, metal rockers *Y&T* recorded their *Rock & Roll's Gonna Save the World* album for A&M Records with producer *Tam Allom*, *Andy DeGanahl* at the board. . . . *Montage Recording Co.*, Newark, CA, sessions include a first EP for *Dean Keith*, *Dave Hartzheim* and *Randy Spendlove* engineering. . . . In San Rafael's *Patchbay Studios*, two local groups, the very popular *Yanks*, with *Karl Derfler* engineering, and the *Kurt Deerfield Project*, with *Chris Rowan* producing, were so pleased with the quality of recent 8 track "demo" work they've transferred their material to 24 tracks for further work and future release. . . . *Avid Productions* in San Mateo, CA, completed a dozen public service radio spots for the *Lawrence Livermore National Laboratories*. *Chris Craig* engineered and scored the original music using their *DX7* and *LinnDrum*. . . . *Triad Studios* in Redmond, WA, has been busy with *Maury King* in for a KYYX compilation album project, *Tickle Tune Typhoon* completing tracking for the *Enchanted Village Show* with *Danny Deardorff* producing, and an LP project for *Kathy Hart* with *Luig Gore* producing. . . . *Ram*, a rock-reggae band, recorded their second album for *Zebra Overground Records* at *Jungle Sound* in Santa Cruz. . . . Activity at The Plant studios in Sausalito included *Huey Lewis & the News* mixing a live show for Westwood One with *Huey* producing, *Jeffrey "Nik" Norman* and *Rick Sanchez* engineering, and *Survivor* in mixing a new song for the Columbia Pictures film *The Karate Kid*. *Ron Nevison* produced that one and engineered under the supervision of *Brooks Arthur*, who is acting as the executive producer for the film score. Engineers *Gabe Weltri* and *Rick Sanchez* assisted on the mix. . . . In Studio A at the *Music Annex* in Menlo Park, Ca, *Steven Halpern* has recorded a new album for Palo Alto Records, engineer *Roger Wiersema* mixed an album by *Denny Zeitlin* and one of a "Be Bop Summit" with *Lee Townsend* producing. . . . At the *Automatt* in S.F., *W.A.S.P.*, LA's most offensive heavy metal group, recorded an album for Capitol Records with *Mike Varney* producing, *Steve Fontano* engineering and *Michael Rosen* assisting, and *The*

Whispers recorded a guest vocal appearance by *Phylliss Hyman*, for an upcoming Solar Records release with *Nicholas Caldwell* producing, *Dave Frazer* engineering and *Ray Pyle* assisting.

NORTH CENTRAL

The *Ohio Players* completed recording and mixing their new single at *QCA Studios* in Cincinnati, OH, with *Ric Probst*, *Robin Jenny* and *Jim Greene* engineering, *Marshall Jones* producing. . . . *Spectrum Sound Studios* in St. Clair Shores, MI, had the rock group *R.F.A.* in the studio putting the finishing touches on their upcoming LP. . . . At *Sound Impression*, Des Plaines, IL, the *Banjo Buddies* finished their long awaited third album. *John Nevin* recorded and mixed the album. . . . At *Audio Graph Productions* in East Lansing, MI, *Tsunami* finished the final mixes for their new single with *David Tsunami* producing. *Glenn Brown* engineered. . . . In the studio at *Trade Secret Recording* in Northfield, OH, is the *Michael Stanley Band*. They are once again taking advantage of the huge Variable Acoustics studio space and Live End control room for pre-production toward the release of their next album. . . . Recent recording activity at *Pinebrook Studios*, Alexandria, IN, included *Sandy Patty* recording vocals for her next album and *Gary Rhodes* recording orchestra tracks. Engineers on these projects were *John Bolt*, *Steve Archer*, *Mark Aspinall*, and *Dan Meyer*. . . . Producer *Mel Davis* did final mixes on sultry soul singer, *Liz Taylor* at Studio A in Dearborn Heights, MI.

SOUTHWEST

Recent sessions at *Crystal Clear Sound* in Dallas included: *The Elements* cutting several demos to send to interested labels (*Keith Rust* engineering), and *Janie Fricke* recording demos to send to her label. *John Carey* engineered those sessions. . . . *Yes* hired *Chaton Recordings* of Scottsdale, AZ, to tape two of their concerts during their U.S.A. tour, one in Phoenix and a second in Tucson on the campus of U. of A. . . . Producer *Jimmy Iovine* was in Dallas' *Omega Audio* recently cutting vocals with *Rachel Sweet* for the score of a new Universal Studios film titled *16 Candles*. The film is scheduled for a summer release. Engineering the sessions was independent *Gabe Veltri*. . . . At *Rivendell Recorders* in Pasadena, TX, *Reggie DeVaughn* has completed his Contemporary Black Gospel album with *Fletch Wiley* producing and *Brian Tankersley* and *Paul Mills* engineering. . . . Mixing was completed at *Infinity Recording* in Tulsa, OK, for a single by heavy metal *David Dover Band* and one for blues/rockers *Captain January*. . . . In Houston, TX, at *Wooden Studio*, *The Max* recently completed their album produced by *Roger Cummings* and engineered by *Gus Buzbee*. . . . At *Precision Audio* in Dallas, *Rudy "Tunes" Wilson* produced an LP for *Lynn Daye*. . . . Producer/engineer *Jon Early-Ligon* has been very busy working with the new music group *Edge of the Wedge* from Louisiana, local singer/songwriter *Billy White*, *Jimmy Wallace and the Clue*, and R&B singer *Kim Farmer*, all at *Studio South* in Austin.

STUDIO NEWS

With the delivery of their 4th 3M digital 32 track, *Digital by Dickinson* can offer full-time in-house 64-track and post-production facilities. . . . *The Bennett House* recording studio in Nashville has purchased a pair of new Studer A800 MKIII 24-track recorders. . . . *Groundstar Laboratory* recording studio in Nashville also purchased two new Studer A800 MKII 24-track recorders. The new units replace Studer A80VU recorders, which were taken in trade by Studer. . . . *Nibor Recording Studio* of Hurley, NY, has upgraded from 8 to 24 track with the purchase of a Soundcraft 1600 Producer Series Console and Soundcraft 760 24 track recorder. . . . *Audio Graph Productions* of East Lansing, MI, has recently updated their 24-track Studer facility with the addition of a Lexicon 224X digital reverb with LARC, Lexicon Prime Time II, Aphex Exciter, Eventide Instant Flanger and additional Kepex, UREI compressors, Neumann and AKG Microphones. . . . Hank Waring has announced the appointment of *Bob Brown* to the position of staff engineer for *Quad Teck* studios in L.A. . . . *California Studios* in LA have recently purchased several new items: a Lexicon 224X with LARC, and two Lexicon PCM-42 digital delay lines. . . . *L.D. Systems* of Houston, TX, has added 30 QSC 3500 and 3800 power amplifiers to its largest touring system. Incidentally, L.D. Systems was recently appointed the Gulf Coast representative for the Otari MTR-10/12 and MTR-90 II lines of audio tape recorders. . . . Design work for a new two studio complex called *Sounds Unreel* in Memphis has recently been completed by *Phase Audio, Inc.*, a Memphis-based sound contracting firm. Sounds Unreel, owned by Memphians *Don Smith* and *Jon Hornyak*, opened its doors April 1st. . . . *Sammy Gene Music* of San Rafael, CA, accepted delivery of their brand new MCI JH-24 24-track recorder and 1600 Soundcraft console, supplied by *Leo's Pro Audio* of Oakland. . . . *Greene Street Recording*, NYC, has updated their studio monitoring by adding the new John Meyer 833 studio monitors making them the first in New York City to have these prestigious speakers. . . . *Future Disc Systems*, one of the newest and most advanced mastering facilities in Southern California, recently installed the console version of Mitsubishi's digital two-track mastering recorder, the X-80A, and the DDL-1 Digital Preview Unit. . . . *Sigma Sound Studios* of Philadelphia, recently put into operation its Audio for Video Post Production facility, the first such facility in the Philadelphia area. The facility includes such video equipment as a Sony BVH-2000 1" C-format video recorder, a JVC CR-825OU address-track capable U-matic videocassette recorder, and a Sony CVM-1900 Trinitron color monitor. Synchronization is provided by an Audio Kinetics Q-Lock 3.10, and an Otari EC-101 Universal Resolver is available. . . . *Jay Siegel* has announced the acquisition of *Mayfair Recording Studios*, at the hub of the New York recording scene—47th Street and Seventh Avenue. Jay said there will be a comprehensive upgrading of outboard equipment, the installation of an automated MCI console.

THE HIT SEAT



Photo courtesy | New River Studios, Fort Lauderdale, Florida

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75th AES CONVENTION

PARIS...MARCH 27-30, 1984

The Audio Engineering Society held its 75th Convention March 27 to 30 at Paris' Palais des Congres, the largest facility ever used for this European meeting. Two neighboring hotels housed most of the 3920 attendees, up 10% from last year's record attendance in Eindhoven, Holland.



The grand and spacious Palais des Congres proved to be a conveniently located venue, and integrated exhibit areas, meeting rooms, auditoria, gourmet restaurants, designer boutiques, luxury hotel accommodations and a variety of municipal services. The generously wide exhibit hallways added a mellow contrast to the convention's fast paced and high density New York counterpart.

Conventioneer support services were at an all time AES high, with bilingual hostesses, travel agents, tour planners and information officers standing by. The on-site foreign currency exchangers were even giving the best rates in the area.



Exhibit space featured the most accessible layout in recent AES history. All of the 177 exhibitors (and about 30 other trademarks represented by exhibitors) were comfortably situated around two elliptical floors of the convention hall.



One of the convention's technical highlights was the DASH 'roundtable' which brought together the prime movers of digital recording; Sony's Dr. Toshi Doi shown here addressing the assembly. Fifty-six other technical sessions were presented with topics ranging from "New Loudspeaker Diaphragms Using Fiber Reinforced Plastics," to "Sound Recording Principles Combined with the Video Signals on a VTR," to "The Design of a Digitally Controlled Assignable Sound Mixing System for Broadcast and Recording Studios."

Left to right: Richard Garrido, Convention Chairman; Albert Grundy, AES President Elect; Donald Plunkett, AES Executive Director. Garrido: "The European market is a door to the Eastern Bloc market. We'd appreciate that every U.S. manufacturer consider the European convention important." Grundy: "Of all of the different venues that we've been in, this one rates near the top in terms of pleasantness and comfortability." Plunkett: "March seems to be an ideal month (for the European convention.) Airline rates are down, for U.S. travelers, and hotels are more available."



Oh, yes...one more thing. If you were at the Paris convention and happened to request being placed on our mailing list, please drop us a line. That list is missing in action. —D.S.



John Chowning:

“When people speak of the dehumanization of music, I speak of the humanization of computers.”

CCRMA

Computer Music at Stanford

by Larry Oppenheimer

Five miles south of the Stanford University campus, down a eucalyptus-lined country back road of Palo Alto, is an unobtrusive sign pointing the way to Stanford's Donald C. Power Laboratory. Sitting on a grassy knoll at the top of the driveway is a redwood-beamed building in a partial crescent shape. Stanford acquired the building after GTE (who intended the building to resemble a giant donut) abandoned the project with only the first third completed, and up until 1979 the Stanford Artificial Intelligence Laboratory (SAIL) and its DEC PDP-10 computer resided here.

In 1964, two years before the SAIL moved off the main campus and up to the knoll, a Music Composition graduate student became curious after encountering an article by ace researcher Max Mathews of Bell Laboratories on the subject of computer generation of sound. The student began experimenting with some of Mathews' programs on the SAIL's computer during off-hours, and when the SAIL moved their computer to the Power

Lab, the musical experiments followed. From these early explorations by John Chowning grew Stanford's Center for Computer Research in Music and Acoustics—the current residents of the donut-to-have-been, and one of the most advanced and well-respected facilities of its kind in the world.

The Center (CCRMA, pronounced, appropriately enough, “kar-ma”) was formally created as a University Center in the Music Department in 1975 with grants from the National Endowment for the Arts and the National Science Foundation, and is directed by now-Professor Chowning. It currently consists of more than 50 students, staff, composers, and researchers working on pushing the frontiers of their widely varied interests a little further every day, tied to each other with a sense of community and the common threads of computers and sound.

From the beginning, the relaxed atmosphere, idyllic setting, and uncharted territory of emerging computer technology have attracted top calibre creative minds (like

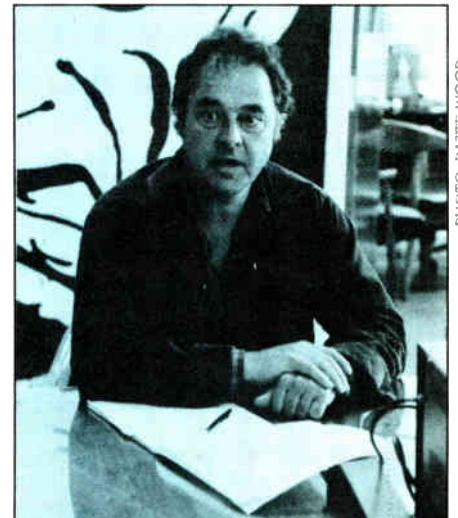
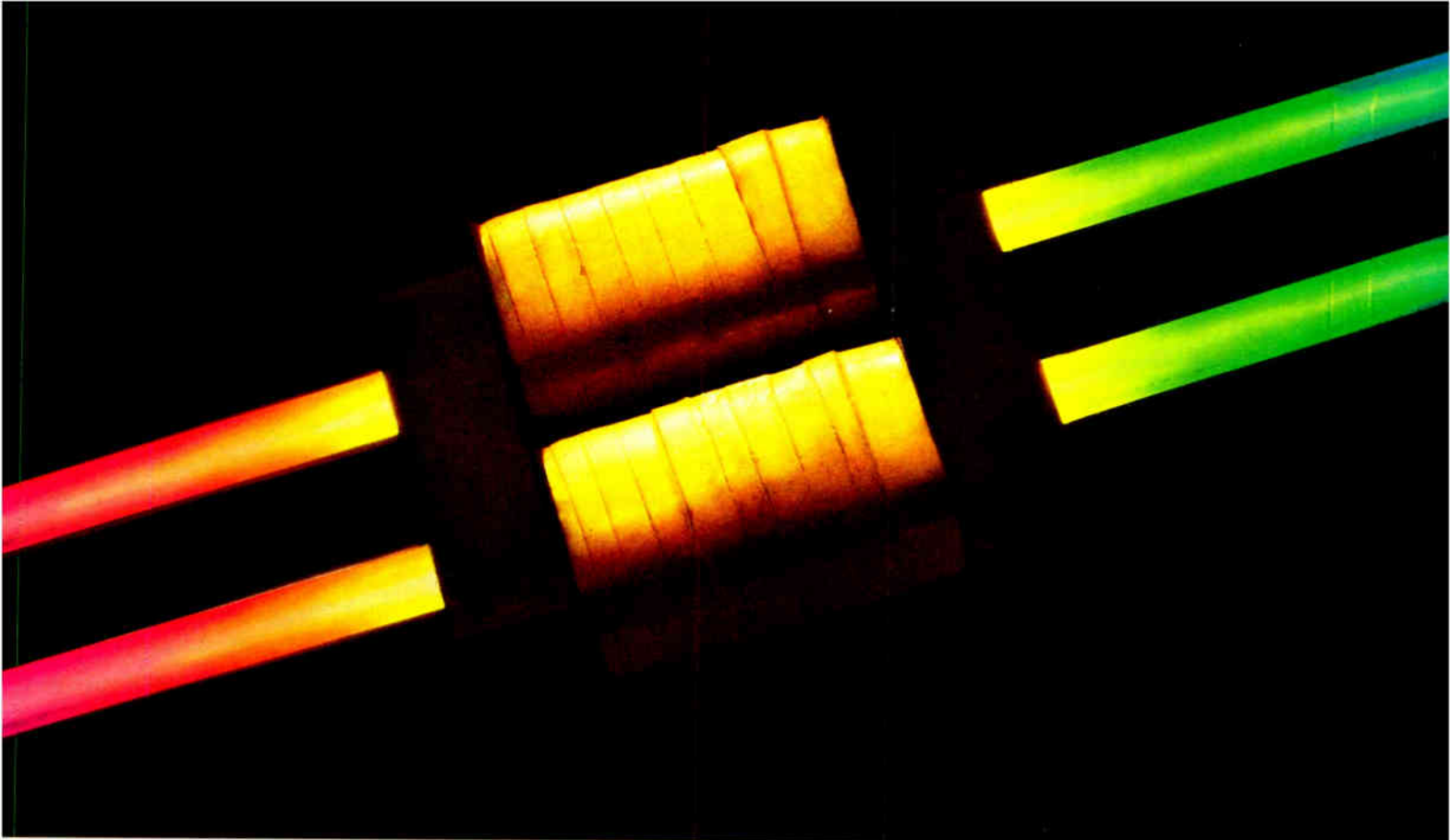


PHOTO: PAITTE WOOD

John Chowning, CCRMA's Director

founders Chowning, Loren Rush, Leland Smith, John Grey, and James A. (Andy) Moorer), and produced spectacular results. Perhaps most familiar of the developments to emerge from CCRMA are Chowning's techniques for the synthesis of musical timbres through the use of frequency modulation (see sidebar); which led to



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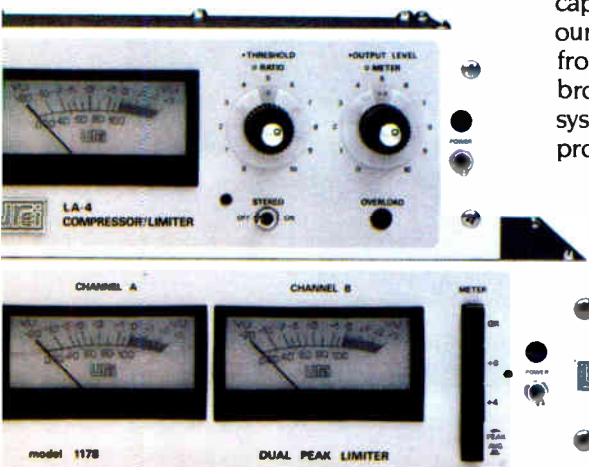
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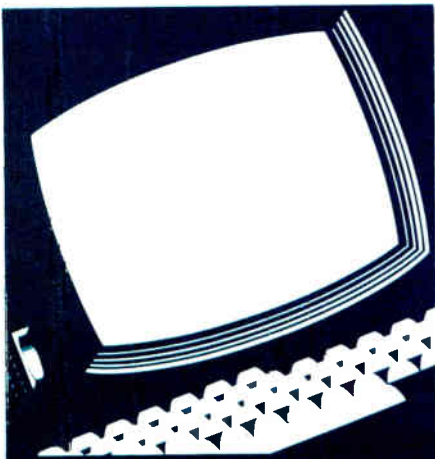


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Betsy Cohen:

"CCRMA exists for music. The research into perception, music cognition, psychoacoustics and signal processing that goes on—all that is to get the music out there."

the introduction by Yamaha International of DX series synthesizers this past year.

Chowning's discovery of FM synthesis as a viable means of creating interesting musical sounds with complex spectral changes started in 1967, when he modified some of Mathews' programs to give wildly exaggerated vibratos; that led serendipitously to the revelation of FM's timbral properties. Stanford patented the process, and in the early '70s contacted several major organ manufacturers to determine their interest in licensing it. One was curious enough to send an engineering team out to have a look. After auditioning some brass and percussion sounds, the team left, apparently unimpressed.

"My feeling is that they didn't really quite understand the whole digital domain," recalls Chowning, "I guess they thought it was some spurious, quirky result from FM, rather than a powerful way to generate complex spectra." Shortly thereafter, Yamaha's name came up as the world's largest (at that time) maker of electronic musical instruments, and so it happened that Chowning once again demonstrated his discovery for visiting engineers. "Yamaha sent an engineer over who took about ten

seconds to understand why FM was interesting." Yamaha licensed the technology in 1974, and then spent nearly a decade of effort cultivating the DX series.

The evolution of FM synthesis was a major step at CCRMA, but amongst such a group of musically and technically long-legged people, great strides are not uncommon. For example, the groundbreaking work in computer analysis and resynthesis of musical instrument tones which was done by psychoacoustician Grey and systems programmer Moorer. The procedures they framed for breaking down and reconstructing in a controlled manner actual instrument tones provided researchers (like Grey) with new tools to tackle such elusive and subjective topics as perception of timbre, without having to rely on traditional test sources (e.g., sine tones, pulse trains, etc.). Or computer Bill Schottstaedt's creation of Pla a high-level computer language specifically designed to reduce the sharp limitations and tedious, non-musical delineation required by many existing music composition languages. Pla is flexibly structured, to avoid forcing a composer into a particular compositional process (as early languages like Mus V did).

With Pla, says Schottstaedt, "You can build up your own compositional world. You can build procedures that will allow you to describe

musical events in any way you like." But even as Pla provides greater structural freedom, the use of default values for the multitude of parameters that are available (which in early days were listed one by one before any sound could be heard) saves creative energies from being sapped by tasks irrelevant to the moment. "You don't want to have to think about every detail all the time," Schottstaedt concludes. This combination of features is potent enough that most of the music created at CCRMA is written using Pla.

These are only a very few of the breakthroughs achieved at CCRMA. A full accounting of accomplishments could easily fill several articles, or even a book (and hopefully will). However, as significant as these advances are, to merely list and discuss them is to remove them from their true context and miss the real point of the work: at CCRMA, technical achievement is a means, not an end. "CCRMA exists for music," states Betsy Cohen, an Assistant Professor of Physics at Stanford with a background of equal parts music, psychoacoustics, and electrical engineering. "The research into perception, music cognition, psychoacoustics and signal processing that goes on—all that is to get the music out there." Chowning concurs, adding, "There's nothing I do in the domain of research that doesn't have

FM Made EZ

Frequency modulation is a concept long familiar to those involved in radio or analog synthesis, and the application of FM to timbral synthesis actually requires only a few extensions to the concept. A detailed explanation can be found in John Chowning's original article, published in the September 1973 issue of the *Journal of the Audio Engineering Society* (Volume 21, Number 7). To give a basic understanding of the process, here is a brief summary taken from that paper, and discussions at CCRMA.

In its simplest form, FM consists of two signals, known as the "carrier" and "modulator" (in radio, this is the program). For the sake of simplicity, it is assumed that both of these are sine waves (typically the case in digital FM synthesis). As the modulator goes from zero up to its peak amplitude, back down through

zero to its lowest value, and up to zero again to complete a cycle, the carrier's frequency varies accordingly, its frequency rising and falling with the modulator's amplitude fluctuations. The maximum amount that the carrier's frequency changes from its starting point is dependent on the maximum amplitude of the modulator, and is called the peak deviation. As the carrier is modulated, frequencies (known in radio as "sidebands") occur above and below the carrier at multiples of the modulating frequency, e.g., a 2kHz carrier and 500Hz modulator could have side frequencies at 500Hz, 1kHz, 1.5kHz, 2.5kHz, 3kHz, 3.5kHz, etc. The number of side frequencies is determined by the modulation index (the ratio of peak deviation to modulating frequency), with the curious twist that as the

—PAGE 24

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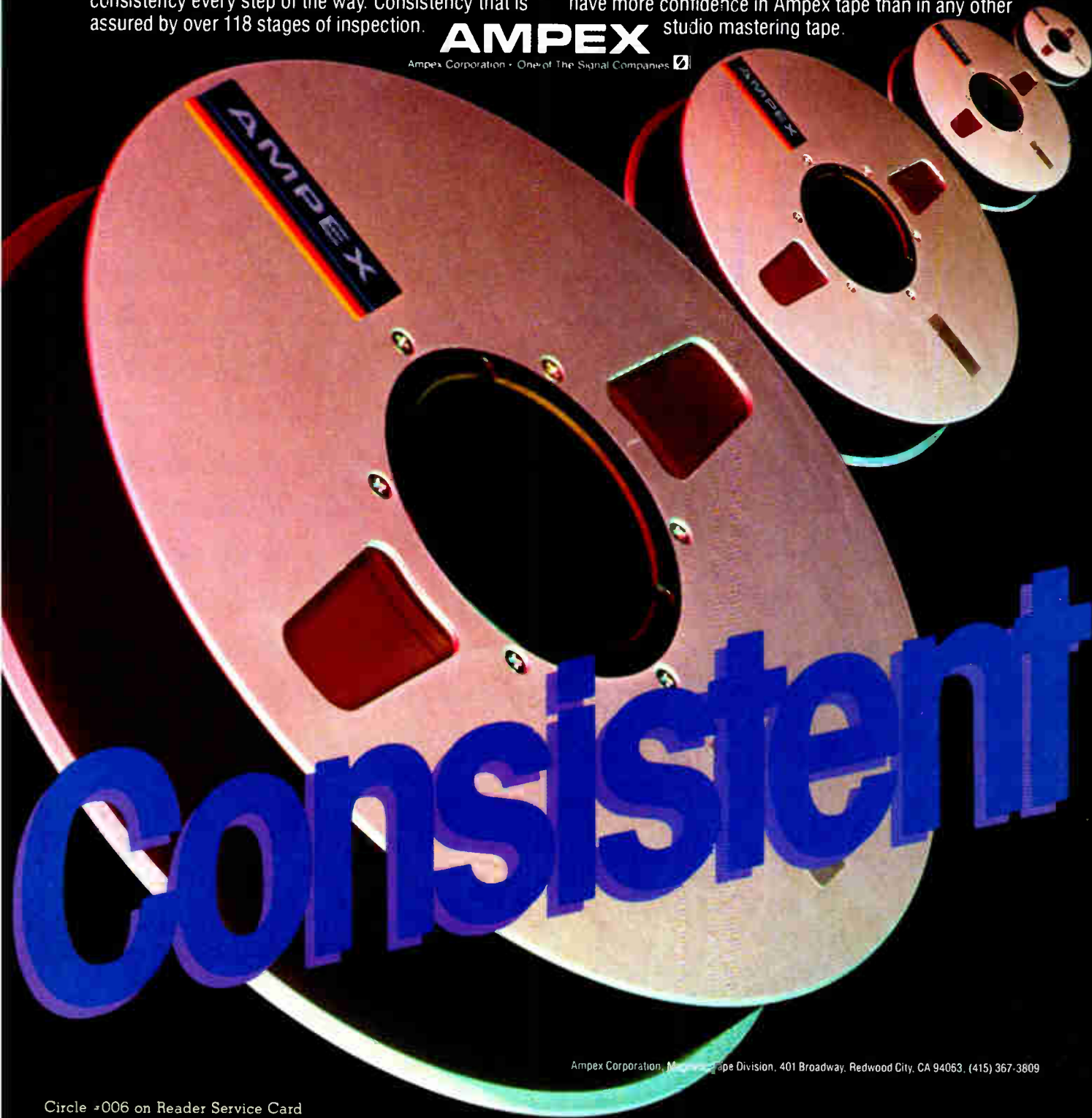
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some compositional value finally."

In fact, most of the technical undertakings here begin as a solution to a musical or compositional need that either arises during the creation of a piece, or is seen as a limitation to that process. Schottstaedt's Pla language started from his inability to compose comfortably with the existing software, and resulted in the creation of a procedural program to help him write the new piece he was starting. Over a period of about three years he refined, expanded, and generalized the program into the current version, which Chowning describes as "a major piece of programming." Michael McNabb's sung vowel sounds using additive synthesis were created for his piece "Dreamsong," but they so interested Chowning that he investigated further, using FM synthesis, eventually publishing a paper on his findings. And all the while, no one loses sight of the fact that the final value of the work is in the music.

The strong concern for music as a primary motivation for projects is voiced by nearly everyone here, and is indicative of an underlying attitude that is reflected not just in the work that is done but also in the atmosphere: professional in approach, but loose enough to allow both

creative individualism and working interactions. As a new idea unfolds, technical or aesthetic problems often crop up and threaten to block further progress, but the Center's openness in many instances helps to alleviate these situations.

Composer David Jaffe ran into some knotty problems in digital filtering while adding some sophistication to an elegantly simple algorithm devised by two computer science students for synthesizing plucked string sounds. He sought out Julius Smith, an expert on digital signal processing, and gained the solution needed. Later encountering further questions, Jaffe continued to tap Smith as a resource; eventually they together published a paper on their results. But during the collaboration Smith also gained some insights and information which he was able to use in his own work on the synthesis of bowed strings.

This informal "shoulder rubbing" is common here, and in fact is a desired result of Chowning's deliberate efforts to gather students of several related disciplines under one roof. Having brought together this variety of creative spirits, Chowning endeavors to avoid an environment restrictive to inspiration. He em-

phasizes, "We have to recognize that various people will have various attitudes towards the use of some idea. If there is any monolithic attitude towards the work or the music at CCRMA, I don't think there should be, and I would fight that. I don't believe that's a very healthy environment."

The human element plays an increasing role in CCRMA's direction, a trend seen at many major computer music centers (other significant installations include IRCAM in Paris, MIT, University of Illinois, University of California at San Diego, University of Toronto, Lucasfilm, and Bell Laboratories in New Jersey). The first explorations of computers in music probed the vast capabilities this new tool brought to the field. As the field and its related technology matured, many projects began to turn their attentions to the problems of the man-machine interface, seeking to minimize the degree to which technology impedes the creative process. Consider this refreshing perspective: John Chowning sitting with a reporter a few years ago, at Stanford University—the very silicon heart of the beast—talking about anthropomorphizing technology, "When people speak of the dehumanization of music, I speak of the humanization of computers." At CCRMA, this has been reflected in software like Pla, and hardware like the Samson Box.

The Samson Box is a powerful, real-time, fully digital synthesizer/processor which was built for the Center by Systems Concepts, Inc. of San Francisco, and is named for its designer, Peter Samson. It can produce up to 256 oscillators which can be configured for any of the standard methods of digital synthesis (although additive synthesis and non-linear types like FM and Waveshaping are all that are normally used at CCRMA), and has 128 filter units plus 32 delay units which can be used for processing synthesized or recorded signals in a host of ways; reverberation or filtering for analyses being two typical examples. Although most of the compositional work is done out of real time on CCRMA's Foonly F4 processor (which emulates a PDP10, where the Pla language resides), the Samson Box, having hardware and extensive software interfaces to the Foonly, performs the high-speed "number crunching" and computes the actual sound samples, thus greatly reducing the work load of the Foonly. What this means for the composer is that there is rarely a significant delay (more than a few minutes) between the time a sound is defined and when it can be heard. This immediate aural feedback



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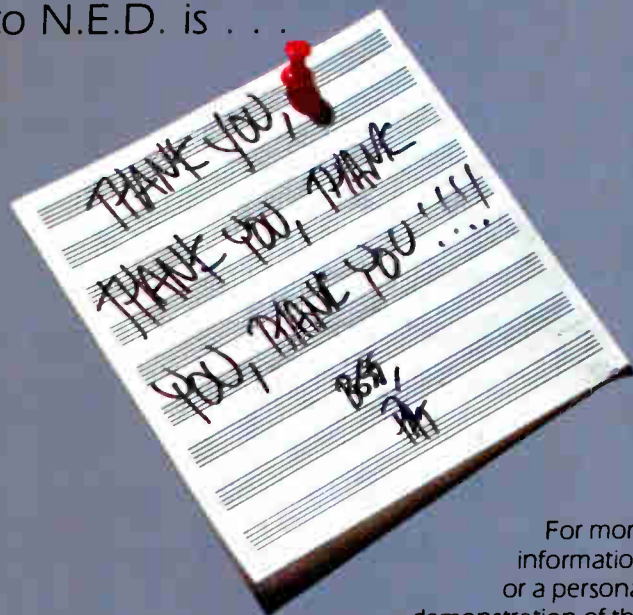
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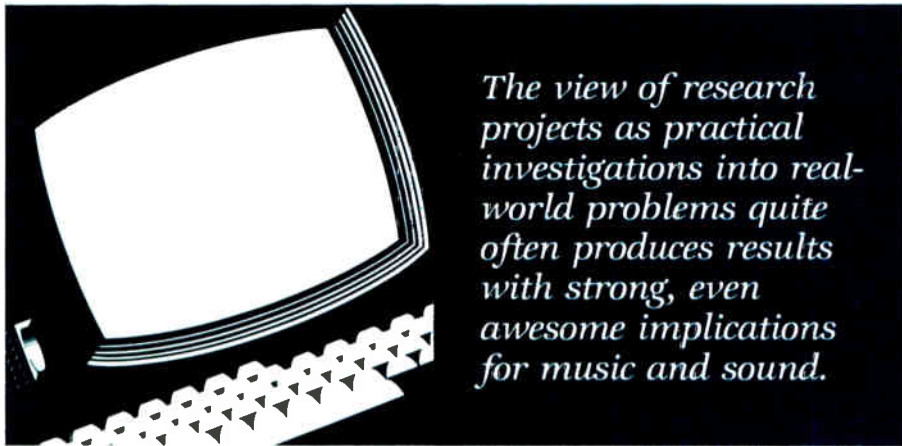


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The view of research projects as practical investigations into real-world problems quite often produces results with strong, even awesome implications for music and sound.

is vital to keeping an idea flowing, and is in direct contrast to the days when computer musicians had to submit a pile of punched paper cards and wait as much as a day or so to hear a few seconds of sound (or even to the orchestral composer who often writes pieces without ever hearing them because of the expense of hiring an orchestra).

Logically, CCRMA's research efforts have been strongly affected by the advent of microprocessors. Massive numbers of people now have everyday contact or involvement with computers, the price of computer equipment is now low enough for almost anyone to afford (from \$30), and the computing power of available machines steadily increases. In response to these facts, research on new hardware and software for the Center's present system is slowing, and energy is being focused on the design of a "personal workstation" system. The concept of the system will be similar to that of the current system: a generalized computer (based on the Motorola 6800 microprocessor, the same chip used in Apple's Lisa and Macintosh computers), with most of the programming and control functions residing in software, controlling various ancillary hardware-based devices which will be specialized for particular functions, such as a synthesizer card or an A/D-D/A converter card.

The workstation will not have the power of the Foonly/Samson system, and tasks requiring that power will still be done on the current setup, but it will have two large advantages over the present system. First, it will be a single-user machine, not time-shared as the Foonly/Samson is. (Time sharing is a system wherein a computer services multiple users by sequentially performing small chunks of each user's task, theoretically cycling through the users fast enough to give each one the appearance of having the machine's full attention. The

system can get considerably slowed down, however, if the computer is asked to do heavy computational jobs while supporting a number of simultaneous users.)

Second, and most important, the workstation will be small enough to be portable (it is being built into a professional road case), powerful enough to do real-time synthesis and processing, and cheap enough to build several of them. This will allow in-concert performances, with musicians able to interact and even improvise with the computer. Currently, Chowning is using a workstation and several Yamaha synthesizers to write the first performance piece he has composed since getting involved with computers. It will involve several keyboard players performing scored parts, while computer musicians control what the keyboard information does.

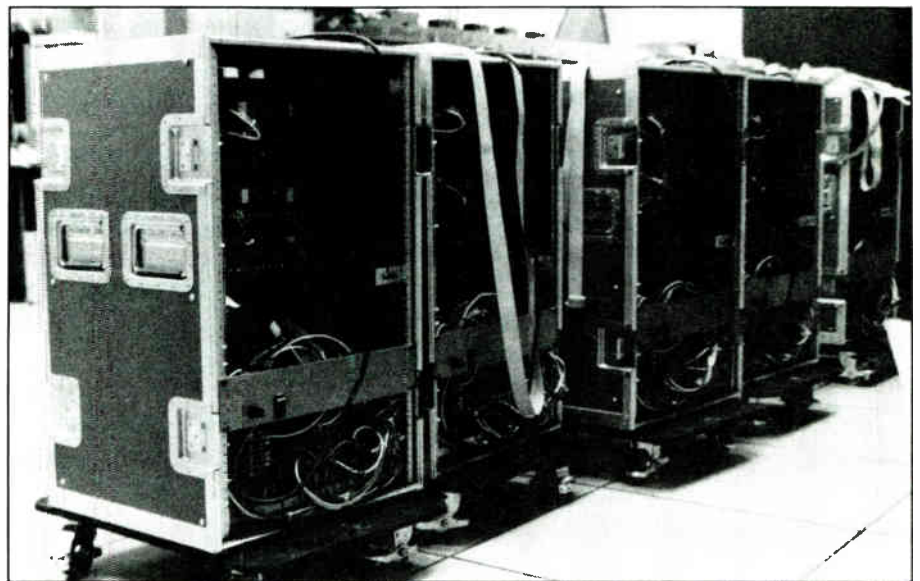
The direction that the workstation project indicates is one of bringing digital synthesis to the masses. Betsy Cohen puts it like this:

"The idea is to get this new instrument into the hands of as many composers as possible to produce music that stands as music independent of the adjective/modifier, 'computer'."

Aside from the artistic value, falling costs and rising public acceptance of computer-based music machines give tremendous commercial value to the workstation concept (as some foresighted company will surely find out). The success of the Yamaha FM instruments will almost certainly result in the music industry having a heightened awareness and greater interest in work going on here. Several companies have already loaned, donated, or sold the Center equipment to use and/or evaluate, reaping in return the benefits of research and direct feedback from a highly knowledgeable and very critical group that puts the equipment to perhaps the most demanding musical test of its abilities possible. Some performing musicians have also had contact with CCRMA, resulting in mutually beneficial musical exchanges. This type of activity is one that CCRMA would like more of, and efforts are underway to formalize some of these relationships.

It is interesting to note that the view of research projects as practical investigations into real-world problems quite often produces results with strong, even awesome implications for the ways music and sound will be generated and manipulated in the not-so-distant future. A very striking case in point is the musical intelligence project headed up by Loren Rush.

Rush is a composer whose close alliance with members of the San Francisco Tape Music Center in the '60s allowed him to observe the birth



6800 based computer music workstations under development.

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—FROM PAGE 16, FM

number and energy of the side frequencies increase, the energy of the original carrier frequency decreases. In FM synthesis, both the carrier and the modulator are at audio frequencies (as opposed to the ultrasonic carriers used in radio), and so the side frequencies form the audible spectrum of the sound. Now we come to the points that give FM synthesis its timbral properties.

With some choices of carrier and modulator there will be "negative" side frequencies, such as a carrier of 700Hz and a modulator of 1kHz. These components are "reflected", with an inversion of phase, back into the positive spectrum, adding to the components already there to produce what may be a harmonic, or in this case, inharmonic complex spectrum. But this is only half the fun. Natural sounds tend to have more interest than most synthesized sounds because their spectrum changes over the course of the sound. By varying the amplitude

of the modulator over the course of an FM synthesized sound, we can cause the side frequencies to have dynamic activity, hence creating time-variant complex spectra. The analog synthesis equivalent to this would be to put the modulator through a VCA and control the VCA with some envelope function.

Chowning's research showed that the exact nature of each side frequency's variation is not as important to the ear as the shape of the overall spectrum's change, which simplifies emulation of some families of acoustic instruments. Furthermore, the sine waves can be easily generated by storing a sine table from 0 to 1 in memory, and reading it forwards, then backwards, and then repeating with a change of sign (phase) to make one complete cycle.

Using multiple carriers or modulators in various configurations gives rise to a huge amount of FM "instruments", lending the technique great versatility.

—L.O.

of modern electronic music, while writing acoustic, primarily orchestral, music himself. Intrigued with the potential of computers in music, and interested by Chowning's early work, Rush became a graduate student and a part of the fledgling Center, then still attached to the SAIL. He has been involved at CCRMA on and off ever since then, working less on synthesis and more on digital recording and processing of recorded material. Rush's first experiments in digital recording were in 1968, about eight years before he and Andy Moorer set out to write a recording/editing software package that CCRMA desperately needed. Moorer finished the basic recording software in about a week. Rush never stopped writing the editing program.

The program's capabilities are staggeringly powerful, allowing transcription, editing, analysis, and processing of sound to be performed in any order. Least the impact of this project be underestimated, here are a few specifics:

Sound is recorded into "sound files," which may be thought of as "takes" consisting of however many "tracks" are available on the system. A sound file is currently limited to four "track, but up to 19 files are simultaneously available. Mixes can be composed and stored complete or in process, although real-time mixing is not yet implemented.

Basic editing capabilities, like auditioning any selected portion of the available sound files and "cutting and splicing" them together in any desired fashion, are possible—but with the previously unheard-of precision of editing down to the sample. Sampling rate in the system is programmable, depending on the requirements of the specific material, but at a full-bandwidth rate of 44 to 50 thousand samples/per/second, it becomes orders of magnitude more precise than the 1/30 second capability of a SMPTE time code-based editing system. Additionally, when a digital splice is performed, the system uses an inaudible sinusoidal crossfade function, as opposed to the "straight line" linear interpolation used in some current editors. Furthermore, the splice can be ten milliseconds, ten seconds, or virtually any other length required, within the limits of the system (which generally exceed any practical requirement). Various types of envelope and spectral analyses can be done and displayed in three-dimensional graphics, with the display rotatable through several angles.

Although some of these features seem beyond most production applications, Rush has already had occa-

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sion to make use of some of them. "In creating the Compact Disc [described below], we were using a digital magnetic tape copy of Andy Moor's piece, 'Lions Are Growing.' This copy had been knocked around a bit, and played on various machines, and had some very serious drop-outs which couldn't be corrected by the normal error correction of the mag tape reader. The only way I could repair it was to let it come through with all its errors, and then go back and patch the waveform. So I'd listen for clicks and pops and things like that, and then go in and find, by eye, the sample that was wrong and correct it by taking it and moving it graphically to where it should have been in the waveform."

Other startling features include the ability to retune instruments and to apply synthesis approaches (such as envelope modification and dynamic filtering) to signals, but all the aforementioned aspects of Rush's editor scarcely even touch on tasks that use musical "intelligence." Some of the capabilities envisioned for the future are: "intelligent" tuning (the ability of one instrument to follow and adjust to another), "recognition" of different instruments, and "understanding" of musical structures and



PHOTO PATTE WOOD

Working setup (session) in CCRMA's studio.

elements (these last two allowing transcription and musical analysis of compositions or even improvised performances). In the studio, this will mean the ability to give commands like, "find the fourth note of the second trumpet entrance and transpose it up a minor third for the remainder of the thematic restatement," or, "Bring the lead vocal into tune with

the guitars on the last chorus, and change the harmonies from major to minor." In performance, this means being able to consider the computer as a "sideman" or another soloist, able to respond to musical changes as they occur. The suitability of the workstations to real-time applications has convinced Rush to wait for them to reach functionality before continuing

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work on the editor, so that the existing software can be transferred.

At this point you may be wondering just how soon you can expect to see this technology trickle down to use in the "real world." It already has. A few years ago, Andy Moorer moved north from CCRMA about sixty miles to head up the Digital Audio project at Lucasfilm. Working with a team of bona fide heavies from the audio, video, film, and computer worlds, Moorer has constructed an impressive beast known as the Lucasfilm ASP (Audio Signal Processor). Several articles on the ASP have been published in the *Computer Music Journal* (the leading periodical in the field, and a primary outlet for publications from CCRMA) which give some detail, but, in brief, it is a machine which has some abilities similar to CCRMA's system (sophisticated interactive graphic manipulation of sound files, powerful digital synthesis/processing), other capabilities not currently implemented at CCRMA (such as a totally "soft" console which consists of a collection of sliders, knobs, switches, and buttons, each one's function fully programmable), plus still other features specific to film production. The ASP bears mention here for two

significant reasons: 1. At this writing, the ASP is in large part functional, and is being used in the production of George Lucas' next film. 2. Lucasfilm plans to develop the ASP further and then market it, perhaps as soon as a year from now. (Don't mark the date on your calendar yet—projects of this complexity tend to drag beyond their intended deadlines.) Rupert Neve is already delivering their DSP, a digital mixing console which is not as general or powerful as the systems described above, but probably an eviction notice for present consoles and automation systems..

Meanwhile, at CCRMA, evolution continues. Expanding their efforts to bring their music to the world, CCRMA has had recent releases in several recorded media. *The Digital Domain* is a Compact Disc produced by Loren Rush with his old friends, Elliot Mazer and Janis Mattox, and consists of more than a dozen selections from compositions done at CCRMA plus digitally recorded, mixed, and/or processed "live" sounds. There are another dozen or so bands of test material for evaluating the limits of your sound system. The disc is intended as a demonstration of the sonic capabilities of the CD, and demonstrates it certainly does, from

the twitter of little birdies in the park to the roar of a Huey helicopter. Composer Janis Mattox has produced a standard cassette entitled simply, *Computer music from CCRMA, Volume 1*, which contains eight compositions from the Center (some of which are also on the CD), including Chowning's 1972 composition "Turenas", the first use of both FM synthesis and his Moving Sound Source Simulation program. The cassette was mastered directly from the digital master (CCRMA makes extensive use of the Sony PCM-F1), but still suffers from the limitations of the cassette medium. It is difficult from the cassette to really appreciate the extended frequency response, absence of noise, and impressive spatial localization of the original (much of the work at CCRMA is recorded in four channels, and actively takes advantage of that fact), but the music still shines through. Finally, there is a record from Michael McInabb with the distinctive title, *Computer Music*, which contains "Dreamsong" and two other titles. Other releases are planned, but no specifics are available as of this writing.

Concerts are put on several times a year, including a summer event at Stanford's Frost Amphitheatre, a pleasant outdoor site in which to enjoy the texture and spatiality of CCRMA's music. This year's event will use a recently donated sound system from Meyer Sound Labs, Inc. of Berkeley, who also donated a pair of studio monitors to the Center.

This fall, CCRMA will finally abandon the splendid isolation of the knoll in favor of building on the main campus. This will allow them to build a new, professional studio facility, and to hook into the Ethernet (Stanford's computer communications network) on campus, enabling information exchanges between CCRMA and other departments and facilities. Everyone seems very excited about the move, and ideas are flying about what it will really mean for CCRMA's evolution, but it is all just conjecture at this point. As Chowning points out, "No one can really predict what kind of ideas come out of a place like this." ■

The Digital Domain (Elektra 9 60303-2) is available where compact discs are sold.

Computer Music from CCRMA, Volume 1 is available from: CCRMA—Music Department, Stanford University, Stanford, CA 94305. *Computer Music* may be ordered as Recording #S-1800 from: 1750 Arch Records, 1750 Arch Street, Berkeley, CA 94709.

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MIDI is all about communication—a composer in New York could perfect a score and telephone it to synthesizers in Los Angeles.

M · I · D · I

by Ken Pohlmann

If you think MIDI is the skirt length for the new spring fashions, you better go back to the maintenance shop and fix some more broken cables. The Musical Instrument Digital Interface is the hottest thing since black keys. It was inevitable, I think, for electronic keyboards to go digital, for the same general reasons that most of our technology has gone digital, for example, lower production costs, higher reliability, more versatility, etc. and also for some rather specific reasons such as pitch stability, programmable timbres, recordable timbres, etc. Of course digital is old hat now; watches, clocks, toasters, and voices that tell you your car door is ajar hardly excite public interest anymore. What's in is networking. You see, once a device goes digital, it often wants to have someone to talk to—and I don't mean a ponderous human type. Digital devices want to talk to each other. Thus we set up a network for them and they busily begin to chat, exchange data, gossip, or whatever. Science fiction writers used to postulate that computers would take over the world; networking is definitely the first sign of this happening, in the same way that teenagers with their own telephones have taken over the telecommunications system.

MIDI was introduced in

January 1983 by five far-seeing manufacturers; many new synthesizers now contain a MIDI interface. Using the interface, the instruments can exchange data. For example, you could utilize one instrument's electronics by playing another's keyboard. Doesn't sound like much? Keep reading. A common data base can be established so that all the networked instruments can share timbres, compositional notes, etc. All electronic instruments can be coordinated, for example, drum machines and synthesizers can be synchronized to a single polyphonic track. Twenty-four track tape recorders aren't as important as they used to be; a composer doesn't have to bounce tracks anymore—he can bring the entire arrangement to the studio and record it on one track. In fact, he doesn't even have to visit the studio; he can phone in his part using a modem to transmit the control data to studio synthesizers. No more expensive studio time—get it all right in the privacy of your own home. Or use the same amount of studio time, and indulge in more sophisticated arrangements. And MIDI-based electronics could be expanded to permit direct acoustic instrument input into electronic instruments for recording and processing.

MIDI is thus all about communication—that is, it is a protocol which defines how communication will take place. Specifically, MIDI is a serial

protocol operating at 32 kBaud (32 thousand words per second) through a standard five pin DIN plug. That connection is a generic one depending on the application; instruments might have input, output, and throughput jacks. A controller might have only an output jack whereas a synthesizer might send and receive data. How fast can you talk on a MIDI? Roland has demonstrated a rate of 500 notes (on and off) per second; which could be thought of as 27 note chords, in 32nd note triplets, at 120 beats per minute. What can you talk about over MIDI? Well, almost anything. MIDI is merely a protocol, and what is said is up to the software. Note duration and pitch, modulation, key velocity, and dynamics are the most obvious, but anything is possible; if it can be conceived, and expressed in terms of binary data, then MIDI will carry it.

The point, of course, is that the musical instrument has gone electronic, and digital, and thus computer. Instruments are well on their way toward the general purpose computer in which the circuits stay the same, and only the software changes. The future musician might buy one controller and merely buy new software (or write his own) as musical tastes change. Much like the home hacker, the musician would use a video display to compose and edit his pieces, do arranging, and assign voices. That future instruments would be talking to the rest of the digital studio—its console, signal processors, etc., to permit a highly facilitated method of making music. The digitization of music, both in terms of composition, recording and production will be complete.

The first step toward that not-so-distant future is the linking of musical instruments to the personal computer. Several companies are quickly entering the market with small computer applications packages. Passport Designs is offering the PolyWriter software package which utilizes the Apple II and Soundchaser for music printing, and Sequential Circuits is reportedly ready to introduce music software. The Roland MPU-401 is the first example of an intelligent interface between MIDI instruments and the personal computer; an ambitious LSI handshaking system permits coordination with virtually any kind of small computer. Software written by Ralph Dyck presently uses the MPU-401 and either the IBM PC or the Apple II to control MIDI instruments.

The MPU-401 has MIDI input and output lines, synchronization lines for other sequencers and drum machines, and an interface to the host computer. It communicates with the host via interrupts to request data transfer from the computer to the MIDI instruments, or transfer to the computer. Since it is a background processor, other host jobs may be run simultaneously as well as screen updating, DMA, disk I/O, etc. Using the host computer's memory, the MPU-401 functions as an eight-track recorder, performing all the bookkeeping necessary to maintain the correct data flow for playing and recording. Using polled interrupts, a hierarchy of up to four MPU-401's may be interfaced to the host computer. Thus with the addition of an MPU-401 to an existing personal computer and MIDI-ready instruments, a complete system is obtained; future compatibility and expansion is simply a question of updating software.

Clearly, the MIDI concept represents a decentralization in the process of recording and producing music. Work is no longer limited to the recording studio; composition, production and recording can all take place at home in the artist's workshop. The advantages of multitrack recording technique will be fully available to anyone. Even the simple need to record music so that it may be communicated no longer exists—fully produced music may be instantly transmitted on telephone lines via a modem to anywhere in the world. A composer in New York could perfect a synthesized score, using either synthesized or acoustic sounds, then telephone the complete score to synthesizers in Los Angeles, all without needing a recording studio, its equipment, its musicians, or its technicians.

And what will become of the traditional recording studio? That, I think, is a good question. Certainly its role will undergo tremendous change in the future. As decentralization occurs, the studio will be forced toward more sophisticated facilities not available to the layman. It will require even more sophisticated computerization and advanced signal processing and recording facilities; perhaps studios will eventually move exclusively toward the production of music created at home, their contribution being primarily the mastering of digital tapes and discs. The digitization of music will parallel the advent of small computers—advanced technology raises the level of personal expertise, and professional facilities must in turn utilize technology to raise their own level of expertise. The important point is that each individual's contribution is extended. MIDI is another step toward the democratization of art.



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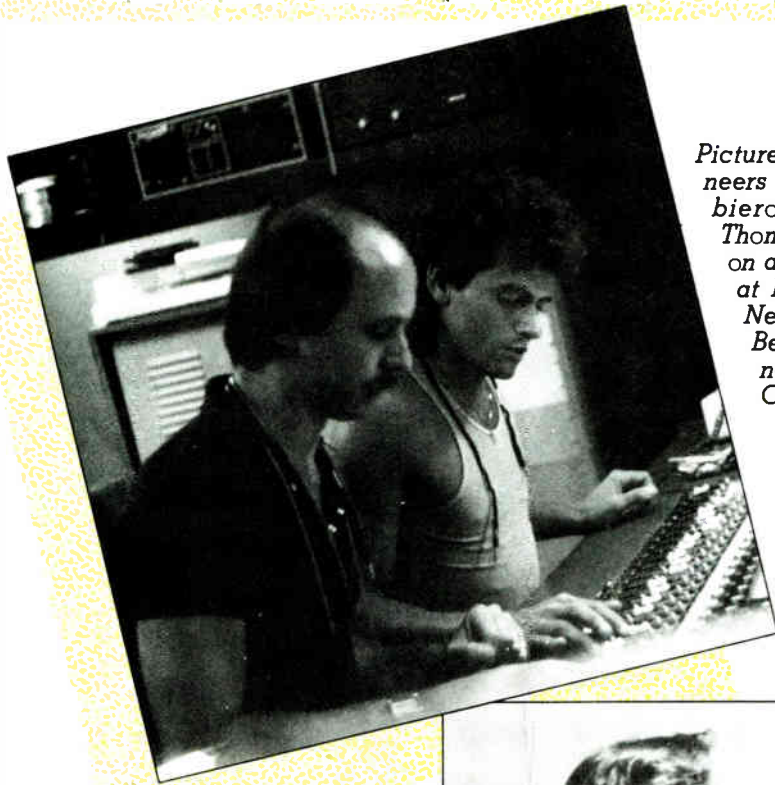
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YOKO'S CHOICE



Pictured at left: Engineers Michael Barbiero and Steve Thompson working on a recent project at Mediasound in New York City. Below: John Lennon and Yoko Ono.

PHOTO: BOB GRUEN

by **Wolf Schneider**

It was early last summer. Yoko Ono decided it was time to ready some of John Lennon's final tapes, as well as a few of her own songs, for market. The selections would be compiled on an album called **Milk and Honey**. Used to producing her own records with John, Yoko decided she would enlist the aid of remix engineers on this project.



New York boy Steve Thompson was about to get his shot. He and his partner, engineer Michael Barbiero, were in the right place at the right time. As he remembers it, "I had worked with [one-time Beatles' associate] Klaus Voorman. He recommended me to see Yoko. I went over there and we sat down and talked for an hour or two. Yoko was interviewing for people to work on *Milk and Honey*. She usually does all her own work, but this was a very emotional thing for her.

"I didn't hear from her for over a month," Thompson recalls. "Then her associate Sam Havadtoy gave a call and that's how we hooked up. Originally, we were only going to do Lennon's "Every Man Loves A Woman" for her 50th birthday album, which has guest artists like Elvis Costello doing Yoko's material. [Costello does "Walking On Thin Ice."] We did it, and it blew her away. So she said, "Would you like to do the whole project?" She wanted dance mixes on some of the tunes."

For Thompson, who began his career copping guitar riffs from Beatle records as a 10-year-old boy, it was the opportunity of a lifetime. As a pre-teenager, he played guitar in a rock and roll band. When older, he worked at New York's well-known Sam Goody's record store, and then managed several record stores of his own. In 1970 he became a club DJ, segueing rock, R&B, and disco songs together at clubs on Long Island. Later, he took his dance music expertise to New York radio stations WBLS and WKTU, where he put together special shows.

"To this day, I still try to work in clubs," the 30-year-old producer/engineer reveals. "They're pop-oriented these days. They give me a good scope on what's happening in the music industry. They allow me to keep up with the trends, and progress instead of regress. I get to see exactly what people react to, instead of working at a radio station and going by the Arbitrons."

In the late 1970s, Thompson got his first chance to work on a record production. He chose the songs for a compilation LP called *Disco Hustle*. A Roulette Records release, he believes it might have sold as much as nine to 12 million copies worldwide. "I got a \$250 check and never saw an album credit," Thompson laughs ruefully. "I was pretty young at the time." He learned.

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He remixed about 30 records for TK Records as an independent engineer and also did dance remixes for Casablanca Records, CBS Records, and various other labels. His remix accomplishments include songs by George McCrea, Cameo, Junior, Katmandu's "The Break," "Begin The Beguine" by Johnny Mathis; "You Can't Run From My Love" by Stephanie Mills, and "Take A Chance" by Queen Samantha. He has also remixed movie soundtrack selections on *Return of the Jedi* and *Staying Alive*.

The Project

Yoko booked a room downstairs in New York's A&R Studios for the months of August and September, 1983. "She booked out the studio for 24 hours a day, every day," Thompson reminisces. "We worked 12 to 16 hours a day."

It was decided that Thompson and Barbiero would ready John's tunes—most of which had originally been recorded for *Double Fantasy* and then shelved until a later date due to their raw rock and roll sound—for *Milk and Honey*, while Michael Barbiero would take primary responsibility for working with Yoko on her songs.

"There was a decision to be made whether to put additional musicians on this album or to keep it as it was. I was all for the idea of just leaving it the way it was, not putting more musicians on it," Thompson states. "I felt we should leave it in its raw state, but try to make the tracks sound as if they had been recorded yesterday even though they had been sitting around for about four or five years."

"The only songs that had overdubs were Yoko's, not John's. I didn't feel right about putting musicians on his work. I think that almost everything that comes out nowadays has a lush, overproduced sound to it. I think it's about time to get back to some basics."

Thompson explains, "Most of John's songs had been recorded live, so there was leakage of instruments onto John's vocal track. If we wanted to key some instruments out, we'd be taking his vocal out. It was very hard to mix. It's a little more polished now, it's tighter. We tried to work within the guidelines of each song, doing the maximum we could do, without changing the song."

What specific alterations were made to those original tapes? Thompson responds, "On 'Borrowed Time' we decided to let the instruments fade

in. They were all basically playing the same progression throughout the song. So we faded in the guitars, bringing emphasis to John's voice. On that song we were lucky to be able to key out instruments without disturbing John's vocal."

"In 'Nobody Told Me' [the hit single] all the drum tracks were on John's vocal track. Either it came from headphone noise or they were playing at the same time as he was singing. It felt like they were recorded live. It's very rare that an artist would have his headphones so blaring loud that it would come onto the track as loud as it did. We spent a lot of time getting his voice to sound just right. "We wanted it to be big, airy, sometimes a little trippy or spacey. You try to portray what he's singing about in the sound of his voice. A Publison [electronic signal processor] worked great on his voice."

"The first single that was going to come out was 'I'm Stepping Out.' Michael and I felt that 'Nobody Told Me' was a better tune to put out. We pushed for 'Nobody Told Me,' but Yoko makes the final decisions on everything. Yoko had the choice of the final edit, which verses she wanted in, et cetera," Thompson emphasizes.

"I voiced my opinion. I was an



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outside person for Yoko to confer with. I love Yoko and we got along great. I can see why John married her. As a team together, there was so much love there. She's also a pro as far as studios go. She's been in the business a long time and no one can put anything past her in the studio. She knows. She was in lots of Beatle sessions with John. She is very intelligent, very business.

"When I was doing John's tunes, Yoko was usually upstairs. It gave us more freedom. We'd do our thing, then she'd come down to check it out and if she wanted any adjustments, we'd do them. Yoko lived with the tapes for awhile afterwards, and then she did some additional editing in California."

Mastering was done at New York's Sterling Sound, by Greg Calbi, Thompson recalls. Thompson's memories of this project are vivid. "First of all, I felt John's presence in the studio," he insists. "I felt he was there, okaying things, smiling. He definitely wanted the music out. Some of these tracks were going to be on *Double Fantasy*, but they decided that the didn't fit that sound.

"Yoko did not put this album out for the money. She put it out because she felt that it had to be put out. *Milk and Honey* was planned at the same stage as *Double Fantasy*—John talked about it in that *Playboy* interview. It was the best feeling I've ever had in the world, working on this project. I appreciated working with Yoko, I like her a lot, and I have a lot of respect for her."

As has been reported in other magazines, Thompson verifies the intense harassment and loss experienced by Yoko since John's death. Although John's assistant, Fred Seaman, has since been convicted of second-degree larceny and sentenced to five years' probation for stealing many of Yoko's possessions, certain precious belongings were never recovered. The version of "Grow Old with Me" used on *Milk and Honey* was the only remaining version Yoko still retained; others had been recorded by John, but stolen over the past several years. This one remaining version was the last one recorded, appropriately, in John and Yoko's apartment at the Dakota in New York City.

The Future

For Thompson, the future is promising. He has completed some 7-inch and 12-inch remixes for Frank Stallone; a remix single and 12-inch on Talk Talk's "It's My Life"; a remix 12-inch of Icicle Work's "Birds Fly (Whisper To A Scream)"; and produced and mixed a single called "Contagious" by New York artist Nancy

West, which he is shopping to various labels.

Based in New York, Thompson's favorite NYC studios are Media Sound, Power Station, Right Track, Sound Works, and Sigma Sound, as well as London's Advision. He prefers Neve and SSL consoles. He tries to stay away from large studio monitors, commenting, "Yamahas are good for an in-between sound. UREIs are all right. But I really like to listen to small speakers. The speaker on a Studer machine is my favorite speaker because I like to know how it's going to sound on the radio and that gives me my best overall sound balance. People probably think I'm crazy—I could have any speaker I want in the

world, and I use that little Studer speaker most of the time," he chuckles.

Thompson prefers remixing in small to medium sized rooms. However, 1984 will probably find him in quite a few different places as he segues his career from that of a remix specialist to that of a full-fledged producer. *Milk and Honey's* commercial success should certainly help him along.

Wolf Schneider covers the music industry for several publications, as well as producing a talk show on L.A.'s KMET radio, and serving as associate editor of computer trade Software Merchandising.



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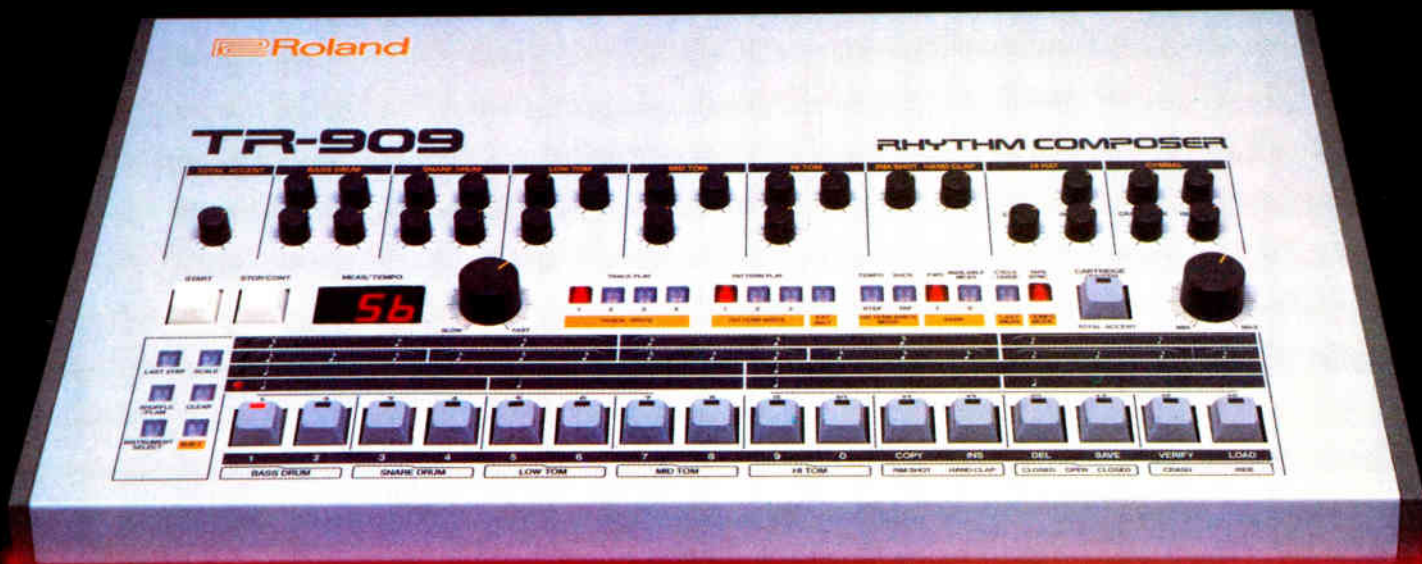


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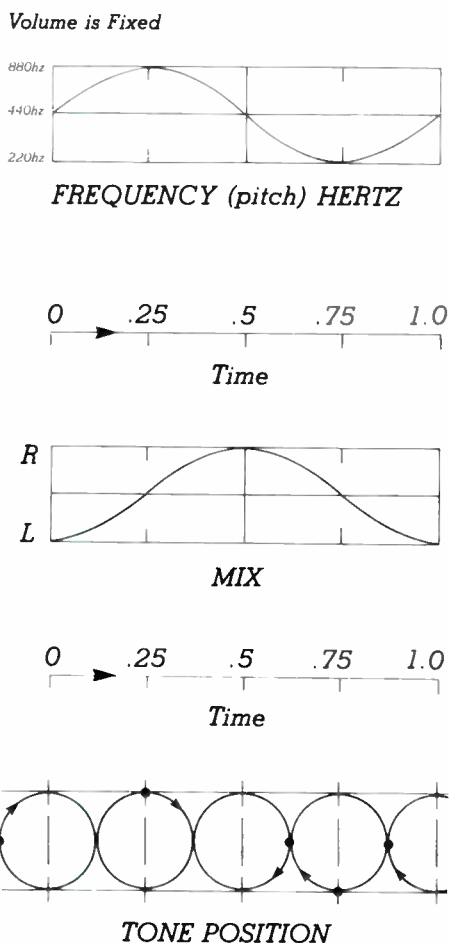
Drawing with Sound

AUDIO ANIMATION

by Dan Cracraft

All images result from the brain's interpretation of data that appears to exist at specific locations in real or illusionary space. For example, twenty dots drawn on a chalkboard in a circular shape can be recognized as a circle, each dot making up this circle having a particular location in space. It is also possible to perceive a given sound as having a location in space. Twenty sounds positioned in a circular

Figure 1: Control Voltages. Audio Graphic V Circle



arrangement in space can also be perceived as a circle. The theory of "AUDIO ANIMATION" refers to the creation of "images" or "pictures" through the generation of sounds having this type of locational information.

This article describes two methods for creating locational information with sound that will result in the perception of predetermined images by the listener. "Audio Graphics" requires the conscious interpretation of volume, mix, and pitch as having specific relationships to location. ALPIP (Audio Location Point Image Processing) applies the principles of psychoacoustics and the brain's automatic interpretation of the components of a given sound as having a source (location) in perceived space.

Both of these methods are useful in applications involving the entertainment industry, mobility aids for the blind, etc.

AUDIO GRAPHICS

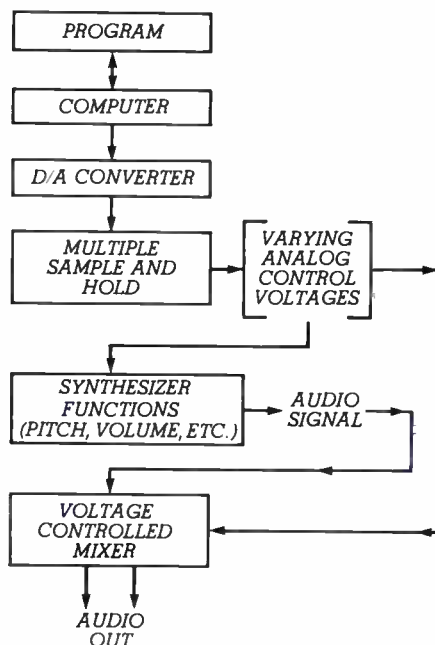
There is a semi-automatic interpretation of the principles of Audio Graphics into locational information. These principles are: Pitch (frequency) equals Height (the vertical plane). Volume equals Depth of distance. Mix (the relative volume levels between channels) equals position on the horizontal plane.

MIX: When the same tone is present in both channels of a stereo audio reproduction system, at the same level and in phase, the *apparent source* of that tone is perceived to originate at the midpoint between the two speakers. (The listener is assumed to be located at an equal distance from both speakers.) If the volume level of this tone is made to increase or decrease in either channel, the *apparent source* of the tone will move toward the louder side. This perception of apparent movement is a psychological effect rather than a physical one, as the actual source of the

sound is always from the physical location of the speakers. A tone can be "moved" then along the horizontal plane by adjusting the relative volume levels of a tone occurring in two speakers. The farthest left/right position that is obtainable is limited to the physical location of the speakers. (This limit can be extended using psychoacoustic waveform processing, described later.)

PITCH: The psychological conversion of pitch into height is less automatic than is mix to horizontal location, but pitch and height do have their sub-conscious connections. Evidence for this lies in the verbal term used to describe pitch, such as tone being "higher" or "lower" in pitch, and also with such effects as when the pitch of the sound of a bottle filling with water goes *up* as the water level does, and

Figure 2: Audio Graphic Equipment



down as the water level drops. There is also the association of descending pitch with a falling object, such as the Roadrunner's nemesis, Wiley Coyote, on his way to making a tiny cloud of dust at the base of a high cliff.

