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THE RECORDING INDUSTRY MAGAZINE

Mix

Paul Simon in Africa

**Directory:
Sound Reinforcement
and Remote Recording**

**Mixing Consoles
for Live Sound**

**Little Richard
Cables and Connectors
Video Director
Stephen Johnson
CD Video**



The Intelligent

Westar Outperforms That Well-Known Console.

Compare features, specifications, sonic performance and dynamic automation options, and you'll agree. Exclusive features are: Fully parametric EQ on all 4 bands, eight echo/cue sends, dual stereo mix buses. 60 segment LED meters with spectrum analyzer, up to 64 track monitor, from 20 to 60 inputs. field expandable frame, and three levels of automation options. And excellence in performance: Transformerless +28dBm outputs, EIN at -129dBm, Output noise at -86dB, IM distortion at 0.02% with VCAs, Crosstalk at -80dB, Wide band frequency response and high RF immunity.

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Compumix PC is a powerful and technically advanced automation system, providing storage on floppy diskettes of an unlimited number of mixes and off line editing of mix data. The Compumix PC comes complete with IBM XT compatible PC (with Dual Floppy and 20 MB Hard Disk Drives), Mitsubishi 13"



ent Choice.

color graphics monitor, custom and standard keyboard, and all cables and software. Compumix PC is probably the most cost-effective high-performance automation system available today, and a perfect fit for Westar. As a bonus, the new AMP (Assistant Mixer Program) software provides the mixing engineer and the producer with time saving and practical features like track sheets, telephone auto dialing, timers, and quick-find reference tables.

Westar— The Best Console Buy Around.

With cost-effective digital processing consoles scheduled to be available by 1990, the profit-oriented studio today needs a reliable high-performance analog console to match the sonic qualities of the new digital recorders like the Mitsubishi X-850. The Westar is such a console system, at a price the studio can pay back by the time digital consoles become reality. It all adds up to a professional studio console system offering the most attractive performance/price ratio. Call or write for our comprehensive brochure.




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Cover: Showco's Prism system, shown here on the Genesis tour at the L.A. Forum, is a modular array using all JBL components. The Prism system is designed specifically for arena venues, and at press time, a second system was touring with Eric Clapton.

Photo by: Walter Urei

Corner photo of Paul Simon: by Gary Heery



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Usually in our June issue we take a look at developments in sound reinforcement and remote recording. These are two drastically different areas, for the most part, but sometimes they get so similar it is hard to tell one from the other. So often, when recording concerts, remote recorders work hand in hand with the live sound engineers—sharing equipment, working out miking schemes and cutting through the red tape of a sophisticated production in a difficult venue.

Two articles in this issue deal with concert recording in Africa, certainly a complicated locale for any North American sound operation. For Paul Simon's Zimbabwe concert, a television production for Showtime, the politics of a racially troubled society added a new dimension to the job of dealing with sound. In the story of recording King Sunny Ade in Lagos, Nigeria, the sheer difficulty of local customs and environmental factors placed challenges on the sound crews that no one could have anticipated. For example, the chief remote engineer for Comfort Sound, Doug McClement, writes, "...the promoter had neglected to provide a stage large enough for King Sunny's 22-piece band, so the film crew spent the whole day constructing a stage out of the type of wood most readily available in Nigeria: mahogany. . . . Building the stage on a cement square in 100-degree heat with no power tools was hard work, but it helped unify a crew of strangers into a team."

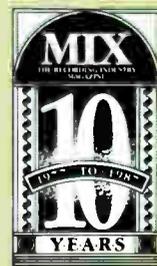
McClement goes on, "The air conditioner on our truck had not worked for two days. . . inside the truck it was at least 120 degrees. The multi-track machines were too hot to touch. . . in keeping with the rest of the week's events, there was no power, no air conditioning and no running water at the hotel."

Many people take for granted the efforts required to make a musical performance appear seamless in the midst of chaotic conditions. We applaud these road warriors of summer and salute them in this issue.

Keep reading,

A handwritten signature in black ink, appearing to read 'D. Schwartz'.

David M. Schwartz
Editor/Publisher



CURRENT

Chicago NAMM Show Expects Big Turnout

More than 600 exhibiting companies are expected to show products, ranging from musical instruments to stage lighting, at the 1987 NAMM International Music & Sound Expo.

The Expo, held June 27 through June 30 at McCormick Place in Chicago, should draw more than 25,000 people, representing all 50 states and many foreign countries. "It's shaping up as a good year for music dealers, and we expect heavy attendance in Chicago," says Larry Linkin, NAMM executive vice president. "This is going to be a 'down-to-business' trade show."

The Expo will feature educational sessions throughout the four days on subjects ranging from music technology and retail management to sales training. Special NAMM speakers include Dr. Ken Blanchard, co-author of *One Minute Manager*, and sales/management trainer, Dr. Tony Alessandra.

Registration fees are \$5/NAMM members, \$25/non-members at the door. For more information, contact the National Association of Music Merchants, 5140 Avenida Encinas, Carlsbad, CA 92008, (619) 438-8001.

NAB Technologies Announces First Project

The first project for the new, non-profit NAB Technologies, Inc., a subsidiary of the National Association of Broadcasters, will be to participate in the final development and marketing of FMX.™

FMX is a system that improves distant reception of FM stereo signals, providing fully separated stereo reception where the stereo signal is too weak to activate the receiver's stereo detector. It involves circuitry both in the transmitter and the receiver, yet the FMX signal is fully compatible with a receiver that doesn't contain the system.

According to Edward Fritts, NAB Technologies' president, laboratory development and field testing have solved some earlier FTX performance prob-

lems. Completion of development will be conducted by Broadcast Technology Partners in Greenwich, CT.

New Music Seminar Set for July

The New Music Seminar began eight years ago as a new wave-oriented alternative to standard music industry conventions. Today, its scope has broadened immeasurably and the NMS has become one of the most important music business gatherings in the U.S., drawing thousands of musicians, producers, managers, label representatives, instrument and equipment manufacturers and plain old fans. This year's convocation—to be held July 12 through 15 at the Marriott Marquis Hotel in Manhattan—promises to be the biggest yet. Over the course of just a few days, 64 panels and workshops will be presented, more than 130 different companies, bands and organizations will host booths in the exhibition area, and some 300 bands will play special shows at 25 different area clubs.

This year there will also be a pair of seminars of particular interest to people in the recording field: producer/engineer/studio owner Arthur Baker will be moderator for a special session on engineers; and Paul Rice of NYC's Sam Ash Music will host a panel titled "Music Technology 1999," which will speculate about how music will be played, recorded and transmitted in the post-CD, post-DAT age. That one's sure to whip up some controversy.

For information about attending the Eighth New Music Seminar, contact NMS at 1747 First Avenue, New York, NY 10128, or call (212) 722-2115.

1986 Musical Instruments Exports and Imports are on the Rise

U.S. exports of musical instruments, parts and accessories, in decline since 1980, last year made an upward swing in value of 21% over 1985 figures, according to the American Music Conference's (AMC) annual analysis of U.S. Department of Commerce data.

Imports reached their highest mark yet, with a 30% increase over 1985.

Exports valued at \$112.5 million in 1986 had averaged a 15% yearly decline for the past six years after peaking at \$210.9 million in 1980. Leading the way were all musical instruments up a total of 43% to just less than \$40 million. The synthesizer/electric piano category, consistently strong, led the pack with a 113% dollar value surge to \$3.3 million and a 76% rise in units.

Last year's 21% rise is a welcome change for American instrument manufacturers, who in 1985 saw the total dollar value of exports sink to its lowest point since 1973. Experts attribute the 1986 increase to more attractive prices due to the dollar's decline against foreign currency.

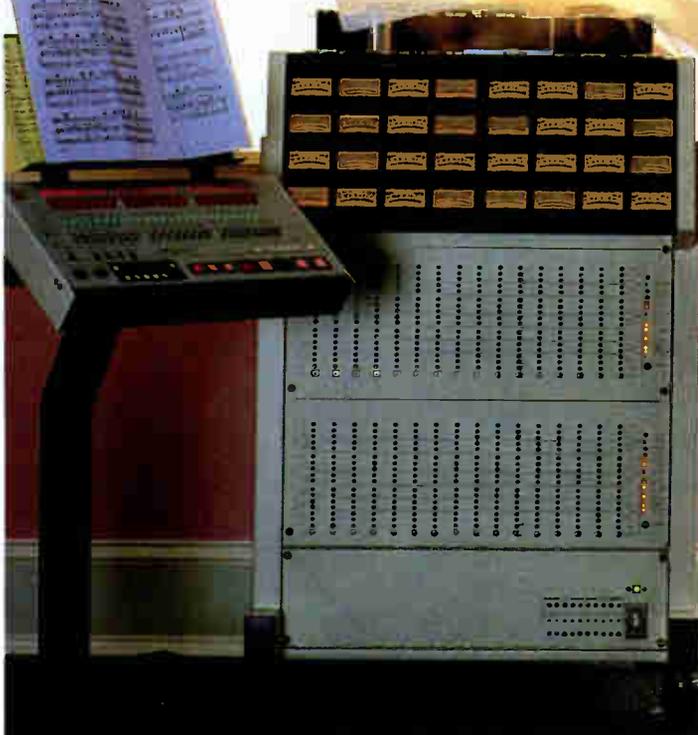
NMPA, SGA & RIAA Petition CRT for Royalty Rate Adjustment

The National Music Publishers' Association (NMPA), the Songwriters Guild of America (SGA), and the Board of the Recording Industry Association of America (RIAA) jointly petitioned the Copyright Royalty Tribunal to adopt their proposal for adjustments to the statutory mechanical royalty rate over the next ten years.

The proposal calls for the present mechanical royalty rate (five cents per tune) to be adjusted in proportion to changes in the Consumer Price Index (CPI) every two years, beginning on January 1, 1988 and continuing until January 1, 1996. Regardless of changes in the CPI, however, the rate cannot decline below five cents or exceed the previous rate by more than 25% in any two-year span. Resulting royalty rates are to be rounded to the nearest 1/20th cent. The "overtime" rate (presently .95 cent per minute of playing time) would likewise be adjusted in proportion to changes in the CPI.

The initial rate adjustment would be based on CPI changes between December 31, 1985 and September 30, 1987, and every two years thereafter. ■

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INDUSTRY NOTES

Mix Publications has named **Ron Taff** as advertising director of *Mix* magazine. After stints at *Mother Jones* and *Rolling Stone*, Taff joined GPI Publications in 1980 as advertising director of *Keyboard* magazine. He subsequently served as both corporate advertising director and corporate marketing director, as well as advertising director of *Frets* magazine... **Allied-Signal Inc.** and **Lanesborough Corporation** announced the sale of Allied's **Ampex Corporation** to Lanesborough for \$479 million, plus assumption of certain liabilities. Ampex, headquartered in Redwood City, CA, had 1986 sales of over \$500 million... **Emerald**, a new Nashville entertainment conglomerate, has been formed to incorporate diverse aspects of the entertainment business under one corporate wing. Under the Emerald umbrella is **Emerald Sound Studio**, **Robert Porter Management**, **Moore Publishing Company**, **Moore Aircraft Leasing** and the Missoula, MT music club, **Park Place**... **Ron Rose Productions** opened a new stereo television audio post-production facility recently at Postique, Inc., 23475 Northwestern Highway, Southfield, MI... **Jerry E. Smith** has been named division vice president of **Sony Professional Audio**, responsible for sales and marketing to the recording studio and film and video production markets. **George Kuchmas** has been chosen general manager of manufacturing for Sony's Professional Products Company and **Carlo Severo** was named vice president, customer service for Sony's Communications Products Company... **Atlas Sound** and **Soundolier**, divisions of American Trading and Production Corporation, combined their sales and sales support organizations throughout the U.S... **Philips** established an office in Knoxville, TN, to handle marketing, sales, service and customer support for its line of optical disc mastering equipment in North America. For more information contact: David Pushic, director of marketing, Philips, 1111 Northshore Drive, Bldg. 2, Ste. 726, Knoxville, TN 37919, (615) 558-5267... **Joseph Vayda** has been appointed vice president of research and development and quality assurance at **WEA Manufacturing Inc.** of Olyphant, PA... In what may be an industry first, **Westlake Sales Group**, the Los Angeles pro-audio equipment dealer unit of **Westlake Audio**, assembled a hands-on digital audio equipment demonstration room at its L.A. studio/office

complex. Access to the digital demo room can be arranged by calling Westlake at (213) 851-9800... **Ed Schummer** has been named vice president, marketing, of **Dolby Laboratories**... **Full Compass Systems Ltd.**, Madison, WI, a dealer of audio and video equipment, announced three appointments: **Mark Edelstein** as service manager, and **Michael Beckon** and **Jeffrey Boardman**, who have joined the sales staff... **Alpha Audio Automation Systems** announced agreement with **GEXCO Technology International** on international marketing representation for Alpha Audio's **BOSS** automated audio editing system... **A Studio Designer's Workshop** will be held June 12 through June 14 at Master Sound Astoria in NYC. For more information contact Synergetic Audio Concepts at (812) 275-3853... **LaserVideo** announced that its parent company, **Quixote Corporation** and **Dainippon Ink and Chemicals, Inc.** of Japan have agreed to share results of their research and development in optical disc technology. **LaserVideo** is a leader in mastering and replicating compact discs, laser videodiscs and CD-ROM. **Dainippon Ink's** optical disc technology focuses on the development of a new Direct-Read-After-Write (DRAW) optical disc and an advanced erasable optical disc... The five audio teams nominated for an "Achievement in Sound" Academy Award were honored by **3M** at the sixth annual **Lyra Awards** in Toluca Lake, CA... **Louis P. Stricoff** has been named sales manager at **E.J. Stewart, Inc.**, a Pennsylvania film and video production facility... **CITICAM**, NYC's location services packager, has opened a West Coast office in Hollywood, CA, which can be reached at (213) 874-8940... **Innovative Television Equipment (ITE)** has opened an East Coast regional sales office at 250 Gorge Rd., #6, Cliffside Park, NJ 07010, (201) 943-7470... **En-Vision Productions** is a new, full-service video media communications company in Southern California. For further information call (714) 951-5440... **Perreaux Sound Ltd.**, a New Zealand hi-fi company marketing in the U.S. for four years, announced distribution of its "Pro" amplifiers through **G.M.I. Distributors, Inc.** of Newport Beach, CA. For more information on Perreaux products, contact: G.M.I. Distributors, Inc., 5000 Birch Street, Ste. 3000, West Tower, Newport Beach, CA 92660, (714) 476-3606...

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2. Neve V Series Dynamics



Engineer Rex Recker of Photomagnetic post production facility in New York City is used to working with on-location tracks. But he can't imagine working without the Neve 60 channel V Series console with Necam 96:

"It's great for cleaning up tracks and getting rid of unwanted background noise or room tone.

"And noise gating with the V Series is so simple. You can get the quality and sound you want, quickly...when it counts. It's a luxury which, once experienced, becomes a necessity.

"We already have two Neve V Series consoles and we're getting a third."

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Neve makes it easy to remove spill-over, tighten up rhythmic sounds and create dazzling special effects, whether tracks are made in or out of the studio.

There's no clipping. No pumping. Just warm, compelling sound from the most musical dynamics unit yet available.

The Neve V Series Dynamics is only one of the powerful reasons top recording professionals like Photomagnetic's Rex Recker choose Neve.

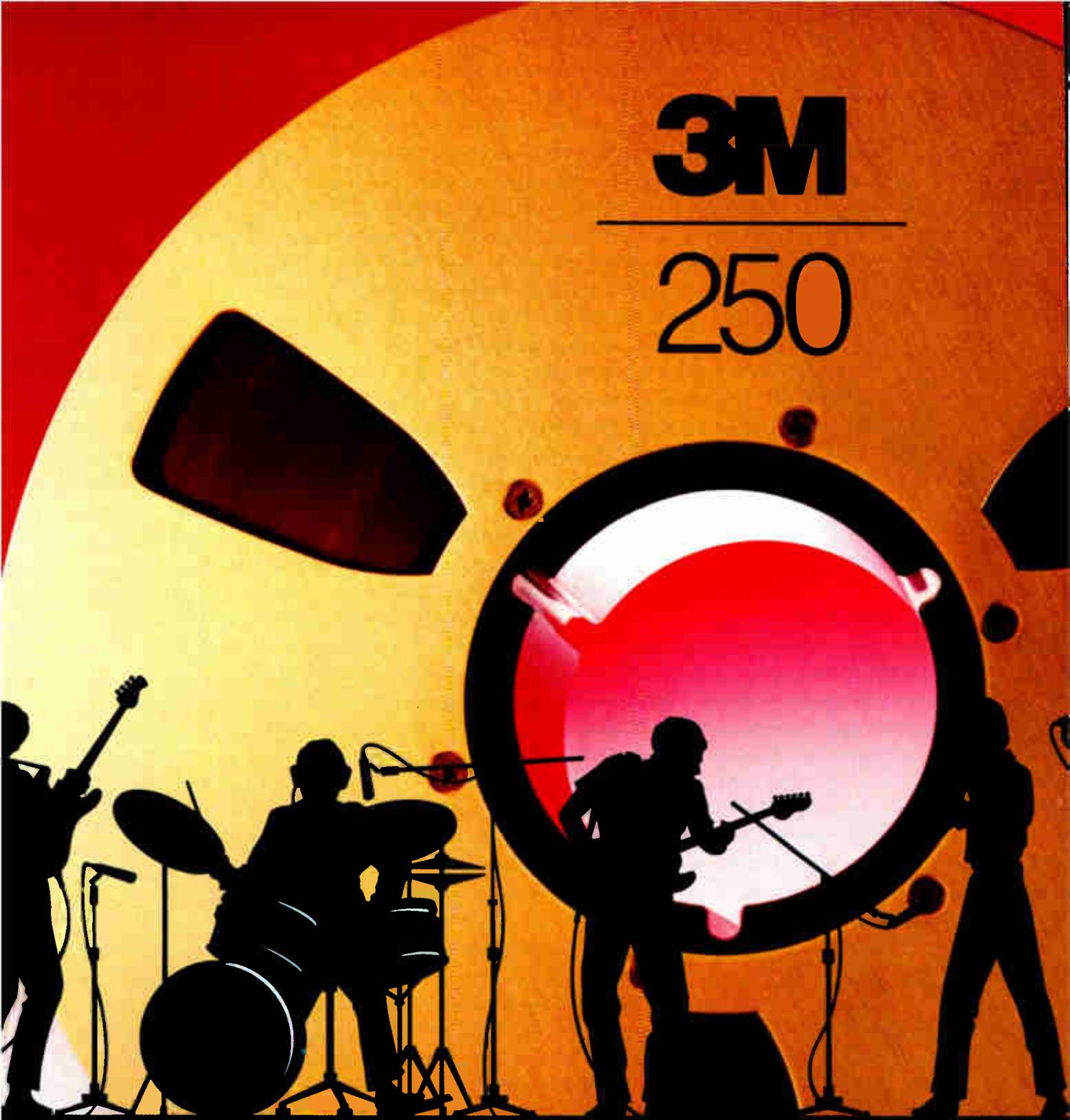
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SESSIONS

NORTH CENTRAL

At *Soto Sound* in Evanston, IL, "house" boys **George Karchmer** and **Michael Griffen** teamed up with **Jerry Soto** to record "Close Your Eyes" on the new AKA Dance Music label. Soto composed and performed the music and also co-produced the 12-inch single with **Matt Warren**. . . *Solid Stage Logic* (SSL) relied on *Producers Color Service* (PCS) in Southfield, MI, for the post-production of their 1987 Demo Reel. The demo was used at trade shows for hands-on demonstrations of SSL's audio consoles. . . Recent sessions at *Audio Graph Productions* in Okemos, MI, included **Dave Collini** for his upcoming album on Optimism Records. . . The Indiana musical collective *The Balance*, featuring bassist-producer **Mark Manley**, recently finished recording an EP at *W.A.K. Studios* in Chicago. **Al Rowe** engineered the sessions, assisted by studio owner **Bill Keyes**. . . At *Tone Zone Studios* in Chicago, **Haus Nouveau** were in with **Steve Boykin**, **Reggie McFadden** and **Wayne Williams** producing for Music Systems Productions. **Roger Heiss** was engineering with **Roy Montroy** assisting. . . *Meet the Press* finished tracking at *Barn Burner Studio* in Annawan, IL, for an album to be released on the Impression label in June. **Harry Heath** engineered. . . In at *Seller Sound* in Sterling Heights, MI, were **John Eaton** and **Melvin Riley Jr.** (from Ready for the World) with **Gary Spaniola**, co-writing and co-producing a song for the movie *Beverly Hills Cop II*. Spaniola also engineered the project. . . **Ted Wright**, **Travis Morris** and **Percy Bady** have been in Chicago producing their new project at *Paragon Recording Studios*. A previous project by Percy and the Thompson Community Singers was on the charts for 37 weeks. The sessions were engineered by **Scott Barnes** and assisted by **Tom Quinlan**. . . At *Seagrape Studios* in Chicago, *The Voyage Band* returned to complete two more funk dance demos. Both songs were written and arranged by the band with **Mike Konopka** and **Tom Haban** splitting the engineering chores. . . At *Studio A*, Dearborn Heights, MI, heavy metal rockers **Tommy Boyd** put down rhythm tracks for their first album with producer/engineer **John Jaszcz** and assistant **Peter Prout**. . .

SOUTHEAST

At *Criteria Recording Studios* in Miami, FL, *Genuine Parts* mixed a dance single for Atlantic Records. Production was handled

by **Avy Gonzales** for Pizzaz Productions. The engineer on the project was **Keith Morrison**, assisted by **Dana Horowitz**. Also at Criteria, the *Everly Brothers* began rehearsals for an upcoming album project on PolyGram records. As yet no producer has been named and road mixer **Sparky Neilson** has been handling sound duties assisted by **Kurt Berge** and **Matt Gruber**. . . At *Morrisound Recording* in Tampa, FL, *Deaf Dealer* was in mixing its latest album for PolyGram Records, produced by D.U.A.F. Productions. And **Dave Williams** completed the movie soundtrack for *Terror Squad*, produced by Hollywood-based Matterhorn Productions. . . At *Cheshire Sound Studios* in Atlanta, **Warren Zevon** was in laying tracks with members of REM and Georgia Satellites guitarist **Rick Richards** for his upcoming project for Virgin Records. **Niko Bolas** produced and engineered, with **Lewis Turner Padgett** assisting. . . I.R.S. artists *R.E.M.* cut their fifth LP for the label at the *Sound Emporium* in Nashville. Producers were **Scott Litt** and *R.E.M.*, Litt engineering. The yet-untitled album is due for September release. . . *Mr. O Audio Studios*, a new recording facility in Columbus, GA, had producer **David Norman** in working on several projects, including engineering/co-producing for the group *A.C. Black & the Mean Katz*. . . At *Wally Cleaver's Recording* in Fredericksburg, VA, *Goin' Goin' Gone* finished work on their new single with **Peter Bonta** engineering. . . At *Reflection Sound Studios* in Charlotte, NC, producer **Don Dixon** made new mixes on the *L'il Eden* album for Mega Records of Denmark, **Marti Jones** assisted. . . At the *Music Mill* in Nashville **Gary Chapman** worked on his new album project for RCA records with **Mark Wright** co-producing the album with Chapman; engineering by **Gene Eichelberger** and **Joe Scaife**. . . The *Fabulous Thunderbirds* were in *Ardent Recording* in Memphis cutting tracks with **Dave Edmunds** producing. This will be his first complete stateside album project. **Dave Charles** did the engineering with **Tom Laune** assisting. . . The *Mystic Angels*, an all-girl group, were in Ft. Lauderdale's *SoundShine Productions* recording a new single called "OOO AH". . .

NORTHWEST

At *The Plant* in Sausalito, CA, Island Records artist **Melissa Etheridge** was in working on her debut album with production being handled by **Jim Gaines**. Engineering the sessions was Gaines, assisted by **Moira Marquis**. . . Producer **Todd Rundgren** has been

working at *Studio D* in Sausalito, CA, cutting tracks on *Bourgeois Tagg*. . . At *Jopheir 12* studio in Los Gatos, CA, *The Cha Chi Experience* completed their latest project, which included a four-song demo. It was produced and engineered by **Colby Pollard**. . . Recent activity at *Crow Recording*, Seattle, included demo sessions for former Zappa band member **Jeff Simmons** and **Leroy Bell** of Bell & James. Also, *Dominant Seventh* vocal jazz quartet was in producing demos requested by *The Tonight Show*. All projects were engineered by **John Nelson**. . . Canadian recording artist **Connie Scott** was in at *Inside Trak Studios* in Vancouver, BC, completing her third solo gospel album. It was produced by **Roy Salmond**, with veteran engineer **Dave Slagter** at the helm. . . **Anthony "Sir Mix-A-Lot" Ray** was in Seattle's *Steve Lawson Productions* working with engineer **Terry Date** on the single "I Want a Freak." The song is off of the computer scratch artist's four-song EP release *I'm a Trip*, also recorded at Steve Lawson Productions. . .

SOUTHERN CAL

I.R.S. recording artists *Wall of Voodoo* have completed their fourth LP for the label, entitled *Happy Planet*, at *Hit City West* studios in L.A. **Richard Mazda** produced; **Peter Kelsey** engineered. . . At Hollywood's *Sunset Sound*, **George Benson** and **Earl Klugh** worked on their album project for Warner Bros. Records, produced by **Tommy Lipuma**. Engineers were **Al Schmitt** and **Eric Calvi**, assisted by **Stephen Shelton**. . . At *Producers 1 & 2* in Hollywood, **Mark Isham** scored *Made in Heaven* for Lorimar, engineered by **Ben Rodgers**, assisted by **Andy Harper**. And **Paul Rothchild** and **Ray Manzarek** produced Synclavier sweetening of *The Doors at the Hollywood Bowl*; **Greg Townley** and **Andy Harper**, engineers. . . At its base in North Hollywood, *Le Mobile* hosted producer **Neil Geraldo** who worked on overdubs for a forthcoming *Pat Benatar* movie soundtrack project. **Guy Charbonneau** engineered the sessions. . . Action at *The Rock House* in L.A. included *The Cally Boys* mixing their debut single for Avatar Records. **Larry Robinson** produced and **Vaughn Clay** engineered. . . **Natalie Cole** was in at *Encore Studios* in Burbank completing her first album for Manhattan Records. The disc was produced by **Reggie Calloway** with **Craig Burbidge** engineering and **Adrian Turjillo** assisting. . . *The Whispers* were in *Skip Saylor Recording* in L.A. working with producer **Gary Taylor** on a project for Solar Records. Skip Saylor engi-



ROLLIN'



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neered with **Tom McCauley** assisting... At **Rumbo Recorders'** Studio B in Canoga Park, Elektra recording artists, **X**, finished up tracks and overdubs for their new album, with **Alvin Clark** producing, and **Julian Stoll** engineering... **MixMasters Recording** in San Diego put the finishing touches on the first solo project for **Gregg Walker**, former vocalist for Santana. Other recent projects included the national theme song for the "Just Say No to Drugs" campaign and final mixes for **Keith Alexander's** album project... Mixed at **Studio Masters** in L.A. was **The Whispers'** new single, "Rock Steady" produced by **Antonio Reid**, and "Babyface," engineered by **Jon Gass**... Producer **George Duke** was in at **Mama Jo's Recording** in North Hollywood doing basic tracks on **Sadao Watanabe** and **Diane Reeves**. **Erik Zobler** was at the controls with **Steve Ford** assisting... Producers **Paul Fox** and **Skip Drinkwater** completed cuts for the new **Princess** album at **Summa Music Group Studios** in West Hollywood... At **Master Control** in Burbank, producer **Don Gehman** was in mixing the new **Cock Robin** album for CBS Records. **Greg Edward** handled the engineering, with assistants **Toni Greene** and **Dan Nebenzal**... At **Harlequin Studios** in Northridge, **Buffalo Springfield Revisited** was in recording with **Scott Ross** engineering...

SOUTHWEST

Arnett Cobb was in Houston's **Sugar Hill Recording** cutting a soundtrack for a feature length documentary titled **This Is Our Home, It Is Not For Sale**, produced and directed by **Jon Schwartz**... At **CAVE Productions** (Creative Audio Video Engineering), Prescott, AZ, new age group **The Beamer Project** finished recording and mixing their new album, **Side-tracked**, on the Sphere label for the **CAVE Music Group**. **Joe Robertson** and **John Wilson** produced, with **John Wilson** engineering... Producer/director **Bill Cox**, owner of **BCP International**, and **Tom Cunningham**, principal partner of **Real-to-Reel Recording** in Dallas, produced a 30-second spot for the annual **Wildflower Festival** in Dallas utilizing the bluesy **Rodney Johnson Band**...

NORTHEAST

Dee Snyder of **Twisted Sister** was in at **Cove City Sound Studios** (Glen Cove, NY) producing a new act for **Atco records** called **Envy**, engineered by **Eddie Delaina**... **Southside Johnny and the Asbury Jukes** were in at **Shore Fire Studios** in Long Branch, NJ, recording a demo of "Expressway To Your Heart" which will be featured in a new Disney film. Staff engineer **Jan Topoleski** was at the controls... Washington, DC gospel group **Spiritual Defenders** recorded and mixed an album **Made In Washington**,

DC at **Lion & Fox Recording**. **Alex McCullough** engineered... At **RBV Recording** in Southbury, CT, the **Little City String Band** completed their LP with engineer **Evan Jones**... At **Digitel** in NYC, **Michael Baker** and **Axel Kroll** were in producing cuts for **V-Corporation** on **Chrysalis Records**; and the **Fat Boys** were in again with **Gary Rottger**, who was producing another song for their movie, **Disorderlies**... At NYC's **Secret Society/Chung King House of Metal** profile artists **Run-DMC** have been working on their soundtrack LP for **Tougher Than Leather** with **Steve Ett** engineering... Recent activity at **Bearsville, NY's Dreamland Recording** included **Genya Ravan** producing four tunes for Boston-based women rockers **Mata Hari** (formerly **Lizzy Borden & the Axes**)... At **Quantum Sound** in Jersey City, NJ, producer **Reggie Lucas** has been working with a new artist on **A&M Records**, **John Adams**. **Gragg Lunsford** is engineering, **Craig Johnson** assisting... At **Evergreen Recording** in NYC, producers **Lotti Golden** and **Tommy Faragher** have been in producing **Brenda K. Starr** for **MCA Records**, with **Lancy McVickar** engineering and **Andrea Bella** sampling/assisting... At **Shakedown Sound** in NYC, **Pete Warner** and **Rainy Davis** were in working on a 12-inch remix from her debut album on **CBS**. **Jay Henry** handled the engineering... At **Calliope Productions** in NYC, **Gerard McMahon** recorded his album for major label release, as well as several jingle projects, **Chris Irwin** co-produced... **Tom Lord-Alge** mixed several projects at **Blue Jay Recording** in Carlisle, MA: an album for **The System** (Atlantic), a 12-inch single for **Dance Like a Mother** (Virgin) and an album for **Living In A Box** (Chrysalis). **Rob Feaster** assisted on all the sessions... At **Trademark Music** in Browns Mills, NJ, progressive rock trio **Mastermind** finished recording their debut album for **Impact Records**, **Trademark's** new label. It was produced by **Bill Berends** and **Rich Berends**... At **Quad Recording** in NYC, producer **Bill Laswell** and engineer **Bob Musso** have been feverishly busy on **Herbie Hancock's** next album for **Columbia Records**, and they've been laying tracks and mixing several cuts for **Sly & Robbie's** new album on **Island Records**... Producer **Duke Bootee** was in **I.N.S. Recording** (NYC) working on an album project entitled **Beauty and the Beats and Scratches**. **DJ Cheese** was in recently to do scratching on a couple tracks. **Craig Bevan** engineered... Activities at **Soundscape Studios** in Poughkeepsie, NY, included **Audience** cutting tracks for their first album on the **Dutchess Entertainment** label, produced and engineered by **Rob Sanderson**... At **Intergalactic Music** in Manhattan, **Gregory Williams**, formerly of the group **Switch**, produced **Double Vision** with engineers **Jorge Esteban**, **Jeff Jones**, **DJ Walker** and **Tony Cox**... **Suburban Dog** was in at **Hackelbarney Studios**, Chester, NJ, finishing initial tracks for a future release... At **EARS** in East Orange, NJ, **PolyGram** recording artist **Gwen Guthrie** was hard at

work on her second album for the label. Behind the board was **Tom Zepp**, with **Michael Van Duser** assisting... **Shatter Records** recording artists **Aku-Aku** have been currently recording their second album at **Rawlston Recording Studios** in Brooklyn, NY. "Capt." **Carl Segal** is producing, and **Tommy Weber** is engineering... **Dan Daley** has signed a long-term, multi-disc production agreement with **Parfaq, Inc.** entertainment subsidiary of **North Coast Productions**. Record production is underway at several New York facilities, including the newly opened **Pyramid Recording Studios**... At **D&D Recording** in NYC, producers **Matt Noble** and **Kevin Calhoun** were in working on tracks for **Capitol** Recording artist **Ava Cherry**. **John Leposa** assisted...

STUDIO NEWS

micro PLANT, a new computerized MIDI-synth room, has opened its doors at the L.A. **Record Plant** recording complex. The cost-efficient independent operation is a compact synthesizer studio designed for songwriters, scoring composers and jingle producers. **micro PLANT** houses a **TAC Scorpion 32x8** console, **JBL** and **Yamaha** monitors, with racks of synthesizers, sequencers, and effects processors. A **Macintosh Plus** is the hub of the studio, linking MIDI data for keyboards, sequencers and outboard gear... **Air Craft Studios**, located in **Pittsburgh, PA**, has recently upgraded from a 16- to a 24-track recording facility with the installation of a **Trident Series 80B 30x24x24** mixing console and **Sony JH-24 24-track** recording machine. **Air Craft** also now has digital mastering capabilities with their new **Sony PCM-3202**, and **Sony PCM 501** and **601** digital processors, and has upgraded their analog mastering with the installation of an **Otari MTR-10**... **D&D Recording** in NYC has taken delivery of a new **Sony/MCI JH-24** multi-track, as well as a complete MIDI setup to be available at no extra charge... **The Warehouse** in Philadelphia has opened its doors to MIDI production. **Studio XYZ** incorporates over 14 different brands of MIDI synthesizers and samplers, all run by the most up-to-date and creative software available... **Sterling Sound** in Manhattan recently became the first facility on the East Coast to install **Neve's** new digital **DTC-1** console... **Fantasy Studios** in Berkeley, CA, completed building a new **CD Master Preparation Room**, equipped with **Mitsubishi X-80**, **Sony 1630, F1**, and **Harmonia Mundi** sampling converter... **Boutwell Studios**, Birmingham, AL, is now offering 16-track video sweetening services in addition to 24-track music and 8-track broadcast and A/V rates... **Soundwave** in Washington, DC has completed the first phase of its renovations headed by **Chips David LEDE Designs, Inc.** The renovations included the re-design of control rooms B and C and the installation of new monitors and amps in conjunction with reflective and absorbent materials, conforming to **LEDE** principles...

Every Bit a Studer



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Prepare to be surprised. Our new Emax™ will make you rethink your notion of what a digital sampling keyboard can do. And what one should cost.

Then again, we *are* talking about magic. The magic of sampled sound. Voices. Instruments. Sound effects. Machines. Anything. All digitally recorded. Ready to be woven into a musical tapestry of unlimited colors.

We're also talking about a new keyboard from E-mu Systems. The leaders in digital sampling technology.

Years ago, we invented affordable digital sampling with the Emulator™ and redefined the way music is made. Now, with Emax, we're redefining who will make it.

A sample of our power

Like all of our products, Emax features our characteristic commitment to superb sound quality. Sound quality that's evident whether you sample your own sounds or select disks from the comprehensive Emax Sound Library.

Either way, the music you'll make with Emax is like nothing you've ever heard before from an affordable sampling keyboard.

You begin with a full 19 seconds of sampling time at Emax's standard sampling rate. And you can take advantage of our variable sampling rates to allow up to 57 seconds.

Impressed? Just wait. The magic really begins when you hear what Emax can do with your sound. Emax packs a full complement of analog and digital processing functions. Like digital splicing and merging, or filters and VCAs with individual 5-stage envelopes for dynamically modifying the timbre of a sample. So one sample can be the raw material for hundreds of sounds.

Once you have that sound, give it motion. With Emax's true programmable panning, you can place each sound anywhere in the stereo image. Or sweep it with a wide variety of real-time controls.

The perfect loop

If you've been frustrated in your search for a glitch-free loop, search no longer. Emax has AutoLoop™—a feature E-mu invented that ingeniously



enables Emax to help you locate the best possible loop points.

But the magic doesn't stop there. With Emax you can even loop the unloopable. How? Our new Crossfade Looping™. Which digitally modifies your sound, smoothing it around the loop points, to eliminate even the smallest glitches.

Control at your fingertips

To ensure that you maintain total control, Emax's keyboard assignment scheme lets you place sounds wherever you want them—up to 100 on the keyboard at one time. And our Dual Sample Mode™ enables each Emax voice to consist of *two* individual samples. (Think of them as the equivalent of two



Emax



VCOs on an analog synth.) What you gain is a whole new range of effects — stacked, chorused or doubled sounds — with *no* decrease in polyphony.

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And if you think you know what an arpeggiator is, think again. You haven't experienced anything like the magic of Emax's sophisticated arpeggiator.

You also haven't experienced anything like our RS 422 interface for

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Stretch your capabilities with our rack

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Or add an Emax Rack to your Emax keyboard. With our MIDI Overflow Mode™ you can link two Emaxes for true 16 channel capability. And Emax accepts a full seven octaves of MIDI control.

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Magnavox prototype CD Video player.

CD VIDEO

by Ken Pohlmann

Something I do not recommend: fly to Amsterdam Monday night, attend a Philips press conference on Tuesday and fly back to Miami Wednesday morning. The body does not appreciate this; the brain doesn't even know what's happening.

Since it was for a worthwhile cause, and because Insider readers deserve to know the latest, and because the flight was funded fully by Philips, I took the trip, and brought home the scoop on the latest CD incarnation—CD-Video.

CD-Video is the brainchild of Philips NV, co-inventor of the compact disc. It is an optical disc format designed to create a new retail market, using a bridge between a new media (compact disc) and a not-so-new media (Laservision). From that merger comes a new media, the CD-V Single, and a new hardware product, the CD-V "combi-player." The result is a multi-

faceted marketing play, which makes sense from most of the angles you consider it:

The CD-V Single is targeted precisely at the dwindling audio 45 rpm single market; a few cuts of music will be put on CD, along with a full motion video cut. One immediately thinks of the pop market, and buyers who would be attracted to single cuts from an album, and the music video as well. From a marketing standpoint, the product is too good to be true. First, a video single promotes album sales, in much the same way that audio singles and music videos do. In addition, for the first time, record labels are given the opportunity to sell music videos to the mass market; a unique situation of the consumer lining up to pay for promotional material. In short, the CD-V Single transforms music video from a promotional tool into a popularly priced, saleable product.

The CD-V player will play these vid-

eo singles, along with conventional full-length audio-only CDs, and 8-inch and 12-inch video discs as well. Hence the name, "combi-player." The hardware is thus particularly attractive to its inventor, Philips. After considerable investment, its Laservision system has never achieved market potential. With the combi-player, Laservision is given a second chance, and a considerable advantage from association with the highly successful CD format. If Laservision cannot succeed on CD's coat-tails, it never will.

The longer playing times of the 8-inch and 12-inch discs also access other markets such as video classical music, and feature films. If the consumer is offered a CD player which also happens to play Laservision discs, it is certainly possible that these latent markets could take off.

The marriage of video and digital audio is being enacted in many product areas, and the CD/LV union would appear to make sense as well. There is no question that video is a major influence on the audio market; not only does CD-V serve to strengthen LV, it also could strengthen CD as well.

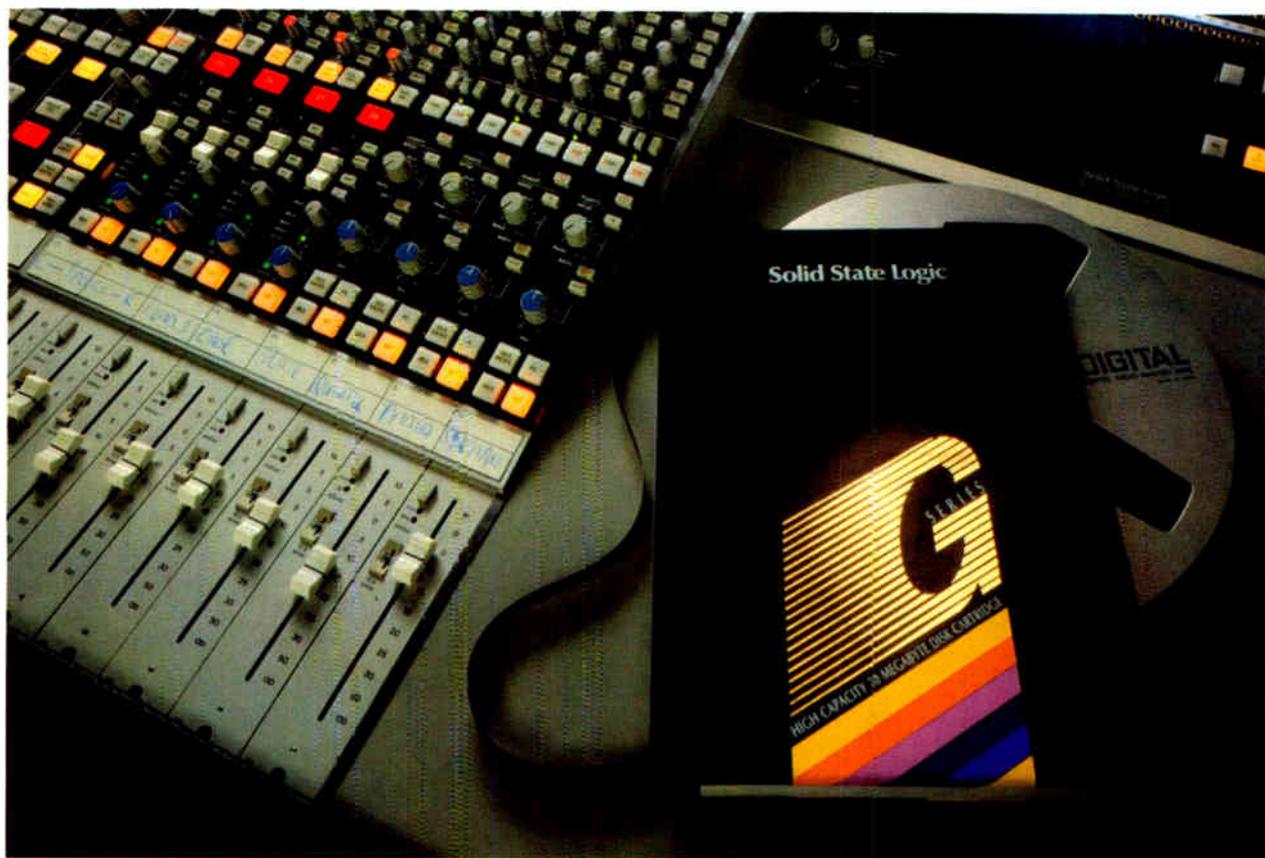
From still another perspective, the introduction of CD-V is a smart move in terms of insurance against R-DAT. CD-V heightens awareness of the CD format, brings new market applications to it, and frankly does something that R-DAT probably could never do very well—namely, reproduce extremely high quality video.

Of course, such an ambitious merger must have a certain downside to it. In this case, it appears to be limited indeed. First, the introduction of CD-V may create confusion in the mind of the consumer. The idea of the once-simplistic CD is now clouded with CD-DA, CD-ROM, CD-I, and CD-V. CD-V makes matters slightly worse by throwing in two new disc diameters.

Worse still, CD-V violates the universality of the compact disc, the unique advantage of playability and interchangeability between any discs and any players worldwide. The problem is video: the two standards, NTSC and PAL, are incompatible. Thus a PAL CD-V disc will be unplayable on a NTSC player and vice versa.

Finally, in the debit side, there is a chance of consumer nonacceptance of the format. That failure may diminish the luster of the CD, lending a marketing advantage to competing

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off-line. Individual faders can be instantly updated in rollback. A staggering 20 megabytes of audio mixing information — equivalent to 80 floppy disks — can be stored on just one SSL G Series disk, taking up less space and weighing less than a reel of quarter inch. And all this data can be loaded, processed, edited and copied faster than ever before.

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Rack Magic



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

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

- **"Sense Inputs" (Telemetry Ports)**

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

- **User variable loudness compensation**

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

- **Subsonic Filtering**

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

- **Excursion Protection**

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

- **Thermal Protection**

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

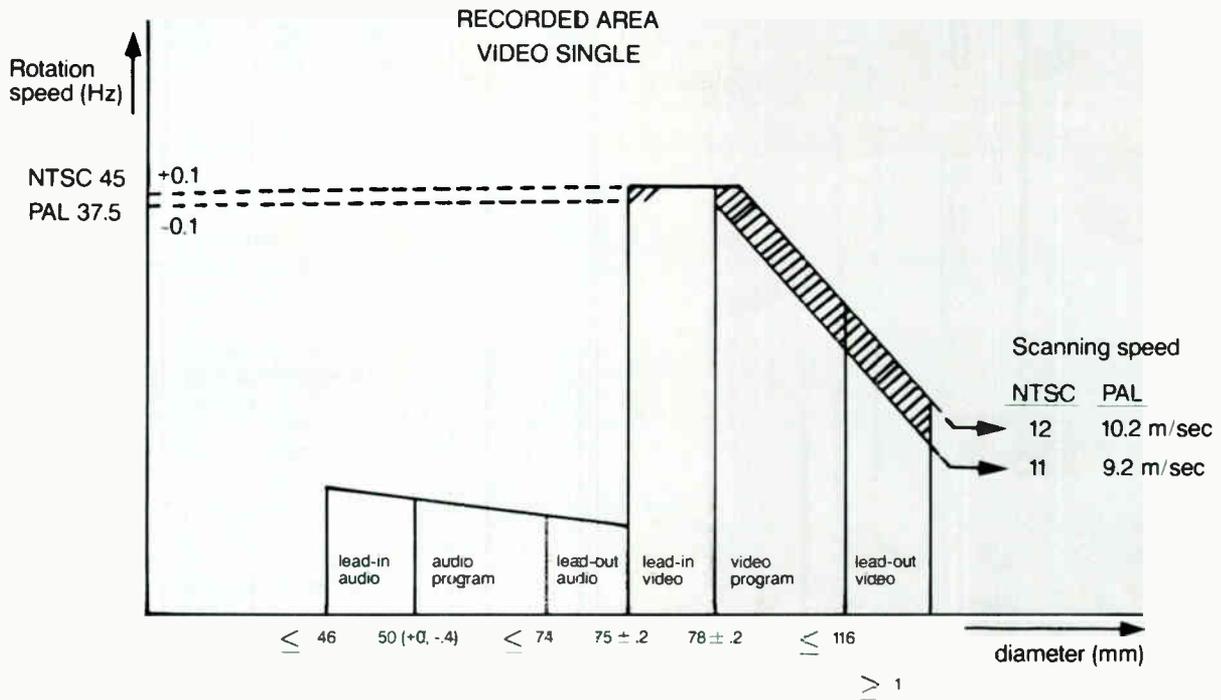
Use the Peavey PCS (Processor Controlled System) in its 2-way mode with the Peavey SP-2™ or the new SP-4™ trapezoidal enclosure, or for bigger jobs use the PCS in its three way mode by adding a subwoofer to either enclosure.

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



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FIGURE 1



formats such as the R-DAT.

However, on balance, CD-V appears to be a gamble well worth taking. Certainly Philips is convinced of that; a major marketing push will occur later this year. Success, of course, will be decided by the consumer in months and years to come. However, an estimate of its chances may come from an analysis of the technical and product design behind the format. Let's take a look at CD-V, and try to decide whether it's an innovative media with potential to open new markets, or a reworking of old media destined to die on the crowded battlefield of format war.

The biggest news about CD-V is the new software format, the CD-V Single. The CD-V Single appears similar to an audio CD, but the substrate and top lacquer are gold-tinted to distinguish it visually. PolyGram, A&M, Capitol, EMI, Manhattan, Argel, Chrysalis, Island, MCA, RCA/Ariola, Virgin and Warner Communications Record Group plan to release titles on the CD-V Single; CBS has expressed interest. The CD-V Single plays approximately five minutes (for NTSC) of full motion, high quality video with digital CD sound, plus an additional 20 minutes of digital audio only. Because the digital audio portion is placed in the inner diameter, the audio portion of the CD-V Single may be played on a regular CD-audio player. Likewise the CD-V player may play any audio CD. Typical Red Book standards are used,

including scanning velocity of 1.2 to 1.4 meters/second, and track pitch of 1.6 micrometers.

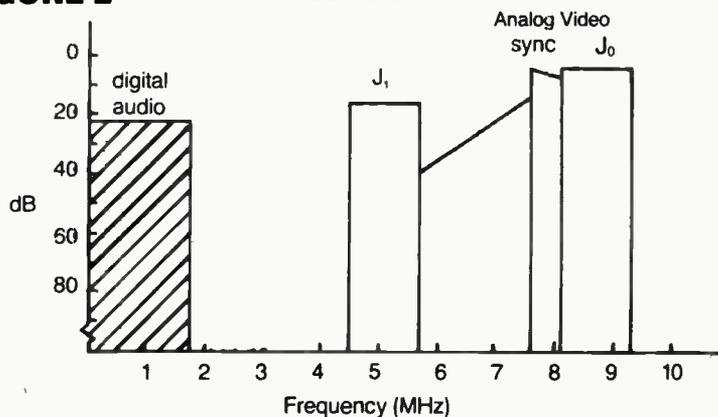
Video information is contained on the outer diameter; encoded according to the Laservision format, however, digital audio is used instead of analog audio. The video signal itself is analog. The scanning velocity is increased to 11 to 12 meters/second (for NTSC), and track pitch is 1.7 micrometers. The player thus must sense the presence of either digital-only or video signal, and adjust its operating parameters accordingly. Typically, the player's pick-up would read the audio lead-in area, skip to the video portion, then return to the audio-only portion. The allocation of the audio and video sig-

nals is shown in Fig. 1. You can see that each information area consists of three parts: lead-in, program and lead-out. Fig. 2 shows the specification of the combined digital audio in NTSC video format.

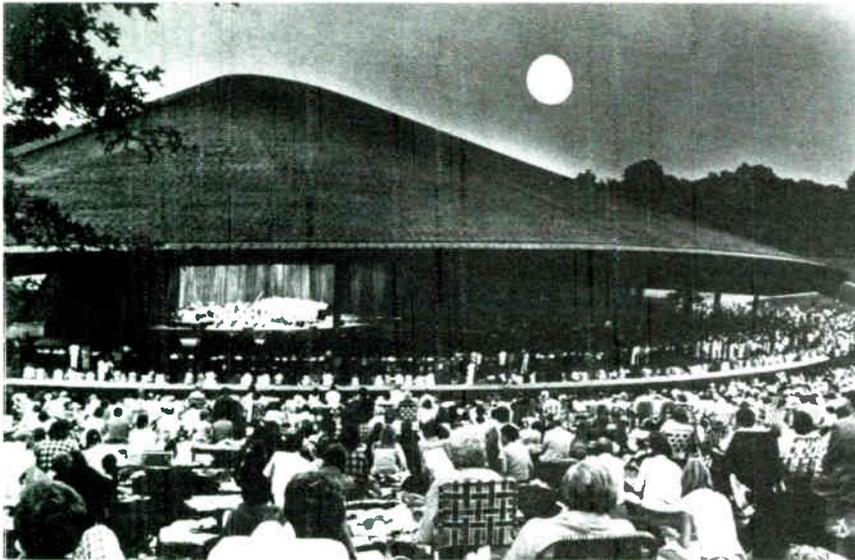
The 8-inch and 12-inch discs are denoted as CD-V EP and CD-V LP respectively. They contain audio conforming to the CD standard and video conforming to the LV standard. Analog audio may be used in lieu of digital audio. For NTSC both have a scanning speed of 10.2 to 11.4 meters/second. The CD-V EP plays two 20-minute sides, the CD-V LP plays two 60-minute sides. Obviously these discs cannot be played on a CD player. The

—CONTINUED ON PAGE 82

FIGURE 2 NTSC FORMAT



SOUND ON STAGE



Blossom Music Center

by Mike Stande

The specialized facility requirements of the touring entertainment industry has brought major changes in the way new concert venues are designed, built and operated. Architects and facility management staffs alike have begun to take the touring rock show seriously; in fact, an entire network of multi-million dollar concert amphitheaters has sprung up across the continent within the past decade or so, and even established civic auditoriums and arenas are upgrading their in-house production facilities in an effort to present an attractive package to concert promoters.

In 1967, when touring acts such as Peter, Paul & Mary, Herb Alpert, Elvis Presley, and the Beach Boys were hitting the road, many major cities did not have ideal sites to accommodate such events. Due to outmoded building policies and/or the lack of such basic concert production tools as spotlights and adequate electrical circuits, the infrastructure of auditoriums and civic arenas was an environment that was incompatible with rock and roll.

Today, that has changed. Not only are the established facilities lining up to bid for their chance at a percentage of the Bon Jovi T-shirts that will be sold or the Huey Lewis sunglasses, but many are even advertising in national trade publications, touting such things as number of spotlight positions, and type of acoustical treatment.

Along with the increased interest in the touring concert business for civic-owned auditoriums goes an entire new generation of concert clubs and outdoor amphitheaters that has been built specifically to service this trade.