VOLUME: Volume is associated, psychologically, with distance or depth. The volume of any object making a sound is known to be louder when closer to the listener and quieter when farther away. A sound increasing in volume is sensed to be approaching, or to be moving away as it grows quieter.

There is no direct correlation between pitch or volume and any *specific* location, i.e., a given pitch is not always perceived as occurring at the same height on all occasions, nor is a given volume always perceived to be at a specific distance. These relationships are subjective to some extent and therefore generalized.

The association of MIX with horizontal location is more clearly related to the actual mechanics of hearing and therefore is more predictable. Since equal volumes in both channels create the illusion that the sound is coming from the center position between them, having 75% of the volume on the left side and 25% on the right will position the apparent source of the tone

roughly half way between the left speaker and the midpoint.

"DRAWING PICTURES" WITH AUDIO GRAPHICS

A two-dimensional circle can be "drawn" using audio graphics by adjusting the mix and pitch controls simultaneously. With the volume at a set level, the mix control all the way to the left and the pitch of an oscillator set at a midpoint, the sound will appear to come from the left speaker position. The graphs in diagram #1 indicate the changes in the control settings over a period of time. The pitch (freq. of the oscillator) is gradually increased while the mix control is similarly adjusted from the extreme left to the center position. This causes the apparent motion of the tone to travel upwards and toward the right along the first 90° of the arc of the circle. As the mix control is adjusted further toward the right, the pitch control is likewise decreased until it has returned to the initial frequency, thus completing the upper right section of the circle. These steps are then reversed to complete the entire circle.

The resolution of Audio Graphic images is at best poor when compared to normal vision. The significant point is that images *are* possible to create with this method.

These are many ways to increase resolution, such as using different tones simultaneously to create multiple images, or to use tones that are intermittent rather than continuous. This could be compared to flashing a series of dots in specific patterns on a screen rather than moving a single point of light.

The "circle" described above can be made to move in three dimensions by controlling overall volume. It should be considered that the circle is being drawn at a fairly rapid rate, such as fifteen complete revolutions per second. The circle can be made to move *away* from the listener by reducing the overall volume, or closer by increasing it. The effect is made more believable by reducing the apparent size of the circle as it moves away. This is accomplished by reducing the maximum left to right pan and upper and lower pitch limits in relation to intended distance.

If four channels are used rather than just two (with the listener positioned generally toward the center) the perception of Audio Graphic images can be extended to 360°. This means that "images" can be made to move before and behind, above and below the listener simultaneously, a perceptual experience never before possible.

The process has its limitations. Because the information must be consciously interpreted, the location of a moving tone cannot be followed if it travels too fast. Experiments have shown that in situations such as drawing a circle, the maximum number of revolutions around the circumference of the circle is less than twenty per second. At faster rates the result is a blur that cannot be defined. There is also the problem of intermodulation distortion (IMD) to contend with. This being that when a tone is present and then not present at the ear at a rate that is within the audio range, a secondary tone of that frequency is perceived audibly. If Audio Graphic images are created with short bursts of sound, this IMD becomes apparent. It may be possible to simultaneously generate multiple tones with different waveforms (timbres) at a rate in the sub-audio range to increase resolution or to produce multiple images. Different methods of sequencing the appearance of tone bursts (scanning sequences) may be employed to further increase resolution and avoid IMD.

Figure #2 shows a possible equipment set up which can be used to generate Audio Graphic images. The computer program contains the information required to produce the desired effect(s). This information is in digital form and must be converted to analog in order to control the voltage controlled devices. This is done with a digital to analog converter (DAC). The

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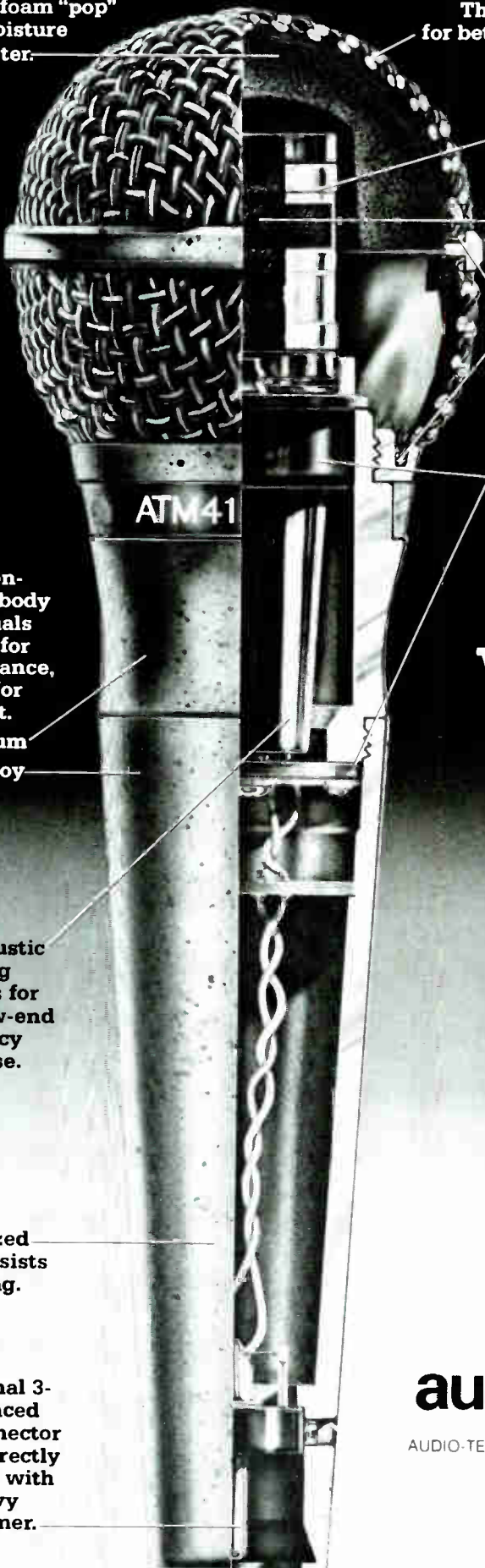
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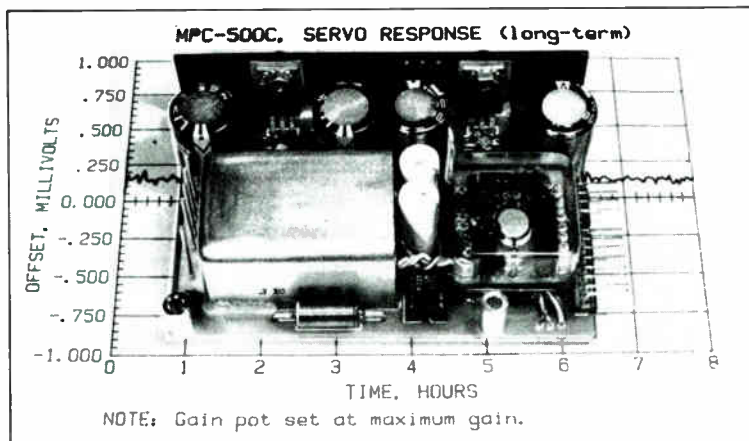


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output of the DAC is a rapidly changing control voltage which is processed by a multiple sample and hold device. The output of the sample and hold device is a series of control voltages, each being assigned to the various control inputs on the synthesizer and voltage controlled mixer. The synthesizer contains an oscillator and amplifier (pitch and overall volume) and may also include envelope generators, filters, etc. The output of these synthesizer functions is processed by the voltage controlled mixer, which provides a stereo output containing the appropriate mix information. The processed signals are then recorded or played back through standard stereo audio equipment.

Using headphones to monitor the sounds, rather than speakers, creates the impression that the images are localized more toward the area between the ears, rather than in the space in front of the listener. The effect is interesting, but somewhat more difficult to predict. It is possible to modify the waveform information of the original signals according to the principles of psycho-acoustic locational information processing, as described in the following section on ALPIP. In this way it is possible to listen to Audio Graphic effects through headphones, with the images appearing to be located several feet from the listener.

ALPIP: "Audio Location Point Image Processing"

The human brain is capable of perceiving the source of a sound. The source of a sound is a location. Images are created by controlling data perceived to exist at specific locations in space. Images can be made by causing sounds to be present or not present at specific points in space. A point in space that is recognized as a source of a sound is herein referred to as an "Audio Location Point" (ALP). An ALP does not always have to generate a sound, but is a point in space where a sound can be made to occur. This "space" can be either real or illusionary.

The brain determines the source of a sound by subconsciously analyzing the nature of the sound waves that strike the ear drums. For example, left to right recognition of the source of a sound is largely a function of the time delay between the arrival of the frontal wave of the sound at each ear; a sound wave coming from the right of the listener will strike the closer (right) ear drum before striking the left. Vertical perception is largely a function of frequency content in the neighborhood of 8kHz. The recognition of depth or distance has much to do with the level differences between the initial wavefront and the reverberated signals. This type of data is referred to as psychoacoustic locational information. The

—PAGE 136



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DIGITAL DISCUSSIONS

Digital Audio On Trial!

by Ken Pohlmann

The Coral Gables campus was the site of the SPARS/University of Miami Digital Audio Seminar this spring. Industry leaders met to discuss the most important topic in audio today—the digitization of audio. No other technological advance has promised to so drastically change the nature of the industry, as has digitization. Recording techniques which have served us so well for analog are being questioned for digital. Production techniques as well will have to be re-evaluated. Recording studios face the prospect of rapid obsolescence of their analog equipment, and the high cost of re-tooling with digital equipment. Consumers will switch to digital in increasing numbers and perhaps that move will awaken their interest in recorded music. And the future holds the promise of even greater changes as digitized audio revolutionizes the method of music storage. Manufactured pieces of music software might become obsolete as direct software delivery becomes a reality. Rather than purchase music firmware, the consumer could simply ask a central library to play the music over a data line; that service could be provided to every home—for a monthly fee, of course. In short, things will never be the same again. But will they be better? When will this happen, and at what cost? Should the industry embrace that change, or resist it? America's recording industry is foremost in the world; as its automobile and steel industries used to be. How will the digitization of audio affect our future? With these and other questions on their minds, an audience of several hundred settled in Gusman Concert Hall to participate in panel discussions designed to

provide information and understanding of the phenomenon of digital audio.

Introduction to Digital Audio

The seminar opened with an introductory lecture delivered by this reporter, designed to provide a common language of technical understanding for the participants, and to point out some of the engineering decisions which influence the course of digital audio. In the first part of the lecture, a complete digitization system was detailed from input to output with an emphasis on the hardware required to accomplish digitization; the anti-aliasing filter, analog to digital and digital to analog converter, anti-imaging filter and other hardware subsystems were explained. The second part of the lecture dealt with the fundamental design criteria of a digitization system; topics such as system architecture, sampling rate, quantizing word length, and dither were discussed relative to their impact on the performance of the system. Are such crucial design decisions best left in the hands of design engineers who are not necessarily audiophiles?

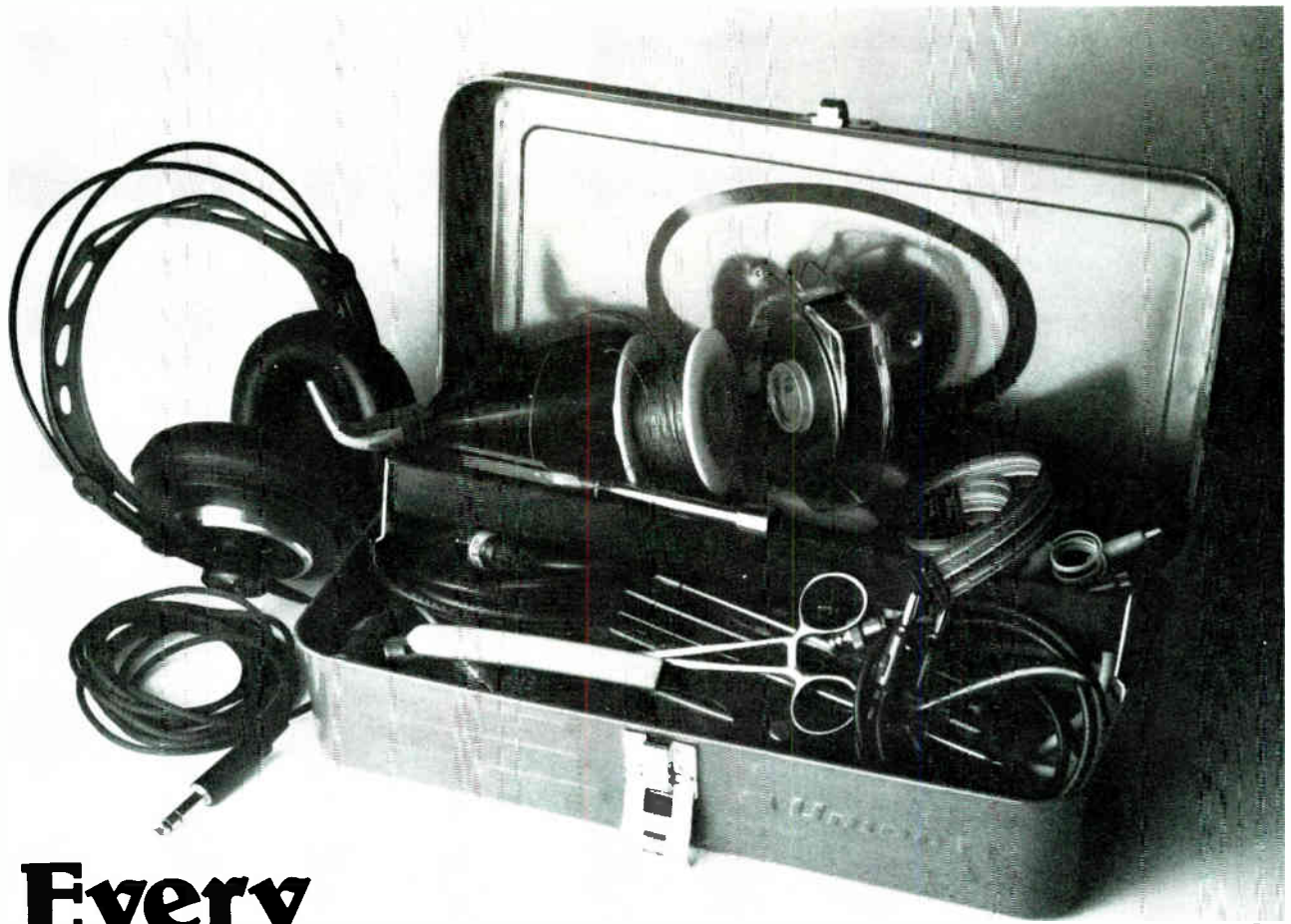
If It's So Good, Why Is It So Bad?—Bruce Botnick, Roger Nichols, Michael Tapes, John Eargle

This panel examined the question of the audibility of digital aberrations; does digital possess inherent sonic problems, or does the problem lie in our production techniques? The panel generally agreed that production was the problem, the fact that many digital recordings are sonically excellent validates the technology. Some digital recordings are unsatisfactory because inapplicable analog compen-

sations are used, and aesthetically insensitive technicians merely perform transfers by rote instead of listening to the result. Thus carry-over habits from analog production can spoil otherwise good digital recordings. A process of education is needed to inform audio practitioners of the new techniques required for digital recording and transfers. Likewise the production assets of digital are still not fully recognized; tight punch in and out is possible as are crossfades and more sophisticated editing. Thus the transition to digital will require a re-learning of technique in every part of the recording chain. After years of unconscious adaptation to the analog medium, those habits will have to be dispelled for the newer more transparent medium. In the consumer realm, the foolproof operation of CD players should enhance the quality of playback and stimulate the sale of higher quality amplifiers and loudspeakers. Paradoxically, for a relatively small investment, the consumer can obtain a system with higher fidelity than many recording studios can deliver.

The Recording Studio and the Compact Disc—Bob Ludwig, Bob Foster, Roger Nichols

The second panel targeted their discussion to the question of how to adapt the production technique to best utilize the high fidelity of the C.D. It was quickly established that production was a serious problem, and that digital demanded stringent quality checks to maintain the integrity of the product. Poor technique is usually obviously audible on a CD whereas the LP is more masking and forgiving. Much of the discussion centered around the Sony PCM 1610, the digital processor which is used to master all CD recordings. This unit interfaces with a U-matic recorder such as the BVU-200 series for storage and provides for digital-to-digital dubbing, digital editing with the BVE-500A or DAE-1100, synchronized operation, 16 bit quantization, and additional emphasis switch. While familiar to video operators, this recorder is new to many in the audio field thus again a re-learning is required. The panelists stressed the need to use digitally certified tape to insure tape quality, and dropouts due to dust, etc., must be guarded against. Also included in the discussion was the PQ code used in the CD which are user bits designed to provide table of contents, music number, and absolute address time code for random access and disk identification. A cue editor is used after editing and the data is placed on an audio track at the beginning of the U-matic tape. The PQ channel signal is then modulated into the CD frames during disk cutting.



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World Radio History



MAKING THE SUMMER SOUND GOOD

by George Petersen

The sound reinforcement business has always been difficult to pigeon-hole into any particular category. In many ways, it is subject to the same short-lived fads and fashions as any

projection becoming de rigueur in the staging and pre-production plans for many groups' major venue tours. The current popularity of the music video genre has also had a positive impact on touring, as a video clip in regular rota-

tion increases not only record sales, but also the likelihood of a sold-out tour in ever-larger venues.

We talked to a number of sound reinforcement companies, both large and small, concerning their prediction of this summer's touring season, and how some of the aforementioned topics relate to their business. We also discussed some of the new products on the market which are becoming established as the "old standards" of the '80s, as well as how these companies deal with remote recording firms and the complexities of running a sound reinforcement business in this day and age.

Albert Leccese, vice-president of Audio Analysts in Plattsburgh, NY, feels that "This year is going to be busy. All indications point to a real good summer." When asked why his company, (which does sound for both major and lesser-known acts in venues ranging from 1200 seats to large festivals and a Papal visit for over a half million persons), feels confident about this year's concert season, Leccese replied: "First of all, promoters are being very conservative, because last year there were way too many acts out there and a lot of promoters got nailed. This year they've learned from their mistakes and a lot of

Showco's setup for Genesis' USA Tour. See this month's cover for a look at the system in action.



PHOTO: LEWIS LEE

other facet of the music business, yet at the same time, it is one of the most conservative factions of the industry. Traditions in equipment design and production techniques, proven after thousands of road miles and countless one-nighters in venues across the nation, are not easily broken. And while loyalty to certain brands of products remains strong, major manufacturers of sound reinforcement gear continually have to strive to stay on top, amid a flood of new companies and new technologies.

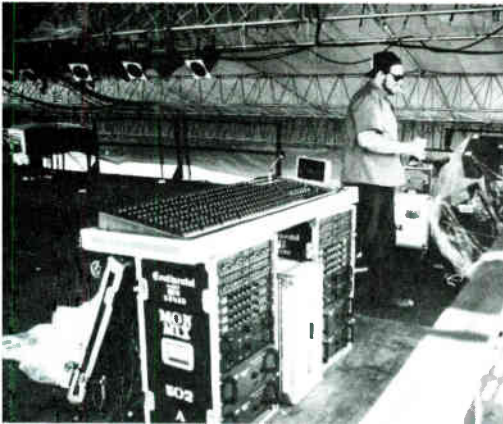
Today, video has become a vital force in the sound reinforcement scene, with live video and large screen

The Audio Analysts' crew at work during a midwest stop on the Lover-boy US tour.



bands are doing shorter tours or smaller venues, but we're expecting a great summer."

Another sound reinforcement



Continental Sound's monitor mixing station for Berwyn Festival. Monitor console is a modified Studiomaster 32 x 8.

operator who has also noted a general tightening of the industry is Al Siniscal, owner of A-1 Audio, which has branches in Los Angeles, Las Vegas, Lake Tahoe, and Atlantic City. "I expect business to be better this summer," explained Siniscal. "Business in general is picking up, but it's also tightening up as well. Promoters are getting very cost conscious: Years ago, people would take five trucks on tour, and not think about it at all. Today they've been demanding to have more efficient sound systems which require less space." Siniscal also noted how having an efficient horn loaded system was important four years ago, when his company was contracted to provide sound for a Frank Sinatra concert in Rio De Janeiro in January of 1980. All of the gear required to fill the giant 175,000 capacity Maracana Stadium with sound had to be transported to the site from the company's headquarters in Los Angeles. The show later became an entry in the *Guinness Book of World Records* as the largest concert attendance of a single vocal performer.

While predictions made just a few years back assumed that bands would eventually replace their touring schedules by instead performing in videotaped concerts and music video clips, this has not happened yet. According to Jack Maxson, the president of Dallas-based Showco, "I think video really helps touring." Maxson's company regularly tours with some of the biggest names in the industry.

"When people see MTV, it's just a taste, and they want to see more. If you like Motley Crue, from what you see on video and what you hear on radio, you'll be even more inclined to go see them live."

Leccese of Audio Analysts feels much the same about the idea of video replacing touring: "That's a real fallacy," he commented. "It's like when people said television would wipe out radio, television would wipe out movies, movies would wipe out theatre. If you look right now, theatre is alive and well, and television is alive and well. It's the same in the music industry—people will always go to concerts, but it's got to be something worthwhile."

Along similar lines, the integration of live large screen video into concert production has been one of the major hallmarks of the live sound experience of the '80s. And the logistics of placing such a huge image on the stage need not worry a sound company in terms of placing main cabinets to avoid obstructing sightlines if a bit of pre-production planning is included. According to showco's Maxson, "a large video screen doesn't normally affect our setup—we usually hang our stacks on either side of the stage. I really like the idea of live video, although it's not financially feasible all the time. I was at the console for the whole Ronnie Lane ARMS benefit tour (covered in the February 1984 *Mix*), and I think the video contributed a lot to the show."

"Live video is excellent for the business," agrees Leccese. "With video, you don't need binoculars to see your favorite artist, and from a sound reinforcement standpoint, we've managed to work it out quite well, although there are some compromises so that the video doesn't suffer and the audio doesn't suffer."

However there are plenty of alternatives in running a successful sound reinforcement company to handling megabuck tours. Mr. Connie Barbour, of Bayfest Sound in the Norfolk/Virginia Beach area, specializes in handling smaller venues ranging from 700 to 4000 seats. "One of the biggest things around here," Barbour notes, "is Christian rock. It's growing bigger and bigger. And with Christian rock shows, you don't get a lot of clients demanding this and demanding that. Everybody's usually really nice. I once did a show with Joe English, and that was the first time I've ever had a musician ask the people in the audience to stay and help the sound crew load their system out. That was a first. The guys on the crew were real pleased."



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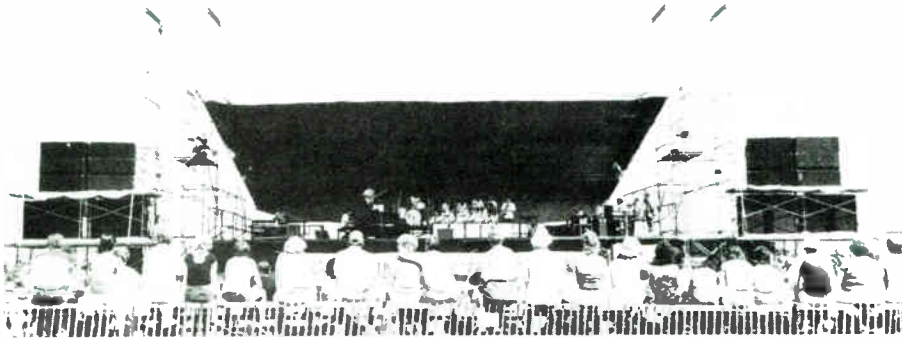


PHOTO. TOM LABUS

The view of the Buddy Rich Band from the mixing position. Audio by Continental Sound.

Pace Sound in New Orleans regularly keeps their staff busy with both concert gigs (such as touring with the Neville Brothers) and non-concert gigs, such as this spring's Louisiana Governor's Inaugural Ball, held in the 85,000 capacity Superdome. Pace Sound's manager Glen Himmaugh reports they are busy with another non-traditional project this summer: "We are supplying sound production for 11 stages at the World's Fair in New Orleans, which opened on May 12." However, Himmaugh adds, sound contractors should always be wary when dealing with clients who are unfamiliar

with the logistics and intricacies of doing sound reinforcement. "A lot of corporate executive-types run the World's Fair, and they thought all their sound problems were solved when Sunn Musical Instruments donated a large amount of equipment from their new Pro Line to the fair. These people in charge didn't realize they had to have people to put it together, with microphones and cables to plug into the mixing consoles. So one month before the fair opened, we ended up with a deal to supply personnel, snake systems, power distribution systems, microphones, stands, equalizers, tape decks.

We're using Sunn speaker systems in most applications. In one case, where equipment has to be flown (in the Jazz and Gospel tent) we're using our own custom systems."

Himmaugh has so far been very impressed with the Sunn gear. "We were slightly apprehensive about it at first, but as we got to use it, we've been very happy with it. In particular, the power amplifier in the line and the 24 channel console with quasi-parametric EQ look like they're going to be serious contenders in the market."

George Minol, of Continental Sound, a Chicago-based sound reinforcement company which handles venues up to about 18,000 seats, had a chance last summer to put his gear through a rather torturous trial. The event in question was the Berwyn Summer Fair, which was an outdoor festival featuring the Gatlin Brothers, Buddy Rich, the Atlanta Rhythm Section, Frankie Valli, and the Captain &

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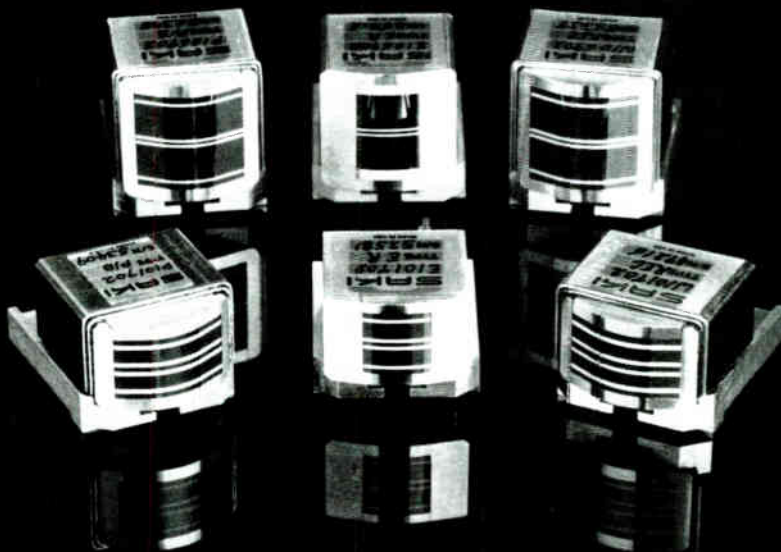
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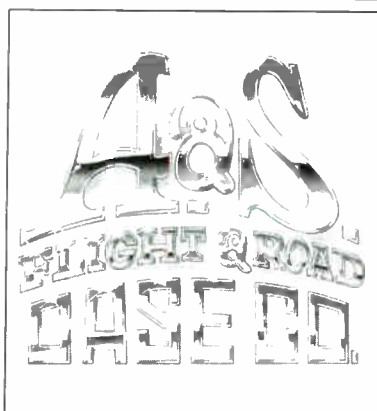
Tennille. "We probably had the worst case condition at Berwyn last August," Minol explained. "It was the worst climate we ever had in Chicago—102 degrees with a minimum humidity of 87%. Most days it rained, but I didn't have any problems with my Biamp power amps. They're convection cooled—not fan cooled—and they got hotter than hell, but they ran and held up really well. That was really amazing."

Like many other sound reinforcement companies, Continental sound uses custom speaker systems, but what makes them so unique is that they are an all-cone system. "For the mid-range, I'm using a 10" driver, and for the highs I use a 6½" tweeter which is custom made for me by a local company. You definitely have to use more drivers to get the same SPL as with a horn system, however it costs a lot less in the long run," Minol notes. The system uses eight tweeters in a single cabinet, along with four tens for mid-range. "I couldn't buy a radial horn and driver for what I paid for the tweeters," Minol continued, "but the sound is very smooth, a lot smoother than horns. At the Berwyn festival, a lot of people were totally amazed at how clean, open, and transparent sounding the system was. It's a lot like listening to a 20,000 watt stereo system."

Maryland Sound Industries/ Northwest Sound is a large sound company with offices in Baltimore, Portland, and Hong Kong. The firm has handled huge concerts such as James Taylor in New York City's Central Park and other such events for up to 500,000 people, as well as smaller arena and coliseum shows. MSI's general manager Will Parry sees a whole new line of products on the market now which he feels will become known as standards in the future: "The Lexicon 224x with LARC, which came out last year, has really caught on. Also the new Yamaha (REV-1) Digital Reverb will also be big once it catches on," Parry predicts. "The state of the art in this business is constantly changing, but there are some staples—and the 224x has become one of them."

"We use a variety of microphones which are very good," Parry continued, such as the Sennheiser 421s on rack toms, Shure SM-57 on snare, and the Sennheiser 431 vocal mike. We have found the Countryman EM-101 and their directional mike to be excellent, and we also use the C-ducer piano pickup which we like very much. Using that combined with another pickup, such as a Helpinstill will give you a very nice blend."

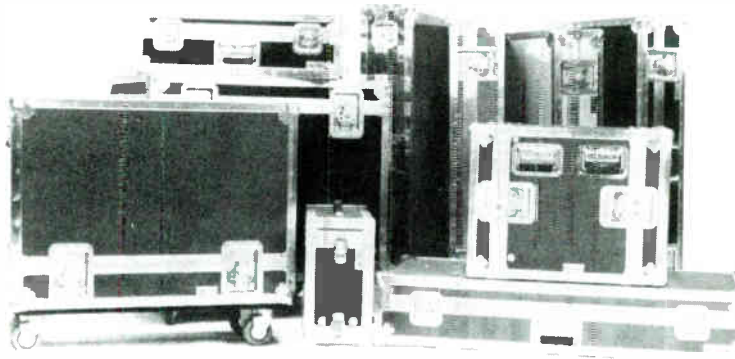
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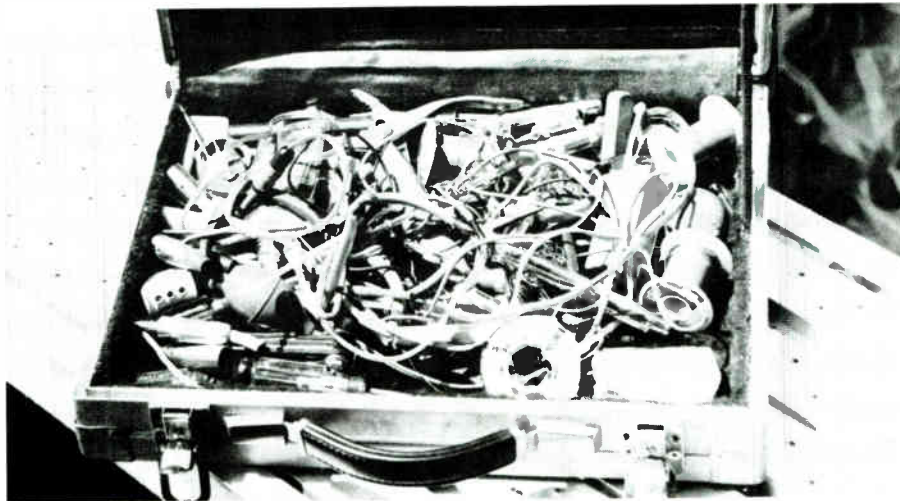
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Connie Barbour of Bayfest Sound feels that it is best to go with "whatever the vocalist wants—a lot of singers still request the Shure SM-57s and 58s. The AKG D-330 BT is an excellent vocal mike, and we've also had a lot of good experiences with the Electro-Voice PL 80 on vocals."

"One thing I am really excited about is the Yamaha digital reverb (model R100), the one under \$1000," says Pace's Glen Himmaugh. "It's just unbelievable. It has four presets to choose from, and it's so clean. Also,

we've been making a fortune doing remote recordings with our Sony PCM F1. It's an unbelievable little device. Ours has paid for itself about six times. We just recorded a jazz album by pianist Ellis Marsalis (the father of Winton Marsalis). A week later, it got picked up for national distribution. It's amazing to get that kind of quality from something that costs less than an analog two track recorder."

The trend towards smaller cabinets was not particularly well received among the companies we talked to. "I

think the trend towards smaller cabinets is going to reverse," commented Leccese. "Smaller cabinets offer weight and size savings, but you're fighting the laws of physics with small enclosures. To get a good low end, you need a big cabinet, and you can't get away from that. I think we'll be seeing a lot of *lighter* cabinets—there will be a lot of surprises coming from both our company and from other companies as well."

This sentiment was echoed by Minol, who feels, "anyone who says you can get a good *clean* and solid low end out of a small cabinet is out of their mind. You need to have air movement to get low end. Now, you can get it by overdriving, and you can get a harmonic generation which a lot of people assume is a good low end, but it's not."

Dealing with remote recording companies can sometimes be a problem for sound reinforcement companies, especially when a remote crew shows up unexpectedly or when technical problems crop up at either end. However, attention to basic audio and a bit of communication between the crews can go a long way towards putting an end to sonic squabbling. Cooperation is also essential, according to Maryland Sound's Will Parry: "We've done a lot of work with remote recorders and we've never had any problems—just have a good splitter, the right mikes, and a good attitude. A lot of times, if the remote people want to use their own splitter and they feel comfortable with it, then it's in everybody's best interest to do so."

Continental's Minol sees the biggest problem in dealing with remote recorders is that "the sound company people feel they are the most important, and the recording people feel that they are the most important. In essence, they both are. It's more of a personal than a technical problem—the actual interface is rarely a problem anymore. It's usually just a matter of getting along with the other people."

Leccese of Audio Analysts says the entire process of interfacing with remote recorders boils down to "simple, basic audio. If you have a snake system with that already in mind, then interfacing becomes real easy. Through our association with Le Mobile over the years, we've managed to debug the interface between the remote truck and the sound crews. As long as a

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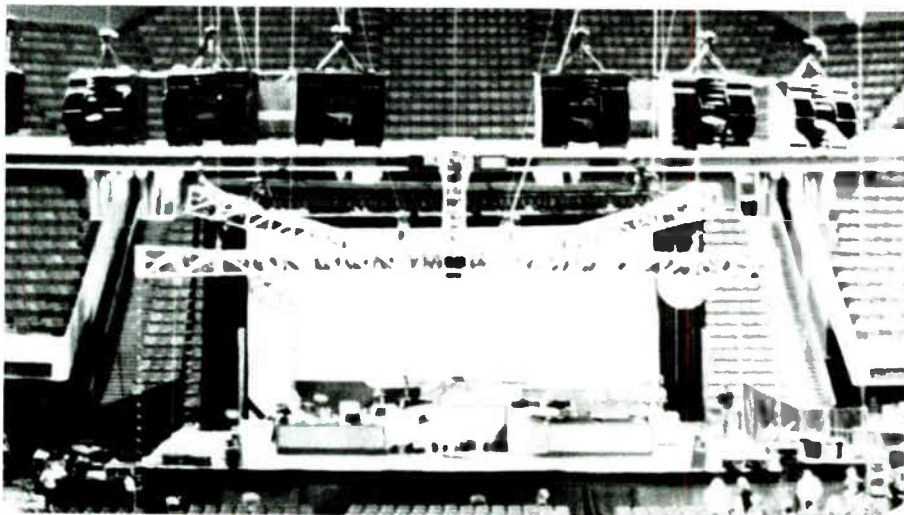
microphone sees five to six times its source impedance, it'll be happy—whether it comes from the input impedances of three or four boards, two boards, or one board. Then all you have to worry about is grounding, and if you have a system established where you can isolate your grounds, and you maintain your balanced lines all the way

through, then there shouldn't be any problems. We've done shows with Benatar live, Journey live, lots of people live: We've never had any problems."

The attention to audio basics also carries a high priority with Al Siniscal of A-1 Audio. "We use very elaborate, well-made 50 pair snake systems, with machined aluminum and

engraved parts, and gold flashed solid pins with the AMP connector system," he explains. "We've put a lot of money into our interconnect—both in the snake systems and in our power distribution systems. If those two systems are correct, then the rest of the system can fall into place. Unless you have good grounding and power distribution, and a *great* snake system you're going to have problems."

As to the future of the concert business, Maryland Sound's Will Parry feels secure: "There's no way to simulate the effect of being in a large hall with a large number of people when you favorite group comes out on stage. The whole industry has matured, and most of the tours out today are well thought out. People are willing to pay a reasonable dollar if they can have a good time, and that means the sound has to be good, the lights have to be good, and the group has to be good. It all has to be good." ■



(Left) A-1 Audio's flying horn-loaded mains system in place for Barry Manilow concert.

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ACHIEVING

HIGH FIDELITY

IN SOUND REINFORCEMENT

by Mike Sofen

In the world of portable sound systems there exists a curious paradox—a product or system that is *measureably* better than another, or uses more sophisticated theoretical concepts, doesn't always *sound* better. Not only that, but factors such as physical deployment and operator savvy can have a dramatic effect on sound quality. In the face of these highly subjective factors, how does a sound system designer approach the task of designing a new system that "sounds better"?

There are givens: portable sound systems must pack efficiently into semi-trailers; they must be adaptable, rugged, and capable of deploying quickly and reliably show after show; there must be back-up systems, failsafes, and multiple redundancies. These factors have no direct affect on fidelity.

Sound system design is based on juggling myriad factors, and making decisions that have a basis in economic reality. It is based on a thorough understanding of bandwidth requirements, headroom (volume) requirements, and an instinctive feel for "achievable fidelity." Combined with this is a most serious limitation—a need to use manufactured products rather than custom building everything. It is simply not time/cost feasible to "build it yourself" all the way down the line. What this means is that one must be content with the quality/performance level of manufactured products or be willing to modify those products to reach performance requirements.

Thus, the design of a system is a two-tiered approach—establishing the theoretical framework around which the system operates, and finding (or building) products that match those

theoretical requirements. We'll look first at this framework, and then at the qualities and limitations of real equipment.

Establishing the Limits

The main limits in a sound system are its dynamic range (how loud will it go?), and its bandwidth (how low and high will it go?). Both of these factors are based on the capabilities and quantities of the power amplifier/loudspeaker system. More gets you more, but is it apples and apples? No. Doubling the number of loudspeakers (and amplifiers) does not get you "twice as much sound." It gives you a theoretical three decibels more sound pressure level. You can see why large systems are necessary for the production of high: sound pressure levels.

Room acoustics, or, more precisely, the physics of sound in acoustically "large" rooms plays a very important role in determining the dynamic range requirements. A small room requires less acoustic output to present a given SPL to a listener than a large room. This is based on the fact that we need to vibrate a LOT more air molecules in a large room, i.e., input more energy. An analogy would be comparing the energy required to boil a cup of water in one minute with the energy required to boil ten gallons in one minute. You'll need an awfully big burner.

Bandwidth is dependent on how the loudspeakers are deployed, how many of each type there are, what type there are, how much power is available at a given frequency, and bandwidth capabilities of the electronics. Since it is quite easy to obtain wide bandwidth and high output without achieving high fidelity, a closer look at other factors is required.

The efforts to achieve higher fidelity revolve around:

1) Minimizing all types of distortion;

2) Minimizing time-related aberrations;
3) Minimizing dynamic and static frequency response anomalies.

These anti-fidelity agents are produced both by electronic and transducer subsystems. And of course, these two subsystems are highly interactive, with the result being an extreme difficulty in pinpointing which factors are active at any given time. Jack Kelly of Klark Teknik explains: "The common problem has been that sound has a time-related dimension that does not show up on conventional analyzers. The new Crown TEF analyzer gives us this information, but how is this converted into working knowledge, useful tools? This is where research is being focused."

Distortion

While distortion can occur at any point in a sound system, most typically it is the loudspeaker systems that produce the majority of it. This is due to the relatively advanced nature of the electronic technologies employed, and to the relatively crude nature of the mechanical electro-acoustic devices we call loudspeakers or "transducers."

Electronic distortions are normally generated only during overload conditions, i.e., when an electronic device is being used outside its designed operating parameters. Certain classes of electronics, such as compressor-limiters, are prone to dynamic distortions and require finesse on the part of the system operator. Dynamic distortions are defined as those produced when either a shift of frequency or amplitude causes an increase in distortion products. "The dynamics of the control circuitry can overreact to input signals," says Dan Kingsbury of Symetrix. "Gain changes

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can become audible, especially from peak limiters. A limiter can modulate low frequency signals and change the frequency spectrum. These are all distortions."

Power amplifiers are a class of equipment that is consistently abused. The most frequent cause of distortion products in amplifier outputs is an excess of low-frequency content at the amplifier inputs. Low frequency peaks, such as those generated by a kickdrum or synthesizer are capable of causing the amplifier's nominal distortion level to rise dramatically. An amplifier's ability to develop high current at low frequencies extends system headroom and reduces peak distortion or "clipping."

Loudspeaker distortion tends to be proportional to input power. Thus high input powers tend to generate higher levels of distortion. The high fidelity cure for this is to increase the number of loudspeakers to the point where each loudspeaker is receiving maybe one-half its rated input power. The economic solution is to feed as much power as possible into as few loudspeakers as possible. Juergen Wahl, applications engineer for JBL/UREI says that loudspeaker distortion is developed in different ways by different loudspeaker types. "Distortion levels stay linear at low to medium power levels. At maximum power levels or excursion limits, the distortion becomes exponential."

Equally troublesome are two dynamic loudspeaker limitations: dynamic bandwidth limiting, and non-linear power response.

Dynamic bandwidth limiting is best explained by example. Let's assume we have a 15" woofer that is capable of a "flat" response from 40 hz to 500 hz. This response is measured with an input power of say, one watt. When ten watts are applied, response stays essentially the same, but at 100 watts, we notice that the "flat" bandwidth only extends down to 60 hz, and at 200 watt input levels, the bandwidth extends to 80 hz. Remember that this is just an example—no manufacturers provide this specification. This limiting is brought about by either excursion or input power limitations.

Non-linear power response also is a direct result of input power limitations. The ideal loudspeaker will give us a linear increase in acoustic output when a linear increase in input power is applied to its input terminals. Thus our theoretical loudspeaker will generate 100 decibels with one watt in, 110 dB with 100 watts, 113 dB with 200 watts, and 116 dB with 400 watts. Also theoretically, this acoustic output is uniform across the full rate bandwidth of the loudspeaker (this is where

Dynamic Bandwidth Limiting comes in).

In real life however, not only do loudspeakers deliver non-linear power response, but that power response varies with the applied input power AND time. At low power levels the

The desired goal of any system is to have a frequency response that is nominally flat.

power response is nice and linear, and if we keep the power low it stays that way. Beyond a certain threshold the power response is controlled by how much power is applied and for how long. Tom McCauley, of McCauley Sound explains: "Non-linear power response is caused by the sum of all the mechanical losses, and voicecoil heating. Mechanical losses include magnetic eddy currents and suspension components. Voicecoil heating causes a rise in impedance which in turn reduces the dissipated power."

Time Related Aberrations

This class of anti-fidelity agents are commonly seen lurking around crossovers and equalizers, and are implicated in loudspeaker positioning and placement, microphone technique, and transformers. The sensitivity of the human ear to phase (time) shifts is well documented and can be used to justify the current emphasis on phase or "time" alignment. Explains Jack Kelly:

"Phase shifts are inherent in equalizer/crossover design. The filters used introduce a time (phase) change in current or voltage that is frequency dependent."

Modern sound systems have no lack of equalizers—they are found on input modules of mixing consoles, they are used on subgroups, monitor mixes, and they are used to equalize the room/system interface. Equalizers are eminently useful items, but are prone to tragic overuse.

Crossovers, on the other hand, have the unique distinction of being the single most critical electronic device in the sound system. Specifically, the crossover sets the maximum bandwidth of each transducer in the system by interposing a set of filters between the respective amplifiers. If these filters

were capable of infinite attenuation in a single octave, and if these filters produced no phase shift, then the only interaction between the various loudspeakers would be acoustic. (Acoustic interactions are relatively easy to solve.) Instead, what we have is an extremely complex electro-acoustic interaction matrix.

If crossovers are so critical, why isn't more research being done to improve their performance? Good question. The marketplace is literally bristling with crossovers, and, with very few exceptions, they are identical. (Read "lousy.") With most companies, it is a case of a "me too" product; with others, they are trying to be everything to everyone.

A current fad is to put time delay circuitry into a crossover, the theory being that since correction works in a controlled environment, it'll work in an uncontrolled (live) environment. Once again, theory changes history! Let's do a quick run-through of the acoustic environment that exists at a live concert:

1) We're in a hall with a long reverb time. Sounds tend to be masked by echos.

2) We're using a LOUD monitor system. This is pumping multiple decibels into the acoustic equation.

3) Because of the location of the rigging points, the main sound system is hanging 20 feet in front of the band.

4) The vocal microphones are ungated/unmuted when they aren't in use, allowing them to pick up all sorts of auxiliary signals at a distance of 15 feet from the signal generators (such as guitar amps).

5) The sound system utilizes direct radiating woofers and horn loaded compression drivers on the high end.

Now let's add up all the time delays and their relative magnitudes. A large hall simply overwhelms most sound systems, but does not in itself cause time delay problems. A loud monitor system is a major contributor of REFLECTED sound energy. This energy is hitting the back of the stage area and bouncing forward again to combine with the direct sound of the main sound system. The band sound being produced by their stage equipment is mixing with the reflected monitor sound AND the main sound system. The sum of these three staggered acoustic sources is of such magnitude that it will tend to mask all of the theoretical refinements built into a system. The point here is that in an uncontrolled environment, it is very difficult to differentiate between a time compensated system and one that is not. Obviously, a hall with a long

AFFORDABLE PERFORMANCE

Since the introduction of the Model 1000B and Model 1500 audio professionals throughout the world have consistently acknowledged both units as unequalled in both low noise and unmeasurable distortion. In an industry that relates cost to performance, SPECTRA SOUND equalizers stand alone. The cost of both units is far below lesser performing equalizers, an important consideration when selecting your next equalization device.

For further information on the affordable performance of SPECTRA SOUND equalizers, see your local professional audio dealer, or contact SPECTRA SOUND, 3750 Airport Road, Ogden, Utah 84405 (801) 392-7531.

SPECIFICATIONS, 1000B/1500

DISTORTION: Unmeasurable, THD less than .0018%, IM less than .0018% (20Hz to 20kHz, +20dB).

SIGNAL NOISE RATIO: 104dB below -4dB, 20kHz bandwidth.

OUTPUT IMPEDANCE: Less than 1 ohm, typically .3 ohm.

Spectra Sound 

3750 Airport Road
Ogden, Utah 84405
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Circle #034 on Reader Service Card



reverb time loads up the acoustic environment with artifacts, causing both measuring and listening difficulties.

Dynamic and Static Frequency Response Anomalies

The desired goal of any system is to have a frequency response that is nominally flat. That is, the amplitude (volume) of all the various frequencies is uniform within our designed operational limits. This response should not waver when levels change, or when the listening/measuring position shifts. If the response changes with level, then we have a DYNAMIC frequency response problem; if the response changes with a change in listening location, then it is a STATIC problem.

One of the causes of a dynamic frequency shift is bandwidth limiting, mentioned earlier. This can be on a component or system level. Another cause is distortion. Again, this can occur at a component or system level. Frequency shifts can be an insidious form of sound system malaise—they can happen randomly, in different halls, with different program sources; they can appear disguised as other problems. Frequency shifts can cause an operator to make adjustments to the system that might not otherwise be made.

Static frequency shifts can occur when loudspeaker system dispersion isn't uniform. This means that certain sectors of the loudspeaker system aren't reproducing what they're being told to reproduce. Improper stacking and splaying of horns, transducers out of phase, and deployment errors are common causes.

The Real Equipment World

Since the control and reproduction of low frequencies is the most difficult chore in sound reinforcement, attention to detail can really determine system fidelity in this critical region. The entire amplifier/connector/cable/speaker interface must be scrutinized for design flaws. According to Dean Jensen of Jensen Transformers, another not-to-be-overlooked point is the checking of audio transformers for flat full power response. A damaged or poor quality transformer can destroy low end cleanness.

Also very important are the ultrahighs, the "air" in a system. Slew unlimited electronics all the way through the audio chain can maintain the transient, shimmering quality of cymbals, the depth of percussive instruments, and the breathiness of a human voice. Uniform high frequency dispersion is very difficult to achieve,

and requires an inordinate amount of devices to even come close.

Low frequency transducers need to possess as close to unlimited power handling as possible. There must be enough of them to develop low frequency headroom, and enough cabinets to ensure high enough Q factors.

The highest quality crossover must be used, preferably with 24dB/octave slopes and Linkwitz-Riley filters (see Journal of Audio Eng. Soc., Jan/Feb 1976 or Rane Corp. Note #107.) 24dB slopes reduce the area of acoustic interaction between transducers of different, adjoining bandwidths. The phase is 360 degrees between adjacent outputs making it unnecessary to reverse the phase of the transducers. Since most pro crossovers are installed out at the mixing console, high current line output drivers are essential.

Obviously, it is impossible to go into too much detail in this space. There is an enormous need for more quantifiable research, and a need for higher performance loudspeaker systems. The quest for higher fidelity is certainly one that is rigorous, conflicting, controversial, and expensive. Fortunately, the end result ultimately benefits many music patrons. ■

700 WATTS/\$595 FAN COOLED MOS-FET AMP



The SCS 2350 power amplifier is designed with reliability and sonic performance as the primary consideration. MOS-FETs were chosen for their excellent longevity due to a positive temperature coefficient (thermal runaway impossible) and SOA (safe operating area). A unique multi-speed forced air cooled heatsink with over 644 square inches of active cooling further enhances reliability. A completely discrete design optimizes signal to noise ratio while providing a high slew rate and unmatched sonic quality.

SPECIFICATIONS:	
Power per channel:	260 watts @ 8 ohm 350 watts @ 4 ohm
Typical full power THD+S/N	.007% @ 1 kHz ω 260 watts
Slew rate:	>50v/micro second
Dimensions:	19"x5.25"x12.125" 38 lbs.



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Hill Audio

TOA: Fifty Years of Innovation

Nineteen eighty-four marks a special year for the TOA company. It is not only the 50th anniversary of TOA Japan, but also the tenth anniversary of TOA U.S.A. The company actually began researching the U.S. market in 1968 and in 1974 started the commercial sound division of TOA U.S.A., which is mainly involved with the sales of fixed installation gear for paging, intercom, background music, and cinema sound systems. Based on the success of the commercial division, TOA decided to make a major push into the pro-audio and musician industry markets a few years ago, and has been making significant inroads into the field ever since: 1983 sales were 800% above sales in 1975.

Today, TOA has expanded its U.S. headquarters located in South San Francisco, and two facilities in Canada are now in full swing. Currently, the public's perception of the firm remains somewhat of a mystery—yet like many other so-called "overnight successes," many years of careful planning and steady growth are behind TOA's rise to prominence.

TOA U.S.A. president Sam Sakata, who has been with TOA for over 20 years, feels that keeping a "small company attitude" is a basic part of the TOA philosophy, and a "warm, human-touch relationship" is important in maintaining good customer and dealer relations.

"But still," Sakata explained, "a large part of our sales basically come from the commercial sound industry. Our 900 series amplifiers have really been our bread and butter, and having success in that market, we looked to a new market—the M.I. industry."

At present, TOA does all of its manufacturing at its facilities in Japan, although Sakata was quick to point out that this may change at some future date: "Someday, we've got to do that—not only for political reasons, but in many cases the payroll in Japan can be equal to or higher than in the United States. Also, manufacturing and assembling are two different things: We may start by assembling goods here,



PHOTO: GEORGE PETERSEN

TOA's USA headquarters in South San Francisco, California.

and begin manufacturing goods here at a later time."

Terry Taylor, head of Pro-Series marketing for TOA U.S.A., sees the company's sales approach in terms of careful analysis: "We make over 4000 different products in Japan," Taylor notes, "and although we import only about 500 of them, that's still a huge product line. We're after what we call the professional music and entertainment market—music stores, pro-audio people, recording people, and broadcast people."

Part of the analytical look at the market revealed the changing character of today's music retailer: "The role of the music store is changing. They don't sell so many guitars, but they're selling lots of audio gear. A lot of people are buying keyboards because they're so exciting now. Today, the electronic music player, who's got keyboards, drum machines and stuff, has specialized needs in terms of mixers and speakers, and we're going to provide for those needs.

"We're starting with a speaker system we'll introduce this summer," Taylor continued, "which was developed with the idea of electronic music in mind. Our requirements were that it had to be loud, clean, and it had to sound good. Our approach is psychoacoustic satisfaction—that's not just an advertising term we use—no matter how good the specs are, if it doesn't sound good, then who needs it? That's the way we come up with products."

Taylor also sees the computerization and MIDification of the music industry as powerful forces looming in the near future. "I believe that every musician is going to need a computer. He's got to have one. And while MIDI is a little bit rough right now, we support it all the way, although at present, MIDI only refers to musical instruments. What we see happening is that maybe in two years, every piece of TOA gear is going to have a MIDI port

on it—perhaps it won't be called MIDI; it might be called MIDI II or it may be an RS-232C port.

"We intend to be on the leading edge of whatever's happening, and in the next few years, we're going to introduce some radically different products with radically different ideas."

—George Petersen

New Products

AHB Monitor Mixers

Allen and Heath Brenell USA, Ltd., have introduced their SRM-186 18 input, 6 output stage monitor mixer. The mixer incorporates an internal mike splitter system and is designed so that external processing gear can easily be patched into any of the six individual groups and can be monitored by the engineer through the PFL (solo) with headphones or external speakers. A mute switch is provided for this output to eliminate the need for adjusting the engineer's monitoring level when switching between headphones and speakers.

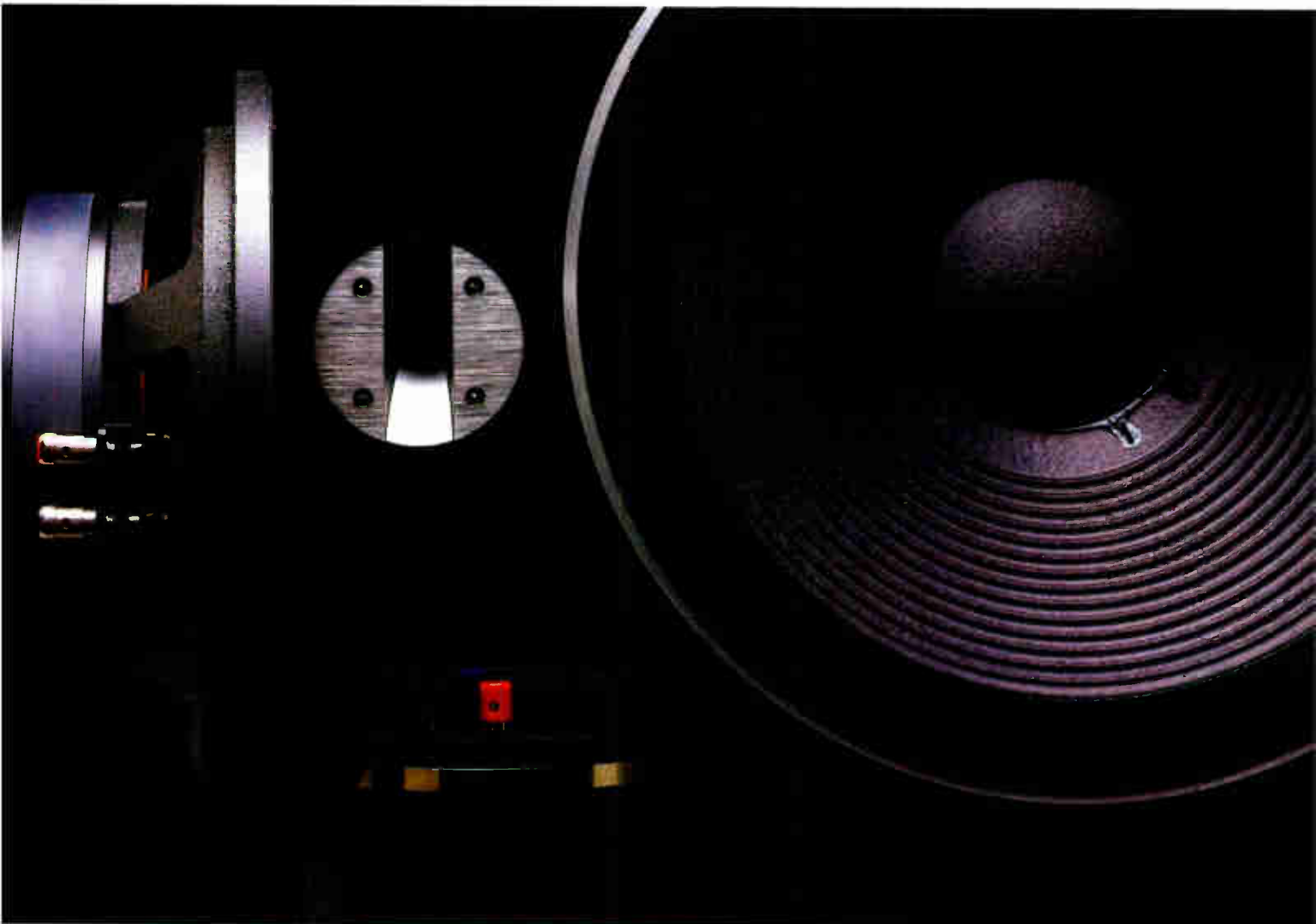
The SRM-186's physical layout and coloring scheme were selected to facilitate operation under poor lighting conditions, and BNC connectors are provided for use with optional gooseneck lighting fixtures.

Circle #143 on Reader Service Card

Tannoy Wildcats

Tannoy Wildcats are a new line of live performance loudspeakers which utilize a modular design that allows the system to adapt and grow with the artist's needs. The Wildcat series are based around Tannoy's dual concentric speakers which look like a single speaker, but contain a bass unit and compression tweeter mounted in the same chassis. All of the models in the line use the concentric design (except the Leopard bass bin), and by combining different speakers a variety

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of systems can be configured, ranging from 100 to 800 watts RMS.

The Wildcat line consists of: the Lynx, a compact 12" co-axial driver system for smaller venues and AV use; the Puma, a concentric 15" driver in a compact enclosure; the Jaguar, which uses the same 15" driver but in a larger enclosure for extra bass response; the Panther is a horn-loaded enclosure design using a 15" dual concentric driver, and is the most efficient speaker in the line; the Leopard bass bin with a single 15" woofer; and the Cougar is a stage wedge monitor with a co-axial 15" driver.

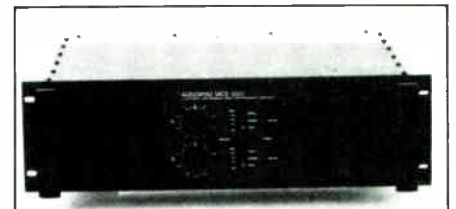
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DeCuir Speaker Enclosures

Recently introduced by DeCuir Sample Case Company is a quality line of sound enclosures that lets dealers or customers create their own customized sound system at a low cost. Constructed out of solid plywood with a premium carpet covering, most models come equipped with fiberglass, phone jacks and recessed handles.

These cabinets are presently available in 14 popular styles which include monitors, stacks and P.A. enclosures. Additional models will soon be available. Manufacturing is done at DeCuir's West Coast plant that has been producing quality sound enclosures and instruments cases for the music and sound industry since 1920.

Circle #145 on Reader Service Card



Audiopro MOS 1200 Amplifier

The MOS 1200 two channel power amplifier is the latest addition to Yorkville Sound's Audiopro line. The amp incorporates MOS-FETs in the output stages running in tandem with large S.O.A. bipolar devices driven by separate internal power supplies. Nominal output power into 8, 4, and 2 ohms is rated at 200, 400 and 600 watts per channel respectively. LED indicators and non-interruptive protection features are provided for open-, low-, and shorted-load conditions. Other features include two-speed, thermally regulated fans, dual automatic linear limiters which engage at and above the clipping level, and ten segment floating-bar level displays.

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Just The Right Mix

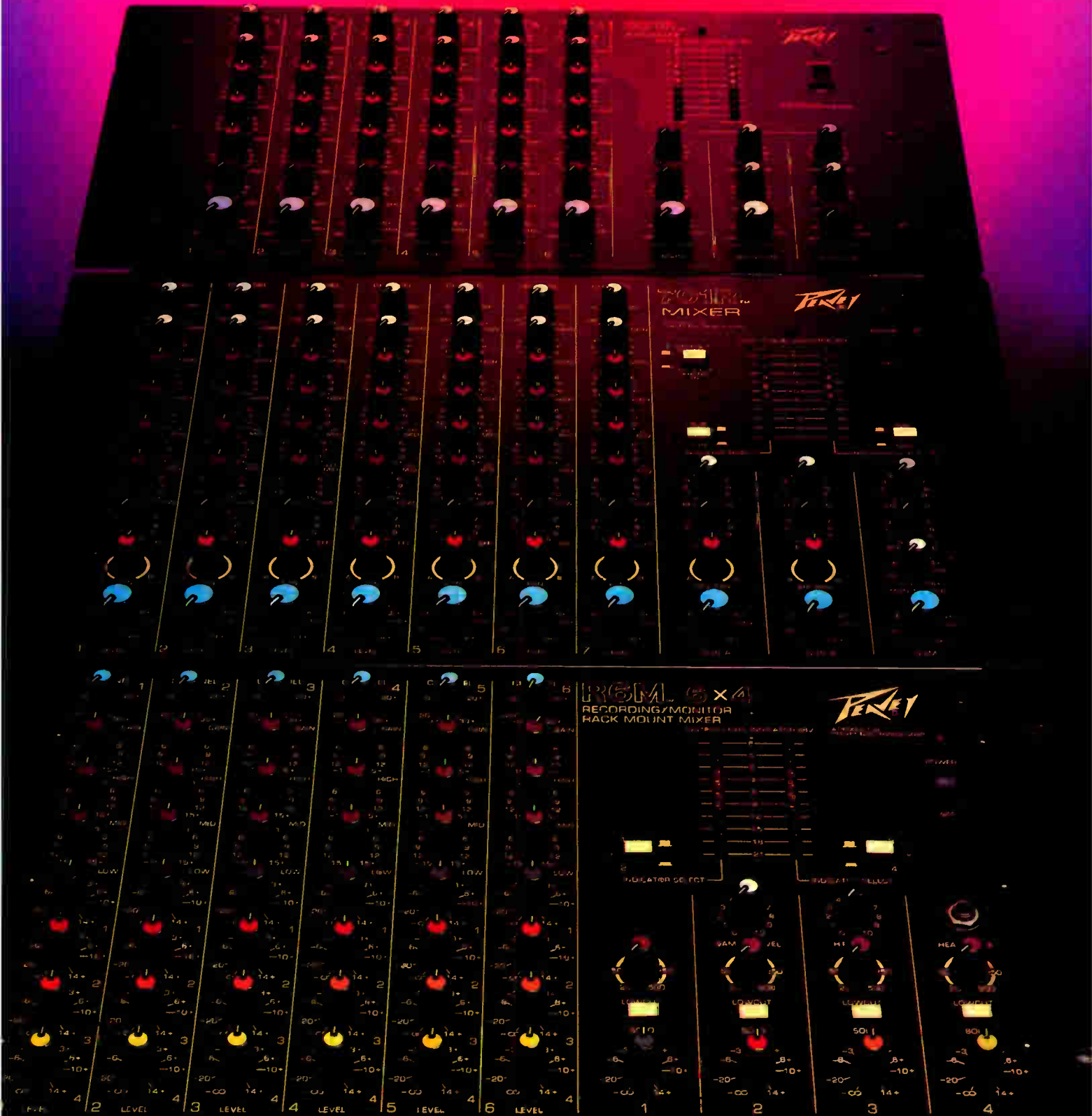
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For the complete run down, write for our new Monitor magazine or contact your nearest authorized Peavey Dealer.



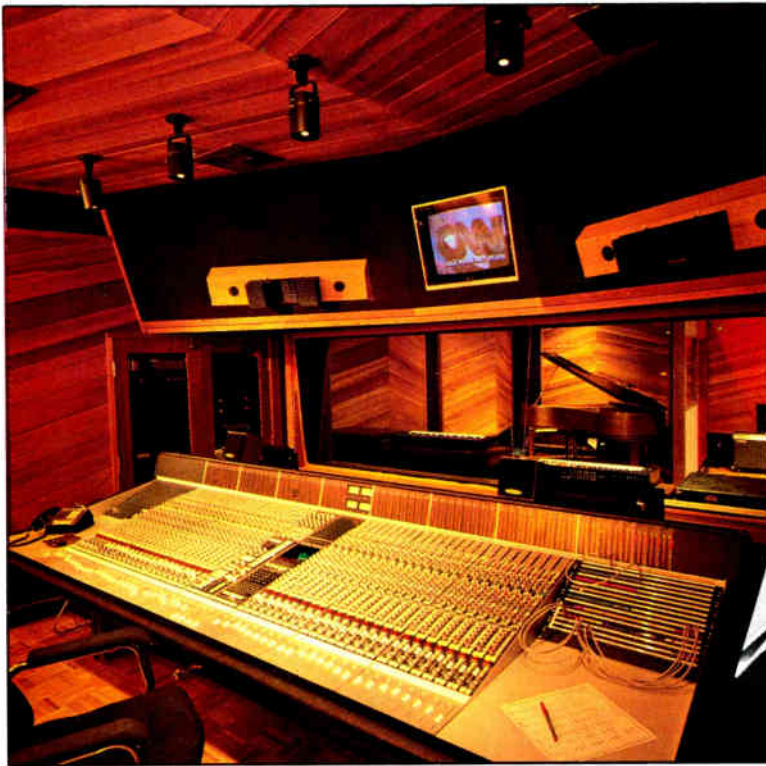


PHOTO: PIERRE OF LAHAINA STUDIOS



PHOTO: ION SIEVEH

MAUI NO KA OI:

GEORGE BENSON'S LAHAINA SOUND

by Robert L. Missbach
and George Petersen

It's certainly not where you'd expect to find it. One block from the historic waterfront in old Lahaina Town, across the highway from a busy sugar mill, just down the road from one of the most magnificent resort areas on earth—in a shopping center!—you'll find the studio nestled between the hair salon and an interior furnishings store. George Benson's Lahaina Sound Recording Studio is a gem of a studio on a Pacific jewel, the island of Maui, Hawaii.

Benson, who has become a favorite of Island audiences, and has maintained a residence on Maui the past few years, wanted a first-class studio where he could work on his material, but it had to be close to home and heart. But in Hawaii, where



Lahaina, Maui

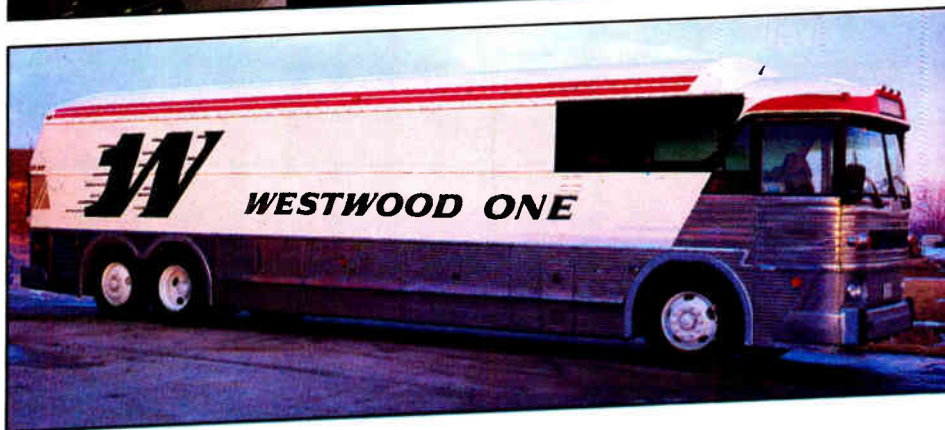
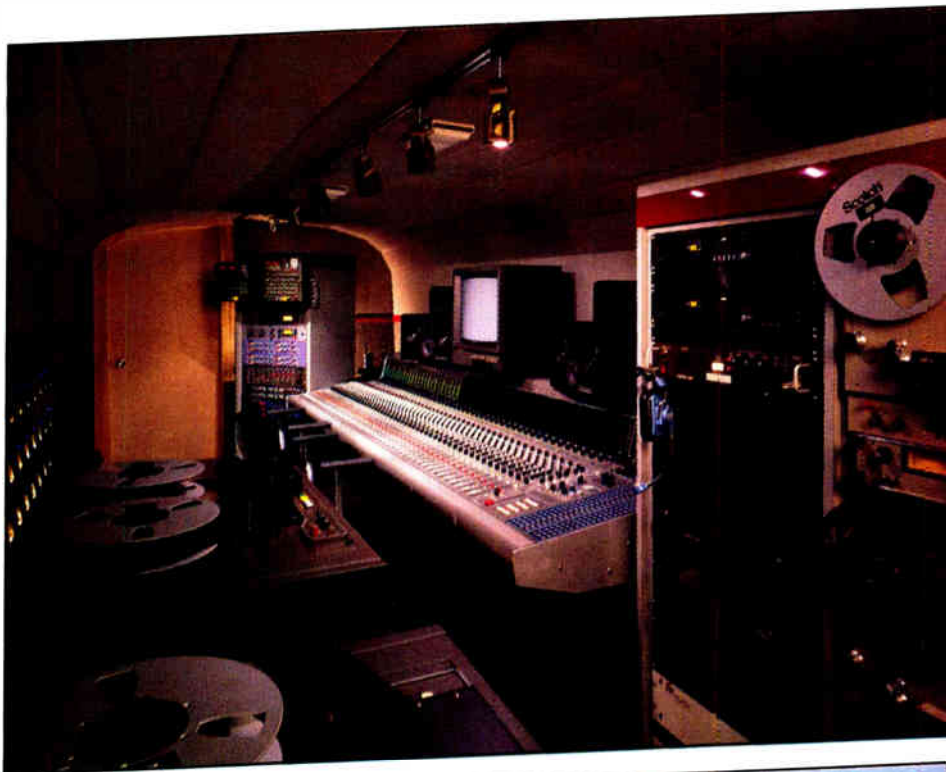
there are some fine studios in Honolulu, one doesn't just drive from one county to the next. So, Maui got her first truly world-class studio.

Upon arriving at Lahaina Sound, you enter from the unhurried shopping mall into a small office area hung with many of George's gold and

platinum records. Studio Manager Amos Daniels greets you with a relaxed Island manner which reminds you that this not a high-pressure sound factory found in many Mainland metropolises. All of which leaves you unprepared for the first glimpse of the control room. While your eyes are still adjusting from the bright Hawaiian sun, you find yourself in a softly-lit, warmly inviting high-technology zone.

George's original concept for the studio was to have a small facility for cutting demos and making rough 24 track mixes "just to hear how things sound," the guitarist explained. "When I started talking about building, people around here started getting excited about it, so I decided to put a few more dollars in it—although it turned out to be more than a few—it turned out to be a fortune! We started from scratch, by tak-

Milam Audio equips Westwood One's new world class mobile.



Primarily built for location recording in Central and Eastern United States, Westwood One's new customized bus features 50 simultaneous mike inputs, parametric e.q., unlimited grouping, automation, dual 24 trks, auto lock, digital reverb, effects, time align monitors, and mastering machines.

Nationally acclaimed engineer/producer, Mr. Arnold (Arnie) Rosenberg, project manager, designed the bus to function as an on-location vehicle and automated mixing facility. Assuring interface compatibility between the bus and Westwood One's California based truck, harnessing of both units are identical.

We wish to thank Westwood One for contracting Milam Audio as a major audio supplier during the construction of both Westwood One mobiles built since 1981. We also wish to thank project engineers, Arnold Rosenberg, Biff Dawes and Richard Kimball for their very fine assistance, and Mr. Rosenberg for his following comments:

"During my first business encounter with Milam Audio years ago, it took me a while to understand where they were coming from. Their lack of hype and pressure was just not in keeping with sales companies.

\$600,000.00 in purchases later, I have seen no change in their business approach and philosophy. Service is outstanding, credibility impeccable, and most important is their concern for people. Need I say more?"

Arnold Rosenberg;
WESTWOOD ONE

MILAM AUDIO

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ing over two 600 square foot storefronts, taking the middle wall out, and gutting them."

Designed by Chris Huston (who has done rooms for Baby-O Studios, The Osmonds, Glen Larson Productions, and Tom Petty, among others) and built in 1982, the studio began operations in the fall of that year. The room layout consists of a spacious control room, a moderate-sized music room, essentially rectangular with variously reflective/absorptive surfaces, and a small sound lock/iso booth between rooms. The studio can comfortably fit a 4-5 piece ensemble with clear sight lines all around and a very neutral room ambience, being neither too dead nor too live. There are many partitions of all shapes and sizes to configure drum booths, amplifier traps, or vocal areas anywhere on the hardwood floor. The iso/sound lock uses sliding glass doors for access and gives an excellent view of both control room and studio. The cartage door into the studio from the mall outside is well insulated and provides easy access as well as good isolation.

Designer Huston talked about his involvement in the Lahaina Sound project: "George had seen the two rooms I designed for Baby-O Studios [Hollywood, CA] and he was very impressed with those, so he commissioned me to design his studio. He had certain parameters—he had a limited amount of space and he wanted a live room. Actually, live acoustics have always appealed to me, since I've been in the business 21 years and I started when it was four track—when you documented a performance, rather than creating one. So the idea of a live room came very easily to me, and it fit in well with his style of music."

The studio's acoustics can be adjusted via drapes which can be pulled out to cover the cedar walls. "We used heavy four-weight velour with 14 ounce denim backing. With draperies, it's always important to have a double layer," explained Huston, "because the air in between is actually the medium which cuts the sound."

"The studio also uses my system of slat resonators, which I use in a lot of my designs now. George wanted cedar, which he shipped over from the mainland, and it works out very well. Cedar is a very nice wood to work with acoustically, because it has a high resonant frequency. If used correctly, it can actually help allay some of the anomalies that can occur in small rooms."

Among the studio's many instruments-in-residence are a Yamaha

grand, Fender Rhodes 73 and Yamaha CP-30 pianos, a Hammond B-3 with Leslie, Tama drum kit, Roland Jupiter 8, Korg Poly-Six, and Yamaha DX-7 synthesizers. The microphone selection is excellent with Neumann and AKG tubes and condensers, Sennheiser, Electrovoice, and Shure dynamics. But the one feature which stands this studio above many of its world counterparts is in the control room.



GEORGE BENSON

The heart of Lahaina Sound is the studio's Solid State Logic 4000E console. "We started off with an API board I bought from Alan Sides," Benson commented. "It was actually a portable console that was owned by Wally Heider, and since it was designed as a mobile console, there were some things that it lacked as far as a studio set-up was concerned. It didn't have the automation we needed, so I traded that console in and bought an SSL 4000E with 48 inputs."

Late in 1983, when the studio was upgraded with the SSL board, the existing monitoring system was also revamped with the installation of custom George Augspurger monitors. According to Augspurger, "George heard custom monitors of mine in studios on the mainland, and he felt that custom monitors would be a desirable addition to his studio. The units he has, like many others I've designed, are based on JBL components. Each has a pair of 2235 woofers, the big JBL midrange unit, and a pair of JBL super tweeters. The cabinets were designed to keep the

components in the proper geometry in respect to each other, yet at the same time fits into the space available in that particular control room and enabled us to get them at the right angle and tilt.

"The cabinets were built locally. I went over there for about three days and supervised the actual installation of the speakers into the existing soffit and did the initial balancing and equalization of the system. We used mirrors to get the angle and tilt exactly the same on both monitors, and then we experimented with the flushing in. Very often you don't want the monitors to be totally flush—you may find one of the panels should be angled or the center part of the soffit should be left open. It all depends on how things work out in room that's already built. So we experimented a bit and arrived at the combination which worked best."

The custom biamplified Augspurger monitor system uses White 1/3 octave equalizers with plug-in crossovers, driven by Bryston 4B amplifiers. Alternate reference monitoring is provided by JBL 4350s, Yamaha NS-10s, Visonik David 9000s, and the obligatory Auratones.

The 48-input SSL console is configured as 24 and 24, with each half responsible for a 24-track Ampex MM1200, synchronized by the BTX Shadow system. The console is, of course, computerized, and the video monitor in the front control room soffit will entertain you with your choice of computer program/console status displays, video playback from the synchronized Sony VO 2600 VCR, local television broadcasts, or if nothing else is happening, a view from the front door security camera.

Additional tape machines are an Ampex ATR-102 with 1/4" and 1/2" heads, an Ampex AG-440 four track, and a Nagra-T two track with center time code. Available noise reduction includes Dolby 361 for the two tracks and the new Dolby SP series for multitrack with AB playback.

"For outboard gear, we have all the latest toys," Benson notes, "but the SSL board has so many things built into it that we probably won't need so much outboard gear anymore." The studio's outboard arsenal is well equipped, with an EMT 251 digital reverb, an EMT 140 stereo tube plate, Lexicon's new Super Prime Time, and an Eventide H-949 Harmonizer. In addition to the SSL's versatile in-line gate/limiters and programmable EQ, outboard units include a rack of Kepex IIs and Gainbrain IIs; a pair each of UREI 1176LNs, LA-4s, LA-2s, and Lang PEQ-2 equalizers. However, it is

—PAGE 70

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This is the time of year things start to really cook for remote recording facilities. The freak spring snows have melted and the chilly winds have been replaced by the benign glow of the sun. *Everyone* tries to tour in the summer, and that means a lot of business for studios on wheels, which roll along the endless expanses of interstates right along with bands, both big and small.

These are generally good times for the mobile recording industry anyway. Although there aren't nearly as many big live album projects as there once were—sales have slipped in that category—radio and TV concerts are flourishing, and increasingly, performers at the lower levels of the business, independents for example, are finding that they can save a lot of money by renting a mobile unit and recording live, instead of spending a fortune being sequestered in a studio for a month. Today's best mobile trucks offer clients state-of-the-art equipment and a previously unattainable clarity in remote recording at prices that are usually quite affordable. —PAGE 66



Interior of Westwood One's Mobile Recording Studio

REELS ON WHEELS

A MIX OVERVIEW ON THE PRESENT STATE OF MOBILE RECORDING



Reelsound Rec. Co. "Mobile"



John Cougar Mellencamp and Richard Kimball of Westwood One outside one of their mobile studios.

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Less than six months old, Georgia-based Mobile Audio has been making waves in the mobile recording business with its fabulously equipped, custom-built 45-foot trailer. That trailer houses two Otari MTR-90 24 tracks, Otari four and two tracks, a BTX Softouch synchronizer and much more. It also includes a roomy lounge that doubles as a video monitoring station.

"TEN YEARS AGO, WHEN YOU MENTIONED AUDIO, TV PEOPLE WOULD SAY, 'OH YEAH, AUDIO, THROW A MIKE IN THERE.' NOW, MUCH MORE CARE IS BEING PAID TO THE AUDIO AND ALSO, MORE MONEY IS BEING SPENT ON AUDIO PERCENTAGE-WISE."

Not all remotes use music as their primary draw, however. For example, Carleton Productions in Ottawa, Ontario has built a sizable reputation for its video and audio work in both sports and entertainment. Recent projects have included events as diverse as the cable television production of *You Can't Take It With You* starring Jason Robards, the Liberal Party Convention in Canada, the World Figure Skating Championships and bodybuilding in Toronto. And because their cameras are compatible with ABC's equipment, Carleton's Bill Graham tells us that the company will help out on the summer Olympics in Los Angeles. Carleton is building a new mobile unit, Graham says, to keep up with the demand for good audio and video. "There's much more to video than just a good picture," Graham comments. "Ten years ago, when you mentioned audio, TV people would say, 'Oh yeah, audio, throw a mike in there.' Now, much more care is being paid to the audio and also, more money is being spent on audio percentage-wise."

Whereas television has become the bread and butter of some remote units, most still thrive on live music recording. Reelsound Recording in Manchaca, TX, for instance, does the bulk of its work for such radio syndication outfits as DIR Broadcasting (who produce the *King Biscuit* show), The Source, RKO Network, and Westwood One. Reelsound's Malcolm Harper says that '83 was his company's best ever, thanks to clients like the above, and a

slew of local gospel work. "We've been doing remotes for 15 years," he says, "and our engineers are known as some of the best in the business. When you have that kind of track record, your business sells itself, almost." Which doesn't mean that Reelsound is resting on its laurels. The company now has a mobile unit in the Baltimore-Philadelphia area and they have increased the amount of work they do with satellite feeds.

Midcom, Inc., in Arlington, TX, services a different breed of clients for the most part, according to Mike Simpson, who notes, "If you orient yourself as a straight music truck you limit the possibilities for yourself." Midcom does mainly audio-for-video, and they're equipped with top of the line gear all the way, including a pair of MCI JH-24 24 tracks locked together with a BTX Softouch. "Video has gone about as high as it can go until we get high definition TV," Simpson says, "but there's a long way to go with the audio. If audio gets one percent of a TV show's budget it's amazing. But I think it's changing." Among the TV work done by Midcom is the *Country Crossroads* program on the new American Christian Television cable network. Also, they provided the network feed for the Mondale-Hart-Jackson debate before

"IF YOU ORIENT YOURSELF AS A STRAIGHT MUSIC TRUCK YOU LIMIT THE POSSIBILITIES FOR YOURSELF."

the Texas Democratic primary. Simpson says Midcom will be moving to the ever-growing Dallas Communications Complex in the near future.

Richard Kimball of giant Westwood One says that one reason remote recording has improved so much in recent years is that, "Artists really know what they want. A lot of these are people who understand recording studios, know what they're capable of, and they want remote recordings to sound as good as studio recordings. Without the input of artists, we wouldn't be as far along in the field as we are." That input can affect everything from Westwood One's deci-



At left: The Arlington, Texas-based Midcom mobile unit.

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"The monitor system in this bus is better than any studio I've ever been in."

Paul Blakemore,
Recording Engineer, "Jazz Alive," Radio Series.

"I wasn't listening to the monitors, I was listening to the music."

Bob Dawson,
Co-Owner, Bias Recording Co., Inc.



Bob Skye, Owner



In the real world of remote recording, Skyelabs considers the main factor that makes up a good working environment; excellent equipment in a comfortable, user-friendly space, designed for human beings with ears.



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World Radio History

sion to go (Sony) digital, to their recent addition of Yamaha NS-10 monitors. "The state-of-the-art has increased dramatically in the past several years,"

Kimball says. "Three years ago, equipment wasn't really up to snuff in the eyes of some artists. Now, a mobile unit can roll in and have really good stuff."

Westwood, of course, is one of the most successful radio syndication firms in the country, having built their company on a combination of live rock and roll broadcasts and programs oriented to the youth market. Among their recent live shows were concerts by Duran Duran, John Cougar Mellencamp, The Pretenders, Kool & the Gang, Stevie Wonder, The Romantics and Quarterflash, as well as a big heavy metal fest.

Another remote company that does a lot of radio concert work is Beachwood Recording, based in Cleveland (actually Beachwood), Ohio. Through its parent company, EDR Entertainment, Beachwood landed a



Norm Rowland and engineer Bob Dawson recording "Billy Price and the Keystone Rhythm Band" in Skyelabs' new LEDE control room.

LEDE on Wheels

Skyelabs' Rover, featured on this month's *Mix* cover, is the world's first certified LEDE™ (Live End-Dead End) remote control room. The Dover, Delaware-based mobile unit is built into a GM PD4106 motor coach. Owner Bob Skye got the idea of remodeling his bus to conform to the LEDE design parameters about a year and a half ago, and after a year of experimenting, testing and construction, made its debut by recording Billy Price & the Keystone Rhythm Band in March of this year.

However, building an LEDE control room in a bus was no easy task, since the LEDE concept usually requires a fairly large control room. "You won't find any chapters in any acoustician's book about controlling low end in small rooms," Skye explains. "Once I built the thing, I took it over to Neil Muncy, of Neil Muncy Associates, and we started measuring. It turned out we still had a long way to go. We started pulling out carpet and adding more soft stuff around the speakers because we were still getting frequencies that were bouncing through the soft stuff and coming back out again. I stripped the walls to the ribs, sprayed them with two inches of urethane foam, and then put a half inch of plywood and cosmetic treatment over that. Because the walls are so light, they don't contain that much low end energy. I think the walls are

resonating and allowing the low frequencies to pass through the walls. We're still measuring, because we're still not sure why there's no low end problem in the room. The sound is remarkably clear."

The most important point, Skye emphasizes, is that the system works. "Skyelabs' Rover was built for engineers with ears. When people first bring a tape and listen, they all have the same reaction. First they relax and listen. Then they get a big grin on their face and start playing with the panpots, because you can literally bump a panpot and hear something move. One engineer who worked in here was used to listening at 115dB in most studios. At the end of the evening, he was listening at 100 dB. And he loved it."

Aside from an accurate control room, Rover offers other useful amenities including a 10 x 7½ foot lounge, an extensive AC isolation system with separate grounds for power and audio components, a Sound Workshop Series 30 console (36 x 24 with a 12 x 8 expander), MCI 24 track recorder, and a wide selection of microphones and out-board gear.

"Basically," Skye concluded, "what I've tried to do is to take the latest in acoustic and electronic technology and put it all in a control room that you can take anywhere. And at the same time achieving a control room standard where mix-down is just as viable as recording."

—George Petersen

"THE STATE-OF-THE-ART HAS INCREASED DRAMATICALLY IN THE PAST SEVERAL YEARS"

large contract to provide remote services for NBC radio's *The Source* rock program, and to accommodate that work they put in a new live broadcasting facility in Mobile One. Where there were once beds, there is now a live-announcer booth with cart facilities and its own McCurdy 8808 broadcast console. "This way," says EDR's Denny Martin, "the same engineer who is dealing with the music and the [Soundcraft] board, doesn't also have to worry about commercials and the announcer and all that. Keeping the music engineer totally independent from that outside stuff helps the music quite a bit." According to Beachwood's Keith Voigt, their mobile facility has been quite busy of late, though it's no match for their regular facilities, which are "really booming, operating 24 hours a day, seven days a week." Aside from their work with NBC, Beachwood has been kept busy doing a lot of gospel work with Al Green and various small religious labels, and some concert work in Chicago, with performers like Frank Marino, Golden Earring and Rick Nelson.

For Nashville-based Fanta Recording, diversity has been the name of the game, as they seek to increase the options they can offer their many clients. Fanta now has three trucks: their Ampex and Sphere equipped

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main truck which Johnny Rosen tells us is booked in the "90-plus percent range" by a wide variety of musicians; a truck purchased from Florida's Criteria Studios which is used primarily for smaller projects; and a third unit mainly employed on audio-for-video projects. "Business is the best it's been in ten years," Rosen says, adding that he's

pleased by the broad range of clients Fanta has been attracting, from various radio syndication shows (*Silver Eagle* and *King Biscuit* for DIR) to a number of album projects—about ten in the first three months of this year alone. "Not having a studio in addition to our trucks was the smartest move we ever made,"

—PAGE 72

—FROM PAGE 62, BENSON

unlikely that all these goodies will change the guitar sound that George Benson is so well known for. "I don't really like to use a lot of processing for my guitar—maybe just a bit of compression or limiting with the 1176 or the LA-2," George explains. "I don't like a lot of gimmicks: I like the guitar to sound as natural as possible."

Benson has put Lahaina

Sound to good use on his own projects recently. Part of the overdubs (including vocals) and mixing work for his 1984 Grammy award winning "In Your Eyes" was completed at the studio with engineer Bill Ravencraft. At the time of this interview, George was working with producer Tommy LiPuma on an instrumental project tentatively entitled *Instrumentally Yours*. When asked about some of the advantages of having one's own studio, Benson replied, "It's a lot looser. I feel like I'm more in control of what's going on. I hate being kicked out of a studio, like when you're in the middle of something and there's another session coming in 20 minutes. But owning a studio is exciting, and watching it grow into something is very gratifying."

Lahaina Sound operates commercially when Benson is away.

Because of its video capability, the studio was chosen by Carol Burnett, also an island resident, as the place for her ADR for the movie *Between Friends*, in which she starred with Elizabeth Taylor.

With its 48-track/SSL combination, Lahaina Sound would be in an elite minority even in a California location. But to place such technology in a paradise like Maui makes it truly exceptional. Lahaina Sound has hosted several Japanese, Australian, and American artists who have made the most of the studio/resort experience. The Hawaiian music business has grown enormously in past years, also. While "Tiny Bubbles" and other favorites are old standards, Don Ho's former band, The Alii's, has done recent album work there, as well as contemporary artists like guitarist Peter Moon, whose electric/acoustic blend of jazz and Polynesian/Pacific styles is as advanced as the recording system.

"One of the best things we can offer is peace of mind while you work," says Benson, summing up the resort recording philosophy of Lahaina Sound. "We want people to feel that this is their studio too, and I think we've pretty much succeeded in this."

In Hawaiian, the phrase "Maui no ka oi" means "Maui's the best!" And now, for George Benson and the clients of Lahaina Sound, it's truer than ever. ■



Van-tastic Sound!

If James Bond were an audiophile instead of a double agent, he certainly would have wanted his boss, M, to get him one of the prototypes of The Mobile Studio. That's the trademarked name of the fabulous new brainchild of Jim Cassily (best known as the inventor of The Projector, a now widely used sonic "exciter") and designer George Augspurger. The Mobile Studio came about, Cassily says, "because I was looking for a way to bring pro audio to another point. I wanted to work on something that would bridge the gap between pro audio manufacturers and the more sophisticated audio consumers."

And so, working with Augspurger and Dick Chrysler of Cars & Concepts (who make convertibles and T-roofs for the major auto makers as well as designing pace cars, etc.), Cassily set out to put together the ultimate car stereo—really more of a sophisticated sound monitoring system than what we think of when we imagine a car flying down the highway with stereo blaring. Using one of the new Chrysler mini-vans (that's *the* Chrysler Motors, not Dick) Augspurger worked long and hard coming up with the right combination of equipment to make the van sound as good as a recording studio. He got the prototypes of the new JBL F104H professional monitors which, Cassily claims, "sound absolutely phenomenal, with a mind-blowing bass response." To drive the speakers is a Crown amp with six 50-watt channels "of studio quality sound," Cassily says. Equalizers flattened the sound to the

point where, "if you spent the day in a recording studio working on tapes and then you played them in the van, they'd sound like they did in the studio. It's that flat and that clean."

But wait—there's more. In one of the mini-van conversions the design team took out the refrigerator and in its place put in a 19-inch rack that included two stacked 16 channel Neve 5432 consoles, a dbx digital processor, a Lexicon 224X and DeltaLab digital delay, the Projector, and a slew of other gear. A matching mini-trailer hauls outboard gear, an Otari MTR-90 recorder, and even a satellite dish for uplinks, so in effect they have developed a fully equipped micro-studio that delivers top quality results. The interiors were immaculately constructed, using leather, hand carved German burl wood and other fine materials. What's more, "This thing drives like a dream," Cassily testifies.

This isn't just some futuristic pipedream, either. Chrysler actually commissioned them to build a vehicle and board chairman Lee Iacocca is going to test one of the units (*sans* recording gear) himself with an eye toward actually putting the super-sounding vans out on the market. Cassily says a van with the sound monitoring system will go for about \$25,000; obviously adding the recording gear adds considerably more. "The time is right for this," Cassily says. "There are more people than ever before who want to hear great sound—professional listeners. It's a tribute to pro audio and to Mr. Iacocca that those people will be able to get what they want in a great car."

—B.J.



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Rosen says, "because people know that remote is our business. Some studios buy a truck and treat remote like a hobby. I don't think you can run a business that way." Incidentally, though headquartered in the country music capital, only about 10 percent of Fanta's business overall comes from country music. Which proves you can't judge a remote by its home base.

Certainly Reflection Sound Studios in Charlotte, NC, considers its remote truck more than just a "hobby," but it is an example of a studio that uses remote more as a sideline to its main studio business than a primary generator of income. In fact, when the

studio's truck gets booked, they simply take Studio C and move it into a truck, giving them an instant MCI studio on wheels. According to Mark Williams, Reflection owns the only pro 24 track remote truck in the Carolinas, and so far it has been used mainly for local projects.

How does a relatively new company break into the field? Well, in the case of Rocshire Studio in Anaheim, CA, they purchased a truck that was already famous in the industry—the Record Plant's Mobile One, "one of the most accurate trucks in the world," according to Rocshire's Lester Claypool. It's been used by a number of top musi-

cians, including Stevie Wonder, who recorded two of his most successful albums, *Songs in the Key of Life* and *Hotter Than July* using it. Claypool says that they've modernized the truck some, increasing its mike line potential from 54 to 88; 80 were used for a recent Judas Priest project Rocshire worked on with ABC television. Other bands to use Mobile One over the past couple of months were Alcatrazz (who cut a live album), Billy Idol, and the popular Denver-based band Zebra. In addition, Mobile One does ongoing work with Showtime's *Rock of the '80s* program.

San Francisco's Phil Edwards Recording, which has been doing remotes since 1958, is currently looking for an up-and-comer like Rocshire to purchase their wonderfully equipped Mobile 2, as PER scales down its operations to a degree. "We made a major update a year ago to be comparable to the biggest trucks," Edwards says. PER does a lot of jazz and ethnic work; in fact albums handled by Edwards & Co. are regular Grammy winners, as recent disks by Tito Puente and the team of George Shearing and Mel Torme show. Edwards says that 1983 was a rough year for the company but that streamlining the operation by selling Mobile 2 will make a tremendous difference to the operation.

Not everyone has huge buses and trucks loaded with half a million dollars worth of gear, of course. Take San Francisco's Transparent Recording, operated by Lolly Lewis. Lewis uses a Nagra T (one of the new 30 ips models), a Studer 169 mixer and various mikes—mainly Neumann and AKG—to cut live stereo recordings, primarily of classical performers. "There isn't a large market for what I do," Lewis admits, "but I find it very rewarding and I have been able to make a living of it." Lewis works at the San Francisco Conservatory of Music and has met a lot of connections that way, such as noted contemporary composer John Adams. "A lot of classical musicians aren't comfortable in the studio, so recording them in a performance environment is more appealing to them. She says that miking orchestras is always a challenge, particularly when the score calls for exotic instruments. "You really have to listen and be aware when you're mixing," Lewis says, "because with a stereo recording you're not able to go in after the fact and make these strings louder and these horns softer. It requires a lot of concentration and a lot of pre-planning, getting the mikes in the right places." Lewis packs her gear into a small truck. "I'm lucky it doesn't take up much space—sometimes I have to work in a room the size of a closet." Ah yes, the romance of the recording business! ■



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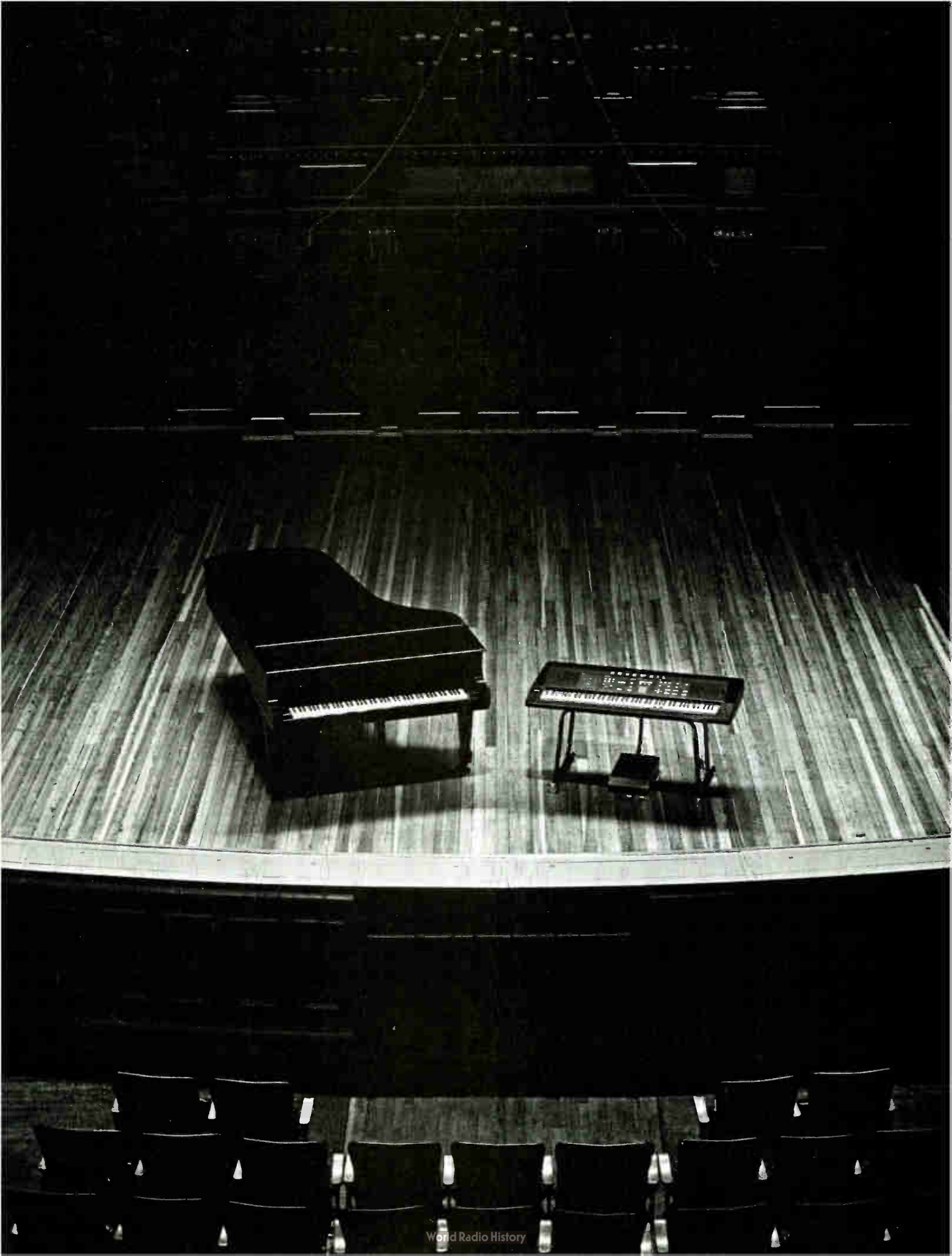
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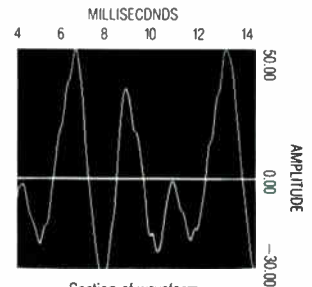
For example, a middle C on the piano activates a very different set of overtones than an F# two octaves above it. The Kurzweil 250 takes this into account and accurately duplicates this changing harmonic structure across its entire keyboard.

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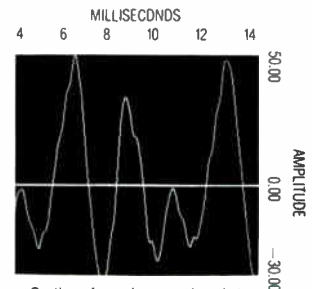
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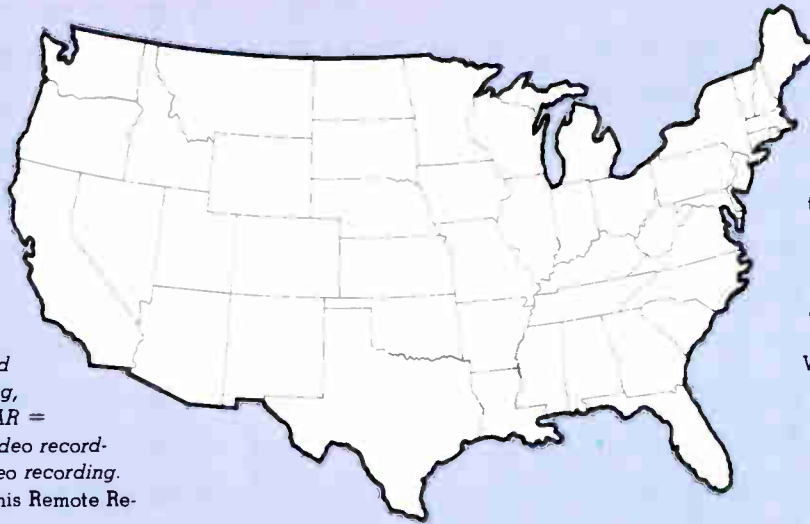
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REMOTE RECORDING & SOUND REINFORCEMENT

L I S T I N G S

The following companies offer a variety of services in the field of sound reinforcement and remote recording. Many of the listings in this directory also contain a code which indicates the specialties of each business: *SO* = sound reinforcement, *SL* = sound and lighting, *ST* = staging, *ER* = equipment rental, *AR* = audio recording, *VR* = video recording, *AV* = audio and video recording. All of the information in this Remote Re-




cording and Sound Reinforcement Directory is based on questionnaires mailed in February 1984. People, equipment and locations may change, so please verify critical information with the companies directly. *Mix* does not take responsibility for the accuracy of the information supplied to us by the firms listed. We encourage all remote recording operations (audio, video, or both) and sound reinforcement companies to contact us here at *Mix*, so as to be included in our next listings.

NORTHWEST

AATRONICS INC.
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SL, AV
 5903 Franklin Rd., Boise, ID 83709
 (208) 343-0900
 Contact: Bill Donnelly

ADVANCE SOUND & ELECTRONICS
SOUND REINFORCEMENT
 Box 41221, Sacramento, CA 95841
 (916) 334-9800
 Contact: Don R. Becker, gen mgr



ALIVE RECORDING CO.
 149 N.E. 59th Seattle, Wash. 98105
 (206) 522-8168

Bruce Buckner / Owner

ALIVE RECORDING CO.
 Seattle, WA

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REMOTE RECORDING
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 Contact: Bruce Buckner, owner
Equipment: 2 ton International Loadster 1600 truck, Ampex MM 1200 24 track w/additional 16 track head assembly, Otari MX5050 1/2 track, Revox A77 1/2 track, Sony cassette, TEAC 1/4 track tape recorders, Neotek modified 23x24x8x2 transformerless board; JBL 4333, Auratone 5C, E.V. Sentry 100 monitors, Hafler, BGW monitor amplifiers; AKG BX10 reverb, Lexicon digital delay, UREI, dbx, Symetrix, Universal Audio tube com-

pressors/limiters, Orban parametric, UREI, audio Control EQs; Symetrix noise gates, Clear Com Intercom system, Panasonic video camera and monitor, "Soia" voltage regulation, 250' 24 pair audio snake, 250' AC power snake, Sony direct drive turntable, G.A.S. Servo Loop pre-amp, headphones, mike cords, mike stands, AKG N66 phantom power, AKG, Sennheiser, E-V, Shure, Crown PZM, Sony and Beyer mikes, Countryman Direct Boxes. **Services Available:** Digital recording, video synchronizations, and any other outboard gear available on request.

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 (415) 494-9366
 Contact: Jack R. Minkoff

AUDIO HAWAII, INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
 866 Iwilei Rd., Suite 230, Honolulu, HI 96817
 (808) 533-2657
 Contact: Jim Perr, Dana Herzog

AUDIO SYSTEM RENTALS
SOUND REINFORCEMENT
SO
 21169 W. River Rd., Stevenson, CA 95374
 (209) 576-8632; 632-7098
 Contact: Donald Setaro, Ray Vierra

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 Contact: Frank Short

BARATH ACOUSTICS, INC.
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SO
 7800 E. Hliff, Suite F, Denver, CO 80231
 (303) 750-6474
 Contact: Harry Warman

BLUMER BROS. MUSIC
SOUND REINFORCEMENT
 992 Lincoln Ave., Napa, CA 94558
 (707) 252-7035
 Contact: Jeff Blumer

BONNY DOON SOUND WORKS
SOUND REINFORCEMENT
SO
 7994 Empire Grade, Santa Cruz, CA 95060
 (408) 426-5249
 Contact: Allen Hall

BOUNTY MUSIC
SOUND REINFORCEMENT & REMOTE RECORDING
 P.O. Box B - 98 Hana Hwy, Paia, HI 96779
 (808) 579-9498
 Contact: Paul Weinstein

BROADCAST SUPPLY WEST
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SO, AR
 7012 27th St. W., Tacoma, WA 98466
 (206) 565-2301
 Contact: Tim Schwieger

BROWNELL SOUND & HI-FI
SOUND REINFORCEMENT
SL
 3601 S.E. Concord, Milwaukie, OR 97222
 (503) 659-0394
 Contact: Kurt Bevers

CARAWAY AUDIO
SOUND REINFORCEMENT
SO
 3224 Bay Rd., Redwood City, CA 94063
 (415) 366-1690
 Contact: Doug Caraway

CASABLANCA MUSIC
SOUND REINFORCEMENT
 2107 James Ave., Box 7838, So. Lake Tahoe, CA 95731
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16 to 56 Inputs, opt. VCA Automation
- **M-2500TV** 24 Buss, 24 or 48 Monitor
24 to 56 Inputs, VCA Automation
- **M-3500TV** 24 or 48 Buss, 24 or 48 Monitor
24 to 120 Inputs, VCA or optional
Motorized Fader Automation
- **M-5000AIR** 24 or 48 Buss, 24 or 48 Monitor
36 to 120 Inputs, VCA or optional
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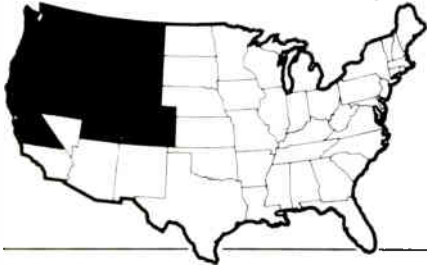
AMEK
TELEVIDEO

In the UK: AMEK SYSTEMS & CONTROLS, Ltd., Islington Mill,
James St. • Salford M3 5HW, England • 061-834-6747 • Telex 668127

REMOTE RECORDING & SOUND REINFORCEMENT

NORTHWEST

Many of the listings in this directory also contain a code which indicates the specialties of each business: *SO* = sound reinforcement, *SL* = sound and lighting, *ST* = staging, *ER* = equipment rental, *AR* = audio recording, *VR* = video recording, *AV* = audio and video recording.



C.A.V.E. RECORDING
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
P.O. Box 3667, Santa Clara, CA 95055
(408) 244-2283
Contact: Brett Tyson

CHONK MOONHUNTER
REMOTE RECORDING
AV
2721 Bellaire Place, Oakland, CA 94601
(415) 436-6978
Contact: Curtis Choy

COLORADO CONCERT SOUND, INC.
SOUND REINFORCEMENT
SO
P.O. Box 1652, Longmont, CO 80502
(303) 772-3933
Contact: Tom Beaman

THE COLORADO SPRINGS MUSIC CO.
SOUND REINFORCEMENT
321 N. Tejon St., Colorado Springs, CO 80903
(303) 635-1561
Contact: Mike Harper

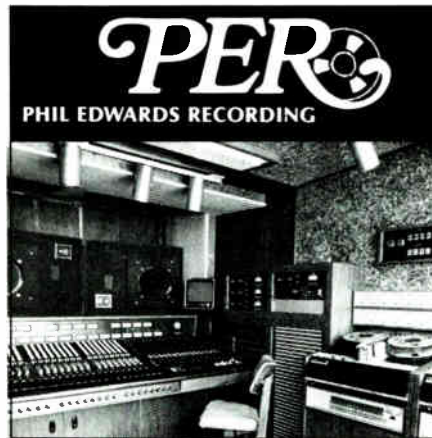
dB AUDIO
SOUND REINFORCEMENT
SO
S. 4816 Madelia, Spokane, WA 99203
(509) 448-8740
Contact: Drew Bunch



DuMORE AUDIO
Tahoe City, CA

DuMORE AUDIO
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(916) 583-1392

Contact: Jim Knight, Glenn Carrier
Services Available. DuMore Audio offers the finest in audio signal processing for all of your touring needs. DuMore Audio features Jim Gamble Consoles, Meyer Sound Speakers and Crest Audio Amps, complemented with a full array of support equipment.



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San Francisco, CA

PHIL EDWARDS RECORDING (PER)
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Contact: Phil Edwards
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1906 E. 115 Pl., Northglenn, CO 80233
(303) 457-0730
Contact: Terry McMurty

FEELINGS EXPRESSED STUDIO
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(801) 258-5350
Contact: Joseph Swatsell

FM PRODUCTIONS
SOUND REINFORCEMENT
3775 Bayshore Blvd., Brisbane, CA 94005
(415) 468-6500
Contact: Larry Hitchcock

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SO, AR
998 Spencer Ave., San Jose, CA 95125
(408) 998-2527
Contact: Bill Cormier

GUITARS ETC.
SOUND REINFORCEMENT
11810 N.E. 8th Ave., Bellevue, WA 98005
(206) 451-3878
Contact: Cam Nichols, manager

HAIGHT ASHBURY MUSIC CENTER
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
1458 Haight St., San Francisco, CA 94117
(415) 863-7327
Contact: Massoud

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SOUND REINFORCEMENT & REMOTE RECORDING
SO, ER, AR
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(503) 996-2575
Contact: L.F. Caulkins

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(303) 777-3561
Contact: Mark A. Bresher

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REMOTE RECORDING
AV
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(206) 481-3477
Contact: Clint Hoerner

HORODKO SOUNDTRAX
REMOTE RECORDING
111 Vallejo St., San Francisco, CA 94111
(415) 956-8729
Contact: Ed, Steve, Randy

HOWZIT? SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
1464 Glenbrook Dr., Santa Rosa, CA 95401
(707) 527-9071; 578-1479
Contact: Dixon, Rick-O-Shay

INTEGRITY SOUND
REMOTE RECORDING
AR
248 N. Broadway, Fresno, CA 93701
(209) 237-9640
Contact: Paul Fontaine

J.V. SOUND
SOUND REINFORCEMENT
SO
622 3rd Ave., San Francisco, CA 94118
(415) 752-6389
Contact: Joe Begin or Vicky Hamle

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(206) 632-8989
Contact: Sandy Carter or Spring Selby

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. . . and so you can keep track of what's going on, there's a headphone monitoring system and fluorescent, assignable bargraph meters.

But that's just for starters.

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Four mixers, in fact. The MCX is an independent on-stage monitor mixer.

It's an effects mixer. Every channel has its own post reverb/effects send.

It's a main house mixer, with an extensive patch bay and an assignable auxiliary input.

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everything record/mix/playback system.

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The MCX belongs wherever pro-quality audio is important.

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Employ the components of the MCX in one integrated system, or use them as separate and independent tools of production. Or put the MCX to work with other audio gear, using the patch bay for all your

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The MCX-106 provides a sound foundation for your musical recording project — your live

performance — your multimedia presentation — your A/V training film — or your video post-production strategy.

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(415) 588-2538

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KUOP-FM
REMOTE RECORDING
AR
3601 Pacific Ave., Stockton, CA 95211
(209) 946-2582
Contact: Bob Lyons
Services Available: Specializing in remote live to 2-track; chamber, orchestral, choral, jazz. Credits: Jeane-Pierre Rampal, Chuck Corea, Gary Burton, Dave Brubeck, Borodin Trio, Vermeer Quartet, Pacific Acapella Choir.

KUSTOM SOUND SERVICES
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
P.O. Box 4902, Missoula, MT 59806
(406) 728-3216
Contact: John Campbell, Jay Straw

Equipment: Concert sound and lighting for up to 5000 seat venues. 4-way system with integrated mid/high cabinets and JBL components. 6-way monitor mix with high power JBL monitors that can be bi-amped or passive. Consoles by Hill Audio with 24x8 on house. Effects and outboard gear by Lexicon, dbx, Ashly, Symetrix, Biamp, Tapco, Aphex. Power amps by Hafler, Carver, Phase Linear. Microphones are Shure, E.V., AKG, Sennheiser, Beyer. Recording equipment includes a Tascam 80-8, Tascam model 5 mixer, dbx noise reduction and AKG condensers. Lighting equipment from Teatronics and Capitol.
Services Available: At Kustom Sound Services, we specialize in small to medium size concerts, with emphasis on high quality and efficiency. We have done sound throughout the Northwest for acts such as Taj Mahal, Rick Nelson, Badfinger, The Hager Twins, Legendary Blues Band. We can also provide live 8 track remote recording, and with our lighting services can provide a complete tour package. In addition to concert sound, we provide sound and lighting support for touring club acts who work the Northwest, and are seeking constant, high quality reinforcement and stage production. Transportation, Engineering, set-up, and consulting are available.

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(206) 852-7556
Contact: Alan Ogard

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SO, ER
685 S. Pearl St., Denver, CO 80209
(303) 778-0949
Contact: Bill Rollin

MATEEL SOUND CO.
SOUND REINFORCEMENT
SO, ST
432 Church St., Garberville, CA 95440
(707) 923-3388
Contact: Jimmy Dangler

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191 Oakridge Dr., Daly City, CA 94014
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Contact: Joe Bajza

Services Available: We specialize in concert sound production, convention services and planning, also, custom designed installation—rentals and leasing. We maintain an inventory of over 50 Harbinger high efficiency loudspeaker systems which can be custom tailored to your specific needs from a 150 watt fashion show system to a 20,000 watt concert. We feature very affordable rates.

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(415) 574-0908
Contact: David W. Thomas

HARRY McCUNE SOUND SERVICE
SOUND REINFORCEMENT & REMOTE RECORDING
SL; VR
951 Howard St., San Francisco, CA 94103
(415) 777-2700
Contact: Allen McCune

LLOYD F. MCKINNEY ASSOCIATES, INC.
SOUND REINFORCEMENT
25350 Cypress Ave., Hayward, CA 94544
(415) 783-8043; 351-0855
Contact: Lloyd F. McKinney

MELODY MUSIC
SOUND REINFORCEMENT
3451 So. Acoma, Englewood, CO 80110
(303) 789-4496
Contact: Gordon Close



MORGAN SOUND, INC.
Wynwood, WA

MORGAN SOUND, INC.
SOUND REINFORCEMENT
SO, ER
2004 196th S.W., #2, Wynwood, WA 98036
(206) 771-7257

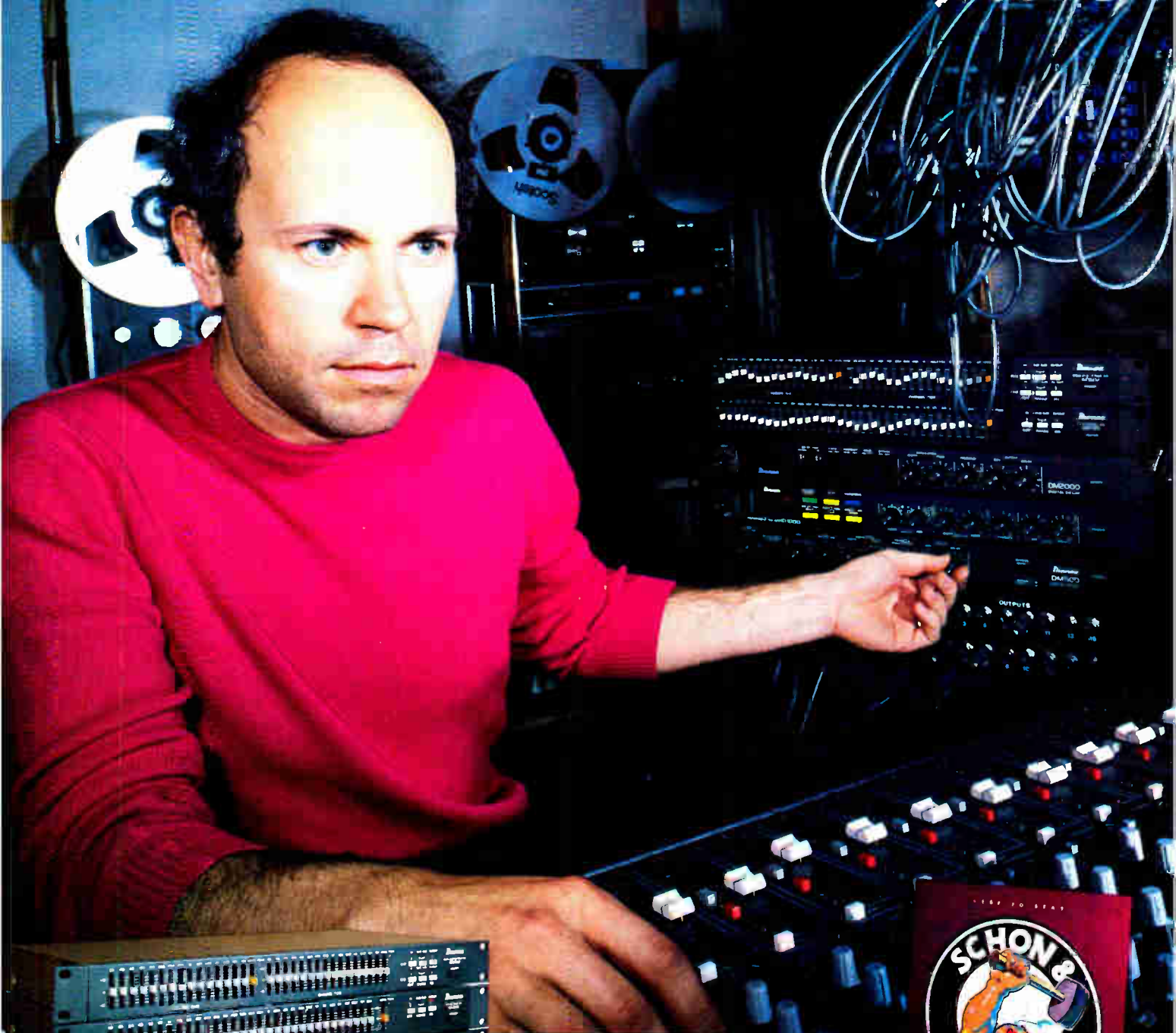
Contact: Charlie Morgan or Bruce George
Equipment: Complete sound reinforcement service using 4-way JBL speaker systems. Soundcraft 800B-32, 400B-24, Yamaha PM2000-32, PM1000-16, Consoles/UREI processing JBL 6233, Phase Linear, QSC Series 3 power amps 16x6 and 32x10 monitor systems. 3-way NW Sound floor monitors. Complete line of microphones Lexicon DDLs, Master-Room and AKG reverb. JH Tractor w/30' trailer
Services Available: Factory authorized warranty repair for JBL, E.V., Tapco, QSC, Crown, Audio Arts, Peavey, Roland. We repair all brands pro-audio equipment. Factory authorized repairs on all JBL loudspeakers. Rental systems available. Complete concert sound reinforcement services. Well stocked retail showroom with all above brands plus Nady, Goldline, Soundcraft, Audio Technica, Shure, AKG, IVIE, Anvil, Calzone, Sennheiser, BFI, JBL studio monitors, Lexicon, Countryman, Pro-Co, NW Sound, Neutrik, Real, TOA, Littlelite, Whirlwind, Easy Talk. Sound consultation and custom design work on request.

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REMOTE RECORDING
Rt. 1 Box 25, Tulelake, CA 96134 (30 miles south of Klamath Falls, Oregon)
(916) 667-5508

Contact: Web Staunton
Equipment: State of the art - Located in a Silver Eagle bus - Console Neotek Series II 28x28. Tape machines Otari MTR90 24 track w/Autolocator, 3M 79 2 track; 32 channel splitter (3-way split). Outboard gear includes Lexicon Prime Time, AKG BX10 reverb, Orban DeEsser, Valley People gates, dbx 160X comps.

—continued on page 82

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Jan Hammer - long recognized as a pioneer of the electric keyboard - also pioneered the use of advanced signal processing techniques in his medium. Jan learned early on the value of quality signal processing in the creation of his unique musical voicings. In his Red Gate Studio Jan has chosen Ibanez digital processors and graphic equalizers. For Jan has learned what more musicians, producers, engineers and soundmen are learning everyday: Ibanez delivers!



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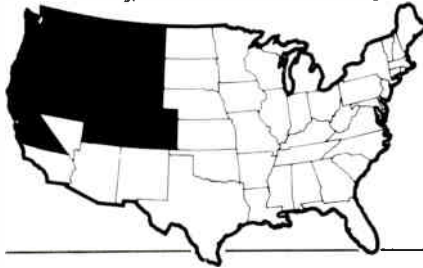
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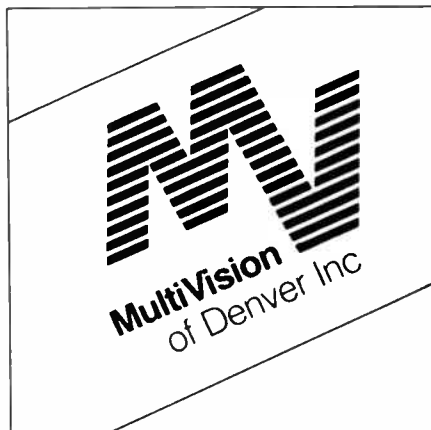
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MOUNTAIN MOBILE RECORDING INC.
 Tulelake, CA

etc. Monitor speakers UREI 811A.
 Services Available: Mobile recording. Recent clients include album projects for Merle Haggard (The Epic Collection), David Crosby, The Montana Band, etc. Other projects for Terry Talbot, Gene Watson, Denny Rae Lamson, etc. Anywhere, anytime. Extremely reasonable. Additional 24 track available upon request. At Mountain Mobile we pride ourselves with offering a mobile bus that has everything from a state of the art control room to a state of the art lounge which includes restroom facilities, refrigerator, hot coffee and tea, and couches for relaxation. Try us, you'll like us.



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 Denver, CO

MULTIVISION OF DENVER, INC.
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(303) 698-0420
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 (415) 332-2416
 Contact: Brian Risner
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 P.O. Box 1103, Clovis, CA 93613
 (209) 292-8438
 Contact: Mark Seibert

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 SOUND REINFORCEMENT
 SO, ER
 251 Poplar Ave., Hayward, CA 94541
 (415) 581-1281
 Contact: Ed Tucker
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 SOUND REINFORCEMENT
 420 Mountain View Dr., Kalispell, MT 59901
 (406) 752-3100
 Contact: C. John Hirschfelder

NORTHWEST SOUND, INC.
 SOUND REINFORCEMENT
 SL
 P.O. Box 3586, Portland, OR 97208
 (503) 286-9411
 Contact: Robert Sterne

NORTHWEST SOUND AND RECORDING
 SOUND REINFORCEMENT & REMOTE RECORDING
 SO, AR
 1228 4th Ave. W., Kalispell MT 59901
 (406) 755-3132
 Contact: Bob Taylor

ONE PASS INC.
 REMOTE RECORDING
 AV
 One China Basin Building, San Francisco, CA 94107
 (415) 777-5777
 Contact: Client Services

PACIFIC MOBILE RECORDERS
 REMOTE RECORDING
 AR
 2616 Garfield Ave., Carmichael (Sacramento), CA 95608
 (916) 483-2340
 Contact: Kat Hibbard
 Equipment: Otari MTR-90 24 track w/Autolocator, Otari MX5050 8 track, MCI JH-110B-14 2 track, 3M-M56 2 track, Tascam 25-2 2 track, TEAC V-4RX cassette decks (4), modified Tangent 3216 console (24x24, transformerless), E-V Sentry 500 monitors, JBL 4313 monitors, M&K close field monitors, Auratones. Outboard gear includes: UREI, dbx, and Eventide gates and limiters, DeltaLab and Ibanez delay lines, 4' x 9' plate (stainless, w/tube electronics), Orban 111B w/tube electronics, active direct boxes 250' 3-way isolated split w/individual ground lifts. 65' stage boxes. Mike complement includes: Neumann, AKG, Sennheiser, Crown, E.V., RCA, Shure, and Beyer. Plus: stands, adapters, and video monitors... all in a custom designed 18' GMC truck. (Yes, it's air conditioned!)

Services Available: Complete 24 track location recording for

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Culver City, California 90232
(213) 204-5000



Cleveland
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Cleveland, Ohio 44132
(216) 289-1900

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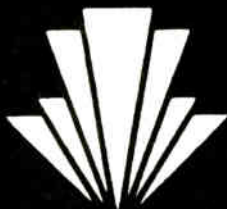


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Contact: Liz Inart

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SOUND REINFORCEMENT
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(415) 391-7610
Contact: Joel A. Lewitz, P.E.

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SO, AR
2111 Francisco Blvd. #7, San Rafael, CA 94901
(415) 459-2331
Contact: Ron Saurman

PERFORMANCE AUDIO
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
2358 So. Main, Salt Lake City, UT 84115
(801) 355-8890
Contact: Klay Anderson

P.F.S. RECORDING
REMOTE RECORDING
AR
Box 6840, San Jose, CA 95150-6840
(408) 275-6322
Contact: Mike Halloran

P&G SOUND & PHOTO
SOUND REINFORCEMENT & REMOTE RECORDING
ER, AR
931 DiGuilio Ct., Santa Clara, CA 95050
(408) 988-4503
Contact: Paul Goeltz, Chuck Thompson

PHANTASMASOUND
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
7935 Fremont Ave., Ben Lomond, CA 95005
(408) 336-2494
Contact: Errol

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SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
P.O. Box 1192, Philomath, OR 97370
(503) 757-8702
Contact: Henry Zellers

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SOUND REINFORCEMENT
SO
3473 So. West Temple, Salt Lake City, UT 84115
(801) 484-8747

Contact: Deward Timothy
Equipment: Concert Sound System features IBL and E-V speakers. All constant directivity mids and highs. Electronic time compensation for main clusters. Amplifiers are Crown and Crest. Equalizers and limiters are UREI. We use some custom signal processing. Main console is Neotek, monitor consoles are PS. All popular vocal mikes are available, also PZMs, 421s, etc. Direct boxes are UREI. Monitor system has 8 mixes. UREI EQ, Crown power. Side fill and wedges, most are time aligned.
Services Available: Services include: sound services for shows from small variety shows to medium sized concerts. All technical and operational personnel are provided. Also, over the counter rentals and leases, professional systems and components repair, systems engineering, sales, and installation. Call or write for complete detailed information.

PORTLAND MUSIC CO.
SOUND REINFORCEMENT
520 S.W. 3rd Ave., Portland, OR 97204
(503) 226-3719
Contact: Fred Coyner or Doug Metzger

PROFESSIONAL PRODUCTION SERVICES OF HAWAII
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, AV
1648 9th Ave., Honolulu, HI 96816
(808) 735-3625
Contact: Whittier Davis

PROFESSIONAL SOUND INC.
SOUND REINFORCEMENT
3180 Bredshoft, Sacramento, CA 95821
(916) 338-3484
Contact: Bill Goodwin



PRO MEDIA
San Francisco, CA

PRO MEDIA
SOUND REINFORCEMENT
SO, ER
185 Berry St., Suite 358, San Francisco, CA 94107
(415) 957-1383
Contact: Debra Kay
Equipment: Pro Media's support to the professional users of

SYNCON series B

Shopping for a Desk these days can be a chancy business. Limited budgets all too often mean limited equipment, limited performance – and limited potential for future expansion. It's a story that many smaller studios know to their cost.

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Allen & Heath Brenell (USA) Ltd.
Five Connair Road
Orange
Connecticut 06477
USA
Tel: (203) 795-3594

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sound equipment is aimed at maintaining the most up-to-date products from the leading manufacturers in the industry. The latest technical advances from Meyer Sound Labs, Lexicon, AB Systems, Altec, dbx, Sennheiser, Crown, Vega, Revox, HME, Studiomaster, E-V, TEAC/Tascam, Yamaha, Shure, JBL, Ampex, UREI, Trident, AKG, etc. are immediately available from Pro Media's extensive inventory of rental equipment. All equipment is serviced and tested by experienced Pro Media technical personnel.

Services Available: Pro Media's technical staff is available to assist in the support of your sound reinforcement equipment needs from design, to delivery, to installation, to complete on-site system engineering. Custom designed speaker system feature Meyer Sound Labs; custom designed patching systems have been developed from Pro Media's extensive field experience; custom Pro Media rack systems incorporate power and processing equipment. All Pro Media systems include the latest state of the art equipment and design and are available to meet your specific sound reinforcement needs.

RAINBOW SOUND STUDIOS
REMOTE RECORDING
 24289 Mission Blvd., Hayward, CA 94544
 (415) 582-9980/886-6048
 Contact: P.A. "The 8-Track Whiz" Allen - remotes engineer

BILL RASE PRODUCTIONS, INC.
REMOTE RECORDING
AV
 955 Venture Ct., Sacramento, CA 95825
 (916) 929-9181
 Contact: Bill Rase

RICH SOUND
SOUND REINFORCEMENT
SL, AR
 P.O. Box 3385, Chico, CA 95927
 (916) 891-1972
 Contact: Rich Pires

ROLLING THUNDER STUDIOS
REMOTE RECORDING
AR
 P.O. Box 840, Occidental, CA 95465
 (707) 874-2278
 Contact: Joe Hoffman

REMOTE RECORDING & SOUND REINFORCEMENT

NORTHWEST

Many of the listings in this directory also contain a code which indicates the specialties of each business: **SO** = sound reinforcement, **SL** = sound and lighting, **ST** = staging, **ER** = equipment rental, **AR** = audio recording, **VR** = video recording, **AV** = audio and video recording.



ROSE CITY SOUND, INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, AR
 2515 SE Ankeny, Portland, OR 97214
 (503) 238-6330
 Contact: Wayne Lund

SANTA CRUZ SOUND CO.
SOUND REINFORCEMENT
SO, ER
 1110 Live Oak Ave., Santa Cruz, CA 95062
 (408) 475-0768
 Contact: John or Chuck

RANDALL SCHILLER PRODUCTIONS
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
 1207 Fifth Ave., San Francisco, CA 94122
 (415) 661-7553
 Contact: Randy Schiller
Equipment: We are utilizing the finest equipment on the market from JBL, Gauss, Eastern Acoustics, Harbinger, Tapco, Crown, SAE, Electro-Voice, AKG, Neumann, DeltaLab, dbx, Eventide, RDS, Otan, etc.
Services Available: Our services include sound systems for small groups up to stadium systems for 60,000 people. We also are designing, installing, and maintaining sound systems for many clubs throughout the Bay Area providing live sound reinforcement and systems for the playback of recorded music. We have a complete recording studio available and specialize in remote recording especially in conjunction with providing live sound for the concert. For private parties we will install sound, lights and video systems that will rival permanent installations.



SHYNE SOUND
 San Rafael, CA

SHYNE SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
SO, ST, AV
 40 Woodland, San Rafael, CA 94901
 (415) 459-2833
 Contact: Leroy Shyne
Equipment: MCI 110B 2 track, TEAC 80-8 track, TEAC C35 cassette w/dbx NR & 2x speed, Soundcraft 15 mixer, A&H 12-2 mixer (upgraded) Whirlwind 200' 27 pair snake system w/Jensen 3-way transformer mike split, Klipsch MCM 1900 4-way speaker system, (4) Klipsch La Scala speakers, (4) Bose 802 speakers, 16x24 portable stage, UREI 31 band graphics, dbx 165 comp./limiters, Orban stereo paragrahic, Orban dual reverb, DL2 Acousticcomputer, BGW power amps, Panasonic WV 3900 video camera, Sony Umatic 3/4" video cassette, JVC BR6200V stereo 1/2" video cassette

SIGNAL COMMUNICATIONS, INC.
SOUND REINFORCEMENT
 851 Poplar Pl. S., Seattle, WA 98144
 (206) 324-8400
 Contact: Harold B. Lander

SILVER LABEL RECORDING
REMOTE RECORDING
AR
 305 Melville, Palo Alto, CA 94301
 (415) 321-5776
 Contact: John DiLoreto

SKIP'S MUSIC, INC.
SOUND REINFORCEMENT
SL, ER
 2740 Auburn Blvd., Sacramento, CA 95821
 (916) 484-7575
 Contact: Collin Hobbs

SMEED SOUND SERVICE
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ER, AV
 790 W. 8th, Eugene, OR 97402
 (503) 686-1654
 Contact: Glenn H. Smeed

SONOMA VIDEO MUSIC PRODUCTIONS
REMOTE RECORDING
VR
 1717 Darby Rd., Sebastopol, CA 95472
 (707) 829-1016
 Contact: Mike Heumann



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 PHONE (704) 487-7012

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- 1980 September — SOLD OUT.
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- 1981 January — SOLD OUT.
- 1981 February, Southeast Studio Listings. Ray Stephens. Norbert Putnam. Ardent Recording.
- 1981 March, Southwest Listings. History of the Tape Recorder. Producer's Role. Indian Creek Recording.
- 1981 April, Northeast Listings. Todd Rundgren's A/V Studio. Women in Audio. History of the Tape Recorder, Pt. 2.
- 1981 May, AES Spring Update. Mike Love's Studio. Envelope Controlled Filters. Women in Recording, Pt. 2.
- 1981 June, Video Focus. Moogy Klingman. Video Equipment Manufacturers. Introduction to Video.
- 1981 July, Recording Services Listings. Recording School Listings. Remote Recording. Maintenance.
- 1981 August, Studio Design Listings. Dealing with the Bldg. Dept., Building Materials. Monitor Field.
- 1981 September, S. Cal. Listings. Tape Editing. Creative Record Promotion. John Ryan.
- 1981 October, North Central Listings. Digital Reverberation Survey. Chicago Music History.
- 1981 November, 1982 New Products. Studio Monitor Report. Synthesized Drums. Larry Cariton. Al Kooper.
- 1981 December, Tape to Disk Listings. Lee Ritenour. Tape Tips. Sony Compact Disk. High Speed Duplication.
- 1982 January, Northwest Listings. Mixing Consoles. Grateful Dead's Studio. Lindsey Buckingham.
- 1982 February, Southeast Listings. Digital Synthesizers. Dave Edmonds. John Meyer.
- 1982 March, Northeast Listings. Car's Studio. Microphones. Phil Ramone.
- 1982 April, Video Focus. A/V Studio Listings. Video Music Satellite. Mike Nesmith. Legal Issues in Video.
- 1982 May, Southwest Studios. Quarterflash. Charlie Pride's Studio. Digital Recording. Fantasia. Digital Soundtrack.
- 1982 June, Concert Sound & Remote Recording. Drum Machines, Pt. 2, Keyboard Artists Forum, Video Legal Issues.
- 1982 July, Studio Design. Listings of Designers, Suppliers. Power Amp Report. Quincy Jones.
- 1982 August, 5th Anniv. Issue. History of Recording. Asia. Oscar Peterson. Bill Porter.
- 1982 September, S. Cal. Listings. Film Sound. The Dregs. Video Synchronizer Survey. Digital Discussions, I.
- 1982 October, N. Central Listings. Studio Monitors. John Cougar. Digital Discussions, II.
- 1982 November — SOLD OUT.
- 1982 December, Tape to Disk. Record Restoration. Starting Out in Video. Digital Discussions, IV.
- 1983 January, Northwest Listings. Multi-track Analog Tape Recorders. Record Restoration. Michael Palin.
- 1983 February — SOLD OUT.
- 1983 March, Southeast Studios. Echo, Reverb & Delay, I. Buddy Buie. Electronic Religion. Phil Dunne.
- 1983 April, Music Video. Video Production, Post Production Listings. Missing Persons. Echo, Reverb & Delay, II.
- 1983 May, Northeast Listings. Donald Fagen, Mixing Console Forum, Echo, Reverb & Delay, III.
- 1983 June, Sound Reinforcement/Remote Recording. Showco, Frank Zappa, Mixing Console Forum, II.
- 1983 July, Southwest Listings/Recording School Listings. Audio Special Effects, Josef Zawinul, Education Update.



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REMOTE RECORDING & SOUND REINFORCEMENT

NORTHWEST

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SONRISE PRODUCTIONS
REMOTE RECORDING
696 Mayten Dr., Livermore, CA 94550
(415) 449-5185
Contact: Andy or Kathi Tullis

SASS—SOUND ADVICE SOUND SYSTEMS
SOUND REINFORCEMENT & REMOTE RECORDING
SO, ER
1901 S. Bascom Ave., Pruneyard Tower #1, Suite 353
Campbell, CA 95008
(408) 996-9988
Contact: Dick Chadwick

SOUND ON STAGE, INC.
SOUND REINFORCEMENT
100 Northhill Dr. #30, Brisbane, CA 94005
(415) 468-2990
Contact: Jerry Pfeffer, Bob Walker
Equipment: Mixers: Gamble, Soundcraft & Yamaha custom quality house and monitor mixers. Certified rigging to fly our own Power Physics TM 4-way speaker systems in any coliseum. We offer complete sound systems with a full complement of effects including Lexicon 224, echo, reverb, gates, flangers and phaser. Additionally we specialize in monitor system service with Bi-amp monitor 32x16 Gamble consoles, special drum monitor and the best monitor mixing engineers available.
Services Available: Nationwide Concert Tour, Trucking, West Coast one nighters and most importantly complete sound system service.

SOUNDPLEX
REMOTE RECORDING
P.O. Box 763, Ashland, OR 97520
(503) 482-4822
Contact: Douglas K. Faerber

SOUND PRESERVERS COMPANY
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
911 East 4th Ave., Olympia, WA 98506
(206) 352-9097
Contact: Allen P. Giles

SOUNDS AHEAD
SOUND REINFORCEMENT
SL
1385A Fairfax Ave., San Francisco, CA 94124
(415) 641-7576
Contact: Pamela On

SOUND VISUAL PRODUCTS
SOUND REINFORCEMENT
P.O. Box 99, Jamestown, CA 95327
(709) 532-3272
Contact: Jerry Chappell

THE SOUND STAGE
SOUND REINFORCEMENT & REMOTE RECORDING
1615 N. Blackstone (at McKinley), Fresno, CA 93703
(209) 233-6531
Contact: Rocky

SOUTH END PRODUCTIONS
(formerly PARALANDRA PRODUCTIONS)
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
840 E. 3925 S., Greenbank, Whidbey Island, WA 98253
(206) 321-6697
Contact: Michael and Lisa Bade

SPEEDA SOUND
SOUND REINFORCEMENT
SO, ER
5746 E. Shields Whse. #102, Fresno, CA 93727
(209) 292-2702 or 2203
Contact: Mike King

Equipment: Equipment brands: JBL, Northwest Sound, Yamaha, A.B. Systems, Audio Arts, Lexicon, dbx, Symetrix, Shure, AKG, Sennheiser, Electro-Voice, Audio Technica, Countryman, Sescam, Wireworks, Whirlwind, Anvil, Flagg Systems. House consoles 40x8x2, 32x8, 32x4, 16x4, 8x2, 6x2, monitor consoles 32x16, 24x8, 20x8. Monitor speakers: Full range and Bi-Amped wedges, up to 48 monitors available. Speeda Sound is equipped to handle most any venue in the country. IBL 3 and 4 way main stacks. Speeda Sound's equipment inventory is set up to send out 3 major complete sound systems at the same time. We have our own 40' semi air-ride van and 2 bobtail trucks. We also have small systems in addition to our large system. We also have an instrument rental department with a full inventory.