Accommodating Today's Concerts

Traveling shows today roll into town with custom-built stages, packaged sound and lighting systems, and even laser effects crews or video support hardware. Equipment means trucks, and trucks mean loading docks. More care and attention is being given to this critical part of the live show; if docks allow several trucks to load or unload simultaneously, that venue becomes more attractive to traveling shows. Canvas awnings for rainy climates and heating units for cold ones

CONCERT VENUES EVOLVE INTO THE '80s

OUR FAVORITE VENUES

by Linda Jacobson

When we asked sound reinforcement engineers to name their favorite venues, the typical response was, "It's easier to remember the halls I hate." Most concert sound engineers travel with their own systems, so when they discuss their top theaters, amphitheaters and arenas, their reasons include everything from acoustics and house staff to ambience, baffling, seat material and even color schemes. And sometimes, it's simply a good vibe that makes a good venue.

Alpha Sound & Light of Charlotte, NC, headed by Al Forbes, covers gigs throughout the Southeast, including all shows with the Charlotte Symphony. The 2,500-seat civic auditorium in Charlotte, Ovens Auditorium, scores with Forbes: "It's a nice old hall with good acoustics, like a small-time

Carnegie Hall. We do lots of jazz there. It has everything you expect to see in a good hall—good load-in, rigging facilities and stage crew, and easy access to power." But the 6,000-seat Fox Theater in Atlanta is Forbes' favorite; that's where his crew has worked such shows as Bobby Womack and Lou Rawls. Says Forbes, "It has fancy wooden stair rails, lots of wood, padded seats, real good acoustics. It was built over 100 years ago, when money went a lot further than it does now."

Showco's senior sound engineer since 1976 has been arena specialist M.L. Procise III. In the last two years alone he mixed 200 ZZ Top shows. Procise likes a spacious-sounding room, "with a lot of height, but not a tremendous amount of steel and reflective surfaces. Generally I look for padded seats, but

—CONTINUED ON PAGE 24

keep crews and drivers happy.

With many shows requiring 400 amp 3-phase service for a major touring sound system and at least as much for lights, contemporary buildings are beefing up their electrical service provisions.

Spacious, secure mixing console locations for traveling systems are a necessity; with several racks of outboard processing, 40 to 64 main input desks and auxiliary consoles for opening acts, the need for audio real estate is a primary consideration when a new building is being designed that will cater to the concert industry.

Sturdy, large sound "wings" [speaker platforms] are required for massive touring loudspeaker systems; the best-equipped outdoor amphitheaters also offer permanently-installed towers with rear-area delay speaker systems to insure adequate musical coverage of the farthest seating zones.

Many concert clubs offer entire in-

"Architects and facility management staffs have begun to take the touring rock show seriously...."

house sound systems, complete with multiple-mix stage monitoring systems and hanging loudspeaker arrays; some even offer the provision for live recording and videotaping with separate cable systems and mixing consoles.

House sound, lighting and stage crews made up of road-veteran technicians can be found now in most major cities; many a veteran road crew member has chosen a city, settled down, and found himself or herself in charge of a local concert venue. This experience and expertise benefits today's touring shows.

While every region of the nation is somewhat different, certain patterns do emerge on a cross-country tour today; whether the venue format is 500-seat concert clubs or 50,000-seat stadium shows, a certain level of quality in available production facilities has been reached that was only hoped for in years past. As the production managers for today's touring groups continue to fine-tune and expand their show needs, the new generation of concert venues is striving to provide a string of facilities from coast to coast that effectively can showcase the best that live music has to offer. ■

THE NEW AMPHITHEATERS

MAKING LIFE EASIER FOR THE TOURING PRO

It's no secret that the touring industry has changed over the years and the complexity of even an "average" concert has expanded geometrically, with greatly increased production requirements in all areas: sound, lighting, video, sets, rigging and staging. What were once considered extravaganzas are now standard operating procedures, yet at the same time, the economics of touring in the '80s dictates tight scheduling with little time between venues.

Over the past five years, dozens of outdoor amphitheaters have sprung up across the country, and besides the obvious audience appeal of enjoying a concert under the stars on a cool summer evening, these new facilities, designed for quick load-ins and setups, have also found favor with production professionals.

"I'm sure it's true all over, but particularly in the northeast part of the country, people just look for this type of environment when taking in a show in the summertime," comments Stephen Lombardi, general manager of Great Woods Amphitheater, located on 100 acres of

woodland outside Boston. While the 15,000 capacity facility was designed by G.E. Ross Associates (an architectural firm in nearby Quincy, MA), production professionals were consulted for their insight. "In terms of design," Lom-

Shoreline: "The uniform building code says you only need about 7½-square-feet of lawn space per person. But ours is based on over 11-square-feet per person. It's important to Bill Graham that this place be for the people *and* the act."

bardi continues, "our stage manager Tom Bates and operations manager Bruce Montgomery certainly had quite a bit of input; they've been in and around the business for years. The dressing rooms are more than ample, the back of the house load-in/load-out access is more than adequate and quite a bit of attention was paid to it because our operations and stage managers were involved in the process."

When megapromoter Bill Graham acquired a site to build an amphitheater by the San Francisco Bay, he wanted to ensure that the facility would be done right—for artists, crew and audiences alike. "The design concept wasn't approached in the traditional fashion," notes Steve Macfadyen, operations manager of the resulting facility, Shoreline Amphitheater, "Bill Graham has spent 20 years doing this, and it was really a joint effort of all of the senior people at BGP (Bill Graham Presents), as well as polling every respectable person that we work with in the industry. The basic design was done [by architects of Blue Rock Partnership] and then we took it around and made little changes based on that.

"We talked to bands and touring production managers, asking them to kibitz on what we did," Macfadyen continues. "Consequently, this facility's got everything anybody has ever dreamed of from a production standpoint: from more power than anyplace else, to conduits under-

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even wooden seats are better than metal or plastic seats. The rooms that fill that role for me are the Brendon Byrne (Meadowlands) Arena in East Rutherford, NJ, the Reunion Arena in my home city of Dallas, and Iowa State University's Hilton Coliseum in Ames, which were all built around 1978. I also love the sound of the Vancouver P&E. Both the P&E and Hilton incorporate wooden roofs, which has a lot to do with the sound you get. I don't have to guess at the intangible problems in these venues. None

of them have problems in the low end with resonant frequencies in tune with the room—none of them have loading characteristics."

When asked to name his favorite venues, Roger Gans of the San Francisco Opera sighs "that's a tough one." But when pressed, this sound engineer (who also tours the world doing shows for Pavarotti), admits his fondness for Maple Leaf Gardens, a hockey arena in Toronto where he mixed a show with Pavarotti and Placido Domingo. Like Procise, Gans also approves of Dallas' Reunion Arena. "I also like the

Market Square Arena in Indianapolis, the Spectrum in Philadelphia, and the Omni in Atlanta. In all these spaces they play basketball and they have the standard size floor. But the rooms are pleasant, clean, have a cooperative, professional staff, and don't have bad echoes or excessive reverb. We tune the rooms with SIM™ (Meyer Sound's Source Independent Measurement), and the only thing you can't fix with SIM is discrete echoes or excessive reverb.

"We're very fortunate," adds Gans, "that rock and roll has toured in all these places before, so they're used to a show like ours; we use the same stages, and we rig just like rock and roll."

Speaking of rock and roll, sound engineer Buford Jones reports that he enjoys places with their own natural energy: specifically, the Forum in L.A. and Madison Square Garden. Jones has mixed since 1970, cutting his teeth on Linda Ronstadt and James Taylor tours as a Showco engineer. He left Showco in '79 to go independent. Now he works with various sound companies, and recently handled Audio Analysts' gigs with Jackson Browne, Pat Benatar and Don Henley. Discussing the Garden and Forum, Jones explains "For their size, both sound really good, with a little preparation—placing the speakers correctly, determining the coverage and dispersion. There's something about a big live show in those towns—they're always fun for me. The crowd's energy really accents that, and the sound layers in with that, psychologically. There's a lot of excitement, which is what a live show ought to be about.

"The shed circuit is growing more popular—Merriweather Post in Baltimore, Pine Knob in Detroit, Blossom Music Center in Cleveland," lists Jones. "They're popping up all over. I'm really pleased with a new one here in the Dallas/Fort Worth area—the Music Mill at the Six Flags amusement park, of all places. We played Jackson Browne there, and it's one of the few places that really considered sound, trying to contain it within the theater. That's a problem in outdoor sheds, because when the sound gets too loud the neighbors complain. You have to mix at lower levels in ways you wouldn't normally. At Music Mill they put up a large wall that folds inward and contains the

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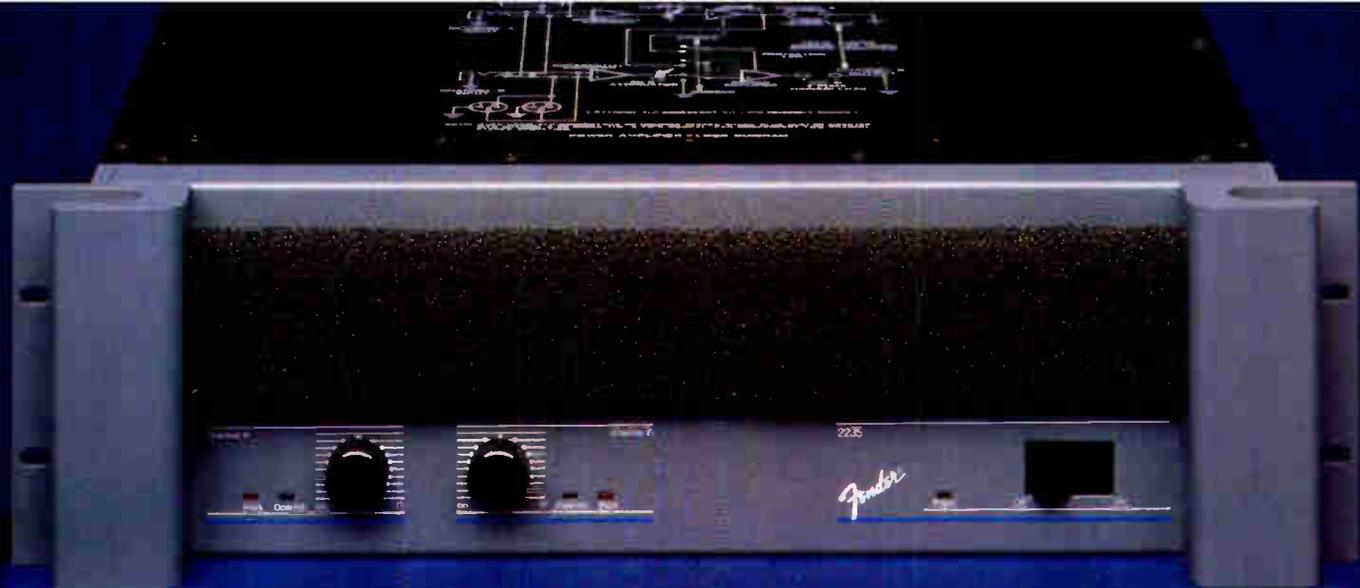
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—FROM PAGE 24, VENUES

sound within the theater. The dressing rooms weren't even completed when we played it, and I was still really pleased with it."

The Blossom Music Center (19,000 capacity) that Jones mentioned is a favorite of Chuck Patton's. He's the operating manager of ELI Audio, based in Cleveland, and says "Blossom is a gorgeous place." ELI Audio handles gigs nationally, from Donna Summer and Pure Prairie League to lots of what Patton calls "corporate rock."

Patton appreciates a handful of theaters and amphitheaters, including "a theater-in-the-round in St. Louis, I believe it's called the Westfield Theater. A great place to work. It demands more out of you because you don't have a single point source. You deal with 360-degree dispersion; the band rotates, so the sound source rotates. Once in a while the band can be behind you, which is wild, lots of fun. The band doesn't have any place to yell at each other or blow their nose without someone seeing. It's great to see how a good act works that room. As far as pure sound of a room, I like Royal Oak Music Theater in Detroit, a real old place with load-in that's a little funky, but the place sounds great. That one and the Westfield are just so intimate. I also like Red Rocks Amphitheater

a lot, outside of Denver. It's carved in red rock in the mountains, in a canyon, absolutely beautiful!"

Amphitheaters rate with jazz sound mixer Zero Nylin, a San Francisco-based engineer who's recently worked shows with Bill Withers, Herbie Mann, Dave Grusin and Lee Ritenour. He started mixing professionally in 1971. "I really like the unpressurized, outside environment of amphitheaters. The Greek Theater in Berkeley is one of the best. It's a nice deep horn that sounds potent for its size, about 10,000 people, regardless of where you sit. Outdoor theaters with covered stages and big lawns are becoming popular, and they're all OK. I have certain preferences that just regards the crew—some places have a really professional crew, where you point at something and it's done. The Concord Pavilion (CA) is like that, 'though it has weird sound. All Bill Graham [promoted] dates are like that, and the Pacific Amphitheater in Southern California is like that."

Nylin also mentions a controversial spot in San Francisco, the new Louise M. Davies Symphony Hall, source of ire to more than a few symphony musicians because of its acoustics. Says Nylin, "In jazz gigs, we're usually better off in a proscenium environment; Davies Hall is a beautiful, predictable-

sounding room, and if it had a proscenium, it would be perfect. We overplayed it a bit because it's so different than the other places, but if we went back a second day we would have played to the room a lot better. A symphony hall usually is strident and harsh, but this one is real even, and flexible—they have banners they can fly in, to shorten the reverb time."

Richard J. Peck of RJ Recording in Geneva, IL, entered the mixing biz in 1976. He covers the entire Midwest. Peck names the Paramount Art Center in Aurora, IL as "the nicest place for me so far." Built in the 1920s with an art deco flair, the Paramount holds an audience of 1,900. It was there that Peck mixed sound for Tony Bennett, the team of Mel Tormé and Jack Jones, Judy Collins, and others. He says, "They refurbished the place in the '70s and recently had it tested acoustically. It's within 1/10th of 1% of being 'perfect.' It's an easy room to EQ, and you get unbelievable clean sound that blasts without a lot of stacks. The people are really easy to work with, they help you unload and stack and tear down. I like it because the place has only one balcony, and it accepts the sound system and doesn't change anything. I like theaters best, because in them you can have the PA system do its work."

The president of Minneapolis' Southern Thunder Sound (dare you to say that five times fast) is Art Welter, whose work ranges from local concert clubs and 60,000-seat arenas to White House gigs. Welter says he is "fond of the local club First Avenue, because of the ambience. It's a real fun place, capacity about 1,500, with a musically daring roster and consistently good acts, from Tina Turner to the Fleshtones. That's where Prince filmed a lot of *Purple Rain*. It's in an old bus depot. It's a good venue to train people in—it's large enough to have a big sound, large enough to get bass waves developing without too much reverberant problems. It's a fairly live room but reasonably tight, not overly boomy."

Moving to larger spaces, Welter reports "The St. Paul Civic Center is a very good room. It's oval, so the acoustics are reasonably good. It's a very easy room to work as far as rigging a system; you can bring in any size system easily. I like working with their staff. Other than that, I like theaters—and there's a good one in just about every town." ■

St. Paul Civic Center

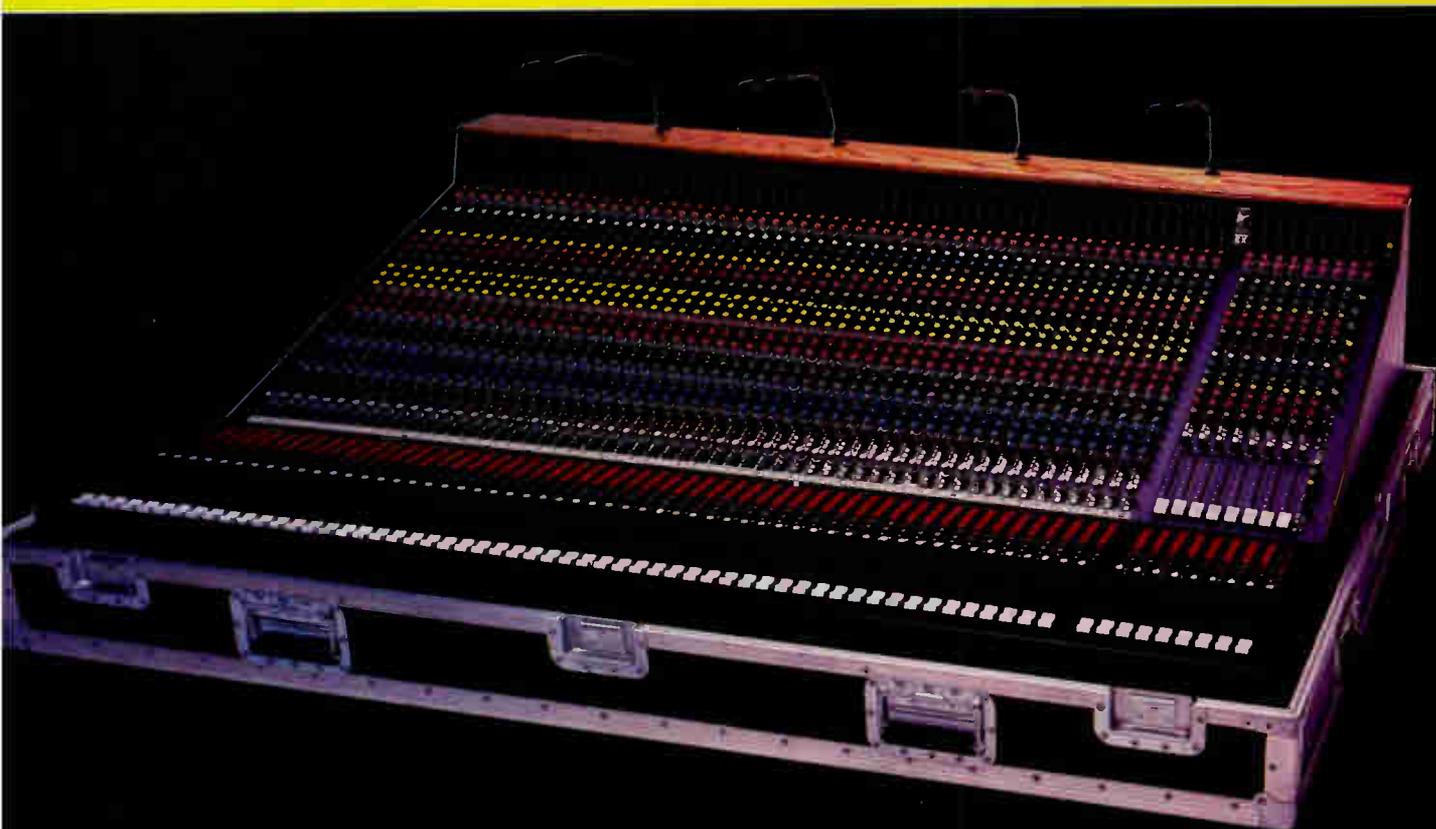


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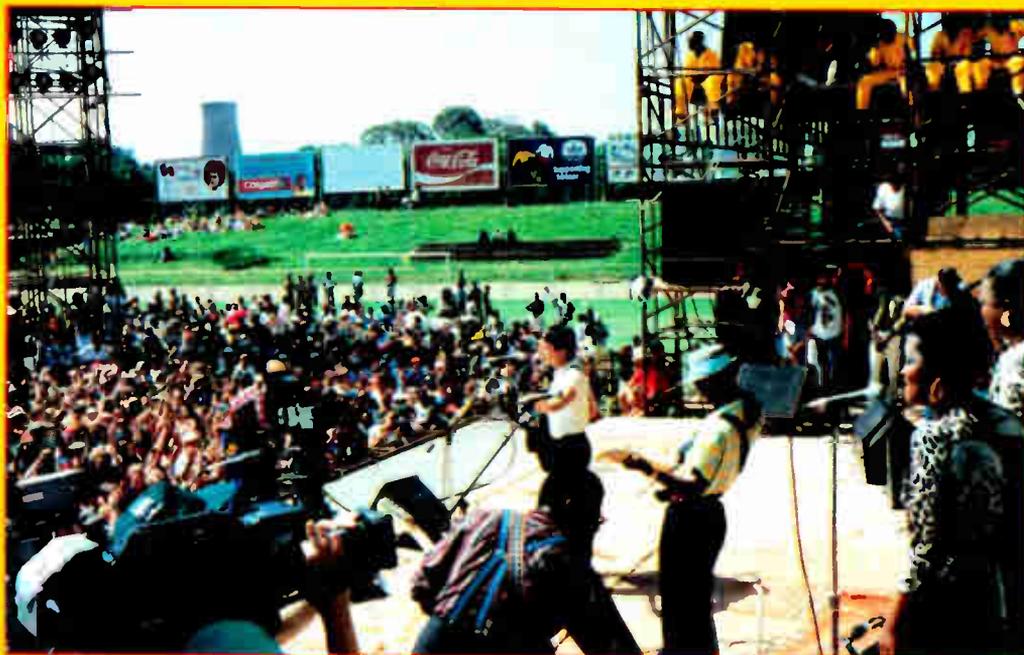
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GRACELAND LIVE: OUT OF AFRICA



The Recording of Paul Simon Live in Zimbabwe

by Dan Daley

Paul Simon's most recent album, *Graceland*, has achieved as much notoriety for its oblique socio-political statement as it has acclaim for the powerful music it contains. Reactions have been heated to the point that the music itself has, to a degree, been overshadowed. Simon's choice of recording in South African studios with African players has been hailed by some as an acknowledgment of musical roots and condemned by others as a *de facto* endorsement of apartheid. And regardless of the considerable musical achievements that make *Graceland* what it is, politics have continued to play a part in Simon's career, seemingly whether he likes it or not

Last February 14 and 15, Simon and his touring entourage put on two concerts at the 20,000-seat Rufaro Stadium in Harare, the capital city of Zimbabwe. Formerly the British colony of Rhodesia, Zimbabwe sits due north of South Africa. On either side of their common border can be found the yin/yang that is emerging Africa: Zimbabwe represents a growing, thriving nation after a (relatively) orderly transition from the colonial government; South Africa looms as a *memento mori* of an Africa past that refuses to budge.

Not Gonna Play Sun City

"Paul wanted to perform this show in South Africa," says Randy Ezratty, owner and chief engineer of Effanel Music, the mobile recording studio that recorded the show for a Showtime

special. "He basically wanted to *this*" — Ezratty raises the middle finger of his right hand — "to the South African government with his South African band."

Ironically, South Africa invited Simon to play its Sun City resort. Not welcome, however, would have been two very visible members of Simon's troupe: vocalist Miriam Makeba and trumpeter Hugh Masekela, both considerable draws on three continents and political exiles from South Africa. So Simon accepted an offer from white Zimbabwean promoter Neil Dunn for two shows in Harare. "The idea was to take the music to where it had originated," says Ezratty.

Zimbabwe, though, has laws against taking any earned currency out of the country, and given the costs of transporting a large revue, with sound

Photo above: Showtime cameras capture Paul Simon and the band in Zimbabwe.

reinforcement and recording, to Africa, the project would require sponsorship, especially since Simon and company wanted ticket prices kept low to insure accessibility to all the performances.

Enter Showtime, which underwrote many of the costs. They also brought in director Michael Lindsay Hogg and the London-based Visions Mobile video recording crew who executed a complex nine-camera shoot of the show, scheduled to be shown on the cable channel in late spring. Maryland Sound of Baltimore prepared to go in with main mixer David Morgan, complemented by Steve Guest and assistant engineer John White. Simon's longtime engineer Roy Halee would be the primary mixer for the live recording, with Stacey Foster in the role of audio director.

Randy Ezratty was no stranger to recording in Africa; in 1981 he took his young company to Ghana in west Africa to record Mick Fleetwood's *The Visitor*. "It was a good way to start up and show that the concept [of a recording studio in flight cases] was credible," recalls Ezratty.

(Since then, Effanel's credits have included over 100 *King Biscuit Flower Hour* live broadcasts, Bryan Ferry's *Boys and Girls LP*, *The Unforgettable Fire* by U2 and George Thorogood's *Maverick*. While Effanel maintains two trucks [one of which is the East Coast's first 45-foot mobile control room] for the more traditional mobile configuration, the flight case approach keeps Ezratty ready for the more exotic field trips.)

Ezratty sent his crew—Mark Shane and John Harris—ahead to Zimbabwe with the equipment a week before the planned shows. Ezratty flew first to Europe to take in a few Simon shows in Milan and London. Working with Simon wasn't a completely new experience for Ezratty; he had done live recordings of Simon & Garfunkel in Tel Aviv, Israel, during their reunion tour.

With all his recording in third world countries behind him, Ezratty knew this wasn't going to be like setting up in a club in Cleveland. Over 16 tons of electronics and instruments were converging on Harare's single airport from several points on the globe (almost everywhere except South Africa). And the first hurdle is invariably customs. "All of us were made to feel as though anything could happen at customs," says Ezratty. "We made sure we had an extremely together freight manifest. But after all this, the roulette wheel spun our way: they looked at only one piece of equipment and passed the rest on through."

Customs was anticlimatic; the rest of the project took its cue from that, it

seemed. Ezratty was pleasantly surprised by the lack of surprises during the pre-show set up and the concerts themselves. He attributes this to a touch of benign paranoia. "In a nutshell," he states, "as far as a video concert shoot goes, it was straightforward and trouble-free because we were so overprepared for problems that never arose that we were ready for anything."

Effanel set up shop in a pre-fabricated, air-conditioned hut at the rear of the stage area. Ezratty's crew had spent a week acclimating itself to an environment where it was sunny one minute and raining torrentially the next. Everyone became experts with tarps.

Soundcheck and rehearsal were slated for the day before the first show. Simon and his group arrived, exhausted after a 12-hour flight from London on an Air Zimbabwe Boeing 707. Roy Halee arrived with them. It was at this point that Ezratty hit the only glitch during the project. "I brought a spare set of Rogers BBC monitors with me, as usual," says Ezratty. "They're used for classical recording. I set up both pairs with a subwoofer, figuring that would sound great in that particular setup. And I set up the speakers stacked because it sounds better. Now you have to understand that Roy Halee is a real mixer, with a capital 'M'—he really gets into it. And Halee likes the board left in position after he leaves it. Someone from the stage crew turned off Paul's wireless guitar while it was plugged in and the resulting hiss blew

out all four tweeters on the Rogers, the main set and the spare pair. So here I am stranded in Zimbabwe without speakers and knowing that Roy Halee is very particular about the way he likes his equipment set up.

"After a lot of calling around, we found a local record pressing plant that does the government-sanctioned records. The guy there had a beautiful set of K&H tri-amped bookshelf monitors. He came and opened up the store at 10 p.m. that night and gave them to us."

The next day was dedicated to coordinating the connections between Effanel, Maryland Sound and the video crew. Maryland Sound had shipped over house and monitor consoles, outboard gear and monitor speakers in an attempt to duplicate the sound Simon had achieved on the European leg of the tour. The P.A. in place was used, though in Ezratty's estimation it wasn't anywhere near the level he expected. But during the previous week, Maryland Sound engineers John White and Steve Guest literally went over every inch of the P.A., according to Ezratty, checking phase and distortion on every component and ultimately re-wiring and refurbishing the local P.A. (much to its owner's delight, he adds).

Video towers were erected, their crews assigned to shooting spots by director Hogg. Ezratty set his array of equipment: he had a pair of both Otari MTR-90 and Stephens 821B 24-track machines (for a total of 96 available

The Week of Living Dangerously A Canadian Film Company Goes to Lagos, Nigeria to Film a Juju Music Festival

by Doug McClement

Last December, Comfort Sound was approached by Jacques Holender of Nemesis Films to submit a quote for a remote concert recording in Africa. The original plan called for a dual 24-track 2-inch system complete with console and all necessary processing and monitoring gear to be crated and flown to Lagos, Nigeria, to record a dress rehearsal and two concerts by five Nigerian "juju music" bands, including the internationally popular King Sunny Ade and Chief Commander Ebenezer Obey. The film was financed by *National Geographic* magazine, the National Film Board of Canada, and Telefilm Canada.

Comfort Sound has been a major independent audio remote studio in Canada for the past ten years, having

worked on live LPs, television music specials, and film soundtracks in cities across the country. I looked on this job as an interesting challenge, especially as it would be my first remote outside of North America, so I was pleased when our bid was chosen and Comfort was contracted by Nemesis for the job.

A series of production meetings followed, and a major budget cut forced us to downscale the equipment requirements. Shipping costs at \$4 (U.S.) per pound became a major factor. Our standard remote package of two Ampex MM1200 recorders and an MCI 636 console would have cost \$10,000 alone to ship to Lagos, and that didn't include snakes, stage boxes, outboard racks or monitor amps.

The production team of me, engi-

—CONTINUED ON PAGE 66

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tracks, although 48 were used) through the 64-channel Sound Workshop Series 34/Logex console. "The Stephens machines have proven themselves to me for five years now—we've taken them around the world a few times," says their owner. "The machines are very rare, actually; I think that there are only about 100 of them around and most of them are found in small audiophile-type studios. They were the basis of the original Effanel system. We had just taken delivery of our new Otaris when this job came along which called for the four 24-track machines. We had flight cases made for the Otaris and, like the Stephens, they proved to travel quite well, too."

The decks were loaded with 3M 250 2-inch tape. The system was supplied with 50 reels of tape, each reel 5,000 feet long. "As on all video shoots with multi-track audio," says Ezratty, "they give us SMPTE time code, but this being an English system, they also gave us their standard, EBU time code. So on both 24-track machines we recorded two different time codes so that different reference points in mixing would be allowed for later on with whatever system was used.

"We also always paired the multi-tracks like this: one Otari, tracks one-24, and one Stevens, tracks 25-48, less the time code tracks. When you're using two different brands of tape recorders in tandem, you have to keep consistency in terms of what tracks are assigned to which machines. You always want to keep your kick drum in the same place, for example, since different machines sound different. And the reason you use two different brand decks brands in the first place is because if a problem develops with one make, chances are good that it won't affect the other make. As it turned out, the Stevens deck didn't really get used much. Halee managed to get most of the show on the Otari and the Stevens was used to hold audience mics and some back-up tracks."

Very little was changed from house mixer David Morgan's 52 stage input assignments, according to Ezratty. "We simply put our splitters in-line and gave David the transformer out and added ten house mics in stereo pairs throughout the stadium which Roy Halee likes to use for ambience and imaging. As a matter of fact, they were so well placed that he never turned on the Lexicon 200 reverb we had in the recording room."

Ezratty found that when all the technical wizardry was finally in place, it all came down to one pair of ears, at least as far as the live recording was concerned. "The difference between an engineer and a mixer is really per-

sonified by Roy Halee," he says. "He is a mixer and he's quite intense about it. And we're there in Zimbabwe in a sort of commando, frontier recording thing where the idea is to get it recorded and worry about the mix later on. Roy can't work that way. He wasn't concerned really so much about technical things. All he worried about was how the music sounded. That's all he wanted to know about. He set up the recording equipment like a little cockpit back behind the stage.

"In Paul Simon's manager's office back in New York before we left he showed me where he wanted to put his hands on the console to reach for Paul's acoustic guitar, and his hands for Paul's voice, and so on," Ezratty continues. "When he did that I thought, 'He'll never remember all this stuff.' Sure enough, when we got there I mispatched something—two tom-toms that weren't the way he showed me he wanted them back in New York. He spotted it immediately. He was amazing. When the show starts he doesn't want to know about tape recorders or anything else—he's there to mix a show.

"He did something else very unusual in live recording—he virtually did a mix to multi-track. That is, he mixed the level changes onto the 24-track machine. He gave me a track list with monitor pan positions for each track. We then set the monitor pots at unity gain on each channel with an oscillator and then never touched them again. The monitor section was basically being bypassed with each 'monitor' move going direct to the multi-track. As we recorded, he made level changes with the slide pots and sent them to the 24-track. So when there was a guitar solo, it got louder on the 24-track; the hi-hat was low in the house mix and he put it that way on tape. He was literally mixing to the multi-track. And it was like 'Roy, are you sure about this? We're in Zimbabwe and if we blow it. . . .'

"Theoretically, you could take those master tapes and put them up for playback, set unity gain and pan for each track, and then have the 48-track tapes 'mix' themselves with the added insurance of being able to alter any moves that weren't exactly right during tracking. Roy was the first engineer that I had ever worked with who approached a live recording in this manner. He's also one of the few guys who could have pulled it off as well as he did. He has such an intimate knowledge of Paul and the *Graceland* material that it was possible to get it very close to perfect on the fly. In the beginning, I was skeptical, but he proved to me it could be done, and done incred-



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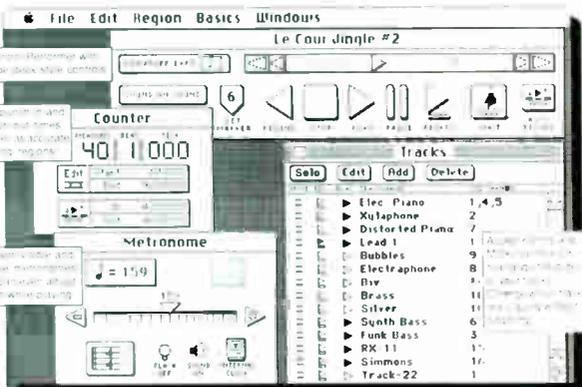
From a digital sampler, to a fully equipped 24 track MIDI studio no one can offer the unique combination of technical and sales expertise available right here.



Keyboards, Samplers: We carry the full line of Sequential, including the 2002+, Studio 440, and new VS Rack, and the Akai range of Samplers and Keyboard Controllers. Watch for new product announcements soon.

I think you'll find dealing with us a different and mutually profitable experience. If you have any specific questions regarding a Midi Recording system you are putting together, or problems you are having with an existing system (even if you bought it from Midi R Us), please don't hesitate to call.

Ask for Karl Wirz.



Software: AEA's Midi Works specializes in Mac software from Mark of the Unicorn, Digidesign, and Opcode.

Ever noticed how noisy it gets in the keyboard department you go to when you are ready to buy, but want to hear something?

Ever noticed how quiet it gets when you're not ready to buy? (Like, you can't even get a 'no problem'.)

Welcome to the saneness of AEA's MidiWorks. Where you can sit. Where it's quiet. Where you can listen. Where you can fiddle. Where

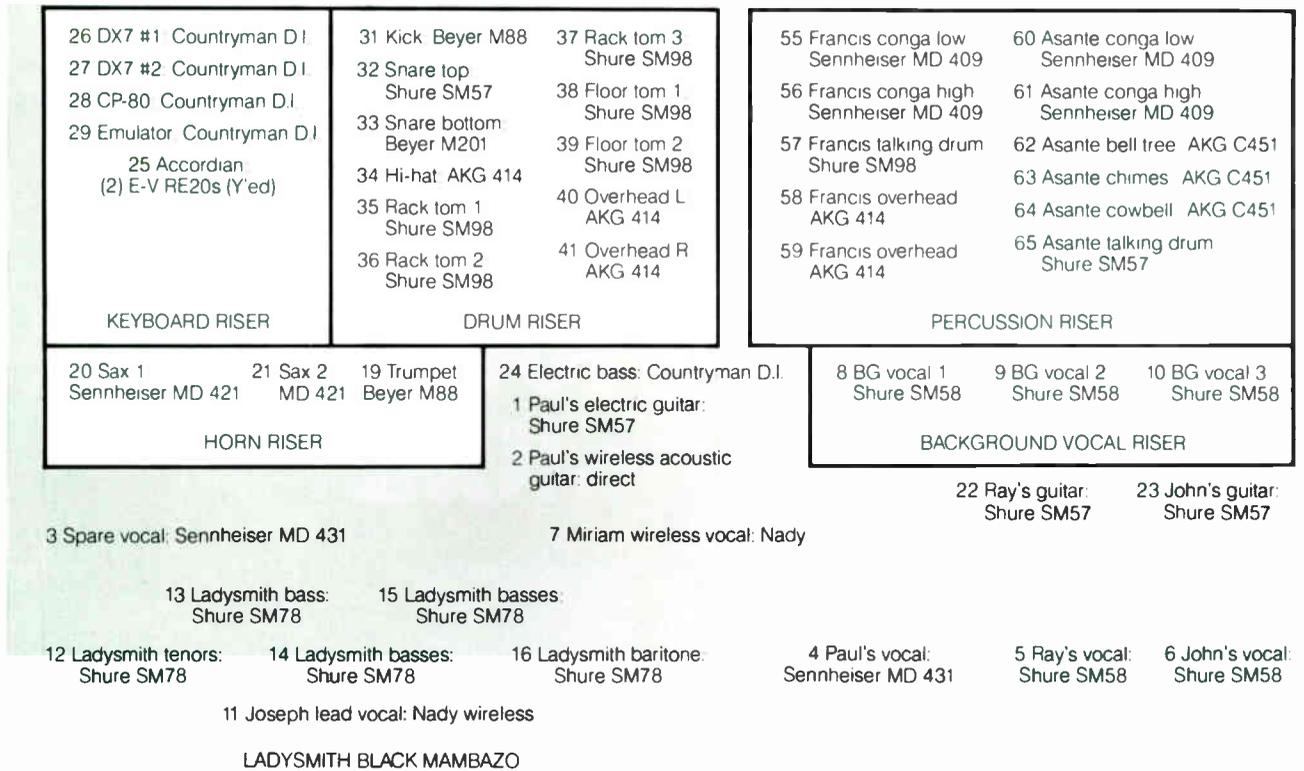
AUDIO ENGINEERING ASSOCIATES'

MIDI WORKS



1029 N. Allen Ave., Pasadena, CA 91104
Call 818-798-9127 or 213-684-4461

Circle #011 on Reader Service Card



Mic/console input layout for Paul Simon's Graceland Live: Zimbabwe '87.
Note: numbers before each item indicate console input number.

ibly well."

As intricate as the technological end of things were, the show itself transcended those considerations—two-and-a-half hours of Paul Simon's wryly lyrical *angst* counterpointed by the tilting, mellifluous vocal and instrumental colorings of native southern African music, as rich in texture as the colored cloth canopies that framed the stage. Simon paced the show well, using different combinations of artists along with his band. The male cap-pella group Ladysmith Black Mambazo came close to stealing the show with their feisty brand of vocals, dancing and *joie de vivre*. At times, Simon would sing a duet with Miriam Makeba as Hugh Masekela played in the horn section, who would in turn come down front now and then for a solo. It was loose enough for Simon to occasionally stop backstage at the recording room and listen in.

At the close of the performance, Simon brought onstage the wife of Zimbabwe Prime Minister Robert Mugabe to present to her a donation of \$15,000 for her favorite charity.

Once the show was over, Ezratty found a couple of things that had impressed him as much as the music itself. One was Simon's grace under the pressure of the flak he was catching at home and abroad from some

critics for his approach to *Graceland*. "Paul has maintained a lot of integrity through all this," he says. "Both he and Ian [Hoblyn] have stood up well throughout."

Ezratty was also struck by the sense of racial harmony that pervaded the atmosphere in Rufaro Stadium and throughout their stay in Zimbabwe; a peaceful ambience that made the small storm of ink in the American and European press dissecting Simon's intentions seem even more remote. "When my wife came over for the show," says Ezratty, "she realized that the control room was the wrong place to hang out, so she went up into the stands for a seat. At first, she told me, looking at the mix of people made her a bit uncomfortable, especially since she was coming right from New York. The whole racial thing in America is so tense compared to here. But within minutes, she said she felt incredibly comfortable with the people around her. It really is an amazing country. This was the perfect place to do this project." ■

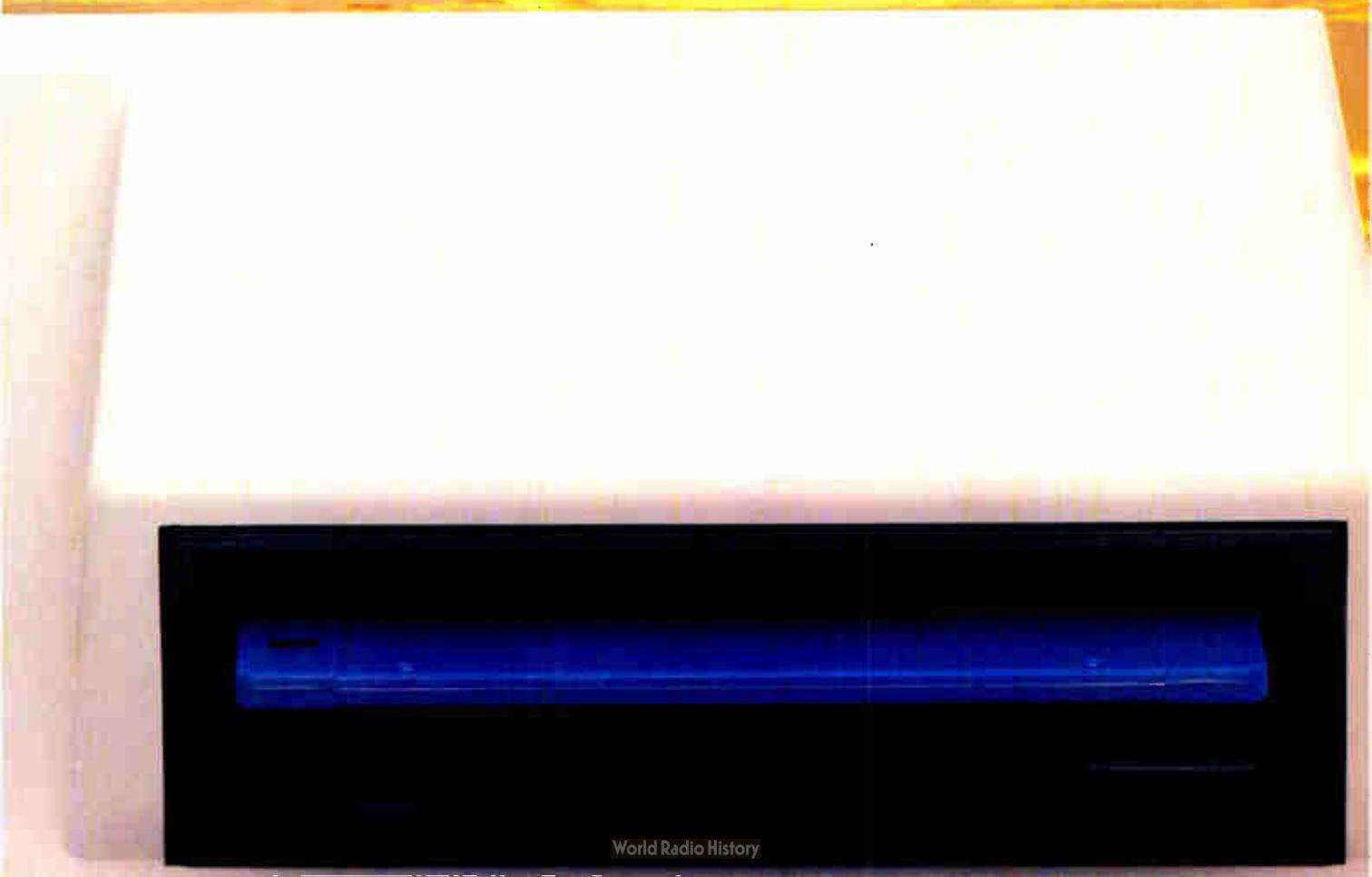
Dan Daley is a contributing editor of Mix. Address all correspondence c/o Yankee Stadium, the Bronx, for the rest of the summer. (And with any luck, part of the fall).

Audio To Go

Effanel Music's Portable Recording System as used for "Graceland Live":

- 64-channel Sound Workshop Series 34
- 34/Logex console (modified for portability)
- Two Otari MTR-90/2 24-track recorders
- Two Stephens 821B 24-track recorders (portable version)
- Two Studer B-67 2-track recorders
- Rogers LS35A/Ace Bass Monitor System
- Quad 405 stereo monitor amps
- dbx 900 processing rack with eight 903 limiters
- Two UREI 1178 limiters
- BTX Cypher Time code reader/regenerator
- Lexicon 200 digital reverb
- HME 2-channel 8-station intercom system
- Four Kenwood UHF walkie-talkies

**THE POWER BEHIND THIS DRIVE
COULD EXPAND YOUR MUSICAL
HORIZONS BEYOND ANYTHING
YOU CURRENTLY KNOW**



INTRODUCING THE MC-500

THE FIRST COMPUTER DEDICATED TO THE

The Goal: Total MIDI Control/We'd like you to spend a few minutes reading this ad. Because what we have to tell you takes a little time — but your time will be well spent. Because no matter what kind of music you play, you could play it better with the help of the amazing new MC-500

MicroComposer. The advent of MIDI has made incredible progress possible for all kinds of musicians — giving them power they never had

before. But in order to harness that power, musicians need the proper tools. The MC-500 was created to fill that need — to harness the power of MIDI and give all musicians the power to control and use MIDI to their best advantage. In recent years, there have been various alternatives to controlling MIDI music systems. Some people have used personal computers equipped with MIDI software and interfaces. Some have turned to dedicated sequencers. Each has had its disadvantages. For all the power they offer, PC's are built for the businessman's environment, not the musician's, and as such they don't take well to life on the road. Also, they can be quite slow in performing MIDI functions, and as we all know, interfacing a computer to a MIDI system is often clumsy at best. Dedicated music sequencers are built for the musician's environment, but usually lack the features and flexibility of personal computers. Simply put, they can't be upgraded with new software, which means they can become obsolete before you've finished paying for them.

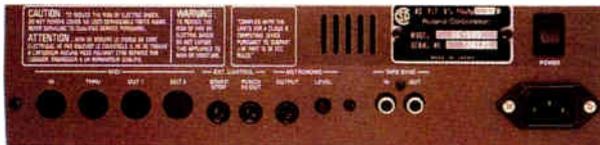
The MC-500: A Computer with MIDI Jacks/To solve this dilemma, Roland's engineers have created an engineering masterpiece — a powerful personal computer, with more memory capacity than the average PC, that is designed inside and out (from the front panel controls to the back panel jacks) for the MIDI musician. Like a computer, the MC-500 MicroComposer has no functions of its own — its functions are loaded off a software disk via its disk drive. In this way, depending on the software you load into it, the MC-500 MicroComposer can become almost any type of MIDI control device you require: a sequencer, a sound librarian, a live performance system controller, and a MIDI interface system — all in one compact, roadworthy unit.

In the Creative Process/The benefits of this type of engineering become apparent almost immediately, as the MC-500 MicroComposer allows you to create and control music with seemingly effortless keystroke commands. In many ways it's more like working with tape recording than computer sequencing, because the

MC-500 MicroComposer is laid out in much the same logical manner as an advanced digital tape recording system. The beautiful ergonomics of the MC-500 MicroComposer make it apparent that you are working with an instrument that was designed for musicians,

from such easily-understood controls as Record/Load, Pause, Play, Stop, to the Alpha dial which speeds you through tasks which might otherwise slow down your creativity, to the speedy 3.5" disk drive, to the back panel — full of MIDI and tape interfaces, as well as footswitch jacks for those tasks too important to tie up your hands. **MRC-500 Software/**The MRC-500 Software Disk is the first in a series of software products for the MC-500

MC-500 BACK PANEL



500 MICROCOMPOSER

ULTIMATE IN MUSICAL PERFORMANCE

MicroComposer. It offers the ability to perform highly advanced MIDI sequencing, editing, disk storage of programs, as well as system exclusive control over patching and assigning your MIDI instruments. Simply load the MRC-500 Software Disk into the MC-500 and you're ready to create music exactly as you've imagined it. The MC-500 can hold performance data for roughly 25,000 notes—up to eight songs—in its internal memory, with additional storage of up to 100,000 notes on the Disk. The MRC-500 allows musical data to be entered from either your MIDI instruments, the ten-key keypad or the alpha-dial, which are then played back through your MIDI set-up. Songs can be named, and linked together, while the 40-character LCD prompts your next command. The accuracy with which the

MC-500 records your performance nuance is simply breathtaking. No glitches, no weird or unnatural error-correction, just simply what you've played. The faithful re-creation of your performance is truly one of the hallmarks of this amazing tool. In fact, so good is the quality of the recording, that you'll probably notice aspects of your technique that you never noticed before.

Recording Tracks/At first glance, you will see that the MC-500 MicroComposer has four polyphonic recording tracks plus a rhythm track. But, as is the case with most of the MC-500, there is a lot more

SOFTWARE DISK



here than meets the eye. A special Merge function allows you to combine the information on one track with the information on another (similar to "bouncing" tracks on a multitrack recorder). Using this function you can record up to 256 musical parts (16 MIDI channels times 16 voices) and MIDI channel information is retained for each merged track. Later, if you desire, you can un-merge tracks using another function called Extract. The MC-500 allows you to merge and un-merge as many times as you like, and because it is all digital information, none of your performance is ever lost.

The Rhythm Track/The rhythm track gives you the programming power of the most advanced rhythm machines, by creating individual rhythm patterns and then organizing them onto a track. In this way you can control sound sources such as Roland Rhythm Composers, Digital Samplers and Drum Modules, as well as most other MIDI-equipped drum machines. Up to ninety different Rhythm patterns can be created in step time, and then combined at will by using the MC-500's Copy, Insert and Delete functions. And, for the first time, you can not only create, but store your rhythm tracks along with the rest of your performance data—all on the convenient disk drive. No more separate loading of rhythm and program data.

Tempo Control/The MC-500 MicroComposer allows you to modify freely the tempo of any recorded performance. Using the alpha dial it is easy to change in real time, the tempo of the entire piece (which is displayed in beats per minute). But the MC-500 MicroComposer also contains a separate Tempo Track, which is capable of altering the tempo over the course of the piece. In this way, it is possible to create continuous tempo changes such as *accelerando* (a gradual increase in speed) *ritardando* (a gradual decrease) or even immediate abrupt tempo changes.



Recording a Performance/The MRC-500 Software allows a performance to be recorded in Real time or in Step time. Overdubs on additional tracks can be made within a few keystrokes of recording the original track, so you can never lose the feel for the music due to complex record set-up. If you make a mistake, the Punch In/Out feature can fix it with minimal fuss (just like on tape) but faster and more reliably than on any tape machine. For sequenced parts or others that are hard to play in Real time, the MC-500 allows Step programming — and since Roland invented this method of programming, you can be sure that it is done here in a manner that is both easy and precise.

Precision Editing/The distinction between a good and a great

program comes in the attention to detail, and it is in the editing process where the MC-500's detail shines clearly through. Any performance, whether recorded in Real or Step time can be fully edited down to the most precise detail. (Figure 1) An exclusive feature built into the MC-500's controls is the Microscope function. By entering the Microscope, you can then manually walk through your performance (event by event, forward or backward) simply by turning the alpha-dial.

Microscope can be used to isolate any unwanted notes or MIDI events, and then they can be easily deleted, corrected or re-written.

Advanced MIDI Implementation/In its MIDI implementation, the MC-500 is perhaps the most advanced MIDI control device ever made. It can receive or send MIDI messages on any or all of the 16 channels, and can receive or filter polyphonic aftertouch, pitch bend, channel aftertouch and system exclusive (even for instruments not made by Roland). (Figure 2) The MC-500's system exclusive features alone could save you hundreds of dollars in the cost of memory cartridges.

In the Studio/On the Road/The MC-500 is designed to be at the heart of any MIDI system, and as such it is

equally at home in the studio as well as on the road. Because of its flexibility, edits can be made to stored programs with breathtaking ease. Does the producer want you to change your song to drop one verse and add another chorus? It only takes a second. For film work there has never been anything in this class before. By synchronizing the MC-500 to Roland's SBX-80 Sync Box, SMPTE sync is perfect. Plus, the ability of the

MC-500 to allow parameter editing in real time means that you can change parameters while you are watching your performance. On the road, the MC-500 can handle as many keyboards as you can throw at it. Need to change programs and parameters on all your instruments eight times for eight different

songs? With the MC-500's Chain play ability, you can string eight different songs together for access in three keystrokes. And with the speed of the MC-500's disk access, you won't ever wait long for new material.

The Result: Total MIDI Control/If you need to control a MIDI system, there is no better choice than the MC-500 MicroComposer. For not only will it fill your needs today, but it will fill your needs in the future through software updates and new uses. Plus, at only \$1395.00 the MC-500 must also rank as one of the

world's greatest computer bargains, especially when compared to the cost of a

personal computer, software and interfaces. If you think it's time you mastered MIDI, rather than the other way around, the best way to do that is with the incredibly versatile, amazingly affordable MC-500 MicroComposer. The MIDI Computer. Roland Corp US, 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685 5141.

FIGURE 1 EDIT FUNCTION CHART

Performance Editing	Track Editing	Merge		Disk Editing	Rename	
		Extract				Delete
		MIDI Channel Reassignment				
	Measure Editing	Transpose			Micro-Scope Functions	
		Change Velocity				
		Quantize				
		Erase				
		Delete				
		Insert				
		Copy				
	Note Editing	Note Name	Micro-Scope Function	MIDI Message Editing	Note	
		Note Strength			Polyphonic After-Touch	
		Note Length (Gate Time)			Control Change	
		Delete			Program Change	
		Insert			Channel After-Touch	
		Timing (CPT)			Pitch Bender	
		Exclusive				
		Timing (CPT)			Tune Request	

FIGURE 2 MIDI MESSAGE TRANSMISSION CHART

Setting of Output Assign	Both MIDI Out connectors transmit MIDI messages on all MIDI channels			MIDI channels can be assigned individually for each MIDI Out connector			MIDI Out 1 connector transmits MIDI messages on all MIDI channels and MIDI Out 2 connector transmits only MIDI clock message		
Functions	Timing Clock	Exclusive	Soft-Thru	Timing Clock	Exclusive	Soft-Thru	Timing Clock	Exclusive	Soft-Thru
MIDI Out 1 Connector	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off
MIDI Out 2 Connector				Off	Off	On/Off	On	Off	Off

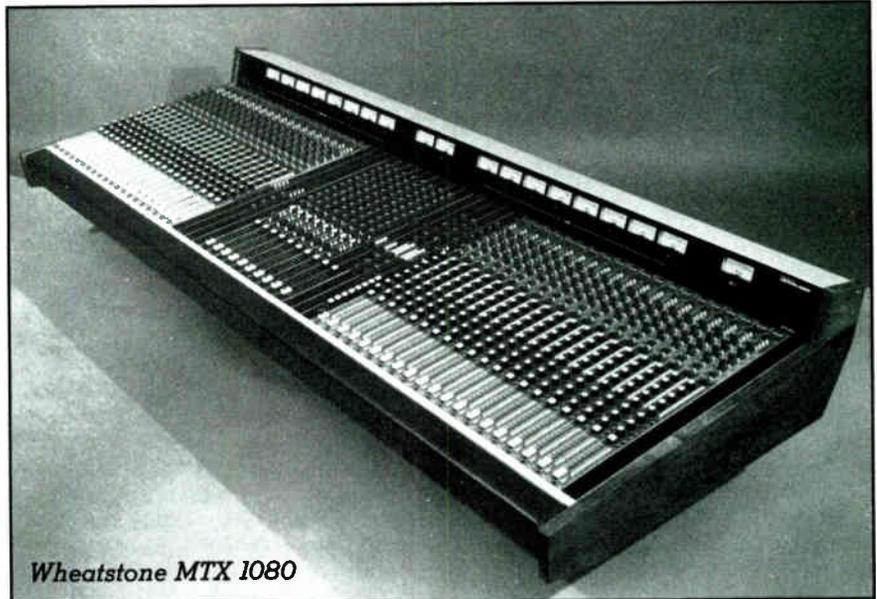
A BUYER'S GUIDE TO PROFESSIONAL HOUSE MIXING CONSOLES

by Mark Herman

In today's high-powered sound reinforcement business, the heart of any sound company's system is the house mixing console. No other single piece of equipment commands as much attention from the audio engineer, as it allows him to directly contribute his professional expertise to the performance. Given the current new sounds and effects, plus the attempt to recreate the studio sound in a live environment, it is important that the house engineer be provided with a modern, up-to-date mixing console with as many inputs, functions and options necessary to get the job done right.

Sound reinforcement companies must be responsive to both engineers' needs and progressive technological trends to maintain their client base and deliver quality pro sound. When it's time to purchase a new house console, factors such as performance, client demand, prestige, reliability, construction quality, serviceability, warranty and cost must be evaluated. An understanding of the available choices is always key to such an important decision. The companies that manufacture professional, portable touring audio mixing consoles offer many models often similar to each other in many of their fundamental functions. Yet wide variations do exist in all phases of this very essential, usually expensive, piece of equipment.

We've prepared a buyer's guide using a chart format on 21 different mod-

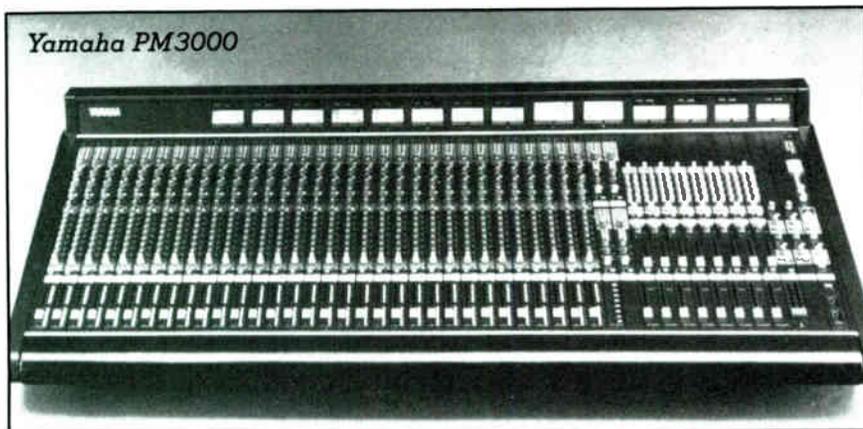


Wheatstone MTX 1080

els made by 12 leading live sound reinforcement console manufacturers. This listing is for new 1987 house consoles that are available directly from the manufacturer or from their local distributors. Only house mixing consoles designed specifically for professional live concert sound reinforcement are shown. "Specifically designed" in this case refers to electronic functions, portability and ease of moving/shipping required by the live pro sound reinforcement business. Theater and crossover recording/live consoles are not included.

The charts are divided into two separate sections. The first chart contains price, functions, physical characteris-

tics and warranty. The consoles are listed in order of List Price (highest to lowest), then broken down into columns. The Unit Price column refers to the total cost of the console divided by the number of input channels. It is *not* the price of a single input module sold by the manufacturer, but a figure provided for comparative purposes. In the Group column, "S" refers to stereo. Mix refers to the main output, where "S" is stereo and "M" is mono. Matrix refers to the number of matrix modules. The Gain Control is the type of control and the range in dB. Since almost all consoles have individual muting, the muting column covers only Programmable Muting. Metering gives a brief look at the type and number of VU meters, usually LED VU or needle VU. Fader type shows conductive plastic or carbon, and manufacturer. The lights that illuminate the console for indoor and night shows are covered under Lights. This may seem unimportant to some, but if you have ever mixed a show with a flashlight, you appreciate a well-lit console. Intercom has its own column, not to be confused with talkback (talkback is not listed because it is standard on almost all boards). If a Patch Bay is a standard feature, then the number of points are given. A few manufacturers offer standard Multi-Pin connectors,



Yamaha PM3000

Model	List Price	Unit Price	Inputs	Sub Groups	Mix Outs	Matrix	Aux SD	Aux RTN	VCA	Gain Control	Pad (dB)	Muting	Metering
Gamble Series EX	100000	1785	56	85	S&M	8	10	0	NO	Var 55dB	-15	8	74 LED VU meters, 20seg, peak reading -33 to +24
Harrison HM-5	89500	2796	32	85	S&M	8	16	16	8	Var 50dB	-20	8	44 LED VU meters, 40 segment
Harrison HM-4	65800	2056	32	45	S&M	4	8	4	8	Var 50dB	-20	8	28 LED VU meters, 40 segment
AmeK/TAC SR9000	65000	1625	40	16	S	8	16	0	8	Select 33dB	-24	8	19 LED VU meters, 20 segment
Midas Pro 40	58560	1627	36	12	S	4	4	0	NO	Var 50dB	-30	NO	8 VU meters: L, R, Matrix, Aux. Input: 8 single LED
Soundcraft Series 4	56750	1419	40	85	S	Opt	8	8	NO	Var 35dB	-20	8	Input Return Send: LED 20seg, Group Master: LED 40seg
Midas XL	52162	1304	40	85	S	2	8	8	NO	Var 50dB	-30	8	Input: LED 10seg, GR, Master, Matrix, Solo: LED 20seg
Harrison Alive	44000	1375	32	45	4S	NO	8	4	8	Var 54dB	-20	NO	8 LED VU meters, 16 segment
Yamaha PM3000	42500	1063	40	8	S	8	8	4	8	Var 34dB	-10-20-30-40	8	14 VU meters.
Wheatstone MTX 1080	34200	855	40	85	S&M	8	8	2	NO	Var 35dB	-20	8	19 VU meters
Hill Audio 4400	33485	698	48	16	S	8	12	8	NO	Var 40dB	-20	2	66 LED 12way. Solo: VU
Soundcraft 8000	32500	812	40	8	2S	Opt	8	Opt	Opt	Var 45dB	-20	NO	10 VU meters
Wheatstone MTX 88	30500	763	40	8	S&M	8	8	2	NO	Var 35dB	-20	NO	14 VU meters: 8GR, L, R, Mono, Solo, Send1-4, Send5-8
DDA D Series	25050	626	40	8	S	8	8	8	NO	Var 35dB	-20	NO	10 VU meters: 8 Group/Matrix, L, R. Input: 5 LED
Yamaha PM1800	23500	588	40	8	S	4	6	4	NO	Var 34dB	-20, -40	8	13 VU meters
AmeK/TAC Scorpion	20950	524	40	8	S	8	8	4	NO	Var 40dB	-20	NO	11 LED VU, 10 seg: 8 Group, L, R, PFL
DDS Series 2	20360	509	40	8	S	8	4	2	NO	Var 46dB	NO	NO	Input: 3 LEDs. Group: LED 10seg. Matrix 3/10 LED
TOA RX7 328	19842	620	32	8	2S	NO	4	4	NO	Var 30dB	-60, -40, -20	NO	14 VU meters
Soundcraft 500	15950	399	40	8	S	Opt	6	8	NO	Var 40dB	-20	NO	10 VU meters: 8 Group, L, R
Soundtracs M Series	13995	437	32	8	S	4	6	0	NO	Var 40dB	-20	NO	11 LED VU meters, 10 seg: 8 Group, L, R, Solo
DDA S Series	13500	422	32	4	S&M	4	8	0	NO	Var 35dB	-20	NO	6 VU meters: Group/Matrix, L, R. Inputs: 1 LED

Professional Touring Consoles: Features and Functions

while most have it as an option only. Other columns are self-explanatory. Optional (Opt) in any column data indicates that the manufacturer can offer that function on the listed model (the option's additional cost is not included in the given list price). Some options can drive up the price of a new console considerably.

Functions provided by every console do not appear on the charts. Phase reverse and +48 phantom power are standard on today's professional house consoles. Cue/solo and talkback are on every console, but variations exist on many makes and models.

The matrix column is a simplified figure. Many models have matrix functions that should be explained in more detail. Contact the manufacturer

or dealer for complete information.

Technical specifications (distortion, dynamic range, frequency response, crosstalk, and noise) are not included because manufacturers use different ways to measure and record their results, and there is no way at this time to verify the accuracy of the claims. In the future, non-biased standard tests will be conducted and the results reported.

Many of the manufacturers offer different configurations and options for the models shown. The matrix, metering, number of inputs and aux/effect returns, faders, other functions and price may vary. Contact the manufacturer or dealer for complete details of the configurations and options available for each console.

The second chart highlights input channel equalization and takes a detailed look at the controls, frequencies, and bandwidth of each band, showing the four standard EQ bands: High, High-Mid, Low-Mid, and Low. Each band is broken down into frequency range and control, gain of boost/cut, type of equalization (peak or shelving), bandwidth in octaves and bandwidth control. Controls are sweepable, variable, selectable, or fixed. "Sweepable" and "variable" both mean the control is continuously adjustable. "Selectable" is another name for switchable, and allows a choice of fixed positions. "Fixed" is just that—one fixed position. The High Pass/Low Cut filter is included and covers the rolloff frequency, control type, and rolloff slope.

Professional Touring Consoles: EQ at a Glance

Model	High EQ	Gain/Type	Bandwidth	High-Mid EQ	Gain/Type	Bandwidth	Low-Mid EQ
Gamble Series EX	Sweep 1k-16kHz	-15dB, peak	Var 0.10-2.0 oct.	Sweep 450Hz-7.5kHz	-15dB, peak	Var 0.10-2.0 oct.	Sweep 140Hz-2.3kHz
Harrison HM-5	Sweep 800Hz-17kHz	-18dB, select sh/pk	Var 0.33-2.0 oct.	Sweep 400Hz-8kHz	-18dB, peak	Var 0.33-2.0 oct.	Sweep 400Hz-8kHz
Harrison HM-4	Sweep 800Hz-15kHz	-18dB, select sh/pk	Fixed N/A oct.	Sweep 500Hz-10kHz	-18dB, peak	Select 0.33/2 oct.	Sweep 350Hz-7kHz
AmeK/TAC SR9000	Sweep 600Hz-20kHz	-14dB, shelf	----	Sweep 600Hz-20kHz	-14dB, peak	Var 0.50-3.5 oct.	Sweep 60Hz-1.4kHz
Midas Pro 40	Sweep 2k-20kHz	-16dB shelf	----	Sweep 500Hz-5kHz	-16dB, peak	Fixed 2.0 octave	Sweep 100Hz-1kHz
Soundcraft Series 4	Sweep 1.25-20kHz	-15dB, peak	Var 0.50-2.5 oct.	Sweep 450Hz-7.2kHz	-15dB, peak	Var 0.50-2.5 oct.	Sweep 150Hz-2.4kHz
Midas XL	Select 5, 8, 12, 18, kHz	-15dB, shelf	----	Sweep 400Hz-8kHz	-15dB, peak	Select 0.33/2 oct.	Sweep 100Hz-2kHz
Harrison Alive	Sweep 800Hz-14kHz	-10dB, select sh/pk	Select N/A oct.	Sweep 350Hz-6.5kHz	-10dB, peak	Fixed N/A oct.	NONE
Yamaha PM3000	Sweep 1.6kHz-16kHz	-15dB, shelf	----	Sweep 800Hz-8kHz	-15dB, peak	Var 0.50-3.0 oct.	Sweep 160Hz-1.6kHz
Wheatstone MTX 1080	Sweep 850Hz-10kHz	-16dB, select sh/pk	Fixed 1.0 octave	Sweep 250Hz-3.5kHz	-16dB, peak	Select .33/1.5 oct.	Sweep 125Hz-1.7kHz
Hill Audio 4400	Fixed at 12.5kHz	-12dB, shelf	----	Fixed at 4.5kHz	-12dB, peak	Fixed N/A oct.	Fixed at 500Hz
Soundcraft 8000	Sweep 1.2k-20kHz	-15dB, peak	Select .6/1.1/1.6	Sweep 8.7k-11kHz	-15dB, peak	Select .6/1.1/1.6	Sweep 70Hz-1.1kHz
Wheatstone MTX 88	Sweep 800Hz-16kHz	-16dB, peak	Fixed 1.0 octave	Sweep 400Hz-8kHz	-16dB, peak	Fixed 1.0 octave	NONE
LiA D Series	Fixed at 10kHz	-15dB, shelf	----	Sweep 600Hz-10kHz	-15dB, peak	Fixed 1.5 octave	Sweep 150Hz-2.4kHz
Yamaha PM1800	Sweep 1.6k-16kHz	-15dB, shelf	----	Sweep 800Hz-8kHz	-15dB, peak	Fixed N/A oct.	Sweep 160Hz-1.6kHz
AmeK/TAC Scorpion	Select 6kHz/12kHz	-15dB, shelf	----	Sweep 500Hz-18kHz	-15dB, peak	Fixed N/A oct.	Sweep 100Hz-5kHz
DDS Series 2	Sweep 2k-20kHz	-16dB, peak	Fixed 1.0 octave	Sweep 1kHz-10kHz	-16dB, peak	Fixed 1.0 octave	Sweep 100Hz-2kHz
TOA RX7 328	Fixed at 10kHz	15dB, shelf	----	Sweep 200Hz-5kHz	-15dB, peak	Fixed N/A oct.	NONE
Soundcraft 500	Fixed at 10kHz	-15dB, shelf	----	Sweep 600Hz-10kHz	-15dB, peak	Fixed 1.5 octave	Sweep 150Hz-2.4kHz
Soundtracs M Series	Fixed at 12kHz	15dB, shelf	----	Sweep 500Hz-10kHz	-15dB, peak	Fixed 1.5 octave	Sweep 50Hz-1kHz
DDA S Series	Fixed at 10kHz	-15dB, shelf	----	Sweep 600Hz-10kHz	-15dB, peak	Fixed 1.5 octave	Sweep 150Hz-2.4kHz

Faders	Oscillator	Lights	Inter-com	Patch-bay	Multi-pin	Frame	Dimensions (inches)	Weight (lbs)	Warranty	Model
P&G3200 con.plastic	NO	4	YES	48Opt	YES	Extruded Aluminum	62 x 39 x 14	210	Unconditional 1 yr, 5 yr service	Gamble Series EX
P&G3200 con.plastic	Var 20Hz-20kHz,PN	Opt	NO	NO	YES	Steel & Aluminum	71 x 40 x 11	400	Limited 3 month parts & labor	Harrison HM-5
P&G3200 con.plastic	Var 20Hz-20kHz	Opt	NO	NO	YES	Steel & Aluminum	75 x 35 x 21	375	Limited 3 month parts & labor	Harrison HM-4
P&G3000 con.plastic	100Hz,1kHz,10kHz	3	NO	144pt	Opt	Tubular Steel	84 x 38 x 15	380	6 month parts, 3 month labor	Amek/TAC SR9000
P&G con.plastic	Var 10Hz-20kHz	Opt	YES	Opt	Opt*	Steel	93 x 31 x 12	600	12 month parts & labor	Midas Pro 40
P&G3200 con.plastic	NO	NO	YES	288	Opt	Extruded Aluminum	78 x 45 x 13	350	12 month parts & labor	Soundcraft Series 4
P&G	Pink Noise only	Opt	YES	Opt	Opt	Steel	73 x 34 x 13	550	12 month parts & labor	Midas XL
P&G3200 con.plastic	Var 20Hz-20kHz	Opt	YES	NO	Opt	Aluminum	63 x 33 x 8	233	Limited 3 month parts & labor	Harrison Alive
Yamaha design carbon	100Hz,1kHz,10kHz,PN	4	YES	NO	NO	Aluminum	76 x 38 x 12	302	Limited 12 month parts & labor	Yamaha PM3000
Wheatstone con.plast	NO	Opt	NO	NO	Opt	Aluminum	84 x 36 x 12	275	36 month parts & labor	Wheatstone MTX 1080
Alps carbon	1kHz,10kHz	Opt	NO	NO	Opt*	Extruded Aluminum	95 x 36 x 12	N/A	3 yr parts,1yr labor/moving parts	Hill Audio 4400
Alps carbon, P&G opt	Var 45Hz-15kHz	NO	YES	NO	Opt	Extruded Aluminum	78 x 30 x 13	230	12 month parts & labor	Soundcraft 8000
Wheatstone con.plast	NO	Opt	NO	NO	Opt*	Aluminum	84 x 36 x 12	240	36 month parts & labor	Wheatstone MTX 88
Alps carbon, P&G opt.	50,100,1k,10kHz	NO	YES	NO	Opt	Steel	84 x 36 x 12	250	12 month parts, 3 months labor	DDA D Series
Yamaha design carbon	100Hz,1kHz,10kHz,PN	4	YES	NO	NO	Aluminum	72 x 34 x 12	220	Limited 12 month parts & labor	Yamaha PM1800
Alps carbon, P&G opt.	100Hz,1kHz,10kHz	3	YES	Opt	Opt	Steel	68 x 33 x 10	250	6 month parts, 3 month labor	Amek/TAC Scorpion
DDS carbon, P&G opt.	1kHz	3	NO	NO	Opt*	Steel	87 x 31 x 11	225	12 month parts & labor	DDS Series 2
Alps carbon	400Hz,1kHz,10kHz	NO	NO	NO	NO	Steel	67 x 33 x 15	303	24 month parts & labor	TOA RX7 328
Alps carbon, P&G opt.	700Hz,10kHz	NO	NO	NO	Opt	Extruded Aluminum	65 x 34 x 12	220	12 month parts & labor	Soundcraft 500
Alps carbon, P&G opt	30Hz, 1kHz	1	NO	NO	Opt	Extruded Aluminum	66 x 31 x 9	132	12 month parts & labor	Soundtracs M Series
Alps carbon, P&G opt.	1kHz	NO	NO	NO	Opt	Steel	61 x 30 x 11	200	12 month parts, 3 month labor	DDA S Series

So you own a sound company or you're an audio engineer, and you're looking for a new house mixing console that really can do large gigs and tours. Chances are business is so good that you've been turning away business and have decided to assemble an additional PA system, or your clients demand (or deserve) better sound quality and service because your current consoles are outdated, trashed, or lacking enough inputs. You've decided to get a new one, but what are your choices, and what console best suits your needs?

What do you look for?

To do medium to large venues and touring in the late '80s, you need at least 32 input channels and six or

more auxiliary/effect sends to handle the increased use of delay, reverb, compression, gates and other goodies. Past experience shows that every few years, house engineers require more input channels to keep up with ever-changing client demands. With the advent of electronic drums, sophisticated keyboards, and advanced mixing techniques, 32 inputs often may not be enough. If the headliner doesn't use all the available inputs, the opening act surely will take what's left over. The trend is toward 40 or more inputs, with eight or more auxiliary/effect sends. If cost is a factor, but expansion a certainty, consider short-loading a new console with fewer inputs. A sound company can get a larger frame size, then purchase additional

inputs at a pace that suits its pocket-book. Some manufacturers offer extender units with additional input channels. Extenders require another shipping case and must be connected to the house board.

Now available on most consoles as standard features are variable gain control, 4-band EQ, high-pass filters, complete muting and solo/cue, talk-back, phantom power, phase reverse, input pad, external rack-mounted power supply, and multi-pin options. Adjustable bandwidth on the EQ, matrix outputs, and programmable mutes are prevalent on high end consoles.

Matrix outputs are becoming more common as standard features of many consoles, which make the house console very versatile. With them, you

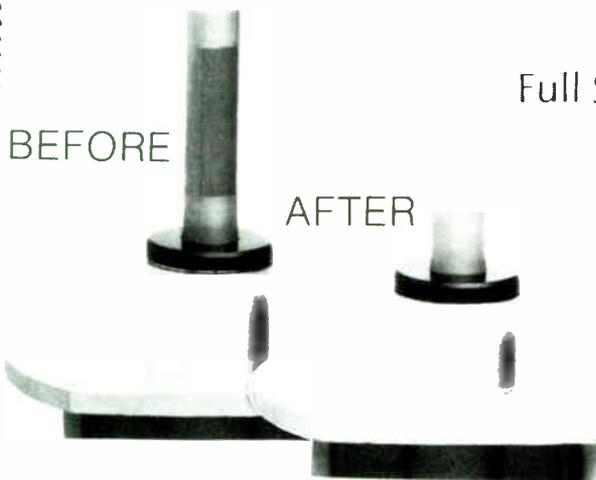
Gain/Type	Bandwidth	Low EQ	Gain/Type	Bandwidth	High-Pass Filter	Model
-15dB, peak	Var 0.10-2.0 oct.	Sweep 30-500Hz	-15dB, peak	Var 0.10-2.0 oct.	Var 15-300Hz, 24dB/oct.	Gamble Series EX
-18dB, peak	Var 0.33-2.0 oct.	Sweep 40-800Hz	-18dB, select sh/pk	Var 0.33-2.0 oct.	Var 5-400Hz, 12dB/oct.	Harrison HM-5
-18dB, peak	Select 0.33/2 oct.	Sweep 40-800Hz	-18dB, select sh/pk	Fixed N/A oct.	Var 5-400Hz, 12dB/oct.	Harrison HM-4
-14dB, peak	Var 0.50-3.5 oct.	Sweep 60-1.4kHz	-14dB, shelf	----	Var 20Hz-1kHz, 12dB/oct.	Amek/TAC SR9000
-16dB, peak	Fixed 2.0 octave	Sweep 20-200Hz	-16dB, shelf	----	Var 20-200Hz, 12dB/oct.	Midas Pro 40
-15dB, peak	Var 0.50-2.5 oct.	Sweep 30-500Hz	-15dB, peak	Var 0.50-2.5 oct.	Var 20-320Hz, 12dB/oct.	Soundcraft Series 4
-15dB, peak	Select 0.33/2 oct.	Se1 30, 50, 100, 200Hz	-15dB, shelf	----	Var 20-400Hz, 12dB/oct.	Midas XL
NONE	NONE	Sweep 30-650Hz	10dB, select sh/pk	Fixed N/A oct.	Var 25Hz-3.5kHz, 12dB/oct.	Harrison Alive
-15dB, peak	Var 0.50-3.0 oct.	Sweep 40-400Hz	-15dB, shelf	----	Var 20-400Hz, 12dB/oct.	Yamaha PM3000
-16dB, peak	Select .33/1.5 oct.	Sweep 45-600Hz	-16dB, select sh/pk	Fixed 1.0 octave	Var 10-250Hz, 12dB/oct.	Wheatstone MTX 1080
-12dB, peak	Fixed N/A oct.	Fixed at 60Hz	-12dB, shelf	----	Fixed 75Hz, 12dB/octave	Hill Audio 4400
-15dB, peak	Select .6/1.1/1.6	Sweep 20-320Hz	-15dB, peak	Select .6/1.1/1.6	Fixed 80Hz, 12dB/octave	Soundcraft 8000
NONE	NONE	Sweep 40-1kHz	-16dB, peak	Fixed 1.0 octave	Fixed 125Hz, 12dB/octave	Wheatstone MTX 88
-15dB, peak	Fixed 1.5 octave	Fixed at 100Hz	-15dB, shelf	----	Fixed 100Hz, 12dB/octave	DDA D Series
-15dB, peak	Fixed N/A oct.	Sweep 40-400Hz	-15dB, shelf	----	Var 20-400Hz, 12dB/oct.	Yamaha PM1800
15dB, peak	Fixed N/A oct.	Select 60-120Hz	-15dB, shelf	----	NONE	Amek/TAC Scorpion
-16dB, peak	Fixed 1.0 octave	Sweep 20-200Hz	-16dB, peak	Fixed 1.0 octave	Fixed 100Hz, 12dB/octave	DDS Series 2
NONE	NONE	Fixed at 100Hz	-15dB, shelf	----	Select 60Hz/120Hz, 12dB/oct	TOA RX7 328
-15dB, peak	Fixed 1.5 octave	Fixed at 60Hz	-15dB, shelf	----	Fixed 100Hz, 12dB/octave	Soundcraft 500
-15dB, peak	Fixed 1.5 octave	Fixed at 50Hz	-15dB, shelf	----	Fixed 100Hz, 12dB/octave	Soundtracs M Series
-15dB, peak	Fixed 1.5 octave	Fixed at 100Hz	-15dB, shelf	----	Fixed 100Hz, 12dB/octave	DDA S Series

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can create separate mixes for special speaker arrangements, live radio and television broadcasts, lobby, tape, etc. Matrix programs are so useful, they surely will become standard in a few years.

The important input channel EQ section should have a high-pass filter and four bands of EQ with boost/cut control, and at least two sweepable bands. The patchpoint insert should be *after* the high-pass filter in the circuit, not before. This prevents low frequencies (such as stage rumble) from entering the device (e.g., limiter) in use. High- and mid-priced consoles typically have an adjustable frequency high-pass filter and four EQ bands of sweepable frequencies, boost/cut, and bandwidth adjustment on at least the mid-range controls. Each manufacturer's EQ has its own "sound" due to circuit design and components. Console equalization is either shelving or peak/dip.

Simply put, "shelving" EQ is similar to treble and bass controls on home stereos. If the EQ has a sweepable frequency control, then the point where shelving takes place can be adjusted accordingly. "Peak/dip" EQ has a center frequency, and rolls off both sides of that frequency. The frequency can be fixed, selectable, or sweepable. When the gain is boosted, it is "peak," and when cut it is "dip." The bandwidth determines the amount of rolloff. A fixed peak/dip EQ sets the bandwidth at one setting (usually 1.5 octaves on a mixing console). If there is a select switch, several bandwidth settings are available. A sweepable bandwidth control allows the bandwidth to be adjusted continuously. Adjustable bandwidth is important because it lets the engineer control a precise portion of the audio spectrum without affecting the surrounding frequencies. Feedback occurs at one particular frequency, so the ability to cut just that small part of the sound by using a narrow bandwidth is extremely useful. A large chunk of the sound is affected by shelving, since every frequency beyond the indicated point is boost or cut the same.

"Semi parametric" means the peak/dip EQ has sweepable frequency control and boost/cut with a fixed bandwidth. With true "full parametric," the peak/dip EQ has sweepable center frequency control, boost/cut, and adjustable bandwidth. Full parametric EQ is more desirable and usually found on high-end consoles.

On the EQ chart, *all* High-Mid and Low-Mid EQ bands are peak/dip on all of the consoles. Shelving equalization becomes more prevalent on the High and Low EQ bands. Since equalization is one of the main functions of



Fred Munch Larry B. Cook

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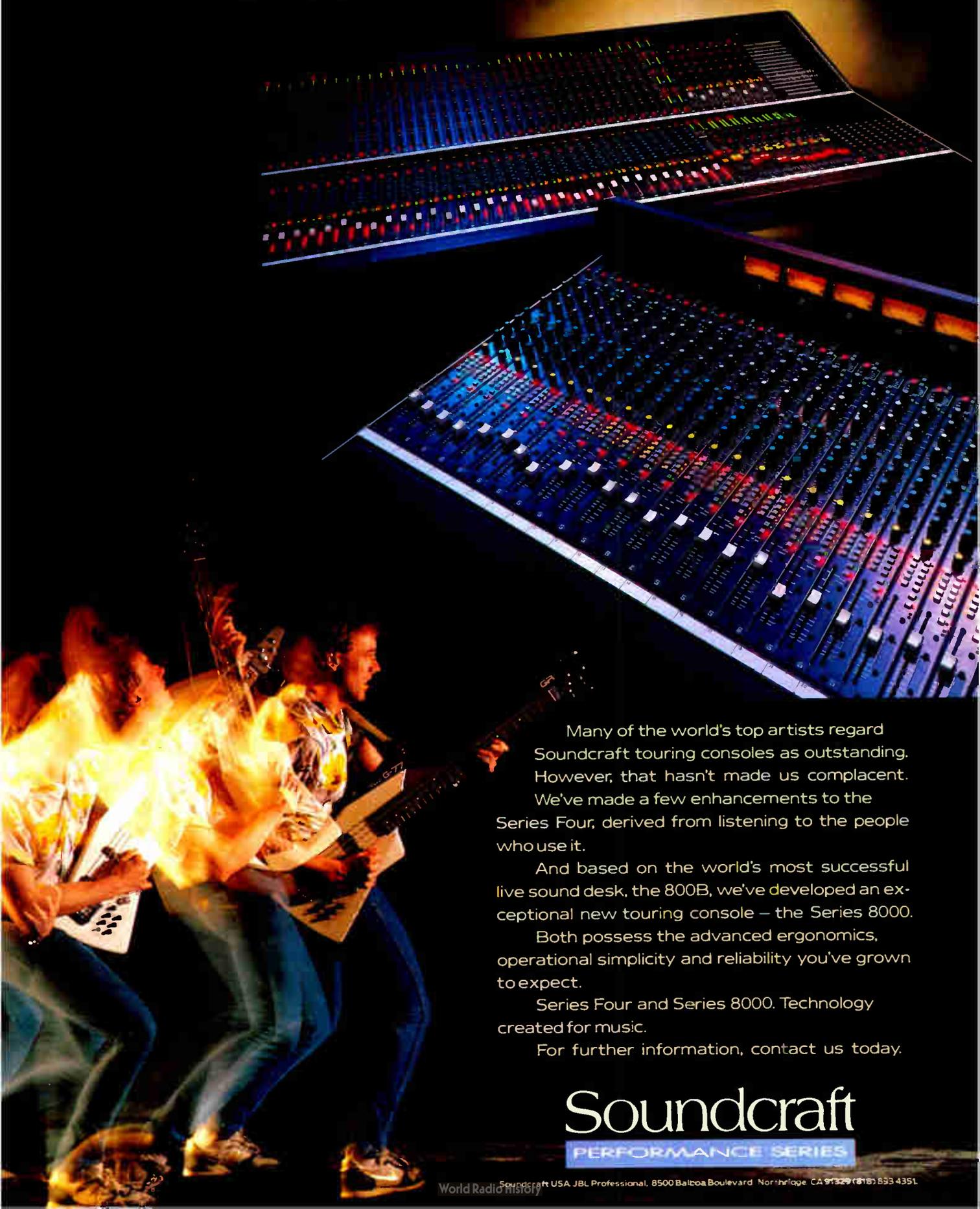
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ACADEMY

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The finest touring consoles never stand still.



Many of the world's top artists regard Soundcraft touring consoles as outstanding. However, that hasn't made us complacent. We've made a few enhancements to the Series Four, derived from listening to the people who use it.

And based on the world's most successful live sound desk, the 800B, we've developed an exceptional new touring console – the Series 8000.

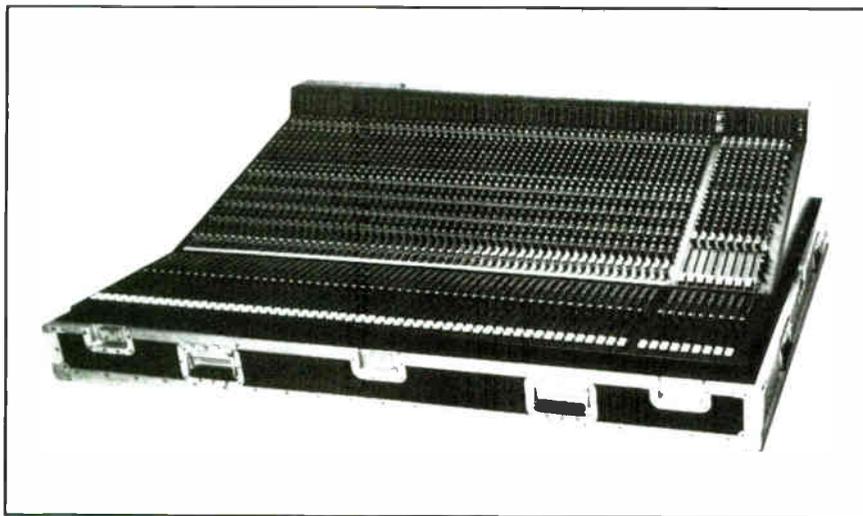
Both possess the advanced ergonomics, operational simplicity and reliability you've grown to expect.

Series Four and Series 8000. Technology created for music.

For further information, contact us today.

Soundcraft

PERFORMANCE SERIES



Gamble Series EX

a mixing console, why don't consoles generally have better EQ on the High and Low bands? The technology is here now and end users would certainly benefit from having more complete equalization. Equalization type and quality are important considerations in choosing a console.

Faders are made of conductive plastic or carbon. Conductive plastic faders have lower distortion and a higher degree of linearity over the operating range. Carbon faders cost much less and wear out sooner. Both types are available in different grades. Environmentally shielded faders also are available; when dirt or ash falls into the fader slot, it doesn't affect the slider mechanism. This is desirable on a hard-working touring console.

Many sound companies use multi-pin connectors on their snakes, consoles, and racks, because these connectors save time and help avoid mistakes. The trend is toward streamlined, efficient operation during setup and breakdown. It takes a minute to hook up one prewired connector instead of a panel of XLRs and 1/4-inch jacks,

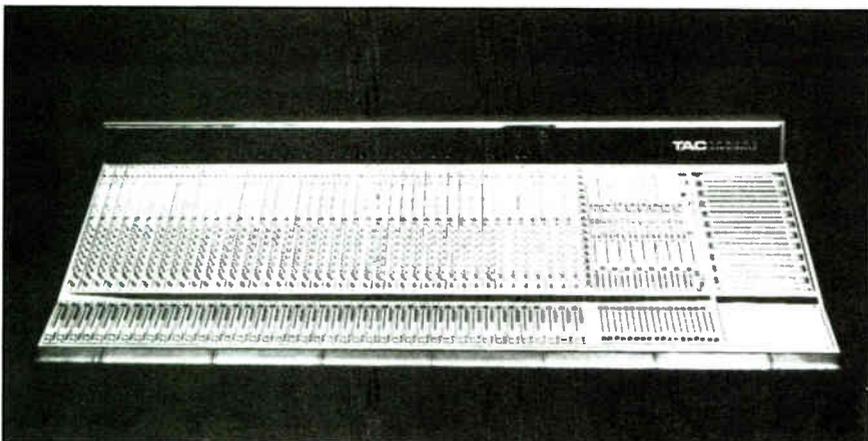
and almost anyone can do it. Think of all the times someone has screwed up the soundcheck by incorrectly connecting the console, snake, or rack! If you buy a new console, do yourself a favor—get the factory to install a standard multi-pin connector.

Physical features such as length and weight can be factors in choosing a model. A compact console is more desirable in terms of operating ease and in saving prime seats at a venue. It also needs less truck space in the pack. A large console can be difficult to operate if you can't quickly access all controls. If your console must be shipped or moved often, a lighter weight board is more economical and easier to handle.

The warranty is often overlooked when buying a console. It is not uncommon to hear about someone who bought a new board only to find that it had major problems. Imagine your horror if your new console dies at (or right before) the gig, or develops an incredible buzz that no one can fix! Make sure the manufacturer stands

—CONTINUED ON PAGE 45

TAC SR9000



PCM 70 parameter settings.
Program Row 3
Concert Hall

REVERB
DESIGN

CONTROLS

MIX 100 W WET

DIFFUSION 60

ATTACK 15

FX ADJ + 6 DB

DEFINITION 40

SOFT KNOB

REFLECTION
LEVELS

SIZE 298 M

LVL 15%

GATE OFF

L1 RFL OFF

PDELAY 24 MS

L2 RFL OFF

HC 902 KHZ

R1 RFL OFF

DECR OPT ON

R2 RFL OFF

CHORUSING 5%

REFLECTION
DELAY TIMES

REVERB
TIMES

DLT 15%

RT LOW 20 S

L1 RFL 96 MS

RT MID 11 S

L2 RFL 300 MS

DOVER 350 MZ

R1 RFL 64 MS

RT HC 627 KHZ

R2 RFL 300 MS

"SPACE SHIFTER" Dynamic MIDI patches
for use with the YAMAHA DX7

MIDI CONTROLLER	PARAMETER	SCALING	LIMIT VALUES
DATA SLIDER	10 RT Low	+13	2.8/52
DATA SLIDER	11 RT Mid	+22	11/26
MOD WHEEL	12 Crossover	+17	350 Hz/ 4.85 kHz
MOD WHEEL	21 Attack	+81	15/ 95
FOOT PEDAL	08 Chorusng	+17	51/ 68
LAST VELOCITY	31 Lt V1 Reflection Level	+33	Off/ -8.5
LAST VELOCITY	33 Rt V3 Reflection Level	+30	Off/ -6.5
MIDI CLOCK	03 Size	-33	298 @ 100 BPM
MIDI CLOCK	40 Delay Master	-110	0 @ 100 BPM

"Space Shifter" was written by Lexicon Applications Engineer Will Eggleston

In sound reinforcement, there are no insignificant details.

An infinite capacity for taking pains

It's an apt description of genius, especially in the arena of sound reinforcement. Each job comes with its own endless list of minor obstacles, all ready to become major headaches at a moment's notice. That would be reason enough for us to design every section of D Series consoles for maximum performance; even if we weren't committed to finding out just how good sound reinforcement consoles can be.

Technical advances are raising audience expectations

CDs, digital recording and related developments have created higher fidelity in the home - and higher standards for live sound reinforcement. Still, some consider our approach to console engineering extremist. They think it unnecessary to reduce crosstalk between groups to a level typically 17 dB below conventional mixing consoles. Or to utilize a military multiple grounding system that virtually eliminates hum generation. To offer transformer balanced mic inputs and line outputs as options, or use rigid steel center trusses and



DETAIL: Auxiliary modules have three band EQ with variable Mid frequency for more usable, functional outputs.

DETAIL: Standard inputs have LED level meters next to input faders for accurate, timely signal monitoring.

DETAIL: All input modules give positive LED visual indication of EQ in/out status.

flexible "mother loom" wiring harnesses to minimize mechanical stress on circuit cards.

We consider all these steps essential, because exceptional performance is the most reliable way to deliver accurate sound under less than ideal conditions. We share that attitude with Klark-Teknik, our parent company.

Options for job-specific configurations

Your live sound console must have the flexibility to do the job your way - and the versatility to cope with unexpected difficulties. The informed, insightful design of D Series consoles gives you a selection of eleven different module types, each optimized for a different job. Configure 36-, 48- or 56-space frames with any combination of Standard, Monitor, Theater or Stereo inputs, Recording, PA or Matrix outputs and Stereo, Monitoring or Auxiliary Master modules. All achieve audio performance that is equal to the most demanding applications, including live-to-digital recordings. D Series consoles are presently used by major British sound companies and studios for reinforcement and remote recording applications.

The extensive features and functions of D Series modules and consoles are detailed in an eight page brochure. To get one, send your business card or letterhead to:

DDA D SERIES

Klark-Teknik Electronics Inc., 30B Banfi Plaza North Farmingdale, NY 11735 (516) 249-3660

Unit #1, Inwood Business Pk., Whitton Rd. Hounslow, Middlesex, UK TW3 2EB



—FROM PAGE 42, CONSOLES

behind its product. Sometimes your dealer can give a better warranty than the manufacturer.

Don't underestimate the power of owning a good mixing console. House mixers for bands often have much to say about which equipment and sound companies should be used for certain events. If the mixer has a choice, he usually asks for a top-of-the-line console, so the sound company with a good modern console has a better chance of getting the gig.

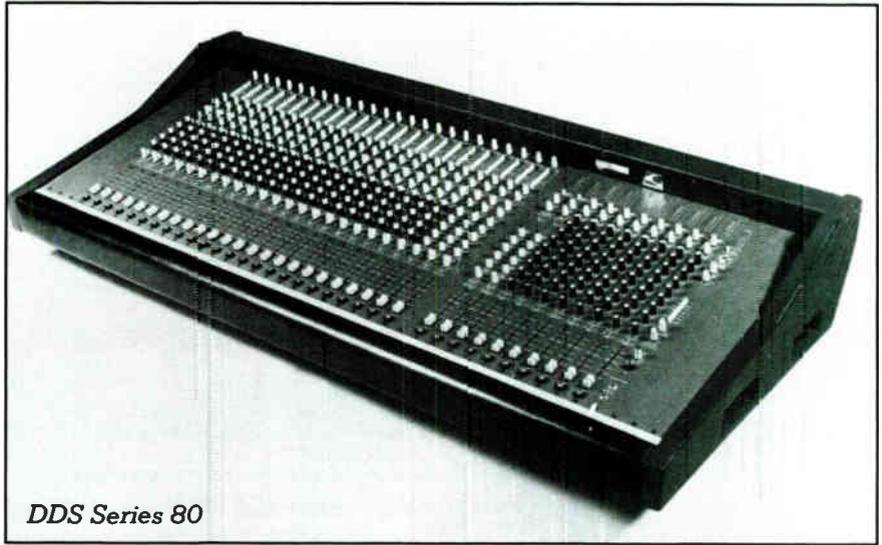
If you're leaning toward a certain model and not sure that it's what you want, rent that console model for a short time to get a feel for the layout, EQ, and overall sound. Spending some money now can save a lot of headaches later. If a company knows you are seriously considering purchasing a console, they will usually help you find a rental. Use a PA and effects rack that you know, so you can judge the demo console fairly.

Of the 21 house consoles listed here, five are offered for the first time: the Amek/TAC SR9000, Midas XL, Hill Audio 4400, Soundcraft 8000, and Yamaha PM1800. The Gamble Series EX debuted in late '86, and the Yamaha PM3000 in early '86. DDA (now distributed by Klark-Teknik) came out with the D and S Series in 1985, as did the Soundtracs M Series and the Amek/TAC Scorpion. Wheatstone's MTX88 has been out for two years, while their MTX 1080 debuted last fall. The remaining models have been on the market for several years, with few changes except for the Soundcraft 500 which recently expanded to 40 channels.

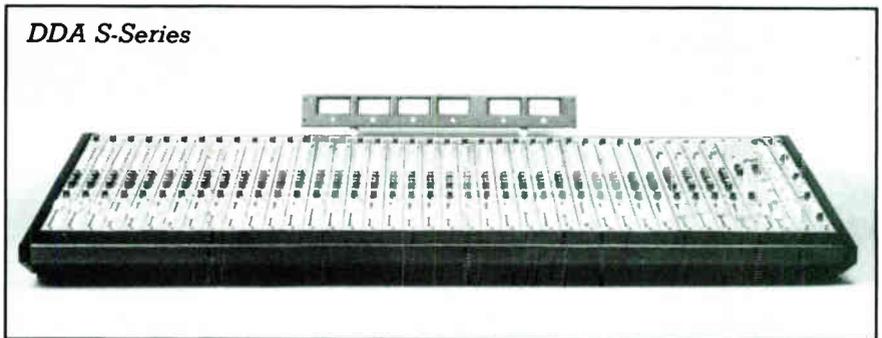
The Gamble Series EX, Harrison HM-5, HM-4 and Alive, Wheatstone (AudioArts) MTX 1080 and MTX 88, and the DDS S Series are made in the USA. Midas Pro 40 and XL, Amek/TAC SR9000 and Scorpion, Soundcraft Series 4, 8000, and 500, Hill Audio 4400, DDA D and S Series and Soundtracs M Series are produced in the United Kingdom. The Yamaha PM3000 and PM1800, and the Toa RX7 328 are made in Japan.

As you can see by the charts, prices range from the DDA S Series at \$13,500 to the Gamble Series EX at a cool \$100,000. Quality, performance and options range as widely. Check out all the consoles and consider every possible factor before making any decision on what to buy, rent, or use. The choice is yours. ■

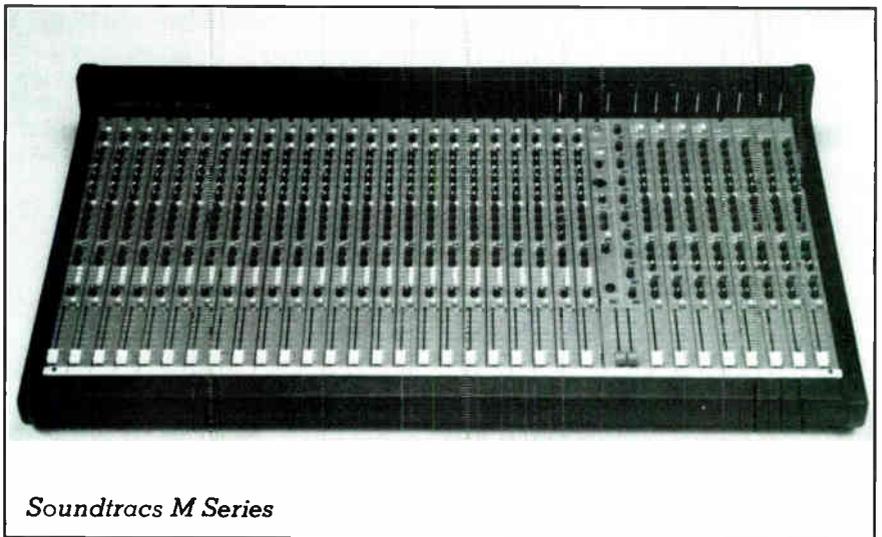
Author Mark Herman co-owns Hi-Tech Audio, a Northern California-based sound reinforcement company specializing in console rentals.



DDS Series 80



DDA S-Series



Soundtracs M Series

Editor's note: As this issue went to press, we received information on the Sigma series consoles from Allen & Heath Brenell. The new series is available in mainframes ranging from 32 to 44 inputs with optional expanders allowing larger sizes. Standard features include 4-band sweepable EQ, six aux sends, PFL, AFL, solo, stereo and mono outputs, tubular steel frame, Alps faders and microprocessor-controlled muting. A 32 x 8 version is \$28,000; a 52 x 8 model is \$42,000. Options include VCAs (DC group sys-

tem) and P&G faders; stereo input modules will be available later this year.

Another late-breaking development is the formation of C.A.D.D., a new manufacturing company headed by Audio Analysts partner Pierre Pare in Brossard, Quebec. C.A.D.D. is now in production on three prototypes of their SM-1H house console, which will be road-tested this fall before the official unveiling at the AES Convention in New York City. Initial console deliveries are slated for late-1987.

—G.P.

WOMEN in SOUND REINFORCEMENT

Four Success Stories

by George Petersen

While careers in teaching and nursing have traditionally been popular choices of women, sound reinforcement engineering hardly comes to mind as a vocation recommended to girls by their high school counselors. In fact, the number of successful women working in this area could probably be counted on two hands, with a few digits remaining. Women are far more commonly seen in the film, video, broadcast and recording studio fields (especially in editing and production) than their sisters in sound reinforcement. And the reasons for this underrepresentation are many, ranging from prejudices and attitudes about women keeping up with strenuous touring schedules and the physical rigors of the road, to a lack of role models for other women to emulate.

Though there is still scant recognition that women can be valuable members of the audio industry, a significant amount of progress has occurred in

this area over the past half-decade, as increasing numbers of qualified female engineers enter the workplace. Recently, we talked to four women who chose sound reinforcement as a vocation. Not surprisingly we discovered four very different viewpoints about surviving and prospering in this male-oriented profession.

Rebecca Fields

They say that showbiz runs in the blood, which may be true for Rebecca Fields: her father played trumpet with Artie Shaw, while her sister (Joanna Stingray) has been involved in bringing Russian rock music to the West (see the Feb. 1987 *Mix*). Fields, whose credits include mixing tours for The Chambers Brothers and Glen Campbell, is probably best known for her engineering work with Rita Coolidge. Over the past four years, that job has literally taken her around the world, in venues of every size, shape and imaginable description, ranging from Farm Aid to London's Royal Albert Hall, from Carribean cruise ship performances to extensive Asian tours

Rebecca Fields has mixed at venues ranging from Farm Aid to London's Royal Albert Hall.



PHOTO: GEORGE PETERSEN

Boden Sandstrom, the owner of City Sound, has toured with Odetta, Pete Seeger, Lily Tomlin and Cris Williamson.



PHOTO: OLIVE ROSEN

(including the mandatory police board auditions in Jakarta) and everything in between. When not on the road with Rita, Fields does freelance work for A-1 Audio in Hollywood.

How did you get started in sound reinforcement?

I was majoring in music at the University of Alabama and performing with a Top-40 band. I used to help the guys set up all the gear, so I had some understanding of how the stuff worked. When I decided I wasn't going to make it as a singer, I started helping other bands with their sound and getting paid for it. I was making more money doing that than singing, so I stuck with it.

I left school to go on the road with a band as a roadie. First they taught me to do lights and later I started mixing monitors. I moved back to Los Angeles and wanted to do lighting, because it seemed to be more acceptable for a woman to do lights; I hadn't seen any women doing sound. In L.A., I was offered a job doing lights and sound at the Troubador and I started working at the club. The next thing I knew, a bunch of the bands wanted to hire me to do their sound at other clubs, and eventually I stopped doing lighting. I think doing sound is more stressful: nobody ever yells at the light man.

I worked at almost every club in Los Angeles. At one point, I was working three different nightclubs at once, and I spent about three years working seven nights a week in the clubs. I worked at a place in Hollywood called The Central. Rita's backup band played there and at some of the other clubs I worked, and Rita came to the shows once in a while and got to know me. They felt that if I could make them sound good in a small club with a terrible PA, then I could do a great job in a real place with a good sound

system, so they asked me to go on the road with them.

Have you experienced any problems as a woman on the road?

In the beginning, it was rough. My first year with Rita, we did a tour of clubs and small theaters in America, and for some reason, these house men resented the fact that I was there. I was really intimidated by these guys and I didn't know how to stand up to them. They gave me a hard time—it was as if they were trying to test me all the time. After a soundcheck I would sometimes find that the guy had changed the limiter on the house to see if I could figure it out. I went through a lot of that.

Another thing I got was the "Oh, you're somebody's girlfriend in the band" attitude, where they thought the only reason I was out there was because I was somebody's girlfriend. They'd want to set everything up for me and only have me move the faders during the set. It was ridiculous.

What advice would you offer women interested in sound reinforcement?

You have to be strong—you can't be sensitive. The worst thing you can do is cry in front of somebody. That's sudden death: it makes everybody else uncomfortable. It's too bad that you can't be yourself. Maybe things will change and it won't be as though everyone expects you to be like a sound man. You're a sound woman and you have to be tough, and not be intimidated by all the other men out there.

You definitely have to be confident, because there are so many people

who would love to take your job and will do it for half of what you're getting paid. The competition is rough and if you're not confident, you don't stand a chance.

Most of what I learned was through experience, actually doing sound, teaching myself. Working in the clubs was a great background, with three or four different bands every night. I also went to Sound Master [Recording Engineer School, North Hollywood, CA] for a while, taking basic engineering and theory while I was working the clubs. I also took theater arts classes at L.A. City College and basic electronics at UCLA at night. It's helpful to get that background, because while you're growing up in school all the girls are taking homemaking, while all the guys are taking shop. You grow up being a step behind the guys.

One of the good things about working at A-1 Audio is I get to fix cables, amplifiers, mixers—I have a better understanding of how things work. When I go out on shows with A-1, it'll often be just me and one guy. We'll load the truck, drive it over, set up the gear, tear it down and drive back. I've driven trucks all over the country and worked crew on many gigs. I don't mind doing it: I actually like the physical work.

What would you like to be doing five or ten years from now?

Hopefully I'll be doing somebody like Journey or Bryan Adams. I love being on the road and traveling. I'm very adept at living out of a suitcase; I love being in hotels. I'm really spoiled: I don't cook, I don't like cleaning up

after myself, and you have maid service being on the road.

I've been with Rita for years and it's been great, but you always want to do something else after a while. I like doing arenas and I'd like to do a rock and roll band that does bigger venues. One of the things that holds me back is the fact that I'm a woman. More often than not, someone will refer me for a gig—maybe they don't give my full name or something—and when the road manager calls and finds out I'm a girl, then all of a sudden they've changed their mind and end up getting someone else. It's not usually prejudice; sometimes they have good reasons: you can't expect to live on a bus with 12 guys for six months. With some bands, like Rita's or Glen's, it works out fine. You may have your own room, or spend a week or two on a bus, so it's no problem. But with a lot of the big acts, where it's night after night with not much sleep in between, they don't think a girl can handle it, but you don't know until you try it. I'm hoping that eventually it won't make any difference and going on the road with a big rock and roll band won't be a big thing.

Things are changing. I've been doing sound for Rita for a while, and people are starting to recognize me because of touring so much. And since I'm working with A-1 now, more people are familiar with my name and I can leave an *official* business card, which is nice, so they don't think I'm just somebody's girlfriend.

Boden Sandstrom

A former librarian turned entrepreneur, Boden Sandstrom operates Washington, DC-based City Sound (formerly Woman Sound), handling events ranging from small embassy parties to large rallies, such as the National Gay March on Washington (over 200,000 attended that demonstration/concert). While specializing in acoustic and folk music, Sandstrom has also mixed concerts for Max Roach, Laurie Anderson, and The Police (among many others), and teaches audio courses at American University. A steady stream of local festival and concert work, as well as providing sound for civic events, prompted Sandstrom to change the company's name to City Sound last year.

How did you get started in sound reinforcement?