STARSOUND AUDIO INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SO, ER, AR
2679 Oddie Blvd., Reno, NV 89512
(800)354-7252
Contact: Scott Bergstrom

Equipment: International w/lift & 22' box. Have 1984 Studer A-80 & 1984 MCI 600 console in-house studio w/over 1000 instruments available on premises. House sound comfortable to 4,000. 24x4x2 Studiomastrer mains, 24x8 Studiomastrer monitors. Full effects, DDL's, digital reverb, compressors, etc. Some lighting, genes w/trusses. Call for current status on all systems. Have done sound in most Northern Nevada venues.
Services Available: We are in Nevada's largest music store complex (17,000 ft) and operate Nevada's newest equipped 24-track studio along with Reno's largest nightclub (rock - 600 seat). We can help with concert promotions in area—often no charge for sound, lighting, security, insurance or house fees! Skeptical—call Scott, 1-800-354-7252.

STILLWATER SOUND
SOUND REINFORCEMENT
SO
1609 Monterey St., Richmond, CA 94804
(415) 525-6011
Contact: Mark or Patsy

STOTZ'S SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
576 Cypress St., Monterey, CA 93940
(408) 375-9718
Contact: Gary M. Stotz



STUDIO ON WHEELS
Glendale, CA

STUDIO ON WHEELS
REMOTE RECORDING
AR
339 W. Windsor Rd. #6, Glendale, CA 91204
(213) 243-6165
Contact: John Falzarano
Equipment: Ampex MM1200, Tascam 80-8 (dbx), TEAC 3300

It copies tape

Fast!

What else is there to say?

Well . . . to be perfectly clear we should say that the Telex 6120 Duplicator copies reel or cassette tapes fast. Then we should add that it does it automatically, easily, efficiently and economically. In fact, we **really** should say that the 6120 produces **high quality** tape duplicates — fast.

Yes, the Telex 6120 high speed duplicator has many time-saving, money-saving benefits, including many **automated** features such as end-of-tape stop and auto rewind on the reel master, with a choice of auto or manual rewind on the cassette master. These automated features can eliminate unnecessary down time between copy cycles. All key set-ups and adjustments are **efficiently** accomplished from the front of the system, with all operating, function controls and LED level indicators **conveniently** grouped together on the easy-to-read control module. These automation and convenience features allow even non-technical employees the ability to operate the 6120 **easily**.

You won't have to buy more system than you need because the 6120 allows practical "building block" growth. The modules simply plug together for easy **economical** additions to your system. Each cassette slave position on the 6120 is independent, so a jammed tape won't shut down the entire system creating costly downtime. An LED indicator warns you of an incomplete copy in case a cassette tape jams or ends before the master, thereby preventing expensive mistakes.

Make no mistake, the 6120 is fast. It has a speedy 16 to 1 speed ratio and copies both sides at once, so it will duplicate full one hour programs in less than two minutes. As you can see it's not just another high speed duplicator. To learn more about the 6120, call or write today for complete specifications and production tables. While you're at it, make an appointment to see our informative video tape presentation entitled "Beating Real Time."

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In Minnesota Call (612) 884-7367

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The new 900 series Digital Delay systems from DOD can do much more than just echo effects. ONLY with DOD do you truly get all three delay functions in one unit. The DOD R-908, R-909, and R-910 all have sweep widths of 10 to 1; this allows each unit to flange and chorus like no other digital delay system.

R-908 Digital Delay: PCM (900 ms.-30-8KHZ)
R-909 Digital Delay: PCM (450 ms.-30-15KHZ)
R-910 Digital Delay: PCM (1900 ms.-30-15KHZ)

*When comparing digital delay systems, check the specifications—you will find that the effect specialists at DOD have developed the only full function digital delay systems available today.

*Note: Most other digital delays have sweep widths of less than 6 to 1.



DOD Electronics, Manufactured in the U.S.A.
2953 South 300 West, Salt Lake City, Utah 84115
Telephone (801) 485-8534

1/2 track, Spectrasonics 28 in x 24 out console, BGW power amps 4310, 4301 Auratones Soundworkshop reverb, flanger doublers, tape echo, dbx 160 limiters AKG, Shure, Electro-Voice, Sony, Sennheiser, Neumann, Crown PZM

**STUDIO SEA
REMOTE RECORDING**

AR
418 Front St., Wheatland, CA 95692
(916) 633-4277
Contact: James Halner

**SUMNER SOUND
SOUND REINFORCEMENT & REMOTE RECORDING**

SL, AV
706 Alder Ave., Sumner, WA 98390
(206) 863-6655
Contact: Denny Livingston

**SWANSON SOUND SERVICE
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SL, ER, AR
916 75th Ave., Oakland, CA 94621
(415) 638-4944
Contact: Don Nielsen

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SL, ER
2740 Auburn Blvd., Sacramento, CA 95821
(916) 484-7575
Contact: Larry Lauzon

**TECHNICAL SERVICE CO.
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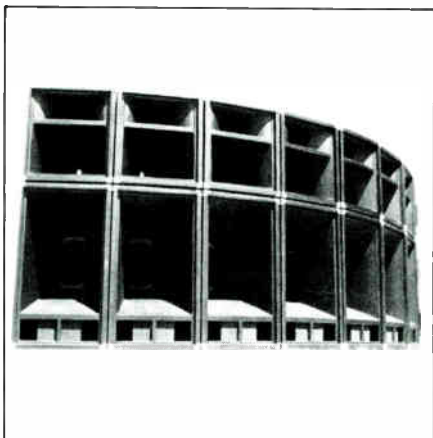
AR
P.O. Box 420, Casper, WY 82602
(307) 266-5222
Contact: Marlin Engel

**TELEMATION PRODUCTIONS, SEATTLE
SOUND REINFORCEMENT & REMOTE RECORDING**

SL, ST, AV
1200 Stewart, Seattle, WA 98101
(206) 632-1364
Contact: Gwen Yazzolino

**TELEVISION ASSOCIATES
REMOTE RECORDING**

AV
2410 Charleston Rd., Mountain View, CA 94043
(415) 967-6040
Contact: Stephen Nestle



THE THIRD EAR SOUND CO.
San Pablo, CA

**THE THIRD EAR SOUND CO.
SOUND REINFORCEMENT**
1507 Hillcrest Dr., San Pablo, CA 94806
(415) 233-2920

Contact: John Hauschild, Raul Suarez, David Trnchero, Greg Vinci

**TIME & SPACE
SOUND REINFORCEMENT & REMOTE RECORDING**

SO, AR
445 Natoma St., San Francisco, CA 94103
(415) 777-0494
Contact: Joe Towers

TRANSPARENT RECORDINGS

REMOTE RECORDING
AR
P.O. Box 880933, San Francisco, CA 94188
(415) 563-6164

Contact: Lolly Lewis
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SO, AR
2470 North Fairfield Rd., Layton, UT 84041
(801) 776-4271
Contact: Jeff Ostler

**UNION GROVE MUSIC
SOUND REINFORCEMENT & REMOTE RECORDING**

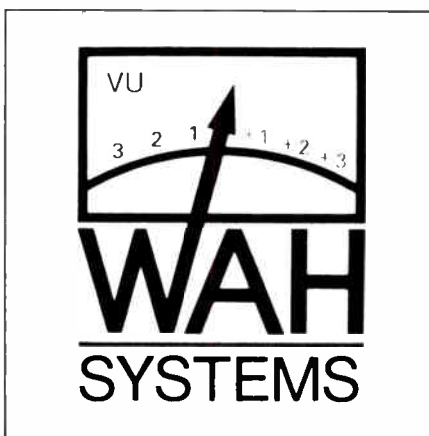
1013 Pacific Ave., Santa Cruz, CA 95060
(408) 427-0670
Contact: Geoff Miller

**VERSATILE VIDEO INC.
REMOTE RECORDING (Video Only)**

151 Gibraltar Court, Sunnyvale, CA 94089
(408) 734-5550
Contact: Ron Sheppard

**VIDEO VISIONS/SUNSET AV CENTER
REMOTE RECORDING**

AV
856 Airport Rd., Monterey, CA 93940
(408) 373-1300
Contact: Tom Rivelli



WAH SYSTEMS
Sacramento, CA

**WAH SYSTEMS
SOUND REINFORCEMENT**
SL, ST
115 "R" St., Sacramento, CA 95814
(916) 444-5491
Contact: Walt Horsting

**WESTERN AUDIO VIDEO
SOUND REINFORCEMENT**
818 Douglas Ave., Redwood City, CA 94063
(415) 366-8294
Contact: Jim Thielemann

**WORTHWHILE SOUND SERVICE
SOUND REINFORCEMENT**
P.O. Box 1151, Pollock Pines, CA 95726
(916) 644-3047
Contact: Dave Weil

**XANDOR RECORDING STUDIOS
REMOTE RECORDING**
407 Camino Sobrante, Orinda, CA 94563
(415) 254-9077
Contact: Jim Weyenath

REMOTE RECORDING & SOUND REINFORCEMENT

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**PHIL A. YEEND PRODUCTIONS
REMOTE RECORDING**
1624 King Rd., Winlock, WA 98596
(206) 785-4675
Contact: Stephen Parr, manager

**ZEPHYRS OF THE MUSE
REMOTE RECORDING**
AR
P.O. Box 1136, Pacifica, CA 94044
(415) 355-4359
Contact: Jack Herbert

SO. CALIFORNIA



A-1 AUDIO
Hollywood, CA

**A-1 AUDIO
SOUND REINFORCEMENT**
SO
6322 DeLongpre Ave., Hollywood, CA 90028;
(213) 465-1101
Branch offices: Las Vegas, NV 89104
(702) 735-3407 and
Atlantic City, NJ 08401
(609) 345-6886
Contact: Bob Ross

Equipment: AKG, Altec, Anchor Atlas, Audio Arts, Auratone, Beyer, BGW, Clearcom, CL&S, Countryman, Crown PZM, dbx, Electro-Voice, Eventide, Frap, Galaxy, Helpinstill, Ivie, JBL, Lexicon, Lodestar, McCauley, MicMix, M&K, Neptune, Orban, Otari, Revox, RTS, Sennheiser, Axe, Shure, Soundcraft, Swintek, UREI, White, Yamaha, A-1 Audio designed speaker systems (including the V.I.P. System), Flying systems, Click-Track systems,

jensen transformers
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1793 E. Main, Ventura, CA 93001
(805) 653-6661
Contact: Bob Spittle, Glona Spittle



ALPHA AUDIO SYSTEMS, INC.
Valencia, CA

ALPHA AUDIO SYSTEMS, INC.
SOUND REINFORCEMENT
25574-A Rye Canyon Rd., Valencia, CA 91355
(805) 257-3593
Contact: Dave Miser

ALTEC LANSING
SOUND REINFORCEMENT
SO
1250 No. Red Gum St., Anaheim, CA 92806
(714) 632-7117
Contact: Gary Rilling, V.P. Commercial Sales
Equipment: Altec Lansing produces a comprehensive line of concert sound reinforcement products, including the patented Mantaray® Constant Directivity Horns, the dual channel, direct coupled 120 Series power amplifiers (200-800 watts), and a complete line of road-proven PA, multi-purpose, monitor and Voice of the Theatre® loudspeaker systems. Also, a totally new line of super-rugged guitar, vocal and musical instrument loudspeakers, and a full selection of related signal processing electronics.

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1631 Maria St., Burbank, CA 91504
(818) 843-2121
Contact: Richard Castleberry

AUDIO ENGINEERING ASSOCIATES
SOUND REINFORCEMENT & REMOTE RECORDING
ER, AR
1029 North Allen Ave., Pasadena, CA 91104
(818) 798-9127
Contact: Janet Dodson
Equipment: Studer, Soundcraft and Otari tape recorders; Soundcraft and custom compact mixers; microphones by Schoeps, AKG, Neumann, RCA, Sennheiser, Crown PZM, Coles ribbon; Beyer, Audio-Technica, Shure & E-V, noise reduction by either dbx or Dolby; and a good selection of outboard gear. We do digital, too—we did the first digital recordings ever in both New Zealand and in Pakistan!

Services Available: We have done a wide variety of location recording in the last 20 years, from Native American tribal music to Black Gospel to Pakistan; religious music to the Los Angeles Philharmonic. "Purist" stereo is a specialty but we also do first class multitrack. Our engineering and equipment are both first rate and our prices are reasonable! Give us a call



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Hollywood, CA

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1419 No. La Brea Ave., Hollywood, CA 90028
(213) 851-4111
Contact: Ike Benoun

AUDIO SPECIALTIES
SOUND REINFORCEMENT
SO
6850 Vineland Ave., North Hollywood, CA 91605
(818) 506-0301
Contact: Jim Barnett

AUDIO STUFF
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
12115 A Woodruff Ave., Downey, CA 90241
(213) 803-1037
Contact: Vince Motel

AUDIO & VIDEO ARTS
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AV
P.O. Box 398, Simi Valley, CA 93062
(805) 526-2230
Contact: Paul Gardocki

BROADCAST ASSISTORS
REMOTE RECORDING
7923 Duchess Dr., Whittier, CA 90606
(213) 696-5503
Contact: Chuck Minear

CANTRAX RECORDERS
REMOTE RECORDING
AV
2119 Fidler Ave., Long Beach, CA 90815
(213) 498-6492
Contact: Richard Cannata

CHERRY SOUND
SOUND REINFORCEMENT
SO
708 Boccaccio Ave. #A, Venice, CA 90291
(213) 398-3349
Contact: Alan Kutner

CONCERTTECH
SOUND REINFORCEMENT
SO
14931 Community St., Panorama City, CA 91402
(818) 891-8911
Contact: Fred Sites

CONCERT SOUND CONSULTANTS
SOUND REINFORCEMENT
SO
405 W. Washington, Suite 65, San Diego, CA 92103
(619) 298-8478
Contact: David Scheirman

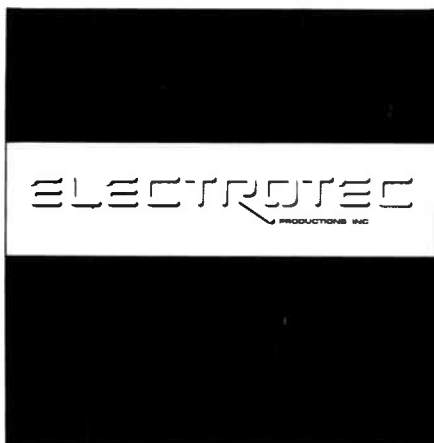
R.E. COPSEY RECORDING
 REMOTE RECORDING
 AR
 P.O. Box 367, Camarillo, CA 93011
 (805) 484-2415
 Contact: Reese E. Copsey

THE DELICATE PRODUCTION COMPANY, INC.
 SOUND REINFORCEMENT
 SL
 7651 Deering Ave., Canoga Park, CA 91304
 (818) 883-2190
 Contact: Chris Smith



DYNO MY PIANO
 Burbank, CA

DYNO MY PIANO
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 SO, ER
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 (818) 845-7864
 Contact: Chuck Monte
 Equipment: Rental of the Dyno My Piano line of studio modified Rhodes and Wurlitzer pianos. Studio tuning and cartage service and rental of the "Tri-Stereo Chorus 618(TM)" and the "FS-1 Flying Saveer(TM)" autopan studio effects. Services available in L.A., New York, and Tokyo, Japan. L.A. (818) 845-7864, New York (516) 486-3315, Tokyo 481-0235
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 Canoga Park, CA

ELECTROTEC PRODUCTIONS INC.
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 SL
 6735 Eton Ave., Canoga Park, CA 91303
 (213) 888-8687
 Contact: Pierre D'Astugues, sound, Bob Gordon, lights

FARRELL AUDIO
 SOUND REINFORCEMENT
 SL, ST
 229 N. First St., Burbank, CA 91502
 (818) 846-3024 (24 hrs.)
 Contact: Dave Farrell, Brent Cemper

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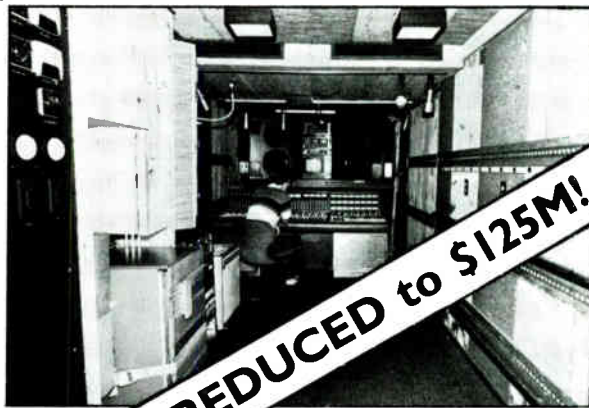
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SO, ST
1757 N. Geoffrey Ave., Simi Valley, Ca 93063
(805) 583-0220
Contact: Dennis Jagard

JBL INCORPORATED
SOUND REINFORCEMENT
8500 Balboa Blvd., Northridge, CA 91329
(213) 893-8411
Contact: Ron Means

ID PRODUCTIONS REMOTE RECORDING
REMOTE RECORDING
151 Prospect Ave., Suite A, Long Beach, CA 90803
(213) 438-4521
Contact: Jim Dotson

L.A. SOUND COMPANY
SOUND REINFORCEMENT
SO
12547 Sherman Way, Unit F, North Hollywood, Ca 91605
(818) 765-6900
Contact: Richard A. Raik

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REMOTE RECORDING
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(213) 849-1321
Contact: Steve Guy

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REMOTE RECORDING
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402 Loma Alta Dr., Santa Barbara, CA 93109
(805) 966-6374
Contact: T. David Sommers

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(714) 739-0882
Contact: Tim Metzger

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612 N. Kingsley Ave., Los Angeles, Ca 90004
(213) 664-1657
Contact: Shelley Hillman

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SOUND REINFORCEMENT
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(805) 544-8944
Contact: Jack Lutz

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SOUND REINFORCEMENT
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(619) 583-7851
Contact: Jeff Grogg, mgr

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(619) 569-1944
Contact: Ron Duff

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(818) 359-8012
Contact: Ron Streicher
Equipment: Location recording specializing in "acoustical music" events—live to stereo mixing and live broadcasts. Microphones by Schoeps, AKG, Coles, Neumann, Beyer, and PZM; custom designed and built mixing consoles; recorders by Studer, Revox, and Sony (including PCM-F1 digital), fully portable and ready to travel anywhere in the world. Also work for sound reinforcement projects of a similar nature.
Services Available: Specialty in classical music recording (and

REMOTE RECORDING & SOUND REINFORCEMENT

SO. CALIFORNIA

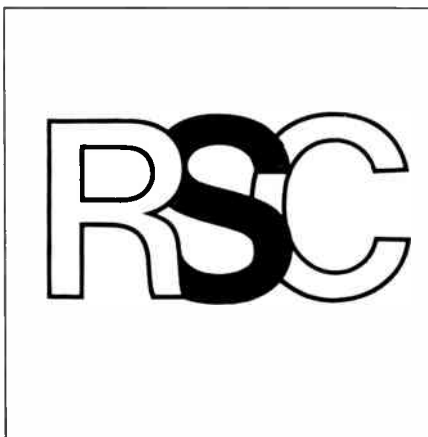
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sound reinforcement); credits include Los Angeles Philharmonic and the Philadelphia Orchestras, National Public Radio, PBS, and numerous other artists and record labels. Particularly adept at live-to-stereo mixing, using primary mixing techniques. Ready to travel, worldwide.

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REMOTE RECORDING
AR

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(818) 792-3531
Contact: Pitt Kinsolving
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RECORDING SERVICES COMPANY
Burbank, CA

RECORDING SERVICES COMPANY
REMOTE RECORDING
AR
2414 W. Olive Ave., Burbank, CA 91506
(818) 843-8640

Contact: Ken Dahlinger
Equipment: In addition to standard complement of limiters and microphones, RSC's 24 track remote truck provides Lexicon 224X w/Larc, Lexicon Super Prime Time, Eventide Harmonizer and all the other toys you'd expect. And what's important—they all work. Quality equipment and quality people have made RSC the thing it is today. Nothing we could say could make us sound any better.
Services Available: For over ten years in Los Angeles and the Western U.S., RSC has been providing quality mobile 24 track music recording for television. RSC's mobile facilities are complemented by its audio post production department. RSC offers a choice of all tape formats, which are fully interfaced to your choice of Shadow and Q-Lock synchronizers.

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(714) 841-3990
Contact: Bob Houser



ROC SHIRE MOBILE RECORDING
Anaheim, CA

ROC SHIRE MOBILE RECORDING
4091 E. La Palma, Suite 5, Anaheim, CA 92807
(714) 632-9452
Contact: Peter Vargo

SERBAN SOUND SYSTEMS (MUZAK)
SOUND REINFORCEMENT
4000 Easton Dr., Suite 10, Bakersfield, CA 93309
(805) 324-9044
Contact: George M. Serban

SCHUBERT SYSTEMS GROUP
SOUND REINFORCEMENT
SO
157 East 163rd St., Gardena, CA 90248
(213) 532-4142
Contact: David Morgan, Dirk Schubert

SILVERFISH AUDIO
SOUND REINFORCEMENT
ER, SO
1975 Diamond St., San Marcos, CA 92069
(619) 744-8460
Contact: Ross Ritto, Les Banks, Mike Adams

SKYSYSTEMS, INC.
SOUND REINFORCEMENT
SL
2720 Birch St., Alhambra, CA 91801
(818) 793-9389
Contact: Chris Bernauer

SOUND AND LIGHTING TECHNIQUES (SALT)
SOUND REINFORCEMENT
SO
P.O. Box 648, N. Hollywood, CA 91603
(818) 761-5239
Contact: Denny McLane

SOUND MASTER AUDIO/VIDEO RECORDING
SOUND REINFORCEMENT & REMOTE RECORDING
SL, AV
10747 Magnolia, No. Hollywood, CA 91601
(213) 650-8000
Contact: Barbara Ingoldsbey
Equipment: 12-Carvin 1330 Horn loaded bass cabinets w/E 140 JBL drivers, 12-Carvin R540 radial horns w/Renkus-Heinz drivers, 2-1215A Alec bass cabinets, 4-908 Carvin cabinets, Renkus-Heinz tweeters, Carvin and BGW power amps equaling 6,000 watts, Carvin 1602 16x4 console, effects rack w/limiters, DDLs, flange graphics, AKG BX-10 reverb, house system is tri-amped, 10-bi-amped floor monitors, 2 Klipsch side fills, Carvin 160z 16x4 console, spotlights, and complete array of microphones. 3 5-ton trucks—one for sound reinforcement; one for remote recording; completely self-contained power, will travel to any location, 5-ton video truck w/generator; microwave, T.V., cameras, editing, full video production for any location. Also, complete video marine lab for all underwater video. Equipment includes Hitachi, Sony, JVC, and Crosspoint Latch.
Services Available: Recording - 24 track in studio, full service

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Contact: David Epstein

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1921 Wilcox Ave., Hollywood, CA 90028
(213) 874-5106
Contact: Bruce Fallis, John Bromberg

STANAL SOUND LTD. (WEST COAST OPERATIONS)

SOUND REINFORCEMENT
16123 Valerio St., Van Nuys, Ca 91406
(213) 786-2500
Contact: Stan Miller

STARLAB AUDIO SOUND REINFORCEMENT & REMOTE RECORDING SO; AR

717 Monroe Way, Palmdale, CA 92670
(714) 635-5153 (pm)
Contact: Mike Kirk

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339 W. Windsor Rd. #6, Glendale, CA 91204
(213) 243-6165

Contact: John Falzarano
Equipment: Ampex MM1200, Tascam 80-8 (dbx), TEAC 3300 1/2 track, Spectrasonics 28 in x 24 out console, BGW power amps 4310, 4301, Auratones, Sound Workshop reverb, (2) flanger doublers, tape echo, dbx 160 limiters, AKG, Shure, Electro-Voice, Sony, Sennheiser, Neumann, Crown P2M. 24 track \$1000/day; 8 track \$200/day Complete mobile video truck also available.

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P.O. Box 958, N. Hollywood, CA 91602
(818) 764-1421
Contact: Richard Holbrook

T.F.A. INC. SOUND REINFORCEMENT

6735 Eton Ave., Canoga Park, Ca 91303
(213) 888-8687
Contact: Pierre D'Astuques

TRITRONICS RENTAL & FACILITIES REMOTE RECORDING AV

733 N. Victory Blvd., Burbank, CA 91502
(818) 843-2288
Contact: Ernie Rinaldi

REMOTE RECORDING & SOUND REINFORCEMENT

SO. CALIFORNIA

Many of the listings in this directory also contain a code which indicates the specialties of each business: SO = sound reinforcement, SL = sound and lighting, ST = staging, ER = equipment rental, AR = audio recording, VR = video recording, AV = audio and video recording.



THE TRUCK REMOTE RECORDING AR

P.O. Box 4573, Glendale, Ca 91202
(818) 247-8358
Contact: Bruce Black
Equipment: Otari MX5050 Mk III-8, Tascam Model 25-2, Biamp 1642 (16 in), Biamp 883 (8 in), Technics SE 9060, Phase Linear 400, Yamaha P2100, Crown D60, E-V Sentry 100As, Auratone, AKG BX-5E, Intersound RV100, DeltaLabs DDLs, Echoplex (hee, hee) Full dbx on 8 track (dbx 180s), on 2 track (built in) 3 ea Symetrix Compressor/limiters, 2 ea Biamp EQ-210 stereo graphics, Orban stereo synthesizer, Shure graphic Mikes: E-V, Neumann, Sennheiser, Shure, Sony.

Services Available: The Truck provides both remote recording and production recording of exceptional technical and artistic quality. Projects we have worked on include independent albums, nationwide TV commercials, live remotes, as well as numerous demos. Our goal is to provide every project with broadcast and album quality, and to offer that quality at any location at which the artist feels most comfortable. We offer both hourly and daily rates.

VESELY MUSIC CO. SOUND REINFORCEMENT SO

1729 E. Charleston Blvd., Las Vegas, NV 89104
(702) 382-8777
Contact: Jerry Vesely

VIDCOM REMOTE RECORDING VR

2423 Townsgate Rd., Suite K, Westlake Village, CA 91361
(818) 991-1974
Contact: Frank Celecia

VJ ELECTRONICS/ANCHOR SYSTEMS SOUND REINFORCEMENT & REMOTE RECORDING SO, AR

913 West 223rd St., Torrance, CA 90502
(213) 533-5980
Contact: Evan Landrum

WEST COAST BOOGIE PRODUCTIONS SOUND REINFORCEMENT SL, ST

69 Pajaro, Ventura, CA 93004
(805) 647-8198
Contact: (Warner) "W.C."

J.R. WEST SOUND RECORDERS REMOTE RECORDING AR

1025 N. Ferndale, Fullerton, CA 92631
(714) 645-8492
Contact: Jack Roberts

WESTLAKE AUDIO SOUND REINFORCEMENT ER

7265 Santa Monica Blvd., Los Angeles, CA 90046
(213) 851-9800
Contact: Jim Fitzpatrick



WESTWOOD ONE REMOTE RECORDING
Culver City, CA

WESTWOOD ONE REMOTE RECORDING AR

9540 Washington Blvd., Culver City, CA 90232
(213) 204-5000
Contact: Richard Kimball, Doug Field
Equipment: MCI JH-600 console, 36 in 24 out (2) Ampex MM-1200 24-track decks, ATR-102 2-track, plus one Technics 1500 reel to reel (4) Technics M-85 cassette recorders A Sony color video system with (2) monitors and remote controlled zoom camera. Plus outboard gear that includes Eventide Harmonizers, Lexicon 200 Echo unit, Sphere sub-mixers, UREI limiters (1178s & LA-4s), dbx, Kepex, Orban EQs, UREI graphs EQs, Altec 604E monitors in Di Medeo cabinets with mastering lab crossovers. Truck is equipped with a lounge for relaxing, over-dubbing, conducting interviews, etc. Lounge is also equipped with TV, computer bar, refrigerator/freezer and coffee maker. Situated in a 45 ft. long trailer.

RICK WISE SOUND SOUND REINFORCEMENT & REMOTE RECORDING SO, ST; AR

4209 LaSalle Ave., Culver City, CA 90230
(213) 838-7642
Contact: Rick Wise

GREG YOUNGMAN PRODUCTIONS REMOTE RECORDING AR

P.O. Box 8102, Long Beach, CA 90808
(213) 425-9597
Contact: Phillip Youngman

SOUTHWEST

A-1 AUDIO SYSTEMS
SOUND REINFORCEMENT
537 E. Sahara, Suite 210, Las Vegas, NV 89104
(702) 735-3407
Contact: Mr. Bobby Ross

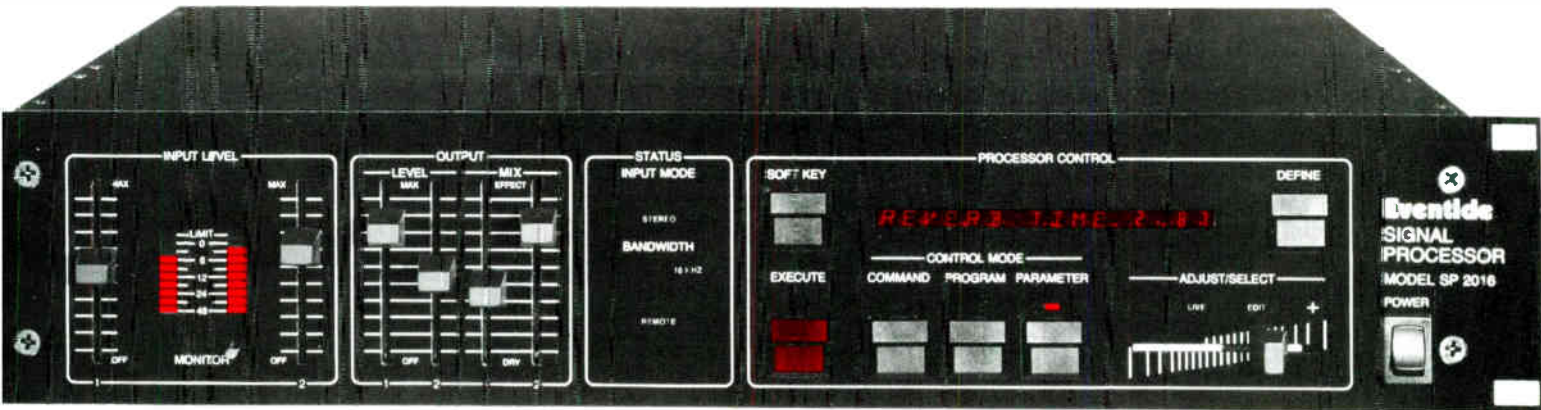
ASI ABADON/SUN, INC.
SOUND REINFORCEMENT
P.O. Box 6520, San Antonio, TX 78209
(512) 824-8781
Contact: Woody Smith

Equipment: Custom built sound systems for tour and fixed installation. Utilizing JBL, Community & Turbosound speaker components and enclosures. Crown & UREI electronics, all wiring, ready to run. Previous systems built range from 3-way 12 channel 600 watts to 52 channel PA plus location recording 5-way 14 thousand watt systems. Other lines represented include TEAC/Tascam, Lexicon, DeltaLab, dbx, Eventide, Orban, AKG, Beyer, Sennheiser, Shure, E.V., Audio Technica, Ramsa, Countryman, etc., etc. Catalog available.

AUDIOGENICS SOUND REINFORCEMENT & REMOTE RECORDING SO, AR

Box 141325, Dallas, TX 75214
(214) 634-2965
Contact: Rick Peeples

EVENTIDE SOUNDS BEST!



Does the Eventide SP2016 Digital Reverb and Effects Processor really sound better than Brands "L", "U", "S" and the rest? Your own ears will say "YES" when you take the time to compare. Here's why . . .

- ✓ **Eventide's SP2016 hardware has the extra data manipulation capability that realistic reverb requires.**

A digital reverb is actually a digital computer at heart. Natural-sounding reverb requires a very advanced digital computer, capable of handling a hundred million bytes every second. And Eventide's SP2016 hardware can manipulate *more* digital data, handle it *faster*, and do *more* with it than most other digital reverbs.

- ✓ **Eventide's SP2016 software has the sophistication to exploit the full capability of our hardware.**

Like any digital computer, a digital reverb can only be as good as the software which tells it what to do. At Eventide, we've found that truly natural reverb requires much more sophisticated software than the reverb programs used by most manufacturers. Our proprietary software makes a difference you can really hear.

- ✓ **Eventide's SP2016 is more than just the best sounding reverb.**

Our more-advanced hardware and software design yields another important benefit. The SP2016 can do much more than just reverb. In fact, the SP2016 is really a general-purpose audio effects processor, with almost unlimited uses. You simply plug in Eventide pre-programmed ROM's (up to eleven at a time) for new and unique effects such as Selective Band Delay, Time Scramble and Lossless Room, and the latest digital updates of old favorites like echo-plexing and flanging. Soon computer savvy SP2016 owners will even be able to write their own effects programs, using Eventide's software development system and a personal computer. No other digital reverb comes close to the SP2016's versatility.

Let your ears decide.

If you're considering the purchase of *any* digital reverb—whether Brand "L", "U", "S", or for that matter Brand "Q", "Y" or even "R2D2"—you owe it to your sound to hear the Eventide SP2016 *before* you decide. We've hand-picked a group of the best pro-audio dealers in America to demonstrate and sell the SP2016. Visit the one nearest you for an ear-opening demonstration.

Martin Audio
New York
(212) 541-5900

Everything Audio
Los Angeles
(213) 995-4175

Westlake Audio
Los Angeles
(213) 851-9800

Leo's Pro Audio
Oakland
(415) 652-1553

Sound Genesis
San Francisco
(415) 285-8400

Professional Recording & Sound
Boston
(617) 254-2110

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 (409) 693-6959
 Contact: Vincent Kapchinski

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SOUND REINFORCEMENT & REMOTE RECORDING
 SL, AR
 3965 E. Foothills Dr., Sierra Vista, AZ 85635
 (602) 458-3208
 Contact: Jim Johnson

CHATON RECORDINGS
REMOTE RECORDING
 AR
 5625 Nauni Valley Dr., Scottsdale, AZ 85253
 (602) 991-2802
 Contact: Marie Ravenscroft

CISCO SOUND
SOUND REINFORCEMENT
 SO
 P.O. Box 16583, Lubbock, TX 79490
 (806) 763-3537
 Contact: C K Bucy

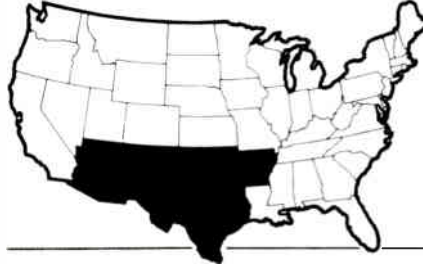
CLEARWATER TELEPRODUCTIONS INC.
REMOTE RECORDING
 VR
 2227-C Michigan Ave., Arlington, TX 76013
 (214) 263-3586
 Contact: Fritzy Kuehn

COOKSOUND PRODUCTIONS
REMOTE RECORDING
 6626 Hornwood, Houston, TX 77074
 (713) 772-1006
 Contact: Shotgun Cook

REMOTE RECORDING & SOUND REINFORCEMENT

SOUTHWEST

Many of the listings in this directory also contain a code which indicates the specialties of each business: *SO* = sound reinforcement, *SL* = sound and lighting, *ST* = staging, *ER* = equipment rental, *AR* = audio recording, *VR* = video recording, *AV* = audio and video recording.



JOHN CROWE PRODUCTIONS—Houston/Dallas
REMOTE RECORDING
 VR
 Three Dallas Communications Complex, Suite 102,
 Irving, TX 75039
 (214) 556-1816
 Contact: Rusty Jones

DIGITAL SERVICES
REMOTE RECORDING
 2001 Kirby #1001, Houston, TX 77019
 (713) 520-0201
 Contact: John Moran
Equipment: Console MCI 636 32x24 automated; 54 mike line input truck; (2) Sony PCM 3324 24 track digital; Sony PCM 1610/F1 2 track; 2 video monitor channels, Otari 5050B 2 track;

Klein & Hunmel; JBL 4311, Auratone; MDM-4 monitor systems. Complete Scamp outboard rack; Nakamichi cassette; 54 channel Dean Jensen 3-way stage split box; Sony DRE2000 digital reverb. Anything client wants we will get!
Services Available: Complete digital 2 track/24/48 track recording. Also analog 24 trk recording, SMPTE interlock, multiple stereo sends for video work, music production, live broadcast and satellite feeds

THE DONTM COMPANY
SOUND REINFORCEMENT
 SL
 2408 Prospect St., Houston, TX 77004
 (713) 522-4162
 Contact: Donald K. Thomas

E.A.R. PROFESSIONAL AUDIO
SOUND REINFORCEMENT & REMOTE RECORDING
 2641 E. McDowell, Phoenix, AZ 85008
 (602) 267-0600
 Contact: Ed Vogt John Gibson
Services Available: E.A.R. Professional Audio provides nationwide sales/service and custom design of multi-track remote audio and SMPTE based audio for video broadcast systems. From road and flightworthy portable systems to fully appointed 24 trk. mobile production vehicles, E.A.R. offers a wide array of quality equipment and custom design services. Call Ed Vogt or John Gibson for information.

ENTERTAINMENT SERVICES/GOPHER BAROQUE AUDIO
SOUND REINFORCEMENT
 SO
 1208 E. Encantada Place, Phoenix, AZ 85014
 (602) 234-2295
 Contact: Greg Wilson

GENERAL SOUND CO.
SOUND REINFORCEMENT
 SO
 1202 Exchange, Richardson, TX 75080
 (214) 231-2541
 Contact: Joe Durham



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they make you sound great! If audio is a part of your life, then we can make life easier for you! Call or write for details.

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109 Bell Street
 Seattle, Washington 98121, USA
 Telephone (206) 624-5012
 Telex 703282

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2608 NINTH STREET
BERKELEY, CA 94706

(PLEASE ATTACH OLD ADDRESS LABEL HERE)

(PLEASE PRINT NEW ADDRESS BELOW)

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

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- FROM \$699/LIST

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Brick Audio

Brick Audio / 102 S. Porter / Elgin, Ill. 60120 / (312) 748-RICK

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The **Mix** Directory of Southern California Studios will be published in September, 1984. Don't miss this opportunity to be included in America's #1 Directory of professional studios!

For a questionnaire, call or write:

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2608 Ninth St.
Berkeley, CA 94710
(415) 843-7901
Attn: Kathy Arnold

Deadline: **June 2, 1984**

150Hz-8k Hz

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SONEX is a high-performance acoustical foam that upgrades your studio inexpensively. Ideal for a temporary isolation booth, it can also eliminate slap echo and harsh resonances in the main room or silence noisy tape equipment in the control booth. Write for our color brochure today.



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REMOTE RECORDING & SOUND REINFORCEMENT

SOUTHWEST

Many of the listings in this directory also contain a code which indicates the specialties of each business: SO = sound reinforcement, SL = sound and lighting, ST = staging, ER = equipment rental, AR = audio recording, VR = video recording, AV = audio and video recording.



MP PRODUCTIONS
SOUND REINFORCEMENT
SL, ST

1601 Westpark Dr., Suite 8, Little Rock, AR 72204
(501) 664-2183

Contact: Michael G. Pinner

Equipment: MP Productions announces the last word in sound reinforcement—the all new Omega V system. Omega V is a true 5-way system which not only offers sound electronically crossed-over 5 ways but also 5 ways to present sound. The house system consists of 40 visually identical cabinets. This system can be set up 5 different ways, ranging from all 40 cabinets flown from a customized truss network to setting on the deck with sub-bass on the floor. The latter creating a low profile with powerful speakers. The system is powered entirely by Crown and Crest amps and JBL speakers. Monitor and house consoles are Stevenson Interface with 3 band parametric EQ, all outboard equalization being White Octave and Klark Teknik.

Services Available: MP Productions, in cooperation with Bylites Inc. is able to offer a complete tour package. For more information contact Michael G. Pinner.

MULTI-MEDIA, INC.
SOUND REINFORCEMENT

4617 Broadway S.E., Albuquerque, NM 87105
(505) 877-8332

Contact: Barbara Favas

MUSICIAN CONCERT SOUND
SOUND REINFORCEMENT

SL, ST
P.O. Box 991, Beaumont, TX 77704
(409) 842-2224

Contact: Frank Halter

I need a top-to-bottom sound system that won't 'Drop Dead' in the middle!

You need Community's "Lone Midranger"

Community

Community Light & Sound, Inc.
333 East Fifth St.
Chester, PA 19013
215-876-3400

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OMEGA AUDIO INC
Dallas, TX

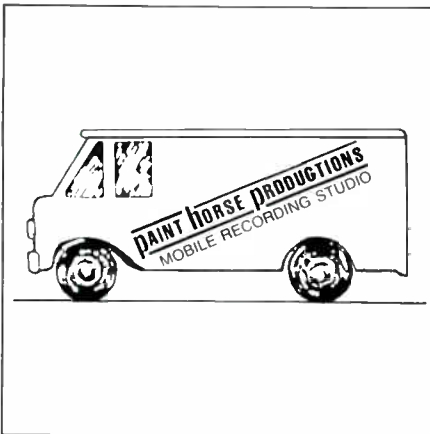
OMEGA AUDIO, INC.
REMOTE RECORDING
AR

8036 Aviation Place, Box 71, Dallas, TX 75235
(214) 350-9066

Contact: Paul A. Christensen

Equipment: 24/48 track remote recording included in our 27' custom finished Ford truck. Equipment includes custom 30 in x 24 out mixing console w/3 band sweep EQ, 2 track audio recorders, Otari MTR90 24 track recorder 24 channels of dbx noise reduction in Gotham TTM rack, 70 microphones of various types, both dynamic and condensers of major brands, 34 pair mike snake w/30 transformer isolated stage splits, JBL monitors, 1/2 octave tuned w/UREI 539 graphics. Auratone monitors are also available, full complement of signal processing equipment including limiters, parametric EQ, digital delay, reverberation, etc., closed circuit video monitors for interface with video production facilities, two way headset communication system, 150 amp stage power distribution, full BTX SMPTE time code.

Services Available: Omega Audio maintains one of the most successful 24/48 track remote facilities in the country. In recent years our remote truck has been refitted for audio support of video/film projects, and we've expanded into a state-of-the-art audio for video post-production facility. Now in our tenth year of service to the Southwest with studio operations at Dallas Love Field, Omega Audio offers turnkey recording services for both live albums and video/film projects. Credits: Johnny Cash, Bob Hope, Helen Reddy, Anne Murray, Ai Jarreau, Spyro Gyra, Willie Nelson, The Oak Ridge Boys, Randy Meisner, Quarterflash, Hall & Oates, NBC-TV, CBX-TV, MTV and PBS.



PAINT HORSE PRODUCTIONS
Dallas, TX

**PAINT HORSE PRODUCTIONS
REMOTE RECORDING**

AR
1515 So. Fitzhugh, Dallas, TX 75223
(214) 823-0091
Contact: Ron Glorioso

**PALACE REHEARSAL STUDIOS
SOUND REINFORCEMENT**

ER
2612 Electronic #407, Dallas, TX 75220
(214) 358-0243
Contact: Ted Liggett, Doak Boettger

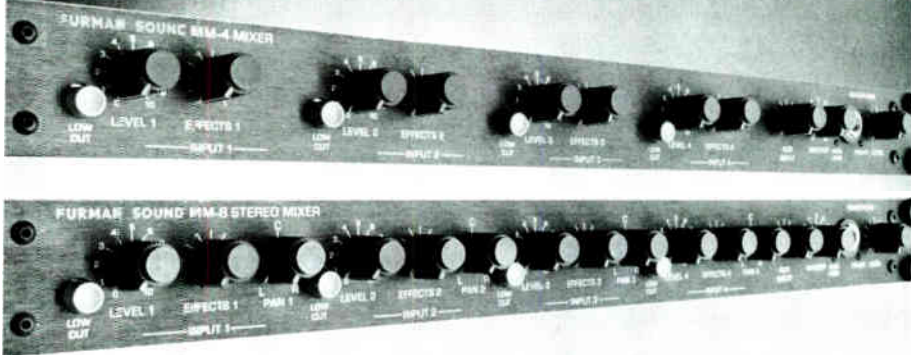
**REELSOUND RECORDING CO
REMOTE RECORDING**

AR
P.O. Box 280, Manchaca, TX 78652
(512) 472-3325, 282-0713
Contact: Malcolm Harper Jr.

Equipment: 42' tractor-trailer room. Acoustical design by Tom Hidley. Lounge and overdub room. MCI 636LM automated console, SMPTE lock unit (2) MCI JH-24 recorders (2) MCI 110B 2 tracks (2) Nikko cassette decks, IBL 4430 monitors, Auratones, Crown power amps, White 1/2 octave voicing, Sony color TV system and switcher, Ursa Major 8x32 reverb, DL-1, DL-2, RTS intercom (4) Dynamics (4) I.A. JAs dbx 900 rack, Jensen 48 input splitter, E.V. Shure Neumann AKG, Countryman, PZMs, Sennheiser Beyer C-tape pickups, UREI, microphones and DIs.

Services Available: 48 and 24 track remote recording for studio and live albums, TV audio support and radio broadcast and syndication. DIB Broadcasting, Westwood One, Patrick Griffith Prod., RKO Network, Epic records, Capitol records, MCA, World, Bensen Co., Savoy, Journey, Triumph, Robert Plant, ZZ Top, Ted Nugent, Fixx, The Gap Band, Frankie Beverly & Maze, Merle Haggard, Willie Nelson, George Jones, The Osmonds, T.G. Sheppard, Mel Tillis, Dolly Parton, Jay Aaron, Dave Perkins Band, Alabama, Oak Ridge Boys, Loretta Lynn, Amy Grant, Dickie Moore and Key, David Meech, Rev. James Cleveland, Farrell and Farrell, Bl. Thomas, Leon Patillo, Billy Squire.

New Multi-Purpose Mixers From Furman Sound Deliver the Performance Features You Need At A Price You Can Afford



Introducing the MM-4 and MM-8 mixers from Furman Sound. Never before has so much versatility been built to such exacting standards of quality and been available at such a low price. With their four wide range inputs you can combine any signals from low level microphones to the sizzlingly hot levels of today's most advanced synthesizers clearly, evenly, and without distortion or noise. And there is more. The MM-series mixers are packed with useful features like: effects send/return loop with level controls for each channel, low cut EQ to combat low fre-

quency rumble and noise, a sophisticated overload detection system, ground lift switch, simultaneously available balanced and unbalanced outputs, a headphone amplifier with front panel jack and volume control, and pan pots on model MM-8. Options include balanced inputs and phantom powering. Our mixers are ideal for expansion mixers for stage or studio, small public address installations, audio-for-video production, multi-media presentations, keyboard system mixers, and more. The MM-4 and MM-8, truly mixers for all reasons!



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30 Rich Street
Greenbrae, CA 94904
(415) 927-1225
Telex 172029 SPX SRFL

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WE DIDN'T LUCK INTO IT!

We set out to make the best time code and tape synchronizing equipment in the industry.

We wanted to meet all specs, handle all standards, work with all formats.

We wanted to make it controllable by its own front panels, by dedicated remote panels, or by external computer equipment.

Besides doing all the routine things, we wanted it to meet emerging professional requirements like —

- Reading VITC up to full VTR wind speed, so VITC could be used for editing in addition to edit decision-making.
- Translating VITC into LTC, for adding VITC capability to existing editing systems — without VTR/Editor modifications.
- Syncing all sorts of ATRs and VTRs together (including digital audio recorders) for jobs like layback, chase synchronizing, TV sound editing and transport control.
- Providing sub-millisecond TV audio editing capability for dialogue replacement.
- Using VITC to free-up the LTC audio track — for TV stereo and multi-language use.

and

We wanted it to be cost effective, modular, purchased as needed, and added to as required — available as individual stand-alone products which could be networked to provide a system greater than the sum of its parts.

WE SUCCEEDED —

SYSTEM 2600 from ADAMS-SMITH.

The industry leader in time code and tape synchronizing technology.



ADAMS-SMITH

34 TOWER STREET, HUDSON, MA 01749 U.S.A.

TEL: 617-562-3801 TWX: 710-347-0096

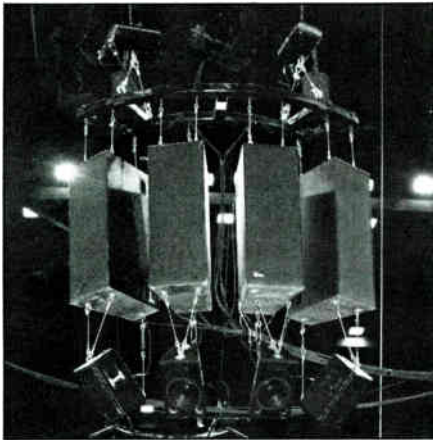
NEW YORK: 516-352-2341 LOS ANGELES: 213-388-8218

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SOUND ARTS RECORDING STUDIO
REMOTE RECORDING
AV
2036 Pasket, Houston, TX 77092
(713) 688-8067
Contact: Jeff Wells

SOUTHERN RECORDING
REMOTE RECORDING
AR
56 E. 53rd Place, Tulsa, OK 74105
(918) 747-7380
Contact: John Southern

SPECTRUM SOUND
REMOTE RECORDING
P.O. Box 1151, Bisbee, AZ 85603
(602) 432-4424
Contact: Scott Baekeland T J Cook



STAGE SOUND, INC.
Phoenix, AZ

STAGE SOUND, INC.
SOUND REINFORCEMENT
SL
4708 E. Van Buren, Phoenix, AZ 85008;
7285 S. Revere Pkwy. #704, Englewood, CO 80122
(602) 275-6060, Bob Gladding;
(303) 790-1295, Pat Nefos

Equipment: Stage Sound offers complete production services for any event from a large Meyer sound system to a 200 lamp digital lighting system. We can provide multi-image shows with AVI, Eagle programming to a General Electric PJ-5055 projector for the brightest of large screen projection. We sell and service over 100 different professional lines of equipment for the most impressive installations in the USA. Air ride trailer service available for touring groups. We also offer specialized electronic products for the sound industry such as our MM-8 monitor matrix. The MM-8 functions as an eight way listen matrix for the touring monitor engineer.

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SOUND REINFORCEMENT
SO
4041 E. St. Joseph Way, Phoenix, AZ 85018
(602) 840-6126
Contact: Jay "Dr." Beltz

TELE-IMAGE, INC.
REMOTE RECORDING
AV
2225 Beltline Rd., Suite 321, Carrollton, TX 75006
(214) 245-3561
Contact: Diane Barnard

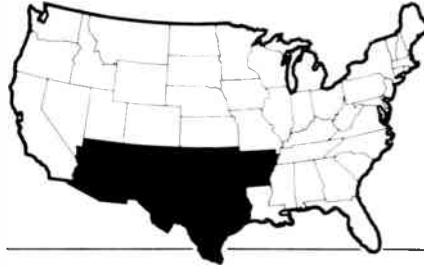
TELE-IMAGE, INC.
REMOTE RECORDING
AV
5630 Beverly Hill, Houston, TX 77057
(713) 977-2635
Contact: Margaret Mims

TOBY'S CUSTOM RECORDING STUDIO
SOUND REINFORCEMENT & REMOTE RECORDING
1024 South Presa, San Antonio, TX 78210
(512) 533-3030
Contact: Toby Torres

REMOTE RECORDING & SOUND REINFORCEMENT

SOUTHWEST

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WESTWOOD RECORDING STUDIOS
REMOTE RECORDING
964 West Grant Rd., Tucson, AZ 85705
(602) 622-8012
Contact: Roger King

WOODEN STUDIOS
REMOTE RECORDING
7334 Rampart, Suite 102, Houston, TX 77081
(713) 988-9872
Contact: Gus Huzbee

AAA SWING CITY MUSIC
SOUND REINFORCEMENT
SL
1312 Vandalia, Collinsville, IL 62234
(618) 345-6700 or (314) 421-1558
Contact: Gary Haselhorst

ACME RECORDING STUDIOS
REMOTE RECORDING
AR
3821 N. Southport, Chicago, IL 60613
(312) 477-7333
Contact: Kim Ibarra Les McReynolds
Equipment: Modified Technics 1520 and modified Sony PCM F1 with phase compensation. Schoeps, Neumann, AKG, Sennheiser.
Services Available: Digital and analog audiophile direct to two track remote recording, 1/2" 8 track remote recording, full in house studio facilities, custom record and real time cassette duplication and packaging, remote audio for video.

ADVANCED AUDIO
SOUND REINFORCEMENT & REMOTE RECORDING
SL, AR
902-11th Ave. So., Virginia, MN 55792
(218) 749-4056
Contact: Bob Cap

ALTER-NATIVE RECORDING
REMOTE RECORDING
AR
4339 Fairmount, Kansas City, MO 64111
(816) 531-8756
Contact: Paul Rosenstein

A.M.S. LOCATION RECORDING
REMOTE RECORDING
AR
P.O. Box 4354, St. Paul, MN 55104
(612) 645-9826
Contact: Jim Higbee

ANDERSOUND AUDIO LAB
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
630 N. 10th, Moorhead, MN 56560
(218) 233-3795
Contact: Steve Anderson

ANDOVER AUDIO
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
2387 So. Coon Creek Dr., Anoka, MN 55303
(612) 757-6589
Contact: Don G. Erickson

THE AUDIO CENTER
SOUND REINFORCEMENT & REMOTE RECORDING
SL, AR
1546 Alexis Rd., Toledo, OH 43612
(419) 476-8410
Contact: Dan Furney

AUDIO-GRAPHICS
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
1516 Ferris Ave., Royal Oak, MI 48067
(313) 544-1793
Contact: Edward Wolfrum

AUDIO MEDIA CORP.
REMOTE RECORDING
112 N. University, Suite L127, Fargo, ND 58102
(701) 237-6863
Contact: Kelly Pratt, production coordinator

AUDIONICS INC.
SOUND REINFORCEMENT
8509 Natural Bridge Rd., St. Louis, MO 63121
(314) 428-4848, 428-4857
Contact: James M. Schell

AUDIO 1
SOUND REINFORCEMENT
SO
51 Hawthorne St., Elyria, OH 44035
(216) 323-6414
Contact: Bill Webner, Rick Galbraith
Equipment: Soundcraft consoles, 4 way and 5 way systems, all BCIW power, JBL & Gauss speakers. Up to 20 kilowatts, 10 mix monitor systems, all Klark Teknik EQ, UREI, Allison compressors, Electro-Voice, Shure, AKG, Sennheiser.

AUDIO RENTAL SERVICE & SALES
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, AR
268 W. Normandy Dr., Chicago Heights, IL 60411
(312) 754-9191
Contact: Gary Cobb

AUDIO VILLAGE
REMOTE RECORDING
AR
1000 W. 17th St., P.O. Box 291, Bloomington, IN 47402
(812) 332-7475
Contact: Wayne Gunn

AUDIOCRAFT
REMOTE RECORDING
AR
915 W. 8th St., Cincinnati, OH 45203
(513) 241-4304
Contact: E.T. Herzog, Jr.

AVC SYSTEMS INC.
SOUND REINFORCEMENT & REMOTE RECORDING
ER
2709 E. 25th St., Minneapolis, MN 55406
(612) 729-8305
Contact: Jon Bormann

NO. CENTRAL

WHAT WE KNOW ABOUT AUDIO SYSTEMS COULD FILL AN ARENA.

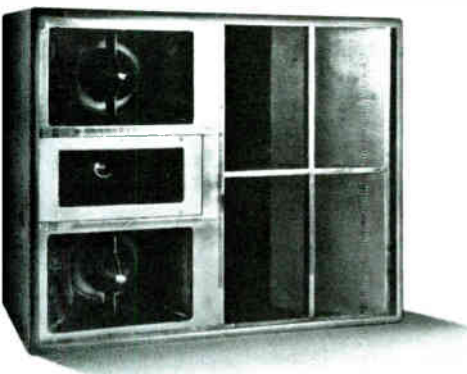
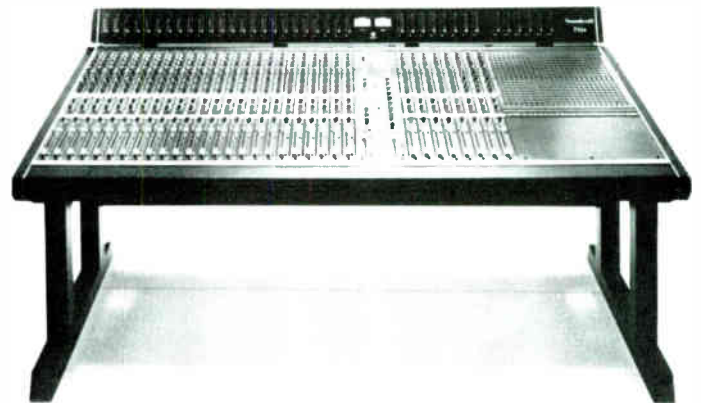
AND IT HAS. We're audio pros. The experience we've gained from our years of studio system design shows in our P.A. systems from fixed arena to touring. Plus we have the latest, hottest equipment for studio and live performance. Each of us is factory-trained. We never stop learning about all of the best in audio sound equipment. We take a "total system design" approach and tailor it to your level of cost and performance. Our goal is to make your sound the very best sound.



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We've been waiting for a new breed of mixing console that doesn't take an engineer to operate. We found it in the TS24. It's a fresh approach to using in-line technology. Easy to understand. Easy to use. The hot new Mix and Channel concept lets you mix as you go, because your monitor automatically becomes your mix. The TS24 takes input directly from instruments. A major plus,

the console can be customized for video post production capabilities.

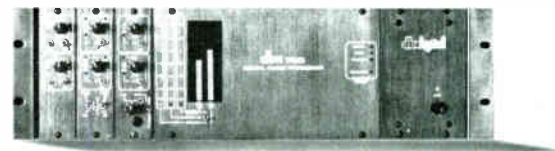


TURBOSOUND TMS SERIES

We've done a lot of listening and this is the best P.A. system to come along. Its sound reproduction is the closest we've heard to true. It's compact and lightweight, with a powerful output that will blow you away. It's easy to move. Easy to use, and the price is right.

dbx MODEL 700 DIGITAL AUDIO PROCESSOR

We've heard a lot of talk about dbx's first shot at digital recording. And it's all good. The 700 is a professional 2-channel processor with the quality of most linear 16-bit PCM systems at a fraction of the cost. They used a new approach to digital recording called CPDM, Companded Predictive Delta Modulation. We think it's worth it at twice the price. Now available for delivery.



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SAN ANTONIO

HOUSTON

World Radio History

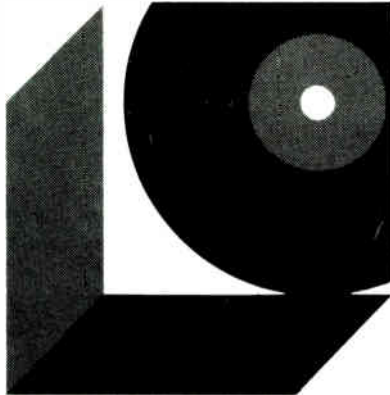
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you could do it
with your eyes closed.

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RED LABEL RECORDING Co.
Winnetka, Illinois
Full Service 24-Track Studio
Fred Breitberg, Studio Manager
Chief Engineer

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The Affordable
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Audio System
and Room Drift

The **GOLDLINE Model 30**
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Analyzer is the affordable and easy-
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guesswork out of audio system
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and tape machines, as well as
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The Model 30 is the ultimate studio and audio system "tweaking machine"

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COMPANY _____
STREET _____
CITY _____
STATE _____ ZIP _____

Circle #080 on Reader Service Card



BEACHWOOD RECORDING
Beachwood, OH

BEACHWOOD RECORDING
SOUND REINFORCEMENT & REMOTE RECORDING
3095 Commerce Rd., Beachwood, OH 44122
(216) 292-7300
Contact: Keith Voigt

BODDIE RECORD MFG. & RECORDING
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AV
12202 Union Ave., Cleveland, OH 44105
(216) 752-3440
Contact: Tom or Louise Boddie

BRIDGEWATER CUSTOM SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
SO, ST, AR
15957 So. Halsted, Harvey, IL 60426
(312) 596-0309
Contact: Paul Driggs

BROWN'S MUSIC
SOUND REINFORCEMENT & REMOTE RECORDING
7507 Pacific, Omaha, NE 68114
(402) 393-3397
Contact: Steve Brown

CHICAGO MUSIC CO.
SOUND REINFORCEMENT
SO, ER
3530 N. Lincoln Ave., Chicago, IL 60657
(312) 472-1023
Contact: Don Battaglia

CITY ELECTRONIC COMMUNICATIONS INC
SOUND REINFORCEMENT
1206 E. 8th, Kansas City, MO 64106
(816) 474-4230
Contact: R E. Stephan

CLAM BEARDS
SOUND REINFORCEMENT & REMOTE RECORDING
SO, ER, AV
6327 New Jersey Ave., Hammond, IN 46323 and
1109 W. 73rd Ave., Merrillville, IN 46410
(219) 845-1838; (219) 736-0064
Contact: Charles R. Snyder

CONTINENTAL SOUND CO. INC.
SOUND REINFORCEMENT
SO
P.O. Box 388173, Chicago, IL 60638
(312) 284-0418 or 581-6446
Contact: George R. Minol, Tom Labus
Equipment: 4 way stereo system consisting of. 32/8/2 custom
Dynamix main mix console (8) bass cabinets w/2-18" drivers in
each (8) low/mid cabinets w/4-12" drivers in each (8) mid/high
cabinets w/4-10" midrange and 8-6 1/2" HF drivers in each
18,240 w/RMS main system power. Monitor system is biamped
consisting of 32x8 monitor console w/3 band variable EQ on
each input and Bus output 10 floor monitors w/1-15" and (2)
HF horns 4-side fills w/2-15" and (1) HF horn. (2) monitor amp
racks each containing (4) 2 way electronic crossovers, (4) 2/3 oc-
tave graphic EQs, (2) HF amps, (2) LF amps (45) assorted
Mixes E.V. Shure, Audio Technica Main interface rack
parametric EQs, quad limiter, flanger/doubler, comp/limiter,
analog delay digital delay pitch transposer, 1/3 octave graphic
EQs 4 way stereo crossover cassette deck reverb For more in-
formation call or write

COUNTRYSIDE RECORDING
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
P.O. Box 13, 116 E. Lincoln, Wellington, Kansas 67152
(316) 326-8164
Contact: Gary L. Terry

CUSTOM RECORDING STUDIOS
REMOTE RECORDING
AR
3829 Scott Ave. No., Minneapolis, MN 55422
(612) 535-2587
Contact: Jim Reynolds

DAGGER RECORDS
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST; AR
4143 W. Nelson St., Chicago, IL 60641
(312) 545-9150
Contact: Kelly Johnson

db SOUND
SOUND REINFORCEMENT
SO
1220 Rand Rd., Des Plaines, IL 60016
(312) 299-0357
Contact: Bruce Gordon

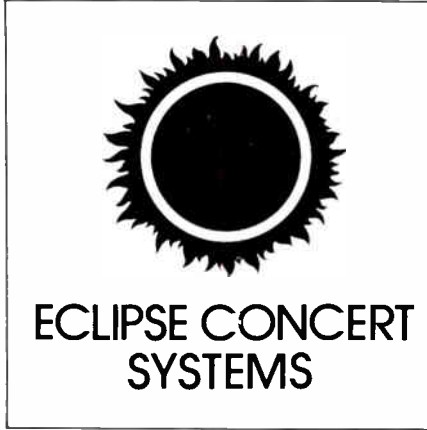
DOTT INFLUENCES
SOUND REINFORCEMENT & REMOTE RECORDING
SL; AR
640 12th Ave., Coralville, IA 52241
(319) 337-2333
Contact: Dick Dott

DYNA-MIGHT SOUND & LIGHTING INC.
SOUND REINFORCEMENT
SL
3119A South Scenic, Springfield, MO 65807
(417) 883-4549
Contact: John M. Gott

REMOTE RECORDING & SOUND REINFORCEMENT

NO. CENTRAL

Many of the listings in this directory also contain a code which indicates the specialties of each business: SO = sound reinforcement, SL = sound and lighting, ST = staging, ER = equipment rental, AR = audio recording, VR = video recording, AV = audio and video recording.



ECLIPSE CONCERT SYSTEMS, INC.
Mendota Heights, MN

ECLIPSE CONCERT SYSTEMS, INC.
SOUND REINFORCEMENT
1062 Wagon Wheel Trail, Mendota Heights, MN 55120
(612) 451-8878
Contact: Mike Justen

ELECTRAX RECORDING
REMOTE RECORDING
AR
904 Ridgewood Place, Highland Park, IL 60035
(312) 432-3464 or 272-5897
Contact: Tom Morgan, Mark Dooley

ELECTRONIC DESIGN COMPANY
SOUND REINFORCEMENT
SO
2958 Cleveland Ave. No., St. Paul, MN 55113
(612) 636-3550
Contact: Douglas Miller

ELECTRONIC SOUND EQUIPMENT CO. INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SL; AV
2249 Division Ave. So., Grand Rapids, MI 49507
(616) 241-3425
Contact: Harvey Jay Kingma

FRENCHIE PRODUCTIONS
SOUND REINFORCEMENT
ER
9041 S. Dante, Chicago, IL 60619
(312) 768-6102
Contact: Jeffrey S. Newman

G+ PRODUCTIONS
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
1102 Milbourne Ave., Flint, MI 48504
(313) 238-9703
Contact: Dennis Gilsdorf

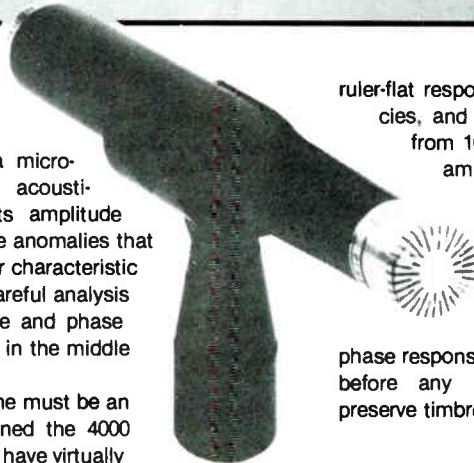
GAND SOUND
SOUND REINFORCEMENT
SL; ER
780 Frontage Rd., Northfield, IL 60093
(312) 446-4263 (Chicago)
Contact: Gary Gand, Joan Gand



A Recording Legend in the Making The Bruel & Kjaer Studio Microphones

The major contributor to a microphone's fidelity to the original acoustic event is the uniformity of its amplitude response over frequency. Indeed, the anomalies that give most popular microphones their characteristic coloration show themselves upon careful analysis to be variations from flat amplitude and phase response, especially those occurring in the middle and high frequencies.

Believing the best microphone must be an accurate one, Bruel & Kjaer designed the 4000 series of professional condensers to have virtually



ruler-flat response through the middle frequencies, and worst-case deviation of ± 2 dB from 10 Hz to 40 kHz. Not only are the amplitude and phase response uniform on-axis, but they remain remarkably uniform even off-axis.

The result of this insistence upon accuracy in both amplitude and phase response is a microphone you can place before any sound source knowing you'll preserve timbre without coloration.

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(313) 471-0027 - from Ann Arbor 994-0934

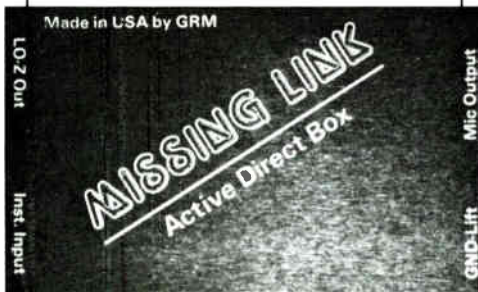
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MISSING LINK

Active Direct Box

Models BP-1 & PH-1

The Missing Link active direct box was designed by a studio engineer and was field-tested for over two years in actual recording sessions and live concerts. After evaluating comments from many professional musicians and recording engineers, we have developed an active transformerless direct box that we feel is one of the most reliable and transparent-sounding units on the market today.