I'm a musician, a classically trained French horn player. I really didn't know what to do with music, and became a librarian. I really missed being involved with music and was trying to decide what to do when I attended

my first women's music concert—it was with Cris Williamson, Meg Christian and Casse Culver. I saw a woman mixing with a little high-impedance system, and thought I would enjoy doing that, so I talked to her and she said Casse Culver needed an engineer. Casse had a small system and taught me how to use it for her sound. Other people asked me to do their sound and I started renting equipment.

I enjoyed it tremendously and within a year or so I decided to start a business. In that period of time, 1975, there was a lot of support and interest in women starting businesses, and I might not have gotten the idea in an earlier timeframe. I actually started Woman Sound in the partnership of Casse Culver: eventually she dropped out and it became a sole proprietorship; later I expanded with stockholders as a corporation. But my main interest has always been as a mix engineer, doing it as an art that I equate with being a conductor.

Did you have any background in audio or electronics?

No, I was a strong science and math person in school and had that aptitude, but all the information I needed to know about equipment and how it interfaces came from asking questions to other engineers. I would also rent different systems when I was hired, so I could check them out. A lot of the guys who rented to me were really helpful, answering all my questions and helping me troubleshoot over the phone. By then, I was teaching a class on how to do sound, because I realized that since it took me so long to get the information, it would be a good thing to teach. I offered to teach that at

American University, because they didn't have that in their program. They gave me a Master's degree in exchange for teaching three years part-time. I also picked up some electronics courses at the school, as well as the Synergetic Audio Concepts [Syn Aud Con] courses and some recording studio classes. I got information in bits and pieces as I went along.

Have you experienced any problems as a woman on the road?

I've toured with Casse Culver, Cris Williamson, and Lily Tomlin, and I've never encountered any problems. Actually it was the other way around in a certain sense: in most of the union halls I went to, where you might think there would be a problem, the guys were pretty supportive and interested. It was the reverse of what you might expect. It's a different situation that probably makes their day more interesting: how many women sound engineers come through town everyday?

Do you have any advice to offer other women in sound reinforcement?

It's still very difficult and I'm distressed by the small number of women that are actually doing sound reinforcement. I've been doing this for 12 years and there are hardly any women engineers who have stuck with it. My advice is to be tenacious and aggressive about it: keep plugging away. Part of the discouragement is because the knowledge is very hard to get and you need hands-on experience to get the knowledge. It's a contradictory situation, because you must have the knowledge before you can get that experience.

Sound reinforcement is a compli-

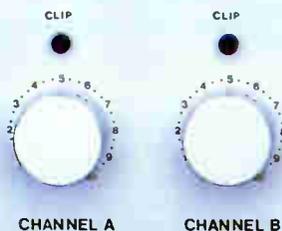
“If sound reinforcement is something you really want to do, and you love doing it, then you should go for it.”

—LORI BOLENDER



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World Radio History



cated field, involving so many different areas—acoustics, electronics, music—and generally speaking you must have enough muscles to throw at least some equipment around, and also be a mixing artist. It's difficult and takes a lot of perseverance, which might be the explanation of why few women are in it.

There may also be a lack of role models for other women to look up to.

That really is true, because I really would have wanted to be a conductor if I had a role model as a woman conductor. It never occurred to me to be a conductor, yet some of the people I've

learned the most from in life have been male conductors. It is hard to conceive of doing something if you don't know it's possible to do it.

Lori Bolender

Working with Pro Media in San Francisco for the past five years has brought a wide variety of assignments to Lori Bolender. These have included mixing pops and outdoor classical concert series, the Palo Alto Jazz Festival and working with the La Scala Opera at last year's World's Fair in Vancouver. Industrial shows are another part of the usual workload at Pro Media, and at press time, Bolender

was about to go on the road for a large trade show featuring a performance by the Pointer Sisters.

How did you get started in sound reinforcement?

I got involved through my guitar teacher, who took me to his friend's studio. I wasn't a great guitar player, but I was really interested in recording and sound gear. I became friends with the guy who owned the studio and he told me I should go to college and get my education as a way to break into the business. I went and got my B.A. in Broadcast Communication Arts from San Francisco State. The real world was a lot different once I graduated, but it was a good foundation, and along the way you pick up what you can in terms of experience: doing on-campus shows, projects and that kind of thing.

I worked for a TV station for a while and did the club circuit for a while. Once I got involved in live sound, I liked the spontaneity of it and hooked up with Pro Media here about five years ago. I've learned a lot in that time: it's a good company with a commitment to state of the art.

Have you experienced any problems as a woman on the road?

Not really. Most people give you the benefit of the doubt if you prove you know what you're doing. Some of the older men may have a macho attitude about a woman being in sound, but I haven't really had problems with that, and I've traveled quite a bit and have worked with crews across the country. Most of the time the crews are great; I've made a lot of friends in my travels.

Do you have any particular goals or aspirations for your career?

One nice thing about Pro Media is there's quite a variety of mixing jobs, which is great; on the other hand, you aren't doing the same thing over and over with an act, where you could really get fancy with effects cues. Working with one particular act is something I'd like to do at some point, being able to customize an ideal system for one group, travel with that, and really refine it.

What advice do you offer to women interested in sound reinforcement?

If this is something you really want to do, and you love doing it, then you should go for it. There aren't many of us out there and it's always a pleasure to meet and work with other women in the field. Generally, people get excited about the idea of women in sound reinforcement. There's an element of

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parametric: or more usually 'semi-parametric equalisers are almost universally used on console input channels. Normally comprising four filters, two (or sometimes four) of the filters can be 'swept' up or down the audio band to centre on the exact frequency needing attention. Proven to work very well, semi-parametric eq's have two major disadvantages:

1. A tendency for audible phase shift 'ringing'

2. A limited ability to control the entire audio band at one time

For example: having used the 'high mid' to suppress the 'edge' on a singer's voice, there is no facility left to boost the critical 'presence' frequencies that lie either side of the unwanted frequencies that have just been cut.

graphic: normally used for system and room equalisation, graphic equalisers use multiple, fixed frequency, fixed bandwidth filters, to generate gentle, essentially phase-free control over the entire audio band.

The graphic principle has one major disadvantage:

1. A limited ability to control narrow band problems.

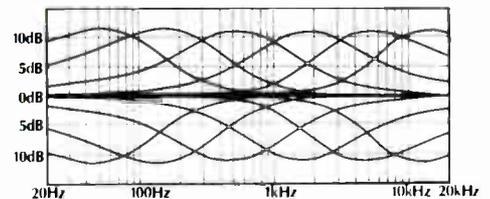
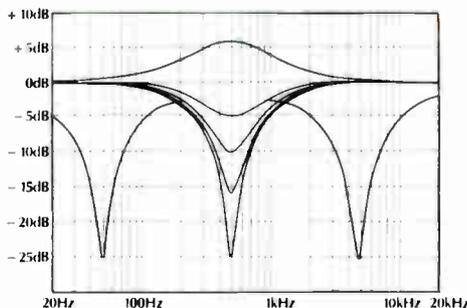
For example: although frequencies in the 'presence' band can be easily and cleanly boosted, that annoying 'edge' to the singer's voice gets boosted as well.

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surprise, but if this is something you really want to do, then by all means go for it.

Cecilia Kelly

The co-owner of Tree Top Sound & Lighting (Portsmouth, Virginia), Cecilia Kelly learned monitor mixing the hard way, when the engineer for a Kool & The Gang concert didn't show up and she was the only person available to do it. However since that first difficult encounter, she's refined her engineering chops considerably and has since toured with a distinguished list of top names including Kenny Loggins, Lou Rawls, Ronnie Milsap, and Merle Haggard, as well as working at Farm Aid and the White House.

How did you get started in sound reinforcement?

Asa Kelly and I formed the company back in 1974 and we have built it up together. Asa was a Clair engineer and he told me the only way I could be with him would be if I got a hammer, so I got a 13-ounce hammer at first, progressed to a 16-ounce hammer, and then an airgun. That's how we built the company. We hang systems now, handle three festivals in the area, and do lots of touring.

I do monitors and staging, and am in charge of all the monitor systems. I'm not into doing mains—you either have a preference for one or the other, almost like an instinct. I've always done monitors and I love it. The first show I ever did was Kool & The Gang and Graham Central Station in Newark, New Jersey. The monitor engineer had missed his plane, so Asa said, "You're mixing monitors!" which still didn't tell me what I was doing. I had feedback all night long, and they stopped the show three times to tell me I didn't know what I was doing. It was a dangerous way to learn. From then on, Asa started teaching me: I caught on fast and we've been growing ever since. I wouldn't trade being out on the road for anything. I love it.

When you get on the road, you learn to do just about everything, which is exciting—you learn to weld, do fiberglass, be a mechanic, everything. The only thing I can't do is cook. I can't do that yet, the Holiday Inns are great."

Have you experienced any problems as a woman on the road?

In years past, there have been problems. I've had union crewmen walk out for not wanting to work with a woman, but I told them I'd rather have them leave if they weren't going to work with me. If they thought they could leave and still get paid, I'd have the head steward take them off the



Cecilia Kelly of Tree Top Sound

worklist, and anyone else who didn't want to work should also leave. There have been some problems, but going back to the same buildings over the years, they look forward to seeing you. You are unusual in a way, and they remember you better than the men, which is an advantage, because you build bonds and get better cooperation over the years.

Did you have any problems getting used to touring?

No. I was an Army brat, and living out of a suitcase was nothing new—in fact, it was something I was rather versed in. I've always been an organizer, and drifting towards stage managing proved that. I've always loved organizing stages, down to the inch, and one of the things acts remember me for is the cleanliness of my stages. You don't like your house messy and they don't like their stages messy. Picking up the duct tape where you ripped a cable open, dressing up the patch cables, cleaning labels off, taking part of your dinner time to check the stage again—I've always been a fanatic about that and it's paid off. I think that women venture towards the clean stages more than men—it seems to be of a matter of pride."

What advice would you offer to other women in sound reinforcement?

When I walk into a building, I call men "gentlemen" and say "yes sir" or "yes ma'am," "please" and "thank you." Exaggerate the politeness, but don't put sweetness in there: you can be

businesslike, but also be a woman at the same time. I've taught my crews to be polite, which is really appreciated, because stagehands don't get "yes sir," "thank you" or any of that.

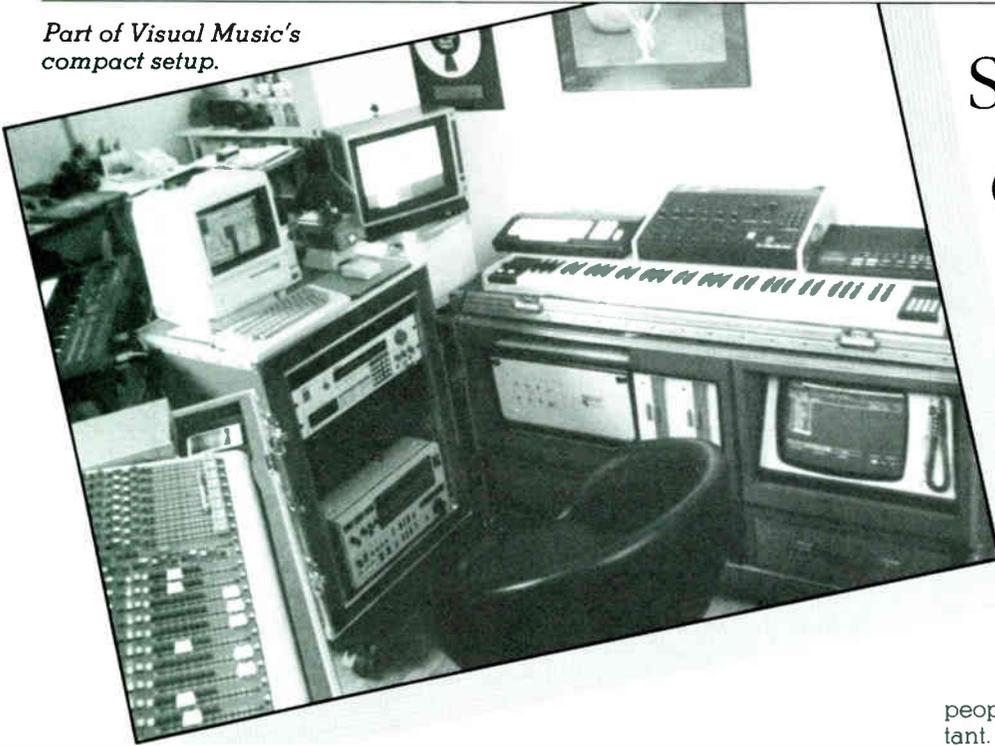
I'm known for my decency and politeness. When an opening act comes on stage and asks how long they have for a soundcheck, I say they have all day. There's a kindness women can give that comes easier to us, and we're allowed to be that way, which is an advantage we have. But I'd advise women not to be syrupy sweet, and don't call men "honey": you don't like being called "honey," so don't call them "honey." It's a mistake some women make.

Cathy Bush, who used to do sound for Roy Clark, and I share the opinion that politeness is very important and that it is missed. Cathy and I have a strong friendship and every now and then we bump into each other and compare notes. It's nice to have someone to share it with, because one of the hardest things to realize is that you cannot and never will be "one of the guys" when you're out there. If we revert back to being a person—a business person, but a lady—the crew members will open doors for you when you go to the restaurant, but will still expect you to lift your piece of the cabinet. It's a very nice, happy medium. And it's very rewarding. ■

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

VISUAL MUSIC'S MOBILE VISIONS

Part of Visual Music's
compact setup.



Studio on Casters Always Ready to Move

by Dan Daley

"It's sort of an inverted mobile recording arrangement," says Jay Henry as he surveys the array of technology strewn about his apartment on Manhattan's east side.

Sitting in newly arrived custom flight cases are a Trident 40-input console, a "hot-rodded" Series II Fairlight CMI, a Macintosh 512K computer and a couple of racks of power amps, signal processors and keyboards. No tape decks here; everything is digitally dedicated.

All this musical firepower sits ready to move when the call comes from a film, video or music client who needs a highly sophisticated recording setup, and Henry and his partner Gene Perla are ready to move with it. Visual Music has gone a step beyond traditional mobile recording by utilizing tapeless recording formats and the increasingly smaller, ever more powerful equipment that is evolving from digital technology. Instead of outfitting

a tractor trailer, their equipment is configured for loading onto any form of transport.

Henry, a freelance engineer and drummer, and Perla, a record producer and bassist, recalled an epiphanic moment at last November's AES show that led to Visual Music's conception: "Gene and I passed each other in the hallway during the show," remembers Henry. "He was on his way to the Synclavier demonstration and I was heading to the Fairlight demo and we both had our minds completely blown by this technology. These sorts of super-synths had always seemed like expensive toys to me up until then, but by that point the tapeless studio approach was finally making sense to me."

By this time, computers and sampling keyboards were staples of the audio/visual world. "A lot of people have Macs and Fairlights these days," says Perla, "and plenty more will, as this sort of technology comes down in price. But by making it as mobile as we have, there are a lot of places we can go—and go quickly—that a lot of

people can't. The mobility is important. As an example, directors go out on a location shoot somewhere and then parts of the crew have to go to other locations to do their audio lay-ins. A lot of the sound effects, music and dialog is laid in months after they've done the original shooting, whereas with a system like ours—which is not that expensive in terms of film production costs—we could go right on location with the film or video crew and provide audio effects and music right there. It would give the director a feel for what the finished product will sound like." (Visual Music quotes rates of \$750 per day for straight audio work on location; \$1,200 per day with video. All rates include an operator.)

Jay Henry amplifies the point: "We can provide source material for a director. Another example is a person who really enjoys working in his house in Connecticut or some other suburban location and hates coming into New York City to work; someone who can't deal with scheduling. We can provide a person like that with a system that incorporates digital audio and world-class sound right in his living room."

Still, given the fact that the two pooled personal resources and borrowed money to the tune of over \$100,000 to finance their venture, Perla's earlier comment about the proliferation of super-synths and computers looms large in terms of the venture's commercial viability.

"What made the mobile digital approach [economically] viable—and the risks acceptable—to us, was the fact that we felt that there was a great deal of untapped market potential in the video post-production area," Henry explains. "We did a great deal of research—talking to production houses, video producers, editors and asking them how would you like a system that would allow you to delay those decisions you have to make about music and sound editing until the last possible minute? Would that kind of a system make sense to you? Would a system where you did not have to go three or four generations down on your audio information on videotape make sense to you? And it's a totally digital system. A lot of people have these capabilities—but not on wheels."

Visual Music had a core of equipment to start with: Jay Henry had his Macintosh computer and an Oberheim drum machine; a few other high-tech odds and ends were available to

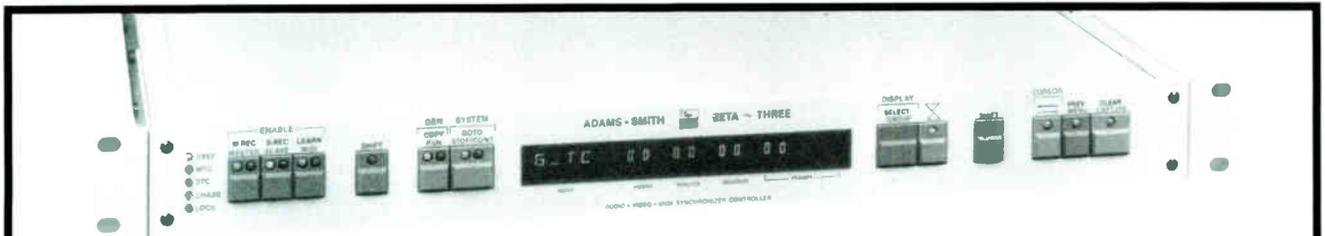
the two partners. But among a growing and technologically intimidating plethora of new digital recording equipment, choices were constrained to some degree by size and weight. Visual Music is designed to be the musical equivalent of the armed forces' Rapid Deployment Force—ready to move at a moment's notice (though hopefully to operate in less hostile environments than its military counterpart).

"My criterion in choosing equipment was for everything to support a portable system," says Henry. "Everything was designed for maximum punch per inch. For example, I limited all the outboard gear to single rack-space items. There's no (Yamaha) REV7; as wonderful as it was for its time, it's a two-rack-space device and very inefficient space-wise compared to the Yamaha's SPX90 digital reverb, which gives me more varied options. Another outboard criterion was to make sure that all the outboard processors were MIDI-controllable. And I also wanted to control all the signal processors on one MIDI channel. To accomplish that, I needed devices by different manufacturers. That way, messages sent to one brand of processor would be electronically ignored by devices made by other manufac-

turers. That is, when I send a Yamaha message to the SPX90, for example, the Roland DEP-5 and the Lexicon PCM70 will ignore that information.

"I also wanted multi-effect processors, like the SPX90 and the Roland DEP-5, which is a discrete stereo digital reverb and effects box. It's become my favorite because you can do chorused non-linear reverbs with it."

Visual Music's choice of super synths came down to the Fairlight CMI over the Synclavier because of cost and portability factors. Their Fairlight is a hot-rodded Series II version with eight internal recording tracks. Jay Henry devised his own interface to use his Macintosh to drive the voice-cards in the Fairlight. "That frees up the 6800-type microprocessor in the Fairlight and I can use it to do other things, like waveform drawing in the Fairlight while the Mac is running the Fairlight voicecards. Normally, if you're running the Fairlight with the Page R sequencer and you try to go to another page in the Fairlight, the sequencer stops functioning. I thought that was unacceptable, so I devised this system. We're only limited by our number of inputs, which is 50 at any one time through the Trident console. But really, our track capacity is unlimited because with the Mac we can



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dump to disk at any time and run it simultaneously with the Fairlight with time code."

If the Fairlight is the heart of the operation, the Mac is the brain. The information sequence is thus: time code information is converted into MIDI info, which is then fed into the Mac and the Mac sequences all outboard and keyboard devices through MIDI channels.

Perla and Henry have chosen Personal Performer as their software package. The package receives the song information worked up in the Fairlight and then allows further, more sophisticated editing. Performer, with its 200-plus real-time tracking capability (depending upon recording

modes), functions as Visual Music's penultimate multi-track recorder (before finally dumping to analog or digital 2-track tape), storing tracks as the Fairlight crunches new musical ideas. "In all the time I have worked with Performer," says Henry, "I haven't had the slightest bit of trouble with it." Perla echoes the sentiment: "Within an hour-and-a-half, I was an expert at working it. Performer is so smooth that you forget you're working with a computer."

"Performer has much better resolution," adds Henry. "The Fairlight has only eight points of velocity resolution; in the Macintosh with Performer you have 128. Performer lets you shape things much more realistically, more humanly. It also frees up the Fairlight

for sampling and other things."

Perla and Henry are using their Mac configured with two 400K disks, and they have plans to upgrade to megabyte status in the near future.

Aside from the technology and mobility, Henry and Perla offer a combined multi-decade history of experience in recording. Henry has worked on discs for artists like Run-DMC, Shannon, Larry Coryell and Alphonse Mouzon. Perla has produced records for the Brecker Brothers, Chick Corea, Lou Rawls and Richie Havens, among others, and was at one time co-owner of Red Gate Studios with Jan Hammer.

Henry would like to see Visual Music move into film scoring. He sees their capabilities—both technologically and musically—as pointing in that direction. In addition to being a post-production vehicle through which directors can realize their audio fantasies on location, they feel they have a lot to offer creatively as well. (Their brochures indicate Henry as the "operator" of the equipment when someone else is in the driver's seat; he is the engineer and Perla is producer when their cerebral input is part of the package.) "We're still musicians and when you get two musicians in a room you tend to make music," says Henry.

While Visual Music's Fairlight is a veteran of the road, the rest of the equipment rests in pristine custom-designed and -built flight cases in Henry's apartment, crowding the usual homey amenities into a bedroom and a cramped, typically Manhattan kitchen. It sits there, awaiting the company's first full-fledged road call. Several in-house projects are underway, including a record production and audio enhancement work on a magician's videotape.

In the meantime, Visual Music is—shall we say it?—a *de facto* home studio. But Jay Henry feels strongly about the meaning of that term, especially as it relates to the level of equipment more and more available to living room-sized spaces.

"What we have tried to do is take a lot of the intimidation out of the technology. There is a certain connotation to 'home' demos or recordings. That doesn't have to be the case with equipment like this. This thing is predicated on the idea of what can happen when the home studio is in the hands of professionals." ■

Dan Daley is a contributing editor to Mix. He writes on a Macintosh computer, owns plenty of digital signal processors and is both fascinated and intimidated by digital tech. But mostly he loves his 31-year-old Guild acoustic guitar.

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STEPHEN R. JOHNSON

The
Big Time
Sledgehammer
Road
To The
Playhouse
Of Life



PHOTO: MR. BONZAI



by Mr. Bonzai

My first encounter with the work of Steve Johnson was the video for "Road to Nowhere." The visual impact of that clip made the Talking Heads song a daily anthem for me. My wife and I would crank it up every morning and march around the living room before setting out on our encounters with everyday absurdity.

Steve has directed a stream of powerful videos, including "Walk of Life" for Dire Straits and the milestone "Sledgehammer" for Peter Gabriel. He's also the director responsible for the children's TV breakthrough, *Pee-wee's Playhouse*.

He called on Devo's Mark Mothersbaugh to do the Pee-wee theme and to score some episodes. It was at Mark's house that I first met Steve. He drove up in a classic 1950 Studebaker. When we shook hands, I noticed something unusual about his grip.

Bonzai: Do most people think of you first as a music video director?

Johnson: Yes, of course, that's where

my recognition is at the moment. It's amazing how much attention one little video can get. I was totally caught off guard with "Sledgehammer," which was completed more than a year ago in England.

Bonzai: You also worked on the "Road to Nowhere" video for Talking Heads.
Johnson: Yes, I co-directed that one with David Byrne.

Bonzai: And also "Big Time," the follow-up to "Sledgehammer."

Johnson: Yes, I was working on that while finishing up the season's final episodes of *Pee-wee's Playhouse*.

Bonzai: Any other music videos that you are especially proud of?

Johnson: Well, those are the most notable, and also the ones where I got to do more of what I wanted to.

Bonzai: Paul Simon's "Boy in the Bubble" video reminded me of your work.

Johnson: That was directed by Jim Blashfield. I was commissioned to do one for Paul Simon, but I got the Pee-wee job at the same time and had to gracefully back out of *Graceland*. I had some phone conversations with Paul and it was under conceptualization, but I didn't have the time.

Bonzai: How did you get involved with the world of music videos?

Johnson: I found myself very frustrated by the Hollywood studio system. I had a deal to rewrite a script for Warner Bros. and I was trying to get other development deals. It's sort of a merry-go-round. Every time I would nurture a deal, and it was ready to happen, the

studio hierarchy would change and it would start all over again.

Bonzai: How did you get to that level of involvement?

Johnson: I went to film school at USC, a good training ground for future filmmakers. It's designed to mimic the Hollywood studio system.

Bonzai: Were you known as a writer?

Johnson: No, as a director, but the usual ticket to directing is to write something that someone wants and you use the leverage to eventually direct. It's hard to get directing breaks, especially right out of film school. It happens occasionally; it happened to a few of my friends. At the time I was very envious. But some of them made films that weren't successful, and as a result, they will have a hard time directing again. Some of them hit it big, like my friend Al Magnoli, who directed *Purple Rain*, which was a big hit. Now he's thinking of doing some music videos.

Bonzai: So you opted to do music videos.

Johnson: Well, my first video was for a friend, who had an unknown band that got a record deal with a video in the contract. Being very frustrated, and needing to work in film—I was two years out of film school and didn't want to get rusty. I hadn't directed anything, and nothing had actually gone into production. So, my friend, Mark Hart had a band called Combonation with Warner Bros.

Prior to that, people had asked me for concepts for videos, so I had moved in rock and roll circles in L.A. I had provided ideas for videos, assuming that I would direct them. Instead, the ideas were produced by other people. I realized that having the concept held the power to direct. For the Combonation video, I withheld my ideas until I met the person in power to give me the directing job—Jeff Ayeroff at Warners. I had a meeting with him, I was crazed on coffee, but he liked what I said. He put me on the phone to Simon Fields, a producer at Limelight, which is the biggest, most successful music video production house. It was a small budget, but I shot from the heart and I think that's what paid off. Simon gave me a break and we did "Girl's Like You," which no one has ever seen except those watching MTV at the time. The video did well, but the band went nowhere.

I made the video a shameless audition for a feature. At the time, I thought that's what videos were good for, and my goal was to do features and tell stories. Afterwards, I got another feature deal, and that went sour, so I decided to move seriously into videos. I called Jeff Ayeroff and he said he knew somebody who was looking for some-

"It's amazing how much attention one little video can get. I was totally caught off guard with 'Sledgehammer'..."

thing special. He sent my tape of student films to David Byrne, including a pixillated film called *Homebody* which had won a lot of awards.

Bonzai: Can you explain pixillation?

Johnson: Animation of solid objects, a broad term. It used to mean only stop-motion photography, but it can also include "go-motion," which means you leave the shutter open a little longer and you get a blur on the frame, so you're sort of painting images.

Anyway, I had a meeting with David Byrne. He thought we were going to talk about doing a section of the fea-

ture film he had planned, *True Stories*. But I already had a bunch of ideas for "Road to Nowhere." We had agreement in our ideas, and my opinion was that videos should not be like little features—they should be a different medium entirely. We should make videos that address different needs—they have to bear up under repeated viewings and still have something to offer. You see a feature one time and you're supposed to get it all.

Bonzai: So, that's why you cram so much information into your music videos....

Johnson: Absolutely, because the kids who watch videos have a big visual appetite, and have been weaned on television. They have the ability to absorb more at a quicker pace than adults can.

Bonzai: How do you layer so much information?

Johnson: I just see more in a shorter time.

Bonzai: Technically, is it done with film, or with digital effects?

Johnson: It can use both, and there are many means of cramming the information. It's all what I consider

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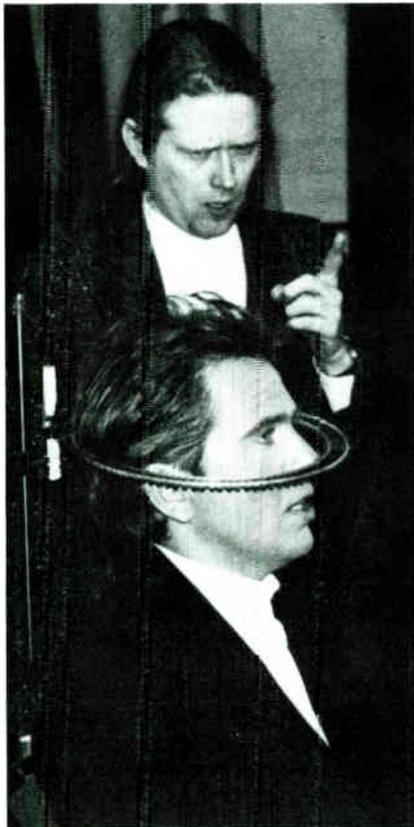
Bonzai: Do you draw on your childhood images?

Johnson: Inevitably, I suppose, but it isn't very conscious. With "Sledgehammer," the animators contributed a certain amount, but most of the ideas were mine. They came about in two two-hour brainstorming sessions, where I was under extreme pressure to produce. Peter had gone away on a vacation and we weren't sure what we were going to do. I knew there were high stakes involved. It was a big project, which I had tried to get out of. But I was in England, and another project had fallen through, so I had to do it. The people at Limelight had learned that I produce best when I am under pressure. I think they may have often withheld projects from me until they knew I would be under the gun. It might be foolish of me to suggest this.

Bonzai: Do you feel better working under pressure?

Johnson: Never, but I have found that I do better. I respond to the adrenaline rush. If I have lots of time, I just waste time until the last minute. It must be habits I picked up in junior high school, studying for tests and doing homework. I always waited until the very last minute, and then I would have a burst of creativity and energy. I got into that pattern, and I've since learned that other people, like Laurie Anderson, work in the same way. Peter Gabriel gets an initial surge and then spends a year polishing it, but a lot of writers wait until they just have to do it and magically the work comes out of nowhere. The adrenaline is used by different people in different ways. It's a legal drug. I'm not suggesting that any way of working is better than another—this just happens to be my pattern.

If I have a meeting scheduled and I'm told to come up with ideas for a project, I could spend all week pacing around and smoking cigarettes, and doing research. I've done all that and I still didn't come up with anything. With "Sledgehammer," I didn't have any ideas at all until I walked into a meeting. A group of people stared me in the face and asked, "What are we going to do, boss?" Suddenly, I was flooded by ideas. It was a stream of consciousness thing. "Let's do this . . . and this . . . and I got on a roll. When they smiled and reacted favorably, I thought, "Well, if they bought that, maybe they'll buy this. . . ."



Johnson working out the tracks for Peter Gabriel's "Sledgehammer" video.

Bonzai: Ah, these are the stories from which legends are made.

Johnson: I wasn't trying to make a legend, I was just trying to make a simple little video to help a guy sell some records. It was difficult for Peter to talk me into doing it, but I love the guy and have great appreciation of his past work. I thought he was long overdue for some recognition. With "Biko," he opened my eyes to South Africa. Everything in "Sledgehammer" came from my appreciation and respect for Peter.

Bonzai: Did you have a lot of interchange with him for the video?

Johnson: We mostly just went out drinking and put off talking about the video. We got to know each other, which helped me a lot in making it. It made me feel comfortable with doing something silly with him. The main reason I didn't initially want to do the video was because he is not a silly guy, and I didn't want to alienate his fans.

Bonzai: I seem to remember some silly stuff on his first solo album.

Johnson: I guess so, but his videos were all serious. I didn't feel like I could fit in, but he said he didn't want to follow a logical progression. He

wanted to break out and have some fun. I think I learned from David Byrne that it was okay to be silly. The truth is, I can't avoid it. I tried to make serious student films, as in one assignment to portray an act of violence. I tried to make serious films, but somehow they ended up completely funny. I couldn't help myself.

Bonzai: Of all the work you've done, which are you proudest of?

Johnson: Well, "Sledgehammer" is the only piece I did where I had complete creative control. Peter had ultimate veto power, but he never vetoed anything. I'll give you a good example. The chickens came about because I was trying to test Peter. I wanted to know how far I could go, to know the limits. It was in the early stages. By then I knew it was okay to be silly, and obviously he didn't feel that the chickens went too far. Initially, I had told Peter the video should be shot in a smoky bar in the rural South, with a mixed crowd and lots of sweat. An earthy, sexual scene. I tried to talk him into it, and even gave him the names of other directors. He said, "No."

Bonzai: Who are some of the directors you admire?

Johnson: I admire Z. Big, of course.

Bonzai: Z. Big?

Johnson: Zbigniew Rybczynski—we call him Z. Big. I think he is quite amazing. He did "Close to the Edit" for Art of Noise, which has won a lot of awards. You can always expect something new from Z. Big.

As a commercial, sort of mainstream video director, Steve Barron is unparalleled. I could never do what he does—work like "Money for Nothing," a ha's "Take on Me," some Z.Z. Top videos, Michael Jackson's "Billy Jean." He did a lot of milestone videos. He works so much, and he's consistently done fresh videos, and perhaps a few clunkers.

I think each work is important; film is a sacred trust.

Bonzai: Isn't this an interesting period of experimentation we're going through—forget the distinctions between films and videos. How long will it go on and where is it going?

Johnson: It's really going to take off when we start doing high-definition, HDTV videos. I'm planning a feature now, and I hope to do some effects with HDTV.

Bonzai: They just finished an entire feature in Italy shot with the Sony HDVS system, starring Kathleen Turner and Sting. . . .

Johnson: Yes, I've heard about it. Z.



Another of Peter Gabriel's many heads for "Sledgehammer."

Bonzai: If you were born before film and video, what would you be doing?
Johnson: I'd be doing something mechanical—I have a very mechanical mind. My great-grandfather was the last remaining blacksmith in Kansas. I come from a long line of mechanically inclined people and my brain functions that way.

Bonzai: To me, your work has a very clocklike movement.

Johnson: Maybe so. I map out the concepts like a piece of machinery with interacting parts. Also, I should point out that I studied psychology, anatomy and physiology. I was a pre-med student, but went into the art department and was accepted by an art institute. Two weeks later I severed my right hand in a bad accident.

Bonzai: Yes, I'd like to hear more about your "bionic" arm. . . .

Johnson: I've got a lot of silicon here. The way it happened was I drove off a cliff in Colorado after a tire blew out. There was no shoulder and I sailed off a mountain, end over end. I punched my hand out through the windshield and essentially severed it. I hitchhiked to a hospital and died from loss of blood.

Bonzai: When you say "died," you mean you were clinically dead?

Johnson: Yes, I was dead and then revived.

Bonzai: Did you have the classic out of body experience?

Johnson: Oh, yeah—the whole bit. But I didn't know what it was until two years later. I got hold of my medical records and found out what had taken place. Prior to that I just thought it was morphine, or a weird dream, even though it was extremely vivid.

Bonzai: What did you see?

Johnson: I went into a slipstream of consciousness where all the elements of my past, present and future seemed to intermingle and go shooting by at a zillion miles an hour.

Bonzai: Was it a pleasant feeling?

Johnson: Oh, yes, very pleasant, and not the least bit frightening. If they could package that in a drug, I would be addicted. It was quite marvelous. And the funny thing was, I was watching myself prior to going into the slipstream. I was up in a corner of the room and watched myself laid out on a stretcher while they worked on me. I thought, "who is that guy?" and then recognized myself. There may be a logical explanation—perhaps sound sensations coming in and you build a

Big has done some tests with high-definition. I've learned a lot doing "Sledgehammer" and "Big Time." It's opened up a Pandora's box for me, being able to use on-line video effects in conjunction with old style film and animation.

Bonzai: Were you a big film buff when you were young?

Johnson: My first memories as a kid are of television—the dawn of my consciousness was in front of a TV set. My first memories are of the dim glow of a 1950 Philco TV.

Bonzai: Which shows, which artists?

Johnson: My first memory is of *Mr. Peepers*, Wally Cox. And I remember some of *Our Miss Brooks*. I think they both went off the air when I was about 2 years old. I remember the plots and found out years later about the shows. I didn't know the name of the shows, but I knew the characters and they were my friends "in the box." I asked my parents about this and it turned out that they used the TV as a babysitter. They would put my crib next to the TV and I was mesmerized. I would pull off the knobs and suck on them—it was a tactile experience. At the time, I didn't make a separation between the reality around the crib and the reality in the TV. It was acceptable to me, and no less real. And then *Howdy Doody* was very important to me. They were still my friends in the box.

Movies were also very important to me. I grew up in a small town in Kansas. Movies were one of the few things that could take me away from the humdrum predictable life of a small town.

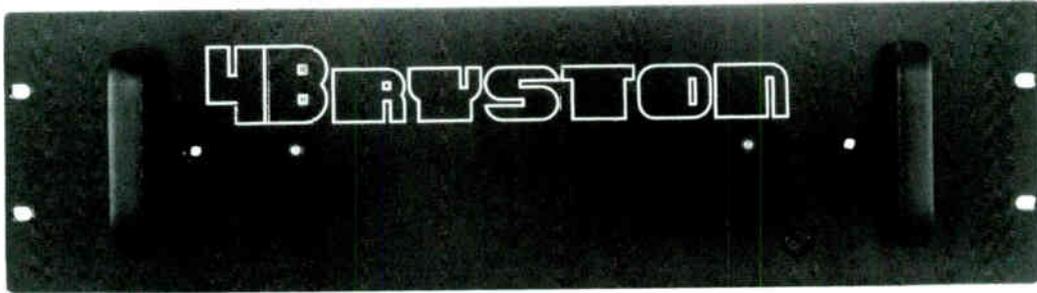
"I was dead and then revived. . . I went into a slipstream of consciousness where all the elements of my past, present and future seemed to intermingle."

Bonzai: I heard that you drove out here to California in that old car outside.

Johnson: Yes, I was almost born in the back seat of that car. My father bought this 1950 Studebaker, and I have very early memories of it. I remember staring up at the moon while he was driving—it's almost as if I can remember coming home from the hospital in that car.

My father tried to sell it in 1965 for \$40. I pleaded with him not to. He said if I could raise the money, I could keep it—not dreaming that I could get ahead of \$40. I was only about 12 years old at the time and went and mowed lawns like crazy. I kept the car in a garage for a long time before I could fix it up and drive. I love it, and still drive it.

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picture as blind people can form visual imagery from sounds. But it was very vivid.

Bonzai: And then you returned to the body.

Johnson: Actually, I was very disappointed to get back into my body. Initially, I felt heavy and uncomfortable. Before I came back I was in a waiting room, like a holding tank, with a bright area behind it. There were a lot of what I would call the "concepts" of people—I knew they represented entities, and they were elbowing me like crazy. It was like waiting in line at a theater and there was some great movie up ahead, and I couldn't get in. Just at the point where I was starting to go through the turnstyle, all of a sudden I felt real heavy, and started hearing noises that were ugly. And then I felt like I was just dropped back into this room with a doctor peering over me, saying, "Boy, you're a lucky bastard." I said I didn't feel lucky.

Bonzai: After this experience, did you have a new surge of creativity?

Johnson: I wouldn't say creativity, but certainly a joy of life and a need to cram as much as possible into every day. Prior to that I was a C student with no interest in school. Afterwards I went back and made straight A's. And I went on the road in Europe for a year trying to find out a few things.

Bonzai: Does this awareness of life and death and creativity have something to do with your rule of not waiting longer than 15 minutes if someone is late for an appointment?

Johnson: Yes, I guess it does. Time is one thing we can't regain. It's precious, important, and I value my time. I want other people to treat time the way I do. I'm very reasonable and fair. We all have a finite number of days, minutes, seconds for whatever we want to accomplish. And it's never enough. I'm not afraid of dying, but I want to use my time well.

Bonzai: So, what are you working on now?

Johnson: I'm trying to develop the right project. Maybe the right one will never arrive. I'm reading a lot of scripts. You can never find the best project—you find the best available.

Bonzai: Will you continue doing music videos?

Johnson: I'm not trying to avoid them, but I am moving on. You can reach people by doing feature films. It's communication on a mass scale that involves almost all the arts. I set out to challenge myself with film—this could

***"To be a director,
you have to be
arrogant. You have
to think that your
work is important,
and you have to
think you are
absolutely right..."***

take me a lifetime to master, even to get a little toehold on it. I wanted to bite off more than I could chew. It's not an exact science—it's an art and that makes it limitless. The boundaries continually change and get updated. Layer on layer, art through the centuries. I hope in little ways, to add to these layers.

To be a director, you have to be arrogant, in a sense. You have to think that your work is important, and you have to think you are absolutely right in order to boss around other people who are intelligent and creative. If everyone starts questioning you, then nothing gets done. Especially with music videos, which are usually shot in a day. Every second counts.

At the same time, there are continual collaborations going on, compromises going on. Any filmic piece has a system of compromises. There is never enough money, and never enough time—that's the nature of the beast. Dealing with that, and being able to function within that, and being comfortable and making progress is the maturation process I've had to go through.

At first it's very frustrating because you have an ideal vision of what you want to do. Then you come up against the reality of trying to recreate that internal vision and get it on the screen. Maybe someday they will invent brain taps, but the way it is now you have to go through a lot of different people who must interpret what you say, and then it goes through the filter of their consciousness and they bring to it their own experience, because their consciousness is filtered through their experience. It gets complicated.

Video demands a specific approach. The music should be the blueprint of the video. You are making a visual

representation and you want to do something that relates to the song, but you also want to make it open-ended enough to allow the viewer to participate and bring interpretation. You don't want to narrow the vision of the song—you want to expand it.

A good example is "Sledgehammer." In the planning stages, Peter told me what some of the sections of the song meant. He'd give me his interpretation and it worked on a different level from what I had perceived. Often, he would tell me original lyrics which didn't end up in the song—the original intentions. Sometimes that ended up in the video. He sings about riding on a rollercoaster and you see it. Later he seems to be doing things unrelated to the song, but it relates to what he intended. There is nothing in the song about an icehead. It wasn't expressed lyrically, but visually. He wanted a sledgehammer—the metaphor may be love as a means of breaking through emotionally to another person. The original line referred to being encased in ice, so I used it.

Bonzai: Freud would have loved music videos. He'd no doubt also appreciate some of the personalities you associate with. Tell me about some other artists you've worked with. . . .

Johnson: I did a video with Danny Elfman, Oingo Boingo's "Just Another Day." Danny is a very smart, creative guy, as is Mark Knopfler, who had a lot of input on "Walk of Life." Totally different styles, totally different bands with different needs. I had creative control, but Mark wanted a video with sports in it. I don't know anything about sports and I had to do the concept in four hours on the plane on the way to the job, which was shot in three hours. It became a very popular video. I appreciate Mark Knopfler's genius. He wanted certain things which I tried to provide through a feeling or a spirit, or a thought that maybe wasn't in the song. We forced a new interpretation on the song, which perhaps he had originally intended.

Same thing working with Pee-wee Herman. He's a brilliant guy and has a vision of what his role is. David Byrne, same thing. All the people I've worked with have their own significant visions of who they are and how they fit in the world and what their art must and should be. And what I try to do is help bring out who they feel they are—and clarify and intensify what they are. ■

Mr. Bonzai, a 15-year veteran of the music industry, is former manager of a major Southern Cal recording studio, and author of Studio Life: The Other Side of the Tracks (Mix Publications).

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King Sunny Ade

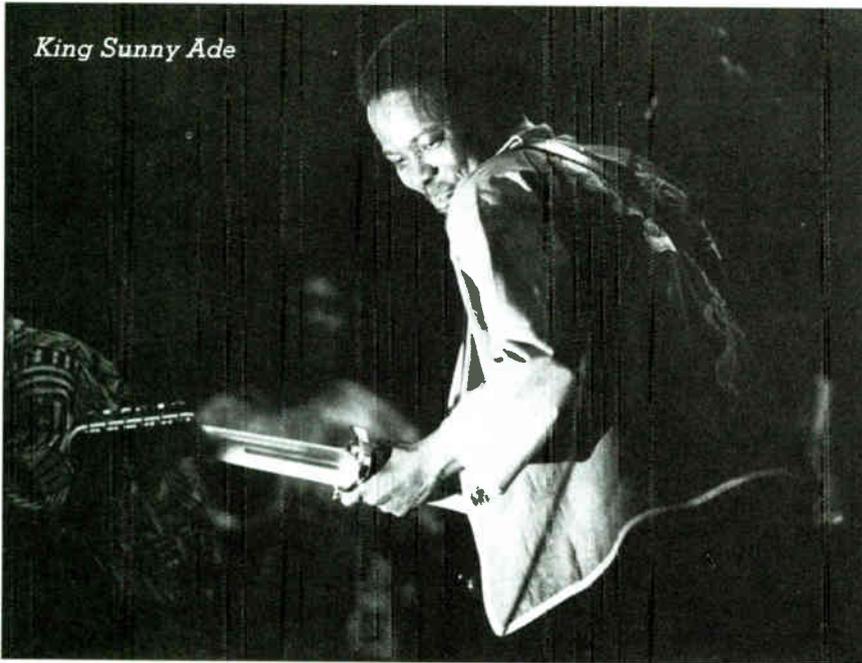


PHOTO: RON DELANY

by a four-hour layover in Amsterdam, we were pretty exhausted when we arrived in Lagos, as well as disoriented by the seven-hour time difference and a 50° temperature change.

The scene at the airport was chaotic, and reminded me of *The Year of Living Dangerously* or *Salvador*, with lots of soldiers carrying Uzis. Our Nigerian liaison, Chief Ojomo, paid off the local customs officials to get us into the country. We were soon to find out that bribing local officials, or "dashing" was the only way to get things done in Lagos. Our passports were taken from us, and we didn't get them back until shortly before we left.

The cab ride from the airport was like driving in a cross-country night rally. Lagos is a city of 12 million people, with no traffic lights, and open storm sewers on either side of the road, so driving across town took hours and was always an adventure. We arrived at the Kalex Hotel in suburban Yaba, which was to be our base of operations for the next nine days.

The next day, after a production meeting where the director outlined some of the problems he'd been having with the local promoter, the bands, and the immediate problem of getting our air container full of equipment through customs, we drove down to the site of the concert. Tafela Balewa Square was an enormous military parade square, about the size of two football fields, with 80,000 seats.

The promoter had neglected to provide a stage large enough for King Sunny's 22-piece band, so the film crew spent the whole day constructing a stage out of the type of wood most readily available in Nigeria: mahogany. Chief carpenter Ian Taylor estimated we paid \$1,200 for mahogany that would have cost us \$25,000 back home. Building the stage on a cement square in 100° heat with no power tools was hard work, but it helped unify a crew of strangers into a team.

The following day, production manager Peter Reid and I went to the airport in an effort to get the equipment out of the customs warehouse. After six hours of bribing our way through the hierarchy of customs officials (and this after Peter's attempts for two days!), an army general finally cleared our equipment for release. A truck was summoned, and we managed to get it loaded five minutes before closing time. We even had to bribe the guard at the gate on the way out of the customs shed, before he would allow our truck to leave.

The advance crew was able to rent a refrigerated meat truck from a local business man. This would be our audio

—CONTINUED ON PAGE 109

—FROM PAGE 29, ADE

neer Charles Wolfe (who'd worked with King Sunny) and my assistant engineer Fred Gilpin decided to instead use two Fostex B16 half-inch 16-track recorders linked with a Fostex 7030 synchronizer, and a Soundcraft Series II 32-input console. This system actually gave us more tracks at one-quarter the shipping weight, with a negligible loss in quality, especially considering the mixes were to be transferred to 16mm mag stock for the film post-production. We also saved a considerable amount of weight by switching from 2-inch to half-inch tape.

A major obstacle in recording anywhere overseas is AC power. Nigeria uses a 220 volt/50 Hz system. Some of our equipment could be converted internally, and 220 to 110v transformers would have worked on most of the outboard gear, but all the video, digital, and time code-related items require 60 Hz for their internal clocks to function properly. We ended up using a system devised by Jack A. Frost Electric in Toronto, which consisted of a 220v/50 Hz motor connected to an alternator which powered a 60 Hz motor. This motor generated 7,600 watts (37 amps) at 110v and was governed by a voltage regulator. The unit weighed 700 pounds, and cost \$4,000 to ship to Lagos, but proved worth it for the security of having regulated power. We were told that the local power was prone to voltage swings of 20%, or from 180 to 260v, and these estimates later proved conservative.

We were informed about some of the problems we could expect in Nigeria, given the fact that the country was being run by a fairly corrupt mil-

itary dictatorship, and that the local currency had just been devalued by 400%. Advice was also dispensed re: mosquito repellent, sunscreen (remember, Canadians in March are possibly the whitest people on earth), drinking water, what clothing to wear, etc.

We then all went to the hospital for a series of six inoculations for yellow fever, typhoid, diphtheria, etc., and a supply of malaria pills. I was beginning to wonder what I was in for.

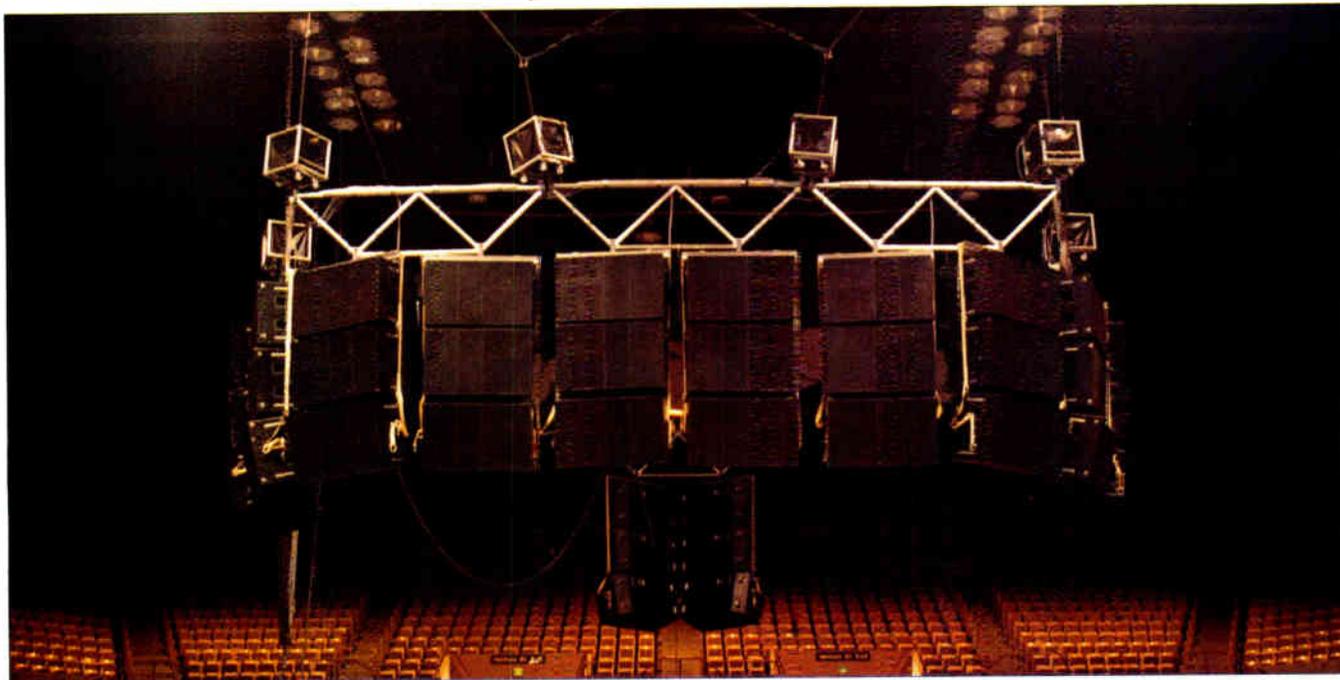
After successful testing in Toronto, the crating began. The rack mountable equipment was fit into four 4-foot flight cases, along with microphones and other miscellaneous small gear. The console, TVs, and video recorders, intercom system, and 400 reels of half-inch tape all went into one large 1,200-pound crate, while all snakes, mic cables, and AC cables were packed into a 700-pound road case.

We were careful to include small necessities that we heard would not be available in Nigeria, such as Q-tips, batteries, head cleaning fluid, flashlights, felt-tip markers and gaffer tape. We were required to list the contents, country of origin, weight, serial number, and insured value of each item on each crate. The crates were then put into an air container and trucked to New York City. They were flown to Lagos via Nigeria Airways.

The crew left four days later. It consisted of three cameramen, three multi-track audio engineers, the director, the assistant director, a gaffer, a carpenter, a camera assistant, a production manager, and a film sound man, who was responsible for the audio on the documentary portion of the film. After two seven-hour flights separated

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INTERNATIONAL UPDATE

The 82nd Audio Engineering Society Convention was held in the Queen Elizabeth II Convention Centre, London, March 10 to 13. This (exhibition only) overview does not claim to mention all the new products exhibited during the convention: instead it concentrates on products and events that attracted the author's attention.

by Richard Elen

The Queen Elizabeth II Convention Centre is a fascinating place. Well situated for foreign visitors (opposite Westminster Abbey and a stone's throw from the houses of Parliament), it is a brand-new development which is really intended for small, top-level development conferences (the following week it was the venue for a major European AIDS conference, for example) rather than the almost unique AES combination of a major exhibition and a full set of technical papers. Unfortunately, it may well be that nowhere in London is truly suitable for AES, due to the need for both a large exhibition hall area and a copious supply of demonstration rooms. As a result, the event occupied not only four floors, but the basement parking lot in addition (some of the consoles would, apparently, have exceeded the size requirements to load on the high floors). This led to a continuous flow of people treading the tortuous path between levels: some elevators went to some of the floors, while others went to the basement, and still more were closed off altogether. Given the shortcomings of the venue, however, the organizers handled things well and it was quite possible to get about, find things (eventually) and discover what was going on on the exhibition floors.

Consoles

On the consoles front, Neve showed a working DSP (Digital Signal Processing) console on demonstration for the first time at an exhibition, and very impressive it was, too. The latest incarnation of the system includes a number of innovations, including optical fiber transmission. Also on the stand was an example of the highly regarded V Series console, running Necam 96 automation.

The other digital console at the convention has been shown before, but never in Europe: the Yamaha DMP7. Enough has already been written elsewhere about this sign of the future;



PHOTO: HILLEL RESNER

AES 82nd CONVENTION LONDON

While a fair number of products new to the European market were unveiled, there was little that hadn't been shown previously. But there was plenty to talk about....



PHOTO: HILLEL RESNER

Neve's Barry Roche demonstrates their DSP console.

suffice to say that I finally managed to have a play with it, and was most impressed. Definitely the shape of things to come.

Of course, even in the analog console field, digital techniques are having a major impact on the way we record sound. One evening, Soundcraft put on a show with Jonathan Cole, formerly of Syco Systems, Britain's largest music technology distributor, and now running his own operation, TSC (The Synthesizer Company). The demonstration showed how a MIDI sequencing package could be used in conjunction with the excellent TS12 console and Saturn multi-track. As is quite common in the UK, the sequencer was Steinberg's Pro-24 running on an Atari ST. An excellent program, it is rather held back by the ill-conceived system software of the Atari machines, but is finding favor in the UK, particularly because musicians can't gener-

ally afford Apple Macintoshes, much as they would prefer them. (A later discussion with an Apple UK representative on the Ensoniq stand will hopefully lead to some changes in this area.) There were other STs around too, handling automation on Trident's Di-An for example.

Also on the computer front, but in rather a different class, Solid State Logic unveiled their new G Series studio computer system. Central to the development is the incorporation of sufficient high-speed dynamic RAM to store the vast majority of production data, giving instant access to any part of the mix. It also features high-speed data manipulation, while on the storage front the familiar 8-inch floppies are replaced by 20 Megabyte hard disk cartridges of the Bernoulli Box type.

Rupert Neve's new company, Focusrite, exhibited their brightly colored modular signal processing systems at

the Turnkey booth. The company offers modules for outboard processing, custom consoles, or for retrofitting.

From console parts to complete systems: the AHB Sigma console system was on show for the first time in the UK. There are two frame sizes, and a wide range of modules for the vast majority of applications. AHB claims to have developed electronics with a better noise performance in practice than 16-bit digital systems, with a dynamic range greater than 100 dB. SMPTE and MIDI interfacing is standard, and modules can be updated when required. Automation can be included or retrofitted.

Recording

Several interesting developments were on show, primarily in the "tapeless" field. The Lexicon Opus was on view, and both AMS and Fairlight unveiled new software (for the AudioFile and the Series III respectively). But most interesting of all (and possibly the most exciting product at the Exhibition) was the SoundSTreamer from Audio + Design: the prototype of what seems destined to be a highly significant development, in that it offers hard disk tapeless recording—an hour of stereo in the first instance—and full editing/assembly capability at budget price (expected to be under \$20,000).

The heart of the SoundSTreamer, as one might expect, is a multi-megabyte hard disk. It's interfaced by means of an SCSI (Small Computer Systems Interface) adapter which enables it to be driven from an Atari ST's non-standard hard disk port. Audio is input and output via a Sony 701 digital audio processor with custom interface, so the system can operate with F1-format tapes, analog input signals, and (ultimately) AES-EBU digital signals or 1610/30 format.

The system was developed by Dave Malham and his team working at the University of York, and the work is allied with the Composer's Desktop Project, also based at York. CDP is successfully implementing mainframe computer music compositional languages (like MUSIC 11) and digital signal processing on Atari systems, avoiding their inherent problems by completely rewriting the system software.

So far, the record/playback aspect of the SoundSTreamer system is up and running: the next step is to design and code software to handle editing, and ultimately multi-track recording and mixing. Audio + Design were also showing a multi-output Ambisonic decoder that can be used successfully to handle cinema surround applications without the need to change the positions of the speakers from those pre-

ferred by Dolby.

More conventionally, several companies showed tape-based recording systems of one sort or another. Sony showed an experimental 3324 editing system and electronic editing on their DASH stereo recorders, while JVC did an excellent job promoting their entire 900 series range of video tape storage-based systems in competition with the Sony product. Some people feel that JVC has an advantage, particularly in ease of editing, as the edit is assembled in memory, making rehearsals quick and straightforward. Otari also showed their digital machine—the PD format 32-track DTR900—alongside their MX80 analog recorder, which offers 24- or 32-tracks on 2-inch tape. Meanwhile, Mitsubishi showed their X-86 stereo digital machine for the first time in Britain.

On the analog side, Tascam had their new professional products, including the ATR-80/24 multi-track and ES50 synchronizer. There was also the M600 console system and the CD501 pro-CD player. On the Tascam stand was a WORM (Write Once, Read Many) videodisc recorder. It's expensive at present, and definitely designed for video applications. But it shows the potential of optical media for digital recording applications in the future, especially when erasable systems are fully developed.

Lyrec showed their new TR533 multi-track, while over on the Dolby stand, the success of the SR system was celebrated and new rack systems were on display.

Finally, on the recording side, the HHB booth included a Sony 3324 multi-track partially retrofitted with Apogee filter blocks. An oscilloscope display showed the difference between the two, and it was both dramatic and disturbing. Disturbing because Sony is not alone in ignoring the findings discussed in the Paris AES paper of five years ago by Roger Lagadec and Tom Stockham: the same is true of all the digital recorder manufacturers. It is a fact that every commercial PCM digital recording ever made has a fundamental flaw—a flaw large enough to be noticed. Apparently, the audiophile "anti-digital" lobby was at least half-right, but the problem is being swept under the carpet. It should not be left to third-party companies like Apogee to do the job that should be done in the factory, by the major manufacturers themselves. They have all had enough time to redesign their filters.

Other Stuff

Elsewhere in the show was a remarkably interesting collection of goodies.

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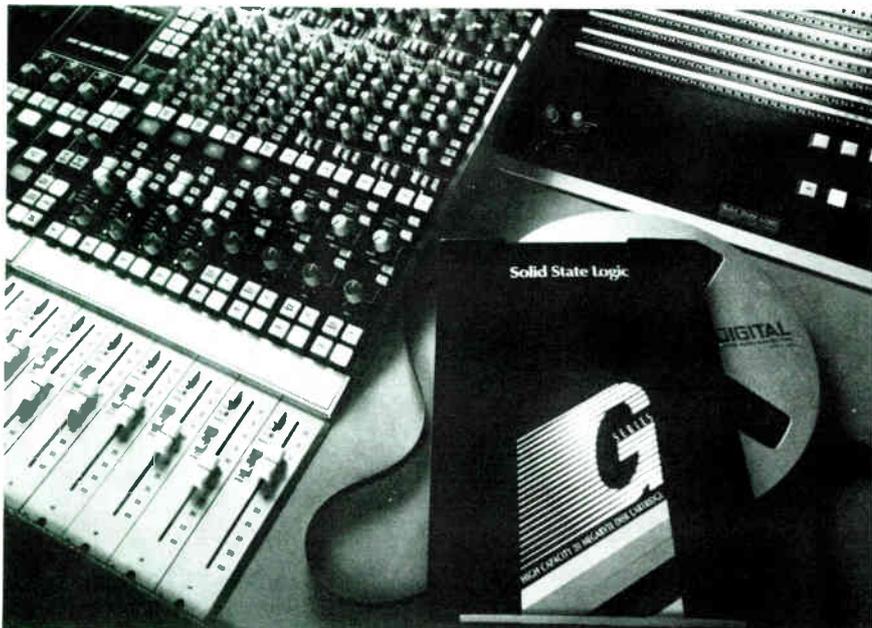
Sony created a considerable amount of interest with the production prototype of their professional R-DAT recorder. The deck (about the size of a PCM-F1) features AES/EBU digital ports, selectable 44.1/48 kHz sampling rates, and up to two hours of recording time.

Quantec, originators of the Room Simulator several years ago, showed their latest effort, the XL. What sets it apart is that it is a PC-controlled system, with RS232 as well as MIDI interfacing as standard. At present, IBM PCs and compatibles can interface with the device—which offers QRS-style room simulation plus other time-domain digital processing effects with a bandwidth of 15 kHz. Apple Mac and Atari ST interfaces will follow shortly. Also of interest was the Stramp MIDI-controlled console automation system

from Peter Struven GmbH, which uses an outboard VCA unit (plugged into insert points for example) under control of your existing MIDI sequencer or their own Commodore 64-based software.

In the basement was Colin Broad of CB Electronics, demonstrating a very useful prototype box: a video inserter. You feed a video signal in and can superimpose a number of pieces of information on that signal, such as SMPTE time code values, punches and streamers. A cue list is stored inter-

Solid State Logic unveiled their G Series Studio Computer, which utilizes new 20MB disk cartridges, each having the memory equivalent of 80 floppy disks.



nally (and can be dumped to tape) and the unit can be set to give visual and audible countdowns to cues at the click rate specified. As the punch approaches, a bar sweeps across the screen to indicate its imminence. All the inserted information is capable of being displayed in many different places and sizes on-screen, reversed white out of a tasteful and easy-to-read gray, and the data are remarkably stable even with a domestic VCR on the input!

New developments were on hand in the loudspeaker field from B&W Loudspeakers Ltd., a long-established British company well-known to British audiophiles and approaching a UK standard for classical music and reference monitoring. Their Matrix series of monitors is specifically designed for digital audio applications. The key to the design—and to the choice of name—is the use of a honeycomb-like internal matrix inside the cabinet. B&W claims it virtually eliminates unwanted radiation. Three systems are available, each having a different size, acoustical output and bass extension.

Talk of the show was the threatened introduction by the British government of a "withholding tax" that would penalize overseas entertainers working in Britain, onstage or even in the studio. Forecasting the death of the UK industry on virtually all fronts should this tax be levied, the British studio association APRS (Association of Professional Recording Studios) launched a massive offensive, which was featured in their revamped newsletter available at the convention. Considerable funds—diverted from a major overseas joint marketing project—were expended on producing a full and detailed report to present to the government, which is seemingly oblivious of the damage that would be caused to one of Britain's primary export industries.

Thanks almost entirely to the efforts of the APRS, the government has now seen sense and amended the proposed legislation. As a result, in the future, Britain will still be the highly attractive recording center it has become over the years. ■

Engineer/producer/journalist Richard Elen launched his career in 1970 at London's Basing Street Studios (now Sarm West). He's since engineered sound on tours throughout Europe and the States, served as a studio manager, and edited the magazines Sound International and Studio Sound. Richard recently moved to his new home in Glastonbury, and works as a consultant in any areas where technology and creativity meet—even laser holography.

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Profile: **André Perry**

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

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

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JIM GAMBLE

TEN YEARS OF THE CONSOLE MAKER'S ART

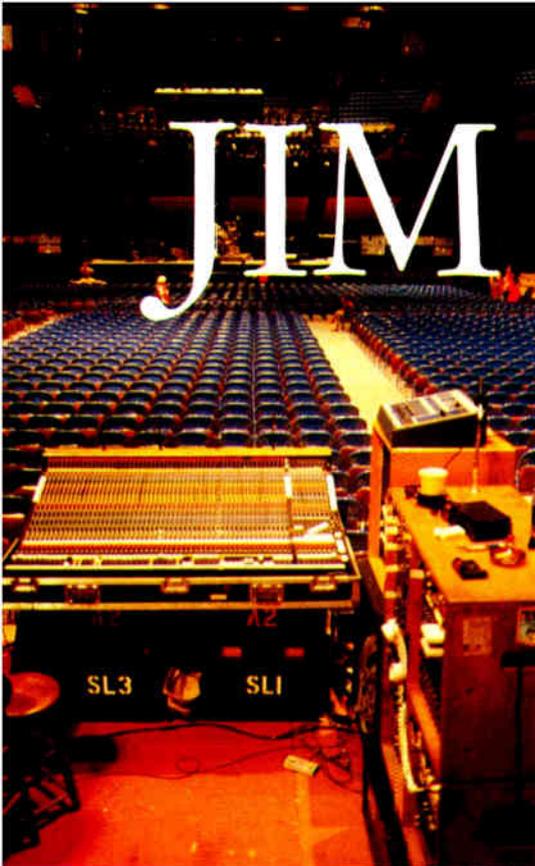


PHOTO: JIM BUGS MORAN

Sound On Stage's Gamble EX house board on Huey Lewis tour.

by George Petersen

While the name Jim Gamble is hardly a household word, the man behind this Lake Tahoe, Nevada-based firm is anything but unknown in the world of touring sound. Jim Gamble Associates specializes in producing a limited number of no-compromise sound reinforcement mixing consoles (about eight per year), catering to discriminating and well-heeled acts and P.A. companies around the world. At \$100,000 each, a 56-input Gamble series EX house board is clearly not for everyone, but are favored by a growing number of groups ranging from Julio Iglesias to the Grateful Dead.

The story began ten years ago, when Jim Gamble, then the director of engineering at Tycobrahe, left that leading Southern California concert sound company to start a console manufacturing business. He'd mixed over 3,000 concerts during his tenure with Tycobrahe (including three world tours with the Rolling Stones, and work with Rod Stewart, Ten Years After, Fleetwood Mac, Kenny Loggins and other top artists), and Gamble had a pretty good idea of what a sound reinforcement console should and should not be.

"I actually began building consoles while I was at Tycobrahe," Gamble recalls. "The boards available at that time were big, heavy and didn't work every night: they had bogus front ends, they had bogus EQ, lousy noise specs, and couldn't drive a 300-foot line without oscillating—the list goes on and on. There were breakthroughs in the 'no more transformers' and chip technology in 1977 and it was a good time to bring something new to the market. I felt my contribution to the world could be more than I was doing at the time, and I decided I wasn't going to do any more touring."

The first Gamble product was a monitor board purchased by Innova-

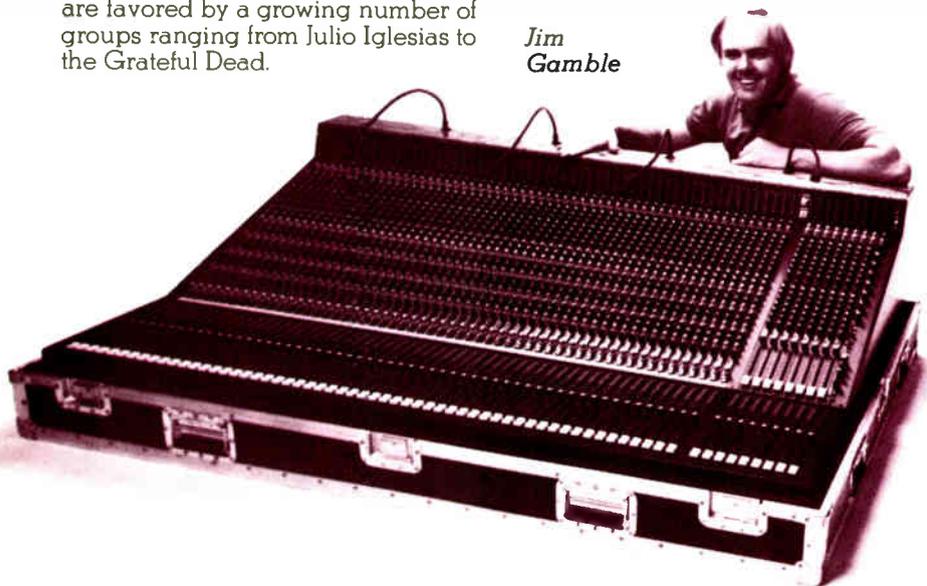
tive Audio, who used it for the Allman Brothers and later ordered the first Gamble house console. "By the end of 1977, people such as Bruce Jackson started seeing the consoles and came to tell me what they wanted in a console and it went on from there," he says. "There were several acts that were quite enthusiastic about it and they helped in promoting it by making sure they got it for their tours. It ultimately meant that the sound companies who worked for these different acts ended up buying the boards."

A more recent twist on this theme is the trend of artists who "purchase their own boards so they can have it all the time, and can have a little more freedom in what sound company they hire, and don't have to deal with a console they're not used to," Gamble says. "Actually, this has been going on for a while now, especially with bands carrying their own console and monitoring systems around, with the sound companies basically carrying the speakers and amps for the front of the house."

Gamble sees an increase in the sophistication of console buyers today, and notes that "EQ is something that people are becoming aware of. There's a need for correct, phase-coherent EQ, which is the thing that John Meyer was preaching about at AES last year. His EQ is phase coherent, which is how he can really tune out feedback problems. Yesterday's typical third-octave graphics weren't phase coherent, and as you boosted or cut them, they would shift phase slightly. So if you were trying to zero in on a particular note that feeds back, you could never get on top of it. It's like trying to push a ball of oil under water: it keeps floating on either side of where you want it to go."

Despite the recent proliferation of digital equipment, Gamble is certain that analog sound reinforcement console designs will be around for some time to come. "One problem with the fully digital console is that it takes a certain amount of time to process the

Jim Gamble

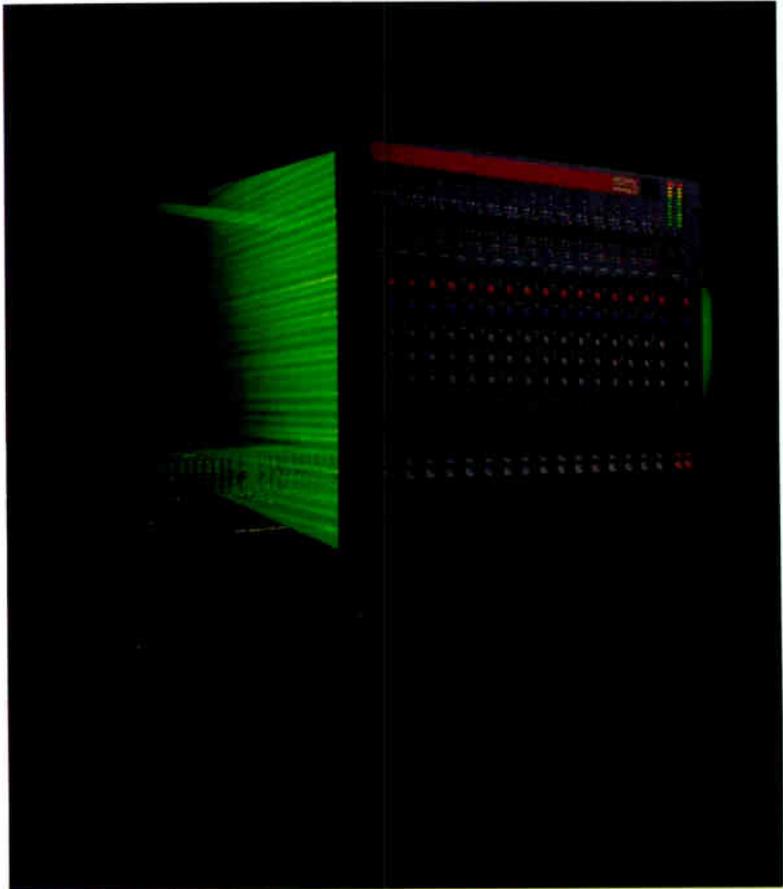


information, and we don't have that time in live, real time work. You have that time in the studio, where the [output] signal may be a millisecond or 100 milliseconds behind—whatever the processing time is—but in real time, having the sound come out of the speakers 100 milliseconds late is not OK: it interacts with the stage sound."

Gamble says another problem inherent in digital consoles is the upper end frequency response, which is typically limited to half of the device's sampling rate. Whether building an analog or digital board, a wide bandwidth is essential to good console performance, and Gamble's Series EX goes from 3 to 75k Hz. "If you've got a 48 kHz clock rate," Gamble explains, "then 24 kHz is the highest frequency the thing's going to put out, and after that the frequency response drops like a rock. It's back to the phase shift problem: if 24 kHz is the roll-off point, then the phase shift starts one decade below at 2.4 kHz, and gets progressively worse as you go up. It's the same on the low end: manufacturers could never figure out why a board with a 3 dB down point of 40 cycles sounded so terrible, but one decade above, at 400 cycles, is where the phase shift starts to accumulate and as you go down the phase shift gets worse."

"These days, a lot of console manufacturers are taking their frequency response down to 20 or even 10 Hz. It needs to be way down there: in the case of the EX, it's down to 3 Hz, so the phase shift doesn't start giving effect until about 30 Hz. Having the high and low end extend that far does affect what you hear. Whether your stacks reproduce 20k isn't the point—you need to have that range to reduce phase shift problems. It's one of the laws of physics and only a few people are approaching the problem."

While Gamble is pleased with all of the improvements he's noted in the sound reinforcement industry over the years, there is one area that remains problematic. "It finally comes down to the hall or venue," Gamble comments, "and your ability to deal with that. John Meyer was over the top with his SIM™ [Source Independent Measurement] system, because it represented a way of dealing with the problem of room acoustics. Outdoor setups are much better, but you still have some anomalies to deal with by stacking a lot of equipment up and how that equipment interacts. At last we have this final medium where we're not putting performances on magnetic tape or CD. This is the last medium where it's *really* live and you can hear everything. That's the final frontier." ■



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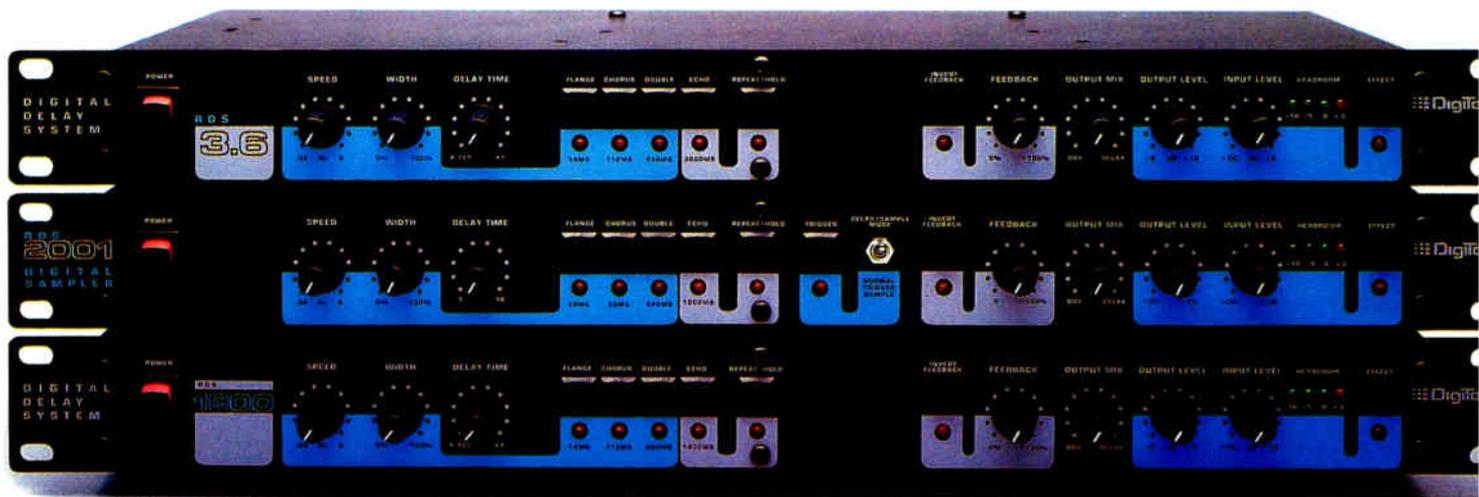


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SOUND SYSTEM SUCCESS

An engineer's worst nightmare is occurring: a fortune in sophisticated audio gear has performed flawlessly during the soundcheck. Then, suddenly, five minutes before the headlining act is to take the stage, a mysterious crackle bursts from the speaker system. The crew races frantically beneath the stage. Sweat breaks out on the palms and forehead of the chief engineer. The crowd, 20,000 strong, turns and focuses on the raised platform at the center of the arena....

At a time like this, nobody cares about the money saved by choosing the low bid on the cabling system. The bottom line is that the majority of prob-

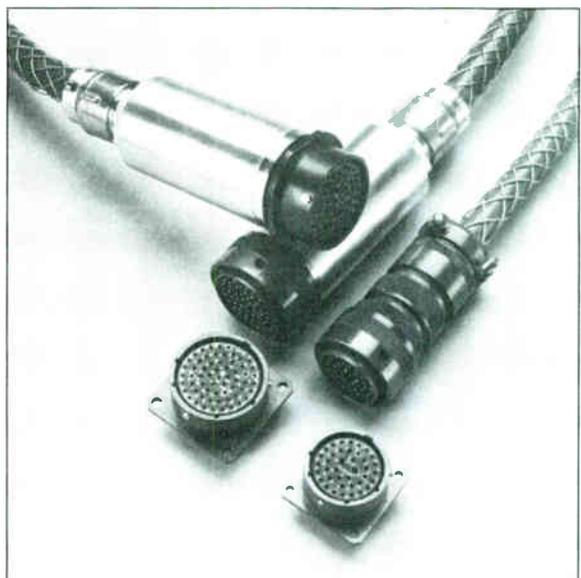
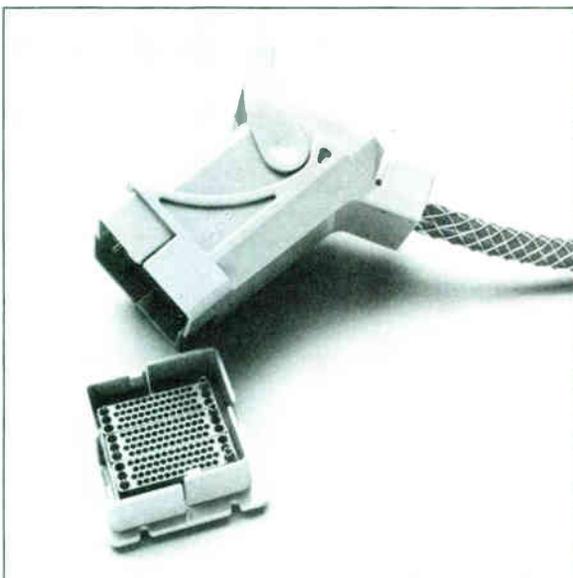
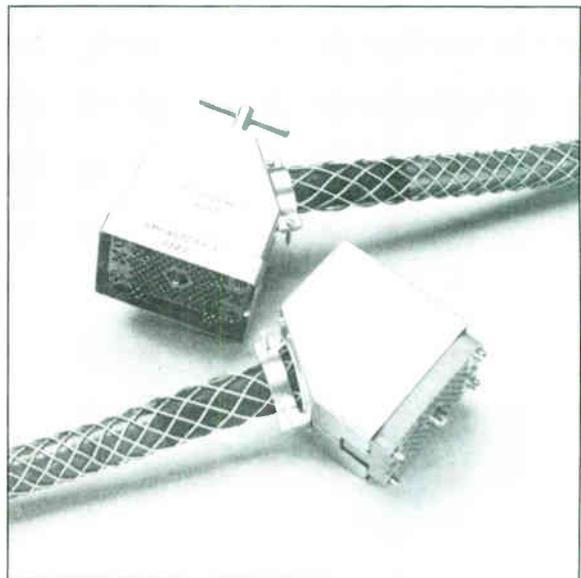
An Illustrated Guide to Interface and Cabling Systems

by Jim Bonis

ALL PHOTOS BY BOB MARTIN & CHRIS MAGGIO

lems in modern sound systems are not in the walls of expensive amplifiers and high-tech gear. They happen in the interface. In layman's terms, the headaches occur most often in the cables used to hook the equipment together. Guitar cords, mic cables, multi-conductor snakes, speaker cables, and electrical lines are the critical links in the chain. Lose one of those links, and the consequences can be very costly. A solid understanding of the mechanics of wiring often makes the difference between success and financial disaster.

In the meantime, the engineer is still trying to isolate the source of the



Multi-pins save time with fast, reliable connections. Four examples are shown here (clockwise from upper left): Cannon MASS connector, AMP connector with twistpin, military type multi-pins, and AMP Latchlock connector.

buzz. He has to find it quickly before the band/promoter/crowd hold a lynching party right above the mixing platform. In order to eliminate a noise, you have to figure out where it's coming from. This is not always an easy thing to accomplish. The best way to avoid cable problems is to do it right the first time.

A cable system is only as good as the weakest cable used. The snake running from the stage to the mixer may cost thousands of dollars. If the guitarist's instrument cable shorts out, the result is still a crackle in the system. Consequently, many live sound companies carry spare instrument cables to compensate for musicians who abuse their cords.

High impedance instrument cords are sold in every style imaginable, and you can often tell who the serious players are by the type of cable they use. A continual source of amusement for audio engineers is musicians who spend thousands of dollars on equipment, yet use the cheapest cables they can find to link the system together.

There are three primary things to look for when selecting instrument cords. Number one: a durable outer shell. Genuine rubber has always been considered the best, but a number of space-age synthetic resins are closing the gap in performance and durability. Number two: heavy gauge signal conductors. The heavier the wire, the less resistance. In high-impedance lines, high frequency loss is always a problem when running more than 20 feet or so. Using an 18-gauge center conductor makes this

A continual source of amusement for audio engineers is musicians who spend thousands on equipment, yet use the cheapest cables they can find.

much less of a concern. Number three: adequate strain relief. Most cord failures occur just above the point where the cable is soldered to the connector. This is usually caused by the cord being pulled by the cable rather than grasped by the plug.

Unfortunately, most strain relief designs don't prevent a pull on the cord from being passed directly to the solder joint. This had been a problem for quite some time, with no manufacturer being able to significantly improve on the design of the standard 1/4-inch phone plug.

In 1986, Whirlwind introduced The Leader,[™] which features a tri-lock clamping system that prevents a pull on the cable from stressing the solder joint. Additionally, the molded flexboot covering the connector extends two inches up the cable and eliminates the sharp bend that ruins so many other cables.

Making sure that the performers' mic and instrument cables are functioning properly is an important part of getting clean audio. Placement of cables away from AC lines and noise-generating equipment is another big

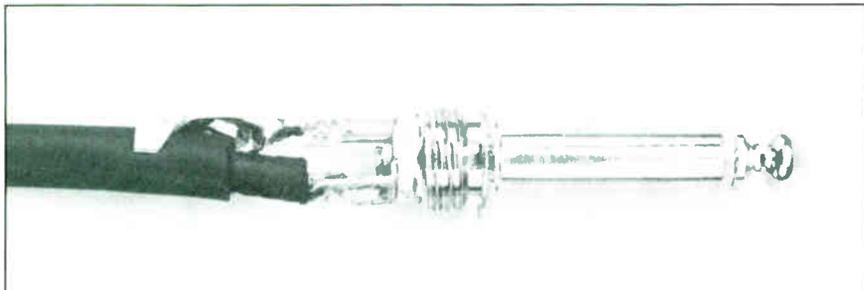
factor. Carl Cornell, a system design engineer for Whirlwind, encountered many problems of this nature during his ten years of concert sound reinforcement with several national acts. "A lot of EMI [electro-magnetic induction noise] gets picked up by poor cable placement," Cornell advises. "You don't want to run microphone cables alongside AC lines if it can be avoided. If a signal line has to cross a high-power line, always cross them at right angles. The same applies to studio layouts. Try to keep at least a foot of space between power cables and line level cables."

Lighting cables and dimmer packs are another common source of hum and noise. Lighting hum can be reduced by keeping sound and lighting systems on separate circuits. In small clubs, the audio gear often is run off standard 120-volt wall outlets. The engineer setting up should make sure that the outlet is not tied to the house dimmers. The same goes for studios with elaborate, dimmed track-lighting. Make sure that any audio gear is connected to a separate circuit.

Tracking the source of a noise can be a time-consuming adventure. If the snake system used does not have independently isolated ground wires, it can be next to impossible. A typical scenario goes like this: the sound system works perfectly during the soundcheck. Two hours later, when the engineer brings up the faders before the band is to go on, he hears a mysterious buzz. Normal procedure is to solo or turn down the individual channel faders until the offending channel is identified. However, if the ground wires in the snake are not individually isolated, the hum on one channel may appear on all channels. If the engineer can't identify the channel where the hum or noise occurs, then *each* instrument, amplifier, or electrical connection must be checked.

For example, the bass player decides to use his new AC powered effects board. He plugs it in after the soundcheck, but instead of plugging it into the same AC outlet as his amp, he plugs it into a wall outlet that is powering a couple of neon beer signs. The result is a ground loop which generates a low frequency buzz. In a snake system using separate ground wires for each channel, the buzz shows up on just that one channel. The engineer can identify it immediately. In this case the problem is solved by plugging the effects board into the same AC powered circuit the amp is on, thus eliminating the ground loop.

Individual grounding is even more of an issue when using multi-pin connectors. Each balanced line in a snake

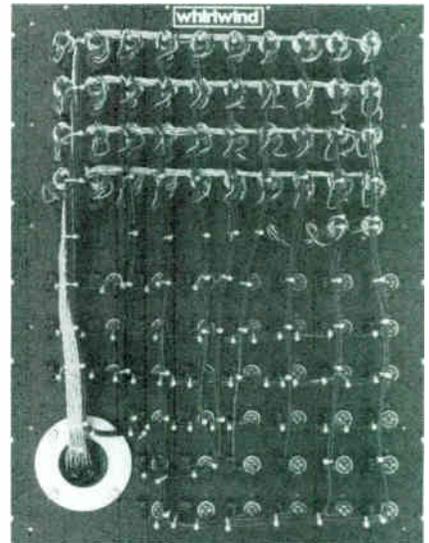
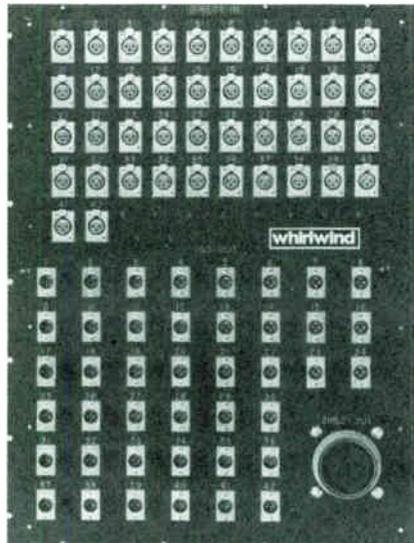


Standard 1/4-inch plug offers minimal strain relief (top photo), while newer designs, such as the one shown below, include improved cord clamping systems for longer cable life.

Custom stage splitter box includes female XLR mic inputs wired in parallel to direct out multi-pin (to feed house console). Transformer-coupled male XLR outputs (with individual ground lift switches) provide isolated feeds to stage monitoring system or recording console.

system consists of three conductors, a "hot" lead, a "cold" lead and a ground wire. Consequently a 24-channel system needs a multi-pin connector with 72 pins. Several manufacturers have elected to use a common ground for all of the lines. In this case, a 24-channel system would need only 48 pins for the hot and cold leads and one additional pin for the ground. Under ideal circumstances, this works. Unfortunately, little in the sound reinforcement industry takes place under ideal conditions. Multi-pin systems with individually isolated ground wires cost a bit more, but are really the correct way to construct snake systems.

"Multi-pins are a crucial time saver," notes Whirlwind president Michael Laiacona. "You have to use them in mobile systems. One 172-pin MASS connector can replace 56 XLR connectors. You can make a multi-pin connection in seconds, whereas indi-



vidually connecting each plug would take quite a bit of time. There are three things to remember when selecting multi-pins. Number one: make sure there are sufficient contacts to accommodate individual ground wires for each channel. Number two: all connector components, (housing, block and contacts), should be made of durable materials. Gold plating on the contacts, while offering a slight conductive advantage initially, is not rec-

ommended for connectors that are to be mated and unmated frequently. The gold wears off and the result is a contact inferior to the tin usually used. The third is quick and positive mating of the connectors: fine mating threads take a fairly long time to connect and can strip easily if cross threaded. A stripped multi-pin is useless."

Multi-pins are the heart of any interface system that is to be rapidly set up or taken apart. They are fairly expen-

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sive. While a single multi-pin can replace many XLR connectors, they are an incredibly labor-intensive assembly. When used in the proper applications, they can save a great deal of time and are well worth the cost. In permanent installations, however, it is better to use directly hard-wired panels and cables. The fewer the connections a signal passes through, the less chance there is for a dirty contact and subsequent signal loss.

Keeping several thousand feet of cable untangled is no small chore for a concert sound reinforcement crew. Reels make the job easier and are essential for keeping the cables intact during transit and facilitate rapid set

up upon arrival. When running a long cable run on a reel, it is best to use a multi-pin connection to the stage box. The alternative is to have the stage box dragged across the floor every time the reel is wound up. When the amount of cable varies from night to night, use a reel with a split divider, for example, placing the first 100 feet on half, the second 100 feet or so on the other.

Another point to consider is the amount of signal loss is directly proportional to the distance it must travel. If the setup varies nightly, it is better to use a different length snake for each job, if it can be afforded. There is no point in running a signal through 250

feet of cable if only 50 feet is necessary to reach the mixing board.

The area probably least understood in interface systems involves the placement and use of isolation transformers. Transformers are necessary when one signal is to feed two or more sources. This occurs when a single microphone is plugged into a stage box and then split to a house and monitor feed.

If a "Y-cord" is used to split a low impedance signal, several undesirable things can happen. Since the mic is no longer loaded properly, its frequency response and pickup pattern can be drastically affected. Additionally, the two mixer inputs end up driving each other with the microphone serving as a jumper. In such a setup, raising the mic level on one board will cause the level to drop on the other, and vice versa. Thus, mixing becomes a real challenge as the house and monitor engineers must keep compensating for each other. By dropping the gain on the house board, the level on the monitors can rise into the feedback range.

One popular misconception is that top quality mixing boards won't interact this way. With the current trend towards electronically balanced inputs (rather than transformer coupled inputs), transformers in the splitting snake are essential. When doing multiple splits off a single source, i.e. a house feed, a monitor feed, a recording feed, and a broadcast feed, transformers must be used at each juncture. Any time a balanced signal is split, a transformer needs to be used to isolate the two sources. When using phantom powered microphones, make sure that the console providing the phantom power is on the direct line. Phantom power can't pass through a transformer.

Ideally, one should make sure all cables are intact before placing them in the systems. An ohm meter or continuity tester may suffice, but the quickest way to check them is with a visual cable tester. Several different models are on the market, but make sure that the unit selected has LEDs bright enough to be seen under a variety of lighting conditions. These devices are well worth the money, and can save a great deal of time when troubleshooting.

Ultimately, any system is only as good as the cables that link it together. ■

Author Jim Bonis is general manager and vice president of marketing for Whirlwind, and also owns a Rochester-based sound reinforcement company.



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—FROM PAGE 21, CD VIDEO

CD-V combi-player will play existing LV discs. In the NTSC format, discs may be encoded with both analog and digital sound, thus CD-V discs will be playable on existing LV players, with analog audio circuitry.

The program material for these formats will focus on video classical music, and feature films. Philips and partner Warner Communications hope that the collectibility and ownership aspects of CDs carry over to feature films on CD-V. The growing sales figures of prerecorded video tapes (75 million unit sales in the U.S. during 1986 versus 53 million during 1985) support the conjecture.

In addition to the CD-V combi-player playing all four optical disc formats, Philips envisions a CD-V-dedicated player, able to play only CD-Audio and CD-V Single discs; one imagines a small portable player, with pop-up LCD screen. Also, CD-V Single boom boxes inevitably should appear. CD-V players will use audio circuitry identical to existing CD players including, for example, 16-bit D/A converters and 4-times oversampling digital filtering. Features will encompass those of both CD and LV players, such as programmability, picture search, fast/slow motion, stills, speed increase/

decrease, etc. Although primarily using constant linear velocity (CLV) scanning, CD-V also provides for constant angular velocity (CAV) scanning. Future enhancements call for CD-VHD high definition picture, CD-I controllers, dual language software, the possibility of Dolby Surround Sound encoding, and use of copy-guard encoding as well. To increase the hardware base, Philips has already signed agreements with Matsushita and Yamaha to manufacture and market CD-V players and OEM CD-V chips.

From a manufacturing standpoint, CD-V discs must be mastered on a dual speed lathe, using video from a one-inch C-type machine and audio from a 3/4-inch U-matic machine, synched with time code. The high bandwidth of 10 MHz (versus 1.5 MHz for CD-audio) necessitates manufacturing procedures closer to those of video discs as opposed to audio CDs. Initial production will occur at the Philips-owned PDO Blackburn, England videodisc plant; however, CD-V discs will subsequently be manufactured at other CD plants.

Price? CD-V Singles should initially retail for about \$8, the combi-player for about \$750, and a dedicated player for about \$500. Of course, as with most new formats, prices should decline.

CD-V thus takes its place in the growing CD family lineup. First there was CD-audio, then subcode was added (but never commercialized). Now the CD-V player adds video playback to CD-audio. The next step will be the CD-I player backward compatible with CD-audio, but adding audio/visual interactivity. Finally, the so-called "CD-VI omni-player" will be introduced, able to play the complete family of discs: CD-DA, CD-V, and CD-I.

In very direct terms, the compact disc thus carries the audio industry into the very diverse markets of video and computer applications. Soon, with technology such as the CD, the distinctions between these fields, and the expertise of the practitioners, will become blurred indeed. Certainly, in terms of professional challenge, and new market potential, the audio industry will welcome the introduction of CD-Video. ■

Ken Pohlmann is an Assistant Professor of Music and heads the Music Engineering Department at the University of Miami in Coral Gables. Author of Principles of Digital Audio and The Compact Disc Handbook, he works independently as an electronics and acoustics consultant, recording engineer, and technical writer.

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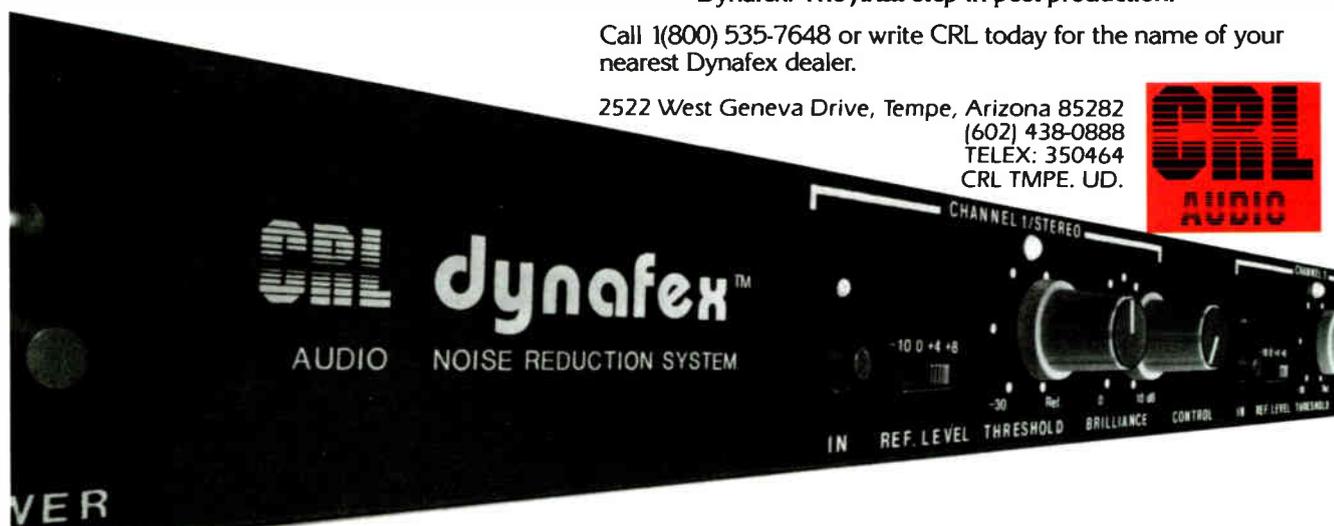
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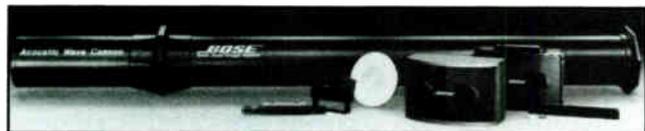


G R E A T C O M P A N Y

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P R E V I E W



Bose Theater Loudspeaker

The Bose Corp. (Framingham, MA) has developed a new speaker system that provides extremely low, clean bass frequencies at high sound levels. The Acoustic Wave Cannon (AWC) bass system, according to Bose, features lower size, weight and cost than conventional bass horn cabinets. Instead of using traditional speaker cabinets, Bose has designed a single, low-frequency driver into a precisely tuned waveguide with a tubular shape. Approximately 12 feet long and under 70 pounds (including 12-inch woofer), the unique AWC installs unobtrusively. The Cannon is part of the new Bose cinema sound system, a modular configuration of audio components that are computer-designed to match the acoustics of any particular theater.

Circle #040 on Reader Service Card



AMR SyncController

The new SyncController from AMR (Meridian, MS) is a SMPTE time code-based synchronizer/controller that can lock together two audio or video tape machines. It generates all SMPTE code formats, and provides MIDI clock and song position pointer for synchronizing MIDI instruments and sequencers to a tape machine. The system also controls transports and stores 99 programmable events. One can assign even cue points as punch-in and punch-out points, or loop-begin and loop-end points. Other features include jam sync capability, a "beep" tone to help rehearse punch-ins and outs, an LED display of complete information and studio quality performance at an affordable price. Software-based control allows the SyncController to work with a wide range of tape machines.

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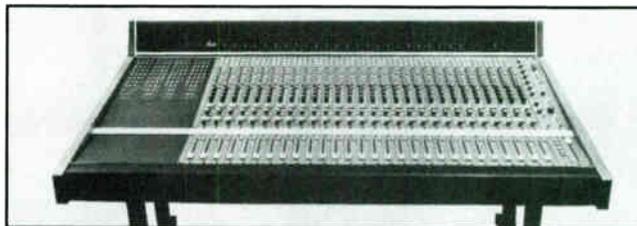
dbx Professional RTA

The RTA-1 Real Time Analysis System from dbx (Newton, MA) is an instrumentation-quality, 1/3-octave spectral

analyzer that computes the frequency response of a device or room, using music signals or its own uncorrelated pink noise. Its many applications include concert venue or sound system installation analysis, loudspeaker testing, on-line comparisons of tape machine performance and fast, accurate measurements for audio or acoustics labs.

The menu-driven RTA-1 interfaces with PCs, offers averaging peak-hold modes along with multi-memory storage and manipulation and includes industry-standard, color monitor output and printer ports. Other features include easy operation, built-in mic preamps and phantom power supply, two pink-noise generators, broadband analyses with A, C, or CCIR-ARM weighting, user-selectable dynamic range and accumulation with variable time constants.

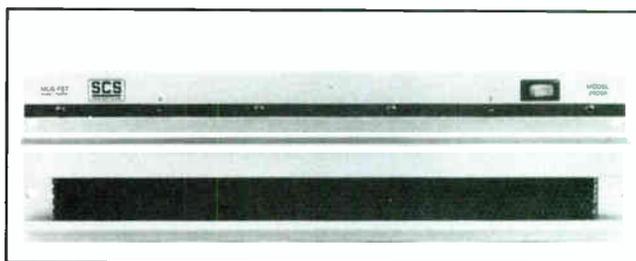
Circle #042 on Reader Service Card



NEOTEK elan Console

NEOTEK Corp. (Chicago) introduces the "elan" recording console. Each of its input modules provides mic- and line-level inputs, 4-band sweep equalizer, six auxiliary sends, assignment to 24 multi-track buses, and bar graph meter. The elan's oakwood frame accommodates 28 or 36 module positions. Each module can accept a second input, increasing capacity to up to 72 inputs and 30 aux buses in a frame six feet wide. Standard features are gold multi-pin I/O connectors, leg set and full patchbay. Many options are available, including fader modules that provide logic mute groups with in-place solo, MIDI Direct console mute automation, or built-in Audio Kinetics, Digital Creations, or Massenburg automation systems. A basic 28-input elan lists for \$29,500.

Circle #043 on Reader Service Card



SCS MOS-FET Amp

The Sound Code Systems (Garden Grove, CA) Model 2600A MOS-FET audio amplifier is designed for long-term, heavy duty applications, and delivers 600 watts per channel into four ohms (both channels driven). Slew rate is 70 volts per microsecond. The 2600A's design optimizes MOS-FET output device advantages to increase reliability.

—CONTINUED ON NEXT PAGE

—FROM PAGE 85, PREVIEW

ity, performance and cost-effectiveness. Automatic 2-speed fan cooling coupled with a "tunnel-type" heat sink enhance reliability. The 3-rack space unit features an extruded aluminum front panel (which doubles as a handle) and aircraft-grade fasteners for extreme ruggedness. Balanced XLR inputs, 1/4-inch inputs, input level controls, 5-way binding post outputs and AC circuit breaker are rear-mounted. Other features include a user-serviceable/easy-access air filter, and a 2-year warranty. Suggested list price is \$1,099.

Circle #044 on Reader Service Card



Richmond Theater Automation System

The Command/Cue 4096 Automated Control System from Richmond Sound Design (Vancouver, Canada) is a user-friendly system providing immediate real time and memory control of volume levels and automatic timed fades. Two auxiliary analog switches can control over 8,000 devices (audio assignment switches, tape machines, CD players, slide projectors, video gear, lights, motors, etc.), along with full-range control of 4,096 faders. The system's disk-based software can be customized for any particular application, whether live or A/V theater or industrial/commercial systems with dedicated configurations requiring widely distributed, real time control.

The basic Command/Cue 4096 system consists of an Amiga computer with keyboard, mouse, dual disk drive, color monitor, interface expansion box and a card frame containing any variety of digital automation, analog audio processing and power supply modules (e.g., 8-channel digital control amp, auto-panner, and master fader, EQ control circuit, audio mixer/amplifier, etc.). A basic theatrical, 16-input, 8 x 8 matrix system retails for under \$11,000. A full-function demo disk for the Amiga is available for \$15. Distributed in the U.S. by Full Compass Systems (Madison, WI).

Circle #045 on Reader Service Card



Fostex Multi-track Cassette/Mixer

The new Model 460 from Fostex, according to the company, is the first multi-track cassette/mixer that can synchronize with video recorders—as well as other audio

recorders. The 460's mixing section contains eight inputs (XLR connector, phantom power, stereo send, solo and parametric EQ on each one), four bus outputs, 4-channel bus stereo mixer, selectable monitoring, switchable bargraph metering and easy-access patch points. The recorder section features a 2-speed transport with separate record EQ for each speed, Dolby B and C NR, 2-position autolocate, zero search, auto repeat and SMPTE/EBU sync capability. Suggested retail price, \$2,495.

Circle #046 on Reader Service Card



Celestion SR Speakers

Celestion (Holliston, MA) presents the SR Series, a full-range sound reinforcement system comprised of a pair of 8-inch integrated dome/cone drivers, mounted side by side in a rigid enclosure. According to Celestion, their "laser-optimized" driver produces uniform dispersion across the 50 to 20k Hz frequency band, and eliminates phase and time-coherence problems by not using separate tweeters, compression drivers and crossovers. For protection from thermal or mechanical breakdown, the system uses an integral electronic controller to monitor amplifier distortion, voice coil temperature, and cone excursion. Maximum power rating is 1,000W RMS per cabinet. These compact cabinets are made of rugged glass-fiber, reinforced polypropylene, fitted with flexible mounting hardware for easy integration with any type of installation.

For more low frequency power, the modular SR-2 subwoofer, equipped with an 18-inch driver, handles 1,000W RMS and reproduces 40-150 Hz frequencies.

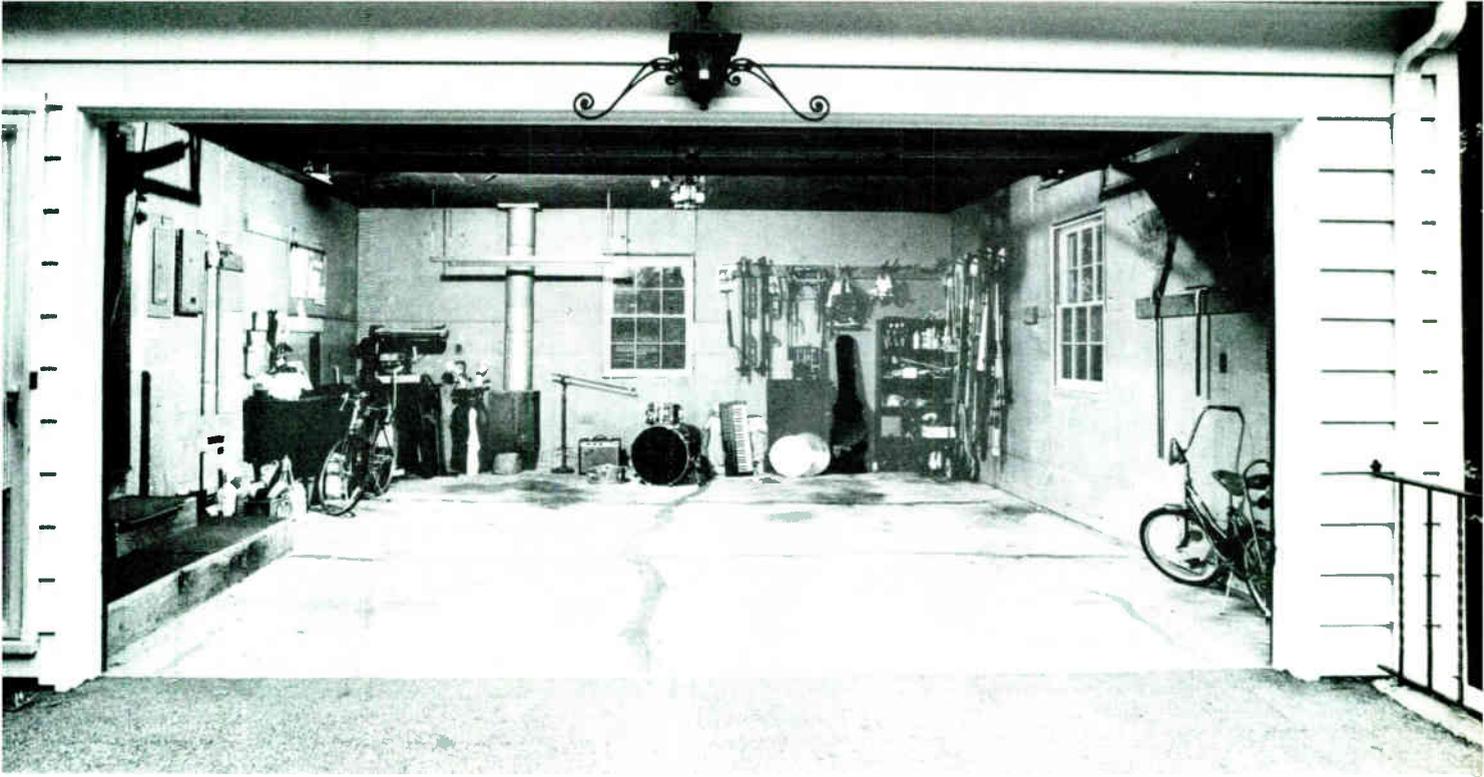
Circle #047 on Reader Service Card



McCauley Compression Driver

McCauley Sound (Puyallup, WA) debuts Model 6510, a one-inch, high frequency compression driver. Designed for 2- and 3-way systems requiring extended high end response, the 6510 features a titanium diaphragm, flat response to 17.5k Hz, 100W RMS rating about 12k Hz and a field-serviceable replacement diaphragm assembly. The 6510 carries a 5-year limited warranty.