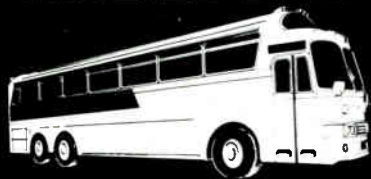
Suggested list price: \$119.95

GRM
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Chicago, IL 60638-8127

Circle #134 on Reader Service Card

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- Separate Broadcast Control Rm. with Announce Booth
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Beachwood, Ohio 44122
216/292-7300

Circle #135 on Reader Service Card

GARGOYLE AUDIO
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, AR
620 E. 11th, Bloomington, IN 47401
(812) 336-4910; 339 6611
Contact: Bryan Haggerty Jack Burke



GHL AUDIO ENGINEERING
Worthington, OH

GHL AUDIO ENGINEERING
REMOTE RECORDING
AV
1758 Watertower Dr., Worthington, OH 43085
(614) 876-1057
Contact: Gary Hedden

HARMONY RECORDING STUDIO
REMOTE RECORDING
2535 Buchanan St. N.E., Minneapolis, MN 55418
(612) 874-7429
Contact: Jon Ott or Bill Jason

HEWITTS MUSIC INC.
SOUND REINFORCEMENT
25110 Gratiot, Roseville, MI 48066
(313) 773-7730
Contact: Steve Neate

HIGH FIDELITY RECORDING, INC.
REMOTE RECORDING
1059 Porter, Wichita, KN 67203
(316) 262-6456
Contact: Jim Strattan

HOOD INDUSTRIES
SOUND REINFORCEMENT
SO
5700 Superior Ave., Cleveland, OH 44103
(216) 431-4663

H.S.A. — HEATHER SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
SL, AR
121 Lincolnway West, Mishawaka, IN 46544
(219) 255-6100
Contact: Richard R. Johnson

"IT'S NO PROBLEM AUDIO" CO.
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, AR
3537 W. Wolfram St., Chicago, IL 60618
(312) 342-2290
Contact: Susan M. Tyda

JEWEL RECORDING CO.
SOUND REINFORCEMENT & REMOTE RECORDING
ER, AR
1594 Kinney Ave., Cincinnati, OH 45231
(513) 522-9336
Contact: Rusty or Linda York

KING SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
SO, ST, ER, AR
325 So. Maple, Manistique, MI 49854
(906) 341-6533
Contact: Keith Polkinghorne
Equipment: Boards: Carvin MX1602, Peavey 900 & 600S

REMOTE RECORDING & SOUND REINFORCEMENT

NO. CENTRAL

Many of the listings in this directory also contain a code which indicates the specialties of each business: SO = sound reinforcement, SL = sound and lighting, ST = staging, ER = equipment rental, AR = audio recording, VR = video recording, AV = audio and video recording.



KING SOUND
Manistique, MI

Stereo Amps: Carvin DCA400, (2) Peavey C'S400's Speakers (2) Peavey SP1's (2) Vocal Projectors (2) Peavey 215 bass cabinets Fender 212 Bananmaster (2) Bose 901 ser #4 w EQ (2) Acoustic Research AR48's, Altec Lansing floor monitor Tape decks: TEAC A 3440 & A 6600 Pioneer CT F6262 BIC T2 Microphones (6) Electro-Voice RE 16's (2) Audio Technica B13s, (2) AKG D1000 100 Whirlwind 16 ch w/3 sens snake Signal Processing Roland SRE 555 Chorus/Space/Echo w/nr Morley pedals — wa fuzz phase Ford Econoline 150 van for transport Ampeg SVT and Sunn Spectrum II amplifiers Rhodes 77 Sequential circuits Prelude synthesizer Gibson Les Paul, Hickenbacker 4001 fretless stereo Alvarez Classic
Services Available: Remote recording demo tapes, disco dances, sound reinforcement Real Time cassette duplication, we can arrange packages to include album or 45 pressings Our credits include Sound reinforcement of live shows—show groups to Evangelists, an annual Telethon, High School Band and Choral Festivals countless dances

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SO, AR
6800 Chase Rd., Dearborn, MI 48126
(313) 846-3800
Contact: George J. Kerej

DuWAYNE KLOOS RECORDING
REMOTE RECORDING
AR
8345 Duluth St., Golden Valley, MN 55427
(612) 544-3050
Contact: Joann Kloos

K&R'S RECORDING STUDIOS INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
28533 Greenfield, Southfield, MI 48076
(313) 574-2080
Contact: Pat or Bob

LAB RECORDING STUDIO
 REMOTE RECORDING
 AR
 3115 97th Place, Suite 8, Highland, IN 46322
 (219) 924-5208
 Contact: Larry A. Brechner

L.A. LIGHTING AND SOUND
 SOUND REINFORCEMENT & REMOTE RECORDING
 30314 Euclid Ave., Wickliffe, OH 44092
 (216) 944-2300
 Contact: Diana or Jim Linger

FRANKIE LaMARR c/o MUSIC/MUSIC
 REMOTE RECORDING
 AR
 1418 N. Woodward, Royal Oak, MI 48067
 (313) 543-5070
 Contact: Frankie LaMarr

LANE MUSIC CENTER, INC.
 SOUND REINFORCEMENT
 2015 Hart St., Vincennes, IN 47591
 (812) 886-9583
 Contact: Jim Lane

LESCO CONCERT SOUND CO.
 SOUND REINFORCEMENT & REMOTE RECORDING
 SL; AV
 P.O. Box 741, 491 Catalina Dr., Newark, OH 43055
 (614) 366-5644
 Contact: Mr. Frank L. Edwards II

L-M RECORDING ENT.
 SOUND REINFORCEMENT & REMOTE RECORDING
 SO; AV
 206 Locust, Americus, KS 66835
 (316) 443-5181
 Contact: Lee C. Muller

L.P. STUDIOS
 SOUND REINFORCEMENT & REMOTE RECORDING
 SO; AR
 1627 Gregory, Lincoln Park, MI 48146
 (313) 386-5368 or 282-9266
 Contact: Shawn Munday, Daniel Frescura

MANTICORE SOUND & LIGHTING
 SOUND REINFORCEMENT
 SL
 525 W. Third St., Cincinnati, OH 45202
 (513) 721-3807
 Contact: Tom Whisner

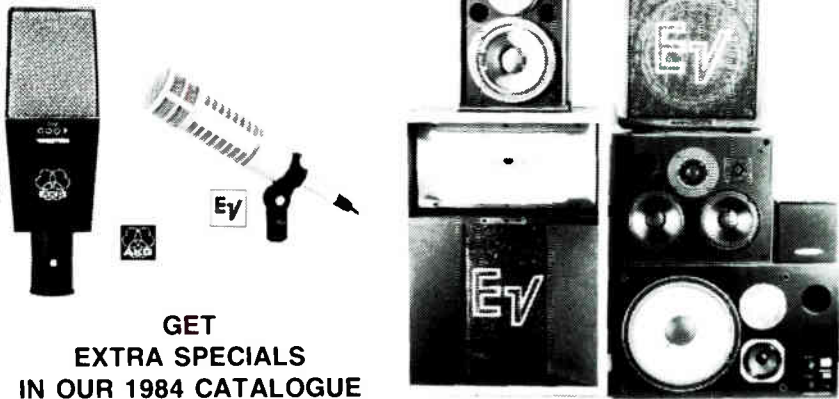
MARGUERITE'S MUSIC
 SOUND REINFORCEMENT
 SO
 2409 So. 10th St., Moorhead, MN 56560
 (218) 233-7546
 Contact: Don

metro mobile
 LOCATION RECORDING

METRO MOBILE LOCATION RECORDING
 Chicago, IL

METRO MOBILE LOCATION RECORDING
 REMOTE RECORDING
 AR
 1316 W. Addison, Chicago, IL 60613
 (312) 883-1393
 Contact: Timothy R. Powell
 Equipment: Neotek Series II 32x24 console; Tascam 85-16B 16

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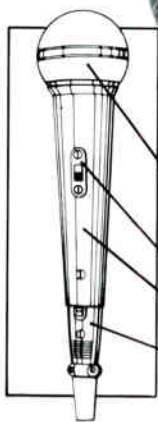


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 IN WISCONSIN
 1 (800) 362-5445
 LOCAL (608) 271-1100

6729 SEYBOLD RD., MADISON, WI 53719

Circle #136 on Reader Service Card

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Hard steel dent resistant basket with built-in foam wind and pop filter
 Durable on/off control switch
 Precision machined metal body with interior mount to minimize handling noise
 Cannon connector for professional cabling. 16 ft. of 1 core shielded cable included

GLI's model 55 is a high performance, professional microphone that combines good looks with a budget price. Absolute clarity of reproduction makes the model 55 one of the best buys in the market today. Compare its unidirectional polar pattern, frequency range 100-15,000 HZ and sensitivity (-76 dB at 1 KHZ) to any other performing mic in the field... there's no comparison! Black matte finish.

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 Melville, NY 11747 • (516) 351-2100

track, M38 8 track, 40-4 4 track, Technics 1500 2 track, Foxtel LS-2B monitors, Auratones; mikes by AKG, Beyer, Neumann, Shure, E-V, Sony, Sennheiser; limiters by dbx, MXR and UREI; dbx noise reduction on all machines, reverb and effects by Lexicon, DeltaLab, SoundWorkshop, MicMix, 40 channel snake and splitter system; video monitors, intercom, and more.

Services Available: With our brand new 14' Chevy HiCube, Metro Mobile offers the economical combination of top quality audio and compact size. We're fully experienced in location music recording, live broadcast, video, film, and demo projects. Since 1979, Metro Mobile has taped WXRT's Sunday Night Unconcert, featuring The Band, Stray Cats, The Clash, and many others. Our most recent video/film project was "Chicago On The Good Foot", a gospel, blues and jazz show for The Disney Channel. 24 track available upon request.

MIDWEST KABLE INC.
SOUND REINFORCEMENT
 25058 West Six Mile Rd., Redford, MI 48240
 (313) 537-0430
 Contact: Kees Bakker



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 Dayton, OH

MS ENTERTAINMENT
SOUND REINFORCEMENT
SO, ER
 (Mail) 1001 E. Second St., (Showroom) 110 Front St.
 Dayton, OH 45402
 (513) 461-1202
 Contact: Monika Shroyer

Equipment: A four way active, two cabinet system for up to 10,000 seats, any venue, any program material. Featuring Chaos Audio, Gauss, E-V, Klark Teknik, SAE Pro, Ashly Audio, dbx, Pulsar, Soundcraft, Renkus Heinz, Eventide, HMF.
Services Available: Rental and retail sales of individual components or complete systems. Design, consultation and custom cabinet construction available. Used by the Victory Theatre Association, the Dayton Ballet Company and the Dayton River Festival.

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 2005 Swift Ave., North Kansas City, MO 64116
 (816) 471-0655
 Contact: Jay E. Fowler

MUSIC MUSIC
SOUND REINFORCEMENT & REMOTE RECORDING
 1418 North Woodward, Royal Oak, MI 48067
 (313) 543-5070
 Contact: Frankie LaMarr

M.Y. RECORDING STUDIO
REMOTE RECORDING
AR
 4519 South Hills, Cleveland, OH 44109
 (216) 741-6453
 Contact: Dennis Yurch

MTS NORTHWEST SOUND, INC.
SOUND REINFORCEMENT
SO
 51 Glenwood Ave., Minneapolis, MN 55403
 (612) 332-1166
 Contact: John Lang

REMOTE RECORDING & SOUND REINFORCEMENT

NO. CENTRAL

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NAKED ZOO ENTERPRISES, INC
SOUND REINFORCEMENT
SL, ST
 1920 Benson Ave., St. Paul, MN 55116
 (612) 699-1155
 Contact: David Fish

NCS SOUND
SOUND REINFORCEMENT
SO
 15167 W. Hwy. 22, Prairie View, IL 60015
 (312) 945-1371 or 634-9022
 Contact: Jeff McRae, Norm Cottelear

NEW COVENANT SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
 1150 Davis Rd., Sandusky, MI 48471
 (313) 648-2614
 Contact: Larry Broughton

PETER ALBRECHT CORPORATION (PAC)
SOUND REINFORCEMENT
SO, ST
 325 E. Chicago St., Milwaukee, WI 53202 53202
 (414) 272-2811
 Contact: Burt J. Boettcher

PMG DIVERSIFIED
SOUND REINFORCEMENT & REMOTE RECORDING
 P.O. Box 1069, Palatine, IL 60078
 (312) 359-9240 or (800) 562-5872
 Contact: Glen Mullis



PRO AUDIO INC.
 Grand Rapids, MI

PRO AUDIO INC.
SOUND REINFORCEMENT
SL
 0-1640 Lake Michigan Dr. N.W., Grand Rapids, MI 49504
 (616) 677-5973
 Contact: Ken

PROFESSIONAL AUDIO SYSTEMS (PAS)
SOUND REINFORCEMENT
SL
 1019 Hill Pl., Jackson, MI 49202
 (517) 787-0058
 Contact: Calvin Williams

PYRAMID AUDIO, INC.
SOUND REINFORCEMENT
SO
 450 West Taft Dr., South Holland, IL 60473
 (312) 339-8014
 Contact: Bob Vukelich

QMP SOUND ENGINEERING
SOUND REINFORCEMENT & REMOTE RECORDING
 1425 W. Whittaker, Salem, IL 62881
 (618) 548-2031
 Contact: Doug Cosby

RAINBOW RECORDING STUDIOS
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, AR
 2322 So. 64th Ave., Omaha, NB 68106
 (402) 554-0123
 Contact: Nils Anders Erickson

RAMHOG SOUND CO.
SOUND REINFORCEMENT
SL
 4284 East 124th St., Cleveland, OH 44105
 (216) 641-6606
 Contact: William Warren

R.G. SOUND CO.
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, AR
 1002 Hawthorne St., Celina, OH 45822
 (419) 586-2273 or 3671
 Contact: Andy Godwin

R/J RECORDING
SOUND REINFORCEMENT & REMOTE RECORDING
SL, AR
 P.O. Box 302, Geneva, IL 60134
 (312) 584-4657
 Contact: Richard J. Peck

REEL SOUND
SOUND REINFORCEMENT
 1502 E. Jackson St., Bloomington, IL 61701
 (309) 829-1612
 Contact: Kevin Kelley

GEORGE RONDINELLI MUSIC
SOUND REINFORCEMENT
 1101 Main, Dubuque, IA 52001
 (319) 583-8271
 Contact: George Rondinelli

ROSELLE MUSIC INC.
SOUND REINFORCEMENT
SL
 217 E. Irving Park, Roselle, IL 60172
 (312) 529-2031
 Contact: Bob Wiggins

SCREAMS & ROSES SERVICES
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AV
 6960 Angora Way, Huber Heights, OH 45424
 (513) 236-1727
 Contact: David Sheward

SKYROCK SOUND CO.
SOUND REINFORCEMENT
SL
 P.O. Box 97, Okauchee, WI 53069
 (414) 567-9232
 Contact: Aldo

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SL, ST
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 (313) 757-7410
 Contact: F.D. Vancalli

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| • OTARI | • LEXICON | • SHURE | • ELECTRO-VOICE | • TAPCO |
| • NEOTEK | • ORBAN | • SONY | • NAKAMICHI | • TECHNICS |
| • TASCAM | • CROWN | • NAD | • SENNHEISER | • JBL |
| • RAMSA | • AKG | • PROTON | • MIC MIX | • AND MORE |

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SOUND ADVOCATE CO. INC.
SOUND REINFORCEMENT
SL, ST
 1763 South High St., Columbus, OH 43207
 (614) 443-6577
 Contact: Dave Mead, Steve Jacques

Equipment: Sound Advocate offers 2 stereo 5-way concert systems for large venues and a 4-way system for halls under 5,000 seats. Featuring Yamaha and Klark Teknik equalizers, UREI crossovers and limiters, and Crown amplification. Yamaha house consoles. Our speaker system utilizes single 18" folded bass horns. Single 15" Forsythe bass cabinet. Community MB-60 and Community BRH-90 RH-60 horns, Gauss and JBL tweeters. Monitor system offers a selection of over 40 monitors from 12" 2-way to triamp side wash and drum monitors. Studio Master 20x8 monitor console with 1/3 and parametric equalizers by Ashly and Biamp. **Services Available:** Specialized in-system packaging, design and fabrication. Past credits include touring productions of The Wiz, Dancin' Best Little Whorehouse. Catering to all markets, our goal is to provide the right equipment and personnel for each performance.

SOUND COM CORPORATION
SOUND REINFORCEMENT
SO
 227 Depot St., Berea, OH 44017
 (216) 234-2604
 Contact: Roy Stuewe

SOUND MACHINE STUDIOS
REMOTE RECORDING
 Check your Detroit Yellow Pages
 Contact: Bryce Roberson

SOUND POST
SOUND REINFORCEMENT
SO
 101 W. Prospect Ave., Mt. Prospect, IL 60056
 (312) 259-0470
 Contact: Chris Mzyk

SOUNDS GOOD AUDIO
SOUND REINFORCEMENT
SL, ER
 410 East Grand River Ave., Lansing, MI 48906
 (517) 372-5278
 Contact: Mark Reed

SOUNDS GREAT ENTERPRISES
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AV
 P.O. Box 292, Athens, OH 45701
 (614) 593-3781
 Contact: Terry (Clifton) McCauley



SOUNDZ MUSIC RENTALS
 Wheeling, IL

SOUNDZ MUSIC RENTALS
SOUND REINFORCEMENT
SL
 516 N. Milwaukee Ave., Wheeling, IL 60090
 (312) 537-8211
 Contact: S.H. Etian

SOUTHERN THUNDER SOUND, INC.
SOUND REINFORCEMENT
SL
 766 Cromwell Ave., St. Paul, MN 55114
 (612) 645-9736
 Contact: Art Welter

REMOTE RECORDING & SOUND REINFORCEMENT

NO. CENTRAL

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SPARROW SOUND DESIGN
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, AR
 3501 N. Southport 2nd, Chicago, IL 60657
 (312) 472-1632
 Contact: Bradley Parker-Sparrow

SPECTRUM SOUND SYSTEMS
SOUND REINFORCEMENT
SL
 2318 N. 6th St., Sheboygan, WI 53081
 (414) 457-6863
 Contact: Carl Vollrath

STAGE PRO LTD.
SOUND REINFORCEMENT
SL
 415 N. 2nd, Lawrence, KS 66044
 (913) 841-1306
 Contact: Robert Schmitt

STANAL SOUND LTD.
SOUND REINFORCEMENT
 P.O. Box 518, Kearney, NE 68847
 (308) 237-2207
 Contact: B J Alexander

STOKES SOUND INTERNATIONAL INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SL, AV
 100 Stokes Lane, P.O. Box 398, Hudson, OH 44236
 (216) 650-1669
 Contact: A J Stokes

STUDIO EIGHT INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
 115 Vine St., Ishpeming, MI 49849
 (906) 486-4573
 Contact: Alan Robertson President

STUDIO G RECORDING
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
 214 S. Bemiston Ave., Clayton, MO 63105
 (314) 727-0770
 Contact: Greg Glazier

SUN SOUND SYSTEMS, INC.
SOUND REINFORCEMENT
SO
 4846 W. Main St., Skokie, IL 60077
 (312) 679-1150
 Contact: Ron Bressler

SUNSET STUDIO
REMOTE RECORDING
AR
 117 W. 8th, Hays, KS 67601
 (913) 625-9634
 Contact: Mark Meckel

SYNDER SYSTEMS
SOUND REINFORCEMENT
SL
 16638 E. Warren Ave., Detroit, MI 48224
 (313) 881-5167
 Contact: Ken Snyder

TAKER
SOUND REINFORCEMENT
SL
 8426 N. Coon Rd., Dakota, IL 61018
 (815) 563-4807
 Contact: Gene R. Fisher

TANTUS STUDIOS
REMOTE RECORDING
 18461 W. McNichols, Detroit, MI 48219
 (313) 533-3910
 Contact: Mary Ann McGrath or Tanis Tramontin

TRACK 32
SOUND REINFORCEMENT & REMOTE RECORDING
 11249 N. Riverland Rd., Mequon, WI 53092
 (414) 242-9010
 Contact: John Walsh, Paul Edwards

TRIAD AUDIO SYSTEMS, INC.
SOUND REINFORCEMENT
SO
 1701 N. Harrison St., Fort Wayne, IN 46808
 (219) 422-4731
 Contact: Joel G. Moss

VALLY ACOUSTICS & MULTITRACK SYSTEMS
SOUND REINFORCEMENT & REMOTE RECORDING
SO, SL, AV
 930 N. Park, Fergus Falls, MN 56537
 (218) 736-2210
 Contact: Maurice Skogen



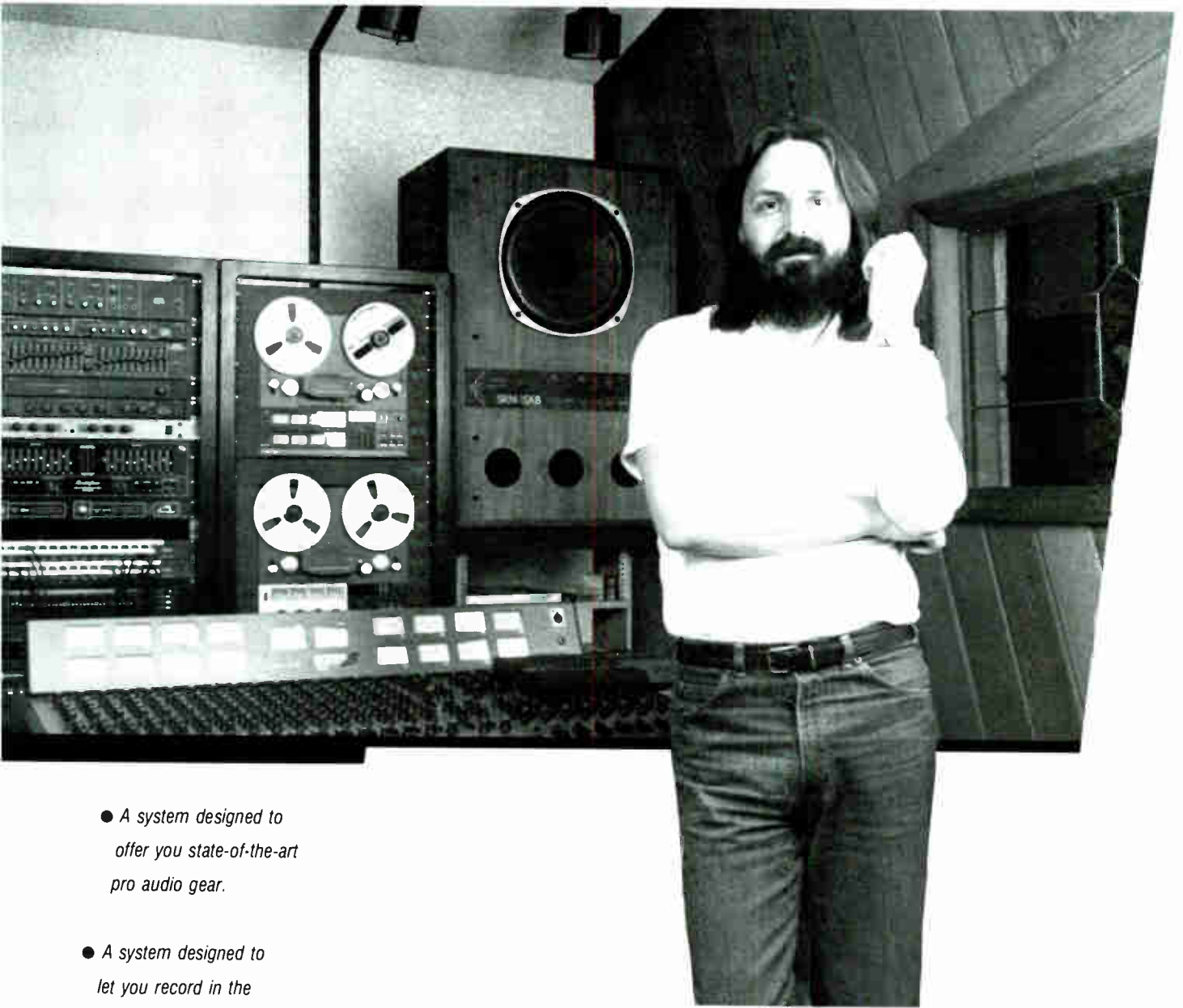
WESTWOOD ONE
 Euclid, OH

WESTWOOD ONE
REMOTE RECORDING
AR
 27801 Euclid Ave., Suite 30, Euclid, OH 44132
 (216) 289-1900
 Contact: Arnie Rosenberg
Equipment: Situated in a 40 ft MCI bus are a custom built Sound Workshop console, 50 inputs, 24 outputs and 40-track capability, (2) MCI 24-track recorders & (2) MCI 1/4" mixdownr. decks, an MCI Autolock Synchronizer for multi-track link-up or to generate time code for video, Westlake Near-field speakers with Hatler amps plus a Lexicon 200 digital reverb and (2) PCM-41 digital delays, Valley People Rack with (6) Kepexes and (4) Gain Brains Orban & UREI limiters. Lounge with audio & video monitors plus refrigerator and computer bar. Bus is equipped to do on the spot mixdowns. also has 2 bunks and a head on board.

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SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, AV
 P.O. Box 39104, Solon, OH 44139
 (216) 248-1317
 Contact: Bob White, Tod White

WORLDWIDE SOUND PRODUCTIONS
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AR
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 (618) 544-7898
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243 Azusa Ave, West Covina, CA 818 966-1781

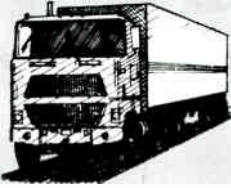
Toll Free 800 423-6583

Circle #083 on Reader Service Card

World Radio History

46 TRACK...

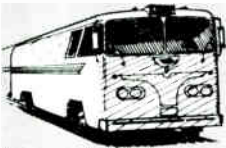
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(416) 968-9417

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REMOTE RECORDING & SOUND REINFORCEMENT

NO. CENTRAL

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WILLOW WIND PRODUCTIONS
REMOTE RECORDING
P.O. Box 4189, Bartonville, IL 61607-0189
(309) 697-2434
Contact: Larry Wilson

ZINN AUDIO, INC.
SOUND REINFORCEMENT
SO
419 Industrial Dr., Carmel, IN 46032
(317) 844-5247
Contact: David Kitterman



Z-LAND AUDIO SYSTEMS
Littlechute, WI

Z-LAND AUDIO SYSTEMS
SOUND REINFORCEMENT
SL, ST
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(414) 788-3545
Contact: Mike VanZeeland

NORTHEAST

AAA SOUND SERVICE, INC.
SOUND REINFORCEMENT
25 Market St., Brockport, NY 14420
Contact: Richard A. Petty, Sr

ACTIVE SOUND
REMOTE RECORDING
AR
314 C St., Boston, MA 02127
(617) 269-0104
Contact: Larry Lessard

MALCOLM ADDEY RECORDERS
REMOTE RECORDING
210 Riverside Dr., New York, NY 10025
(212) 865-3108
Contact: Malcolm Addey

A&G VIDEO
SOUND REINFORCEMENT & REMOTE RECORDING
SL, AV
245 East 84th St., New York, NY 10028
(212) 288-3883
Contact: Bill Ruhnke

AIR IMAGE TECHNOLOGY
REMOTE RECORDING
VR, AV
Minuteman Airfield, Stow, MA 01775
(617) 897-8303
Contact: Jack Keenan

ALL MOBILE
REMOTE RECORDING
630 9th Ave., New York, NY 10036
(212) 757-8919
Contact: Eric Duke

ALTEL SOUND OF CONNECTICUT INC
SOUND REINFORCEMENT
SO
2392 Main St., Bridgeport, CT 06606
(203) 374-0162
Contact: Richard Braca

ARENA VIDEO LTD.
REMOTE RECORDING
AV
180 E. Post Rd., White Plains, NY 10601
(914) 997-0716
Contact: Joellen; David

SAM ASH MUSIC STORES
SOUND REINFORCEMENT
160 W. 48th St., New York, NY 10036
(212) 245-4778
Contact: Richard Ash

AUDIO ANALYSTS U.S.A. INC.
SOUND REINFORCEMENT
SO
P.O. Box 713, Plattsburgh, NY 12901
(518) 561-5071
Contact: Pierre

AUDIO ART INC.
REMOTE RECORDING
AV
102 Greene St., New York, NY 10012
(212) 226-3685
Contact: Naka Suzuki

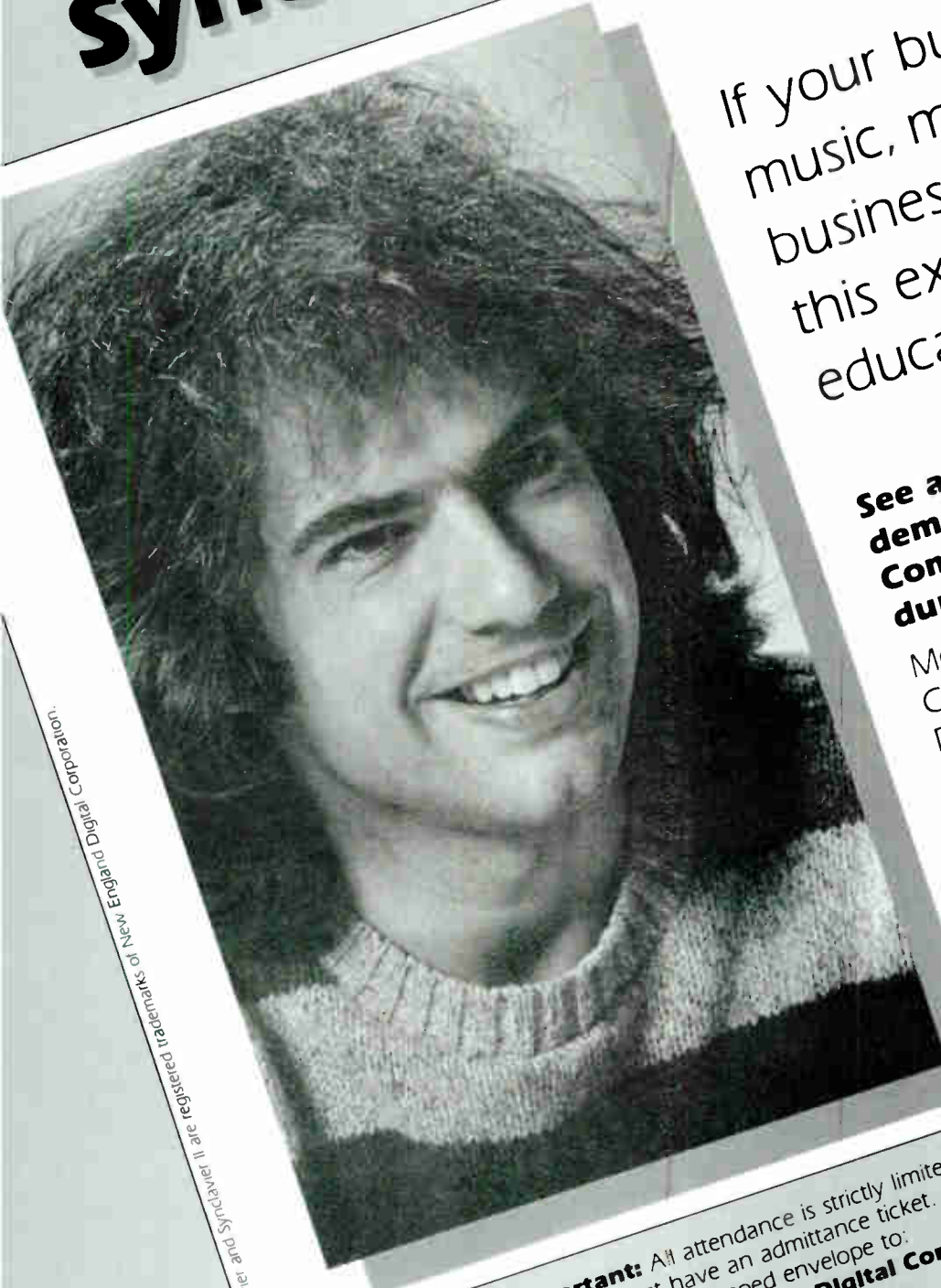
AUDIO PROMEDIA
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
114 Old Amherst Rd., Sunderland, MA 01375
(413) 665-7122
Contact: Art Steele

AUDIOTECHNIQUES, INC.
REMOTE RECORDING
AR
1619 Broadway, New York, NY 10019
(212) 586-5989
Contact: Laura Goldfeder

AUDIOTEK RECORDING
REMOTE RECORDING
AV
182-35 Jamaica Ave., Hollis, NY 11423
(212) 526-1456
Contact: Herb Horton

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SL, AV
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(212) 397-5020
Contact: Steven Baker

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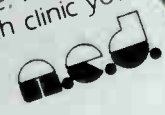
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Pat Metheny Clinic
P.O. Box 546 MX
White River Jct., Vermont 05001

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Please indicate which clinic you wish to attend.



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(203) 646-2387
Contact: Cary St. Onge



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Flushing, NY

AURA SONIC MOBILE AUDIO
REMOTE RECORDING
AV, SO
140-02 Poplar Ave., Flushing, NY 11355
(212) 886-6500
Contact: Steven Remote

Equipment: Aboard our mobile unit as standard equipment: 32 channel Sound Workshop series 30, (2) Sony MX 20 mixers, Ampex MM 1200 24 track, Otari 5050 BII, (2) Denon DR M4 cassette decks, (12) Rebis gates, (4) Rebis de-essers, (4) Rebis comp/lim, (4) Rebis para. EQs, Rebis timer, (4) Rebis Mic/line arr.ps, (2) dbx 160X, (2) dbx 160, (2) UREI 1176LN, (2) Ashly SC 50, Klark Teknik 30/30, (2) Orban 622B, Crown EQ 2, MXR 170 EQ, Lexicon 93, 41 and 42, DeltaLab DL 2, Ursa Major Space

REMOTE RECORDING & SOUND REINFORCEMENT

NORTHEAST

Many of the listings in this directory also contain a code which indicates the specialties of each business: SO = sound reinforcement, SL = sound and lighting, ST = staging, ER = equipment rental, AR = audio recording, VR = video recording, AV = audio and video recording.



Station, Korg SDD 3000, Klark Teknik DN 700, Eventide 910 Harmonizer, MicMix XL 305, (4) Valley People Dyna-Mites, Orban 245E, (2) Shure Audio Masters. Over 60 mikes and directs including Sennheiser, Shure, Sony, E-V, AKG, Neumann, ASL, Sescam and Brooke Siren. We have many monitors to choose from like E-V, JBL, EAW, AR, Yamaha, Advent, Auratones and Big Reds for studio playback if needed. Crown and Yamaha power amps are used in the Truck. Chaos Audio communications and closed circuit TV is standard along with a 720 point Bantam jack bay with 57 Mic/line send and returns to the truck via 3 x 19 pair snake (additional lines available with no problem). We have all the splits you need up to 127 mikes. We have many other items and equipment available and are constantly adding and updating equipment and accessories, etc. Please call us for anything you don't see on this list!

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has worked with a wide range of clients. We specialize in live FM broadcasting, pre and post production audio for video and multi track live and/or studio recording. Our mobile unit can be docked at your favorite "in house" location or any venue desired. Recording with ASL Mobile will accommodate your producers, engineers, artists and guests in a relaxing atmosphere of your home, etc. or give them the excitement of a concert and the full big sound of a large hall.

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(212) 466-0234
Contact: Chuck Cali

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SOUND REINFORCEMENT
ER, SO
315 Mt. Read Blvd., P.O. Box 60977 Lyell Station,
Rochester, NY 14606
(716) 328-1220; 328-0066
Contact: Dave Baker

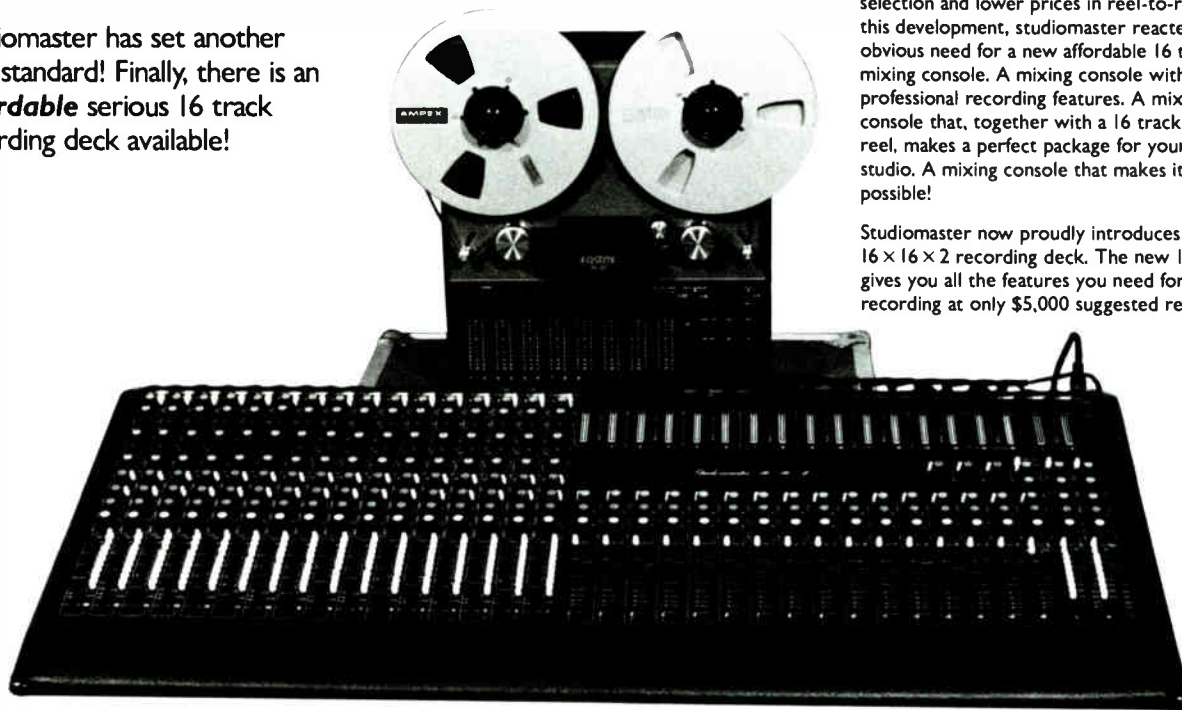
BRITANNIA ROW PRODUCTIONS, INC.
SOUND REINFORCEMENT
21-29 45th Rd., Long Island City, NY 11101
(516) 799-9597
Contact: Micky Treadwell, Kevin Hartmann

BRONEN ENTERPRISE
393 N. Central Ave., Hartsdale, NY 10530
(914) 428-3393
Contact: Jack Brown

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Contact: Brooks Equipment Leasing

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Contact: H. Barnum Cole

C&C STUDIOS
REMOTE RECORDING
AV
R.D. #1, Box 581-A, Glassboro, NJ 08028
(609) 881-7645
Contact: Edward P. Candelora, Jr.

CAPE COD AUDIO/CHARLIE'S MUSIC
SOUND REINFORCEMENT & REMOTE RECORDING
ER, SL, AR
80 Enterprise Rd., Hyannis, MA 02601
(617) 617-1710
Contact: Lee Davis

CAPRON LIGHTING AND SOUND CO. INC.
SOUND REINFORCEMENT
ER, SL, ST
278 West St., Needham, MA 02194
(617) 444-8850
Contact: Jay Arthur

CARUSO MUSIC STORE, INC.
SOUND REINFORCEMENT
SO
20 Bank St., New London, CT 06320
(203) 442-9600
Contact: Richard Caruso

CENTRAL JERSEY SOUND CENTER
SOUND REINFORCEMENT
SO
P.O. Box 332, 2137 Route #35, Oakhurst, NJ 07755
(201) 542-4100
Contact: H. Ducore

CINA-SOUND, INC.
SOUND REINFORCEMENT
SO
168 W. Camden Ave., Moorestown, NJ 08057
(609) 234-8948
Contact: Frank Conicella or John Langan

CLAIR BROS.
SOUND REINFORCEMENT
P.O. Box 396, Littitz, PA 17543
(717) 665-4000
Contact: Greg Hall

COLLEGIUM SOUND, INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
35-41 72nd St., Jackson Heights, NY 11372
(212) 426-8555
Contact: Don Wade

COMMUNICATION CONTRACTORS CO.
SOUND REINFORCEMENT
SO
956 Wyoming St., Allentown, PA 18103
(215) 439-4063
Contact: James A. Landis

COMMUNITY LIGHT & SOUND, INC.
SOUND REINFORCEMENT
SO
333 East 5th St., Chester, Pa 19013
(215) 876-3400
Contact: Thomas C. Walter

CONNECTRONICS CORPORATION
SOUND REINFORCEMENT & REMOTE RECORDING
SO
652 Glenbrook Rd., Stamford, CT 06906
(203) 324-2889
Contact: Richard Chilvers

CRYSTAL CLEAR AUDIO
SOUND REINFORCEMENT
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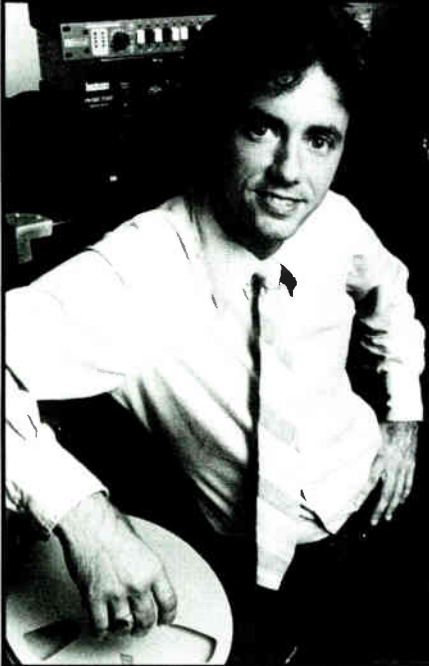
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FOR THE DIGITAL ERA

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PRS

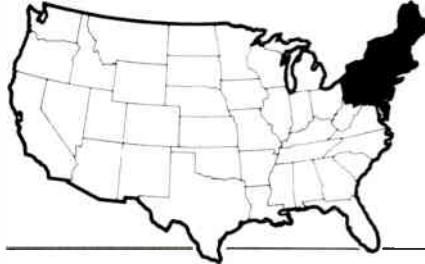
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CRYSTAL SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
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9 Thomas Dr., West Springfield, MA 01089
(413) 739-7763
Contact: James Koppel

DEMO-VOX SOUND STUDIO, INC.
REMOTE RECORDING
1038 Bay Ridge Ave., Brooklyn, NY 11219
(212) 680-7234
Contact: Laura Grassi, studio manager



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Bloomfield, NJ

DIGITAL BY DICKINSON
REMOTE RECORDING
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(201) 429-8996
Contact: Enn Ohlsen or Frank Dickinson, Jr

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SOUND REINFORCEMENT
103 Towantic Hill Rd., Oxford, CT 06483
(203) 723-0346
Contact: Tom Young

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(516) 582-6700 or (212) 895-6700
Contact: Basil Matychak, Jack Kanakaris

ECHO AUDIO
SOUND REINFORCEMENT
SO
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(201) 382-1571
Contact: Gary Fannel
Services Available: Specializing in small to mid-sized rooms (350-2800 people) for professional acts only



EFFANEL MUSIC
New York, NY

EFFANEL MUSIC
REMOTE RECORDING
P.O. Box 454, Effanel Station, New York, NY 10014
(212) 807-1100
Contact: Randy Ezratty
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65 Clinton St., Malden, MA 02148
(617) 321-1017
Contact: Mark Hanrahan

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SOUND REINFORCEMENT & REMOTE RECORDING
7400 Alaska Ave. N.W., Washington, DC 20012
(202) 882-6660
Contact: Patricia Heck

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SOUND REINFORCEMENT & REMOTE RECORDING
SL; ST; AV
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(201) 792-3604
Contact: Pierre Manen, Edward E. Hauser C A C

ESPN MOBILE PRODUCTION SERVICES
REMOTE RECORDING
ESPN Plaza, Bristol, CT 06010
(203) 584-8477
Contact: Carl Peterson

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FAX PRODUCTIONS
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VR
 4924 Hampden Lane, Bethesda, MD 20814
 (301) 652-7800
 Contact: Paul Manning

FEDCO AUDIO LABS
REMOTE RECORDING
AR
 60 Manning St., Providence, RI 02906
 (401) 272-3157
 Contact: Jeff Eustis

FSR, INC.
SOUND REINFORCEMENT
 40 Commerce Rd., Cedar Grove, NJ 07009
 (201) 783-3966
 Contact: William G Fitzsimmons

CHRIS GATELY AUDIO SERVICES
REMOTE RECORDING
AR
 P.O. Box 526, Bryn Mawr, PA 19010
 (215) 525-3605
 Contact: Chris Gately

GBH PRODUCTIONS, UNIT 4
REMOTE RECORDING
 125 Western Ave., Boston, MA 02134
 (617) 492-9273, 492-2777
 Contact: Jane Pikor, Steven Colby
Equipment: 40 x 24 Automated Processes mixing system, (2) Otari MTR 90 24 track, (2) Ampex ATR 102 2 track, UREI 811, Auratone monitors, dbx 903, 162 compressor/limiters, Lexicon 224 digital reverb, PCM41 effects units, 24 channels Dolby noise reduction, RTS communications and distribution amps, 2,000 point patching system; studio quality mike inventory, custom multi cable system featuring 40x3 Jensen transformer mike splitter. Production lounge/announcer area w/audio and video systems. Fully isolated AC power system. Ampex ATR 104 1/2" recorder, Adams-Smith synchronizer and video cassette playback facilities available on request.
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 (716) 442-6209
 Contact: Tom Greene

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SL, ST, AR
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 (617) 661-1520
 Contact: Terry Hanley, Dan Kidwell

HI-FI CENTER
SOUND REINFORCEMENT
 511 Walnut St., McKeesport, PA 15132
 (412) 672-6921
 Contact: Stanley Kaminski

IMMEDIA SOUND
SOUND REINFORCEMENT
SL
 11 Catherine St., Worcester, MA 01605
 (617) 791-3366
 Contact: Gerry Kopoyan

INDEPENDENCE COMMUNICATIONS, INC.
SOUND REINFORCEMENT
 960 Rittenhouse Rd., Norristown, PA 19403
 (215) 666-7550
 Contact: William J Ahern

JERRUTH RECORDING STUDIO
REMOTE RECORDING
 930 N. Duke St., York, PA 17404
 (717) 854-2542
 Contact: Jerrold D. Duncan

K&M SOUND CO.
SOUND REINFORCEMENT
SO
 412 Farmington Rd., Mars, PA 16046
 (412) 776-2075
 Contact: Mark Lapsansky

KOLLAR SOUND & RECORDING
REMOTE RECORDING
AV
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 (215) 643-6427
 Contact: Gregory Kollar

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 363 Adelaide St. East
 Toronto, Ontario M5A 1N3

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(617) 244-6881
Contact: Phil Sills

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1890 E. Marlon Pike, Cherry Hill, NJ 08003
(609) 424-4660
1605 E. Trapelo Rd., Waltham, MA 02154
(617) 890-6325
Contact: Jim Landy, David Newborg

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(212) 477-2694
Contact: Hector Lavergne

LE STUDIO INC.
REMOTE RECORDING
AR
715 Boylston St., Boston, MA 02116
(617) 267-2825
Contact: Samuel Boroda

PETER LEWIS PROFESSIONAL AUDIO SERVICES
SOUND REINFORCEMENT
SO; ST
231 East Prospect Ave., Mount Vernon, NY 10550
(914) 667-5856
Contact: Peter Lewis, President

LITTLE CORNERS SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
38-30 209th St., Bayside, NY 11361
(212) 631-0701
Contact: Eddie Ajajian

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Rt. 6N South Lake Blvd., Mahopac, NY 10541
(914) 628-7172
Contact: Russ Seavelli

MANNA PRODUCTIONS, INC.
SOUND REINFORCEMENT
128 Colonial Parkway, 4H North, Yonkers, NY 10710
(914) 337-4462
Contact: Concert Sound Division

MARYLAND SOUND INDUSTRIES, INC./
NORTHWEST SOUND
SOUND REINFORCEMENT
SL, SO; ER
4900 Wetheredsville Rd., Baltimore, MD 21207
(301) 448-1400
Services Available: MSI/NW specializes in international sound reinforcement services. Our offices are in Baltimore, Portland and Hong Kong. Current touring client list ranges from Stevie Wonder and Hall & Oates to Frankie Valli, Manhattan Transfer and Frank Sinatra. We offer complete air-ride trucking services and state-of-the-art equipment.

MIDDLE HOUSE SOUND COMPANY
SOUND REINFORCEMENT
512 Kingman St., East Taunton, MA 02718
(617) 823-5127
Contact: Rick Washburn

JON MILLER PRODUCTION STUDIOS
SOUND REINFORCEMENT & REMOTE RECORDING
SL; ST; AV
7249 Airport Rd., Bath, PA 18014
(215) 837-7550
Contact: Jon Miller

MISTY MORNING PRODUCTION, INC./
NORTHERN LIGHT LIMITED
SOUND REINFORCEMENT & REMOTE RECORDING
SL; ST; ER
#1019 Linda Rd., Darley Woods, Wilmington, DE 19810
(302) 475-4644, Studio B
Contact: Will Griffith
Services Available: Remote/studio recording, concert sound reinforcement, theatre/state production. Staff: Technical, concert, recording engineers, lighting directors, operation, staging, stage.

REMOTE RECORDING & SOUND REINFORCEMENT

NORTHEAST

Many of the listings in this directory also contain a code which indicates the specialties of each business. *SO* = sound reinforcement, *SL* = sound and lighting, *ST* = staging, *ER* = equipment rental, *AR* = audio recording, *VR* = video recording, *AV* = audio and video recording



road crew personnel. Although being a very young corporation, it has become one of sound reputation. We at M M P consider ourselves professionals at/on every stage of business. Private contracts available for established units or venues of all sizes, local or long distance. Contracts covering all services, available on short or long term. All clients are handled by phone or appointment only. Any scale of business will be accepted. Call for info/appointment or send for standardized estimate or service contracts.

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REMOTE RECORDING
AV
Berkshire Rd., Southbury, CT 06488
(203) 264-2659
Contact: G Rothar

MOTORCITI REMOTE
899 Troy Ave., Brooklyn, NY 11203
(212) 282-7344
Contact: Detroit Brothers

MUSKRAT PRODUCTIONS, INC.
REMOTE RECORDING
44 North Central Ave., Elmsford, NY 10523
(212) 409-1902
Contact: Bruce McNichols

NATIONAL VIDEO CENTER/RECORDING STUDIOS
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AV
460 W. 42nd St., New York, NY 10036
(212) 279-2000
Contact: Sales

NATIONAL VIDEO INDUSTRIES, INC.
REMOTE RECORDING
VR
15 West 17th St., New York, NY 10011
(212) 691-1300
Contact: Allen B. Goldman

N.B.F. SOUND SYSTEMS INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
Star Route, Box 22, New Hope, PA 18938
(215) 862-2624
Contact: Brian A. Skinner

NICKEL RECORDING
REMOTE RECORDING
168 Buckingham St., Hartford, CT 06106
(203) 524-5656
Contact: Jack Siang

THE NINETEEN RECORDING STUDIO
REMOTE RECORDING
AR
19 Water St., So. Glastonbury, CT 06073
(203) 633-8634
Contact: Steve Fanelli

OFF THE WALL SOUND
SOUND REINFORCEMENT
SO
10 Howland Circle, West Caldwell, NJ 07006
(201) 228-4099
Contact: Dennis Wall

PALACE AUDIO
SOUND REINFORCEMENT
SL
61 Field St., Waterbury, CT 06702
(203) 575-0357
Contact: Pat Temporale

PITTSBURGH COMMUNICATIONS CORP.
SOUND REINFORCEMENT
431 McNeilly Rd., Pittsburgh, PA 15226
(412) 344-3555
Contact: Michael L. Bieda, Fred Soop

PMA ENGINEERING
SOUND REINFORCEMENT
2600 Commercial Dr., No. Providence, RI 02904
(401) 353-6221
Contact: Mr. Peter M. Archambault

PRAGMATECH SOUND CORP.
SOUND REINFORCEMENT & REMOTE RECORDING
SO; VR

4516 Byron Ave., Bronx, NY 10466
(212) 325-8888
Contact: Tim Sala
Equipment: Yamaha PM 2000 32 channel mixing console, full range horn loaded speaker boxes, Gauss and JBL components Crown & BGW power, Lexicon digital delay, UREI & MXR equalization. In house production via our video concert sound stage. 10 ton capacity on our Truss. 200 KW power available. Box trucks available.

PROFESSIONAL MUSIC AUDIO
SOUND REINFORCEMENT
SL
2600 Commercial Dr., N. Providence, RI 02904
(401) 353-6221
Contact: Peter M. Archambault

PROFESSIONAL RECORDING AND SOUND
SOUND REINFORCEMENT
1616 Soldiers Field Rd., Boston, MA 02135
(617) 254-2110
Contact: Mr. Peter Engel, President

PROPHETIC GOSPEL SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AV
597 E. 95th St., Brooklyn, NY 11236
(212) 346-3513
Contact: Karl Williams

PROTEX BLUE ROCK ENTERTAINMENT
SOUND REINFORCEMENT
SL
Box 564, Newburyport, MA 01950
(617) 462-1361
Contact: Tom Reeves, Darlene Rowe

PYRAMID SOUND
SOUND REINFORCEMENT
SO
1401 N. George St., York, PA 17404
(717) 843-4230
Contact: Jay, Duncan

RAINWATER RECORDING
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
c/o Phoenix Audio, 91 Elm St., Manchester, CT 06040
(203) 684-5617 or (203) 649-0342
Contact: Rob Rainwater

RCI SOUND SYSTEMS
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
8550 2nd Ave., Silver Spring, MD 20910
(301) 587-1800
Contact: Dave Hoover

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Student — With the new upsurge in audio recording courses offered by universities, more and more men and women are entering the recording business. What they need to get a head start is a complete step-by-step guide on "How to" make money in a recording business. Also included are thoughts on starting your own business.

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SMS unfolds for you a precise blue print for personal and career success

Not only does SMS give you a detailed model of success, more importantly it provides you with a powerful learning system that allows you to internalize and master the 12 audio sessions... and to program every cell of your mind with BEHAVIORS, ATTITUDES, and SKILLS of the higher achiever in the recording business.

Why Do I Need the SMS Program

When you invest in the SMS program you live with the experts in the recording industry, absorb their ideas and let them stimulate your ideas. You profit from many years of hard-won knowledge and experience. From many thousands of dollars of professional know-how. Hundreds of ideas are compressed and simplified to offer you the most practical, proven successful, ways of running a recording business.



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12 powerful, idea packed sessions in 6 audio cassettes that can be learned and developed into a wealth-making system that works for you.

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Record Pressing & Packaging Companies · Commissions · Establishing A Record Co. · Publishing · Arranging · Charting
- **Jingle Production**
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- **Radio, Television Production**
Announcers · Music and SFX libraries · duplication · Advertising Agencies · Broadcast companies · Public Relations
- **Video Production**
Profile of the market · Marketing Techniques · Profit Potential · How to develop new Businesses
- **On Location Recording**
Artist · Speakers · Conventions · Weddings · Churches
- **Goal Setting & Achievement**
How to achieve your income goals · How to set priorities · How to get what you want · Creating an image of achievement
- **Finance Planning & Strategies**
The most powerful wealth building strategies · How to speed the flow of profits · Don't let money hold you back
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Selling techniques for your recording business · Making the opportunities come to you · The key to added profits
- **Advertising & Promotion**
How to build a big name fast · How to generate new clients · Planning a successful campaign

- Enhance your leadership skills · Motivate others · Solve Problems · Learn how to manage Money, Time, Ideas, People
- **Constant Habits of High Achievers**
A model for success · Attract wealth ideas like a magnet · Multiplying profits becomes a life long habit
- **Building A Successful Operation**
How to capitalize on your abilities and experience · Enjoy learning the secrets of Business success

Also included is your print progress guide which contains simple but effective "How to" ideas to put ATTITUDES, CONCEPTS, STRATEGIES and TECHNIQUES you'll gain into immediate action. Easy to use guide lines help reinforce success principles for bigger profits.

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Easy To Use! What a simple and convenient way to learn in HOURS what usually takes YEARS to accumulate. When you listen in your car, studio, or home what you get is a time saving source of money making ideas that work for you.

Complete! No other audio cassette program on the market today contains such a wealth of information on the RECORDING and MUSIC INDUSTRY and how to make money in it.

Improves Performance! The SMS program will enable ALL individuals to constantly achieve high levels of CREATIVITY, EXCELLENCE, and SUCCESS in their chosen endeavors in the recording business.

Gets Results! "How to make money in the recording business" is the most powerful tool available today for PERSONAL ACHIEVEMENT and SUCCESS in the recording field. The SMS program will give you the necessary INSIGHTS and SKILLS needed to meet and surpass your income goals.

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Pick up your phone or fill out the coupon and make what could be the most important move of your career. We're ready to help you enjoy a rich, more profitable recording income. But you've got to take the first step.

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Yes, I want to know "How to make money in the recording business." Please send me _____ copy(s) of the 5 cassette, 12 audio sessions and Progress guide album at the special introductory price of \$69.95 plus 3.00 postage and handling.
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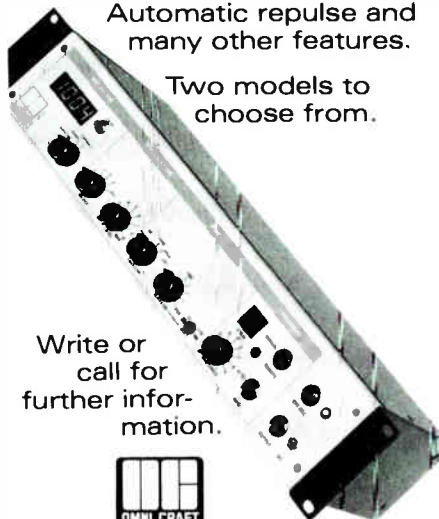
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REMOTE RECORDING
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(609) 963-3000
Contact: Pat Landon

RECORDINGS
REMOTE RECORDING
AV
336 Belmont St., Watertown, MA 02172
(617) 926-0546
Contact: Sam Negri

RECORD PLANT STUDIOS LTD.
REMOTE RECORDING
AV
321 W. 44th St., New York, NY 10036
(212) 581-6505
Contact: David Hewitt, Randi Greenstein

REEL PRODUCTIONS
REMOTE RECORDING
AR
P.O. Box 427, Allston, MA 02134
(617) 576-2872

REELSOUND RECORDING CO. (East Coast Division)
REMOTE RECORDING
AR

P.O. Box 25, North East, MD 21901
(301) 287-2420
Contact: Dave Perkins
Equipment: 36' 1948 Flexible Bus unit, MCI 428LM console, Ampex AM-10 mixer, JBL 4313 and 4401 monitors, Crown power amps, Sony Color TV system, (2) dbx 160 limiters, Allison rack, (4) Gain Brains, (4) Kepexs, (2) UREI 9 band graphic's, RTS intercom, MCI JH-114 24 track recorder, Ampex 440B 2 track, (2) cassette decks, 32 input Jensen splitter system, MicMix XL-305 reverb, DeltaLabs Effectron 3, E.V. Sony, Neumann, AKG, Beyer, PZM, Countryman, UREI DI's, Shure, Sennheiser microphones.

Services Available: 24 track remote recording, studio sound stage available 75' x 150', Yamaha C-7 grand piano, Hammond organ, Rhodes M-70 piano. Live in quarters with meals available located on the Chesapeake Bay Credits Ted Nugent, Judas Priest, Journey, Genesis, Triumph, ZZ Top, Willie Nelson Alabama, Oak Ridge Boys, Loretta Lynn, Dolly Parton, Tom Petty, The Gap Band, Christopher Cross, Quarterflash, Amy Grant, Farrel and Farrel, Leon Patillo, O'Neil Twins, Rev James Cleveland, DeGarmo and Key Band, DIR Broadcasting, Epic records, Capitol records, Westwood One, PG Prod

RESOLUTION, INC.
REMOTE RECORDING
AV
1 Mill St., The Chace Mill, Burlington, VT 05401-1514
(802) 862-8881
Contact: William H. Schubert

Credits: Aside from being a full all Dolby A analogue recording facility with mix down to high speed half inch or PCM-F1 (3/4"), we are the largest real-time cassette duplicator in North America capable of producing 10,000 real-time cassettes a week. Our price and service as well as quality control are second to none. We duplicate for a dozen record labels. We are also a full one inch production facility SMPTE locked to our professional audio studio. We specialize in very high quality audio for video including digital audio for video.

ROAR PRODUCTIONS, INC.
REMOTE RECORDING
AR
6655-H Dobbin Rd., Columbia, MD 21045
(301) 596-0600
Contact: Steven Rosch, Gary Zeichner

RO-CEL ELECTRONICS
SOUND REINFORCEMENT & REMOTE RECORDING
SO, SL, AR
731 Butler St., Pittsburgh, PA 15223
(412) 781-2326
Contact: Jim Slaughaupt

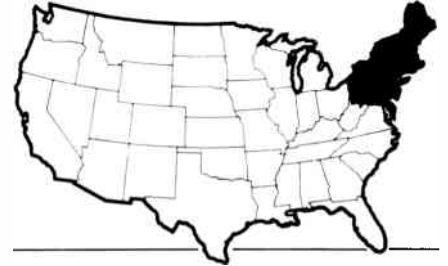
ROSNER CUSTOM SOUND, INC.
SOUND REINFORCEMENT
SO
11-38 31st Ave., Long Island City, NY 11106
(212) 726-5600
Contact: Alex Rosner

SAWMILL SOUND COMPANY, INC.
SOUND REINFORCEMENT
330 S. Dukeland St., Baltimore, MD 21223

REMOTE RECORDING & SOUND REINFORCEMENT

NORTHEAST

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(301) 624-7676
Contact: Mike Hanna

SCOOP AUDIO VISUAL
SOUND REINFORCEMENT
SL
Room 125 Union Bldg., Stony Brook, NY 11794
(516) 246-3316

SEAWIND AUDIO, INC.
REMOTE RECORDING
AV
1134 Fox Chapel Rd., Pittsburgh, PA 15238
(412) 963-7455
Contact: Thom Mechlin

Equipment: 1977 Ford E350, 14' x 7' control room heat and air conditioning, Tangent 3216 24x16 console, Otari MTR-90 16 track, Tascam 80-8 8 track, Technics 1520 2 track, dbx noise reduction, UREI LA-4 comp/limiters, Orban parametric EQs, Orban stereo reverb, RCA video monitoring system, Clear-Com intercom system, 3-way transformer mike splitter, condenser & dynamic mikes from AKG, Beyer, E.V. Sennheiser, Shure & Sony
Services Available: Complete 2, 8, 16/24 track remote recording, specializing in concerts and album work. Past activity includes live sessions with Mel Torme, The Charlie Byrd Trio w/Bud Shank then again with Herb Ellis and Barney Kessel, plus many other local and regional acts. Please call for more information or rates.

SECRET SOUND STUDIO INC.
REMOTE RECORDING
AV
147 W. 24th St., New York, NY 10011
(212) 691-7674
Contact: Jack Malkin

SHEFFIELD AUDIO VIDEO PRODUCTIONS
SOUND REINFORCEMENT & REMOTE RECORDING
ER, AV
13816 Sunnybrook Rd., Phoenix, MD 21131
(301) 628-7260
Contact: Nancy Scaggs

SHRUG PRODUCTIONS UNLIMITED
SOUND REINFORCEMENT
SO
Trent Building, S. Buckhout St., Irvington, NY 10533
(914) 591-6667
Services Available: Quality multi-mix monitor systems, club sound systems, live and dance club installations.

SIEDLE INTERCOM/U.S.A.
SOUND REINFORCEMENT
1 Wynnewood Rd. Bldg., Wynnewood, PA 19096
(215) 649-7722
Contact: Earl Zausmer

SIGHT & SOUND SYSTEMS, INC.
SOUND REINFORCEMENT
1236 MacArthur Rd., Whitehall, PA 18052
(215) 776-7100
Contact: Dean Lichtenwalner

SID STONE SOUND, INC.
SOUND REINFORCEMENT
 SO
 145 Ipswich St., Boston, MA 02215
 (617) 262-2470
 Contact: Paul Carelli



SKYELABS INC.
 Dover, DE

SKYELABS INC.
REMOTE RECORDING
 AV
 58 W. Tidbury Dr., Dover, DE 19901
 (302) 697-6226
 Contact: Bob Skye
Equipment: "Rover", the Skyelabs' mobile recording unit is a GM PD4106 Motor Coach fully outfitted for two to 24 track live or "in house" recording. Tape machines: MCI JH-24 24 track w/Autolocator III; Ampex AG 440B 1/2" 4/2 track, Ampex 351/440 2 track, Technics RS 1500 2 track Console Sound Workshop Series 30 36x24, Sound Workshop 12808 12x8 expander. Monitor amps: Phase Linear; Crown. UREI 811A monitors; Auratone monitors. Outboard gear: UREI EQ, Delta-

graph EQ, UREI LA 3A; Gain Brain, DeltaLab DL-4, Master Room XL-305 reverb, various gates and limiters, more on request, RTS Communications. Microphones: Sennheiser, Shure, E-V, AKG, Sony. Misc.: 330' 42 x 3 audio snake.
Services Available: Live concert recording, remote broadcast. A/V audio link, in house recording anywhere you desire with cue feeds, mikes, headphones, etc. Skyelabs offers a mobile control room environment unlike any you have worked in before. "Rover" is the first and only certified LEDE™ mobile control room which features an acoustic accuracy that surpasses many in-house control rooms. We specialize in dreams, ideas and flexibility so that spontaneity and creativity are always preserved in your project.

SMILING EARS SOUND
REMOTE RECORDING
 AR
 10167 Pasture Gate Lane, Columbia, MD 21044
 (301) 730-3695
 Contact: Gary Zeichner

SOLO SOUND
SOUND REINFORCEMENT
 SL
 83-55 Austin St., Kew Gardens, Queens, New York, NY 11415
 (212) 849-9733
 Contact: Lenny Kotke

SOUTHERN AUDIO
SOUND REINFORCEMENT
 SL
 800 Archer St., Millville, NJ 08332
 (609) 825-3182 (George Cuccia)
 (609) 691-1075 ext. 54 (David Duffield)
Services Available: Designing and manufacturing of custom lighting systems. House sound & lights. The Med, Sommers Point, NJ; Alexanders, Browns Mills, NJ. Credits: A's, AWB, Babys, Chuck Berry, Black Oak Arkansas, Blue Magic, Karla Bonoff, Brooklyn Bridge, Coasters, Joe Cocker, Commets, Crack the Sky, Derringer, Dovells, Drifters, Jay Ferguson, Steve Forbert, Full House, Lowell George, Good Rats, Grease Band, Hall & Oates, Horslips, David Johanson, Eddie Kendricks, Kenny Loggins, Marshall Tucker, John Mayall, Model One, Nektar, Point Blank, Ramones, Rockets, Romantics, Rundgren, Sea Level, Skyy, Squeeze, Steppenwolf, Tower of Power, Travers, Village People, Edgar Winter, Johnny Winter, McQuinn, Clark & Hillman

STEED AUDIO INC.
SOUND REINFORCEMENT & REMOTE RECORDING
 1133 Pennsylvania Ave., Monaca (Pittsburgh), PA 15061
 (412) 728-1234
 Contact: Vince Steed or Tom Beck

STUDIO DUAL REMOTE/BROADCAST DIVISION
REMOTE RECORDING
 Box 4395 Station A, Portland, ME 04101
 (207) 773-7176
 Contact: John Elnier

STUDIO 198 PRODUCTIONS, INC.
SOUND REINFORCEMENT & REMOTE RECORDING
 AV
 198 Bloomfield Ave., Newark, NJ 07104
 (201) 481-0972
 Contact: Greg Furgason
Equipment: Itam 1610 i6 track, dbx, Ampex MM1200 16 track, Otari MX-5050 8D/dbx 155s 8 track, Ampex PR10 1/2 track, 3M UR 210/Sony PCM-10 digital mastering system, Pioneer RT 2022 1/2 track, Otari MX-5050B 1/2 track; Pioneer C77 1250 cassette and Sony TC 158SD cassette, custom built 20 x 8 Yamaha PM700, Harrison "Alive" 16x16x16x8, Soundcraftsman PA 5002, Dynaco ST 110/C 100, Bose 800, E-V Sentry, Gauss 3-way speakers; Echo reverb and delay; Marshall Time modulator, MXR flanger, Space Station, AKG BX10, Audioarts parametric EQ, Ashly SC 50 limiters, dbx 163 limiters, dbx 160 limiters, Sansui SE-7 graphic EQ, RG Expander, Shure MK63, Ampex MX35 tube mixer, Shure M67 4x1 Mikes, Sennheiser MD421s, E-V RE11s, 664, 66, 1776, Sony ECM50; Shure SM57s, SM58s and SM60
Services Available: Color and black & white video production, digital 2 track mixdown, audio layback to video, sound reinforcement, location recording. Studio 198 is a warm and congenial production company dedicated to the highest levels of broadcast and music production. Our clientele includes radio stations, major record labels, independent producers, religious organizations and law firms. We will guarantee our work and do not charge for set up time. Sound reinforcement and location recording for artists and producers are easily arranged to fit the individuals time and budget restraints.