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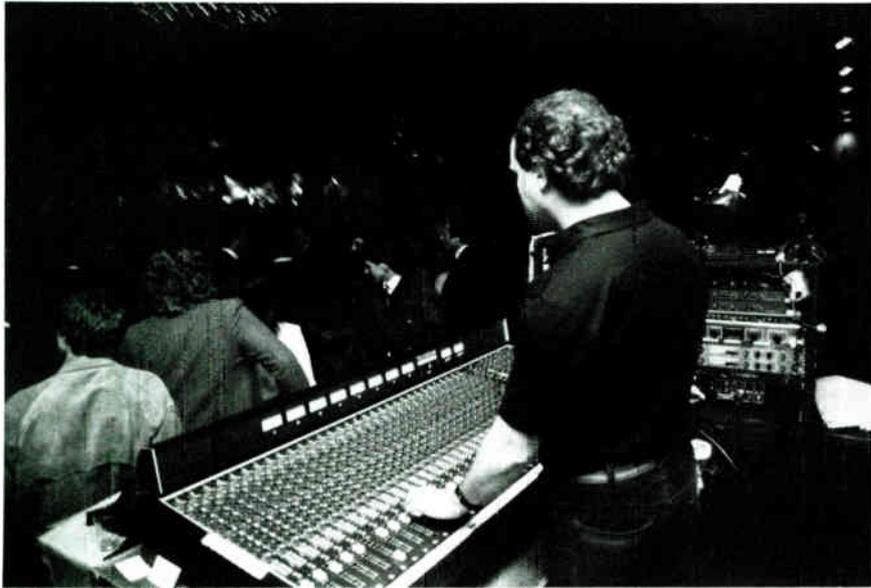
Now that tape machines (most of which use dbx noise reduction), mikes and consoles for home recording are better than ever, doesn't it make sense to complete the cycle with professional signal processing from dbx? After all, the better your demos are today, the less you'll have to wait until you can get your recording out of the garage and into the studio — where it belongs.

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PHOTO: GEORGE PETERSEN



Third Ear's David Trinchero, mixing the post-Bammies celebration on the 8000.

useful, offering detailed descriptions of all modules—both standard and optional—as well as troubleshooting and minor maintenance procedures.

Operationally, the 8000 is logically laid out, with the controls pretty much where you'd expect them to be, so I was able to get down to the business of mixing right away, with a minimum of confusion. Such attention to design is bound to be appreciated by engineers who have to mix on the board for the first time. Another nice touch is the liberal use of detented, 41-position pots throughout the board, including input trim, EQ, and aux sends. These controls not only have a quality feel, but also offer the luxury of precisely

SOUNDCRAFT 8000

Sound Reinforcement Console

by George Petersen

Last year, when Soundcraft announced they were replacing their 800B sound reinforcement console with the 8000 series, I was curious about what direction these new models would follow. The 800B had proven itself to be a dependable workhorse and has been a popular choice among mid-sized sound reinforcement companies over the years. Like the 800B, the 8000 is available in 24-, 32-, and 40-input versions; I had the opportunity to test drive a 32-channel model for several weeks.

The first thing I noticed when the

6-foot carton arrived was the unit's 200-pound weight. The 8000 uses the same extruded aluminum mainframe as its predecessor, and Soundcraft wisely chose not to cut any corners in this area—the console has a solid feel, and the decision to retain that time-tested frame was a good one. After all, why argue with success?

Next, I unpacked the accessories box, containing the rack mount power supply, a very long PS-to-console interconnecting cord, spare fuses, ribbon cable extender for troubleshooting modules, vinyl dust cover and user manual. I perused the manual, looking for set up instructions, which it did not contain; fortunately, the 8000 is fairly simple in this regard. However, the power supply has a row of six unmarked LEDs (I assume these indicate the operating status of various power supply rails), which is unexplained in the manual, and these turn off in a strange order when powering down. To make matters worse, the manual lists the wrong address/phone for Soundcraft USA on the opening page. Despite these deficiencies and a few other quirks, this 50-page book (with another 15 fold-out pages of schematics and flow charts) is very

repeatable settings for night-after-night touring applications.

The most striking change between the 8000 and its precursor is the EQ section, now 4-band fully parametric. A three-position switch provides bandwidth control, the degree of which is indicated on the console as three different shaped peaks ranging from narrow to broad. The actual bandwidth—also known as "Q"—of the network is never defined and the manual only includes blank spaces where the Q values should have been. However, whatever these values may be, the 8000's EQ section is fast, versatile and highly musical. The importance of having quality input equalization on a sound reinforcement board cannot be overemphasized, and the 8000 gets high marks in this area.

The auxiliary sends section was also considerably upgraded by the 8000's designers. Rather than four pre-fader and four post-fader controls (as the 800B offers), the new console incorporates four pairs of concentric controls with a pre/post/off switch on each pair for greater flexibility. Obviously, the use of the concentrics was a space saving measure, and they do

—CONTINUED ON PAGE 93



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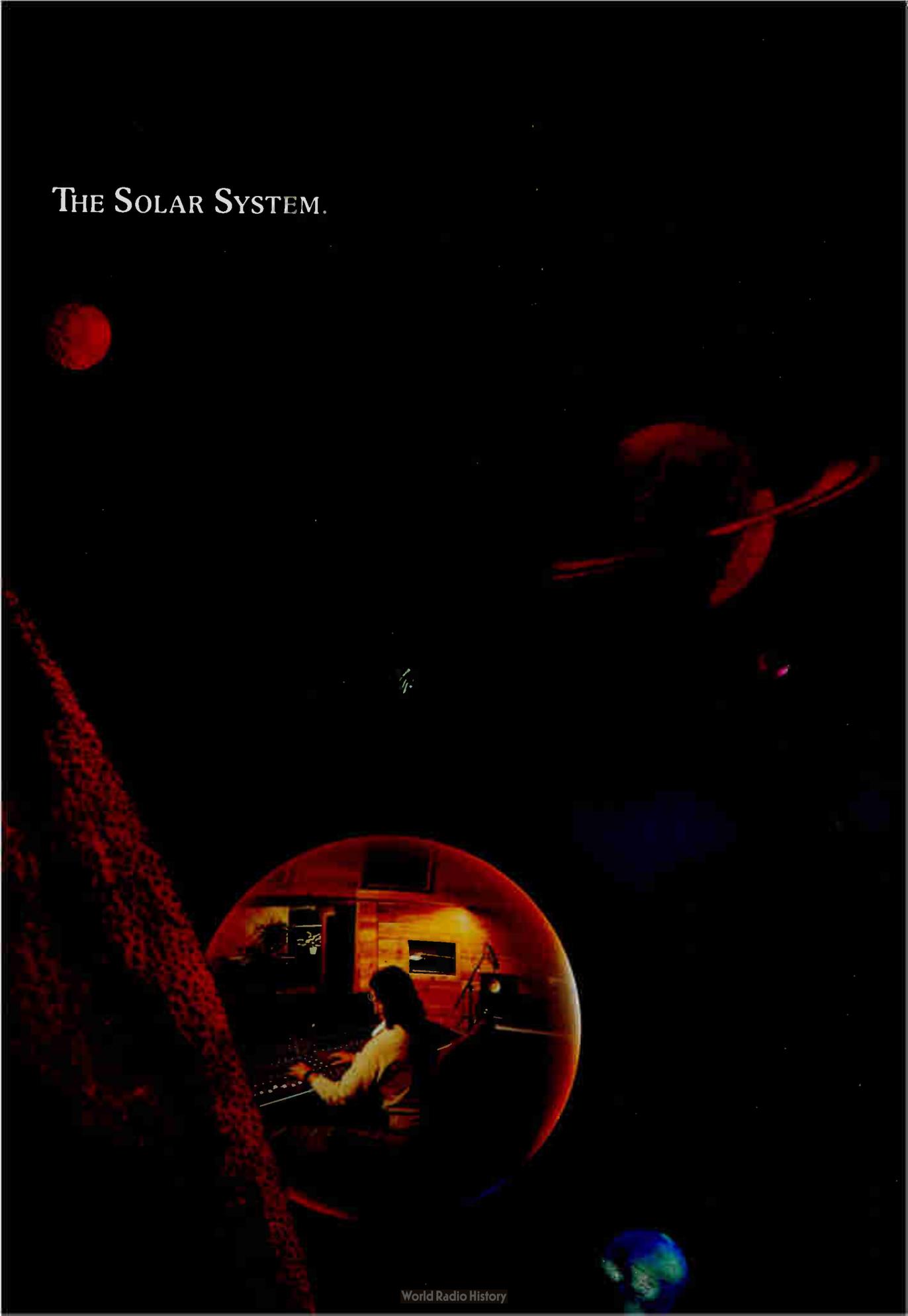
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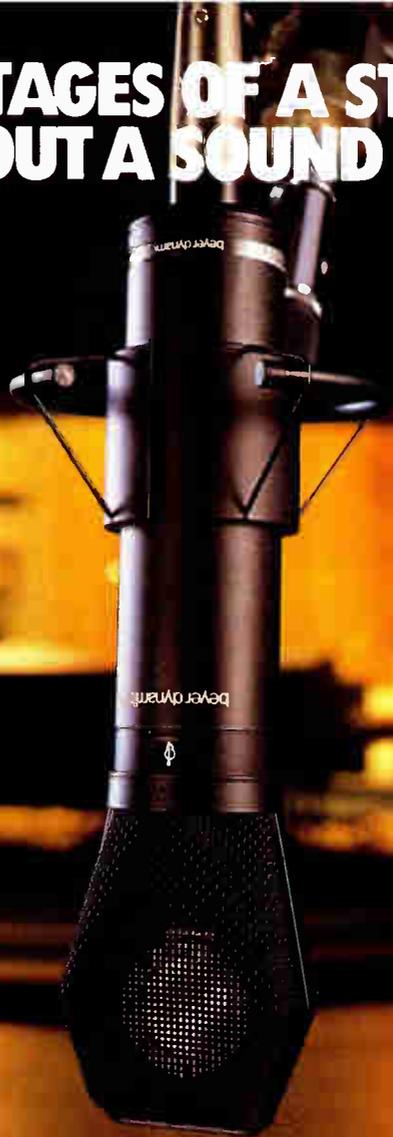
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Photographed on location at Clinton Sound, New York, NY

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Circle #049 on Reader Service Card

World Radio History

—FROM PAGE 88, FIELD TEST

take a little getting used to, but I found that assigning my most commonly adjusted effects to the odd-numbered sends (the upper controls on the concentrics) made the transition much easier.

Besides the usual features one would expect to find on a console in the 8000's price range—such as phase reverse, phantom power, high pass filters, parametric EQ and eight effects sends—the console also incorporates a lot of little touches which make life on the job a lot easier. LED indicators are used extensively, so operating status can be monitored quickly, at a glance: for example, each input module has 16 LEDs for displaying status of high pass filter in/out, EQ in/out, pan/mix, subgroup routing, mute, PFL (solo), channel active and overload. The channel input can be routed to any of the eight subgroups with panning between any even and odd numbered groups. The master modules contain a wideband 45-15k Hz oscillator; talkback section with routing to the main mix, subgroups or to a series 8000 monitor board via an internal/external switching system; two sets of stereo mix output faders—one set can be switched to mono sum if required; and a cassette level control. The latter routes a stereo balanced

line input signal to the main mix outputs and is a useful addition for playing pre-show entrance music without having to use console inputs or effects returns for this purpose.

Overall, I was quite pleased with the performance of the Soundcraft 8000, both sonically and ergonomically, but I wanted to get another opinion. I contacted David Trinchero, the engineer and co-owner of Third Ear Sound, a nearby sound company, to lend his expertise. Third Ear began in 1974, and over the years has worked with a wide range of clients ranging from Eddie Money and Sheila E., to Translator and the Gil Evans Orchestra. Since Third Ear owns an 800B console, and was about to do sound for the post-show party for the 10th Annual Bay Area Music Awards (Bammies), this occasion (featuring performances and a jam session with local luminaries for a packed house of 1,500) was perfectly suited for the test.

After the gig (which went flawlessly), Trinchero offered these comments: "Obviously, the most impressive thing about the board is the EQ. It's 100 times better [than the 800B] in every way—the switchable parametrics really open up your ability to EQ, and the fully sweepable 8000 is much improved over the two fixed/two sweepable EQ on the 800B. I liked the way

they set up the 8000's sub assigns, with the pan and mix outs, and the LEDs make it easier to see what you are doing.

"I wasn't very excited about the concentric effects sends," Trinchero explains. "A lot of the boards available today use them, and I find they can be confusing. But once you're used to using the board, you'll know exactly what you're doing, although a sound person coming in to mix a show on someone else's console could get lost in the concentrics. Other than that, the board was really nice, and having the extra set of auxiliary left/right master out faders is very useful. Somebody always shows up and needs an audio feed for a video camera or an audio cassette, and having a control right there is nice."

By making a few much-needed changes in an already successful product, Soundcraft has a winner on their hands with the 8000, especially considering the modest price increase over its predecessor. A 32-input 8000 retails for \$27,950, while a similarly sized 800B was only \$3,000 less. With a wide variety of available options (including matrix outputs, VCA grouping, P&G faders, individual LED input metering, and multi-pin connector), users can configure this versatile performer to suit their own needs. ■



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Little Richard, Born-Again Rocker

by Bruce C. Pilato

"A-wop bop a-lu-bop, a-wop bam boom!"

Coming out of the mouth of Little Richard in 1955, that phrase electrified an entire generation. Over three years in the mid-'50s, Richard Penniman racked up a string of hits that sound as good today as they did 30 years ago. "Tutti Frutti," "Lucille," "Long Tall Sally," "Rip it Up," and "Good Golly Miss Molly," among many others, helped define rock and roll and influenced everyone from Elvis to The Beatles to Prince. With more than 35 million records sold, Little Richard is a true rock legend.

He's thrown it all away a few times.

In 1958, at the height of his career, he tossed his jewels into the Mississippi River and retired to study the Bible. After five years as a preacher and gospel singer, he was coaxed back into rock by British promoters and went on tour with a new British pop group called The Beatles.

Little Richard languished as a nostalgic act, despite having put out two solid albums in the early '70s, until—addicted to drugs and struggling with the lifelong conflict between his homosexuality and his strong religious beliefs—he left rock for the church once again in the mid-'70s. He has remained in the ministry ever since, and for several years he toured the country delivering fire-and-brimstone sermons, singing gospel and denouncing rock and roll singers as "the Devil's evangelists."

In 1984, with the publication of *The Life and Times of Little Richard* (co-authored by Penniman and Charles

White), Penniman slowly began to re-surface. In 1986 he returned to secular music with "Great Gosh A'Mighty," from the soundtrack of *Down and Out in Beverly Hills*, in which he also appeared as an outraged record producer.

Then he was in a car crash and nearly died.

Today, at 57, Little Richard is fully recovered and doing what he does best: singing rock and roll. He doesn't call it that any more; now he writes and sings "message music in rhythm"—rock with positive lyric content. He is still religious, practicing an odd blend of Orthodox Judaism and Seventh-Day Adventism. And he has a new album, *Lifetime Friend*.

His uneven profile has cost him a certain amount of credibility; some have called him an opportunist. On the other hand, no one can deny the importance of the role he played in rock and roll's pioneer days—and for that alone, he will always remain a star.

Mix: While making this album, did you ever worry that you wouldn't be able to live up to your past accomplishments?

Little Richard: I never try to compare them. The mountain of the years back has been built and all that stuff is classic. I was much younger at the time, although my voice sounds as good today. There are so many more entertainers and singers today. The competition is so much heavier.

Mix: What was it like for you to re-enter the recording studio after ten years and experience all the technological advancements? Were you conscious of the new technology, or did you leave that to your producer and engineer?

Little Richard: I was aware of it, but I had never worked with much of it myself. Like with synthesizers, this was my first time. It's so much easier now than it used to be. You must remember, when I recorded my first songs we only had three tracks. We had to use the same microphone for the voice and the saxophone and someone else singing.

Mix: How did you settle on Stuart Colman as your producer?

Little Richard: The album was originally recorded with Jesse Boyce [from Nashville] and Travis Womack [from Muscle Shoals], and I wish they had

done the [final] production. On a lot of things Stuart Colman mixed, he didn't even get in touch with us, because I had been in the car accident. We recorded it three weeks before my accident. Stuart Colman's ear is different than Jesse Boyce's or Travis Womack's or Dan Hartman's.

Mix: Why isn't Dan Hartman credited for producing "Great Gosh A'Mighty"?

Little Richard: He didn't produce it for Warner Bros. He produced it for MCA [for the *Down and Out in Beverly Hills* soundtrack].

Mix: So there are two different versions?

Little Richard: Yes. The one on MCA is much better, to me. This thing that Stuart Colman did wasn't the real record at all. I was just showing him this song that I had in *Down and Out in Beverly Hills* and he slipped it on the album without my permission at all!

I love the song Dan Hartman did. It was fresh. Stuart Colman pulled all that from under me! "Somebody's Coming" matched up to it—that has the same sound quality. You've got to get the sound of today, the sound of Prince and Michael. You've got to compete with these people for the sound, and Stuart Colman wasn't into that.

Mix: You recently said you don't consider yourself a gospel singer. If not, then what are you?

Little Richard: My music is called "the message sound in rhythm." I'm still in the ministry; I haven't given that up. I don't call it gospel like Shirley Caesar or Al Green. I'm not into that, because my audience is the rainbow. It's all races. All my songs must have a posi-

tive message from above about drugs, life itself, and how to live comfortably with all people. That's what I want to talk about. I want to talk about love, about living, peace of mind and eternity. I haven't quit the ministry; I'm still in the ministry and always will be. There's nothing else I want to do.

Mix: Your first recordings were in 1951 for RCA. What happened with them?

Little Richard: I was on RCA before Elvis Presley, in 1951. If you were black, the label was Camden; if you were white, it was RCA Victor. I was singing rock at that time, and they didn't promote those records. After I recorded for RCA, I recorded for a black company out of Houston called Peacock.

Then Specialty Records got me from Peacock. I sent them a demo of a song called "Wonderin'," that I did at WBML in Macon, Georgia. I met Lloyd Price, who was then on Specialty Records, and he gave me the address in Los Angeles to send my tape to.

Bumps Blackwell was the A&R man at Specialty Records, and they sent him down to record me in New Orleans. He said the label wanted me to sing blues like B.B. King and Ray Charles. I sang some blues for them, and then I played "Tutti Frutti" for them. They didn't realize I could play piano. Then they brought me back in and we recorded it. That was the first big hit.

Mix: Some of those early Specialty recordings sound distorted. I read once that they couldn't maintain a stable level on your voice because you screamed so much.

Little Richard: Well, I never heard that before. You see, when I came out there wasn't any rock and roll no place. There wasn't any rock and roll, with black or white people. It was blues, country, gospel or jazz; that's all you heard. When I came out with this wild music, they had never heard anything like it. Everyone was afraid of it. There was nothin' like that. They were scared to take a chance with it. That's why they have called me the originator and the architect of rock and roll. And that's where the "king" thing came from. Before long people started calling me "the king" from all over the country. When Elvis came on The Steve Allen Show he was singing my "Tutti Frutti." It was a strange situation, the way it happened.

Mix: Were those early hits recorded in one or two takes, or did you labor over them?

Little Richard: They was done quick. You couldn't do it any other way or
—CONTINUED ON PAGE 195



Jason Miles: Band Member On Call

by Larry Oppenheimer

Jason Miles' speech is the dead giveaway. It doesn't have that smooth, mellow, L.A. quality, or the nasal twang of Nashville. It's definitely New York: thick like Brooklyn cheesecake and as hard and fast as Manhattan itself. And the company he keeps is certainly high class; his credits include synthesizer programming and/or playing on Miles Davis' "Tutu," Chaka Khan's "Love of a Lifetime," Luther Vandross' "Give Me the Reason," Kool and the Gang's "Forever," Scritti Politti, the Pretenders, David Sanborn, Jennifer Holiday, Jamaica Boys, Grover Washington and on and on.

Yet Miles insists he's not a session musician, and the people he works with agree. "He's not your typical session mentality," asserts engineer/producer Ray Bardani, who has worked on a number of projects with Miles over the past two years. "He's not one of these guys who says, 'Yeah, yeah, OK,' and then gives you some stock preset like you don't know the difference. Jay will go in there and pull his hair out for you—which is good.

"He has a wide variety of things, and he just brings everything. If something new is coming out, Jay has it before anybody. I don't know how or why, but he always does. He takes it upon himself to learn his equipment, so, as a producer/engineer, I can experiment with new things.

"He's pretty loyal to the people he works with: if he's working with me and comes up with an amazing brass sound, he won't go to the next session and put that sound up and say, 'Man, check this brass sound out.' He pushes

THE FAR SIDE

By GARY LARSON



In the early days, living in their squalid apartment, all three shared dreams of success. In the end, however, Bob the Spoon and Ernie the Fork wound up in an old silverware drawer and only Mac went on to fame and fortune.

himself and I know he works hard."

Veteran producer Tommy LiPuma is another fan of Miles': "He isn't just fast, which is important when the creative process is taking place," LiPuma says. "He is very sensitive to what's going on and is able to come up with fresh sounds."

After working with Miles on the Jamaica Boys project, Lenny White hired him to lay tracks for a band White was producing, Tech & the FX. "Jay gives me an extensive library of sounds to choose from, and I can use those sounds in a lot of different contexts," White explains.

"He came up with some real good ideas for a tune we were doing ["Primal"] which is based on African chants. He contributed the African chants that we used. The part was actually a guest appearance by a band from Africa, and Jay came up with some real good ideas for getting this band to mesh with today's sounds."

Still, with all that going for him, Jason Miles' biggest asset seems to be his ability to fit into a situation comfortably and keep things relaxed. "Jay just seems to be different from everybody," says Bardani. "People can get crazy at the sessions, but he hangs pretty well with everybody."

Miles is aware of his individuality, and uses it to keep the atmosphere at

a session easy. "I try to loosen things up all the time; I've always got a story about something. Basically, people know that I'm a little quirky. Marcus said to these guys from England, 'Jay's an American, but he's a different kind of American.'

"The other night we did the Miles Davis remix of 'Full Nelson.' We did overdubs for four hours, really working on getting them to sound good—spaced out, crazy stuff, you know. That's when I really go out and get into my other personality, the weird guy from Brooklyn who's in outer space half the time. They love it. Sometimes I have a Brooklyn accent. [Sometimes?—L.O.] I'm in the studio with Marcus and I go, 'Hey Marcus, I gotta talk to you about 'chu loya,' and Marcus goes, 'Yeah, tell me about my loya.'

"They're always getting on my Brooklyn groove, but as we're working, I find that if they're getting onto me like that, that means that it's really cool. If they're gonna jive on me and have a good time, I'm gonna come back on them and all, but it means they like what I'm doing. If they didn't, they'd go, 'Yeah, yeah, OK. Let's go on.'

"Basically, my thing is rolling with the punches. Marcus Miller is a keyboard player, too, and a really good one at that; he plays parts great and he hears the parts in his head. There-

fore, I don't even approach him about playing parts, because he plays everything he needs to play on his songs. In the beginning, when we first started working together, he was playing a lot, but when he saw the sequencer work... Now, we sequence a ton of stuff and fly with it all in.

"For different projects with different musicians, you try to see where they want to go. If it's a remix, I'll know that I have to bring out some stuff that's totally out of left field, they want my suggestions as far as where it should be with the sound. Most of the people you do remixes with are going to want a lot of samples and extra percussion.

"I like somebody throwing a curve at me. The whole thing is trying to immediately envision what these people want. Lenny White doesn't want to hear Rhodes sounds, he wants to hear something from Planet Z; Marcus Miller is a combination of both."

Miles' ease in different musical situations comes largely from his well-rounded musical background. "I've been a musician my whole life: I played accordion when I was six, then I got into the piano, then I played in rock bands, blues bands, studied classical piano with a master piano player in New York, studied bebop with a brilliant piano player, Mike Malila, who lives in Italy now, and hung out in



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MUSIC TECHNOLOGY's Paul Wiffen had a great time mixing colors with the ESQ-1's 32 on-board waveforms and 3 oscillators per voice. "After a few minutes of twiddling, you can discover that, for example, an analog waveform can make the piano waveform sound more authentic, or that a sampled bass waveform can be the basis for a great synth sound. Fascinating stuff!"

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New York checking the music out totally. So when I go and do a date, you're not talking to some guy who's a tech-head, you're talking to a guy who's a musician, a writer and a producer."

In the early '80s, Miles performed with New York fusion artist Teru Nakamura and recorded his own album, but "I found that being a good producer and a good writer doesn't matter in this business, which has a very heavily political vibe. So the way I had to do it was to break into the studios more—but synthesizers hadn't really taken over. Then I got a DX7, and all of a sudden things started changing: 'Whoa, bring it to the studio! Whoa, do this, do that!' And then MIDI happened, and, man, I was really into MIDI."

In 1986 Miles got the call from Marcus Miller to do synthesizer programming for Miles Davis' new album, *Tutu*. "Miles is a legend. Every record he's ever made, I've bought. He saw that there was something crying out for a direction, somebody had to lead the way. Miles always set the direction, but he surrounds himself with people who pick up on what the direction is. It was like that on this record: Marcus had this idea of a canvas and of what the painting should be: a lot of pastels and colors and textures.

"Some of *Tutu* was sequenced, some of it was played by Marcus. Some of it was enhanced with other musicians just for a little brightening up. Miles trusted Marcus, and Marcus really hit what his (Davis') direction would be. Miles listened to Marcus' stuff every day, and if he didn't like something, he'd tell you. He's an extremely sensitive musician.

"One night, we put the bass clarinet up on the Emulator and Marcus was listening to Miles play, and he started doubling some of these lines. All of a sudden it just came together for me what the thing is with Miles, man. It's how Gil Evans wrote stuff around Miles' lines: when Marcus doubled Miles' lines, it sounded like he was playing in an ensemble and Miles wrote all this ensemble stuff, but it was just purely impressionistic things out of his mind. It was really deep."

Of course, the only way Jason Miles can control his elaborate setup is through mondo MIDI. Although he experiences his share of problems with it, Miles is a firm believer. "MIDI is a lot of the reason why records are sounding better, why even jingles are sounding better," he says. "Everybody's into it. Six or seven years ago in New York I had a Prophet-5, and some people put me down, saying, 'Oh, man, he ain't playin' the changes,' or 'He's turn-

in' knobs and everything.' Now, I know guitar players, drummers, bass players, saxophone players—you don't know how many horn players have called me about helping them put together MIDI systems in their house to write with.

"'Drum machine!' they say, 'I gotta get a drum machine!' And years ago they said, 'Oh, they're replacing drummers, oh, forget it.' That's not the case; people are writing with the stuff. If you [the artist] want a drummer, you're gonna use a drummer. Look, Luther [Vandross] brings Yogi Horton with him all the time, because Yogi gives him the feel. You're not gonna replace the feel of a real drummer, but to sit home and write a song, you gotta have a drum machine these days. You gotta have a MIDI setup."

Interestingly, Miles does not like using a computer in the studio. "I'm seeing people bringing computers into the studio, and I can appreciate that, but I think when you try to get the flow of a date going... everytime I see somebody with a computer it's always slowing down the date. Dedicated musical hardware like sequencers speed the process up, but the only thing that I'd like to have a computer in the studio for is maybe to have my files down and be able to know, 'Oh, this is my Matrix 12, and this is what I have for

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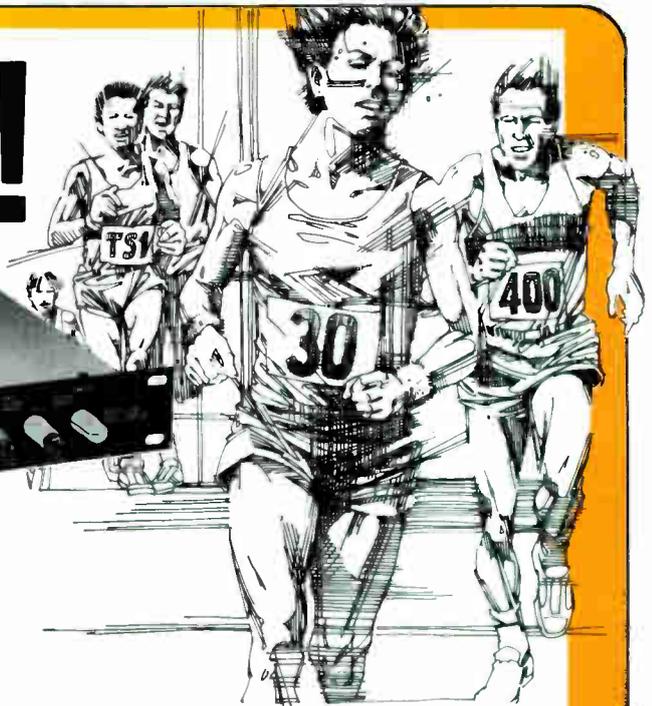
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the PPG, or this is my librarian for the DX7.'

"I know that Roger Powell's stuff [Texture] works on the IBM; I've seen it work. But I also know that it was very time-consuming, putting tracks together on it. When you're in there for your own session, I understand that, but when you're in there with somebody else. . . . I think the added flexibility of software sequencers weighs more when you really have the time at home to sit and work with it—for composing, as opposed to record dates. There will be people out there who will disagree with me, and all that I can say is, whatever works for you."

Jason Miles certainly has found what works for him. He has established not only a reputation for having the latest electronic instruments and knowing how to use them creatively while maintaining a relaxed atmosphere, but also a more elusive attribute: an identity. "If I were to sum it up," concludes Ray Bardani, "I'd say he's almost like a band member on call. He gives you that kind of input, and he's not the straight-laced, straight-faced session guy that just wants to get in for his three hours and go; Jay'll hang with you for 14 hours if he has to. That helps the project a lot of times, not having the pressure of knowing that the guy wants to go to the next thing."

Book Review: "The Beatles Live!"

by Rip Rense

John, Paul, George, and. . . Chas? John, Paul, George, and. . . Norman? It sounds like something out of Monty Python, but these lineups were Beatles lineups, once upon a time.

And how about this: On Oct. 15, 1960—almost two years before Ringo Starr joined the group—three of The Beatles (Lennon, McCartney, Harrison) went into a Hamburg, Germany recording studio with two members of another group and cut a version of George Gershwin's "Summertime." The other two were from Rory Storm and the Hurricanes, Walter Eymond (who sang) and a drummer named Ringo Starr.

It was, quite by chance, the very first record containing what was to be the final incarnation of The Beatles—and it still exists. A cousin of Eymond who lives in Australia owns the lone remaining disc.

These and many other rather remarkable tales are accurately pinned down for the first time in a very remarkable new book *The Beatles Live!*—a truly exhaustive chronicle of the

group's approximately 1,400 (!) live performances. Written and researched as a labor of love by British Beatles devotee Mark Lewisohn (winner of the 1976 "Beatle Brain of Europe" competition), this is a downright scholarly work documenting the group's evolution and decline as a live act—from June 9, 1957, when 16-year-old John Lennon's Quarry Men skiffle group played the Empire Theatre on Lime Street in Liverpool, to Aug. 29, 1966, when The Beatles played their final live concert at Candlestick Park in San Francisco.

Not only does the book (Henry Holt & Co., \$14.95) rewrite Beatles history in terms of dates and places, it in-

cludes notes whenever possible detailing the significance of *each individual concert*—and includes one bona fide treasure, at least for Beatles fans. Every copy contains a seven-minute flexi-disc recording—not heard in 25 years—of the very first Beatles radio interview, from Oct. 27, 1962. Recorded for, of all things, a hospital radio service in the small Mersey County town of Wirral, it took place just a few weeks after Starr joined the group, and just after the release of the first Beatles single, "Love Me Do."

"It is a fascinating interview," Lewisohn said from London. "You hear Paul McCartney saying 'John Lennon is the leader of the group,' and all The

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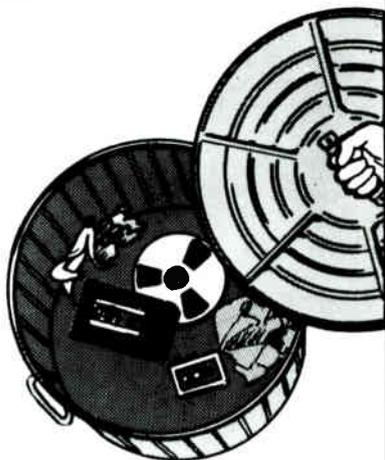
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Beatles chant in unison the catalog number of 'Love Me Do'—such was their pride at the time. They also discuss their months in Hamburg nightclubs, and their 1961 recordings with Tony Sheridan."

How Lewisohn came across the interview is practically Byzantine (as was the case with much of the book's material). Initially, he was just trying to nail down exact dates of a couple of shows The Beatles played in Wirral. Leafing through yellowed copies of defunct newspapers, he discovered a photo of the band being interviewed by two teenagers for a program hosted by one Monty Lister. (The program, *Music With Monty*, was broadcast to all of two local hospitals.) Hoping that one of the two teenagers might still be around to recall the date, Lewisohn found one still listed in a Wirral directory, and wrote to him. Weeks later, a reply came—not from Wirral, but from Liverpool. The boy, it seemed, had migrated to Canada, where the letter had been forwarded. A sister had, in turn, forwarded it to Lister, who was living in Liverpool. Lister, as it turned out, had the date of the interview and concerts in a diary—and something more. As Lewisohn tells it:

"He wrote, 'I'll have to dig out the interview when I get a chance and remind myself of what was said.' Naturally, I nearly fell over when I read this—confirmation that this tape had survived the passing decades!"

The entire project began in 1979 when the now 29-year-old Lewisohn was asked by Beatles biographer Philip Norman (*Shout! The Beatles in Their Generation*) to pinpoint the *true* date of the meeting of Lennon and McCartney. He did so, and for the first time, the date was reported accurately—in Norman's book—as July 6, 1957.

From there, things just snowballed. Lewisohn, admittedly "besotted" with The Beatles since the early '60s, began researching their live shows. A pastime turned into seven years of evening and weekend research, during which Lewisohn went to Sherlock Holmesian lengths to clear up inaccuracies—however trivial—perpetuated by past Beatles books. He burrowed through mountains of old newspapers, tracked down and interviewed former owners of, or partners in, obscure theaters where The Beatles once performed, pored over old receipts and business records, and in the end compiled a book that McCartney reportedly pronounced the "best" Beatles book he had ever read. This is not hard to understand, considering that *The Beatles Live!* certainly contains more specific information regarding the group's less-documented pre-Beatlemania years—its finest performing

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years—than any of the remaining Beatles could possibly remember. (Lewisohn, incredibly enough, corrected several George Harrison anecdotes for former Beatles press officer Derek Taylor's book, *Fifty Years Adrift*.)

"For two years alone I worked through every weekend, going through every single local newspaper in the UK for the first four years of the '60s," said Lewisohn. "None of The Beatles kept diaries. Clive Epstein, Brian's brother, confirmed that all of Brian's stuff was gone. In the absence of official records, I'm afraid it was the only way the job could be done."

No one had done it before. . . .

"Only a handful of real loonies would be prepared to do something like that!" he chuckled.

Yet it was that dedication that produced what is probably the most astonishing news in the book—that there was a Beatle named Chas Newby. No, he was not one of the many pals of Lennon and McCartney who drifted in and out of their high school group, the Quarry Men, in the late '50s. He was, like McCartney, a left-handed guitarist/bass player (born exactly one year after McCartney) from Liverpool, and for a brief time, a bona fide Beatle. That's right, in addition to the band's ill-fated first drummer, Peter Best (ousted with-

out warning in August, 1962), and the much more ill-fated Beatle bass player, Stuart Sutcliffe (who died of a brain hemorrhage after leaving the group in 1962), there was Newby—who, in fact, can make a claim to being with the band the night "Beatlemania" began.

As Lewisohn tells it, The Beatles had returned to England from their first sojourn to the seedy Reeperbahn district of Hamburg in November of 1960, in considerable disarray. Kaiserkeller club owner Bruno Koschmider, angry that the band had played at a rival Hamburg club, cancelled their contract. Coincidentally (?), at the same time, German authorities discovered that Harrison was only 17 and deported him. McCartney and drummer Best were also booted out—over Koschmider's charges of arson (they lit some moldering wallpaper to see their rooms by, as they were packing to leave.) Sutcliffe, the bass player who largely faked his playing, stayed behind in Germany to pursue painting and live with his girlfriend. Lennon, band-less, eventually made his own way home—broke, adrift, with his amplifier strapped to his back. By Dec. 15, all were back in Liverpool and looking for gigs—minus Sutcliffe. Best suggested they replace him with Newby, who had played a year earlier in Best's family-



owned Casbah Club with a band called The Blackjacks. Newby, home for Christmas holidays, readily accepted. The new, black-leather-clad lineup: Lennon, McCartney, Harrison (guitars), Newby (bass), and Best (drums). They played two shows at the Casbah, one at a ballroom in North Liverpool. Then, on Dec. 27 in the Town Hall Ballroom

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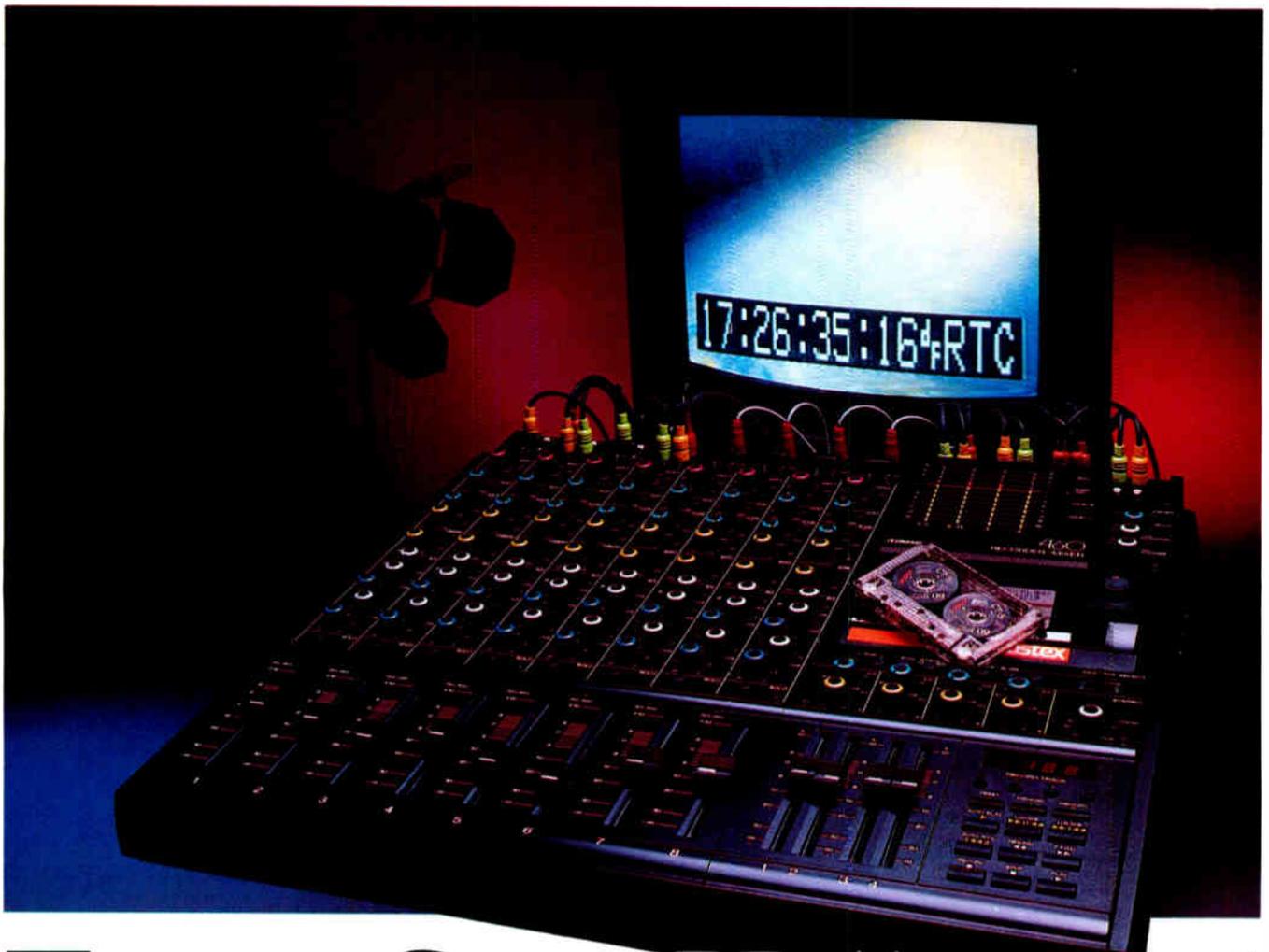
in Litherland, The Beatles truly became the rock and roll kings of the Merseyside. As Lewisohn wrote:

"As the curtains shuffled open and Paul McCartney launched himself into Little Richard's 'Long Tall Sally,' everyone suddenly—and spontaneously—crushed forward to the front of the stage, swept away by the group's sheer magnetism. *Five hundred hours* on stage in Hamburg had forged the style that would conquer the world. The five-man Beatles were an absolute powerhouse, creating an unprecedented and inexplicable frenzy among the teenagers, for whom all thoughts of dancing were quickly forgotten. They were quite simply, spellbound. . . Beatlemania was enjoying its birthpangs."

Newby, in what proved to be a multi-million dollar decision, then left the group and went back to school. In a 1984 interview with Lewisohn, he said he felt no bitterness about his decision—despite the fact that Lennon "semi-seriously" asked him to go back to Hamburg with them.

Another quirk of fate, perhaps, denied Beatledom to one Norman Chapman. In June of 1960, plagued and frustrated by lack-of-drummer and lousy gigs following their first, rather unspectacular tour (to Scotland as a back-up group), they offered the drummer's slot to Chapman, whom they found drumming in an office one evening across the street from the Jacaranda Club (where the group frequently played). Chapman joined the Silver Beatles, as they were known at that moment, but left after only three gigs when he was called for two years' national service in Kenya and Kuwait.

The book is also rife with information more appealing, perhaps, to persons whose interest in The Beatles is more esoteric. For example, contrary to all prior reports, Lewisohn says that it will probably remain a mystery exactly which tracks The Beatles played on in Hamburg with Tony Sheridan in 1961 (he does make a guess). There are quaint tidbits, too—like the time the Silver Beatles backed up a stripper named Janice on a stage 7 feet square, playing arrangements of "It's a Long Way to Tipperary," "Begin the Beguine," and "The Harry Lime Theme." There is also a heretofore unmentioned Lennon-McCartney song title listed as among the band's early repertoire—an instrumental called "Pinwheel Twist"—plus some rather obscure standards they padded their repertoire with, particularly on long, seven-night work weeks in Hamburg: "Darktown Strutters' Ball," "I Wish I Could Shimmy Like My Sister Kate," and "Over the Rainbow." And, believe it or not, "When I'm 64," not recorded until 1967's *Sgt. Pepper's Lonely Hearts*



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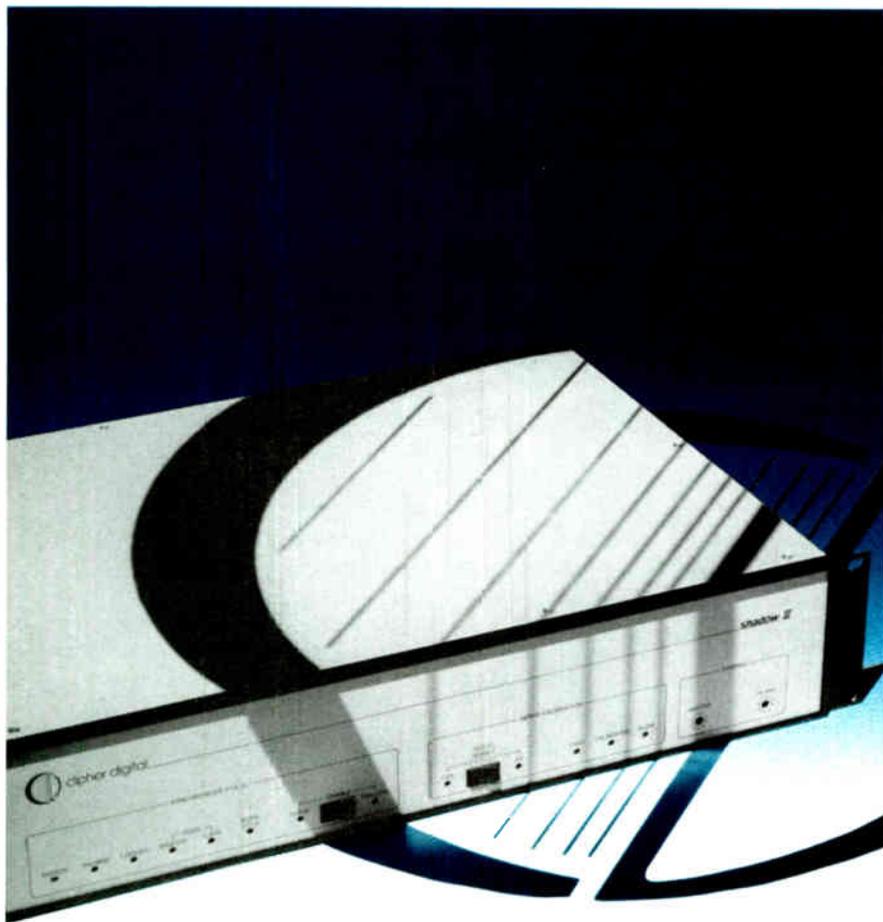
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Club Band album, was part of The Beatles' performing repertoire in the early '60s, too.

The book also touches on Brian Epstein's earnest and awkward first dealings with The Beatles, their audition for Decca Records (and the fact that they were turned down in favor of The Tremeloes probably because The Tremeloes lived closer to Decca), Epstein's reshaping of their concert performances—and probable repertoires of the band on a year-by-year basis. *The Beatles Live!* is also, not surprisingly, filled with previously unpublished photos, reprints of tickets, handbills, newspaper clippings, and business documents—including such oddities as a list of Beatles songs played in one 1961 concert as jotted down by John Cochrane, drummer with (get this) Wump & His Werbles—to prevent the Werbles from repeating any of The Beatles' onstage material.

"In total, thousands of hours went into compiling all of these things," Lewisohn sighed. "The actual volume of mental labor involved turned out to be massive. This year alone I must have put in a final 1,000 hours."

In the end, Lewisohn's book leaves one impressed with the fact that The Beatles worked very, very hard between 1957 and 1963, before the shrieking monster known as Beatlemania effectively ended their days as a serious live band. (They never heard themselves play, in all probability, during Beatlemania-period shows.) As the author puts it, they "absolutely slogged for their success." For the record, they played at least 274 shows at the famed Cavern Club in Liverpool alone. During their stints in Hamburg in 1961 and '62, they worked every night for months without a break (four hours a night weeknights, six hours on weekend nights). They often played lunch shows as well as evening shows; everything from ballrooms and theaters to horticultural society gatherings—and they did their share of traveling thousands of miles crammed in the backs of small, clattery vans. Even the well-known years of Beatlemania here are seen in a new light; the mere re-printing of the touring itinerary (and Lewisohn's descriptions) in 1964, '65, and '66 indeed makes one wonder how much "fun" a lot of that time was. In all, *The Beatles Live!* goes a long way toward explaining Harrison's bitter remark made after the 1966 tour ended, when he said, "That's it. I'm not a Beatle anymore."

Or, more appropriately, it underscores all too well the 1980 quotation from John Lennon that Lewisohn insisted adorn the book's cover—

"Didn't The Beatles give everything on God's earth for ten years?" ■

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ALESIS

—FROM PAGE 66, ADE

mobile. We assembled the racks, and had most of the equipment installed by 2 a.m.

On Thursday morning, we returned to the square to find that the power had been cut off by a local official. Although we had suffered frequent power failures at the hotel since our arrival, this was the first one at the square. We spent the afternoon laying cables for the microphones, video camera, and the time code monitors. Power was finally restored at 8 p.m. after "dashing" the local hydro official. We aligned the tape machines and checked the 28 microphone lines. Meanwhile, the band's road crew set up the PA, which was about the same size as a system that a North American band would have used in a medium sized hall in the early '70s. They had no outboard processing gear whatsoever.

All the guitars, keyboards, basses, and the pedal steel were run through DIs only. There were no instrument amplifiers, so the musicians were totally dependent on the monitors to hear themselves. On the plus side, the DIs meant better separation on the recording and a very clean stage for the film.

We managed to convince the band's sound mixer to set up his console out in front of the speakers, instead of at the side of the stage, where he normally set up. While Charles helped troubleshoot the PA, Fred and I worked on the interface between their system and ours. The air conditioner on our truck had not worked for two days. It was 105° in the square, and very humid. Inside the truck, it was at least 120°. The multi-track machines were too hot to touch. We had to use a fan from the hotel to keep them from shutting down completely. Fortunately, we were using only dynamic microphones, due to previous bad experiences at humid outdoor shows back in Canada. The band only had mic stands for the vocalist and the talking drums, so we had to improvise with lighting stands and gaffer tape to mic the drum kit.

The dress rehearsal started at midnight and went until 3 a.m. Aside from a few intermittent cables, we didn't have any more problems than on a similar sized job back home. We rolled tape on all five machines, checked playback, sync, and validated the time code with a reader. We were then notified that the Friday concert had been cancelled by the promoter, which meant that the whole film would have to come from the Saturday show!

On Saturday morning, we had a final production meeting in the hotel dining room, and set out for the square. Fortunately, that afternoon a local mechanic was able to get the air conditioner going



Author Doug McClement in the mobile.

in the mobile, to the great relief of the audio crew and the equipment.

The concert featured five bands, and started at midnight. Although only 2,000 people showed up, the lighting made it seem like a much larger crowd. The lack of proper security would have made a larger crowd a dangerous situation. The opening act, as at most festivals, was pretty mediocre, but gave us a chance to set rough levels and make sure our audience mics were positioned properly. The next two acts were not bad, and we filmed one song by each. The third band, I.K. Dairo, is the "father" of juju music, and has been popular in Nigeria since the '50s. We recorded most of his set.

King Sunny Ade and His African Beats took the stage at 2 a.m. and they gave a magical performance to the great delight of the audience. Some of the percussion interplay was incredible. The talking drums had a huge dynamic range, and our compressors were put to good use. It was important that the recording of the first song be almost perfect, as the director planned it to be the opening shot of the film. After all the hassles getting to Lagos and delivering the equipment to the site, it was great to actually do what we came to do—to film and record great musicians playing in their home town to an enthusiastic crowd.

The final band of the night, Ebenezer Obey, started his set at 4 a.m. Obey is a bigger star in Nigeria than Ade, and this concert was the first time in 20 years that they had appeared together on the same stage. During

Obey's set, one of the lighting consoles went up in smoke when the voltage to the square went up to 285. We were saved by the sunrise, as the band kept playing till 7 a.m. The final hour of the concert reminded me of the Hendrix segment of the *Woodstock* movie, with the tired but faithful few at the front of the audience, the sun coming up, and lots of concert debris on the ground.

A very exhausted crew then tore down the gear, and went back to the hotel after a 40-hour shift. In keeping with the rest of the week's events, there was no power, no air conditioning and no running water at the hotel. The following day, we returned the remnants of the lighting system to the University and the French Embassy, then crated the audio gear for the long journey home. There was no opportunity to check the tapes from the previous night without AC power, so we crossed our fingers and headed to the airport.

We played back the multi-track tapes and the digital rough mixes upon our return to Toronto, and found that they survived the return journey with no apparent problems. Our landing was delayed by six hours due to snow on the airport runway. Welcome home to Canada!

The film is now in post-production, with a release scheduled for late summer. It probably will be broadcast on PBS in the USA. Hopefully, viewers will get some of the feeling from the film for what proved to be the most challenging yet most interesting remote recording I've been involved in to date. ■

Mobile Fidelity Introduces The Ultradisc

by Philip De Lancie

While seen by many as the finest available means of distributing prerecorded music, the compact disc format is the product of compromise. System specifications were determined not solely by what was possible, but by what would be feasible to produce at a cost that would allow the configuration to establish itself in the face of its competition. The most obvious example of this price/performance consideration at work was the decision to use a bare minimum sampling rate of 44.1 kHz. It is clear that this specification is less than ideal, yet it may fairly be said that it allows for a reasonable level of quality for most of the people most of the time.

Though reasonable compromise is apparently acceptable to much of the prerecorded music market, there are those to whom the concept is distasteful. Mobile Fidelity Sound Lab has built its business on catering to this "high-end" clientele. The Petaluma, California-based company, perhaps best known for its audiophile LP offerings, has now come forward with "audiophile CDs" dubbed "Ultradiscs." Repressing any suicidal urge to go toe-to-toe with the big boys over the sampling rate specification, Mobile Fidelity has instead concentrated its attentions on the physical properties of manufactured discs as they relate to fidelity during playback. Specifically, the company asserts that using gold rather than aluminum as the reflective layer in CDs increases not just price (Ultradiscs retail for \$30 each), but reflectivity and corrosion resistance. The corresponding alleged decrease in error correction activity is said to noticeably improve the quality of sound.

In the past, some of Mobile Fidelity's claims, for instance those regarding the advantages of half-speed LP mastering, have been the subject of some debate. This latest step by the

company seems likely to prove similarly controversial. To get a first hand perspective on Mobile Fidelity's work in this area, I contacted company president Herb Belkin for the following conversation:

Mix: Let's start with the program material selection process. How do you decide what you wish to release on Ultradisc?

Herb Belkin: We do the same things that we do for all the products that we put out. Everything is auditioned from a technical rather than a creative point of view. It is our initial and primary concern that the material that we work with be of the highest technical quality. So generally we work almost exclusively with 2-track stereo original master tapes. If we wind up with a 2-track that we think is superior even by our standards, then it qualifies as an Ultradisc candidate.

In the case of the first two Ultradisc samplers, this is material that we already had in our possession. The first is a jazz sampler, with the material being 20- to 30-year-old analog re-

This standard CD has begun to show signs of aluminum coating corrosion, resulting in scarring of the reflective layer.



PHOTO: GEORGE PETERSEN

cordings. The classical disc, which is the second release, is exclusively from recordings which we licensed from Melodiya, the Soviet Union's recorded music company. Our appraisal of a number of these masters, some of which are digital and some fairly old analog, was that they are of sufficiently high quality to be representative of what we are trying to do with Ultradisc. Once we've done the two samplers, we will revert back to artist releases, one complete album per Ultradisc.

Mix: Do you do the mastering to PCM 1610/1630 format at your own facility?

Belkin: Yes. What we've done, as we did previously with our half-speed mastering and real-time cassette duplication, is that we buy the hardware and rebuild the electronics ourselves. In our processors, though, they are Sony in terms of hardware; the electronics are ours. So we have a proprietary technical edge, we think, which was developed specifically for analog to digital transferring. We work with a gentleman in the San Francisco Bay Area named David Haynes, who has a significant reputation for designing and building state-of-the-art circuitry.

Mix: Tell us about the company mastering and manufacturing your discs, and their background in optical disc manufacturing.

Belkin: They are called Ultech. It is a joint venture involving a giant Japanese chemical company and an entrepreneurial Japanese gentleman. We have been working with them in the development of a physically superior disc. Their expertise is directed at the computer market. CD-ROM is all they manufacture other than our Ultradisc. We are sort of an R&D project for them, I guess.

Mix: Your literature refers to application of the gold reflective layer through a "vacuum particle deposit ionization plating process." Aside from the use of gold rather than aluminum, is this process different from the sputtering techniques employed by some conventional CD manufacturers?

Belkin: Absolutely. Ultech has developed a very specialized vacuum particle sputtering process, and they are continuing in their development because we are still losing quite a bit of

gold in the vacuum cycle. I'm not in a position to tell you exactly in detail the technology they use. But we are advised that the process is unique to Ultech, developed by them specifically for the purpose of using a gold material. It's a finer sputtering process.

Mix: What is it about the use of gold rather than aluminum that allows for the creation of a superior reflective surface?

Belkin: Gold is a much more dense material. It is much more easily used in a fine environment, so you have an easily applied, very dense material. It can be laid out very finely and smoothly so that there are no pin holes or pits in the layer. Also, because it is a more dense material, it has a higher degree of reflectivity. So you get more information coming back as the laser reads across the disc.

Mix: Describe the kinds of testing you have done to arrive at the conclusion that the use of gold reduces the amount of error correction activity needed in CD playback.

Belkin: We test every disc that we get using the Cambridge analyzer. Cambridge is a high-end CD machine manufacturer from the UK. They developed a machine which is an analyzer. It tests several things, including dropout count and the use of error correction. That is our main test instrument.

Mix: In terms of actual listening tests, fair comparison would require having the same program material available in both gold and aluminum CDs. With that in mind, what sort of comparative listening tests have been conducted, and what have the results indicated?

Belkin: Several of the albums from which selections have been used for the samplers are out in full on aluminum CD, and in the next several months we will have all of those titles out. So today you can do an A/B comparison with our aluminum CDs versus the Ultradisc. That is why we chose to use the sampler format.

We have done pure human listening tests on our own in controlled environments. A lot of our high-end audio dealers have done the same thing, and reported back to us the results they have obtained. They have generally been incredibly favorable. Others have done testing as well, including the Cambridge people. It is our contention that you can hear the difference between an aluminum CD and a gold CD.

Mix: Your literature alludes to aluminum discs exhibiting "significant deg-



*Mobile Fidelity president
Herb Belkin.*

body knows over what period of time.

Mix: Conventional CD manufacturers are currently offering finished product to record companies at \$2 to \$2.50 apiece, and in some cases as low as \$1.75. Hypothetically speaking, how much might these prices go up if the industry as a whole were to switch to metalizing with gold?

Belkin: Probably three and a half to four times. Just look at the difference between the cost of gold and the cost of aluminum.

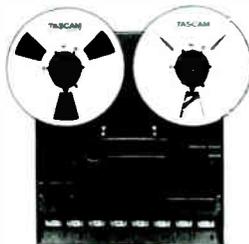
The gold disc is not for everybody. Regular record companies have a mission that is somewhat different from ours. Their mission is to get lots of product to lots of people very quickly and very cheaply. Our mission is a little different. We see ourselves servicing a tiny niche in the marketplace: very critically aware people who are willing to spend more money.

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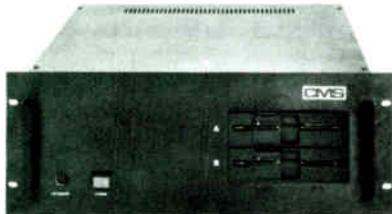
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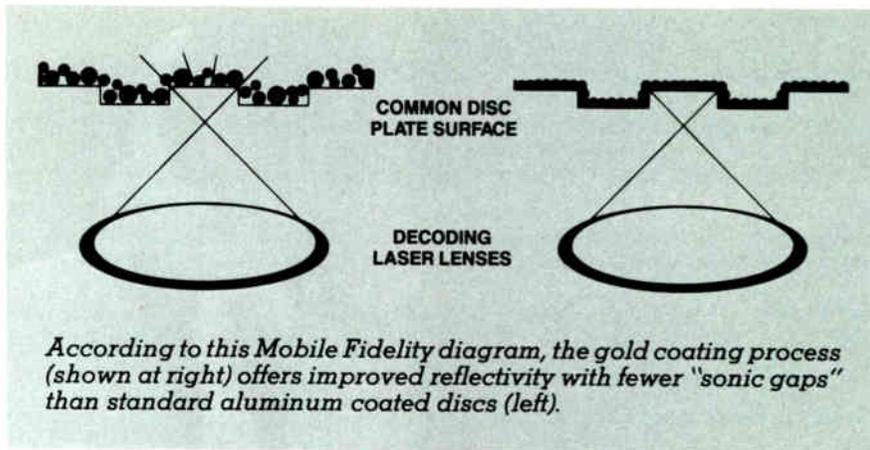
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duced in both houses of Congress earlier this year, has been approved by the House Energy and Commerce Committee in the form of an amendment to a major trade bill. The amendment requires, for one year, that all DAT machines transported in interstate commerce contain a copy code scanner chip to prevent the unauthorized duplication of encoded copyrighted recordings. It also makes it unlawful to render a copy code scanner inoperative, or to manufacture, assemble or offer for sale any device or service that does so. The copy code approach to copyright protection has the support of both the RIAA and the Reagan administration.

Denton Vacuum Inc., a Cherry Hill, NJ maker of optical coating equipment, has introduced a new system for metalizing compact discs in line without a clean room. The Denton DiscLine-500 metalizes up to 500 CDs per hour in line, one on one, as close as 24 inches from the CD injection molding machine. The new machine has its own clean air system, a laminar hood, to protect the CDs from contamination as they travel from the injection molder. The cost of the fully computer controlled unit, with 20M hard disk for auto data logging, is under \$200,000.

SHAPE Audio Products Division, of Biddeford, Maine, has added capacity for its Mark 10 audiocassette line. SHAPE is increasing capacity by 14 to 15 million units per year to meet increasing demand. The Mark 10 was first introduced in 1984. Olamont Industries, a joint venture of SHAPE and the Penobscot Indian Nation, began production in 1985 with a capacity in excess of 30 million cassettes annually. SHAPE's total current capacity for Mark 10s is approximately 60 million.

Versadyne of Campbell, CA, has announced the incorporation of two en-

hanced quality recording technologies into its 1500 series duplication system. Versadyne's proprietary HFE circuitry, similar in concept to Dolby's HX Pro, monitors the high frequency content of audio program and adjusts bias level in accordance with the overload characteristics of the magnetic tape. At the same time, the 1500 series will utilize the company's LX3 feature, which "conforms the audio signal to complement the anticipated third harmonic distortion before it is received by the record head." The combination of the two systems is said by the company to result in "dramatic improvements in cassette duplication performance."

Digital Intelligence Systems Corp. [DISC] of Santa Ana, CA, has developed a compact disc stamper analyzer, which it believes to be the first of its kind commercially available. Designed for use normally in the electroforming clean room of CD manufacturing plants, the SP-1 will facilitate the testing of stampers for conformity to quality standards prior to their mounting in the molding press. The SP-1 consists of three major components: the stamper analyzer with computer interface, the microcomputer with stamper analysis software, and the computer monitor. An optional clean air supply system [Class 00 filtering] is available in a separate housing.

Agfa-Gevaert has introduced a new standard bias premium grade tape designed for high speed duplication. Agfa PE 649/949 is now available in standard 8,200-foot C60 and 11,500-foot C90 pancakes. Super length pancakes in the new formulation will be available soon.

Phil De Lancie is a mastering engineer at Fantasy Studios in Berkeley, California.

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Creative At Heart.

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by Lou CasaBianca

3-D Animation Update

The leading edge in computer graphics is real time 3-D animation systems. Hardware systems manufactured by Sun, Apollo and Silicon Graphics, among others, have set new standards in the resolution, rendering the image processing of three-dimensional animation. Software packages created by Abel Image Research, Wavefront, Alias and Vertigo have created a new look that has been enormously successful in industrial simulation, package design and broadcast television.

Larry Barels, president of Wavefront Technologies, and Robert Abel, chairman of Abel Image Research, have announced an agreement on the purchase of the AIR 3-D Software Division of Wavefront Technologies. Wavefront will continue to pursue the development and marketing of its multi-purpose graphics software, and will install their system at Abel's Hollywood studio for use in future productions. The ultimate goal is to combine the best features of each into a new generation of graphic software. AIR will concentrate on producing high-end computer imagery for its industrial clients, and develop opportunities in the new markets for CD-ROM, CD-I and interactive laser videodisc productions. Wavefront president Barels observed: "This represents a win-win situation for both companies and the graphics market place in general. We believe that this new relationship will yield high profile images, since Abel's creative team has always been known for its award-winning productions."

Actually, the relationship between the two firms dates back several years. In the late 1970s, when Abel's studio began pioneering computer graphics productions, proprietary software had to be written. Much of that early software was designed by Bill Kovacs and Roy Hall, who later became principals at Wavefront. "Such a shared heritage and our collective compatible experience," noted Abel, "will yield a new generation of computer-generated software that will benefit the Wavefront user." Abel indicated that the company will place an emphasis on high-end industrial projects and the burgeoning CD and interactive laser disc markets.

Vertigo 3-D Computer Animation Seminars

The San Francisco Production Group is the first company in the Bay Area to offer Vertigo 3-D animation and the first in the world to offer the Vertigo V-2000, one of the most advanced systems of its type. The Vertigo represents the latest generation of animation technology. The Vertigo V-2000 is being used in combination with SFPG's other capabilities, such as the Images II paint system, Ultimatte, motion control, multi-channel ADO and the Abekas A-62 digital compositing system.

And now SFPG is offering seminars on the system to familiarize visual communicators in all areas with the process of 3-D animation and effects production in general, and the potential of the Vertigo V-2000 in particular. Attendees have included producers, directors and art directors in the advertising, corporate and entertainment industries.

The free seminars are hosted by SFPG's facilities manager Don Ahrens and art department coordinator Rick Schulze. Conducting the seminars is Kirk McInroy, formerly of Vertigo Systems International, where he spent several years as chief animator helping to develop the system. For further information, contact June Knott at (415) 495-5595.

Cinemagic Productions

Cinemagic has released *Computer Magic*, an entertaining and educational hour-long program on how computers are being used to create graphics, animation and special effects. *Computer Magic* features filmmaker/ animator Robert Abel as host of the show. Abel shares his insights and enthusiasm as he leads viewers behind the scenes for a look at the world of "computer magic."

The program has won Best Documentary awards at both the Professional Media Network and the 34th Columbus International Film and Video Festival. *Computer Magic* also has earned a Silver Medal at the International Film and Television Festival of New York. *Computer Magic* should be required viewing for professionals in the fields of graphics, art and advertising. Produced by Colyer Dupont, *Computer Magic* includes works by

Ampex, Cranston/Csuri, Cubicomp, Quantel and others. Industry professionals wanting to keep in touch with state-of-the-art techniques used by the leaders in the field, members of the academic community seeking solid supplementary material for students, or people who want to see how computers are helping make visual magic all will gain valuable insight from this innovative program. For ordering information write to: Cinemagic Productions, 537 Jones St., SF, CA 94102.

Ampex Sold

Allied-Signal Corp. has sold Ampex Corp. for \$479 million to Lanesborough Corp., a New York investment firm. Ampex, the Redwood City, CA-based company that first brought multi-track audio to the world and invented video recording, will keep its current management and structure. Ampex said the new arrangement offers a degree of independence the company has not known since it was first sold in 1981. "We will basically be an independent, stand-alone company," said Charles Steinberg. The deal, a form of leveraged buy-out, will be financed by a combination of Lanesborough's own money and an offering of debt or equity securities, Lanesborough said. In the interim, the firm said it had arranged for a bank credit line of up to \$475 million.

Lanesborough's chief executive, 35-year-old Edward Bramson, said: "We intend to make sure that Ampex has the financial and other resources to continue investing in its future." Steinberg said there would be no need to dismantle Ampex to pay off debt, as in many leveraged buy-outs. "There are no plans and there have been no discussions about selling off or phasing out of any business Ampex is in today," he said.

Ampex's businesses include audio and video tape, professional video recording and effects equipment, computer terminals and data recording equipment. It currently is enjoying a strong rebound from a 1983 slump, which led to the layoff of 5,000 workers. Last year, Ampex earned \$53.7 million pre-tax on \$522 million in sales, Steinberg said, and generated about \$74 million in cash for Allied-Signal. Ampex was first purchased by the Signal Companies in 1981 for \$440 mil-



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lion. Signal merged with New Jersey-based Allied Corp. in 1985 to form Allied-Signal.

JVC Introduces Animation & Effects Option

The Professional Video Communications Division of JVC Company of America has introduced its new M-4210 Animation & Effects option for the M-1500 Advanced Titling System. It offers the industrial video user the ability to easily animate, flip or zoom characters, logos or images created with the M-1500 system. According to Dave Walton, new products manager, the M-1500 system will allow 3/4-inch and VHS producers to employ quality effects literally in minutes. "Sequences normally costing thousands of dollars to produce on 'high-end' graphics or video character generators can now be done far less expensively," he said.

Apple Macintosh II

Well it's finally arrived—color, video and power in one package. Based on the Motorola 68020 microprocessor, with an optional 68881 numeric co-processor and an optional 68851 memory manager, the Mac II can handle one to 8 megabytes of RAM. Its custom digital sound chip provides 4-voice stereo through small internal-external "Walkman" type stereo headphones or an external amplifier and speakers. It can handle one or two internal floppy disk drives. The unit can manage 20 to 80 megabyte SCSI hard disk drives, and its six expansion slots use the NuBus architecture developed by Apple. A third-party 80286 co-processor card will provide MS-DOS compatibility. Apple also is working on a version that will allow the unit to operate in the UNIX environment.

The previous generations of Mac use a bit map to represent the screen; one bit represents one pixel providing two "colors," black and white. The Mac II can deliver one, 2, 4, 8, 16 or 32 bits per pixel. The first video board from Apple will use either 4- or 8-bit pixels, providing 16 or 256 different colors. Video is broken out into a graphics card that plugs into the NuBus slot. The video card can provide up to 256 colors or shades of gray drawn from a palette of 16.8 million colors on a 640-by 480-pixel display. The core of the video card is the TFB custom chip, named after its developer. It uses two clocks on the card: one at 30.24 MHz for use with color monitors; the second is a 12.27 MHz clock used to generate RS170 RGB signal with NTSC timing which can be used with projection TVs or film recorders.

The sound component also has been decoupled from the Mac hardware and partially incorporated into a cus-

tom chip. The sound drivers have been expanded and now are incorporated into Sound Manager. The Mac II's independent sound generation circuitry can sample at 44.1kHz, the same sampling rate as the compact disc, encoding at 8 bits instead of 16 bits. The sound quality's biggest limitation is in its frequency range of 7.5kHz. Apple is developing new standards to enhance sound quality and standardize sound generation methodologies, which should be able to be retrofitted into the Mac II. The current hardware includes the Apple Sound Chip (ASC), providing two pulse-width-modulated outputs, and two Sony power amplifier chips to provide stereo sound. A 4-voice wave table synthesizer is built into the ASC. Frequently used wave forms can be loaded and played without tying up the CPU. So, for example, for the first time you could read a sequencer file off of the hard disk while looking at lyrics or spreadsheet information read from the internal floppy.

The programmer has four new synthesizer software options available. Note Synthesizer is a square wave program which can play simple melodic notes. Wave Table Synthesizer plays sound by way of wave table look-up synthesis. (A wave table is one complete waveform oscillation stored in a table of 512 or 256 8-bit samples encoded in an offset binary format.) The third is the MIDI Synthesizer, which provides software interface to play any MIDI synthesizer connected to the Mac II. (A MIDI interface is still needed to link the synthesizer to the Mac's serial port. The Sound Manager has 16 channels that correspond to MIDI channels.) The fourth is the Sampled Sound Synthesizer, which plays pre-recorded or sampled sounds. The sounds can be played in the original or at different sampling rates.

At about \$6,000, the Mac II is generally about three to four times faster than the Macintosh Plus. Its open architecture color and video capability, with MS-DOS and UNIX compatibility, make the Macintosh II the most powerful computer in size and price range. For the first time, the kind of innovation that changed the world of computing when the Apple II was released will now be accessible with the Macintosh interface. Its potential in the hands of the creative and technical community will be enormous and interesting to watch. ■

Lou CasaBianca's primary interests lie in the areas of advanced music, motion picture and television production, with emphasis in interactive authoring and visual design, and the application of computer systems in media production.

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As a singer, songwriter, producer, and musician, Gavin Christopher has worked with the best in the business: Herbie Hancock, Chaka Kahn, Huey Lewis, Carlos Santana, Teddy Pendergrass. But after five years in New York, he moved home to Chicago to get the Royal Treatment.

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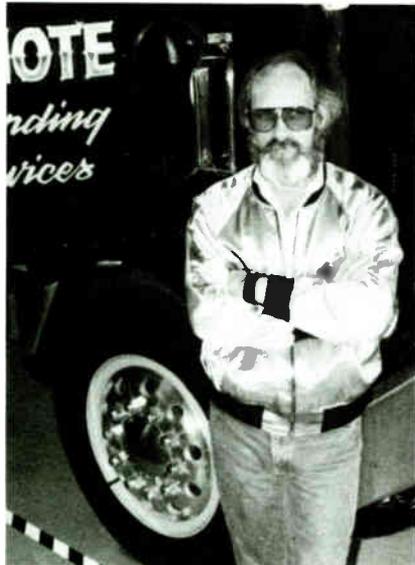
WELCOME TO IT?

by Linda Jacobson

When audio meets video in the studio, usually it's a pleasant encounter. And getting better all the time. But out on the road, do audio and video mesh as smoothly?

That's what we asked a few remote audio engineers, to learn what problems lie in the relatively new practice of interfacing with video trucks for

David Hewitt of Remote Recording Services.



concert recording. Whether the client provides the video/TV facility, or hires independent mobile audio and video production firms, the audio and video teams must do the show to please the client, not each other. And that sometimes means grinning and bearing it. Every audio engineer we contacted pointed to grounding problems and poor communication as the major sources of interfacing difficulty, but we also learned that, since video folks think visually, sometimes audio folks must fight to achieve their goal of good sound.

Remote Recording Services

Well-known sound designer and engineer David Hewitt ran the New York Record Plant's remote recording division for 12 years before leaving to form Remote Recording Services (headquartered in Monsey, New York). His team works around the country and in Europe, handling audio for jazz and classical dates, as well as major events such as Live Aid, the Tony Awards, and the annual MTV New Year's Eve Ball. While researching this article, Hewitt's name was mentioned in nearly every conversation. So we launch our forum with his input—an outline of how to approach any video interface.

The first point Hewitt stresses is the

supremacy of pre-production: "Each show has its own character and set of demands. You have to find out exactly what will go on at the show, and what the client wants. That can range from a simple three-camera rock and roll shoot to an immensely complicated, full-blown awards show. Once you know what it's all about, you make your advance calls to the video facility, to the EIC [engineer in charge]. The EIC knows what the client expects from the video end; you discuss with him what he wants from you in terms of audio, and what you want from them in terms of video, communications, and sync signals. You find out what equipment they have and who's on staff. Their audio guys, generally speaking, are in charge of communications, and they might want you to handle some extracurricular activities. You don't want to get there and find they expect your guys to run 450 com stations on 12,000 feet of audio cable. It's vital to straighten out *all* responsibilities up front. The body count gets pretty high when there's a lack of understanding.

"Next comes your on-site inspection. You hit the beach and go look at their truck, talk to the EIC and other people there. You and the EIC both make numbered lists of what you expect. You find out if there have been any changes in signals since you first talked. Then you set up your interface cabling. We use our own interface system whenever possible. We break it up into different 'aux' systems; each snake consists of 12 audio pairs and three coax pairs. We have an A snake, a line-level com system that goes to the audio stage crew, a B snake to send audio signals to video, a C snake to receive audio playback signals and sync sources from the video truck, and a D snake to cover whatever A, B, and C didn't cover, to handle system integrity, such as problems with crosstalk from high level signals. We use a large distribution amp. We buffer the clean audio feeds by isolating them in our DA; even a dead short doesn't affect other lines. We also have our own closed-circuit TV system set up for a wide shot of the stage, which is vital. And we always take the video director's switch line as the main feed. On the big shows, you need a routing switcher in your truck so you can get their cameras and see what they're up to.

"After we cable up, there's verification. The first thing you verify is your communications, then all the stuff on the lists made by you and the EIC. Go down the line with the EIC to verify that it all works, and verify all levels, phase, and sync signals.

"Assuming it's all verified, you then

Remote on Remotes

The history of Aura Sonic Ltd. sounds more like an American success story than the realization of a cold business plan. In 1976, Steven Remote was a 17-year-old bassist often asked by his band to mix their sound. Steven's habit of hanging out in his high school's electronic music lab had prepared him for manipulating sound waves. Back then, recalls Remote, "I just came up with the idea that it would be incredible to have a studio come to the artist. I didn't even know any mobile trucks existed. In college, I sat around and daydreamed about designing a mobile studio. So I quit, and put together the truck."

Just prior to assembling that truck, Steven filed papers in Flushing, Queens, thus setting up his New York State corporation, Aura Sonic, Ltd. By then he had learned the ropes of recording in the thick of Manhattan's punk rock scene. "I recorded my first band at 18. I just threw a Revox 2-track, little Sony mixer, eight mics, tiny amp and headphones into my car, drove to Max's Kansas City, and approached the manager about recording their bands. He asked how much I wanted, and I said, 'Ah, just give me \$25,' to cover the tape costs. The first bands I recorded were the New York Dolls and Blondie. Later I re-

—CONTINUED ON PAGE 123

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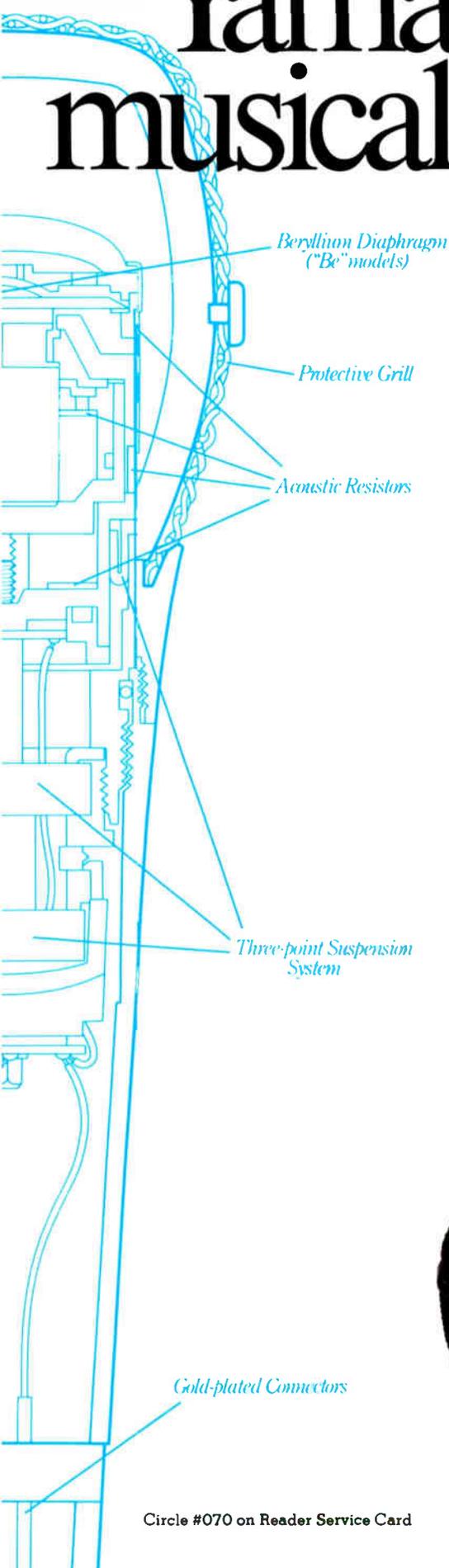


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subjectively listen to all this stuff, sending tones. We also use a CD player, with program material that suits the gig, and play it down the chain. We'll physically go through the chain, trace it back to our audio group. Check for any noise—you never know what that chain will contain. Most important is to hear the program in the A/V control room, where the client's going to be. In the control room, they do listen to the program for the rhythm, for cutting, but they use their ears mostly to hear each other *talk*. While they concentrate on their job, you not only have to make the signal very clear, but you process it with TV in mind. You EQ, and squash the dynamic range, particularly in variety shows and classical music. Modify it so they're comfortable with it.

"Hopefully, you've got all the technical problems fixed ahead of time by having your equipment and your act together. But the political problems sometimes are more difficult, and one you run into first is at the soundcheck. Sometimes next door they don't understand that the mix goes up and down. They get pretty blunt about it. Things are getting better than they used to be, but it pays to negotiate up front for a real soundcheck. There's never enough time at a live show; but generally speaking, if you know the board and the chain, you pre-set any console for any generic mix, then work on it as you mix the show.

"Throughout the show, you use the com system. Before hand, you identify yourself and everyone you're going to talk to, find out who's where and how to reach them. Then you drop back. It's a party line, so you don't want to be annoying, but you don't want to wait for a problem and then find out who to deal with. The com is the real nerve center of any show. You gotta communicate, because that video director wants to hear things in the monitor mix that you may not think are real musical. They *always* want more vocals and applause than any music mixer will be comfortable with. If the director next door starts feeling frustrated that audio's not listening, that creates problems. It's important to remember that you're in *their* world, not vice versa. Video or TV is the end product, even at a rock concert. So you help them make the client feel comfortable, which you can only do with your charm and on that com."

P.E.R.

P.E.R., based in Hayward, CA, is essentially engineer/producer Phil Edwards. He's been working remotes since 1969, and purchased his rolling studio in 1978. Along with the full complement of audio gear, the P.E.R.

—FROM PAGE 120, REMOTES

corded just about all the bands that played Max's—Mink De Ville, Tuff Darts, all before they had record deals."

Remote designed his mobile studio that year. "I was so naive! My first truck was a 4-track remote truck, which was absurd. In '77 I had a chance to work with Jimmy Iovine, who was working with Patti Smith, and he totally put down my truck and set me straight. After doing the show with him, I tore the truck apart and redesigned it. A couple of years later, I was contracted by WPIX-TV to do all their live broadcasts for *Live At Eleven*, and got to work with the Police, XTC, a whole slew of hot bands." And so Remote was on a roll.

Today, the Aura Sonic remote truck is more than a rolling recording studio. It's a complete post-production and mixdown facility on wheels, equipped to handle album, video/TV and MIDI projects anywhere in the country. The vehicle, a new one delivered last month, is a turbo-charged International air ride diesel, complete with four-door production crew cab. The cab, which contains four captain's chairs, is set up for working announcers and air personalities. A couple of speakers and a bank of video monitors also ride in the cab.

Video entered the Remote story in 1981, when "I was lucky enough to work on Frank Zappa's last show at the Palladium, on Halloween, which was MTV's first live satellite broadcast. We were the main distribution truck, providing the TV audio mix. I said, 'Wow, this is where I'm heading.' Our setup at that gig formed the basis of our current truck design.

"These days, we use video cameras for closed-circuit operation on most video gigs, and have an extra monitor to receive a feed from the video truck. When we work with Unitel or Reeves Teletape trucks, they send us a camera feed, a couple of iso feeds, a couple of mixed feeds, which is what we work on. I have two Nakamichi DMP-100 digital machines for video playback, hooked up to two black-and-white monitors. I have a 12-channel video switcher at the engineer's position, so we can switch to any of 12 inputs and see it on a color monitor. Another color monitor receives whatever feed the video truck gives us. Depending on what we're doing—multi-track recording, digital audio, whatever—we can mix and

match whatever we want to do with the four video monitors.

"Something we do often is drive up to a 3/4-inch video facility, Videogenics in New York. We run our cables up five flights of stairs, lock up our machines with theirs, send audio and video feeds, and then I sweeten audio for them. The interfacing itself takes about 40 minutes. We have it down to a science. We have this extensive interface panel with 76 mic lines in, eight video inputs, four independent com lines, five incoming phone lines, two stereo outputs and a mono feed out.

"Now, with the advent of digital and MIDI technology, the whole idea I had as a kid has really come into play. I not only drive to venues for live performances, but drive up to people's houses where they have MIDI pre-production studios. I cut tracks to tape right in the driveway. I do signal processing in the MIDI domain, and I'm assembling a good MIDI hardware package with a full patchbay. MIDI opened up a whole new market for mobile units. But most other mobiles, even the really top-flight ones, didn't buy an automated Harrison console and \$70,000-worth of outboard gear. I did, because as a budding engineer/producer, that's what I need for my facility. So I don't book studios anymore for my own productions."

His own productions? Does this guy ever stop? He recently formed Remote Men Visual Music, under the corporate blanket of Aura Sonic, to create and produce TV commercials. "I'm putting together a nice crew of artists, musicians, and engineers to work for that company. It's really in the embryo stage right now."

The Aura Sonic truck also doubles as a sampling studio. One of Remote's clients, Korg USA's R&D department, sends him to college auditoriums to record various sections of orchestras, and to churches to record bells, harpsichords and choirs, all on a digital 2-track and two Beta machines (he mixes down on-site). The Korg people then take his recordings to their lab, and process the sounds for their products. If you own the Korg DSS-1 sampling keyboard, your marimba and harpsichord sounds were born in the borough of Queens.

Oh, and the name... yes, Remote is his legal surname, albeit different from the one on his birth certificate. And it's been his name for years. "All I thought about was remote—so I became Remote."

—Linda Jacobson

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vehicle is equipped with a video monitor and camera to keep an eye on the stage, and another monitor to receive a switched feed from the video truck.

Phil Edwards finds few problems in the video interface. A typical setup, says Edwards, "requires a couple of feeds to TV-land, and we want time code back. Most audio for video we've done requires a stereo or a mono feed or both from us, sent to the video truck, which they'll record straight onto the VTR. If it's a SMPTE thing, we get a SMPTE line from the video end, because SMPTE is their domain. But we keep a time code reader on hand so we can look at their signals and make sure the numbers are being counted correctly.

"The biggest problem we ever have with video is an electrical thing. Occasionally, you run across a video operation which has no way of distributing audio to different pieces of video equipment. They put together the pieces. For some reason, video still holds onto a 600-ohm input impedance on the audio side of many VTRs. So when you output a signal, depending upon the output impedance of your console or whatever's feeding the video machines, it loads the level. If you parallel the output to two or three VTRs, your level gets sucked down considerably and that affects program linearity.

"So it's wise to put a distribution amp ahead of whatever you're feeding to video. We have a DA as an integral part of the truck, and anything that leads to the outside world runs through it, which effectively prevents anything from either loading or shorting your signal. Remember that TV debate between Ford and Carter, and they were off the air for about 20 minutes, they just sat there and smiled? My guess is they weren't running a DA and something shorted out, and all the mics went off. So they had to sit on their hands.

"We always make sure we've got two lines or a composite line going to the video truck. They say 'OK, we got it,' and that's that, but we send our guy over there. We'll call him on the intercom and run tones and program material, then run nothing, and have him jack up the monitor levels to make sure it's linear and clean. *That's* procedure."

GHL

Gary Hedden engineers the six-year-old, Nashville-based GHL truck, recording remotes on the East Coast, in the Great Lakes region, and, of course, the South. They've handled it all, including live recording for video uplink to satellite. "My approach is to provide an entire, dedicated interface package to the video truck, including



the cable, so I can be confident about the connections to us," he says. "The audio part is pretty easy to handle; balancing the audio signal is the key. It's essential that we don't in any way share a ground with the video truck. The audio end is resolvable by having balanced signals and using transformers, if necessary.

"The most difficult part has been getting a video picture from them that's free of hum. Larger video trucks often have a dedicated distribution amp for our signal and we put a humbucking coil on the end, so there's no problem. But with smaller trucks, which send us a feed from a video machine, a common difficulty is getting a clean picture without grounding problems. However, we always carry a closed-circuit camera setup. Sometimes the video engineers say, 'You're going to have a feed from us, you don't need your surveillance camera in there.' And we say, 'Yeah, every time we need to see what's going on you're doing alignments or you got color bars coming through.' Our setup is a remote-controlled RCA surveillance system. It's two cameras on the same tripod, one with fixed focus. Then we remote-control the focus on the other one, and remote-control zoom, pan, and tilt on both. They work in low-level lighting, and we put them in the house out of the way, then we can move the cameras around from inside the truck. Even with the house lights down, even with a blacked-out feed from the video truck, we can still see what's happening on stage. And that always helps."

Rover/The Plant

Bob Skye and his faithful Rover (based at The Plant recording studios in Sausalito, CA) have handled lots of video and film work for many major clients. "In video, we not only record to multi-track or live to 2-track or both, but we send out reference feeds as well as stereo feeds to the video truck. Very often, the video people have one tape truck for the video tape machines, and a production truck for the switchers, monitors, etc. We'll send a mono feed to the production truck, and a stereo feed to the tape truck. When

you feed several different places, it's good to be cautious, as there are many possibilities for ground loops. Most of the TV trucks I've encountered, with a few exceptions, don't even ground their chassis to their vehicles, which to me is frightening. But to my knowledge no one's ever been fried.

"The thing is to think in terms of grounding—who has the central ground, and what line is it going to? Usually, I allow someone else to establish the central ground, or if we can't determine what it is, we make sure we're absolutely isolated. Usually we make our chassis ground, as a safety precaution. Then we figure out the audio ground. You've got a few different signal paths, so the first thing I think of is the marvelous transformer—a day without Jensen is like a day without sunshine! There is no more appropriate way to interface possible potential differences than by isolating them with transformers. Because of the nature of the video work environment—their trucks are so bloody noisy, with so much fan and air conditioning noise—that they usually don't notice the little errors and glitches that we notice in the audio truck.

"I'm speaking very much in general, but five years ago interfacing was more of a pain in the neck. I think there was a lot of resentment from the video people, with them asking, 'Why do we need all this?' But it's just a matter of conditioning and experience, and they're finally saying, 'OK, we know what we have to do to connect with the audio people,' so we get a good feed from them, and they aren't jumping up and down and pulling their hair out.

"There's a great deal of PR in all this. You grin and try to do your best, and not let the client know if there's a technical problem. It doesn't concern the client. The client's concerned that he's paid a great deal of money, he wants a good product, and he doesn't give a flying leap on how we go about it. That's our job—and this is why a lot of new, fledgling companies die: they may have good equipment, but they can't deal with people. They get up and say 'You're wrong, you need to change your electrical!' There's gotta be a compromise, and somebody's got to know what's going on.

"We did a job with Reeves Teletape—David Hewitt contracted us for that; he's been responsible for my better, fun jobs this past year. This gig involved recording a 1,500-voice choir in Ocean Grove, New Jersey at a place called the Barn, a huge structure with a beautiful, enormous pipe organ. It was the typical situation where you walk in and say, 'Omgod.' But I work strictly with Murphy; I always assume

that he's watching over me at all times, and if I don't see a problem, he'll find it for me. It's totally unsurprising to do a gig for a couple of days, come in the next day, and find new clicks and buzzes that you didn't have the day before. In these types of jobs, you can't take anything for granted. And that way you come out with the least amount of problems."

Record Plant

Kooster McAllister, director of remote recording for the venerable Record Plant of NYC, cites ground loops as his biggest problem. "Our truck has a totally isolated video patchbay, just to handle video stuff coming in. My interconnect snake system is 12 audio lines and three video lines. Onto that bundle I tape a regular, external mic cable to run SMPTE on, because SMPTE seems to get into everything. We take SMPTE and vertical drive from the video truck, so if you lose one, you can generally resolve the other in post.

"We always put a dual-track oscilloscope on the outputs of the machines. That way we have a visual reference to make sure the v-drive is locked to the time code. We have independent distribution amplifiers, selectable for 600-ohm termination. If we're handling audio for a live broadcast, we prefer to handle the audio directly to

the uplink or to Telco, to keep it as pure as possible—we know what's coming out of our truck, and a lot of the time the patchbays in video trucks are not wired all that wonderfully. When we do live shows, we always do our own frequency sweeps with the satellite to make sure response on the uplink is tuned properly."

Metro Mobile

Metro Mobile, the only 24-track truck that calls Chicago home, is owned by engineer Timothy Powell. In operation since 1979, Metro Mobile covers record dates, live broadcasts, and sound for video and film. Powell reports, "Normally, when we work with a video truck, they give us a switched video feed so we can watch what they're watching. If it's a larger truck, they feed us time code and video sync. We round off the vertical drive, which is a video component, and put it on tape as a back-up to the time code.

"Sometimes the video people don't switch live. They have five or six cameras, each one output to its own video tape machine. Then they just go with the flow and the director watches the six monitors. We did a Pee-wee Herman show where they weren't switching, so they gave us the output of one camera. But it wasn't a usable picture.

—CONTINUED ON PAGE 196

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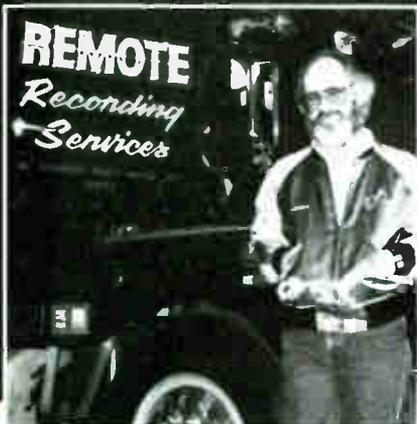
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David Hewitt of Remote Recording Services Inc.

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When David Hewitt takes his show on the road, he does it in grand style. His show, of course, is REMOTE RECORDING SERVICES, INC. and it's a hit with some pretty popular folks in the recording business. Chances are, people who know David also know something about *remote recording*. Their demanding criteria for audio excellence depends on the exceptional sonic quality and widely accepted recording format which the Sony PCM-3324 has built its reputation on.

These are the reasons why David's famous Black Truck (shown here with two Sony PCM-3324 digital multi-track recorders) is fitted with the type of equipment which can withstand the hazards of the road and still perform like a star.

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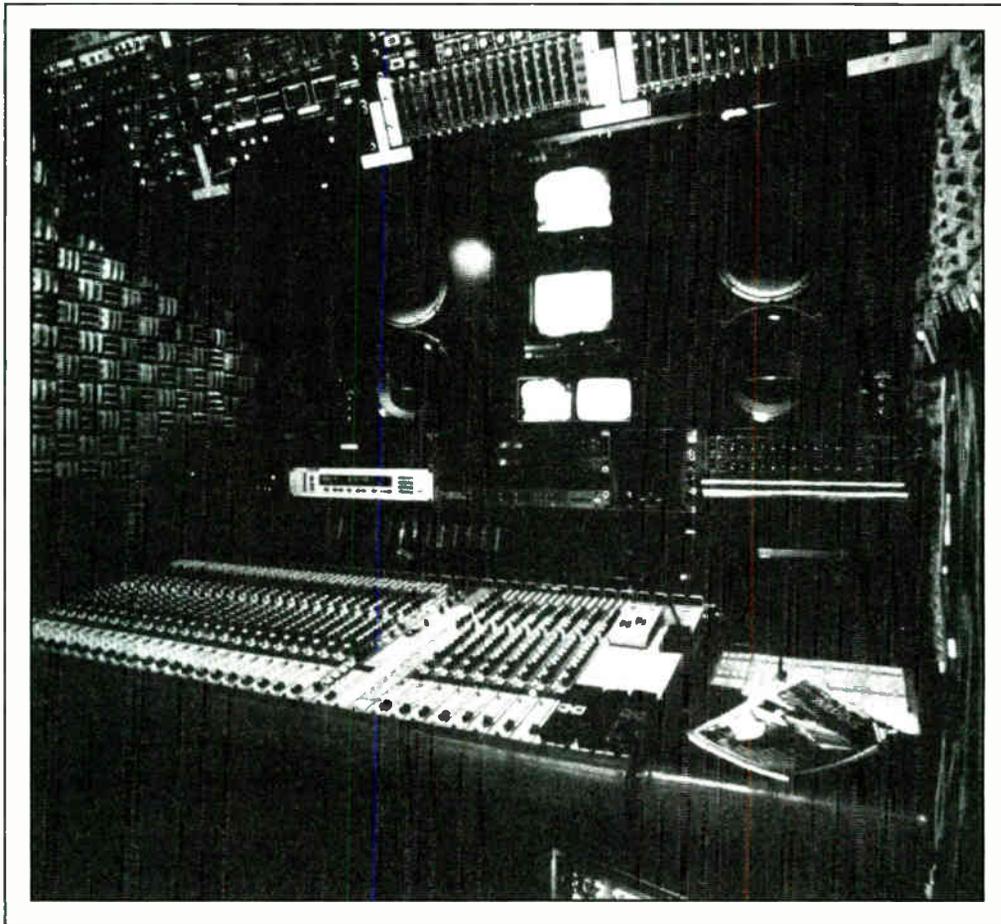
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REMOTE RECORDING and SOUND REINFORCEMENT

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



Pictured here: Steven Remote's Aura Sonic Ltd. (ASL) remote truck, based in Flushing, NY, is equipped with a Harrison MR-4 36/32 console, Otari 24-track recorders, a Lynx TimeLine synchronizer, and a full complement of outboard gear, monitor options, microphones and much more. Since 1977, ASL has worked with dozens of audio and video clients on every kind of remote job imaginable. (A story on ASL appears in this issue's remote recording forum, which begins on page 120.) Photo by Steven Remote.

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

Upcoming Directory Deadlines:

Southern California/Hawaiian Studios: **June 12, 1987**
 AES/New Audio, Video & Music Products: **July 2, 1987**
 North Central U.S. Studios and Canadian Studios: **August 3, 1987**
 Tape & Disc Manufacturing: **September 3, 1987**



REMOTE RECORDING and SOUND REINFORCEMENT



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.



The following companies offer a variety of services in the field of sound reinforcement and remote recording. All of the information in this Remote Recording and Sound Reinforcement Directory is based on questionnaires mailed in January 1987. People, equipment and locations may change, so please verify critical information with the companies directly.

L I S T I N G S

NORTHWEST

AKASHIC RECORDS GROUP
Rental, Audio Recording
PO Box 395
Danville, CA 94526
(415) 837-7959
Contact: Stephen G. Jarvis

ALASKA STAGECRAFT, INC.
1025 Orca St., #7
Anchorage, AK 99501
(907) 276-5671
Contact: John Nelson, Linda Nelson, Cynthia Wicher

ALLERICE VIDEO
Audio & Video Recording
350 E St., Ste. 309
Eureka, CA 95501
(707) 445-3922
Contact: Darrell Shull

AMERICAL SYSTEMS INC.
Sound Reinf.
30982 Huntwood Ave., Ste. 204
Hayward, CA 94544
(415) 471-7451
Contact: Richard T. Kehoe

AMERICAN CONCERT TOURS
Sound Reinf., Staging, Rental
3618 Tahoma Pl. W.
Tacoma, WA 98466
(206) 863-6655
Contact: Dennis Livingston, Jr.

AQUARIUS SOUND INC.
Sound Reinf., Audio Recording
347 Loma Vista
Pacifica, CA 94044
(415) 359-7210
Contact: Robert J. Ring

ARTICHOKE PRODUCTIONS
Audio & Video Recording
4114 Linden St.
Oakland, CA 94608
(415) 655-1283
Contact: Paul Kalbach

ASSOCIATED SOUND
Sound Reinf., Rental
2120 P St.
Sacramento, CA 95816
(916) 443-4773
(800) 492-6800
Contact: Wally Clark

AUDIO ACTIVE SOUND SYSTEMS
Sound Reinf., Rental, Audio Recording
#10 Regent Loop
Oroville, CA
(916) 533-7958
(916) 533-6152
Contact: Stan Bunstock, Hank Hampton

AUDIO DESIGNS
Audio Recording
PO Box 15501
Seattle, WA 98115
(206) 325-9286
Contact: Ric Vaughan, Neil Burmester

AUDIO VISUAL ASSOCIATES
Sound Reinf., Lights, Staging, Rental, Audio & Video Recording
1350 Old Bayshore Hwy.
Burlingame, CA 94941
(415) 340-8611
Contact: Ron Vierra, David Steinen

AUDIO WEST
Sound Reinf., Lights, Rental
PO Box 4611
Stockton, CA 95204
(209) 948-6623
Contact: Ed Etzel

AUDIOWORKS RECORDING
Audio & Video Recording
7479 S. Teller St.
Littleton, CO 80123
(303) 972-4255
Contact: Bill Prentice

AUTO-TRAK
Sound Reinf., Audio Recording
6655 SW Princess
Beaverton, OR 97005
(503) 626-6702
Contact: Bob Bentley

BACKSTREET AUDIO
Sound Reinf.
4304 N. Madison
Spokane, WA 99205
(509) 326-2827
Contact: Mike Canning

BACKSTREET RECORDING
Box 5799
Missoula, MT 59806
(406) 721-9789
Contact: Phil Hamilton

BAY SOUND CO.
Sound Reinf.
3131 Marina Dr.
Alameda, CA 94501
(415) 865-1860
Contact: George Jackson

BBI (BLACK BOXES INC.)
Sound Reinf., Lights, Staging, Rental, Audio Recording
1570 Davidson Ave.
San Francisco, CA 94124
(415) 695-9555
Contact: Mike Joseph

BIG EAR DIGITAL RECORDING
Audio Recording
PO Box 2758
Novato, CA 94948
(415) 892-5911
Contact: Catey Nash

CARAWAY AUDIO
Sound Reinf.
1775 Old County Rd., Ste. 19
Belmont, CA 94002
(415) 594-1790
Contact: Doug or Steve Caraway

CASCADE SOUND
Sound Reinf., Lights, Rental
6695 Joseph St. SE
Salem, OR 97301
(503) 581-5525
Contact: L. Carroll

CHAMPAIGN SOUND
Sound Reinf., Rental, Audio Recording
PO Box 7003
San Jose, CA 95150
(408) 252-4536
Contact: Ted Champaign

CHERRY RECORDING
Audio Recording
1235 15th St. SE
Salem, OR 97302
(503) 399-9775
Contact: Ron Skog

CHONK MOONHUNTER
Audio Recording
484 Lake Park Ave., Ste. 289
Oakland, CA 94610
(415) 444-3074
Contact: Curtis Choy

CIRCLE SOUND
Sound Reinf., Rental
PO Box 1746
Sonoma, CA 95476
(707) 996-9261
Contact: John Yacura

CLAWS-ON PRODUCTIONS
Audio Recording
1355 "C" Bear Mtn. Dr.
Boulder, CO 80303
(303) 499-1144
Contact: Lisa Clawson

COLORADO CONCERT SOUND, INC.
Sound Reinf., Lights, Staging, Rental
PO Box 1652
Longmont, CO
(303) 772-3933
Contact: Tom Beaman

THE COLORADO SPRINGS MUSIC CO.
Sound Reinf., Lights
321 N. Teton
Colorado Springs, CO 80903
(303) 635-1561
Contact: Michael Harper

CREATIVE SHOW SERVICE
59A Maxwell Ct.
Santa Rosa, CA 95401
(707) 546-7540
Contact: Don Lind

CREATIVE SOUND RECORDING
Sound Reinf., Lights
6412 Cerromar Cir.
Orangevale, CA 95662
(916) 969-8785
Contact: Michael Nolasco

CROSSROAD AUDIO
Sound Reinf., Rental
4029 Goldust Dr.
Modesto, CA 95355
(209) 578-0287
Contact: Bill Borgh

CROW RECORDING
Audio Recording
4000 Wallingford N.
Seattle, WA 98103
(206) 634-3088
Contact: J. Nelson

DANCE EXTRAVAGANZA
Sound Reinf., Lights, Rental
PO Box 487
Maple Valley, WA 98038
(206) 432-1179
Contact: Eric Koch

DB AUDIO
Sound Reinf., Rental
S. 4816 Madelia
Spokane, WA 99223
(509) 448-8740
Contact: Drew Bunch

DBC SOUND
Sound Reinf., Audio Recording
20900 NE 42nd St.
Redmond, WA 98053
(206) 868-8980
Contact: Mark Crouter

DIGITAL SOUNDSCAPES
Audio Recording
3614 Woodlawn Ave. N.
Seattle, WA 98103
(206) 547-3482
(213) 668-0130
Contact: Keith Keller, Mark Lynette

DISCOUNT MUSIC RECORDING
Sound Reinf., Lights, Rental, Audio Recording
415 Broadway
Vallejo, CA 94590
(707) 643-2588
Contact: Frank Henderson

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

DRIVER SOUND
Sound Reinf., Rental
PO Box 42271
Portland, OR 97202
(503) 233-9072
Contact: Jeffrey Handley

EAGLE NEST RECORDING & SOUND REINFORCEMENT
Sound Reinf., Audio Recording
PO Box 196
Ferron, UT 84523
(801) 384-2304
Contact: Craig C. Garrett



PHIL EDWARDS RECORDING
Hayward, CA

PHIL EDWARDS RECORDING
Audio Recording,
1534 W. Winton Ave.
Hayward, CA 94545
(415) 784-1971
Contact: Phil Edwards
REMOTE RECORDING
Vehicles: 31' GMC 6500 bobtail w/liftgate; Ford van
Control Room Dimensions: Mobile II: 20 x 8 x 8
Mixing Consoles: API 40 x 24 x 24 w/550A EQ, API 1604 w/550A EQ.
Audio Recorders: (2) 3M 79 24-track or 16-track, MCI 110-B 2-track, Ampex 440C 2-track, (3) Sony cassette decks.
Noise Reduction Systems: Dolby M24 "A", (4) Dolby A361 "A"
Synchronization Systems: Adams-Smith 605B 3-machine synchronizer.
Outboard Equipment: (5) UREI 1176LN limiters, (2) UREI LA3A limiters, Orban dual parametric equalizers, Orban 3-channel de-esser, Lexicon PCM70 digital reverb, (2) Pultec MEQ-5 equalizers.
Microphones: (5) Neumann U87, (2) Neumann U47 FET, Neumann KM84, (2) AKG 414, (2) AKG 451, (4) Sennheiser 421, (2) Shure SM85, (2) Shure SM87, (32) Shure SM56, Shure SM58, (2) Shure SM53, Stereo C-Tape, (4) E-V RE 15, (2) E-V 1751, (2) Sony ECM-22P, (2) RCA DX77, (6) Countryman FET 85 DIs.
Monitor Speakers: (2) UREI 811B Time Align, (4) Auratones.
Power Amplifiers: (2) McIntosh MC2100s, Crown DC300A.
Video Monitors: Sony KX-1901 Proelec color, Sony 8" B&W.
Cameras: Sony 1900 color camera.
Other Major Equipment: (54) line isolated mic splits, (5) Clear-Com stations, 200' 50 amp 220 volt line, 300' 27 pr. snakes, (100) individual mic cables.
Rates: \$1,500-\$2,300 per day, mileage and expenses extra.
Extras & Direction: Complete packages for record production, video and radio broadcast taping, film and commercial production. Simultaneous record and broadcast packaging a specialty. Experienced crew. Recent credits include Grammy-nominated Woody Herman album (Concord Records), Edwin Hawkins (Birthright Records), George Thorogood & The Destroyers (Concert Video), Zasu Pitts Memorial Orchestra, Carmen McRae and Betty Carter (Great American Music). Call for brochure.