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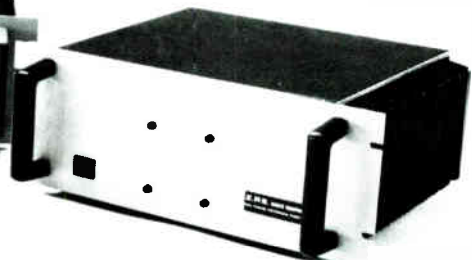
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 800W 4 OHMS

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300W 8 OHMS
 450W 4 OHMS
 900W 8 OHMS
 Bridge mode

\$876.00



250W 8 OHMS
 350W 4 OHMS

POWER OUTPUT, RMS PER CHANNEL 20 Hz — 20 kHz

SLEW RATE
 75V per microsecond

TOTAL HARMONIC DISTORTION
 Less than 0.015% up to rated output

Authorized Dealer



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 Thousand Oaks, CA 91359

Professional Audio

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 (818) 843-6320

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SOUND REINFORCEMENT
 SO
 518 Pleasant St., Northampton, MA 01060
 (413) 586-3465
 Contact: Herb Mayer

SUSQUEHANNA SOUND
SOUND REINFORCEMENT & REMOTE RECORDING
 SO, AV
 48 "A" St., Northumberland, PA 17857
 (717) 473-9733
 Contact: Bob Spangler

TECHNIARTS
SOUND REINFORCEMENT & REMOTE RECORDING
 SL, ST, AV
 8555 Fenton St., Silver Spring, MD 20910
 (301) 585-1118
 Contact: Judith Deitz

TELETIME VIDEO PRODUCTIONS
REMOTE RECORDING
 AV
 3 Grace Ave., Great Neck, NY 11021
 (516) 466-3882
 Contact: Andrew Ambrosio

TEL-E-VUE PRODUCTIONS
REMOTE RECORDING
 AV
 P.O. Box 217, Ferndale, NY 12734
 (914) 292-5965
 Contact: Paul Gerry

THEATRE WORKS
SOUND REINFORCEMENT & REMOTE RECORDING
 SL, AV
 1601 Village Square, Park Ave., Danbury, CT 06810
 (203) 743-5290
 Contact: Chris Pattacin

TOTAL STAGE ASSOCIATES
SOUND REINFORCEMENT
 SL
 224-56 77th Ave., Bayside, NY 11364
 (212) 445-3385
 Contact: Charlie Koepfel

UNISTAGE, INC.
SOUND REINFORCEMENT
 SL, ST, ER
 330 Genesee St., Buffalo, NY 14204
 (716) 853-6500

VIDEO COMMUNICATION SERVICES
REMOTE RECORDING
 AV
 208 Linden Ave., Riverton, NJ 08077
 (609) 786-1775
 Contact: Dyan Alan, Frank Siegel

VIZWIZ INC. TELEVISION PRODUCTION
REMOTE RECORDING
 AV
 115 Dummer St., Brookline, MA 02146
 (617) 739-6400
 Contact: Tony Armelin, Acct. Exec

WESTEC AUDIO VIDEO
SOUND REINFORCEMENT & REMOTE RECORDING
 AR
 1841 Broadway, New York, NY 10023
 (212) 586-1662
 Contact: R. Matland

ZENON SOUND COMPANY
SOUND REINFORCEMENT
 SO
 26 Sycamore Lane, Roslyn Heights, NY 11577
 (516) 621-0044
 Contact: Joe Light

REMOTE RECORDING & SOUND REINFORCEMENT

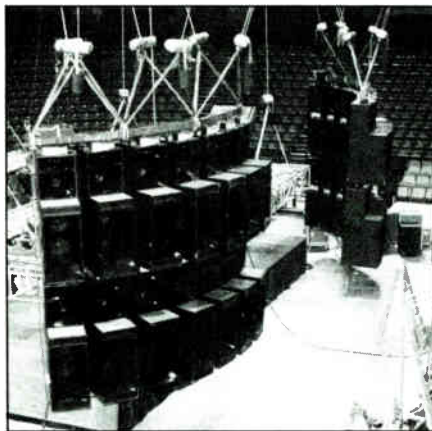
SOUTHEAST

Many of the listings in this directory also contain a code which indicates the specialties of each business: *SO* = sound reinforcement, *SL* = sound and lighting, *ST* = staging, *ER* = equipment rental, *AR* = audio recording, *VR* = video recording, *AV* = audio and video recording.

A&B PRODUCTIONS,
SOUND REINFORCEMENT & REMOTE RECORDING
 SL, ST
 1295 NW 90th Way, Coral Springs, FL 33065
 (305) 752-7317
 Contact: Brian Austin, Tony Brown

ADCO PRODUCTIONS
SOUND REINFORCEMENT & REMOTE RECORDING
 SL, VR
 7101 Biscayne Blvd, Miami, FL 33138
 (305) 751-3118
 Contact: Earl Wainwright

AMERICAN COMMUNICATION SERVICES, INC.
SOUND REINFORCEMENT
 P.O. Box 680297, Miami, FL 33168
 (305) 371-2513
 Contact: J. Cordie Miller, President



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 Burlington, NC

AMERICAN MULTIMEDIA INC.
SOUND REINFORCEMENT & REMOTE RECORDING
 SL, AV
 Rt. 8 Box 215-A, Burlington, NC 27215
 (919) 229-5554
 Contact: Clay Spivey

Equipment: 100,000 watts of Crown amplification for custom 4 way enclosures, JBL components, 20,000 watt subwoofer system for house. Over 5,000 watts for customized Altec monitors. Signal processing for house, monitors, and recording. Aphex, dbx, Dolby, Dynaflex, DeltaLab, EXR, Klark-Teknik, Orban, UREI, Lexicon Super Prime Time, Prime Time II, 224X with LARC Microphones. AKG, E-V, Crown PZM, HME & CETEC-VEGA wireless systems. Remote recording utilizing the NEVE 8108 32x24 console, Otari MTR 90 24 track, Otari MTR 12 2 track, 24 channels of dbx noise reduction & comp/limiters. Mastering by Studer, Otari, and JVC digital Monitors. UREI, JBL & Auratone 500,000 watts of computer controlled lighting mounted on custom trusses, including truss mounted spots. Strand Century computer light pallet and dimmer packs. Grass Valley 300 production switcher, Mark II DVE, Chyron graphics, Ikegami color cameras, Ampex VPR-2B 1" recorders. GE projection with 30" screens.

Services Available: Full sound and concert production includes sound reinforcement, lighting, video projection, audio/video remote recording, rigging, and transportation. Fully equipped audio/video post production studios include 24-32 track studio for over-dubbing and mixdown to 2 track JVC digital. Demo, album and music video packages available, staff writers/arrangers meet

any A/V or music production needs, including sound tracks and jingles. We are America's largest independent facility for quality high speed cassette and VHS duplication, featuring Electro Sound, Otari, and Gauss bin loop duplicators. In-house graphics and full color printing services insure quality custom printing of labels, inserts, and booklets.

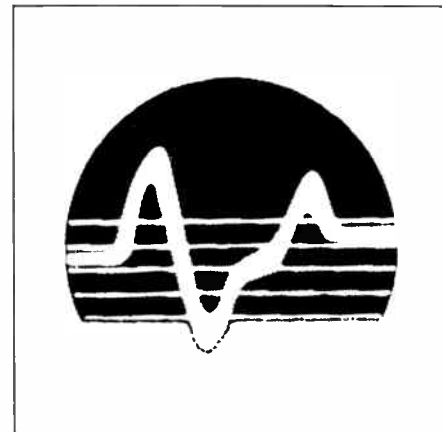


ARTISAN RECORDERS, INC.
 Pompano Beach, FL

ARTISAN RECORDERS, INC.
REMOTE RECORDING
 AR
 1421A S.W. 12th Ave., Pompano Beach, FL 33060
 (305) 786-0660 or 475-7969
 Contact: Peter Yanilo

Equipment: Vehicles: GMC 260 Transmode—27' L x 8' W x 10' H, 13,000 lbs gross weight. Support truck. Both flyable. Recorders: (2) MCI 24 track, (2) MCI 2 track, Nagra stereo portable, Technics cassettes. Mixer: 40 inputs via MCI 24x24 LM & Midas 16x4 Monitor. UREI 811A w/McIntosh amp. Secondary speakers on request. Outboard: Eventide Phaser & H949 Harmonizer, Ursa Major reverb, MXR and Roland DDLs. Alison Gain Brains and Keecees, Inovonics and UREI comp/limiters, UREI parametric EQs, Eventide Omnprocessors, Orban de-essers. Microphones: AKG, Neumann, Sennheiser, Sony, E-V, Shure, Schoeps, Bevier, Crown PZM, Jensen and Sescam DI boxes. Total 80+ 50 input transformer split stage box. Comm. Clear-com, UHF radios, wireless headphone system, CCTV.

Services Available: Now in our eighth year as an on location audio specialists serving the record, broadcast and film industries, we have earned a reputation as one of the finest remote recording companies in the business. The key to our success is people—a crew of highly trained individuals with an undying dedication to music with an undying dedication to music. Among our proud achievements are Gold and platinum award-winning albums recorded for: Pat Benatar, Heart, Jaco Pastorius, Pat Travers, Blackfoot, The Commodores, Crosby Stills & Nash, and The Outlaws. Television specials for Kenny Rogers, The Bee Gees, Roy Clark, The Allman Brothers, Wayne Newton, and The Pointer Sisters. Recording for George Martin, The Police, Supertramp, Triumph, Weather Report, Linda Ronstadt, The Temptations, Peter Frampton, Tammy Wynette and Al Jarreau. Flying our facility to Jamaica where we have recorded the Reggae Sunsplash Festivals since 1982. Thanks to you all!



ATLANTA SOUND AND LIGHTING
 Atlanta, GA

ATLANTA SOUND AND LIGHTING
SOUND REINFORCEMENT & REMOTE RECORDING
 SL, AV

500 Plasamour Dr. N.E., Suite #3, Atlanta, GA 30324

(404) 876-5600

Contact: Scott Waterbury

Equipment: Sound—Lights—Stage Equipment Soudcraft:
Eastern Acoustic Works, UREI, Crest, HGW, Lexicon, Eventide,
MasterRoom, Sennheiser AKG Shure E-V 4024 16 CH mains,
24x8 16x6 16x4 12x4 onstage monitors: Leprecon, ETA, L&E,
Altman, GE, ACLS, etc Haraworking, reliable crews with a
commitment to excellence"

Services Available: Men Without Hats Atlanta Symphony Or-
chestra Modern English X Tammy Wynette Miles Davis Winton
Marsalis, Pylon, T.G. Shephard Outlaws, R.F.M. Helen Reddy,
etc

AUDIO, LIGHT & MUSICAL

SOUND REINFORCEMENT

SL

3301 N. Military Hwy., Norfolk, VA 23518

(804) 853-2424

Contact: Jim Hogan

AUDIO UNLIMITED OF NORTH AMERICA, INC

SOUND REINFORCEMENT & REMOTE RECORDING

SL, ST, ER, AR

11 Battleground Ct., Greensboro, NC 27408

(919) 274-4682

Contact: Donnie Gardner

AURORA SOUND CO.

SOUND REINFORCEMENT

104 Verna St., Lafayette, LA 70508

(318) 837-1650

Contact: Claire "Ralph" Peyton, Bill Peyton

AVT TELEVISION PRODUCTIONS

REMOTE RECORDING

AV

1466 Amherst Rd., Knoxville, TN 37920

(615) 584-2166

Contact: Russ Manning

BACKSTAGE, INC.

SOUND REINFORCEMENT

SL, ST

310 W. Broad St., Richmond, VA 23220

(804) 644-1433

Contact: Fred Brumbach

BIAS RECORDING CO. INC.

REMOTE RECORDING

AR

5400 Carolina Place, Springfield, VA 22151

(703) 941-3333

Contact: Bill McElroy

BLACK NIGHT MOBILE RECORDING

REMOTE RECORDING

AV

1295 NW 9th Way, Coral Springs, FL 33065

(305) 752-7317

Contact: Brian Austin

"BOP/AV"

REMOTE RECORDING

AV

1521 Nassau Blvd., Charlotte, NC 28205

(704) 376-2864; 889-4508

Contact: Cal Walker

BROADCAST INTERNATIONAL INC.

SOUND REINFORCEMENT & REMOTE RECORDING

111 S.W. 2nd Ave., Ft. Lauderdale, FL 33312

(305) 463-1662

Contact: Bill Nassou Ken Cameron

CARLO SOUND & CASES INC.

SOUND REINFORCEMENT

2 Music Circle E., Nashville, TN 37203

(615) 259-0900

Contact: John Logan David Threest

CETACEA SOUND INC.

SOUND REINFORCEMENT & REMOTE RECORDING

SO, AR

2850 Lamb Pl. #5, Memphis, TN 38118

(901) 363-3856

Contact: John John or Tim

"What's a place like this doing in Charlotte?"



We're doing great records.

The best 24-track studios in the Carolinas are both
under one roof. Our roof.



1018 Central Ave., Charlotte, N.C. 28204, Ph. 704/377-4596

Circle #095 on Reader Service Card

HIGH-TECH AUDIO

AUGUST: STUDIO DESIGN SPECIAL ISSUE

- * Listings: Designers, Suppliers & Acoustical Consultants
- * Latest trends in studio design, construction and acoustical measurement
- * Studio Monitor Placement
- * Sound of the Olympics

Ad closing: June 7th

Materials due: June 15th

SEPTEMBER: SOUTHERN CALIFORNIA RECORDING

- * Listings: Studios of Southern California
- * News & views: the L.A. studio scene
- * Sound and vision at Lucasfilm
- ** Special Supplement: Digital '85—a magazine-length report on the emerging technologies

Ad closing: July 7th

Materials due: July 15th

OCTOBER: AES SHOW/NEW PRODUCTS DIRECTORY

- * Listings: New audio & video products for 1985
- * Maintenance Engineers forum on digital recorders
- * Sound on Stage: World's Fair Sound System
- * Commercial music production
- * Special features and interviews to be announced

Ad closing: August 7th

Materials due: August 15th

Circle #096 on Reader Service Card



COMMUNICATIONS CONCEPTS, INC.
Cape Canaveral, FL

COMMUNICATIONS CONCEPTS, INC.
REMOTE RECORDING
AV
7980 North Atlantic Ave., Cape Canaveral, FL 32920
(305) 783-5232
Contact: Jim Lewis

CUSTOM RECORDING & SOUND, INC.
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
1225 Pendleton St., Box 7647, Greenville, SC 29610
(803) 269-5018
Contact: Jere Davis

THE DANFORTH COMPANY
SOUND REINFORCEMENT
2543 Industrial Blvd., Orlando, FL 32804
(305) 299-2110
Contact: Mark H Dantorth

DUNHAM'S MUSIC HOUSE
SOUND REINFORCEMENT
1143 C Tunnel Rd., Asheville, NC 28805
(704) 298-4011
Contact: Randy Hughes

DUUWANNA SOUNDZ
SOUND REINFORCEMENT
SO
2329 Weddington Ave., Charlotte, NC 28204
(704) 372-7312
Contact: Randy Waters

ENTERTAINMENT SOUND PRODUCTION
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AR
7400 Alaska Ave., N.W., Washington, DC 20012
(202) 882-6660
Contact: Patti Heck

EXECUTIVE COMMUNICATIONS
SOUND REINFORCEMENT
2872 Hartland Rd., Falls Church, VA 22043
(703) 573-6910
Contact: Todd Morse

FABER ELECTRONICS COMPANY, INC.
SOUND REINFORCEMENT
SO
3825 Gilbert Ave., Suite 124, Shreveport, LA 71104
(318) 865-0282
Contact: Jim Faber

FANTA
REMOTE RECORDING
1213 16th Ave. South, Nashville, TN 37212
(615) 327-1731
Contact: Johnny Rosen
Equipment: 40 input Sphere console, (2) Ampex 24 tracks, (2) Ampex 2 track AG440Bs, Ampex 4 track, Nagra 4 2L, 2 cassettes, Eventide 910 Harmonizer, (4) Valley People Dyna-mite



FANTA
Nashville, TN

Dynamic Processors, (4) dbx 160s, (2) ADR Vocal Stressers, (2) UREI 1176, (2) dbx 163, Master-Room stereo reverb, McIntosh MC2105 amp, BGW, Sony and Pioneer amps, E-V Century 3s, JBL 4311, Auratones, 10 station/16 set earphone system, Clear-Com intercom, private channel 2-way radio, 17 channel mobile telephone, 5-line telephone system, color and B&W monitors, carry approximately 80 microphones, synchronizers for video lock-up
Services Available: Fanta has added within the last year two additional mobile recording trucks. The Criteria truck meets the needs of many of our clients who have smaller budgets but still require the quality of a Fanta remote. The third truck specifically meets the needs of dialogue recording for television and film



FCI PRODUCTIONS
Atlanta, GA

FCI PRODUCTIONS
SOUND REINFORCEMENT & REMOTE RECORDING
SO, ST; AV
3095 H Presidential Dr., Atlanta, GA 30340
(404) 458-0901
Contact: Arie Landrum

F&F PRODUCTIONS
REMOTE RECORDING
AV
10393 Gandy Blvd., St. Petersburg, FL 33702
(813) 576-7676
Contact: Marc Orgera, Production Mgr.

F.M.P.S., INC./FRANK McVEY SOUND
SOUND REINFORCEMENT
255 South Hanover Ave., Lexington, KY 40502
(606) 266-1955
Contact: Frank McVey

T.W. GARDEN & ASSOCIATES, INC.
SOUND REINFORCEMENT
P.O. Box 2608, Springfield, VA 22152
(703) 569-4500
Contact: Thomas W Garden

HI SEA MUSIC CO.
SOUND REINFORCEMENT
SO
500 E. Spanish River Blvd., Boca Raton, FL 33431
(305) 392-3930
Contact: Bill Cramer

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or write for a FREE brochure: 3301 N. Military Hwy., Norfolk, VA 23518

Circle #097 on Reader Service Card

IMAGE RESOURCES, INC.
REMOTE RECORDING
 VR
 801 S. Orlando Ave., Winter Park, FL 32790
 (305) 645-4200
 Contact: D. Armstrong

JALEX RECORDINGS
REMOTE RECORDING
 AR
 319 Clematis St., West Palm Beach, FL 33401
 (305) 832-1538
 Contact: Jon A. Lind

JOYFUL NOISE SOUND
SOUND REINFORCEMENT
 3206 Valley Lake Dr., Greensboro, NC 27410
 (919) 294-2301, (919) 668-7392
 Contact: Ron Massengale, Jim Reece

K&L PRODUCTION
SOUND REINFORCEMENT & REMOTE RECORDING
 SL, AV
 2749 N.W. 58 Terr., Lauderhill, FL 33313
 (305) 731-8236
 Contact: Leonard C. Williams

PAUL A. KADAR, INC.
SOUND REINFORCEMENT & REMOTE RECORDING
 SL, ST, AR
 11420 Airline Highway, Baton Rouge, LA 70816
 (504) 292-5105
 Contact: Paul Kadar

LONGS ELECTRONICS
SOUND REINFORCEMENT
 1580 Montgomery Hwy., Birmingham, AL 35216
 (205) 979-9022
 Contact: Porter Winfree

LONDON TOWN ASSOCIATES
SOUND REINFORCEMENT
 2101 S.W. 27th Ave., Miami, FL 33145
 (305) 858-7000
 Contact: R.C. Ganter

LOWRANCE SOUND & COMMUNICATIONS
SOUND REINFORCEMENT
 SO
 2132 Nailling Dr., Union City, TN 38261
 (901) 885-4504
 Contact: Mark A. Lowrance

MAS PRODUCTIONS
REMOTE RECORDING
 AV
 14951-61 N.E. 18th Ave., N. Miami, FL 33181
 (305) 949-6554
 Contact: M.J. Mas
Equipment: complete mobile production & post production capabilities. a 30' 6" camera production coach equipped with 1" (slo-mo) or 1/4" mastering, full four machine A/B/C roll availability, Microtime time base correctors, Sony PVM monitors, waveform monitoring, Chyron character generator (6 fonts), Shintron's new series 80 broadcast production switcher, 10 KW lighting package with scrims & filters. Audio: Soundcraft 16 x 8 x 2 mixing console, Otari 8 track recorder, (2) 2 track recorders, Prime Time digital delay, Orban compressor, limiter, de-esser, parametric EQ, etc. Last but not least Lounge, viewing room, dressing room, air-conditioning and Otari generator.
Services Available: Production capabilities in broadcast, CCTV production, commercials, music video, corporate, special effects, religious, industrial, sports and news

MOBILE AUDIO, INC.
REMOTE RECORDING
 AV
 P.O. Box 6115, 501 Broad St., Suite 313,
 Rome, GA 30161
 (404) 232-7844; 232-7846
 Contact: Rick Norvell
Equipment: 45' air ride trailer, control room 20' x 8'3", lounge 15' x 8'3". Tape recorders (2) Otari MTR 90 II 24 track, Otari MTR-12 1/2" 2 track Otari MTR 12-4 OB 1/2" 4 track, Sony #TCFX 1010 stereo cassette deck, Sound Workshop Series 34 36 in x 24 out audio console, Hafler #DH500 power amp, (3) Hafler #DH220 power amp, (2) Fostex LS3B monitors, (2) Electro-Voice #100A monitors, (2) Auratone 5C monitors, Lexicon #200 digital reverb unit, Valley People #430 stereo Dyna-Mite unit, Valley People #431 Dyna-Mite/Dyna-Mic Combo, (2) Valley People #HH 2x2 units w/rack mount, (2) dbx #160 X limiters, Audio Arts



MOBILE AUDIO, INC.
 Rome, GA

#4200A (stereo parametric EQ), Panasonic #3400 camera and power supply, (3) Panasonic #BTS 1900N color monitors, 300' video snake (2) 150' cables, BTX Sottouch System for two machines including Shadow Synchronizer, Cypher SMPTE Generator/Reader plus front panel, Video Character inserter Patch Bay for video interface
Services Available: Mobile Audio is primarily equipped to handle audio for video and 24 track remote recording of live performances. Mobile Audio can handle multiple audio feeds and radio interface. Comfortable audio and video monitoring lounge. Prepared for unlimited equipment possibilities. Additional equipment available upon request.

NASHVILLE REMOTE RECORDING
REMOTE RECORDING
 AR
 P.O. 40854, Nashville, TN 37204
 (615) 885-3238
 Contact: Jimmy Corn, Vic Gabany
Equipment: 3M 16 and 24 track machines, Ampex 8 track, PR 99 Studer 2 track, Audiotronics Peavey and Soundcraft mixing console, AKG Beyer EV plate mikes, Shure, Neumann and Sony mikes, dbx 160 limiters, Orban reverb, Valley Audio gain brains, Altec A75 and Yamaha 4115 house speakers, Altec 1221 and Yamaha monitors, Peavey and Crown amps
Services Available: Complete 8, 16 and 24 track custom album projects. Complete 24 channel PA for medium sized halls. Also on location production work and audio for video production.

PACE RECORDING SERVICE
SOUND REINFORCEMENT & REMOTE RECORDING
 SL, ER, AR
 2504 Bayou Rd., New Orleans, LA 70119
 (504) 949-2414
 Contact: Glen Himmaugh, Peter Schulman
Equipment: Location & studio recording with equipment by IBI, Gauss, mixing consoles include 32ch Soundcraft & Neotek. Tape recorders by Otari, Technics, Tascam and Sony digital 2 track. Complete line of mikes including Sennheiser, AKG, Shure & Audio Technica. Transformer & transformerless Splitter system. New Orleans' only remote recording truck housed in a Mercedes Benz bus. Recording album projects and specializing in high quality audio for video. Plus the area's "Largest & Most Complete" Sound and Lighting system. Concert sound to cover 1 to 100,000 all equipment specially rigged for flying 200,000 watts of lights and a full line of stage and studio instruments.

PARAGON PRODUCTIONS
 SL, ER, AR
SOUND REINFORCEMENT & REMOTE RECORDING
 720 Old Friendship Rd., Rock Hill, SC 29730
 (803) 324-0559
 Contact: Alan Smith

PATHWAY RECORDING STUDIO
REMOTE RECORDING
 AR
 6902 Mountain View Rd., Greensboro, NC 27410
 (919) 668-7392
 Contact: Jim Reece

PROFESSIONAL CONCERT SERVICES
SOUND REINFORCEMENT
 SL
 120 Park St., Tupelo, MS 38801
 (601) 842-0300
 Contact: J. Mark Xble

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 PROFESSIONAL SERVICES
 NASHVILLE, TENNESSEE
 615-327-1731

40 INPUT DUAL 24 TRACK
MOBILE RECORDING

PROFESSIONAL SOUND IND. (A division of PSI)
SOUND REINFORCEMENT
SO
2737 Dorr Ave., Fairfax, VA 22031
(703) 698-8888
Contact: Jon Kendall

PROGRESSIVE MUSIC STUDIOS
REMOTE RECORDING
AR
2116 Southview Ave., Tampa, FL 33606
(813) 251-8093
Contact: Ken Veenstra

QL MOBILE RECORDING
REMOTE RECORDING
314 Romano Ave., Coral Gables, FL 33134
(305) 446-2477
Contact: Rob Burr

RAVEN AUDIO
SOUND REINFORCEMENT
SL
1918 Wise Dr., Dothan, AL 36303
(205) 793-1329
Contact: Jerry Wise

RECORDING ASSOCIATES STUDIOS
REMOTE RECORDING
1045 Savannah Hwy., Charleston, SC 29407
(803) 556-5770
Contact: Ronald E. Clifton

REEL ROCK PRODUCTIONS
SOUND REINFORCEMENT
SL, ST
P.O. Box 6842, Tallahassee, FL 32314
(904) 877-1070
Contact: Larry Schmidt

REFLECTION SOUND STUDIOS
REMOTE RECORDING
AR
1018 Central Ave., Charlotte, NC 28204
(704) 377-4596
Contact: Mark Williams
Equipment: 18' truck, MCI JH 636 24 fully transformerless console w/VCA grouping, parametric EQ, (6) Dual mike pre's, MCI JH-24 transformerless 24-track recorder, dbx 900 frame w/gates, de-essers, compressors, dbx 160s, Orban stereo limiter, EXR, Audiotronics EQ, MCI, Revox and Otari 2-track recorders, AKG reverb, and lots of other great stuff

RIDENHOUR MUSIC CENTER
SOUND REINFORCEMENT
2 W. Main St., Salem, VA 24153
(703) 389-6415
Contact: Jim Ridenhour

ROADWORK AUDIO
SOUND REINFORCEMENT
SL, ST
P.O. Box 7070, Jackson, MS 39212
(601) 352-0135
Contact: Mike Allen
Services Available: Sound from 10 to 10,000, lights up to 200,000 watts, spotlights, staging, production, stage crew, motors and cabling for rigging. Our specialization is the pride we take in our work. Our service reflects it. Client satisfaction is always our foremost concern. Ask our clients: Conway Twitty, Louise Mandrell, Juice Newton, Lee Greenwood, Gail Davies, Ronnie McDowell, Sylvia, Janie Fricke, Hank Williams, Jr., U of Miss., Mill State, Melba More, SOS, Roy Ayers, Millie Jackson, ZZ Hill, The Manhattan, Ray Stevens and many more. If your standards are demanding, call Roadwork.

RUCKUS PRODUCTIONS
SOUND REINFORCEMENT
5123 Davidson Rd., Marietta, GA 30067
(404) 973-4387
Contact: Bryon Finkeler, Doug Harkinder

SAM'S TAPE TRUCK
REMOTE RECORDING
AR
2785 Osborne Rd. NE, Atlanta, GA 30319
(404) 237-9075
Contact: Joe Neil

SANDCASTLE RECORDING STUDIO
SOUND REINFORCEMENT & REMOTE RECORDING
SO; AV
Suite 109 Wade Hampton Mall, Greenville, SC 29609
(803) 235-1111
Contact: Christopher Cassels

SCHNEIDER'S MUSIC CENTER
SOUND REINFORCEMENT
829 Broad St., Augusta, GA 30901
(404) 722-5757
Contact: Ira Schneider

SECOND ADVENT, INC.
SOUND REINFORCEMENT
SO
2518 Southview Dr., Lexington, KY 40503
(606) 278-5852
Contact: Don C. Morgan

SEEBURG MUSIC LIBRARY AND SOUND SYSTEMS
5706 New Chapel Hill Rd., Raleigh, NC 27607
(919) 851-5823

SHADY LADY RECORDING STUDIOS
REMOTE RECORDING
AV
P.O. Box 156, Sarasota, FL 33578
(813) 351-2700; 758-9673
Contact: Sausha McInnis
Services Available: State of the art 8 track recording studio. New design techniques by master engineer "Sausha" and house technician Jay Aslinger. 4 and 8 track remote capabilities. Videos of all levels are available. Brand new studios and locations. Engineering schools to be added by mid-summer. Shady Lady—the different approach. Joanne McInnis owner, Sausha McInnis, engineer.

SONGBIRD STUDIO
REMOTE RECORDING
1715 DeFoot Ave., Atlanta, GA 30318
(404) 351-5955
Contact: Richard Head

SOUND HOUSE
SOUND REINFORCEMENT
P.O. Box 11491, Chickasaw, AL 36611
(205) 457-3331
Contact: Mike Evans

SOUNDS OF WINCHESTER
REMOTE RECORDING
P.O. Box 574, Winchester, VA 22601
(703) 667-9379
Contact: Jim McCoy

SOUNDS UNREEL STUDIOS
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ER, AR
1902 Nelson Ave., Memphis TN 38114
(901) 278-8346
Contact: Jon Hornyak, Don Smith
Equipment: Otari MTR 90-II 24 track, TEAC Tascam 80-8 w/dbx 8 track, Sound Workshop Series 30 MB 36 24 console, Otari MTR10 2 track, Yamaha, McIntosh, Crown, BGW amplifiers, Steven Durr custom monitors (JBL TAD) JBL 4311, Yamaha NS10M, Ursa Major 8x32 digital reverb, Korg Programmable digital delay, dbx 900 mainframe w/limiter-compressors noise gates and de-esser Symetrix 501 lim/comp, AKG Neumann, Shure Sennheiser E V Crown & Beyer mikes, wide assortment of rental equipment.

SPECTRUM RECORDING SERVICES
REMOTE RECORDING
536 Huffman Rd., Birmingham, AL 35215
(205) 833-6906
Contact: Noah White

SPECTRUM SOUND INC.
SOUND REINFORCEMENT
429 Space Park North, Goodlettsville, TN 37072
(615) 859-4381
Contact: Ken Porter

STEREO SALES AND AUDIO REPAIR SERVICES
SOUND REINFORCEMENT & REMOTE RECORDING
SO, ER, AR
637 West Tennessee St., Tallahassee, FL 32301
(904) 224-2635
Contact: W. T. Menasco

STUDIO B
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
1119 Bell St., Montgomery, AL 36104
(205) 834-6881
Contact: Harold Bearden

SUNSHINE SOUND RECORDING STUDIO
REMOTE RECORDING
AR
2826 Whitlock St., Louisville, KY 40213
(502) 968-8757
Contact: Carl Sandler

SWEETSONG PRODUCTIONS
REMOTE RECORDING
P.O. Box 2041, Parkersburg, WV 26102
(304) 489-2911
Contact: Roger Hoover

THE SYSTEM
SOUND REINFORCEMENT & REMOTE RECORDING
SL, ST, ER, AV
1924 N.E. 151st St., North Miami, FL 33162
(305) 947-3030
Contact: Mary Fleming, Richard Hilton

TELEVISION MATRIX
REMOTE RECORDING
AV
1666 Kennedy Causeway, Suite 601, Miami, FL 33141
(305) 868-2020
Contact: Frank Beacham

TURNKEY AUDIO VISUAL INC.
SOUND REINFORCEMENT & REMOTE RECORDING
P.O. Box 2184 Miller Park Square, Lynchburg, VA 24501
(804) 528-4448
Contact: Gairy Lynch

URANIAN CIRCUS SOUND STUDIOS
SOUND REINFORCEMENT & REMOTE RECORDING
SO, AR
P.O. Box 593, Misenheimer, NC 28109
(704) 463-7985
Contact: Jeffrey E. Balfrey

USC SOUND ENTERPRISES
REMOTE RECORDING
AR
190 Waynoka Lane, P.O. Box 11211, Memphis, TN 38111
(901) 458-0275
Contact: Rodney Peppenhorst



VALLEY AUDIO
Nashville, TN

VALLEY AUDIO
REMOTE RECORDING
2821 Erica Place, Nashville, TN 37204
(615) 383-4732
Contact: Bob Todrank
Services Available: Consultation, acoustical design, system design, equipment sales and complete equipment interfacing. Specialization: complete one stop turnkey facilities. Credits: Mobile Audio Rome GA.

VIDEO IMAGE, INC.
REMOTE RECORDING
AV
P.O. Box 11701, Ft. Lauderdale, FL 33339
(305) 561-1492
Contact: Randy Griffith

WARREN'S TV & SOUND SYSTEMS, INC.
SOUND REINFORCEMENT
301 Aldridge Rd., High Point, NC 27263
(919) 434-1303
Contact: Joseph J Warren

WILLCUTT SOUND SYSTEMS
SOUND REINFORCEMENT
SL, ST
419 Rosemont Garden, Lexington, KY 40503
(606) 276-2713
Contact: J. Robert Willcutt

WOLFE SOUND AND LIGHTING
SOUND REINFORCEMENT
SL
P.O. Box 11683, Montgomery, AL 36111
(205) 271-1823
Contact: Kevin or Stephen Wolfe

Z-LAND AUDIO SYSTEMS
5009 Timberhill Dr., Nashville, TN 37211
Contact: Charlie Burns

OUTSIDE U.S.

ACES (UK) LTD.
SOUND REINFORCEMENT
Featherbed Lane, Shrewsbury, Shropshire, England
(0743) 66671
Contact: P. Keeling

ALLSTAR SOUND EQUIPMENT LTD.
SOUND REINFORCEMENT
11212 143rd St., Edmonton, Alberta, Canada T5H 2Z9
(403) 452-2546
Contact: Clive Alcock

ANDROMEDA SOUND SYSTEMS
SOUND REINFORCEMENT
10 Donegall Park Ave., Belfast, N. Ireland BT15 4ET
(144) 232-772491
Contact: John Connolly
Equipment: Consoles used for front of house and stage monitoring are Soundcraft 2400 series. Power amps are BGW & Cidron. Loudspeaker system fully horn loaded utilizing Gauss, JBL & ATC driver. Outboard gear includes Audio+ Design Scamp compressors & gates, Klark Teknik graphics & UREI notch filters. The lighting system is controlled by Avolites dimmer packs and both Berkeley & Avolites desks are employed. Follow spots are by Ultra-Arc.
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Many of the listings in this directory also contain a code which indicates the specialties of each business: *SO* = sound reinforcement, *SL* = sound and lighting, *ST* = staging, *ER* = equipment rental, *AR* = audio recording, *VR* = video recording, *AV* = audio and video recording.



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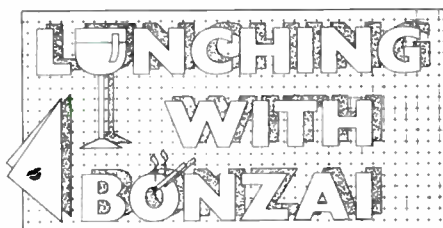


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LISTINGS CONTINUED ON PAGE 138

BERNARD 'PRETTY' PURDIE



by Mr. Bonzai

"Jeeze, this is unbelievable," I thought to myself. I had no idea that the record industry had changed so much since the '60s. I was astounded to hear that Bernard Purdie, known as "Pretty Purdie," was the drummer on many hit records by The Beatles, The Animals, The Rascals and The Monkees. Over lunch at the NAMM Show, he informed me that it had been a typical practice to re-record certain tracks, unbeknownst to the record buying public.

"Actually, most of them could play," explains Purdie. "That was not the major problem. The worst problem was that they couldn't always hold tempo. Time is everything. When you have a group without time, it isn't gonna happen. Nobody is going to buy it."

Bernard Purdie is credited as the most-recorded drummer in the world. By 1975, he had amassed over 3,000 album credits, and his breakdance pace has never slackened.

He began his performing career at the age of 10 in Elkton, Maryland. "I just wanted to play," he remembers. "My teacher was with a 14-piece big band and he used to get drunk every weekend. He would go to sleep in his car and I would finish the job, pack the drums and then drive him home."

Purdie's first paying job came at the age of 13. When his weekly salary surpassed the eight dollars he made on a newspaper route, he became a professional musician. "I could make as much as ten dollars a night—more than a whole week's wage," he says. "That was *big* money."

When artists such as James Brown, Ray Charles, Lloyd Price, Duke Ellington and Count Basie came through town, Purdie would sit in with their bands. "I was just the local boy who everybody raved about," he explains. "They would allow me to play with them. The best thing was that I was given real drum arrangements. I



PHOTO: MR. BONZAI

could read music, but I had been using trumpet parts."

His recording career began with Mickey & Sylvia ("Love Is Strange") in the late '50s. He would go on to become a session drummer with such acts as the Rolling Stones, Paul Simon, Steely Dan, Hall & Oates and Aretha Franklin, to name just a few.

Bonzai: What were those drum re-do sessions like?

Purdie: First of all, let me explain to you what was happening during the '60s. The record companies couldn't care less about who was playing in the bands. They were spending money and they wanted professionals to do the job. My job was to fix up whatever went wrong. I was paid to do this for 15 years.

Bonzai: Which Beatle cuts did you play on?

Purdie: I'd rather not specify which ones, but there were 21 tracks that I worked on in New York. This practice was common with many of the bands, especially the English groups. When I came in to a session the vibes were pretty strong, but I would go down the line and tell them about the other groups I had worked with. It meant trying to calm everybody down and showing them that it would work if they would allow it. I would tell them that it was still their record—they would make all the money and the glory. My job was to make sure that the records would sell.

Bonzai: Did this help your career as a musician?

Purdie: Oh, yes. It made me more

popular and more important to the record companies. I wasn't known to the public at all. It didn't bother me—I was doing 15 to 20 dates a week.

Bonzai: People probably wouldn't have believed you had played on those records anyway.

Purdie: There was no way that people would have believed me. Besides, I was paid to keep my mouth shut.

Bonzai: Were there other musicians working with you in this way?

Purdie: I had my studio band: Chuck Rainey on bass, Richard Tee on piano, Eric Gayle on guitar and Billy Buttman on guitar. The band became "Stuff" in the '70s.

Bonzai: Why do people call you "Pretty" Purdie?

Purdie: When I first came to New York a lot of people called me "Bernard Pretty," because they couldn't pronounce my last name. Then it became "Pretty" Purdie. My first name was dropped for ten years and in the '70s I began using my full name.

Bonzai: How did you fix drum tracks when the time had already been established?

Purdie: There are ways, although it is much more difficult to overdub drums on recorded tracks than it is to do them initially. But people forget that the quarter note is big—you can play on top of it, right on it, or right under it. I learned with an engineer how to go with the flow and to make my track dominant. The big problem was that I had to have the music so loud that I would leave sessions with my ears ringing. But I enjoyed the sessions because I had to play every conceivable kind of music. Luckily, I had the musical training and the knowledge to make it work.

Bonzai: Would you play all the way through, or were you just punching-in certain segments?

Purdie: Punching-in didn't really happen until the late '60s. Before that, you would hear a click if you punched in, so when I started I would just play on through the whole cut.

Bonzai: Would you get any comments from the drummers?

Purdie: Afterwards, they were usually grateful. The industry started to change and with groups like Boston it was a little different. There really wasn't a band. Tom Scholtz would play the guitar rhythms that he wanted and I would lay down drums with the bass player, Joe Mack, while he sang. Then they brought in the rest

of the band to overdub everything else. It was a way of life for me—I would go into a studio and work by myself or with a bass player.

Bonzai: Do you regret that your name wasn't on the early albums that you were especially proud of?

Purdie: Well, I'm proud of all of them. I only regret that my name wasn't there for my own longevity. I could have made a lot more money a lot faster if my name had been on the records. It took me many years to get to the point in life where I was making decent money. What I had to do was become a producer.

Bonzai: Do you have any projects in the works now?

Purdie: Yes, I'm writing a suite and working on an album with Galt MacDermot, who was the writer for *Hair*. I worked with him on that show, which used my band. Hilda Harris, an incredible singer who was trained in opera, is doing the vocals. The whole concept of the album is exciting for me. Victor Feldman and Vic Furth will be in the percussion section. It's great, because they're all my friends.

Bonzai: What does your role as an endorser of instruments entail?

Purdie: I've been with Zildjian for 15 years, and I have a very nice contract with them. As of this year's NAMM Show, I am with Pearl Drums, after a good relationship with Sonor for 15 years. On top of everything else, I just finished my book—after 25 years of writing. Everything that I've done musically is in my book, *Bernard "Pretty" Purdie's Drummer's Text-book Plus*. . . It's a very basic book, but it tells all. It will never be dated. It's the first book to individually cover a complete set of drums and progress all the way through chart reading.

Bonzai: Does your work take you beyond making appearances at musical instrument trade shows?

Purdie: Yes, I'm also a teacher and I conduct drum clinics. I love playing the drums and I'm pleased to give back to the public what they have given me over the years. Now it's time to give it back to the young ones. At about half of the clinics, I do concerts with high school and college bands. It's really a treat for me to do these clinics all over the world. ■

Bernard Purdie is to drums what Kareem Abdul Jabbar is to basketballs. The perfect potential artist found the perfect discipline. The mind and the muscles made the best of friends.

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DO YOU HEAR WHAT I HEAR?



BY DAVID WILSON

 "Daddy, what's the color orange?" My daughter's clear blue eyes searched me as only the eyes of a three-year-old can—calm, open, innocent and absolutely sincere.

"Orange is the color of the fruit called orange," I responded, vaguely annoyed that our fruit basket contained only bananas, and dark ones at that. Her stare continued. Perhaps she had seen too many unripe oranges.

"Debby, it's the color of Clyde," offered Davey, our ten-year-old who had recently lost a stellar Pac-Man performance to that sneaky orange gremlin.

"No, it's the color of a school bus," cried Daryl, our five-year-old who had just started kindergarten.

Somehow, these associations

eluded Debby, whose stare was now becoming rather blank.

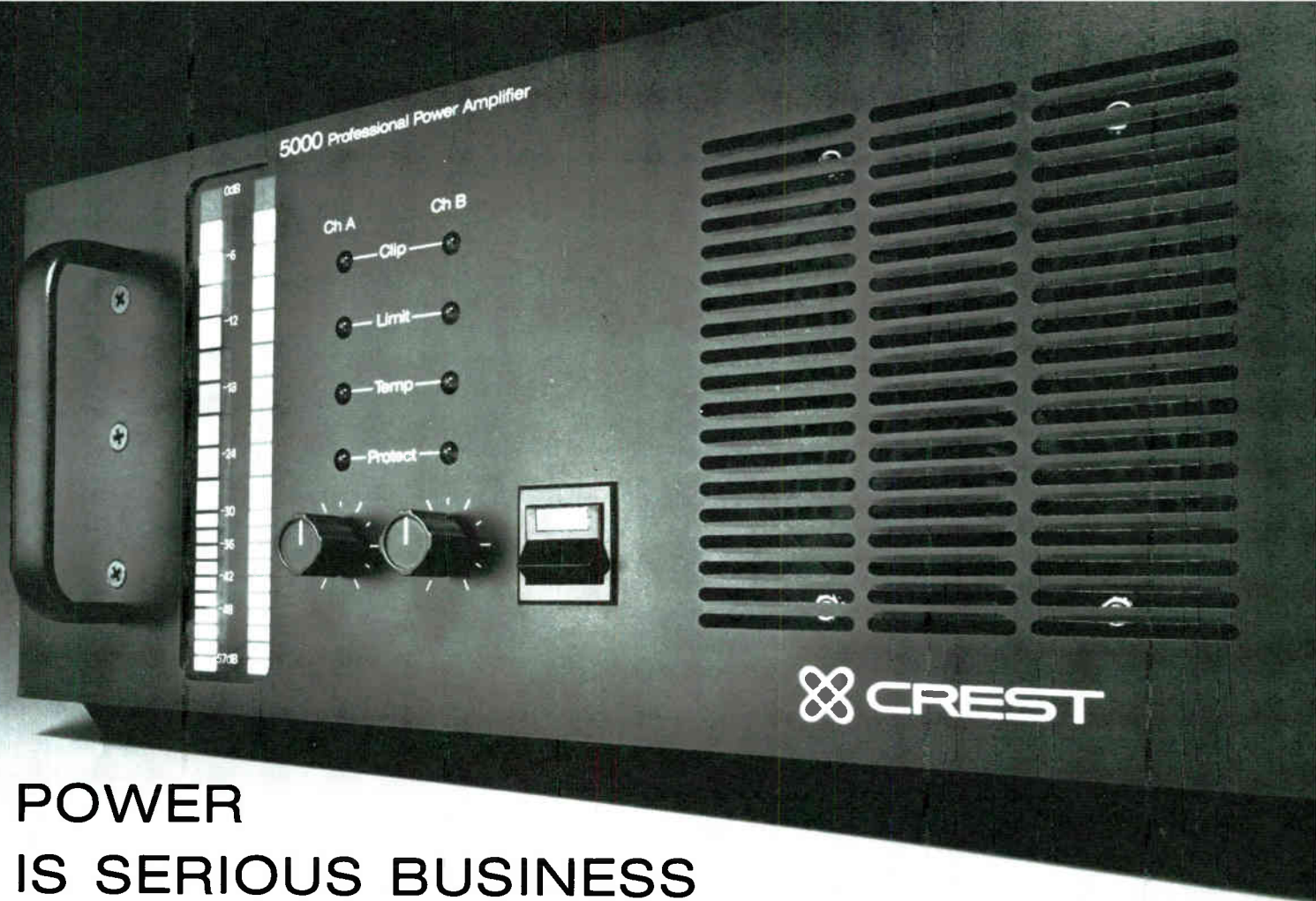
"No, Debby, it's the color of a pumpkin—you know, a Jack-O-Lantern," urged Kevin, our irrepressible nine-year-old who loves pumpkin pie and Halloween. That did it! The association was made and our little girl, apparently satisfied, selected an orange crayon from the orange box in front of her and began to scribble on some paper. Ironically, no one had thought to just show her the orange crayon (my wife, who is very resourceful, would have, but she wasn't there). Instead, we all tried to communicate on object-color association to her, an approach which doesn't work if the person has not experienced both the object and the color together. Communicating perceptions

has been a challenge to mankind since time began. How do you accurately express the image of the color red to one who has been blind since birth? You could be technically accurate and say that red is the visible radiation whose wavelength is approximately 6600 Angstrom units. That would tell the blind person how to work with the wave physics phenomenon, how to design lenses for it, etc., but it fails to communicate the actual perception. To measure the phenomenon, and to attach a number to it, is both useful and convenient, but it is not the same as perceiving it. The challenge, then, is to create a language of perception which can effectively communicate what we actually hear, for example, when we evaluate the sound quality of a recording or audio device. As logical and scientifically correct as it may seem, attempts to communicate perceptions *only* in terms of quantitative data are often incomplete, indirect and sometimes actually misleading. Now, before I am branded as an anti-scientific heretic, let me give you something to consider.

In equipment evaluations I have published in *The Absolute Sound* magazine, I have often used the term "sound stage" as a broad descriptor of the spacial qualities of the stereo panorama one perceives while listening to music, either live or reproduced. Since we have been discussing phono cartridges in the Audio File section of the February, March and April issues of *Mix*, let's reference this to cartridge performance. As a specific example, from one of the equipment reviews, the soundstage of the Dynavector Diamond 17-D was found to be significantly narrower and slightly shallower than the Accuphase AC-2 (in a number of other important respects, the 17-D surpassed the AC-2). In other words, during controlled listening sessions, listeners consistently perceived the width of the

**TABLE ONE
COMPARISON OF GROOVE CHARACTERISTICS**

GROOVE CHARACTERISTICS	TYPICAL TEST RECORD	TYPICAL STEREO MUSIC RECORDING
Location of groove modulations	On <i>one groove wall</i> only at any given time.	Usually on <i>both groove walls simultaneously</i> .
Groove geometry	Groove depth varies gradually over only a narrow range.	Groove depth often varies dramatically and rapidly over a wide range of from 0.002" to 0.010".
Direction of stylus deflection	Almost exclusively 45 degrees relative to plane of record surface.	Primarily <i>rotational</i> (i.e., complex combinations of lateral and vertical deflection)
Groove velocities	<i>Constant</i> , or very gradually changing as a function of frequency.	<i>Changing abruptly</i> in response to the transient dynamics of music.
Magnitude of groove velocities	Never more than <i>low</i> to moderate. (usually 3-6 cm/sec)	Frequently <i>range rapidly</i> from less than 1 to more than 15-20 cm/sec.
Phase relationship between channels	Constant	Always changing (relates to direction of deflection shown above).



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stereo panorama as being wider and the distance between instruments within the sound stage as being greater through the AC-2 than through the 17-D. The sound stage of records played through the AC-2 very closely matched their master tapes. We found that the sound stage dimensionality of the 17-D was very sensitive to load resistance, i.e., very compressed at 10 ohms, slightly better at 40 ohms, and about optimum at 60 to 100 ohms. Other reviewers have since corroborated the above findings using different recordings and associated equipment. Thus, several individuals, under different circumstances not only perceived the same phenomena, but were able to communicate their perceptions effectively to others.

Providing a very interesting counterpoint, however, was an article by Alan Lofft in the October 1982 issue of *Stereo Review*. Consistent with *Stereo Review's* editorial stance against high-end or esoteric audio, this article was very critical of "high-end" audiophiles and the vocabulary we have developed to communicate our listening perceptions. To quote Lofft:

"Perhaps the most disturbing aspect of esoteric audio is its distrust of controlled technical measurements and its reliance on vague, metaphorical

terms that serve only to confuse the reader and obscure differences that do, in fact, exist. Sometimes there is an *equivalent* technical explanation of a subjective impression: 'sound stage width,' a subjective term used to describe phono cartridge performance in a recent test of cartridges in an underground journal, refers directly to left and right-channel separation. But why not call it separation and *measure* it?"

In fact "stereo channel separation" as it is usually measured in phono cartridge tests, is only one parameter (and perhaps not the most important one) contributing to the cartridge's sound stage performance. Interestingly enough, the 17-D actually measures from 6 to 9 dB more separation, from 1 kHz to 5 kHz, than the AC-2, even though the 17-D's sound staging is significantly narrower. How can this be?

The answer lies in the design of the typical stereo separation test record, a test record which hardly begins to adequately simulate groove conditions in a typical stereo recording of music. The test record does not stress the cartridge in the same ways stereo music recording does. Table one summarizes some of the differences between channel separation test records

and stereo recordings of music. Other than differences in location of groove modulation, rate of change of groove geometry, direction of stylus deflection, dynamics of groove velocities, and interchannel phase relationships, channel separation test records seem to be pretty much like stereo music recordings. In other words, they are both pressed in vinyl. Channel separation measured using such a test record cannot be considered equivalent to sound stage width.

The ability of a cartridge's information scanning, mechanical transmission, suspension, and voltage generator elements to maintain geometric linearity under dynamic conditions—the conditions encountered with music recordings—is more important than its static channel separation measurement. Unfortunately, it's very difficult to affix a convenient number to a cartridge's total sound stage performance.

That is why we don't call "sound stage width" "channel separation," and just measure it. One descriptor communicates perception, the other descriptor merely gives you a convenient number.

Remember, if a piece of equipment measures well and sounds bad, it is bad. ■

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Presents the information needed for design, construction, and operation. The emphasis is on budget studios suited to efficient production of audio/visual, radio, television, and film material stressing function, economy, and good sound quality. Includes 12 tested designs. 336 pp. \$9.95

13) THE USE OF MICROPHONES, 2ND ED., Alec Nisbett

This excellent 1983 edition starts off with the sound medium itself, describes the many types microphones available, the balance of speech and music, simultaneous sound and picture recording, leading up to the sophisticated skills of creatively controlling sound performance transmission or recording. 168 pp. \$11.95

15) DIGITAL AUDIO TECHNOLOGY, H. Nakajima, T. Doi, J. Fukuda, and A. Iga of Sony Corp.

Authoritative handbook covering fundamentals of digital PCM recording, audio and video disk systems. It deals with the nature and causes of code errors, low-pass filters, modulation and demodulation circuits, and analysis of future developments. Hardbound. 304 pp. \$18.95

28) VIDEO PRODUCTION GUIDE, Lon McQuillin

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This superb volume comprehensively covers digital microprocessor sound and music synthesis including standard linear techniques, musical applications for the newer 16 bit micros in non-mathematical language, and all phases of waveform shaping and filtering as applied to electronic music generation. 661 pp. \$21.95

45) MUSIC BUSINESS HANDBOOK AND CAREER GUIDE, David Baskerville, Ph.D.

This is the required text in over 90 colleges and universities. Exhaustively thorough coverage of all phases of the industry divided in 7 parts: Music in the Marketplace; Songwriting, Publishing, Copyright; Business Affairs; The Record Industry; Music in Broadcast and Film; Career Planning and Development; Appendix (sample forms). 553 pp. \$17.95

46) HOW TO MAKE AND SELL YOUR OWN RECORD, Diane Sward Rappaport

This thorough book offers technical information, practical tips, and business guidance for self-production. Every aspect of a recording project is covered, from planning and budgeting through sales and promotion. Includes sample forms and worksheets as well as advice on raising money and negotiating contracts. 167 pp. \$11.95

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exact waveform information which results in the precise recognition of the source of sounds has not yet been determined, and will differ depending on room reflection characteristics.

"Audio Location Point Image Processing" refers to the practice of organizing ALP's in predetermined patterns of presence or motion which results in the perception of a predetermined shape, form, or "image."

Following is a simple demonstration that anyone can do in order to generate an ALPIP effect.

If you move an object which makes an intermittent sound (such as your hand while snapping your fingers) in a circular motion . . . and listen carefully, you will be able to detect the location where each snap occurs, and recognize a "circle" being created with sound.

An open air spark can be moved by someone other than the listener to demonstrate the effect more clearly. Having someone else move the sound source also eliminates the foreknowledge of the listener already being aware of the position of his hand. This simple demonstration will effectively indicate the nature of what an ALPIP image is: in this case, a circle made of sound.

It is possible to detect the source of a sound with only one ear, though resolution is greatly improved when both ears are involved.

It has been shown that the recognition of locational information is in a large part dependent on the wave shaping characteristics of the outer ear (pinna). As a sound reaches the outer ear, various portions of the waves are blocked and reduced in intensity. Others pass by the outer ear and into the ear canal relatively unhampered, thus having a greater intensity. Low frequencies "bend" around corners better than high frequencies, and the texture of the surface of various portions of the outer ear will absorb or reflect sound waves depending on their frequencies. Once a sound wave enters the ear canal, it will travel relatively unhampered to the ear drum.

Even though the exact waveform information required to electronically generate the perception of specific ALP's has not yet been determined, the methods of deriving this information is within our present technologic capacities.

The process of binaural recording has been in use for many years. It involves the placement of microphones upon a dummy head, at the same location as where the speaker elements of a pair of headphones will be recreating the signals recorded by the microphones—the object being to reproduce the sounds that occurred during the live recording, retaining the

same locational information as would be heard by a person standing in the room during the live recording.

This works fairly well in non-critical applications. The locations of each instrument can be determined within a few feet of their actual placement. This particular method does not take into account the wave shaping characteristics of the outer ear. Any attempt to record an intermittent noise source moving in a circular manner near this particular mike placement will result in distorted locational perception. The locations of each noise pulse will vary considerably from the original. The circle may appear more like an oval, or portions of the image may be lost altogether.

The solution to this problem is to build a special set of binaural microphones with the recording elements placed inside the ear canal of a very close facsimile of a real person. Using this device, the sound waves would be modified by the characteristics of the outer ear prior to being picked up by the microphones. Because sound waves are essentially unaltered while passing through a tube (such as the ear canal) the waveform information detected by the mike elements would closely duplicate those that normally strike the ear drum. All of the original information would be available for recording or processing. Accurate playback would require a set of ear phones with the speaker elements positioned at the exact locations occupied by the microphones.

In this way, an open air spark could be moved in a circular manner in front of (or above, behind, etc.) the microphones, and the circle would be perceived during playback.

Rather than simply recording the information on tape for playback, the analog output from the microphones can be converted to digital data and stored in computer memory. This is accomplished by placing an analog to digital converter in the signal path between each microphone and the computer input port(s).

Once the equipment has been set up, a noise source can be positioned at a specific location (ALP) and activated to produce a short burst of sound. These sound waves are then modified by the outer ears before striking the microphone elements, and the locational information for that ALP is stored in memory after being assigned a grid number by which it can be recalled. The noise source is then moved to the next Audio Location Point, activated, recorded, etc., until the locational information for a large number of ALPs is recorded in the computer's memory. These ALPs can then be recalled at rapid rates in any desired sequence, allowing complete animated

images to be generated at will by the computer operator.

At this point, playback will require the specialized earphones mentioned above, but it is possible to generate signals so that playback can be accomplished with standard headphones. Once the locational information for each ALP has been determined, sounds can be generated at the headphone speaker plane while monitoring the wave information as it is detected by the specialized microphones inside the ear canal.

The signals are displayed upon the computer screen, and the sounds generated at the headphone speaker plane are modified until the wave information matches the original ALP. This process is duplicated for each ALP and the computer can then provide outputs which can be monitored with either regular headphones or the specialized earphones.

It is acknowledged that due to each individual having differently shaped outer ears, the ALP information recorded for one person may not be as accurate for another. This would probably be more noticeable with ALPs designed for headphone reproduction as outer ear wave shaping occurs more than once with that method. Whether or not this problem poses significant deterioration of the ALP information is still to be determined.

Audio Graphic principles can be combined with ALPIP to enhance the quality and ease of recognition of the locational information. Tones of specific frequencies and volumes can be used as noise sources, etc.

Because sounds can be detected as having sources anywhere in 360° of perception, it is possible to create three-dimensional images with ALPIP that occur anywhere. Sounds can be reproduced through headphones that appear to originate a block away from the listener. This means that an effect such as a rotating cube, twenty feet across, could appear to come from an infinite distance away, crash through the walls of the room, move through the listener and rotate with him in its center for a moment, before descending "out of sight" through the center of the earth.

Preliminary research is under way to design a mobility aid for the blind which will convert visual information into Audio-Animation images. It is hoped that a device will eventually be created that would have resolution of a high enough quality to allow a blind person to operate a motor vehicle, though such problems as intermodulation distortion will have to be resolved before this will be possible.

The questions yet to be answered concerning Audio Animation may be quite significant, but so are its potentials. ■

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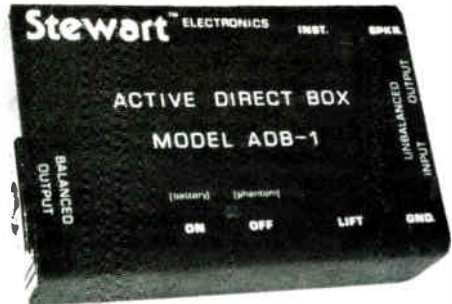
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Gary Mullen, concert sound manager for McCune Audio/Visual says, "We tested the Hi-Energy Miking System for over a year, live, on tour, in all situations against every mic on the market. All of our sound engineers raved about the great sound, compactness, convenience and durability of the system. For drum miking, no other mics come close.

Chel McCracken, veteran drummer of hundreds of recording sessions with groups like the Doobie Brothers, America and Rare Earth says, "There are no phasing problems with the Hi-Energy System because all of the mics are the same. This eliminates a number of problems for the drummer and the sound engineers. And the kick sound is so solid I am truly impressed.

Rik Shannon, Sound Engineer for the Hollywood Palace, Tina Turner, Berlin and others says, "I can get a great drum sound in minutes instead of hours. If the drummer tunes his kit properly, the system does the rest, and every drummer has loved the fact that there are no mic stands to get in the way."



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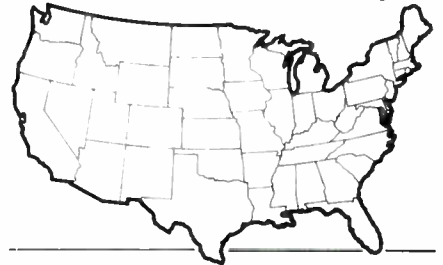
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Many of the listings in this directory also contain a code which indicates the specialties of each business. SO = sound reinforcement, SL = sound and lighting, ST = staging, ER = equipment rental, AR = audio recording, VR = video recording, AV = audio and video recording



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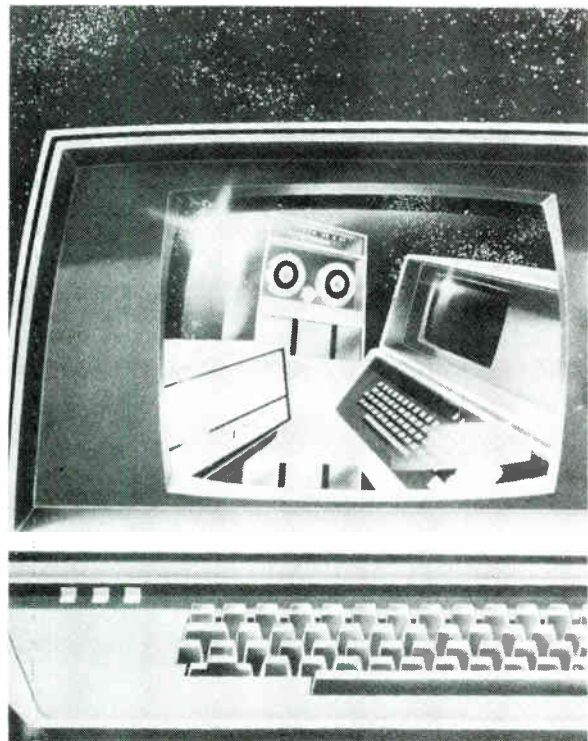
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THE MIX PERSONAL COMPUTER PRIMER & GLOSSARY

BY LOU CASABIANCA

Last issue we presented a brief history of the development of computers, as well as Part One of our glossary of commonly used computer terms. This issue we finish that listing of computer-ese basics.

Code: Generally, any set of characters that stand for different characters. Every programming language is a code in which characters stand for different combinations of ones and zeros (machine language). Therefore, we refer to the written lines of a program as lines of code.

Chip: An integrated circuit contained on a small silicon square mounted on a plastic or ceramic carrier. The carrier is a block with several metal pins that can be plugged into a receptacle on a printed circuit board.

COBOL: Acronym for COmmon Business Oriented Language. A programming language developed for and widely used in business.

Code: Generally, any set of characters that stand for different characters. Every programming language is a code in which characters stand for different combinations of ones and zeros (machine language). Therefore, we refer to the written lines of a program as lines of code.

Coding: The act of converting an algorithm or a flow chart into a sequence of program statements. Part of the programming process.

Compiler: A program that translates another program written in

high level language into a machine language version which a computer can understand. Each high level instruction is translated into one or more machine language instructions. The result is a complete program that may be run anytime without ever being compiled again.

Computer: A self-contained device including at least a central processing unit, a memory, basic interfaces that allow it to communicate with the outside world, and a power supply. It usually includes a keyboard, a screen, and disk drives. Computers are capable of storing and executing programs. It communicates with the outside world by means of input/output devices. The usual input device is a keyboard. The usual output device may be a screen or printer. Additional memory may be in the form of disk drives or cassette recorders.

Computer Language: Any code which is used to write instructions that a computer will obey. This includes machine language, assembly language and high level languages. The term means the same as "programming language."

Computer System: A central processing unit and the peripheral devices connected to it; for example, a monitor, a printer, a disk drive. That is, a computer system is a group of electronic devices which work together not only to process data, but to communicate data to and from the outside world.

Courseware: Personal computer software specifically designed for training and education using the com-

puter or in conjunction with interactive videodisc software.

Core: The main memory of a computer, as distinct from mass storage. The term comes from a kind of memory device which stored electrical charges in metal cores.

CRT: A Cathode Ray Tube. A television-like screen.

Cursor: A symbol used to indicate the current position at which a character will be displayed on the screen. Typically specialized keys are assigned to position the cursor, usually a blinking square or underline, on the screen.

Daisy Wheel Printer: A daisy wheel consists of a round center from which a number of short strips stick out, like petals on a daisy. One keyboard character is placed on each petal. The printer types characters by rapidly turning the daisy wheel so that the correct character is lined up in front of the ribbon, and then striking it against the paper.

Data: The text or numbers on which a program can operate. Data is manipulated by a computer and arranged into groups which convey meaning.

Data Base: A way of organizing information kept in a computer's mass storage. Analogous to all of the file cabinets in an office and the files indexed and stored on paper, the data base is divided into fields, and each field is divided into records. No matter what information is in the files, any piece of information may be found in a certain field, within a certain record within a certain file. Many programs may share

a data base, some putting information into it, some taking it out, and some doing both.

Digital: Breaking down things into tiny parts which can be represented by numbers.

Digital Computer: A computer which works by breaking down every problem or task into parts that can be represented by numbers, and then manipulating the numbers to solve the problem and perform the task. The opposite of analog computer.

Digitizer: A device which converts analog information into a digital form. For instance, a digitizer might convert a signal from a television camera into a series of numbers. Those numbers could be stored in a computer. The computer could then use those numbers to recreate a picture of whatever the camera had been pointed at.

Disk: Magnetic medium on which data and programs can be stored. The information is stored in files that can be retrieved by name. Disks can store a large amount of data and are a common mass memory device used with small computers.

Disk Drives: The mechanism used to read and write from a disk.

Diskette: A floppy disk, i.e., an 8" or 5¼" soft disk designed to provide an inexpensive storage medium for data and programs.

Display: Any visible data coming directly from a computer. Text or pictures on a monitor are examples of computer displays.

Dot Matrix Printer: A printer which can print groups of tiny dots on a piece of paper. These dots may be arranged into the shape of alphabet letters. They also may be arranged to create a picture, like the tiny dots in newspaper photographs. Dot matrix printers may be used to print both text and graphics.

Editor: Program designed to facilitate the entering and modifying of text. Used to remove errors or make corrections while entering data.

Eighty-column card: A printed circuit board which can be plugged into a microcomputer so that its video display is expanded from forty columns across to eighty columns across. Better word processors use an eighty column format because a typed page usually is more than forty characters across.

Enter: To send information from a keyboard, panel switch or other device, directly to the computer. When a user gives a command to the computer, the command is entered when the user hits the RETURN key.

EPROM: Acronym for Erasable and Programmable Read Only Memory. A kind of memory chip which stores certain information whether the

computer is on or off. This information can be erased by exposure to ultraviolet light and new information can be stored in the chip.

File: A collection of data that has been given a name. A program is usually stored on a disk as a file.

Firmware: Data stored in Read Only Memory, usually as part of a printed circuit board which can be plugged into a computer. Since it contains information (software) but consists of circuitry (hardware), it has been given the name firmware.

Flowchart: A symbolic representation of an algorithm.

Format: The way that information is arranged. For example, the widths of margins on a typed page is part of that page's format. The size allowed to records in a file is part of that file's format. The size of files on a disk is part of that disk's format.

FORTRAN: Acronym for FORMula TRANslation. A programming language used widely, mostly for mathematical and scientific tasks.

Graphics: Pictures, figures, or drawings displayed on the screen created by using a pattern of small adjacent spots.

Graphics Tablet: A flat device which plugs into a computer. By moving a magnetic pencil over the tablet, a user can draw a picture which will be sent to the computer.

Hardware: The equipment, including the computer, the disk drives, the CRT, the printer, etc., that make up the computer system. Contrast with: software (i.e., the instructions or the programs).

High-Level Language: A programming language designed to facilitate giving instructions to the computer. BASIC is a high-level language.

IC: Integrated Circuit: An electronic circuit with many transistor and logic functions located on a small piece of silicon.

Initialize a Disk: A process performed automatically by a computer. It records various signals on the disk which become markers. In subsequent use, the computer can find a location on the disk by counting these markers.

Intelligent Terminal: A terminal can display data sent to it from a computer to which it is connected. If it can also run its own programs to process that data, it is called an intelligent terminal.

Interactive: Letting a person influence the course of a program while it is running. For example, a program which asks the user questions and then acts according to the answer, is interactive. Computers are also used to run learner directed interactive videodisc educational programs.

Interface: Anything that makes

it possible for two entities to communicate with each other. An example is a printed circuit board, which alters data so that it can be transmitted to and from a computer and another device, or a language which a person uses to communicate with a computer.

Interpreter: A program which translates instructions in a high-level language into machine language. Each instruction is translated into one or more language instructions, one at a time.

I/O: Abbreviation for Input/Output. It means the part of a computer through which signals pass to and from the CPU and peripheral devices such as printers, disk drives, monitors, keyboards, or remote terminals.

LAN: Local Area Network, a group of eight or more computer terminals linked to access the same data base and to be able to "talk" to each other.

Large Scale Integration: The process of combining a hundred or more tiny electronic components on a single chip of silicon, as in an integrated circuit.

Light Pen: An optical instrument that looks like a ball point pen, but can detect light. A light pen connected to a computer can be used to draw graphics directly on the monitor screen.

Load: This term has two meanings. One is to transfer data from mass storage into a computer's internal memory. The other is to put a storage medium, like a disk or tape cassette, into the device which can "read" it, like a disk drive or tape player.

LOGO: A programming language used primarily in education. LOGO is relatively easy to learn, and is used to teach children the fundamentals of programming. Its distinctive feature is the use of figures called turtles which students can program to move about the display screen, thereby learning the principles of simple geometry. LOGO is one of the few programming languages whose name is not an acronym for anything.

Machine Language: A programming language in which all instructions are coded as binary numbers, so that any number or letter is expressed as a combination of ones and zeros. Before a computer can run a program it must be translated into machine language, usually by a translator program such as an assembler or a compiler.

Main Frame: The largest kind of computer is referred to as a main frame because the CPU of such a machine used to be mounted on a characteristic frame.

Memory: The part of a computer system which holds data. Memory can be inside the computer, for example, in

special chips or in magnetic cores, or it can be outside the computer, in mass storage such as disks.

Menu: A list of actions which a computer can take, displayed on a monitor. Many interactive programs use menus to show the user what instructions he may give the computer, and he can simply select the one he wants from the menu.

Microcomputer: Or Personal Computer (PC). Originally microcomputers were those whose CPUs were all on one chip, called a micro-processor. Now, larger computers also use microprocessors, and in fact there are now microcomputers with the power and speed of mini and even main frame computers.

Microdisk: A floppy disk that is just over three inches (7.62 cm) in diameter.

Microprocessor: An entire central processing unit, the brain of the computer, the part that makes it work, produced in the form of an integrated circuit.

Minicomputer: The middle-size computer, smaller than a mainframe and larger than a microcomputer. Originally minicomputers were much cheaper than mainframes, and they were faster and could do more than microcomputers. Today, it is hard to tell the difference between large minis and small mainframes and between small minis and large micros.

MODEM: Acronym for MOdulator-DEModulator. A device which changes data from a computer into a form which can be transmitted over phone lines or other long-distance carriers.

Monitor: A device which lets you examine something. Usually the term means a cathode ray tube display, but it also may be a special program which lets you see the contents of the computer's memory and registers or some electronic device which lets you see some other parts of the computer's operation.

Mouse: A device that is attached to a computer by a long cable and which is rolled along a flat surface by hand. As it rolls, it controls the movement of a cursor on the computer's display. A mouse controls the cursor's direction and speed. Usually, a mouse also has a button or buttons for selecting menu items from the display or for giving commands to the computer.

Multiprocessing—MPU: This can mean a number of things: using more than one computer to perform different tasks in a single job, designing a computer in which processing functions are performed by more than one device, or processing more than one job at the same time on a single computer.

Network: As a general term this means a system whose parts are some distance from each other but are connected in some way. A computer network is simply two or more computers and their peripheral devices, all of which can send and receive data from each other.

Off-Line: When a job is being performed by a device not under control of a central processing unit. This may mean two things. One is that data is being sent between the computer and some device to which it is not connected. For example, data might be recorded on tape "off-line" and then carried by hand to the computer's tape player. The other meaning is that a device connected to the computer is

operating independently; for example, a printer might be printing a document while the central processor is working on something completely different.

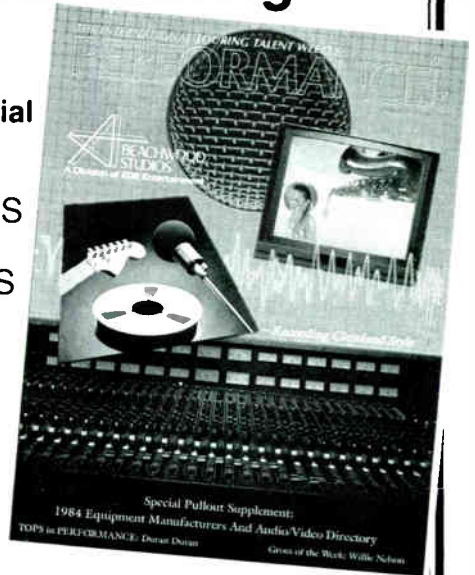
On-Line: When a job is being performed by a device under control of a central processing unit. For example, if a printer is printing data as it is received from the CPU, according to timing signals received from the CPU, the printer is said to be "on-line".

Operating System: A special program or group of programs which controls all the activities of a computer system. For example, an operating system might control the transfer of data to and from peripheral devices, might determine where to put pro-

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grams and other data in memory, might protect data through the use of user passwords, might keep track of how much time each user spends on the system, and so on.

PASCAL: One of the most popular programming languages. It is named after the 17th century French mathematician, Blaise Pascal.

Password: A special word, not known to everybody, which must be typed into the computer before it will let you see certain data.

Peripheral: A device external to the CPU and memory of a computer. For example, disk drives, printers, light pens, keyboards and CRT displays.

Personal Computer: Any microcomputer which is small enough that many individuals can afford it. These computers are for business, professional, and home use. They have made computers available to large numbers of people for the first time.

Pixel: An acronym for PICTURE ELEMENT. A display on a CRT monitor or television screen is composed of thousands of tiny dots. These dots are called pixels.

Program: A list of instructions for a computer to follow. A program is written in a programming language and can be stored in the computer's memory. The original version of the

program, written by a programmer, is called source code and may be written on paper, punched on paper cards or tape, and entered directly into the computer's memory. In any case, it must be in the computer's memory before it can be run on that computer.

Programming Language: One of many codes in which programs are written by programmers. The lowest level of programming languages in machine language, which consists of only ones and zeros. Assembly language is the next higher level. Most programming languages are high-level such as BASIC, PASCAL, FORTRAN or COBOL.

Prom: Acronym for Programmable Read Only Memory. One or more chips of ROM into which data may be entered by using a special device. Generally, once data is entered into PROM, it cannot be changed; that is, it becomes ROM.

Prompt: A character or mark that appears on a CRT display indicating that the computer is waiting for the user to enter data. Some common prompts are: an asterisk, a question mark, the word 'ready?' and an arrowhead (►).

RAM: Acronym for Random Access Memory. While storing it the computer can get data from one any loca-

tion in RAM. RAM CARD is a plug-in printed circuit board that increases the internal memory of a computer.

ROM: Acronym for Random Only Memory. This kind of memory holds data permanently, information that controls vital functions and that cannot be changed by the user.

Sector: A disk is divided into tracks which are in turn divided into sectors. Tracks are concentric rings on the disk, and each track is divided into a number of sectors. A file may be recorded in more than one sector in more than one track.

Semiconductor: A material, the most common element in the earth's crust, silicon, is used to conduct electricity. Semiconductors are used in transistors and integrated circuits.

Software: Any kind of program, instructions or other data which tells the hardware what to do.

Solid-State: Electronics that use semiconductor circuits such as transistors or integrated circuits instead of vacuum tubes.

Speech Synthesis: Any sound, including speech, can be represented by a numerical code that can be stored in computer memory.

Storage Capacity: The amount of data, usually measured in thousands of bytes, that can be stored in storage devices such as disk drives in computer memory.

Telecommunications: Computer data or electronic mail can be sent and received using any method of telecommunications: phone lines, telegraph lines or satellite relay.

Terminal: Any device, usually a keyboard and a CRT, through which data is input to and/or output from a computer system.

Utility program: The opposite of an application program, a utility program is useful in operating the computer rather than in performing a specific job.

VDT: Abbreviation for Visual Display Terminal.

Videodisk: A laser video storage device capable of holding 54,000 frames of information.

VLSI: Very Large Scale Integration, containing thousands of components, are the largest integrated circuits presently possible.

Voice Recognition Unit: The ultimate interface, a device which converts human speech into data which the computer can use.

Word Processing: Using the computer to write and alter documents and other writing.

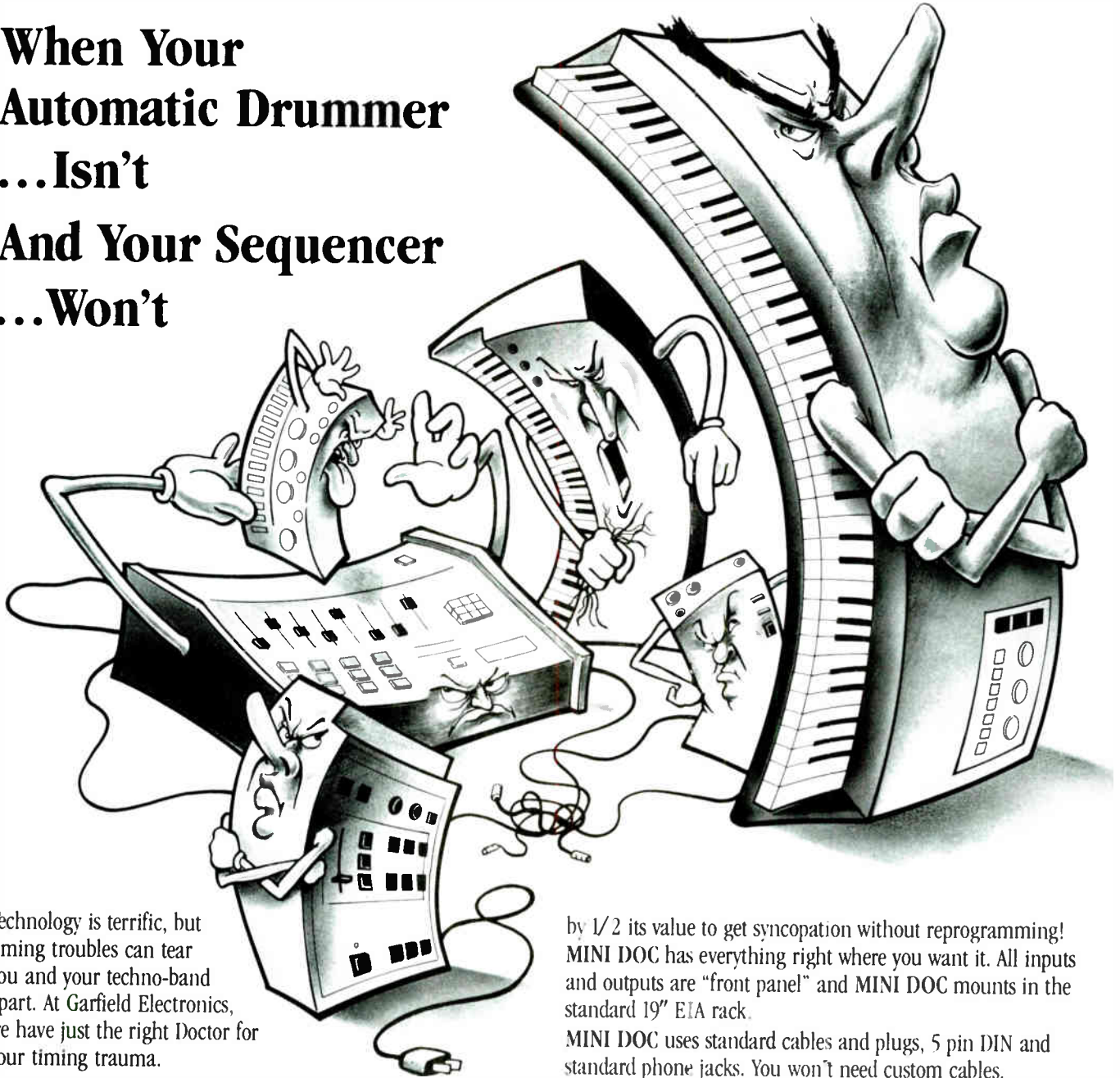
Write: When a device sends data to another device, for example a computer writes data to disk, it is writing to that device. ■

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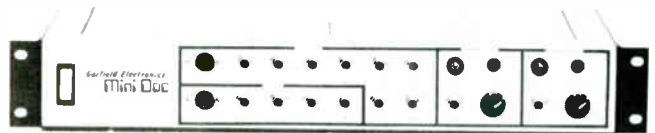
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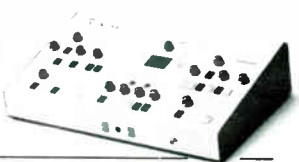
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PREVIEW



Furman Stereo Reverb

Furman Sound Inc. has announced the availability of the RV-2 stereo reverberation system. The unit consists of two complete reverberation systems, each having its own 16 inch triple-spring reverb tank, limiter circuitry, and controls for input level, equalization, and wet and dry output level. Also included are a ground lift switch, power-on indicator, and an LED which indicates if the limiter is above threshold.

When the system is switched into its "stereo" mode the unit generates lifelike stereo reverberation from a monophonic source. Alternatively, the two channels can be used independently (e.g. with two separate instruments, or right and left of a stereo pair) or they can be patched in series, to deliver an extremely dense monophonic reverberation. Standard units are equipped with 1/4" phone jack inputs and outputs. Balanced inputs and outputs are available as an option.

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Norberg Monitors

The Norberg BCS-16 is a compact, accurate monitor designed by classical recording engineer Robert Norberg for studio nearfield and remote recording applications. Measuring 18" x 10" x 10", the BCS-16 contains a 6 1/2" polypropylene cone long-throw woofer, a 2" x 6" piezo tweeter, and a unique Binary Crossover System™ which allows adjustment in 256 subtle and repeatable steps. The Crossover switch controls the high frequency cutoff point of the woofer. The HF Rolloff affects the piezo horn's high fre-

quency range with a total action of 12 dB at 12 kHz, and the HF level switches shelve the tweeter output by up to 6 dB.

Available from Soundstage Electro-Acoustics of Northridge, CA, the Norberg BCS-16 is priced at \$600 per pair. A special version with internal magnetic shielding is also available for use near video monitors.

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Amek Matchless Consoles

Amek Consoles Inc. has introduced their Matchless series of 24 buss audio consoles, which offer such standard features as full 24 buss routing, 4 band EQ with swept mids and selectable Q, 8 sends, 8 returns, 8 mono sub-groups, 2 programmable mute groups and line return facility through the monitor section during mix. The Matchless is a scaled down version of the company's popular "Angela" series console, utilizing the same circuit design and many of the same operational features but in a smaller, more compact package.

The Matchless comes standard in a 26/24 main-frame configuration with larger frames and retrofit extenders also available. The retail price for the standard Matchless 26/24 is \$19,950. The Matchless with optional patchbay, producers desk and console stand will retail at \$24,950.

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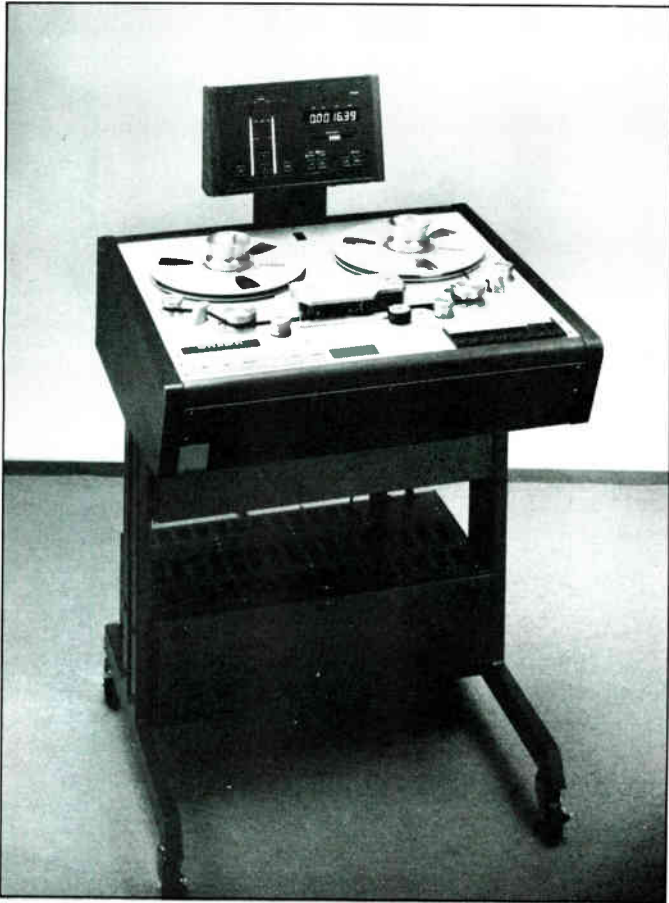


Low Cost XLRs from Connectronics

Connectronics Corporation, of Stanford, CT, is now distributing low-cost XLR-type connectors manufactured by Key Technology, of England. Constructed of black glass-filled nylon material, the connectors are light weight

and unbreakable under normal conditions. The line currently consists of male and female cable and panel mount versions. The panel connectors are designed for front or rear mounting and both male and female types require identical mounting cut-outs, which facilitates fabricating and manufacturing. A printed circuit board adapter is also available for the panel mount connectors.

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Studer Digital Two Track

Studer unveiled a prototype of their DASH format two channel digital recorder at the recent AES Convention in Paris. The recorder utilizes single stack heads which cover all 12 tracks of the DASH format on 1/4" digital recording tape. Both two and three head versions will be available, with one or two reproduce heads, for read-after-write in all recording modes and during editing. A separate DA box, containing all circuitry relating to digital audio, allows the same deck to be configured as either a table-top or console recorder.

The two channel recorder is being prepared for production now and will be available in the U.S. market within a year. Its target price is set at approximately \$20,000. A full line of support peripherals has been planned for the machine. A digital multichannel recorder (32 tracks on 1/2" tape) is also in the works, and it features the same transport and similar digital circuitry.

Circle #112 on Reader Service Card

BTX/Harrison OEM Agreement

Harrison Systems and the BTX Corporation have announced an agreement between the companies covering the development of BTX automation products for incorpora-

tion into the Harrison family of premiere audio consoles. Harrison will offer an in-console version of BTX's Softouch™ audio editing system in their line of consoles and under the Harrison name. BTX will specifically tailor the system to Harrison's exacting specifications and the Softouch System will interface directly with their console systems.

The BTX Softouch System allows the automation and control of many post-production processes associated with sound effects assembly, sweetening, dialogue replacement, and Foley. Softouch also provides a solution to time code complexities as well as the synchronization and control of multiple ATRs, VTRs and film transports.

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Tandberg Mastering Deck

Tandberg A/S, of Kjeller, Norway has unveiled their series TD 50, a new line of professional 1/4" two channel tape recorders. The line includes a studio mastering version (TD 50 SM), a broadcast machine (TD 50 B), and a reproduce-only deck (TD 50 E) for editing/playback applications. All models incorporate a three speed (3 3/4, 7 1/2, 15ips), microprocessor-controlled transport with LED real-time counter, return-to-zero, return-to-start, search-to-cue, and tape dump functions. The machine accommodates NAB, DIN and cine-type reels up to 12" in diameter, and back panel connections are provided for an RS 232 interface, remote control, time code input, variable speed control, and balanced audio inputs/outputs.

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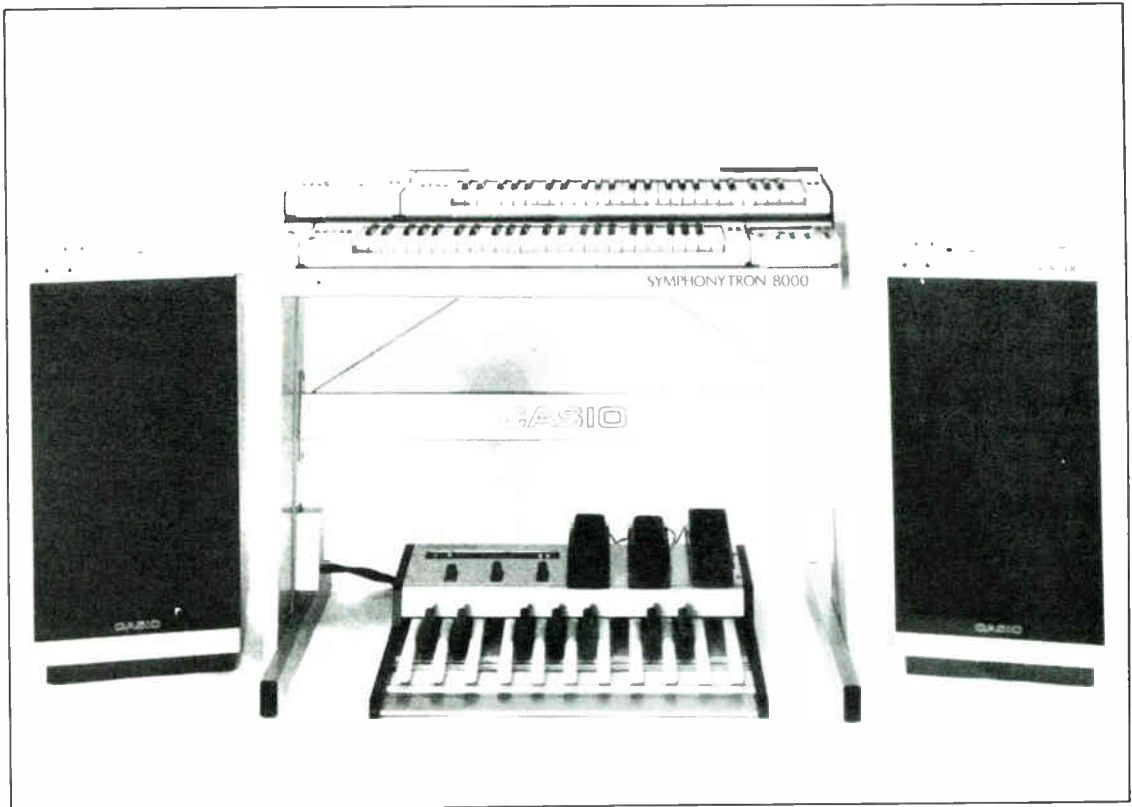
PUP100 Microphone Power Supply

The PUP100 from MSE, in Laguna Beach, CA, is a 12 Volt A/B type power supply designed especially for the Sennheiser model 405, 415, 435, 805, and 815 microphones. The PUP accommodates both European and American polarity standards (with either pin 2 or pin 3 designated as positive), and a switchable 15 dB pad is also provided. The unit operates for up to 60 hours on two standard 9 Volt batteries. A red LED indicates power on and battery condition. Dimensions are 4.6" x 2.375" x 1.25", and weight is only 16 ounces (.45 kg) with batteries. The PUP100 is priced at \$135.00

Circle #115 on Reader Service Card



Casio's System 8000 is a modular keyboard consisting of an upper and lower keyboard each with 49 keys. There are 49 preset sounds in each keyboard. The System also includes a foot keyboard with 18 pedals. Other features include: tone memory, sound effects, tone mix, 16 auto accompaniments and one finger auto accompaniment.



Top-End Casio Keyboards are Pro Units

by Neal Weinstock

Casio's toy keyboards are probably familiar to many a reader who has seen them used by various young musical tyros of his or her acquaintance. This familiarity may breed a little contempt for a company identified as the maker of the successor to the player piano—not to mention those watches and calculators. But Casio has been watching its chances and now has calculated a way into being of great usefulness to the wonderful world of music.

Last year, the company brought out the CT-7000, a \$1000 keyboard with 20 preset sounds,

rhythm section, stereo phase controls, and a built-in digital recorder. This year, the CT-8000 leaps to two boards, 49 sounds, foot pedals for bass, detuning and chorusing to modify and enhance those preset sounds, large bi-amped speakers, and lots of other nice stuff, for all of \$4,600. The Casio people are hesitant, quite rightly, to describe the 8000 as a pro keyboard, but to this writer it seems to offer an awful lot to many a pro. Especially considering the mazuma involved.

So I very much wanted to bring it into a studio and have a closer look. My own uses for it would be in scoring and backgrounding for film and video, where music is not the prime consideration. The immediate appeal of the 7000 and 8000 is that here, in a tight little package, I could have all these sounds. Now, the exigencies of an independent filmmaker's lot are such that this one, for example, does not have a large studio at hand. Nor can I count on easily being able to rustle up a

fully equipped band on short notice if, late at night in the studio, I decide a little background music would go well over that 45-second scene.

Even an audio studio might well find the CT-8000 very handy in a similar way.

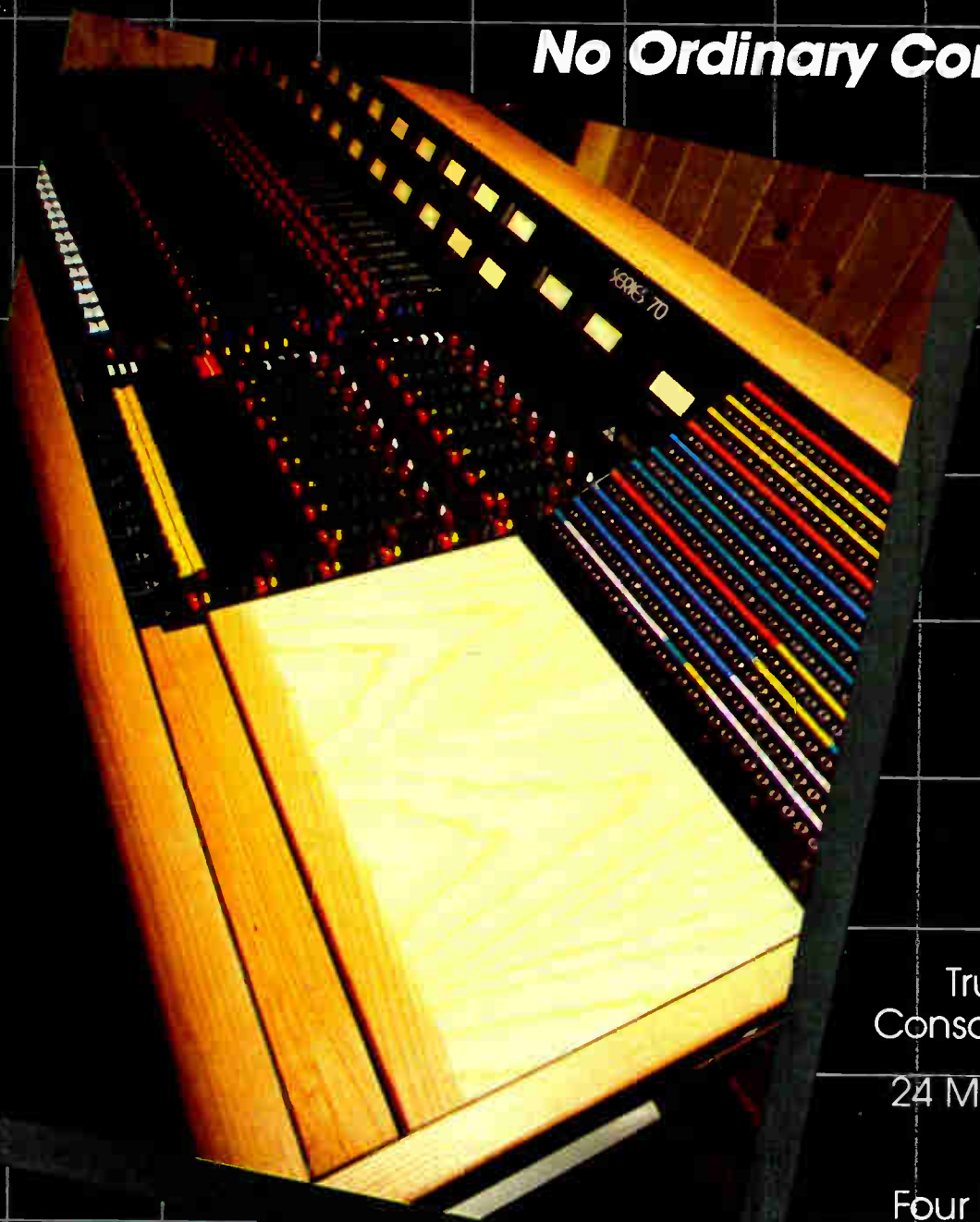
To get a little more perspective on this thing, I called David Rosenthal, the keyboard man with Rainbow. With a couple of reservations that are thoroughly understandable in the context of what these Casios are meant for, he was really delighted with their capabilities. He has now been using the 8000 and 7000, the former at home and the latter on the road, for a few months.

"The regular synthesizer is much more valuable," he says. "But it also costs much more, and that's not Casio's intention with this, anyway. I use them at home, or in hotel rooms, not in concert. They're really good compositional tools." On a recent tour of Japan, Rainbow played Budokan with a full



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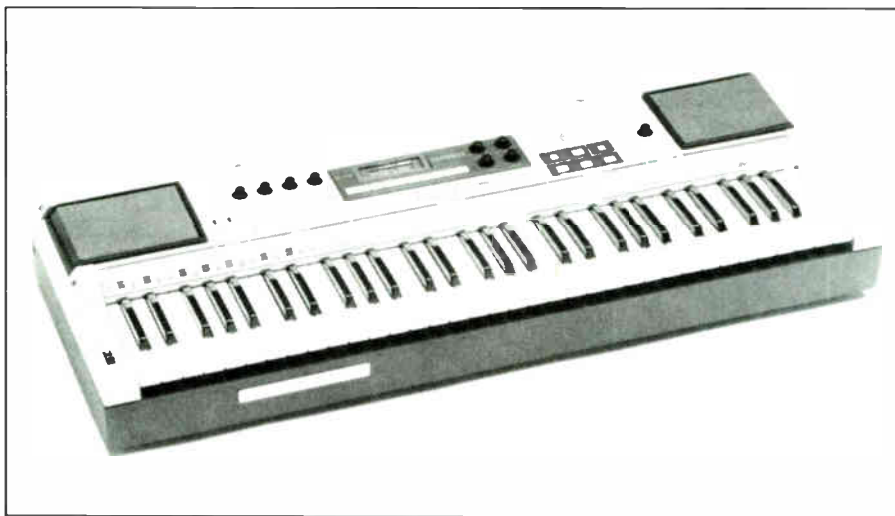
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Casiotone 7000

backup orchestra. Rosenthal used the Casio to develop the orchestrations, "to get an idea of what things would sound like with a full orchestra. I used it as a reference instead of a piano."

Down to details. The 8000 sells in pieces. Just one keyboard runs \$700, and features 49 sounds: seven guitars, two harpsichords, bagpipe, marimba, clarinet, piano, and so forth. This is very similar to the 7000, which has only 20 sounds. Each has a drum section

with tempo control. The 7000 allows a synchronous rhythm and melody start: the 8000 will do that and also give an intro, then synchro start, and will also end on sync. The 7000 has a bass pot on the board, with the first octave keys convertible to chords. The 8000 solo keyboard does this too, or allows the addition of a foot pedal to control bass.

With the addition of a second keyboard—49 more of the same sounds—either or both can be played

in standard manner, or the bottom can be set to one sound and the top to another. Only the top need be played to chorus both sounds. Detuning is possible, and this, along with chorus-ing, can be used to dirty up what Rosenthal describes as "a round, mellow sound. It has no balls unless you detune it—and even then, it's not really a good keyboard for heavy metal."

Rosenthal describes the 7000's sound as "very dry. The 8000 gives a little more motion to it." Some of the preset sounds seem pretty useless in their unadorned state, but Rosenthal says, "I try to use all the sounds. Some that don't necessarily work well on their own, when you combine them with others it gives another sound to the tone mix. I wouldn't say any of the sounds are useless."

The speakers, which come in the same matte finish high-tech gray as the keyboards, pedals and stand, have built-in reverb control and mic inputs. The keyboards also have reverb, vibrato, sustain, and other things to jazz up any sound.

Most importantly, the Casios have digital memory. This is what Rosenthal finds most useful and interesting about them. To find comparable digital memories in the higher-priced pro keyboards runs up the prices tremendously. Casio's is, in the case of the 7000, built-in. In the 8000, you can plug in "RAM packs," user-programmable custom LSICs. These allow the player to just play into it like a tape recorder, but without having to worry about levels. It will record on two tracks, but actually it works more like a multitrack because one track on memory can be played along with and put onto another track. Used with a stereo tape recorder, this is a powerful recording device. Says Rosenthal, "A lot of times when writing music, you're playing and have to think about playing. You can just play right into the memory of this thing, so you can listen with a more objective ear."

For myself, I'm so slow at writing music I find I lose my train of thought if I have to stop to get notes down on paper. Thus the Casio replaces a tape recorder for me in the same way that a word processor replaces a typewriter for a review of said Casio CT 8000 in *Mix* magazine. Casio folks say they will soon come out with a computer interface for the 8000, which ought to allow for dirtying up those mellow notes enough, perhaps, even to play heavy metal.

Rosenthal is taking the 8000 into the studio for Rainbow's next album, which is certainly a hell of a compliment for an instrument that was not meant for pro use. This is a machine with a most definitely useful niche. ■

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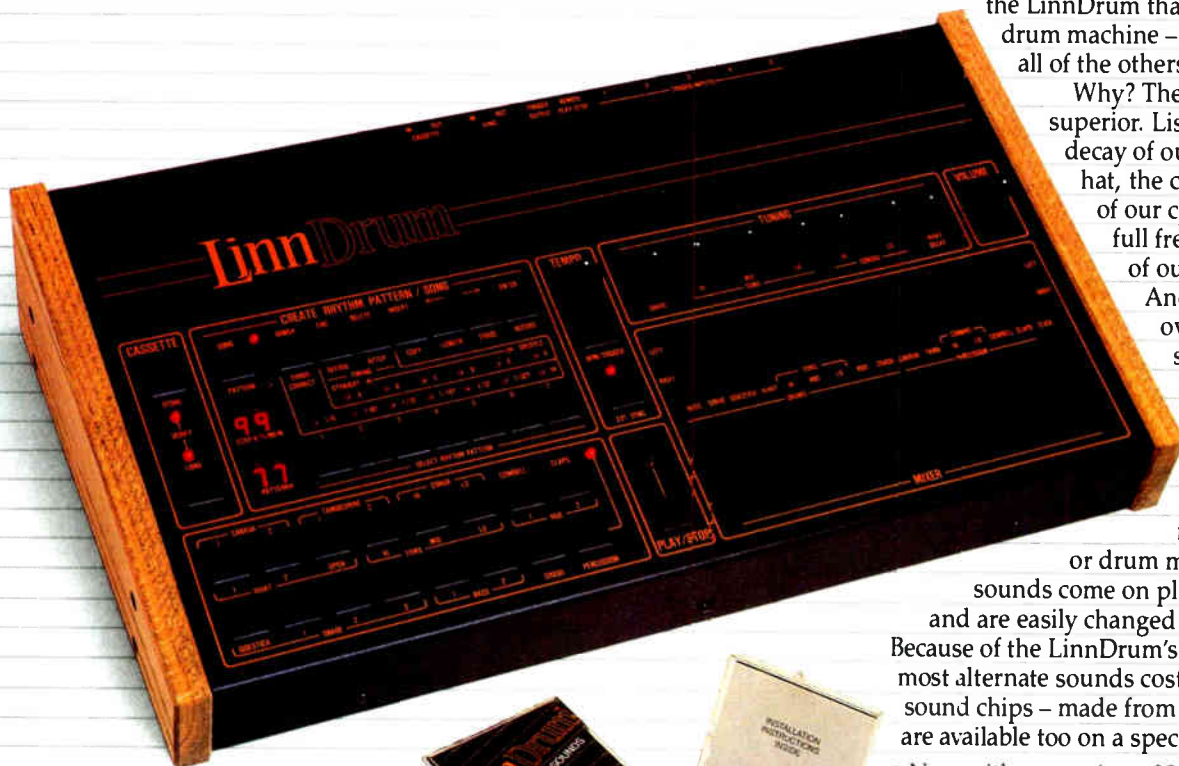
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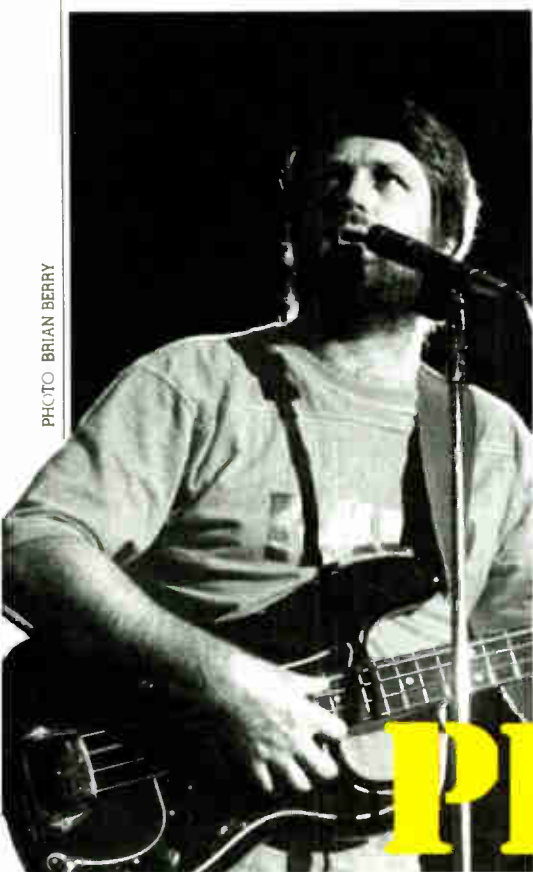
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PHOTO: BRIAN BERRY



Brian Wilson playing onstage with the Beach Boys.

Dakota Staton as band vocalist and a new pianist by the name of R.C. Robinson who later became Ray Charles. Then he started producing Little Richard (who he still manages and produces), Jesse Belvin, Lou Rawls and Sam Cooke. Shortly after Sam Cooke hit, his staff included Herb Alpert, Lou Alder (who later produced the Mamas & Papas and Johnny Rivers), Kim Fowley, and Sonny Bono, all of whom learned much from this master producer. He also gave Quincy Jones his start, even teaching Quincy in his Army band when he was bandmaster.

Bumps had just gotten his master's degree in music when he recorded Sam Cooke's "You Send Me." Sam's first record date was in New Orleans, however, and Bumps recorded him from 10:00 a.m. to 12:00 noon on a Sunday in 1956, took a break to get married, and then, true to studio life, promptly returned to the studio to finish producing Sam's recording of "I'll Come Running Back To You."

Bumps knew that Sam Cooke's voice had a very liquid jazz sound so he hired the Pied Pipers to reinforce the melody of "You Send Me" plus the innovative idea of using only a 4-piece

Bumps set a great standard for beautiful, clean sound and innovative ideas for producing, arranging, coaching of singers, picking repertoire and was influential in getting producers, arrangers, and musicians—black and white—started in the recording industry. He has always had great admiration and respect for talent and a keen ability to find and develop it. He has the gift of supporting and coaxing stellar performance out of everyone he produces. He is currently involved with a new project—the new *Vancouver* LP by Mary Demerf on Bumps' own label, Chelan, which is a Cherokee name. Blackwell's heritage is French and Cherokee Black.

Another current project includes an LP with Yma Sumac. Remember her? She was the golden eight-octave singer of the '50s and she's still got it. I worked on part of the LP and being a past fan of hers, I was thrilled to finally meet this sharp lady who had so much energy and depth. She still has the same magnetism that had all of Europe at her feet for so long. Her beauty is still really something, and her new LP is excellent—very funky, but with ethereal sounds.

Then, there are producers Phil Spector and H.B. Barnum. H.B. taught me many of Ray Charles' tunes and I played a lot of "soul" gigs with his band that was a great mixed group. Hal Blaine played drums on most of those gigs; Steve Douglas on sax and Lou McCreary (a great studio trombonist) were also in the band. While doing a lot of hit sessions with H.B. Barnum, I played a gig at a prison in California where I met Phil Spector. His Teddy Bears hits were popular and I can remember my first impression of him—he was someone who knew what he wanted to do and was on his way to doing it. He's a real jazz fan and in those days I was playing a lot of jazz guitar (H.B. also was a fine jazz sax player as well as pianist—gospel and jazz) so we got along fine and he asked me to record for him. Pretty soon, I was practically living at Gold Star Records, sitting next to Barney Kessel and Howard Roberts. We'd spend hours on the "A" side and do a quick jazz number for the "B" side in 5 minutes. The Blossoms were backup singers in those years and we were all having babies together (my Gwyn must have heard a lot of electric 12-string when I was carrying her).

A Few of My Favorites

group (two guitars, famed arrangers Rene Hall and Cliff White, his brother Charlie Mr. "Time," on drums, and Billy Preston's father on acoustic bass). The date was June 3, 1957, with engineer Vern Thompson, at Radio Recorders in Hollywood and the owner of the record company walked in on the date in progress, heard the jazz sound of the Pied Pipers, saw the band (no piano) and promptly fired everyone. He told Bumps to take the master and leave. That was the start of Keen Records and the career of yours truly.

With "You Send Me" beaming on all the airwaves, Bumps walked in the Beverly Caverns where I was playing bebop guitar with Billy Higgins (drummer) one night and said he liked the way I played—would I like to do a record date? I didn't believe it but there I was, doing sessions for him after that.

by Carol Kaye

Well, it's that time again—true confessions. I've written about a few favorite male singers, female singers, arrangers, fellow musicians, and now for those wild, wonderful producers I've worked for. In those days, we called them A&R men (short for Artists and Repertoire). As I've mentioned, the first producer I worked for was Robert "Bumps" Blackwell.

Bumps produced many big hits in the '50s such as "Night Owl" (Tony Allen), "Lawdy, Miss Clawdy," "Cherry Pie" (Marvin & Johnny), "Confidential" (Sonny Knight), "It's All Up To You" (Don & Dewey), "Things I Used To Do" by Guitar Slim (Eddie Jones) with

The first hit I played electric guitar on was "Zippity Doo Dah." We cut many hits with Ike & Tina Turner, Ronny & the Ronettes, the Righteous Bros., etc. I especially liked "You've Lost That Lovin' Feeling," even though all I did was play rhythm on my 1935 Epiphone Emperor acoustic jazz guitar which used to have a D'Armond pickup on it for live gigs. When I couldn't make a record date for Phil one time, he had the nerve to ask me to send my guitar to the date and I said, "Where my guitar goes, I go" so he re-booked the date. Stan Ross, the engineer, later told me that my guitar was part of Phil's echo sound—he really loved that guitar, being a guitarist himself. Sonny Bono later featured that guitar on runs and fills on his recordings of Sonny & Cher also.

The dates with Phil were like marathon group therapy dates. I've written about these in the past—the dart throwing, chess playing and girlie magazines. Barney Kessel and I loved to go next door to the liquor store and buy ice cream bars. Back to producing. Phil took his time to get the sounds and feel that he wanted. Don Randi, fine pianist and owner of the Baked Potato jazz club in North Hollywood, Mac Rebennack, Larry Knechtel and Leon Russell were the pianists, Dave Cohen (guitarist on "Feelin' Alright") was one of the regulars, as was Mike Post for awhile—then came Tommy Tedesco. Hal Blaine was the resident drummer (sometimes Earl Palmer) and Ray Pohlman played electric bass (called the Fender bass in those days) with his bare thumb. Ray used to do all the bass work in town and then left to do arranging and conducting at the *Shindig* show, which gave me work opportunities. I wound up accidentally playing electric bass one day when the bassist didn't show on a recording date at Capitol Records. I liked the feel of it, the composing freedom and the idea of carrying in only one instrument. Ray was and still is a fine guitarist.

Two-track was used exclusively then, which is amazing considering that horns were usually live and sometimes strings too. We occasionally recorded at United and Western Recorders but mostly at Gold Star. Phil would kid us about our "weak" areas sometimes so we all learned a lot more than music. There would always be that hair-raising moment when we all knew "this is the TAKE." The playbacks would be breathtakingly LOUD but Stan would also switch to the little car radio-size speaker for a check too. It would take awhile to get the ringing out of the ears. I always went in the booth to check out my sound—you learn a lot that way.

Another producer who worked that way was Brian Wilson. The con-

cept, arranging, writing and much of the vocals of the Beach Boys came from him. Carl Wilson would sit in the booth and record with his 12-string (usually) and we'd bump into the rest of the group in the hallway on the breaks, say hello and chitchat. Also, Brian's wife and sister-in-law would be in the booth—great gals, very supportive. Emil Richards would be on various percussion (see his book, *World of Percussion*, Gwyn Publishing Co.), or Gene Estes and Gary Coleman too (also published by Gwyn). Barney Kessel was used a lot on these dates. By the time we did *Pet Sounds* Brian was really taking his time in the studio—the music was maturing into something deeper than it had been.

"Help Me Rhonda" was my first bass Beach Boys recording (I had played guitar on their stuff up to then). Sometimes we'd go in the booth and listen while Brian would hum the various vocal parts. It used to amaze me how he could plan so much and still concentrate. His vocal ideas were pure magic and all of our parts came into focus then. By the way, Brian always used a string bass along with the electric. Lyle Ritz, who used to play jazz with Paul Horn's group around town, was the man. Lyle also played electric

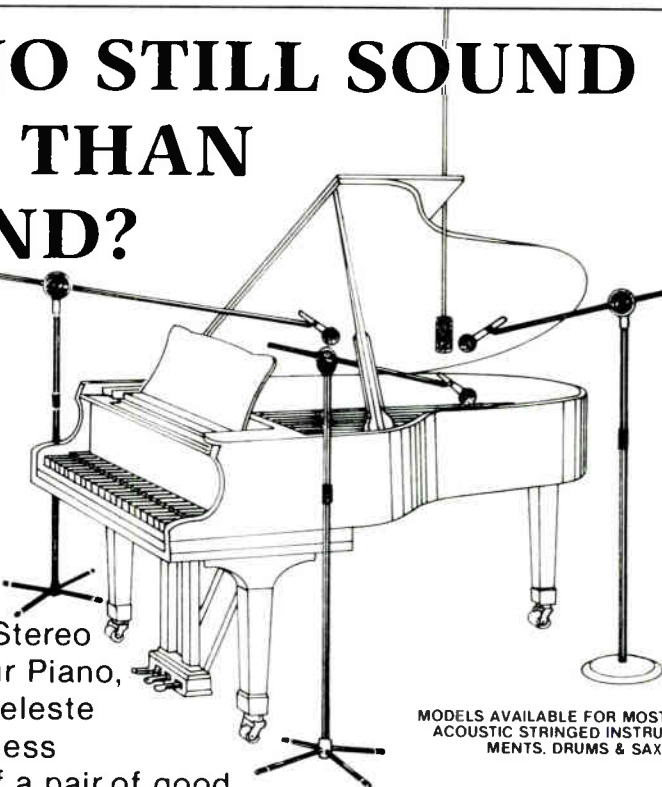
bass on Herb Alpert's LP too (I played guitar on a lot of that stuff and 12-string too.)

Hal Blaine was the only drummer Brian would use. His unique ideas would be the thing that Brian was looking for. Hal even used spoons on one date that fit perfectly. Brian loved the BooBams and Victor Feldman would play those things. Dr. Paul Tanner is the one you hear playing the theremin on "Good Vibrations," which was innovative for that day. Brian usually overdubbed the strings but on the "Fire" recording session at Gold Star, the strings were live and what they played sounded like a real fire. Too bad that Brian literally burned that master; it was a great piece. We all got double pay for using saws, riveting guns, hammers, etc. for the "re-building" part of the recording. It was around the time between "Good Vibrations" and "Heroes and Villains" which was the last recording I did for the Beach Boys. I had gotten into more movie work by that time. Chuck Britz was the engineer on all those Beach Boy dates but Brian would always take over and have Chuck be 2nd engineer. Brian had an uncanny ear for great mixing on this 4-track board. The sound was always beautiful. ■

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Above left to right: Robbie McIntosh, Chrissie Hynde

PHOTOS DAVID GANS

by Susanne Whatley

Chrissie Hynde is not your average working mother. She fronts The Pretenders, one of the most resilient and pioneering bands in New Music, and she writes commanding and absorbing songs about enduring the capriciousness of life and turning bad breaks into new strengths.

Hynde's mettle was put to the test in 1982, when the group's founding guitarist, James Honeyman-Scott, died from heart failure due to an intolerance for cocaine. Bassist Pete Farndon, fired two days before Honeyman-Scott's death because he had a drug problem that interfered with his musicianship, became another drug casualty six months later. With half her band gone and a baby on the way, a lesser woman might have packed it in. But not Chrissie Hynde.

This tough American expatriate has kept the band together. Ironically, the two new members—guitarist Robbie McIntosh and bassist Malcolm Foster—were already being considered for Pretendership when Scott's death made the addition of the guitarist/keyboardist a necessity rather than a luxury. "I didn't know Martin [Chambers, The Pretenders' drummer] or Chrissie at all when I joined," says Foster. "Knowing them now, I can see

why they wanted to carry on. The mentality that they have about wanting to play is so strong that they would never have folded up."

Adds McIntosh: "Martin said once, 'Me and Pete and Jim started this band, and I'm going to finish it.' Martin's very dedicated to the whole thing. He feels that Jimmy would have wanted them to carry on."

The Pretenders, Version Two, have released *Learning to Crawl*, which includes 1982's "Back on the Chain Garg" and "My City Was Gone," recorded immediately after Honeyman-Scott's death, as well as the new masterpiece, "Middle of the Road." They are currently touring the States to confirm their assertion that The Pretenders are not sadder, just wiser. Fans are seeing a more poised and self-confident Chrissie Hynde returning to full throttle, with a new command of the stage.

Midway through a four-night, sold-out engagement in Los Angeles, the media-shy Hynde and her guys sat down with reporters at Warner Bros. Records' Burbank offices to discuss their comeback from cataclysm, Hynde's feelings about rock and roll motherhood, and all the reasons to be cheerful after all. In San Francisco, Foster and McIntosh paused to offer some additional comments.

Mix: Did you ever come to a point where you thought the band wouldn't carry on?

Hynde: No. We didn't really think about it too much. At the time to which you're referring—after Jim died and we fired Pete—we weren't really thinking too much about ourselves and the band.

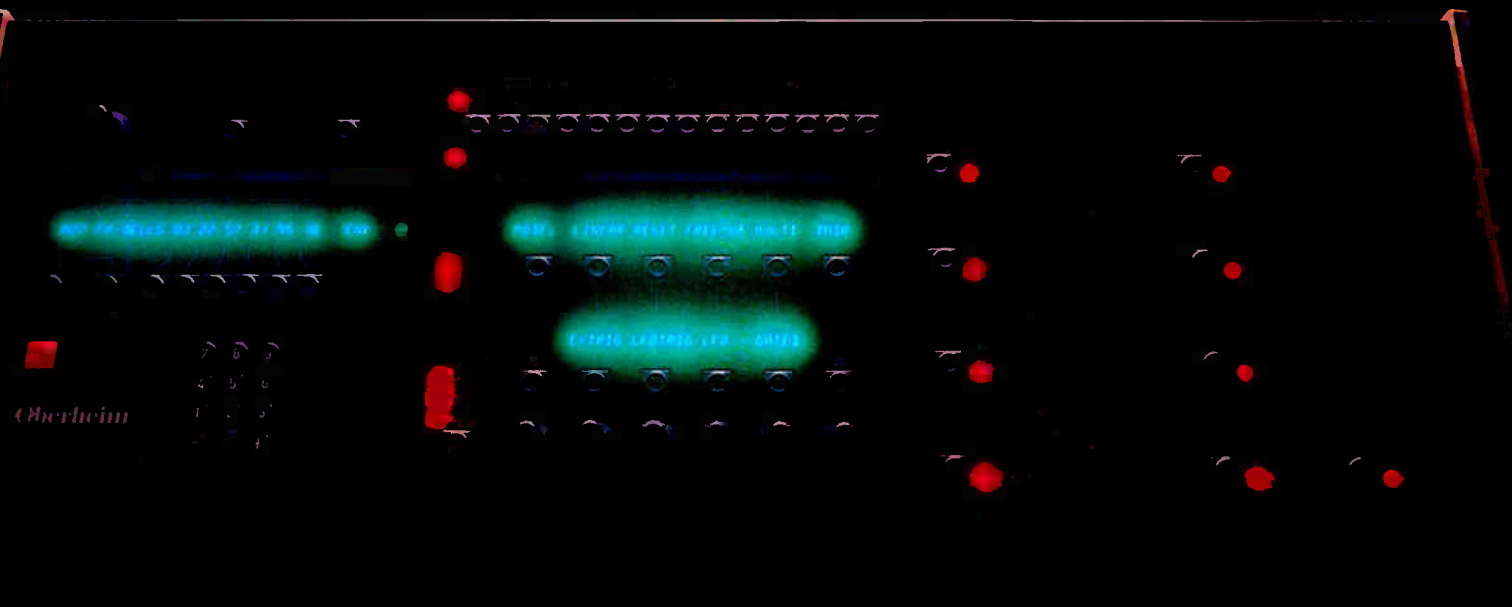
Chambers: We were doing what everybody does. You mourn for a very close friend who died, and that was what was taking place. There was no thought at all about the band, because that didn't seem important.

At Jim's funeral, several people started bringing it up—including Jim's mother, who said, "You must carry on." So we started thinking about it. And what else were we going to do? I didn't want to stop.

Mix: Did you ever consider changing the way The Pretenders sound so there wouldn't be any comparison to the old formation?

Hynde: We don't think about that. We're just trying to make our records, you know. We're just working with what we've got, and we're not making comparisons. Those guys are dead—just let them go their own way now. I'm not going to dig them up and make comparisons, and I really don't think anyone else is.

—PAGE 154



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Xpander



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Mix: Have you thought about changing the structure of the band in terms of musical instruments or the way The Pretenders sound?

Hynde: We've kind of thought about that, because we've included keyboards on the road for live work—but we'd been thinking about that before, anyway. I don't think we would want to change the format for any reason other than, you know, musically it seemed like a good idea.

McIntosh: Up until about a month before we came out on tour, we weren't sure whether to have a keyboard player or not. It all hinged on a couple of songs, notably "Thin Line Between Love and Hate," which is a piano-based ballad . . . We got Rupert [Black] in to do that song and to add some fine little touches, like on "Chain Gang" there's a simple synthesizer line. He doesn't play on some of the songs. He keeps a low profile. He's just the sort of person the band needed: somebody who's fairly quiet and is prepared to play fairly simple parts.

Mix: Was there a point where you were able to put the tragedy behind you and again enjoy a sense of fun among the band members as you played?

Hynde: There's always a sense of fun. Certainly the "sense of tragedy" was with Pete, because it had gotten to the point where we actually had to ask him to leave. That was the tragedy in this band. When Jim died, he was gone, but—I know this probably sounds kind of wild—I miss Jim every day. I felt a great sense of loss. He was a great friend and a brother and I was sad to see him go.

He was just such a great vibe. The guy had a great sense of humor and was such a laugh all the time that somehow whenever I think of Jim it's with a funny . . . It sounds nuts, maybe, you don't think about friends of ours who have died like that—but I think of Jim when I'm with a friend and we're really laughing and I think about something Jim would have said or done. It's always like that. Even at his funeral, I felt if I had been the one in the box and he had been in the pew he would have been looking at his shoes trying not to laugh. He was just that kind of guy. He was kind of irreverent.

I think of Jim onstage if anything funny happens, so it's not like we're "trying to carry on with this sense of tragedy." I don't feel a sense of tragedy.

Mix: How has becoming a mother changed your life?

Hynde: It hasn't that much, really.

Mix: You having fun?

Hynde: Mmmm . . . yeah. It's hard work, and it's fun. It's such a real-life situation that you just get on with it. It's much easier having a baby around than having a drug habit or something. It's less time-consuming—and I'm not just saying that to be cute, really. It's true. *This* is more of a diversion than anything.

I breast-fed her for a year, so that meant that during rehearsals when the other guys would go down to have a cup of tea in a cafe somewhere, I'd have to go back and, you know, [she gestures].

McIntosh: We drank a lot of tea.

Mix: You and Ray [Davies] have collaborated on some songs. What are you going to do with them?

Hynde: Probably absolutely nothing. A friend of ours, Sandie Shaw, was saying something about a song, and then Ray started an idea and I sat down to type out what he was doing. This was just one afternoon; we knocked together a little song with Sandie in mind. Then another day, we were talking about Pat Benatar and we thought, "Oh, we'll write a heavy metal song." They weren't for us. It was just like a little exercise, something to do in the afternoon. We made little demos of them. They're quite good, but I shouldn't think they'll see the light of day.

Mix: Have you started writing songs for your next album?

Hynde: We've thought about it [slight laugh]. Basically, we have to finish a lot of touring now. It's kind of frustrating. If we weren't working now we could go in and start rehearsing and I could think about writing a bit. Maybe in July when we have a month off we could try to record a single.

Mix: You have been giving so few interviews this time around. Did MTV arrange for exclusivity along with sponsoring the tour?

Hynde: No. I'm not even fully aware of this MTV thing. I saw it for the first time myself the other day. We live in England; how are we going to see it? And anyway, I wouldn't sit down and watch more than five videos in a row, or I'd be bored. It's not really my thing, but I guess it's kind of neat for kids to have something their parents hate. They can't do that with rock and roll, because their parents are still listening to rock and roll.

The thing about MTV, though, is we're on the road and I'm kind of busy with the baby, and it's just boring to keep saying the same thing over and over [to interviewers]. So if you can say it on MTV once, you

don't have to say it over again.

The big joke of this, though, is that we did our "definitive" MTV interview in London, spent two hours doing it on our last day of rehearsal. It was really painstaking. We answered every possible question about things we never wanted to talk about again. The whole time, we were saying, "Well, never mind, this is the last time we'll have to do it." We got really detailed, answered *everything*—and then they came to us half an hour later and said, "Look the guy put the tape in wrong. Can we get together and do this again?" So we did it again.

Mix: Chrissie, a lot of women look up to you as a role model. I get the impression, though, that you're not comfortable with that. Why?

Hynde: Well, I'm not very comfortable with the word "role" in the first place, and that's where the problem is: assuming a role at all. That's something I've never done. Not on purpose. . . .

If I want to play guitar, then I will. It's simple. I'm not "working in a man's field"—I'm just doing what I like to do. I think that's discrimination, talking about roles. If I wanted to get a band together and I said, "female guitar player wanted," I might as well say, "Jewish guitar player wanted" or "black guitar player wanted." That's got nothing to do with music, to me. It's just discrimination, and I'm not even going to discriminate between different kinds of discrimination, which all that "role model" kinds of thing implies.

Mix: How did you word your audition notice, then?

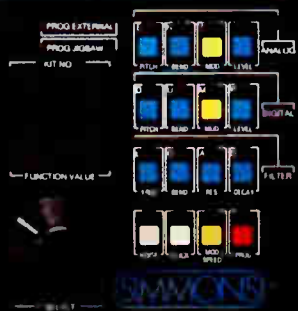
Hynde: Well, I thought about saying "men or women," but then I thought that's just bullshit. If someone wants to join our band and they play the guitar and they come down, well, let 'em come down. I don't have to spell it out for them and say, "Ladies invited, too." If someone has the balls to come and play, then let them! It so happened, though, that there wasn't *one* chick who did come down. So, you know, that's their problem.

I'm not trying to be a role model for anyone.

Mix: Music has been trying to communicate the message of love through lo these many years. You'd think we would have shown some real progress by now. Why isn't it coming through?

Hynde: Good question. To me, that *is* the message in music, and it's what music is all about: love. To me, that is the essential nature of songs. I don't know why it isn't getting through. I would like to find out, too. ■

the next step



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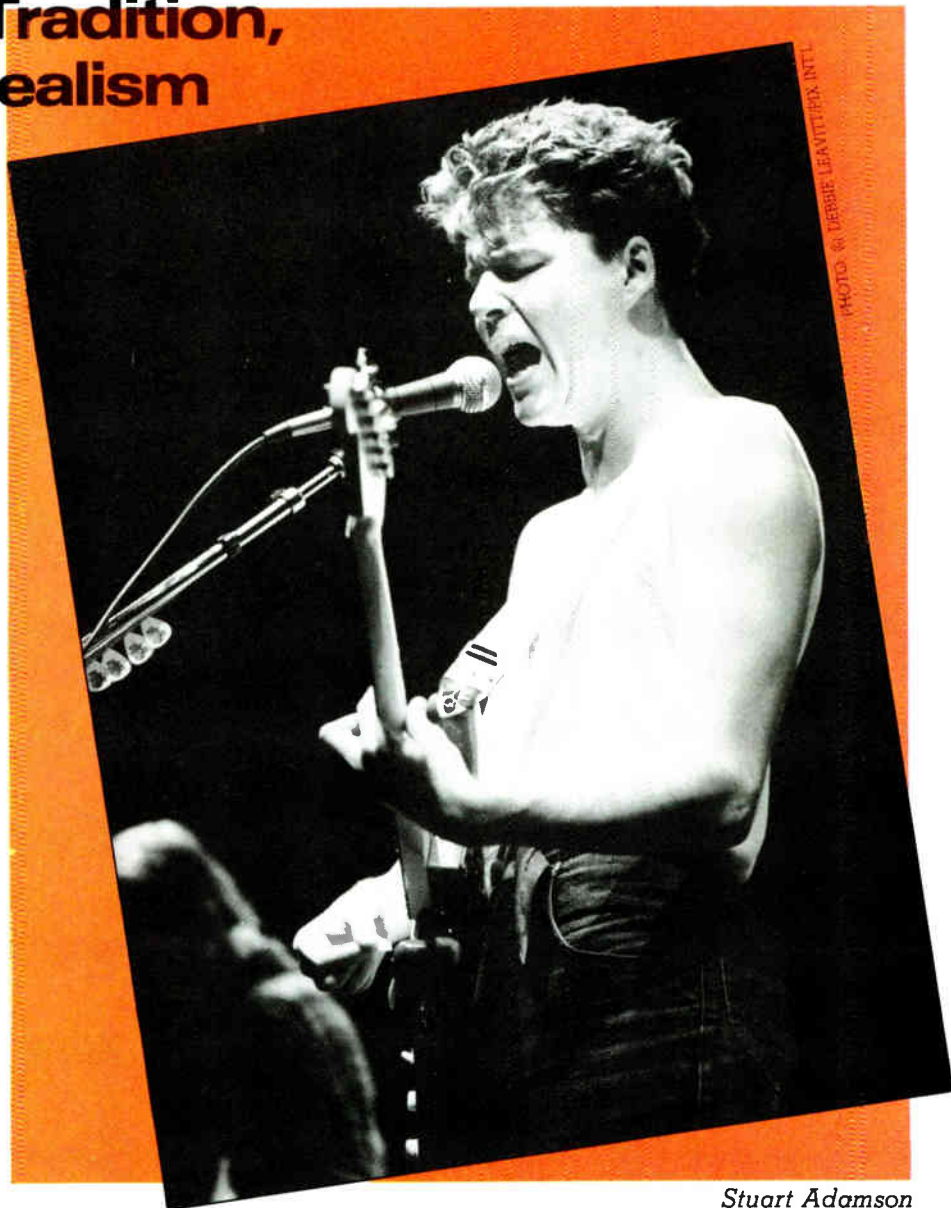
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Big Country: Tradition, Innovation, Idealism

Like prisoners on parole, Big Country shot out of Dunfermline, Scotland, touring madly on the heels of *The Crossing*. Their debut album just wouldn't quit selling; with its blazing guitars, smart arrangements and mighty tales of working-class heroism, the band cut a wide path to glory and became pop's Next Big Thing.

These messengers of the New Sincerity cling to the idea of rock and roll as an agent of salvation and reassurance—which rules out synthesizers and wisecracking. But what of the emotional and creative trapdoors that await artists who fall into the "overnight sensation" groove? Big Country guitarist-vocalist and spokesman Stuart Adamson is confident rather than cocky when asked if the response has exceeded his expectations: "I don't think so. I was well aware that what we were doing with the music was important and relevant to the way a lot of people felt about life. Anything important that comes along usually happens quite quickly." Once you crack Adamson's marshy Scottish accent it becomes apparent that he is a man not on the trail of a career, but on a mission to impart a new rock idealism on a weary music scene.

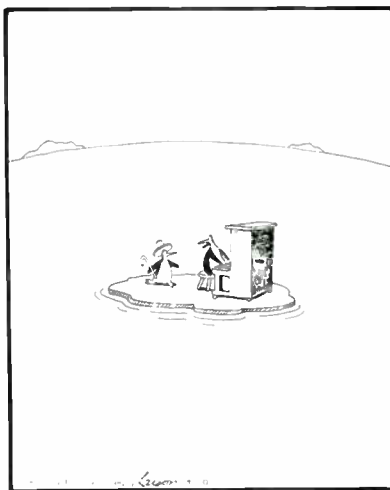
Earnestness has begun to seem like a cultural blemish in these New-Musik times, but Adamson is utterly lacking in cool, ironic detachment. Big Country's songs (credited to the entire band—Adamson, guitarist Bruce Watson, bassist Tony Butler, and drummer



Stuart Adamson

THE FAR SIDE

By GARY LARSON



"No, no, no! Now, try it again! . . . Remember, this is our one and only ticket out of here!"

Mark Brzezicki) lean toward spare talespinning rather than clever quipping. "I try to write about situations that can be applied worldwide rather than restrict the songs to my own area of Scotland," Adamson explains. But those intentions aside, it may be the band's Scottish blood that gives them a musical edge, evoking the wafting of a bagpipe by use of the E-Bow (an electromagnetic string exciter that pulls sustained tones out of the guitar) and jig-gish riffs that echo the old country.

Could it have been geographical isolation that steered the group in forging their sound? "Definitely," Adamson claims, "there's nothing else to do in Dunfermline." It was also a matter of saying *no* to prevailing trends. Adamson quit the Scottish punk outfit The Skids—with three albums to their

name—in 1981, feeling it devoid of content. "I just felt there wasn't anything there spiritually for me." Nor could he find spiritual aid in the then-burgeoning synthesized soul wave in England. "I didn't want anything at all to do with that. I thought, and still think, that there are things to be done with the guitar that haven't been touched on; it's just a much more potent instrument than the synthesizer. I've messed about with [synths] before, and I think they're good for making nice, flowery sounds, but they're fairly gutless, really."

Though the guitar was Adamson's *modus operandi*, his approach was hardly purist in plotting the course of Big Country. Teaming up with chum Bruce Watson, they devised guitar parts that would dart and weave with

—PAGE 158

Memoirs from the Bass Line

New York City has intimidated many people in all walks of life, including those who, like me, chose to live somewhere else after surviving many, many years in the city. However, consider the millions of people who not only live there successfully but don't ever consider leaving. Why is there so much pride, intimidation and *attitude* in the New York environment? Perhaps my experiences in the New York studios in the '60s and early '70s will shed some light.

New York recording engineers, musicians, arrangers, producers, record companies, etc. are equipped for success because of the effects of New York's size and environment on their abilities. This is not to say that engineers, musicians and producers in other cities aren't equipped for success; it's just that New York offers extraordinary opportunities. My feelings about this are substantiated in the following non-musical (but applicable) areas: Privacy, Training, Environmental Support, Opportunity, and Attitude.

Privacy. A visitor to New York might wonder how in the world a person finds privacy in a city of ten million people. But those masses are individually busy with the wear and tear of their own plights, and the environment demands that each mind his own business. While living and working in New York I found this kind of privacy appealing. I am by nature very private, and I do my best work when my ideas and revelations concerning a project can be executed without unnecessary talk. The studio musician operates in an environment where the basic rule of thumb is to copy currently successful styles and concepts; in order for everyone to agree on what's being copied, it's necessary for the individual to expose his or her thoughts and plans. This promotes the danger of one's career consisting of a facade of copied values as opposed to freedom of spirit.

In New York in the '60s and early '70s, the atmosphere in the studios respected the privacy of the musicians. What mattered was not schooling, domestic habits, gossip, money or family—"harmony and theory" as applied to the making of music was what counted. The total performance would set trends and concepts that would be copied all over the world.

Training. When people ask me where I went school and what my major

—PAGE 163



Chuck Rainey at Cecca Recording Studio

The Band at the Country Club: Burning Down the House

One of the questions buzzing around The Band's comeback (after having been dormant since The Last Waltz concert, Thanksgiving Day 1976) was: Could The Band be The Band without the input of guitarist and principal writer Robbie Robertson, who declined to tour in favor of Hollywood's call? The four-piece Cate Brothers Band came in to fill Robertson's void, and after their own set of mild country/R&B augmented The Band's stage full of sound nicely (although the two-drummer format bred some nasty cymbal overring). But Robertson, the gritty player was decidedly missed; he was nonetheless there in spirit, having penned virtually all The Band's classic material.

Which raises another, more essential question: Has The Band survived rock's acid test of time? They basically just reeled off tunes at Reseda's just-homey-enough Country Club without frills, but they still came away triumphant, prodded by an ecstatic SRO crowd (someone even threw a fine brown Stetson up onto the stage in appreciation). The verdict seemed as clear as a gunshot. The Band's tunes—"The Shape I'm In," "Stage Fright," "Up On Cripple Creek," "King Harvest," to name but a few—are genuinely timeless, pumped up with

echoes of vast American musical heritage, frontier ethics and funky folklore.

Only the chemistry of these players could deliver on the promise of the songs, though. Danko is the loose-limbed one, bobbing and slithering like a marionette and singing in a crackling, hesitant wail that seems miles from the breaking point, while Levon Helm sings with a sturdy twang and lays down that plump, loping Band drumbeat. Richard Manuel has logged the most time listening to Ray Charles and provides the vocal link to soul. Behind and around it all is Garth Hudson; or "Caledonia," his honking soprano sax looked like a toy in his massive hands, and his mountainous organ solo intro to "Chest Fever" sounded like the wrath of God in sonic form.

These are the musical and visual treats that comprise The Band, whose tour will generate more musical action if we're lucky. Their show here was an eruption of celebration, with cameos by an accordionist and actor/musician Gary Busey, belting ("I Don't Want To) Hang Up My Rock 'n' Roll shoes" nose-to-nose with an excited Danko. The show was no more an exercise in nostalgia than drinking fine, aged whiskey is.

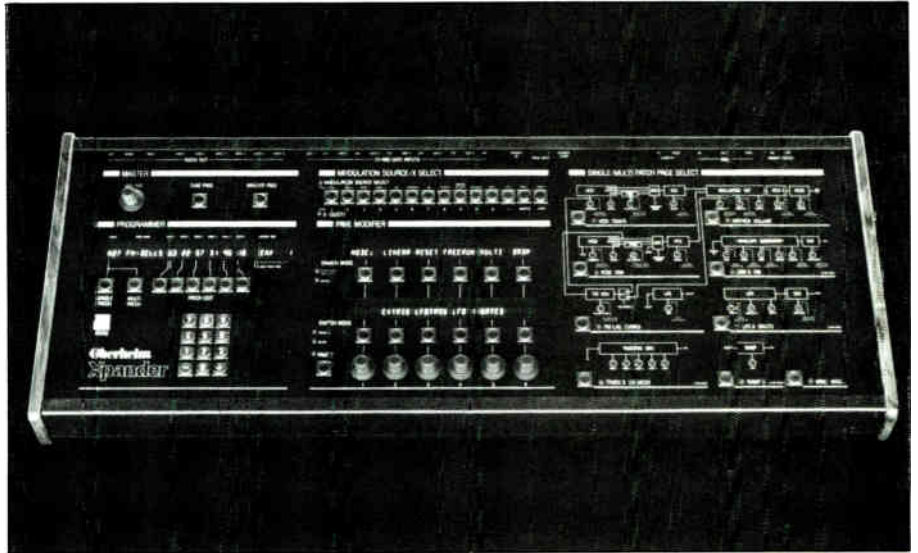
—Josef Woodard

PRODUCT NEWS

Oberheim Xpands the Possibilities: Adds Sync to DX

The Oberheim Xpander is a six-voice programmable synthesizer which can be controlled by any appropriate device via MIDI and CV/Gate inputs. Each voice is separately programmable, meaning that each can have entirely different characteristics, and each has a separate output in addition to the Xpander's stereo outputs.

Each voice has two oscillators and frequency modulation (FM) capability; 15 VCAs, 5 LFOs, 5 envelope generators, 4 ramp generators, three tracking generators, a 15-mode Filter and a Lag Processor—all controlled by two microprocessors. Onboard storage provides for naming of each of 100 online patches; three 40-character alphanumeric displays serve many purposes in programming and operation.



Suggested retail price: \$2995.00.

Other Oberheim developments include a Sync-to-Tape update kit for the DX drum machine, allowing interfacing with Oberheim's DMX drum machine and DSX sequencer. The feature is included in all new DX units,

and can be installed in existing DXs by any authorized Oberheim Service Center for a \$25.00 labor charge (the update itself is free).

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—FROM PAGE 156, BIG COUNTRY

each other, one minute using power chords of the Motley Crue ilk (though mixed oddly low; the idea was "to make the music more textured instead of having it all out front, pulling at your leg all the time," reports Adamson), the next diving into what has now been tagged the Big Bagpipe effect. Bassist Tony Butler and drummer Mark Brzesicki lay their own firm foundation, but it is the surface luster of the guitar patchwork, Adamson and Watson trading off between Stratocasters and Yamaha SG-2000s, that gives Big Country its original zest.

"That's something I've been looking for for quite awhile," Adamson reports, "to use guitars orchestratively and to intertwine them rather than having two guys flogging away at the same chords. I think it's an integral part of the group. Actually, a lot of the harmony on the guitar solo [on *The Crossing*] were done using the Harmonizer, which I also use onstage. It does sound like more than two guitars, but I think the most we used was two tracks on each guitar on any one track. We didn't do a hell of a lot of guitar."

As far as new guitaristic angles go, the record is also significant in its spotlight on the long-ignored E-Bow device, a sort of Edsel of guitar toys which never caught on before the Big Country craze. Essentially a palm-sized

electromagnet which when placed to a string causes it to vibrate indefinitely, the E-Bow seems almost like Big Country's answer to the synthesizer in that it reroutes standard guitar technique. Turned on to the device by ex-Bebop Deluxe player Bill Nelson (who also produced a Skids album), Adamson is thrilled by the magnetic possibilities. "They're used for all different things, from high melodic parts to lowdown, almost a cell-type sound. It's a fantastic little device. I can't understand why it didn't sell more. It's been out about ten years, I think, and apparently because of Bruce and I using them, they've now become real popular in Britain. The guys have just made up a whole new batch, but these are in black instead of chrome, so they look a bit more high-tech, you know."

Guitar-drenched though *The Crossing* may be, its production values are those of the '80s—sophisticated yet raring-to-go. From the breathy colorings of the arrangements to the vacuum effect on the drum intro to "In a Big Country" and scattered reverb dallying on the record, the group and ace producer Steve Lillywhite pushed new blood into the age-old two-guitar blitz. Adamson says the band got on famously with Lillywhite. "The thing about Steve is that he actually gets right into the spirit of the group and what it's about without trying to be an overseer.

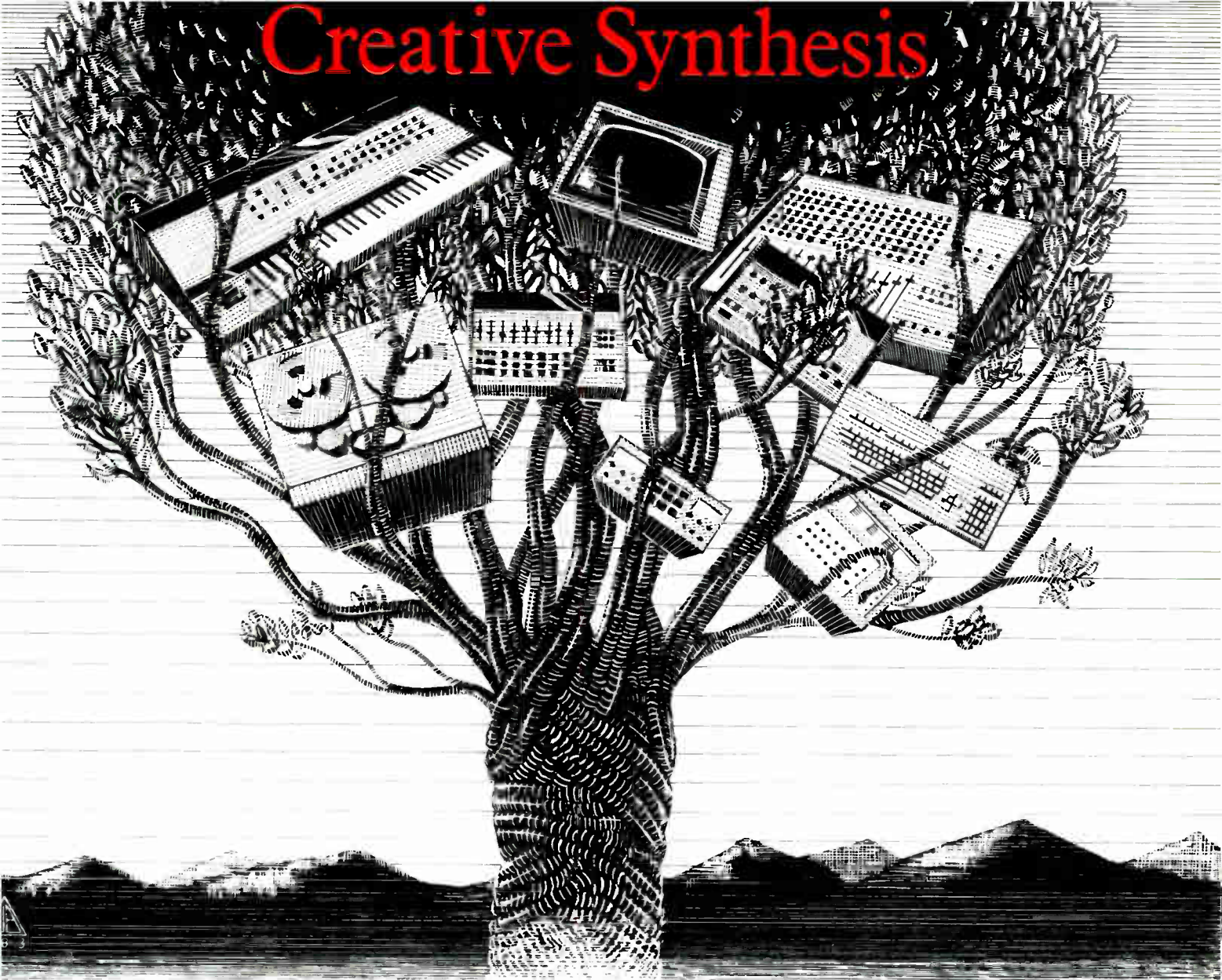
He didn't try and tell us what to do. He'd just listen to our own ideas, and we'd try a few of them out to see which ones worked best."

Lillywhite had previously proved himself a producer of creative instincts in his work with (among other acts) XTC, whose recipe on innovation steeped in folkish tradition is not so different from Big Country's own. But Adamson has mixed feelings about the English group and their terminal eclecticism. "I think they go from being absolutely brilliant to absolutely insane. I want Big Country to develop naturally. I don't want to force any decisions about directions. I think it's much better to let it happen naturally, to let it come out, than to use styles like a set of building blocks."

Given a rather massive vote of confidence at this early stage of Big Country's career, Adamson seems ecstatic—a world-by-the-tail tone comes into his voice. Yet he describes himself as a "depressed optimist," a term that might be Big Country's coat-of-arms. "The depression part of it comes from the economic-social things that are happening in Scotland. But the optimist comes from the fact that people there seem to have a great sense of humor in times of hardship. That gives me hope for the future of things."

—Josef Woodard

Creative Synthesis



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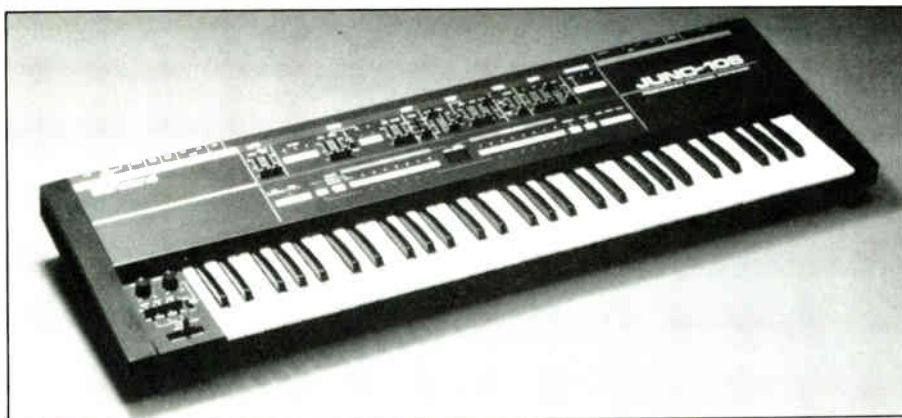


Double-Duty Digital

ADA's new *2FX Digital Multi-Effects* produces two effects at once. Its Flanger, Chorus and Delay sections each have separate controls, and the optional *DM-2 Footswitch Controller* provides remote access to bypass and effect selection; a Memory Bypass feature "remembers" any combination of preset effects. LEDs on the DM-2 indicate the status of effects in use or ready for use.

The Flanger or Chorus can be used in conjunction with the Delay or Repeat Hold function, and ADA's "Patch" switching system allows the user to select the position of the effects in the signal path. Other features of the 2FX include more than 1 second delay at 17 kHz bandwidth, and 10:1 sweep range in the Flanger. Suggested list prices: 2FX \$599.95; DM-2 footswitch \$99.00

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Juno News

Roland's *Juno-106* is a six-voice programmable polyphonic synthesizer with a 61-note keyboard and six digitally-controlled oscillators, each with its own fully programmable VCF, VCA and Envelope Generator. New to the Juno line is the 106's Portamento section, joining Pitch Bend, LFO trigger sensitivity and master volume at the left hand of the synthesist.

The Juno-106 has more on-

board memory than its predecessors. Each of the two groups contains eight banks of eight patches, giving the player a total of 128 presets which can be switched by means of a foot pedal if desired. Other features include Tape Interface for offline memory storage, MIDI input and output for connection with other devices, stereo and mono outputs and a headphone jack. Suggested retail price: \$1,095.00.

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More on the Floor from Pearl

Among the new entries in the Pearl Effects line are the *Thriller* (TH-20) and the *Stereo Noise Suppressor* (SU-19). The Thriller boosts peaks at six points in the audio spectrum (with Frequency, Color, Balance, and Multiplex controls), and when connected to Pearl's DS-06 distortion pedal

offers enhanced "heavy metal" effects.

With two independent channels, the SU-19 Noise Suppressor can be used to keep stereo signal-processing systems clean, or can be inserted at two different spots in a mono system, at less than the cost of two single-channel noise gates.

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Enter the E-Drum

E-MU's E-Drum Digital Percussion Module is a self-contained electronic drum which uses plug-in sound cartridges containing from one to four digitally recorded sounds each. Its drum pad can be set to respond to the individual player's style, with dynamic response and pitch sensitivity independently adjustable over a wide range. There is also a Decay control as well as an active equalizer.

The cartridge library includes a variety of acoustic and electronic drums, percussion instruments and sound effects, and more are being added. The E-Drum's external control input accepts standard DC triggers and gates from other electronic devices as well as virtually any audio source—and the E-Drum duplicates the dynamics of the external audio controller, meaning E-Drums can be added to live drums or used to replace a taped drum track!

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New Simmons Drums

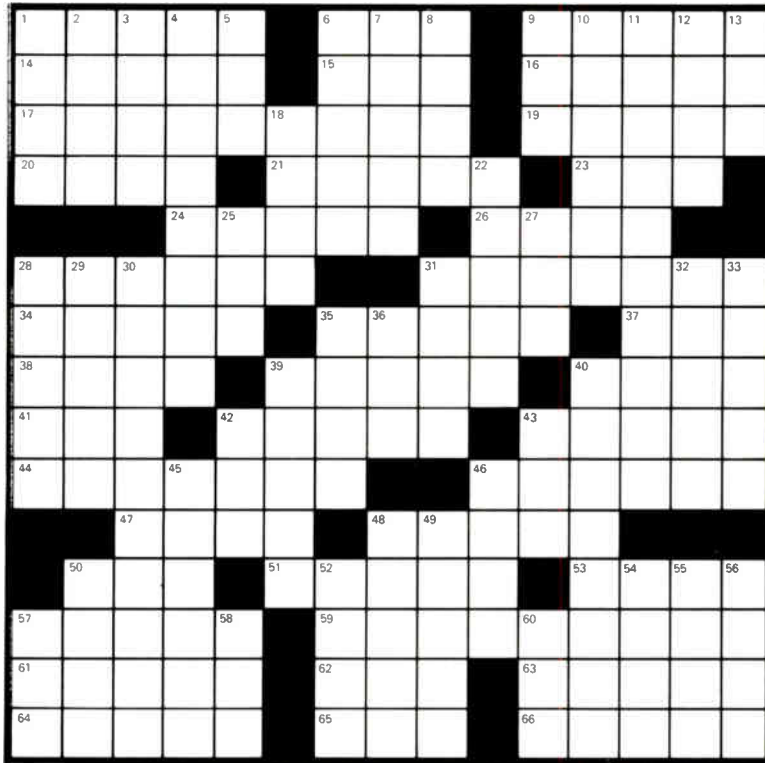
The *SDS8* is a new drum kit from Simmons, with a new "softened" playing surface which emulates the feel of a conventional drum head for more assured control over dynamics. There are five separate channels: Bass Drum, Snare Drum, and High, Medium and Low Toms. Each has a Simmons preset sound *and* a user-programmable option with controls for Sensitivity, Pitch, Filter Resonance, Bend (up and down), Decay, Noise/Tone Balance and Click Content. Each channel has a switch to select preset sounds, and a Master Select (which can be switched at the front panel or by pedal) changes all five channels simultaneously.

The SDS8 has individual channel outputs, a stereo mixer, and a multiway sequencer input for use with the Simmons SDS6 sequencer.

Circle #128 on Reader Service Card

MIX WORDS

by Armand E. St. Martin



"SNAKE JUNGLES, 1984"

ACROSS

1. Meters
6. Resort
9. Type of orange
14. Of birds
15. Aware
16. Resistor placed across a meter
17. Annoying areas in 11Ds
19. Pops
20. Functions
21. Prince of Araby
23. Humor
24. Set a rhythm
26. Charge _____ (abbr.)
28. _____ recording
31. Tutors
34. Worship
35. Fire adjunct
37. Capitol Hill denizen
38. Result of 39A
39. Shark's trade
40. Wait
41. You and me, for short, to a Rasta
42. Fop
43. Ladies' war paint
44. Cays
46. Shared lodging
47. Catch-all phrase
48. Spring sight
50. Filbert
51. Having handles, in pottery
53. Pacific isle
57. Pastry torus
59. On-stage hearing aids
61. Lambish
62. Words of uniting
63. Fly _____
64. Matching
65. Japanese currency
66. Lace again

DOWN

1. Strictly nix
2. Peron and namesakes
3. "Le _____ on scene"
4. Travel necessity (lovecases)
5. Bank abbr.
6. Abase

7. _____ in (spoke up)
8. Cathedral area
9. WWII cloak and dagger grp.
10. Large live sound firm
11. Listening arena
12. Pest
13. Aliens
18. See 33D
22. Studio gear mounts
25. Supped
27. Famed revolutionary
28. Spokes
29. Utopias
30. Item for 28A
31. Name in electronics
32. Shelf-like projection
33. Make haste
35. Offspring
36. Ticked-off
39. Big dipper
40. Cymbal detector
42. Double helix stuff
43. Boulder in the Outback (sl.)
45. Get on the same wavelength
46. Was transported
48. June VIP
49. Deceived
50. New, to Nero
52. Sale sign
54. Came to rest
55. Positively the greatest prefix with "mate"
56. Words of dawning perception
57. _____ Perignon
58. A Kennedy
60. _____ cry

Solution to May Mix Words



Coming in September...

DIGITAL

85

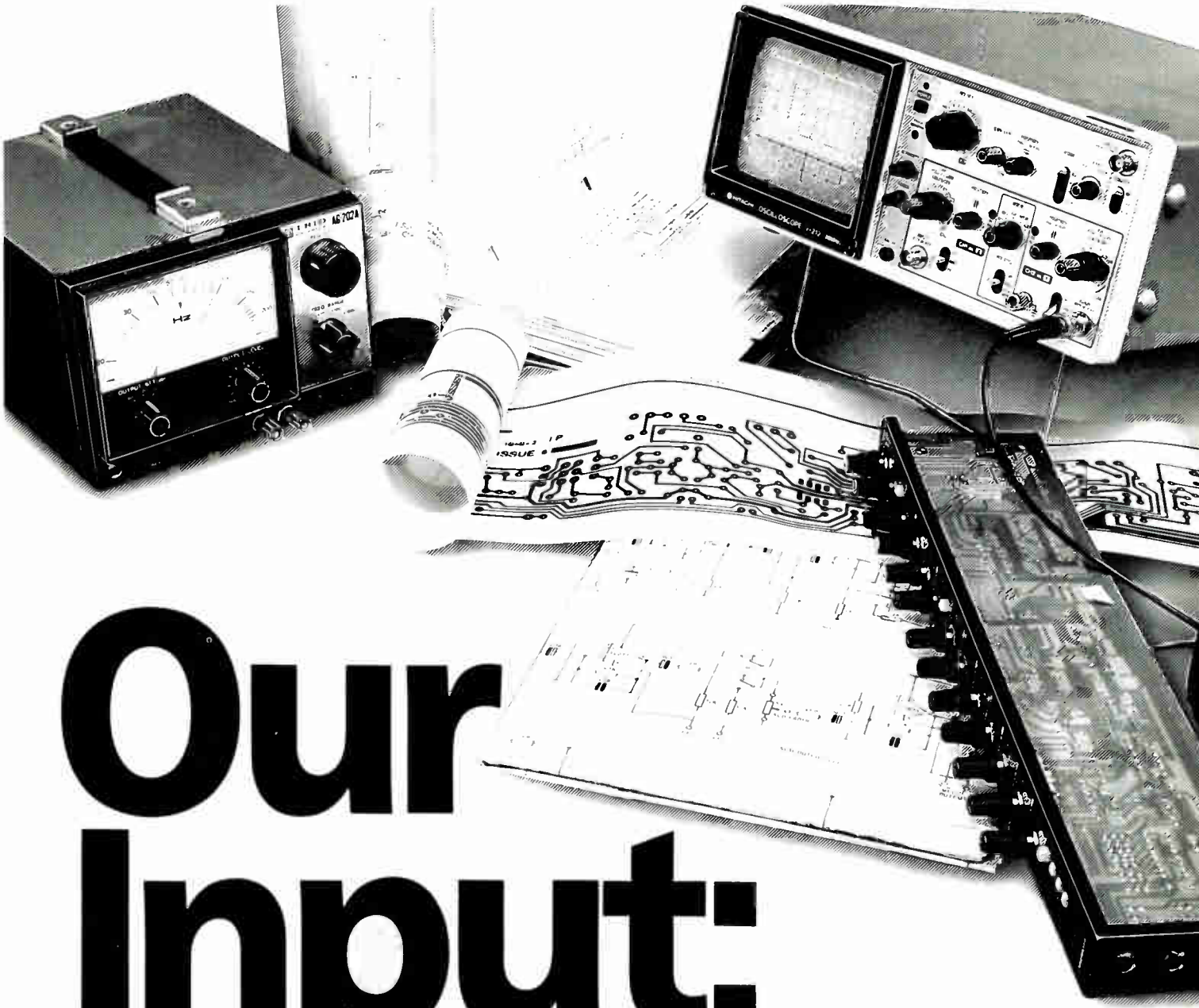
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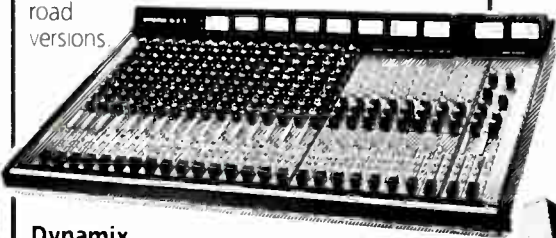
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—FROM PAGE 157, MEMOIRS

was, I reply, "I graduated from New York City with top honors and a major emphasis on playing the electric bass." Before I left Ohio I was the only electric bass player in town; this limited my ability to train myself to compete in my chosen field. Upon arriving in New York I found that there were *many* electric bassists competing and surviving, and I observed their successes and failures while I applied my own talents and skills.

At the age of 22 I knew I was going to survive as a player because everyone around me was teaching me what not to do and how to do what I was doing. Playing sessions and gigs with the likes of Bernard Purdie and Bobby Durham, my ability to groove became a reality rather than a dream. I might have grooved wherever I'd gone, but there were surely more real musicians to groove with in New York than anywhere else. We all had to either pay rent or sleep on the train. Half-assed musicians did not and do not survive in New York, because that environment sets you straight quick.

Environmental Support. The success of my career is due to my ability to function as an individual. Had I been in any other city in my formative years, I probably would have ended up as some New York player's clone. It was very important for me to be able to talk with, walk with, dine with and watch such legends as Mingus, Miles, King Curtis, Milt Hinton, George Duvivier, Eric Gale, and Grant Green, not to mention all the other great talents from other places who flocked to New York at one time or other to get a piece of the environment in order to enhance their skills.

Opportunity. No matter what the player's race, creed or color, New York offers all variety of performance opportunities: Latin gigs, Bar Mitzvahs, R&B, Country and/or Western, stage shows and art for art's sake. There isn't another place on this planet where a player's talent and skill outweigh any consideration of race, religion and/or sex. Racism is as much a part of New York as of other cities, but the competitive environment eclipses the effects of racism in the music scene—which is more than I can say for some other cities which want to compete with the Apple.

Attitude. Aha! Back to my opening statement about being intimidated. New York people don't intimidate each other, and they don't purposely intimidate visitors. Non-New Yorkers have a tendency to misunderstand the difference between "attitude" and "intimidation."

In 1974, after I'd been living and working in LA for three years, I returned to New York to play on Richard Tee's first LP for Tappan Zee. For the first time in three years I was surrounded by old friends—and in one of my favorite recording studios. I had recorded my first album at A&R 44th Street, and being back there with Steve Gadd, Ralph McDonald, Eric Gale, Bob James and Richard Tee was breathtaking.

When we began rehearsing a tune I asked Richard what kind of feel he wanted. He said, "Chuck, what is this LA crap you're bringing in here? Don't you know what to play—or have you been gone too long?" The other guys voiced agreement, and for a moment I felt alone and intimidated.

The fact that all these people are long-time friends quickly brought me to my senses. We're all from the same mold, and my absence from the New York scene had dulled my ability to function without asking stupid questions. Of course, I now had another set of values and pride in LA, but New Yorkers are there to play music—not talk about it. Before I could take it personally, professionalism allowed me to distinguish between intimidation and attitude. What those guys were saying was, "Play the bass, Chuck! You *know* what to do, and that's why you're here."

I know who I am, what I can do, and *when not to do it*. I have chosen where I want to live and work; my New York career established my presence and made me famous, and I am able to function in impromptu situations and improvise without spoiling the soup.

—Chuck Rainey

Application Notes

Matthew Wilder Gets a Little Help from His (Electronic) Friends

Most of the songs on Matthew Wilder's album, *I Don't Speak the Language*—including the hit single "Break My Stride"—feature layers of electronic keyboards and accents from several drum machines. Wilder's band includes keyboardist Brad Buxer, Stick and bass player Lloyd Moffitt, drummer Armand Grimaldi and guitarist Dan Jacob, but there still aren't quite enough hands to cover all the fills and filigrees when taking the songs from studio to stage.

To complicate matters further,

—PAGE 167

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VAN DYKE PARKS

Jump!

Warner Bros. 23829

Produced by Steve Goldman; Arranged and conducted by Lennie Niehaus; Engineered by Rick Ruggieri; Recorded at Cherokee Studios, Hollywood; Mixed by Rick Ruggieri at The Mix Room, North Hollywood; Originally mastered by Mike Reese at The Mastering Lab, Hollywood.

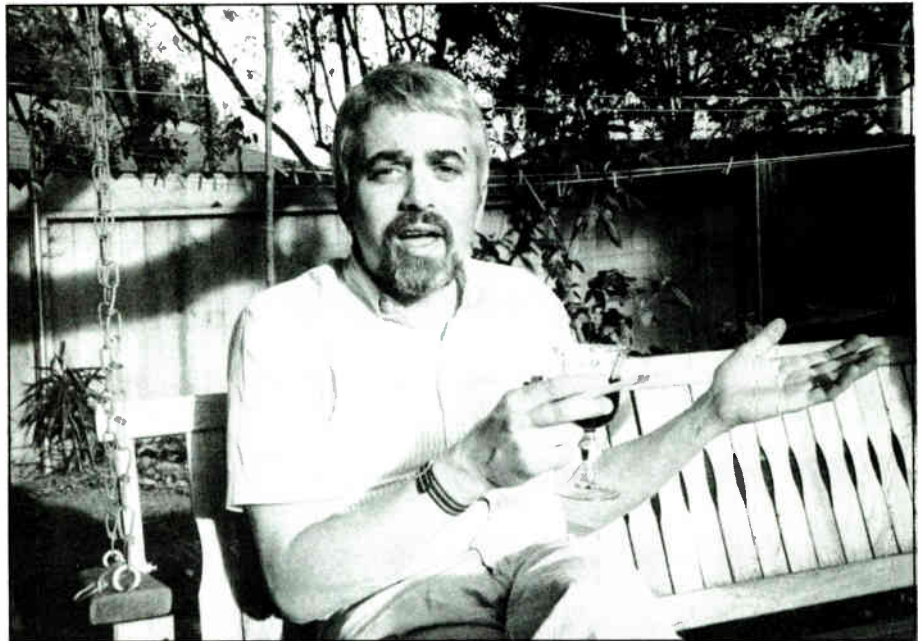


PHOTO MR. BONZAI

The artist sits comfortably in the swing of his modest Hollywood plantation bungalow. "The record is a complete success," admits Van Dyke, "and a big gamble."

Van Dyke Parks' Whimsical, Hare-raising Pop



I was moping around the house feeling like a lonely soul in a world too cool to be true. Then I put Van Dyke Parks' *Jump!* on the turntable, and the saints came marching in. Like the Groucho Marxian president of some mythical kingdom, Van Dyke barged into my living room with a high-

stepping troupe of actors, musical jugglers and sleight-of-tongue acrobats.

Jump! is a concept album, a generous helping from a Broadway-style show Parks has planned. The songs spin out of the Brer Rabbit stories as told by Uncle Remus in the Joel Chandler Harris classic. But this is no Disney story—these Brer Rabbit tales hold visions of dark humor as well as lightheartedness. Parks has written songs that shed colorful light on themes of love, family, virginity, escape, death and sin. "For me, there is a devastating process of self-discovery in writing a song," he reveals. "It's very emotional when I sit down to write." Still, *Jump!* is fun to listen to; little surprises gracefully reveal themselves.

The noted anthropomusicosophist Greg Hofmann offers his impressions of *Jump!*: "Parks has created a complete vision, his very own offbeat, upbeat version of the South—not the real South, but the South of the imagination, the South as created in

songs, movies, cartoons and folk tales. He weaves show music, traditional melodies, exotic scales, classical orchestration and movie music into a single tapestry."

I played the album for my six-year-old god-daughter, Emily, and she remarked, "He really sounds like a rabbit singing."

Parks collaborated with Martin Kibbee on most of the lyrics, and they came up with some wild poetry. It's the spirit of the concept that dictated the wonder of:

"A delightful and debonaire hare on a night dat is right for some devil-may-care. . ."

And this Marcc Polo of the bunny world will take you where few lyricists have dared to venture. He weaves his spell, and a lady answers his call: "So do your worst! You'll be my first/At last in love I'm lost and long to care. . ."

Professor Hofmann elaborates: "These songs are crafted with loving

care, with exactly the same number of syllables in each line as there are notes in the melody. Songs with rich rhyme schemes—double and triple internal rhymes in one line [see above]. They take on more of life than just the vicissitudes of teenage romance.”

Sometimes the music will be just shufflin’ along, then suddenly kick up its heels and hotfoot it through a few measures. Parks even employs the *measured rubato*, which Professor Hofmann explains is “a seemingly arbitrary pause where everyone stays in time.”

Parks explains: “You stay in time so you can do these 360-degree doo-dads and land on your feet. It’s just zero-gravity stuff.”

The vocals are rich and multi-layered, with Parks taking the lead on most tracks. Danny Hutton of Three Dog Night leads on “Look Away,” Kathy Dalton fronts a couple of tunes, and Jennifer Warnes joins a host of background singers along with some energetic kids.

One listen to *Jump!* suggests that the recording sessions were far from the norm. Approximately 40

musicians (no two of the participants seems to remember the same count) were assembled at Cherokee Studios for three nights of live tracking. “It’s like a three-ring circus when Van Dyke is recording,” says producer Steve Goldman. Instrumentation included drums, guitar, bass, piano, harmonica, harp, six saxophones, four French horns, bassoon, clarinet, a 12-piece string section and a few oddities you’ve probably never encountered.

“It was more difficult than recording a rock rhythm section on a normal tracking date,” Goldman understates. His expertise with big bands including Stan Kenton’s and Gerry Mulligan’s proved useful in the humongous Parks sessions.

“It was the most unusual orchestration I’ve ever recorded at one time,” adds engineer Rick Ruggieri.

All of the instruments were played live, with Parks baffled away in a little piano cubicle. Aside from isolating the string section, everything else happened as it would in the bandshell at a Sunday afternoon concert. “Van Dyke was a dream to work with,” says Goldman. “He played and sang

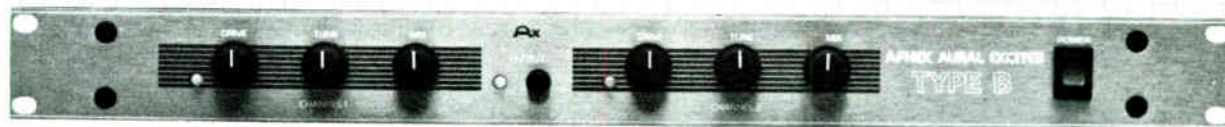
live with the orchestra and didn’t miss a beat. He was absolutely dead on. I don’t think there’s any other pianist who could have played the part.”

And the music is complex. Lennie Niehaus arranged and conducted this musical trek through freshly charted territory. “I have graduated to romance,” Parks says of his compositions. “I decided it was the best place to enjoy music—the Romantic Era.”

The players were hand-picked from the cream of LA’s session hands. “Musicians are wonderful people,” Parks declares. “By and large, I like them better than doctors. They’re more reliable and genuine.” There were no rehearsals; the musicians were given the charts at the studio. No one had heard the music performed en masse.

“We were under the gun,” Parks admits. “Any overtime would have been a financial risk. You’d be surprised how fast \$100,000 can go on a living, breathing musical ensemble. I went with first-call musicians who could read these charts with alacrity. Since I had Lennie Niehaus, I knew I would have *product* at the end of three nights. It was very exciting, and he did a very

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good job of recreating a pit orchestra."

Jim Keltner's expert drumming provided the sensitive stability on which everything rests comfortably. "The drums were difficult," explains Parks, "because I have a tendency to want to push the beat at the head of the measure to accommodate my vocal whimsy. Jim said he's never been as scared before or since." But the adrenalin flowed productively. Van Dyke has a knack for inspiring superhuman effort, as evidenced by a recent concert at McCabe's, a tiny club in Santa Monica, where Keltner, harpist Gayle Levant, guitarist Fred Tackett, bassist Jim Hugbart, Kenny Watson on cymbalom, Robert Greenidge on steel drums, Tommy Morgan on harmonica, and vocalist Kathy Dalton recreated a scale model of the entire album. This material really works out.

There's plenty of spirit in the recorded versions, too. The harp whisks open curtains on a new little world. "The steel drum has instant echo," says Parks. "Acoustically, it creates a lot of depth and mystery." There are some odd combinations, such as harmonica and cymbalom (strung like a piano, it is played with curved chopsticks). "It's not your stock orchestration," comments Ruggieri.

"Different combinations of instruments were arranged to melt together and form a new sound." A pair of old Neumann U-67 tube mikes were placed six to eight inches above the cymbalom to capture its very low-level sound. "The biggest problem was the string section, because they were lower-powered than the rest of the instrumentation. There were some leakage problems, so I built a wall of baffles between the strings and the horns." Additional instruments included trombone, trumpet, orchestra bells, marimba and tympani.

"The instrumentation accommodates the kinds of expression I envision for a musical theater piece," Parks relates. "The story on which this is based is a multi-layered dream escape, told through veils of identity—a white man writing about a black man who is telling some tales about a rabbit. I consider it the premier example of folklore in American literature."

Most of *Jump!* is a parade of robust proportions, but there are moments of sparse drama. The mysterious textures of "Invitation to Sin" are as sophisticated as any seduction sung by Marlene Dietrich in a smoky Berlin cabaret. Kathy Dalton's powerful vocal portrayals provide a high con-

trast with Parks' quirky, bouncy, preacher-like renditions. The harmonic content of this song is best explained by the composer: "I started out to expose the Hungarian minor, one of many Eastern modes that are used in popular music. I decided to use a whole tone scale—as sophisticated as my diatonic heart and soul has experienced."

In other tunes you will catch a whiff of familiar strains, such as a reworking of "Back in the Saddle Again." "He may quote popular classics," notes Hofmann, "but there is always a twist. In 'Many a Mile to Go,' a song sung by Brer Rabbit to his son, the line 'Do not forsake me my dear' uses a scale with a raised fourth—Lydian mode—to kick the melody out of kilter."

The ever moody harmonica is sometimes hanging out alone for stark, full-moon drama; at other times it blends imperceptibly with singers and cymbaloms. "I met Tommy Morgan when I was working with Brian Wilson on *Pet Sounds*," Parks recalls. "His bass harmonica was *huge!* Put it with a hand-powered B3 organ pedal and you've got yourself some kind of a charging waterbed."

Greenidge, the Trinidad steel drummer, goes back to Van Dyke's youth, when he was taken in by LA's West Indian community. "I love Robert Greenidge," Parks exclaims. "I wouldn't care if he was playing a brake drum—I'd want him on the session."

For the lead vocals, Ruggieri chose a Neumann M-49; for the group vocals he placed a pair of AKG C-12s back to back about three feet apart. "I only use the old tube mikes for vocals," he relates. "For the backgrounds, I had the guys face the girls, which gave me a good bit of isolation between the two groups. And it helps to have them facing each other when they're singing in unison."

Parks evaluates the music industry and his odd position in its grand scheme: "We have a shallow and inelastic music market today. I applaud any effort to forge out from the norm and the audience that has been created by it. The public can wield its natural receptivity when it's given the opportunity—which is not to say that what I've come up with is sliced bread."

Steve Goldman offers up this analysis: "The attitude of the record is very uplifting, positive, and happy. I think it's something that people would like to listen to."

Here, though, is Van Dyke Parks' true motive: "I couldn't get all my friends into the same room. That's why I made this record."

—Mr. Bonzai

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SUMMER '84

VIDEO PRODUCTION SUPPLEMENT

A special report on the video boom and its impact on the recording industry, including:

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—FROM PAGE 163, WILDER

Wilder is finding that his obligations as a performer require him to spend less time behind his keyboards. "I was playing a Korg Poly-61 with a digital delay unit and the works," he says, "but the moment I stepped behind the keyboard I started to concentrate as a musician and not so much as an entertainer—there was something between me and the audience. So I've been unloading more and more parts on Brad."

Fortunately Buxer, who is not an octopus, is adept at programming sequencers and drum machines. He's set up a stage system with three drum machines, a couple of sequencers and a Commodore 64 computer talking to each other and driving the keyboards for which the band hasn't got enough fingers.

Buxer prefers not to use taped accompaniment on stage because that brings precision at the expense of flexibility. "When the sequencers are running the 'sizers, you can play around with the 'sizer knobs and change the sounds," he says. "You can't work with tape in real time."

The clock pulse that drives the system comes from a LinnDrum, which also provides some drum sounds to augment Grimaldi's work. The LinnDrum and a Roland CR-8000 are on Buxer's side of the stage, while Stickman Moffitt has a

Roland 606 Drumatix controlling a Sequential Circuits Pro-One. "The 8000 is used for handclaps, because they sound better than the ones on the big drum machines, and also to trigger the sequencers in my OB-Xa," Buxer explains.

The Linn's clock output is split via a special cable and sent to a Sequential Circuits Model 64 sequencer and the 8000. Because the Pro-One's sequencer doesn't have enough memory to handle the band's needs, Buxer rigged it to listen only to the high tomtom output of the Drumatix. Any time a note has to be sounded on the Pro-One (which is used primarily for bass), the Drumatix hits its high tom—which isn't heard as a drum sound. In fact, most of the work the three rhythm machines do isn't heard by anyone; it's just used by the machines.

Buxer also has a Yamaha DX7 digital synthesizer which is controlled by the Commodore 64's sequencer via a MIDI interface. "You can change individual parameters as well as whole patches, so you can make very subtle changes while the DX is playing," he says, adding that he's within 44 notes of reaching the Model 64's 4073-note capacity. "That's enough for a set. I'm trying to get the Commodore modified to double the capacity, but it hasn't happened yet."

The new technology has made it possible to use machines for the subtlest things—including sitting quietly for half a song before coming in. "I bring the rhythm machines in and out all the time," says Buxer.

"For instance, Matthew can play the intro to 'I Don't Speak the Language' as long as he wants. Everything starts at the top of the song, but the CR-8000 cycles through a pattern that's all rests until Matthew goes into the B section. Then I kick a footswitch and the handclaps start.

"You can't just kick it in and hope it starts when it's supposed to—it's all calculated and systematic, and it works really well."

Would the band be able to function if all the computerized gear went blooey one night? "Yeah, it would," says Buxer. "It's not a bunch of computer-sounding music, and the audience doesn't care about computers. They're coming to hear music that moves them. This technology is wonderful, and it enhances the musical thing we're trying to do.

"I choose the best lines and play them live," Buxer concludes. "These are just little parts here and there that we wanted to include, and rather than hiring an extra guy we've programmed the machines to handle them."

—David Gans

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PHOTO: GEORGE PETERSEN

Joe Dea: bringing film fantasy to rock video

Joe Dea, between takes during the "Reunited" clip shoot.

by Lou CasaBianca

Joe Dea is one of the most active directors on the San Francisco Music Video production scene. He has evolved a look and a style that is very personal and recognizable. From Commander Cody's "Two Triple Cheese" to Greg Kihn's "Reunited," his "mini-features" filled with quirky *Psycho-meets-The Wizard of Oz* images have the common thread of a slightly off-the-wall sense of humor and the liberal use of special effects. As a writer and director, Joe has been very successful at visualizing and capturing the "feature film" version of the song he is directing. He likes to take chances. Even with multiple locations, special effects, make-up, wardrobe and dozens of extras, he manages to stretch his budgets and his favors in coming up with his own particular brand of music video spectacular. Most recently he's been working with the folks at Video Caroline, a music video production company based in San Francisco. We met with him to talk about his most recent production for Greg Kihn's "Reunited".

Mix: Where did you grow up, and how did you get into filmmaking?

JD: I was born August 15, 1953 and I grew up in North Plainfield, New Jersey. I have a Bachelors in Fine Arts from the University of Hartford Art School. I got inspired as a director when I was a little kid, from watching *The Little Rascals* and *Spanky*. I started doing shows in my neighborhood in people's garages. I kind of invented my own special effect puppets. In high school I had a light show with some friends. At first we started shooting 8 millimeter films that were like generic rock videos that you could play with any song and they would just cut to a beat. In those days there was no rock video around so our stuff appeared to be synched up perfectly.

Mix: That's an interesting phenomenon, the way the mind and our conditioning unconsciously work toward synching things up.

JD: We took advantage of that and got started by shooting short loops. After about a year we had about 150 little loops. We had a lot of other light show

equipment including four 8 millimeter projectors all hooked up in a row with a switcher panel on it, so you could switch from one to any of the others. We'd put loops on and switch them and essentially do live mixing like they're doing today in rock video clubs where they'll put in several full video tapes and mix between them. That's when I started getting into special effects. I invented the Alka Seltzer slide which was a glass slide that was like a little tiny aquarium that went in the slide projector. You would grind up Alka Seltzer and sprinkle it on a slide and put on a couple drops of water and a couple of drops of food coloring. Put it in the slide projector and you'd have this instant light show like a volcano erupting and it would just be a half hour show with one Alka Seltzer.

Anyway that's how I got into special effects and music. Then I went to Art School and got involved in sculpting and painting. The last year of art school the first Sony Portapack came out and I got access to one through the communications department. The first semester I just did production without editing and the second semester the school got a very primitive half inch reel to reel editing system. I was shooting comedy, although I told them I was doing art. I also worked as a cartoonist and illustrator for the local papers.

A year after finishing high school I went to New York with the best of the stuff that I had accumulated. I had managed to get into group shows and video art galleries like *The Kitchen*, *the Global Village* and a few other places.

Mix: Do you feel that there is a connection between graphic or hand drawn art and using film and video as a means of creating many more stills or frames?

JD: Yes. My illustrating abilities are suddenly coming back real strong. In the new Greg Kihn one, we're actually doing artwork with a paint box and painting right on the screen. I did sketches of what I wanted and instructed the artist as to how to color and draw the other design elements. I'm drawing on my potpourri of training in sculpture and painting in all the art direction I've done.

Mix: That makes it easy to communicate what your visualizing.

JD: It does, although I'm getting to the

point where I'd like to draw on the talents of other people who do art direction and special effects better than me. As long as I can communicate to them what I want, that's the most important thing.

Getting back to my background, I moved out to San Francisco in 1978 and about six months after I moved out here I saw the first Videowest Show. At the end of the show they advertised for volunteers so I went and met them. They didn't have a director. They were just kind of experimenting with TV and at the time wanted to do "TV For the Rest of Us." It was just a bunch of people who were sick of TV and wanted to do their own. The other slogan was, "If you don't like what you see on TV go out and make some of your own." They didn't have a director, and I showed them my video art reel and they hired me. I became the in-house director. I didn't really know that much, but I had done enough work over the years and had equipment available to me.

Mix: And all that experience crystallized on the Commander Cody production?

JD: That was probably the first time that it really paid off and it looked "professional." So for three and a half years I produced mostly comedy for them. Then I saw a few rock videos coming out of L.A. and we started producing rock videos to fit the theme shows. That's how I first got into doing music videos.

Mix: Were you writing comedy and directing?

JD: Yes, I was writing and co-writing the comedy with other people there, as I still do today.

Mix: So launching out of Videowest and moving on, what came next?

JD: Two and half years ago I decided it was time to move on to something bigger and better. I went back to New York with my new reel of rock videos and comedy and went around to *Saturday Night Live* and all the TV shows. I went to all the record companies with Commander Cody and Greg Kihn's "Happy Man." That's how I met Randy Hock, my manager.

Mix: What are some of the other productions you've done since Videowest?

JD: After Commander Cody, I did *The Humans*, and then *Jon Kin* which was a Dutch group. Then I directed David Johansen, which was an *Animals* medley in a simulated live performance. Next was "Happy Man" with Greg Kihn, and then "Jeopardy" with Greg, John Butcher's "Life Takes a Life"

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Greg Kihn "Reunited" Production

When Director Joe Dea presented his "Greg in Oz" theme to the producer for the newest Greg Kihn Band video—Juanita Diana wasn't charmed and delighted; she was anxious. "My first reaction was I was afraid we'd lose our shirts," says Diana, who with partner Mike Feeney runs the San Francisco production company, Video Caroline. She explains, "It was a scramble to figure out how much it would cost, and at the same time, to get enough money." The "Reunited" video came in on budget at \$80,000 financed by Berserkely/Elektra/Asylum Records.

Director and producer worked together to hand-pick the best talent and crew within budgetary restrictions. Diana says her worst nagging fear was that, "When you try to recreate with \$80,000 what MGM spent millions on five decades ago, you run the risk of looking cheap."

Aside from crew costs, the biggest portion of the budget went to the staging. Two San Francisco production houses were used. At Stage 39, one day of shooting took care of the bluescreen scenes that would later be matted over background footage using the Ultimatte system. For the two days of shooting in "Munchkihnland," Diana hired the largest soundstage in the city, Cinerent West's Stage A. There were also two days for pre-light, and two days of location shooting for exteriors.

Tomas Tucker was hired as director of photography because Diana had worked with him before, and knew he would be capable of creating, as she says, "that bright, commercial look we knew we needed." Tucker explains that he lit the set with two priorities in mind. First, since he knew that Director Dea would use as many as sixty set-ups in one day, he wanted to enable the crew to work fast; that meant with as few as ten minutes between set-ups. The other main lighting objective was to achieve

"an entire ambience that was very bright to get the proper depth of field," says Tucker. He and gaffer Pete Thomas decided on 5 K skypanns with two layers of tracing paper to bring the overall top ambience to about F 4. They used two 10 K's to simulate the sun. The Arriflex 16 SR camera equipped with a Zeiss 10 x 1 zoom lens wore a combination of black dot and double fog filters to create a softer, fantasy look on the set. The 16mm film was shot at 30 frames per second, and footage was later transferred to video on Positive Video's Bosch FDL 60 system.

The plot of this video dictates that four of the Greg Kihn Band members get zapped by the Wicked Witch, and turned into the Lion, the Tinman, the Scarecrow, and a flying monkey. It took more than magic to create the special effects makeup for these characters, and for the rest of the cast. It took a three person makeup team headed by Richard Snell to do everything from making masks, to hand-ventilating Dorothy's wig, to pinning pink eyebrows on the Munchkihns. For the Lion, Tinman, Scarecrow and Wicked Witch, Snell fashioned foam latex prosthetic facial masks; that is, each mask was molded on the inside to fit its wearer's face. Larry Lynch, the drummer who played the flying monkey, wore a rubber slush mask which was not molded on the inside.

Wardrobe for 28 creatures in Oz might have confirmed the producer's wildest financial nightmare, if it weren't for Mike Butler and his daughter Jennifer. Mike Butler has been a costumer for television and films for twenty-five years. In 1981 he created the costumes for the Chevy Chase film, *Under the Rainbow* (the one the Little People of America Foundation got upset about). That's where the Munchkihn costumes for the Kihn shoot came from.

—PAGE 170

PHOTO GEORGE PETERSEN

Cinematographer Tucker lines up a shot on the ARRI 16 SR during a Munchkihnland run through.



"This is the first time we used Paint Box on a video," says Diana, "and we'll never do another one without it." In six hours the Quantel Paint Box at Positive Video supplied the following effects for the video: Glenda the Good Witch's crystal ball; the graffiti on the Golden Gate Bridge; the rainbow tunnel; the wide shot of Munchkinland; the nuclear explosion that begets the Wicked Witch; and the yellow brick road at the end.

Although the matting effects may not be as flamboyant as the Paint Box effects, there is perhaps a more interesting technical story behind them. On-line editor Miodrag Certic of Positive Video says this is the first time he ever heard of Ultimatte being used only in post production; that is, the system was not used on the set in conjunction with a video camera, RGB monitor, and a waveform monitor and vectorscope.

Indeed, the entire idea was a gamble considering that Positive hooked up the wires to their new Ultimatte within days of this job. The producer was confident enough in their past performance to take the risk. Diana says, "They stood behind us when we were just starting and they didn't need us. They've done more for music video in this town than anyone else."

Some special effects sequences proved to be quite complicated. For example, the shot where the tornado is chasing Greg and the bride in the car took the longest to construct. It required six layers. ADO was used primarily with DVE used in an auxiliary capacity.

But of course, before any special effects can be done during the on-line edit home stretch, there comes the unsung heroism of the off-line edit. For "Reunited" editor Evelyn Messinger worked with director Dea for six 15-hour days on Varitel Video's VHS system. Messinger also supervised the on-line edit.

Certainly select directors and producers have been resourcefully creating high quality videos for years, but the "Reunited" video reminds one of Hollywood. In borrowing from a film classic it is a reminder of the growth of an industry in a half-century—and also of the narrowing gap between the down and dirty rock video, and the production standards of the film industry. ■

—Elizabeth Rollins

Elizabeth Rollins was assistant producer for pre-production and second assistant director for production, as well as the character 'Dorothy.'

and Krokus' "Screaming In the Night" and "Eat the Rich". Those were two videos shot at the same time; one's a performance, one is concept. Then Hyts, "Backstabber," a Hitchcock take-off, and then "Reunited" with Greg Kihn.

Mix: How did you first start working with Greg Kihn?

JD: First I met with Matthew Kaufman his manager, and co-owner of Beserkely Records, who had seen "Triple Cheese, Side Order of Fries" and loved it. He said, "Here's a song, come up with a story," so we wrote "Happy Man".

Mix: What year was that?

JD: Early 1981. The next one was "Jeopardy". When "Reunited" came along Matthew said, "Here's a song, do whatever you want, I'll see it when it's done."

Mix: What's the progression in budgets from "Happy Man" to "Reunited"?

JD: "Happy Man" I believe was \$5,000 and "Jeopardy" was \$20,000 and "Reunited" \$80,000. "Happy Man" should have cost \$40,000, "Jeopardy" should have cost \$60,000 and "Reunited", if we tried to do it again, easily would cost \$100,000.

Mix: Focusing in on "Reunited," how did the *Wizard of Oz* concept and that song come together?

JD: The first thing was that I definitely wanted to continue "Jeopardy" and make it the third part. "Happy Man" and "Jeopardy" were supposed to be continued. I wanted to start off "Reunited" with Greg and the bride in the car driving somewhere. And so for a year I had in the back of my mind, where are they driving to, and what are they going to do when they get there? I thought that there is a nerve that I can tap, everyone's grown up with *The Wizard of Oz*. The next one will be a prequel. Greg gets a job as a roadie for a bad Elvis Presley look-alike, but I can't tell the whole story, it's top secret. I'm working on the script now. Everybody has a little contribution to make. I'm the head writer, but just about everybody around me contributes. I like to try to stay open. I think most people just keep recycling the same images. That's why you see so many really boring rock videos that all look alike and don't really take you anywhere you haven't already been a million times before.

Mix: You're talking about creative production value not just technique.

JD: Right, creativity, concepts and visualization. The good work comes

from people with the imaginations and who are good writers. Things have started progressing and you'll start seeing more and more interesting videos and the boring ones will start disappearing. To me the biggest sin in a lot of rock videos is not that they're sexist or violent, and I don't care for the videos that are, but that they're "boring," sexist and violent. I'd rather be in front of a TV and angry at what I'm seeing than be in a stupor.

Mix: How did you use "the paint box" on this production?

JD: In the "Reunited" piece, we used it in place of glass matte paintings in order to create simulated artificial stages or sets that we couldn't afford to build or were impossible to build, such as the tunnel and the long shot of Oz. In this case it allows us to do complicated shots very easily. When you're doing a production you have to do a lot of planning in advance, exactly what your painting's going to look like and its relationship to its background. You really have to visualize what you want before you shoot it. We shrunk the long shot of the village and made it small and added to it electronically. It's like painting on the video tape. What the paint box could let us do, for example is to take the real plants that were actually there and multiply them, change their structure, build them up. We could take the hills that were there and blow them up and add them beyond, and match colors that really existed on the set. There are a lot of other things you can do with a paint box that I haven't explored, and I do hope to find out about them.

Mix: It's like an electronic animator's tool, it gives you direct access to the image on the screen.

JD: We did do some animation with it too; the bomb was done in animation. We did special photographic effects; if you were to do them with glass matte painting, needless to say, it would cost a fortune. I think this is one of the first rock videos to use the paint box so extensively. It's a great device.

Mix: Can you talk about your own philosophy in approaching the music video scene?

JD: For the ones that I direct, I guess the most important thing to me is to do the very best I possibly can, and to somehow push the boundaries of what I've already done and feel like I've moved up a level. I feel like I've gone up another plateau in sophistication, as far as every aspect of this most recent production. I just want to keep getting better and better and ultimately get so good that someone says, "hey, let's have that guy direct our movie for us." ■



VIDEO NEWS

by Mia Amato

FCC Switches On TV Stereo

Stereo TV has the green light from the Federal Communications Commission, which announced approval of a transmission system developed by *Zenith* and *dbx, Inc.*

Five years of deliberation sparked to a quick decision on the heels of a recommendation filed by the Electronics Industries Association, which urged adoption of the Zenith system. EIA's own task force had unanimously selected this multi-channel TV stereo system over another developed jointly by *Dolby* and *CBS Laboratories*, and a third system designed by *Telesonics*, which had the support of Japanese electronics manufacturers.

It's a coup for Zenith, the company which created the transmission standard for FM radio, and which has been building stereo-compatible television sets since 1981. The contribution of *dbx* is the encoder located at the TV station transmitter site and the decoder placed within each television set. Low-pass filtering, wide-band compression, spectral compression for balance, and peak clippings circuitry are used to minimize distortion and noise from nearby frequencies. There is also a third free channel that could be used for multi-lingual broadcasts.

The choice of Zenith invited some criticism (after all, *Telesonics*'s system has been up and operating at WTTG-TV in Chicago for several months) but overall reaction has been one of relief. The broadcasting community, which has never forgiven the FCC for its failure to standardize quad and AM stereo, pressed hard for a regulated standard. EIA's efforts showed that manufacturers refused to stomach "marketplace decisions" disastrous in those earlier innovations. By announcing approval but not standardization, the FCC left the door open

for other stereo TV technologies, but it looks like the Zenith/*dbx* system is the one to go for. So many are plunging ahead with high hopes into making and purchasing, and it will pay even those who were flogged by quad not to be too cautious. Audio and video studios need to begin experimenting now with techniques to enhance TV sound.

Hardware Update: New Edit Systems

Even if you missed the NAB, you can still see the latest in video editing technology at *VCA/Teletronics* in New York and at *Pacific Video* in Los Angeles. Both have installed the *Montage Picture Processor*, first in a number of videodisc-based edit systems.

Montage designers *Ron Barker* and *Chester Schuler* call the machine a "processor" as in "word processor," and the machine actually does a kind of cut-and-paste edit that's a lot more like flatbed film cutting than video post.

Footage is stored in stacks of stereo Betamax VCRs or on laser videodiscs. Between these and the console lies an array of computer memory components: 80 megabyte Winchester hard disc, removable hard disc, portable floppy discs, which allow the operator to randomly access any stored tape sequence. Keyboard commands resemble that of a text editor—Trim, Discard, Insert, Copy, and the old familiar Cut, Dissolve, and Black. Using lots of little screens, you work with images, not numbers.

Computer disc memory and rapid random access from multiple sources beyond just A and B rolls is also the heart of *Control Video Corporation's* aptly named *Competitor*, which relies on a *Panasonic* Direct Read After Write (DRAW) erasable disc. There is *EditDroid*, developed by *Convergence* and *Lucasfilm*, a prototype disc-based editor especially appli-

cable to film-on-video postproduction.

"Disc is emerging as the more flexible medium for video postproduction," claims Pacific Video's *Emory Cohen*. His company has added two Montage units to a studio that already has five CMX-3400 edit suits. "Montage is not just an upgrade for us, it's an expansion into an area of service I call 'electronic laboratory.'"

Cohen said producers who prefer to shoot on film but edit on video will be able to have their negatives transferred to "disposable" videodiscs for editing purposes. "We've bought an ODC videodisc recorder so we can make editing discs to accommodate film producers who need the speed and economies of video, and that includes many music-video producers."

Transferring film or tape to disc can be done overnight for \$300 or less. A Burbank firm, *Spectra-Image*, also makes disposable "disc dailies" for use with the new edit systems. The company also modifies consumer laserdisc players to interface with *CMX*, *Ampex ACE*, or other editors so they too can be expanded to multi-roll, random-access postproduction. In New York, the first project to be completed in the Montage suits at *VCA/Teletronics* is a home video cassette by healthstyle maven *Bonnie Pruden*, produced by *Tom Skinner*.

Camcorders on the Rise

We also noticed at NAB the increasing acceptance of one-piece combo cameras (also called camcorders or VRCs) in half-inch and quarter-inch component formats. For broadcasters, the agony of choice between four completely incompatible combo systems has been mitigated with two timely products. *Shintron*, which last year showed a switcher for Beta and "M" half-inch systems, unveiled what its president *Shintaro Asano* calls "the missing link"—a type of standards con-

—PAGE 174

Toward a New Music Video

in which our intrepid V.I. delves deeply into the combined esthetics of experimental film and art music, exploring the cutting edge of what will be imitated on MTV sooner than we all can guess.

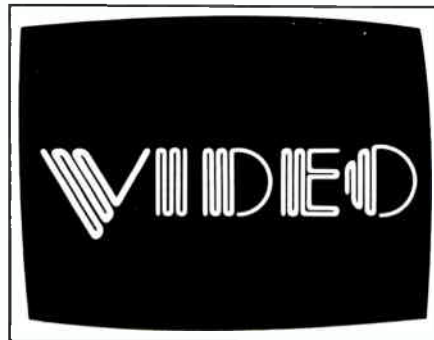
by Neal Weinstock

"'An article in a magazine is a good example of one type of experimental film,' said Eisenstein right after he finished *Potemkin*," comments Alfred Weiss, who spends most of his time composing videos with a Schoenbergian twelve-tone synthesizer and 3D computer graphics system at his studio somewhere under downtown Manhattan. He believes that the words you are now reading can be somehow made to register in your brain as if they were musical notes.

"How must words be, well, prepared, for such audio-visual stimulation? Can we make our eyes hear, our ears read?" asks Video Interface.

"Well, it certainly can't be prepared like John Cage's piano," says Weiss. "Nuts and bolts won't do it. If you take that paper you're writing on—here, like this . . ." He takes my notebook, rips out the page in use, balls it up noisily—musically—and then stuffs it into his ear. "Now I'll let you appreciate this work." He rips out another page and stuffs it in my ear. "I'm sure you never felt the sound of your own words like that," I think he tells me, though I can't be sure I hear right.

What question should be put to this experimental filmmaker next? I wasn't sure; I didn't want to antagonize him further. We sat through a long silence, each with an earful of paper. Finally his fell out. His eyelids squeezed taut, his face assumed an air of bliss. His



INTERFACE

hands applauded, his eyes teared. "The most beautiful song I've heard in weeks," he said.

The paper?

"Your article is wonderful. People will listen to it for centuries."

Doesn't it seem a bit brash for one's interview to turn to a subject like this? I didn't wish to accept his flattery. "Can you show me one of your recent music videos?" I asked.

"Of course. Anything for the composer of the Paper Sonata." He flipped on a monitor, and another, and another. And a camera, and set several recorders rolling. And handed me a telephone extension. "Put the receiver to your ear," said Weiss. I did so, and he picked up another phone himself. "I call this composition Number Six."

My phone and I appeared on some screens. Weiss and his phone and he appeared on others. Other people, with other phones, came up on the rest of the monitors. Weiss pushed the number six. Sometimes he let go, sometimes he pushed again. The intervals were sometimes short, sometimes long. Sometimes feedback from all the phones sounding "six" combined to produce a chord in the key of six. Finally it was ended.

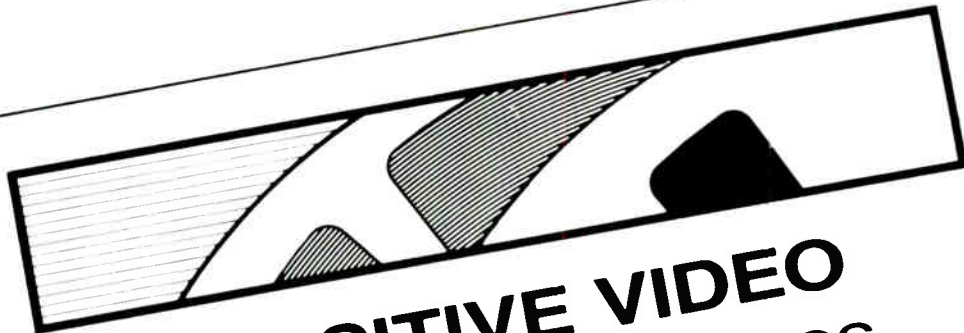
"This one is still a work in progress," he said. "I'm thinking of calling it 'M N O,' too. It's a corporate job, for AT&T. You know, the fact that they're having such problems defining themselves to themselves now is a boon to any number of film and videomakers. They've commissioned a whole series of these. This is the sixth. What do you think of it?"

Never one to hide my naivete, I said, "But it's only one note."

He smiled softly like a zen master. "Yes, but it's a good note. Let me show you how good it was." He drew me over to his blackboard, at the other side of the long, vaulted cellar. He covered the blackboard—actually, it was green, with mold—with equations unfit for a family magazine. He differentiated, he integrated. He took a quantum leap into mechanics. He said, "You see, there is a theoretical basis for this tape, which is explicable in very simple math. Basically, the music video form is

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very friendly to explorations in semiology, in the iconography of film genre, and structure. The essay is a short form, too. So is the equation. It doesn't take so long to hold up a symbol and ask what it means, but this remains in the memory for a long and tasty aftertaste. We are attempting to move from three dimensions of many starting points—you, I, others—to an understanding of the concept of Sixness. The music video is ideally suited to this, as is made plain by the very popular,

though subconscious, folk-art genre that is readily apparent on MTV. This is a symbolist movement in which icons like groupies in spiked heels are examined in the structural context. In fact, one could make a dictionary of what might cynically be called video clichés, but which I prefer to think of as iconographic symbols, to be examined in semiological context. Assigning structure and meaning to these symbols is the true mission of the music video art form . . ."

The light was bad, he bored me to tears, and finally it seemed the arrows and triangles of chalk sprang out three dimensionally into the musty air. He was singing a couple of non-diatonic tones. A subway train rumbled overhead interminably, as if part of an orchestrated video. Suddenly, I felt a kind of music I'd never felt before. I cried out, "I understand. I understand already. Let's go on to something else!"

After apologizing and collecting myself, I asked, "Do you do all your work here?"

"Yes. The rent's cheap. Actually, I take the train into town and spend eight or ten hours everyday working like everybody else. One can't live on music video alone."

"What sort of work do you do?"

"I apply for grants. Very challenging work, until you get the hang of it. You have to find out which coast you're dealing with. Here you don't need words, just calculus. With someone from over there, you have to talk philosophy, but you don't need to know how to read music."

"And someone from the Midwest, the South, Europe?"

"Too eclectic for me. Nothing personal, I just can't rely on scoring with them. In grant biz, it all comes down to the bottom line, I'm sorry to say. But it's in my blood. My parents and grandparents and on down have lived on grants for centuries, a completely musical family, except for various doctors they'd produce or intermarry with so they could afford lox."

"In Europe my friends tell me you have to constantly reapply with the same idea. Once you have an idea, that's your idea. Don't expect another one. I'm glad I haven't had one yet."

"So you inherited the family business?"

"Of course, but I moved it with the times, into video, from the Upper West Side to Soho. Who else? You know the problem about interviewing any composer or videomaker about the important things, about what I'm thinking about when I write music or script, how it's done, what's the system, what the choices are, is that in five minutes you'd be bored silly. In ten you'd be asleep. People say Weiss had this great humanist conception in 'Tone Poem 74,' but actually the whole thing is achieving this transition, that pairing of images. Very boring stuff. Words shouldn't bore, they should sing. Tell your readers to just put the magazine in their ears and listen."

Alfred Weiss's Video Installations in Progress will be on display at the Gallery Carmen Famosum this month, on West Broadway in New York City. ■

—FROM PAGE 171, VIDEO NEWS

verter capable of translating among all existing RGB, YIQ or Y, R-Y, B-Y color video formats. **Ikegami** introduced the HL-95 Unicam, which accepts attachable recorders in the various half-inch and quarter-inch formats and is also adaptable to triax or microwave ENG configurations. It's a universal camera with the legendary HL-series quality and is a big step towards the integration of component video into the NTSC-based studio.

Production Notes & Recent Shoots

New Deal Records is among the first to use the Sony Betacam for two videos of label artists **Nude Ants**. **Lauren O'Neill** and **Scott Fillingham** produced and directed at **Golden Apple Media** (Westchester, NY). **Teletronics** videographer **Mike Pelech** took a cable-free Betacam on a test run to Asbury Park—literally running up & down the beach, boardwalk and 20 other locations for the "Jersey Queen" music demo.

The first and only ADO digital effects device in New England has been installed at **Century III** (Boston) reports **Ross Cibella**. "It's considered an aggressive move," he says. "Previously, the closest available ADO was in New York." Recent rock videos done at the studio include "Don't Say Goodnight" for **John Butcher Axis** and **EBN OZN's** "Bag Lady," shot on 35mm film in Manhattan. (Yes, that is **Imogene Coca** in the bag lady role). **Luis Aira** directed both. NY's **Silvercup Studio** is the setting for "Runaway Girl," the **Bon Jovi** clip filmed in Dolby stereo by director **Mike Cuesta**. Special optical effects done by **David Seeger**.

Productions... West

Maureen Droney and **Ken Kessie** of **The Automatt** (SF) engineered the digital audio mix for **Herbie Hancock's** concert-length video. Shot

live at the Hammersmith-Odeon in London, this is the dynamic "Rockit" stage show many of us glimpsed on the Grammy telecast.

Soundtrack was mastered via a Sony 1610 "pretty standard in the industry," Droney commented, adding that the remix was smooth from the 24-track master supplied by staff of England's **Air Studios**. "Since most of the band uses electric drums and keyboards, the only audio not recorded directly but with mikes was percussion and vocals," she said.

Rhythmic effects like the "scratching" done by **D.S.T.**, seen moving records back and forth with his hands on two turntables, were also directly recorded, using turntable output jacks. The only pitfall in working with Hancock's high-tech funk, according to Droney, "is after you work with it a while, most other music sounds really tame."

VPS Studios has purchased and refurbished a 6,000 square foot soundstage in Hollywood. "It's an in-between size for producers who need something between a small studio and a large network stage," explains **Dennis Biggs** of VPS. The air-conditioned space boasts 25' ceilings, a master control room to handle six cameras and four Type-C VTRs and 16-track audio mixing; sharing rental space is Computech Editorial, which also owns a Montage Image Processor.

In San Francisco: **Third Rail Media** completed a music video for **Wonders of Science**, and is branching out to provide a clip distribution service for unsigned bands. **VideoWest** has added a Convergence 104 editor and VHS offline suite while **BAVAC** now offers a Grass Valley Switcher for U-Matic production as well as a discount rate for members working on video art or non-profit shows. In Sausalito, **Studio D** and **Mason Soundstage** jointly opened a 40' x 60' x 19', featuring complete multitrack audio with a custom 24-track Trident console and an array of film and video equipment for rentals. ■

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"After all, I'm a songwriter, not an engineer."



Songwriters and engineers are not only equipped with very different kinds of talent, they need different kinds of equipment to bring those talents out.

No one is more aware of this fact than Steve Kipner. He's one of the most successful songwriters in the country. You'll find his words and melodies behind many of the industry's top recording artists. Like Olivia Newton John's "Physical", "Heart Attack" and her newest hit "Twist of Fate." Other contributions include songs for Sheena Easton, Dolly Parton, America, and Laura Branigan.

And behind Steve Kipner you'll find Soundcraft's 400B console. Because to create the sound that both audiences and artists respond to, Steve prefers the console that responds to him.

Steve chose the 400B for reasons that are as solid as gold. "I spend long hours in my home studio, and I never know when the creative spirit is going to strike, even at 3 AM. I spend time at this console laying down tracks, not patching and repatching, or fooling around with a lot of confusing controls. The Series 400B does

what I want it to do and lets me do it easily. The quality of the sound is equal to expensive commercial studio sessions, plus I've got the comfort and control of my home environment. After all, I'm a songwriter not an engineer."

It's easy to see why Steve chose the 400B. But of course, at Soundcraft we do more than build the kind of consoles that bring out the best in recording artists and songwriters. We also provide a full line of quality mixers to bring out the artist in the engineer.

Soundcraft The Songwriter's Choice

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