ELECTRONIC SOUND PRODUCTS
Sound Reinf., Lights
3320 Chelton Loop S.
Colorado Springs, CO 80909
(303) 597-9350
Contact: Don Williams, Mike Chilcote
SOUND REINFORCEMENT
Touring Radius: Regional and national
Maximum Venue Size: 20,000 seats
House Loudspeakers: (36) ESP Q4VB 3-way cabinets, (12) ESP Q4LB dual 18" sub woofer cabinets.
Flying System Available: Yes.
Monitor Loudspeakers: (12) ESP wedge monitors w/15" and 1/2" CD, (2) ESP dual 15" custom drum monitors, (4) ESP Q4VB side fill cabinets.
House Consoles: Soundcraft 500B 36 x 8 x 2, Yamaha PM3000 40-input (on order).
Monitor Consoles: Soundcraft 400B 32 x 10.
Outboard Equipment: Lexicon 200 digital reverb, Lexicon PCM70, Lexicon PCM60, Yamaha REV7, Yamaha SPX90, (2) Lexicon PCM42 digital delay, DeltaLab CompuEffectron, (2) Gatex 4-channel gates, (2) dbx 160X compressors, (4) dbx 166 dual comp/gate, (12) White 4650 graphic EQs, Barcus-Berry 802, Orban 672A parametric EQ, Orban 622B parametric EQ.
Power Amplifiers: (40) Hafler DH500, (20) Hafler DH220, (6) JBL UREI 6290, (6) QSC MX 1500.
Microphones: (12) Shure SM57s, (8) Shure SM58s, (10) Sennheiser MD421s, (4) Sennheiser MD431s, (2) Sennheiser MD409s, (2) AKG D12E, (2) AKG D112, (2) AKG 451EB, (2) Shure SM81, (2) Beyer M88.
Lighting: Celco Series II 60-channel w/Soft Patch, (200) Thomas 1000W PAR 64 polished aluminum in 80' of Thomas truss, 180 channels of ESP custom dimmers.
Other Equipment: IH4070B semi tractor, 42'-high cub trailer.
Rates: Available on request.

EMERSON FILM AND VIDEO SOUND
Audio & Video Recording
1490 S. St. Paul St.
Denver, CO 80210
(303) 744-3001
Contact: James Emerson

EVENT AUDIO PRODUCTIONS
Sound Reinf., Rental, Audio Recording
PO Box 1292
Frisco, CO 80443
(303) 668-0153
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Sound Reinf., Staging, Audio Recording
4220 Broadway
Denver, CO 80216
(303) 292-2115
Contact: W.K. Gerbrandt

FERGUS SOUND ENTERPRISES
Sound Reinf., Audio Recording
1925 Orchard Ave.
Boulder, CO 80302
(303) 442-3939
Contact: Fergus

FRED FOXX MUSIC CO.
Sound Reinf., Lights, Audio & Video Recording
5 Elkwood Dr.
So. San Francisco, CA 94080
(415) 994-5908
Contact: FH Nesbitt

FTM STUDIOS
Sound Reinf., Audio Recording
1111 S. Pierce St.
Denver, CO 80226
(303) 922-3330
Contact: John Sundberg

FUNDAMENTAL SYSTEMS
Sound Reinf.
PO Box 842
Berkeley, CA 94701
(415) 644-0740

GARY GADWOOD CUSTOM RECORDING
Audio Recording
11995 NW Kearney
Portland, OR 97229
(503) 664-0683
Contact: Gary Gadwood

GARRETSON SOUND SERVICE
Sound Reinf., Rental
112 Mollitt St.
San Francisco, CA 94131
(415) 334-4033
Contact: Dick Garretson

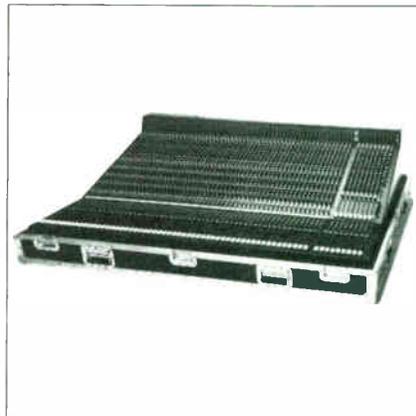
GATEWOOD STUDIO
Sound Reinf., Rental, Audio Recording
1057 Pine St.
Livermore, CA 94550
(415) 447-6455
Contact: Dean A. Gatewood

GOLDEN STATE SOUND
Sound Reinf.
59A Maxwell Ct.
Santa Rosa, CA 95401
(707) 546-7540
Contact: Don Lund

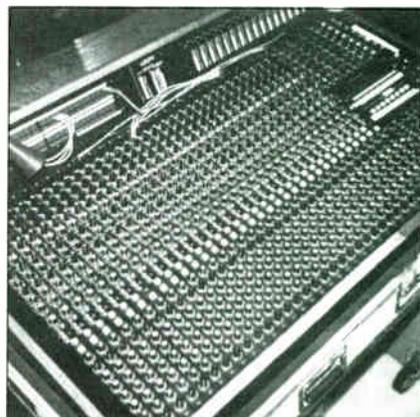
GREEN WEENIE PRODUCTIONS
Audio Recording

2207 Shattuck Ave.
Berkeley, CA 94704
(415) 848-4395
Contact: Jim Bennett

HANK'S BASEMENT AUDIO
Audio & Video Recording
5665 E Colorado Ave.
Denver, CO 80224
(303) 756-8777
Contact: Hank Anderson



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1443 Lewiston Dr.
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Contact: Mark Herman
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Audio Recording
PO Box 2411
Truckee, CA 95734
(916) 587-1583
Contact: Paul Rose

HOERNER AUDIO PRODUCTIONS
Audio & Video Recording
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Contact: Clint Hoerner

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PO Box 840
Occidental, CA 95465
(707) 874-2278
Contact: Tina Dungan

ED HOLLICRAFT RECORDING
Audio Recording
1961 Rose Ln.
Pleasant Hill, CA 94523
(415) 689-3444
Contact: Ed Hollcraft

HORODKO SOUNDTRAX
Sound Reinf., Rental, Audio Recording
111 Vallejo St.
San Francisco, CA 94111
(415) 956-8729

HUN SOUND
Sound Reinf., Staging, Rental, Audio Recording
647 Irwin St.
San Rafael, CA 94901
(415) 454-2911
Contact: Barret, Michael, or Rollie

INTERMIX AUDIO
Sound Reinf., Lights, Rental
1121 Hobson
Butte, MT 59701
(406) 494-7826
Contact: Jana Unon, Scott Kalarchik

J&J SOUND STUDIO
Audio Recording
PO Box 1502
Pleasanton, CA 94566
(415) 462-5209
Contact: Jack

FRANK JAMES PRODUCTIONS
Sound Reinf., Lights, Rental, Audio Recording
411 Broadway
Vallejo, CA 94590

(707) 648-2221
Contact: Charles Feild

JERMYN PRODUCTIONS
Sound Reinf., Lights, Rental
1525 Jasmine Way
Morgan Hill, CA 95037
(408) 779-2704
Contact: John Bronson

JESTER SOUND & VIDEO
Audio & Video Recording
423 Kuhlman Dr.
Billings, MT 59105
(406) 248-5896
Contact: Bob Hale

JET SOUND & LIGHTING SYSTEMS
Sound Reinf., Lights, Rental
625 S. 44th St.
Boulder, CO 80303
(303) 494-0518
Contact: Richard Werdes

JV SOUND
Sound Reinf., Rental
622 3rd Ave.
San Francisco, CA 94118
(415) 752-6389
Contact: Joe or Vicki

KABA STUDIOS (A DIVISION OF KENNETH BACON ASSOCIATES)
Rental, Audio Recording
24 Commercial Blvd., Ste. E
Novato, CA 94947
(415) 883-5041
Contact: Rick Boroughs

KINETIC SOUND AND LITE
Sound Reinf., Lights, Rental
15036 29th Ave. S.
Seattle, WA 98188
(206) 242-7308
Contact: Tom Wilson

KUSTOM SOUND SERVICES
PO Box 4902
Missoula, MT 59806
(406) 728-6655
Contact: John Campbell

LACKEY SOUND AND LIGHT COMPANY
Sound Reinf., Lights, Rental
3425 Stoneway N.
Seattle, WA 98103
(206) 632-7773
Contact: William K Lackey

LINEAR SOUND SYSTEMS
Sound Reinf.
5427 Telegraph Ave., Ste. W-1
Oakland, CA 94609
(415) 652-6048
Contact: Kent Kline, Kaj Kline

LIVE ENTERPRISES
Sound Reinf., Lights, Audio Recording
127 Lake Glen
Carson City, NV 89701
(702) 882-8258
Contact: Chuck Harold

STEVEN LORENTE PRODUCTIONS
Sound Reinf., Lights, Staging, Rental, Audio Recording
5806 Porto Alegre Dr.
San Jose, CA 95120
(408) 268-4344
Contact: Steven Lorente



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They say you get what you pay for. Indeed, the 528 Voice Processor proves the point. Five high performance signal processors in a single rack space, for about what you'd expect to pay for each. Mic Preamp, De-esser, Compressor/Limiter, Downward Expander, Parametric EQ/Notch Filter. Even 48v phantom powering and a balanced line input. No compromises, nothing left out.

The 528 Voice Processor is the ideal mic input system for sophisticated recording and high level sound reinforcement systems. Control annoying sibilance, optimize spectral balance. Set overall signal levels. Reduce noise. And, eliminate resonances and ring frequencies with the 528's extremely selective EQ and filtering.

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Seattle, Washington 98199, USA
Telephone (206) 282-2555
Telex 703282

Signal processing at its best

Circle #082 on Reader Service Card

M&M AUDIO LABS
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 PO Box 2005
 Coeur D'Alene, ID 83814
 (208) 667-7766
 Contact: Chns or Elaine Martin

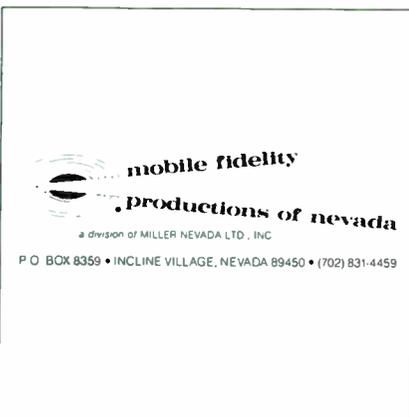
MASTER MIXED PRODUCTIONS
Sound Reinf., Audio Recording
 PO Box 25879
 Lake City Station
 Seattle, WA 98125
 (206) 362-1151
 Contact: Marty Sever

MATEEL SOUND
Sound Reinf., Lights, Staging, Rental
 432 Church St.
 Garberville, CA 95440
 (707) 923-3388
 Contact: Jimmy Dangler

MEAD RECORDS/RAINBOW EXPRESS PUBLISHING
Sound Reinf., Audio Recording
 602 W. Mead Ave.
 Yakima, WA 98902
 (509) 453-6364
 Contact: Mike Waller

MEDIA WORKS
Audio & Video Recording
 1250 Huff Ln., Box 15
 Jackson, WY 83001
 (307) 733-1300
 Contact: Jeff McDonald

MIRAGE PRODUCTIONS, LTD.; PENGUIN AUDIO
Sound Reinf.
 PO Box 460
 Carmichael, CA 95609
 Contact: Christopher



MOBILE FIDELITY PRODUCTIONS OF NEVADA
Incline Village, NV

MOBILE FIDELITY PRODUCTIONS OF NEVADA
Audio Recording
 PO Box 8359
 Incline Village, NV 89450
 (702) 831-4458
 (702) 831-4459
 Contact: Brad S. Miller

REMOTE RECORDING
 Audio Recorders: (4) Colossus digital processor 4 discrete channels, 120v-240v, DMR 2000 U-matic VCR for digital audio data storage, 120v-240v, (2) VO 6800 U-matic VCR for digital audio data storage, 12v remote location, Harmonia Mundi Acoustica BW 102 digital standards converter to compact disc.
 Outboard Equipment: (2) Harmonia Mundi Acoustica BW 102 digital standards converter to CD format, (2) battery pack sets for complete 12v held operation for film sound etc., (3) Rycote windscreens for use w/MS-4 mics in-field.
 Microphones: (6) MS-4 (dual XY) 4-channel discrete surround (4-4-4).
 Extras & Direction: Offers location digital audio recording of music, dialog, sound effects for records, broadcast and film sound. Executive producer Brad Miller is creative director of the Mystic Moods Orchestra ("One Stormy Night" etc.) and founder of Mobile Fidelity Sound Lab (original master

REMOTE RECORDING and SOUND REINFORCEMENT



N O R T H W E S T

recordings, 1/2-speed masters). Lou Dorren is design inventor of Colossus digital processor, contains 95+ db of 4-channel separation and dynamic range; coupled with MS-4 microphone has bandwidth excess of 20 kHz, flat down to 2 Hz. MS-4 is also DC servoed which virtually eliminates DC offset, thus image shifts. Entire system 3-dimensional imaging is deadily accurate. Absolute phase coherence guarantees compatibility with stereo or monaural mixes from 4-channel master recordings. Telarc International recently purchased their own Colossus; Denver Symphony Orchestra was recorded on March 28-29, 1987 with Colossus and MS-4 mic system to provide production sound for major IMAX film. Optical discs (Philips/Pioneer, TEAC) are compatible too!

MOBILE "T" PRODUCTIONS
Sound Reinf., Audio Recording
 286 Martens
 Mt. View, CA 94040
 (415) 964-6913
 Contact: Michael Phillip Oglesby III

MOONLIGHT SOUND
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 11470 Lookout Rd.
 Longmont, CO 80501
 (303) 652-2058
 Contact: Paul Thompson

NEW LIFE BROADCASTING
Sound Reinf., Rental, Audio Recording
 PO Box 117, 440 Lawrence St.
 Quincy, CA 95971
 (916) 283-4144
 Contact: Ron Trumbo

NO WARRANTY SOUND CO.
Sound Reinf., Lights, Staging, Rental
 873 Loring Ave.
 Crockett, CA 94525
 (415) 787-1044
 Contact: Clarence

NORTHERN CALIFORNIA PRODUCTIONS
Sound Reinf., Rental
 PO Box 525
 Chico, CA 95927
 (916) 894-5555
 Contact: Clint Simic

NORTHWEST MOBILE TELEVISION
Video Recording
 7867 S. 180
 Kent, WA 98032
 (206) 251-0560
 Contact: Thom Kroon

ON THE ROCK
Sound Reinf., Staging, Rental, Audio Recording
 1727 Dotsero Ave.
 Loveland, CO 80538
 (303) 669-0739
 Contact: Don Mattson

PACIFIC MOBILE RECORDERS
Audio Recording
 2616 Garfield Ave.
 Carmichael (Sacramento), CA 95608
 (916) 483-2340
 Contact: Kat Colley Hibbard

PARAGON SOUND & LIGHTING
Sound Reinf., Lights, Audio Recording
 3933 Kingridge Dr.
 San Mateo, CA 94403
 (415) 341-2836
 Contact: Patnck Fitzgerald

PERFORMANCE AUDIO
Sound Reinf., Rental, Audio Recording
 2358 S. Main St.
 Salt Lake City, UT 84115
 (801) 466-3196
 Contact: Craig Hylton

PFS RECORDING
Audio & Video Recording
 Box 6840
 San Jose, CA 95150
 (408) 275-6322
 Contact: Mike Halloran

PHANTASMA SOUND
Sound Reinf., Audio Recording
 7935 Fremont Ave.
 Ben Lomond, CA 95005
 (408) 336-2494
 Contact: Errol

PHANTOM POWER STUDIO
Sound Reinf., Audio Recording
 105 Pennsylvania Ave.
 Hamilton, MT 59840
 (406) 363-2835
 Contact: Joe McLean

PINE APPLE STUDIOS
Audio Recording
 PO Box 1192
 Philomath, OR 97370
 (503) 757-8702
 (503) 764-2617
 Contact: Clay Ashley

PINEAPPLE PRODUCTIONS
Sound Reinf., Rental, Audio Recording
 1404 SE 23rd #1
 Portland, OR 97214
 (503) 233-1725
 Contact: Jay Cosnett



THE PLANT RECORDING STUDIOS
Sausalito, CA

THE PLANT RECORDING STUDIOS
Audio Recording
 2200 Bridgeway
 Sausalito, CA 94965
 (415) 332-6100
 Contact: Bob Skye
 Extras & Direction: "Rover", The Plant's mobile recording unit, offers the finest in mobile acoustic environments and

—LISTING CONTINUED ON PAGE 134

New Carver Amps for permanent installation, studio, and concert use. PM-175 and PM-350.

NOW THAT THE CARVER PM-1.5 IS PROFESSIONALLY SUCCESSFUL, IT'S STARTED A FAMILY. INTRODUCING THE NEW CARVER PM-175 AND PM-350.

Month after month on demanding tours like Bruce Springsteen's and Michael Jackson's, night after night in sweltering bars and clubs, the Carver PM-1.5 has proven itself. Now there are two more Carver Professional Amplifiers which deliver equally high performance and sound quality — plus some remarkable new features that can make your life even easier.

SERIOUS OUTPUT. The new PM-175 delivers 250 watts RMS per channel into 4 ohms. As much as 500 watts RMS into 8 ohms bridged mode. The larger PM-350 is rated at 450 watts per channel into 4 ohms. Up to a whopping 900 watts in 8 ohm bridged mode. Both with less than 0.5% THD full bandwidth at any level right up to clipping. Plus 2 ohm capability as well.

SERIOUS PROTECTION. Like the PM-1.5, both new amplifiers have no less than five special protection circuits including sophisticated fault interruption against dead shorts, non-musical high frequency, and DC offset protection, as well as low level internal power supply fault and thermal overload safeguards. The result is an amplifier which is kind to your expensive drivers — as well as to itself.

OUTBOARD GOES INBOARD. Each PM-175 and PM-350 has an internal circuit card bay which accepts Carver's new plug-in signal process-

ing modules. Soon to be available is an electronic, programmable 2-way stereo crossover, with 24 dB per octave Linkwitz-Reilly phase -aligned circuitry, a built-in adjustable high-end limiter and balanced outputs. And more modules will be available in the near future to further help you streamline your system.

PRO FROM CONCEPTION. The PM-175 and PM-350 inherited their father's best features. Including slow startup and input muting to eliminate turn-on current surge, 11-detent level controls, phone jacks, power, signal, clipping and protection indicators as well as balanced XLR input connectors. In a bridged mode, both amplifiers will drive 70-volt lines without the need for external transformers.

MEET THE FAMILY AT YOUR CARVER DEALER. All remarkable Carver Professional Amplifiers await your own unique applications. Hear their accuracy and appreciate their performance soon.

SPECIFICATIONS: CARVER PM-175 Power: 8 ohms, 175 w/channel 20-20kHz both channels driven with no more than 0.5% THD, 4 ohms, 250 w/channel 20-20kHz both channels driven with no more than 0.5% THD, 2 ohms 300 w/channel 20-20kHz both channels driven with no more than 0.5% THD. Bridging: 500 watts into 8 ohms; 400 watts into 16 ohms. THD-less than 0.5% at any power level from 20 mW to clipping. IM Distortion less than 0.1% SMPTE. Frequency Bandwidth: 5Hz-80kHz. Gain: 29 dB. Input Sensitivity: 1.5 V rms. Damping: 200 at 1kHz. Slew rate: 25V/ micro second. Noise: Better than 115 dB below 175 watts. A-weighted. Inputs: Balanced to ground, XLR or TRS phone jacks. Input Impedance: 15k ohm each leg. Compatible with 25V and 70V systems. 19"Wx3.5"Hx11.56"D

SPECIFICATIONS: CARVER PM-350 Power: 8 ohms, 350 w/channel 20-20kHz both channels driven with no more than 0.5% THD, 4 ohms, 450 w/channel 20-20kHz both channels driven with no more than 0.5% THD, 2 ohms 450 w/channel 20-20kHz both channels driven with no more than 0.5% THD. Bridging: 900 watts into 8 ohms; 750 watts into 16 ohms. THD-less than 0.5% at any power level from 20 mW to clipping. IM Distortion less than 0.1% SMPTE. Frequency Bandwidth: 5Hz-80kHz. Gain: 31 dB. Input Sensitivity: 1.5 V rms. Damping: 200 at 1kHz. Slew rate: 25V/ micro second. Noise: Better than 115 dB below 350 watts. A-weighted. Inputs: Balanced to ground, XLR or TRS phone jacks. Input Impedance: 15k ohm each leg. Compatible with 25V and 70V systems. 19"Wx3.5"Hx11.56"D



- Powerful • Reliable • Versatile • Stackable • Rugged • Easy to Install • Compact • Lightweight • Cool Operation • Bridgeable • Quiet • Affordable • Multi-Function Protection • Superb Sound

CARVER

P.O. Box 1237, Lynnwood, WA 98046

POWERFUL

MUSICAL

ACCURATE

Circle #083 on Reader Service Card

World Radio History

Distributed in Canada by: evolution technology

—LISTING CONTINUED FROM PAGE 132

equipment for live concert recording, remote broadcast, audio for film and video, in-house recording and post-production/audio sweetening. Rover is a certified (LEDE™) control room on wheels that features an acoustic accuracy that surpasses many in-house studios. It has become one of the most popular live-to-2-track as well as multi-track mobiles because of its ability to deliver clean accurate sound to the client with virtually no guesswork involved. Rover is available for everything from one-nighters to lengthy tours. If you are looking for more than just saturated tracks, or if you prefer recording and mixing at your place, Rover is the mobile to call. Some of our clients/projects include: John Denver, Stanley Turrentine, Jacques Cousteau, Judy Collins, NFL Films, Anita Baker, NPR, Jimmy Smith, Ronnie James Dio, Kenny Burrell, Island Records, Billy Preston, Chick Corea, Harry Belafonte, Paul Williams, Peter, Paul and Mary, Al Jarreau, John Faddis, Milt Jackson, Les McCann.

PLU AUDIO SERVICES

Sound Reinf., Rental, Audio & Video Recording
Tacoma, WA 98447
(206) 535-7268
Contact: Bob Holden

PRO MEDIA

Sound Reinf., Rental
Two China Basin Bldg.
San Francisco, CA 94107
(415) 957-1383

Contact: Lon Bolender

SOUND REINFORCEMENT

Touring Radius: National

Maximum Venue Size: 100,000

Vehicles: 45' Peterbilt tractor trailer; 20' Ford bobtail; 16' Chevy bobtail.

House Loudspeakers: Meyer MSL-3, Meyer UPA-1A, custom subwoofer cabinets loaded w/JBL

Flying System Available: Yes

Monitor Loudspeakers: Meyer UM-1, EAW SM222 loaded w/JBL

House Consoles: Yamaha PM3000-40, Yamaha PM1800-24, Soundcraft 800B-32.

Monitor Consoles: Meyer ATL 32 x 12, Soundcraft 800B 32 x 8.

Outboard Equipment: Meyer CP 10 parametric EQs, Klark-Teknik DN360 graphic EQs, dbx 900 rack, dbx 160X compressor/limiters, Brooke-Siren FDS360 crossovers, Lexicon PCM60, 200, 224XL digital reverb, Lexicon PCM42, 97 digital delay, Klark-Teknik DN716 digital delay, Eventide 949 Harmonizer, Yamaha SPX90 digital effects processor.

Power Amplifiers: AB Systems 1200, Crest 4001, Meyer MS1000.

Microphones: AKG, Beyer, C-Tape, Schoeps, Shure, Sennheiser, E-V, Neumann, Vega.

Other Equipment: Onan AC generator 100 amps, 3-phase, custom rigging packages, custom 100 amp 3-phase power distribution.

Rates: Please call

PROFESSIONAL SOUND & RECORDING, INC.

Audio Recording
3320 Chelton Loop S.
Colorado Springs, CO 80909
(303) 597-8125

Contact: Chrs Mickle

REMOTE RECORDING

Vehicles: 1984 Winnebago Centaur van, compact 20' x 7.3' x 7.5'. Good for limited access venues. Comfortable custom work environment inside.

Mixing Consoles: Soundcraft 1624 24 x 16 x 24, Rowland Research audiophile 8 x 2, additional consoles available as required.

Audio Recorders: (2) Stephens 821 B 24-track w/autolocator and 16-track heads, (2) Nakamichi DMP-100 2-track digital w/video machines, Revox PR99, Panasonic AG6400 2-track 1/2" hi-fi, (12) TEAC V2RX 3-head cassette decks, real time duplication.

Synchronization Systems: Available as required.

Outboard Equipment: REV7, SPX90, PCM60, ADC 1024, Barcus-Berry 202, dbx and Symetrix compressors, gates and limiters, any piece of outboard gear available upon request.

Microphones: (2) AKG C414 EB, (2) AKG 451 EB w/shotguns, AKG C-33 stereo, Schoeps 501-V stereo, (4) Schoeps CMC 3, Sennheiser, PZM, C-ducer, Shure, E-V.

Monitor Speakers: Spica TC-50, B&W DM 100, Yamaha NS-10, off-air monitoring and Rowland Research X-over and preamp when required.

Power Amplifiers: Rowland Research Model 5, Hafler DH 200, Intersound SP300.

Video Recorders: Panasonic AG-6400 1/2" w/hi-fi.

Video Monitors: (2) BMC composite

Cameras: Canon VC 20A.

Other Major Equipment: Mogami Neglex (all internal wiring), extensive access bay, extensive splitter system, complete location audio production.

Rates: Priced per job and location.

REMOTE RECORDING and SOUND REINFORCEMENT



N O R T H W E S T

PYRAMID (SOUND DIVISION)

Sound Reinf., Lights

398 N. Laurel

Ashland, OR 97520

(503) 488-2034

Contact: Steve Read

SOUND REINFORCEMENT

Touring Radius: Regional

Maximum Venue Size: 2,000 capacity

Vehicles: We use a pick-up and a van.

House Loudspeakers: 4- or 5-way, all JBL components, (4)

JBL 2225 subwoofers, (2) JBL 2220 woofers, (2) JBL horn-loaded 10", (4) JBL 2" drivers, (2) on lenses and (2) on JBL 2380 CD horns, (2) JBL super tweeters.

Monitor Loudspeakers: (4) JBL loaded, each 2220 and 1" JBL driver on horn.

House Consoles: Studiomaster 16 x 4 x 2.

Monitor Consoles: Biamp 16 x 2.

Outboard Equipment: DOD compressor/limiter, Furman PL 8 plus, Boss Superchorus, Lexicon PCM41, PCM42, PCM60, DOD exciter, DOD 1/3-octave EQ, NE1 1/3-octave EQ, Sundholm 1/3-octave EQ, Tapco and DOD X-overs.

Power Amplifiers: SAE P-250, Soundcraft 7501 and 5501, Crown DC300, Audionics 120 per side 8-channel.

Microphones: Assortment of: Beyer, Shure, Sennheiser (14 total).

Lighting: ETA 8-channel 4-scene controller, rack dimmers, 16 PAR 56 cans

Other Equipment: 14 x 5 snake 125', 12 x 3 snake 75'

Lighting: ETA 8-channel 4-scene controller, rack dimmers, 16 PAR 56 cans

Other Equipment: 14 x 5 snake 125', 12 x 3 snake 75'

Other Equipment: 14 x 5 snake 125', 12 x 3 snake 75'

Other Equipment: 14 x 5 snake 125', 12 x 3 snake 75'

RAL-RECORDING

Audio Recording

2855 Oleander

Merced, CA 95340

(209) 722-3220

Contact: Robert Laughton

BILL RASE PRODUCTIONS, INC.

Audio & Video Recording

955 Venture Ct.

Sacramento, CA 95825

(916) 929-9181

Contact: Bill Rase

RECORDING ASSOCIATES

Audio & Video Recording

5821 SE Powell Blvd.

Portland, OR 97206

(503) 777-4621

Contact: Jay Webster, Bob Stoutenburg

REEL TIME REPRODUCTIONS

190 Marianna Way

Campbell, CA 95008

(408) 265-5364

Contact: Timothy Whyte

GEORGE RELLES SOUND REINFORCEMENT

Sound Reinf.

2021 Kincaid St.

Eugene, OR 97405

(503) 686-9325

Contact: George Relles

SOUND REINFORCEMENT

Touring Radius: Regional

Maximum Venue Size: 5,000

Vehicles: 1986 Chevy van; diesel 15' x 8' box.

House Loudspeakers: (8) Meyer MSL-3, (6) Harbinger 512, (6) Harbinger 508, (8) Klipsch La Scala, (2) Community Boxer sub woofers.

Flying System Available: Yes.

Monitor Loudspeakers: (4) Meyer UPA, (4) Harbinger 524, (2) Klipsch Heresy.

House Consoles: Hill Series 4400 (36 x 8 x 2), Hill Series B-3 (24 x 4 x 2), Allen & Heath (16 x 4 x 2).

Monitor Consoles: Hill M3 (24 x 6).

Outboard Equipment: Lexicon 200 digital reverb, Lexicon PCM70 digital effects processor, Yamaha SPX90 digital reverb, DeltaLab ADM 512 Super Timeline digital delay, BBE 202R signal processor, Aphex Aural Exciter B, EXR Exciter, Audio & Design Scamp rack, (2) S30s, S100, (6) S31s, (4) S03s, (2) S04s, (2) Sundholm 2103 EQ, (2) Rane PE-15 parametric EQ, (2) Rane ME-30 1/3-octave EQ.

Power Amplifiers: (8) Crown Micro-Tech 1200, (4) Hafler P500, (3) BGW 250, (3) Carver PM1.5, Crown DC 300A, Crown D150.

Microphones: (8) AKG C451, (2) AKG C414, (4) Neumann KM84, (4) Shure SM81, (6) AKG C535, (6) Sennheiser 421, (2) E-V RE20, (4) Shure SM53, (6) Shure SM57, (4) Shure SM58, (2) Beyer M260, (2) RCA 77, (2) Countryman EM101, AKG D330, Shure SM85.

Rates: \$350-\$1,200/day plus travel.

RICH SOUND CO.

Sound Reinf., Lights, Rental, Audio Recording

641 B Nord Ave.

Chico, CA 95926

(916) 891-1972

Contact: Rich Pires

ROAD WARRIOR SOUND

Sound Reinf., Audio Recording

4455 S. Logan St.

Englewood, CO 80110

(303) 761-7677

Contact: Doug Zeno, Scott Cook

ROCKY MTN RECORDING

Sound Reinf., Audio & Video Recording

1050 E. 1600 N.

Mapleton, UT 84663

(801) 489-7850

Contact: Walt C. Jones

D. ROSS PRODUCTIONS

Audio Recording

3097 Floral Hill Dr.

Eugene, OR 97403

(503) 343-2692

Contact: Don Ross

NORMAN ROSS PRODUCTIONS

Audio & Video Recording

2810 E. Evergreen Ave.

Salt Lake City, UT 84109

(801) 484-0401

Contact: Alice Ross

ROTHROCK PRODUCTION ENTERPRISES

Sound Reinf., Audio Recording

PO Box 1624

Boulder, CO 80306

(303) 499-5475

Contact: John Rothrock

RUTHER REMOTE RECORDING

Sound Reinf., Rental, Audio Recording

108 N. Roosevelt

Spokane, WA

(509) 522-0438

Contact: Bud Ruther

RANDALL SCHILLER PRODUCTIONS

Sound Reinf., Rental, Audio Recording

1207 Fifth Ave.

San Francisco, CA 94122

(415) 661-7553

Contact: Randy Schiller

SOUND REINFORCEMENT

Touring Radius: Local, regional

Maximum Venue Size: 10,000 people

House Loudspeakers: (4) Gauss w/Gauss HF-4000, (16)

Harbinger 1208 w/JBL 2441 drivers, (6) Eastern Acoustics

SR-115 bass bins, (8) Eastern Acoustics SR-215 bass bins,

(16) Cerwin-Vega B-36A/L-36PE LF folded horn, (12) Gauss

1502 super tweeter.

Monitor Loudspeakers: (8) Harbinger 524, (2) Harbinger

514, (4) Altec 511 horn w/Altec 808 drivers, (4) Altec 816

bass cabinet w/Gauss 5840.

House Consoles: Soundcraft 200B SEQ 24 x 4 x 2, Tapco

7416 16 x 4 x 2, Biamp 883 8 x 2 x 1.

Outboard Equipment: Yamaha REV7 digital reverb, Yamaha SPX90 digital reverb, Eventide H910 Harmonizer, DeltaLab 2048 digital delay, DeltaLab DL2 stereo digital delay, dbx 161 compressor/limiter, dbx 163 compressor/limiter, UREI 1178 stereo compressor/limiter, Orban 6228 parametric EQ, Fosgate DSM 3602 360° digital space matrix. **Power Amplifiers:** (3) Carver M1.5T, (7) SAE 2400L, (6) SAE A-501, (8) SAE A-1001, (12) SAE A-201, (6) SAE 2200, (3) Phase Linear 700B

Microphones: E-V RE20, (4) E-V RE15, (2) Shure SM81, (14) Shure SM57, (10) Shure SM58, (3) Sennheiser MD-421, (2) Sennheiser MD-431, AKG D-12, (6) Countryman DIs, (2) Sony ECM-33P.

Lighting: Phoebus Ultra-Quartz.
Other Equipment: (2) RTS 424 distribution amplifiers, (5) Crown VFX-2A stereo 2-way electronic crossover, (2) Rane AC-22 stereo 2-way electronic crossover, Rane AC-23 stereo 3-way electronic crossover, Uni-Sync MS-10 10 x 3 mic splitter, Audio Control SA-3050 spectrum analyzer, Yamaha Q2031 1/3-octave stereo EQ, (4) MXR 171 dual 15-band graphic EQ.

REMOTE RECORDING
Control Room Dimensions: 12' x 15'

Mixing Consoles: TEAC Tascam Model 5B, TEAC Tascam Model M35EX, (4) TEAC Tascam Model 1.

Audio Recorders: Otari MX 5050B, Sony TC-854-4S, Sony TC-850-2T, TEAC Tascam 80-8, Pioneer RT-707.

Noise Reduction Systems: (2) dbx 154 declinear noise reduction, SAE 5000 Impulse noise reduction.

Outboard Equipment: Sony TC WR-930 stereo double cassette deck, (2) Sony TCK-81 stereo cassette deck, Aiwa AD-F990 stereo cassette deck, UNI-Sync MS-10 10 x 3 mic splitter, TEAC/Tascam MB-20 meter bndge, (4) Technics SL 1200 MK.2 turntable, Bozak CMA-10-2DL mixer, UREI 1620 mixer, Sound Workshop 242 stereo reverb unit.

Microphones: Neumann U87, AKG D-12, (2) AKG C-414, (2) Sennheiser MD-431, (2) Shure SM91, (2) Crown P2M 6LPB/PX 18B, (2) Shure SM81, (14) Shure SM57, (10) Shure SM58, Shure "Green Bullet" S20D.

Monitor Speakers: (2) JBL 4411, (2) JBL 4311, (4) JBL 4401, (2) Auratone.

Power Amplifiers: BGW 100-1 30-watt/channel, SAE 2401 200-watt/channel, SAE A-201 100-watt/channel.

Video Recorders: JVC HRD-470U VHS hi-fi/HQ video deck, Sony SL-2700 Beta hi-fi video deck

Video Monitors: Sony KV-1956B 19" monitor, Magnavox 13"

Cameras: Sony CCD V110.

Extras & Direction: We are a multi-faceted company providing facilities and services in the areas of audio, video, film and theater. We are dedicated to providing the highest quality in a relaxed but professional environment. In addition to recording studio services and location recording services, we provide sound reinforcement for venues ranging from small clubs to large outdoor concerts, audio design and installation, film and video production and lighting services. Please come and experience the finest sound system in San Francisco at San Francisco's finest club—the I-Beam!

SCOTT SOUND CO.
Sound Reinf., Rental, Audio Recording
805 Smith St.
Fort Collins, CO 80524
(303) 224-3183
Contact: Scott Moyer

SEISMIC AUDIO
Sound Reinf., Lights, Staging, Rental
1426 S. Jackson
Seattle, WA 98144
(206) 329-8145

ROBERT SHUMAKER RECORDING SERVICES
Audio Recording
2321 Russell St., #1E
Berkeley, CA 94705
(415) 548-9986
Contact: Robert Shumaker

SHYNE SOUND
Sound Reinf., Staging, Audio Recording
Box 9906
San Rafael, CA 94912
(415) 459-2833
Contact: Leroy Shyne

Extras & Direction: Live music engineering is my specialization as a result of a lifetime of performing music. I operate a sound reinforcement facility for an audience of 5,000. I've been contracted to operate larger systems. I have a portable 16 x 24 stage if needed. Stereo microphone recordings (PZMs) of my sound system operation have been released (Clifton Chenier Live at the San Francisco Blues Festival on Arhoolie Records). I just built a live-to-2-track remote recording facility into an extended Ford Econoline van. It was designed to be record quality and cost effective enough to

provide an opportunity for the vast amount of music worth putting on tape. It can be recorded analog with 14" reels (1 hr. at 15ips), or digital to 3/4" U-matic video deck. One camera video shoots can also be provided at the same time without increasing the cost significantly. I also offer sound system consultation, design and installation service.

SOUND ON STAGE, INC.
Sound Reinf., Rental
100 Northhill Dr., #30
Brisbane, CA 94005
(415) 468-2990
Contact: Jerry Pfeiffer, Bob Walker

SOUND VISUAL PRODUCTS
Sound Reinf., Lights, Audio Recording
18425 Fifth Ave
Jamestown, CA 95327
(209) 532-3272
(916) 371-5871

Contact: Jerry Chiappelli, Alan Lyon
Extras & Direction: Concert and club reinforcement systems featuring Renkus-Heinz SMART Systems for venues up to 5,000. Up to 32-channel mains and 24 x 8 monitors. Flying systems available. Remote audio recording services available (4-, 8-, 12-track). Serving all of Northern California from offices in the Central Valley, Sacramento and San Jose. Regional tours a specialty. Complete lighting services available including dual 40' truss. Friendly qualified operators. We strive to offer quality services at very competitive rates.

SOUNDS NATURAL AUDIO SERVICES
Sound Reinf., Staging, Audio & Video Recording
214 Keystone Ave.
Santa Cruz, CA 95062
(408) 425-8015
Contact: Bill Burnside, Ken Bolelho

SPECTRUM INC.
Sound Reinf., Audio & Video Recording
PO Box 757
San Carlos, CA 94070
(415) 593-9554
Contact: Wes Weaver

STARWEST PRODUCTIONS
Sound Reinf., Rental, Audio Recording
1391 N. Speer Blvd., #490
Denver, CO 80204
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Contact: Steve Pettit

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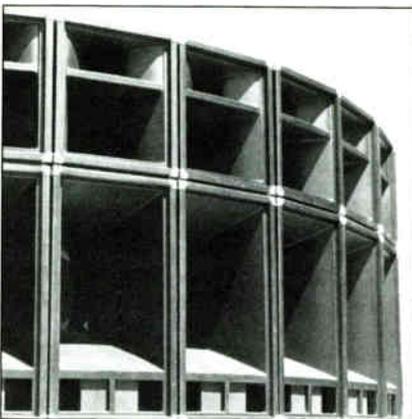
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Power Amplifiers: (20) Peavey DECA-1200 amplifiers-main speaker system, (8) Haller DH-500 amplifiers-monitor system, (6) Crown DC-300A II amplifiers-monitor system, misc. BGW-750, BGW-250, Crown DC-150A II, etc.
Microphones: (8) Beyer M-88, (5) Beyer M-201, (6) Sennheiser MD-421, (2) E-V RE20, (6) E-V DS35, (3) AKG C-451, (2) AKG D-12E, (8) Audio-Technica ATM-41A, (6) Audio-Technica ATM-63, misc. Shure SM58 and SM57, Sony, E-V, Beyer, Ceteq-Vega Wireless.
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Other Equipment: Midas/custom 38-channel, 3-way split-

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Don't miss the August issue, with these special features:

► **ACOUSTICS, DESIGN & INSTALLATION SUPPLEMENT**—The yearly *Mix* review of developments in facility design, construction and acoustics. Included will be illuminating technical articles and our annual **Directory of Designers and Suppliers**.

► **MIX TENTH ANNIVERSARY FLASHBACKS**—*Mix* editors and writers look back on our experiences and those of industry luminaries over the past ten years. Relive with us some remarkable achievements in audio—as well as the hilarious and absurd.

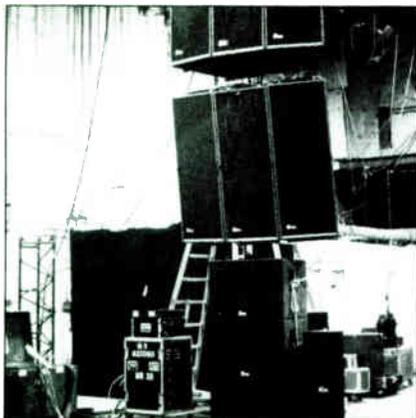
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(619) 282-4011
Contact: Jeff

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2323 Corinth St.
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(213) 477-1938
Contact: Ed Maloney

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(213) 465-1762
Contact: Jeff McLane

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(714) 687-5506
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Northridge, CA 91325
(818) 345-8765
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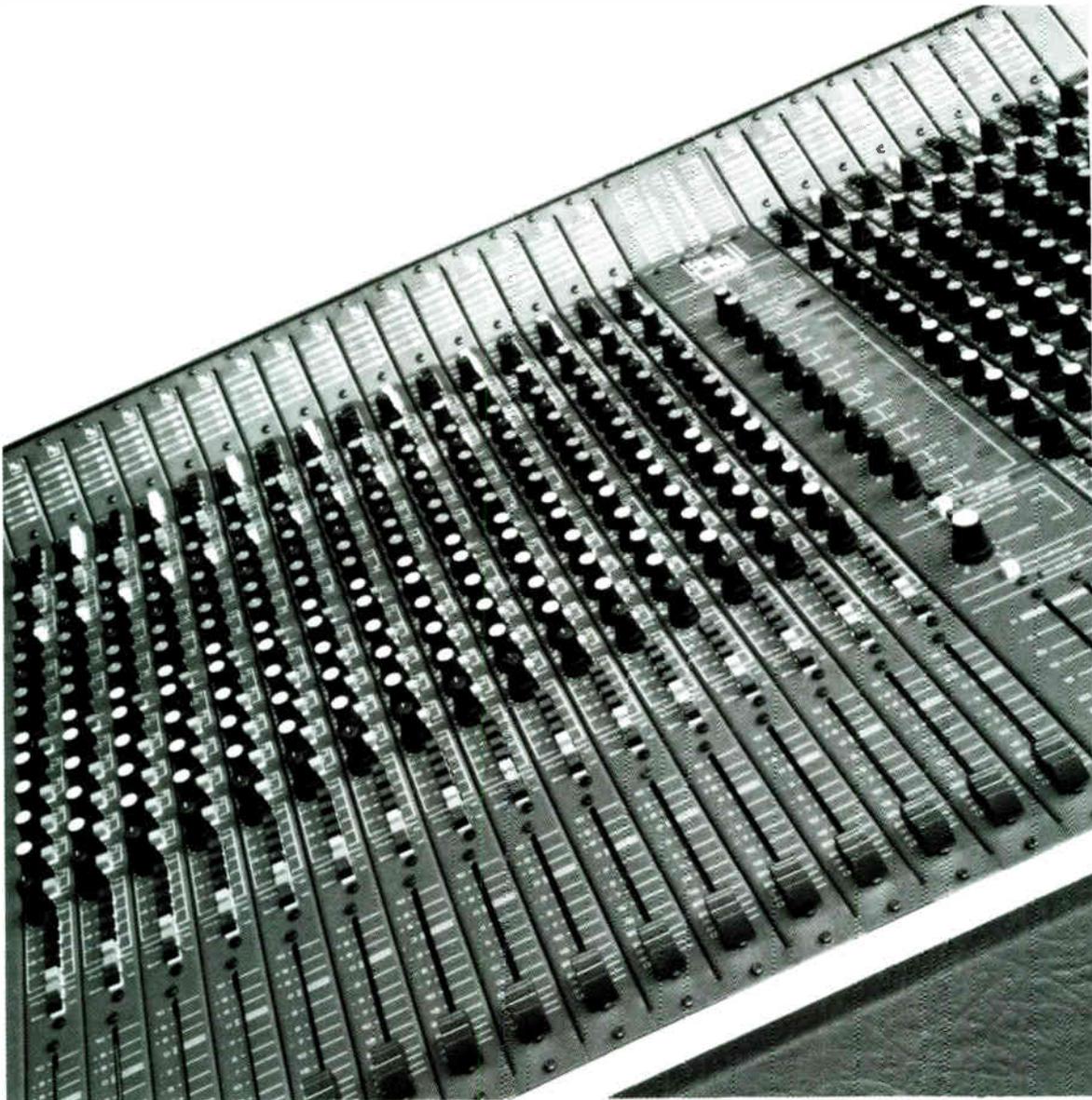
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Garden Grove, CA 92643
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Monrovia, CA*

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Sound Reinf., Audio Recording
545 Cloverleaf Way
Monrovia, CA 91016
(818) 359-8012

Contact: Ron Streicher
REMOTE RECORDING

Mixing Consoles: Soundcraft, Quantum, custom-built.
Audio Recorders: Studer, Revox, Otari, Sony digital.
Outboard Equipment: Lexicon, Aphex, dbx, Dolby, Yamaha, Burwin, etc.

Microphones: Schoeps, AKG, Neumann, Calrec, Soundfield, Shure, Beyer, Sennheiser, Coles, RCA.

Monitor Speakers: JBL
Power Amplifiers: Haller.

Extras & Direction: Ron Streicher has an international reputation for live-to-stereo audio projects on location as well as in the studio. As owner of Pacific Audio-Visual Enterprises, he provides cost-effective, quality-oriented services by specializing in basic, time-proven production techniques—without unnecessary fuss or gimmickry. The result: a successful job...on time, and within budget. Complete facilities are maintained ready to travel for in-studio or on-location projects across town or around the world. Credits: The Los Angeles Philharmonic Orchestra radio broadcasts; sound reinforcement for Mann Music Center productions of The Philadelphia Orchestra, The Metropolitan Opera, New York City Opera, etc.; The Los Angeles County Museum of Art; National Public Radio; American Public Radio; PBS; and record companies including: Angel, RCA, Deste, CRI, etc.

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Contact: Mark Paul

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Contact: Michael Wood

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Los Angeles, CA*

RECORD PLANT INC.

Audio Recording
1032 N. Sycamore
Los Angeles, CA 90038
(213) 653-0240

Contact: Mark Eshelman

REMOTE RECORDING

Vehicles: (2) GMC bobtails w/full air cond. and heat; Mobile Unit II 29'2" x 8'4"; Mobile Unit III 34'4" x 8'4".

Mixing Consoles: Mobile Unit II: API 44 x 24 console w/redundant, back-up power supply, Mobile Unit III: API 44 x 32 console w/redundant, back-up power supply.

Audio Recorders: Otari MTR 90 24-track analog, any configuration of digital recorders is also available.

Noise Reduction Systems: Dolby

Synchronization Systems: Lynx available

Monitor Speakers: Mobile Unit II: JBL 4320, Mobile Unit

III: John Meyers ACD.
Power Amplifiers: Mobile Unit II: Phase Linear 700 w/White 1/3-octave.

RECORDING SERVICES COMPANY

Audio Recording
2414 W. Olive Ave.
Burbank, CA 91506
(818) 843-6800

Contact: John Molino

REMOTE RECORDING

Vehicles: One-ton Dodge conversion remote recording audio truck. Total outside dimensions: 19 x 8 x 10'8".
Control Room Dimensions: Control room: 12'5" x 7'4" x 7'9".

Mixing Consoles: Auditronics 501 26 x 16 x 4, Soundcraft 200B 24 x 4 x 8, Yamaha PM180 6 x 2, custom submixer (line level), 12 x 2

Audio Recorders: (2) Otari MTR90II 24 track, (4) Ampex MM1200 24-, 16-, 8-track, (4) Ampex ATR104 4-track, (2) Ampex ATR102 2-track, Otari MX5050III 8-track 1/2", Otari MX70 16-track 1".

Noise Reduction Systems: Dolby SP24, (2) Dolby M24.
Synchronization Systems: (2) BTX Shadows, Audio Kinetics Q.Lock 3.10.

Outboard Equipment: Lexicon 224XL, Lexicon 200, Lexicon 97 Super Prime Time, (2) dbx 160, Teletronix LA2A (tube limiter), (2) UREI 1176LN, (2) UREI LA3A, UREI LA4.

Microphones: (2) AKG 451, (4) AKG 414, (4) Sennheiser 416, (3) Sennheiser 421, (4) Shure SM57, (6) Shure SM58, Shure SM59, E-V RE20, (2) Sony ECM-50, other microphones available on request.

Monitor Speakers: (2) JBL 4311, (2) Auratone 5C.

Power Amplifiers: BGW 750, BGW 250, (2) Crown D60.

Video Recorders: (2) JVC 6650 3/4" VCR, JVC 850 3/4" VCR.

Video Monitors: Panasonic 6t-S1300n 12" color, (3) Philips 5" B&W.

Rates: Call for quotes.

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Contact: Wayne Birkle

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Thousand Oaks, CA 91359
(805) 499-0539
Contact: Jim McCandless

Microphones: Many combinations of dynamics condensers and ribbons available.

Other Equipment: Associated EQs and active 3-way stereo or mono X-over. Sonipulse and other tuning equipment available.

Rates: Contact us for special rates.

REMOTE RECORDING

Vehicles: Ford 5-ton

Control Room Dimensions: 25 x 10.

Mixing Consoles: TAC Scorpion 28-input 24-bus and 24-monitor. Other outboarded custom mixing/routing networks available for expanding input capability.

Audio Recorders: (2) JH24s, (2) 3M 79s 16- and 24-track, (2) MCI 2- and 4-track, Otari 8-track.

Noise Reduction Systems: dbx complete overall buses.
Synchronization Systems: Lynx locked by Sigma sync generator.

Outboard Equipment: Kepex Is and IIs, REV7s, Gain Brains, cassette decks, dbx 900 frame w/902s, 903s, 904s, dbx 160s, dbx 160Xs, etc.

Microphones: Wide range of vintage tubes, ribbons, condensers and dynamics.

Monitor Speakers: JBL, Auratone.

Power Amplifiers: (2) Hafler.

Video Recorders: Sony BVH-500 1", Hitachi HR200 1", Sony 5850s 3/4", JVC 6600s 3/4".

Video Monitors: (2) Ikegami, (3) JVC, (5) Sony various sizes, 109" CAM/VTR monitors, various Hitachi's.

Switchers: Crosspoint Latch 6112, Crosspoint Latch 6119.

Video Effects Devices: Chyron VP2 titling generator for a freeze frame.

Cameras: HL79s, FP21s, KY2000s, KY1900s, plus others.
Other Major Equipment: Convergence 195 editing system available in remote vehicle along with a Convergence VE90 plus JVC cut only edit system. Host of Lenco sync generators w/Tektronix monitoring facilities w/full control over cameras, complete video system housed in one 5-ton truck, smaller Ford custom van available for remote ENG and EFP applications, 40' camera crane available also.

Rates: Contact us for package rates.

Extras & Direction: Providing the right hardware with competent personnel to meet your needs of any stage work; sound reinforcement; remote video or audio recording project. Our studios also provide you with complete audio post-production facilities, audio-to-video synchronization by Lynx synchronizers allowing lock-up to 3/4" and 1" video. Numerous experience with many remote recording, reinforcement and video situations.

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North Hollywood, CA 91601
(213) 650-8000

Contact: Brian or Barbara Ingoldsby
SOUND REINFORCEMENT

Touring Radius: Regional

Maximum Venue Size: 40,000 seats.

Vehicles: (3) modified Ford 5 tons.

House Loudspeakers: (12) Carvin 1330M bass bins, (12) Carvin RS40E horns, (2) Carvin 980M bins, (2) Altec 1218 bass bins, (4) Altec horns, (2) JBL horns, (2) multi-diaphragm custom tweeters, (2) multi-port Pizco drivers.

Monitor Loudspeakers: (4) Carvin 750M, (4) Carvin 790M, (2) Altec sidefills, (2) Klipsch wedges, (2) Galaxy Hot Spots.
House Consoles: Carvin MX2422 24 x 2 x 1, Carvin 16 x 8 x 2 x 1, Carvin 16 x 2 x 1.

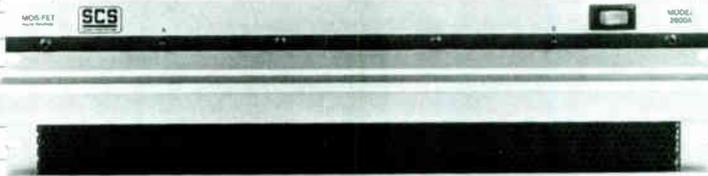
Monitor Consoles: 16 x 5, other configurations available.

Outboard Equipment: (12) Kepex gates, (2) Kepex II, (2) Gain Brains, REV7s, SPX90s, dbx 902, dbx 903, dbx 904, SRV 2000s, dbx 160s, etc.

Power Amplifiers: (10) Carvin DCA 800s, (2) Soundcraft 2500, (2) Soundcraft 2500A, BGW 750, (2) Carvin DCM 301.



MOS-FET Audio Amplifiers



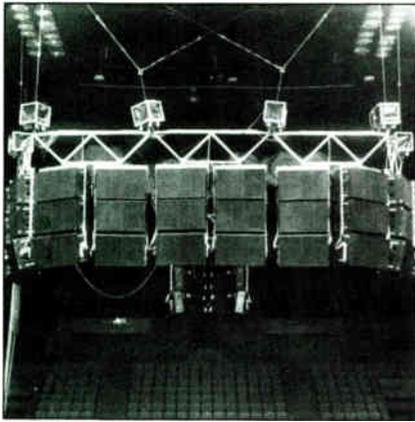
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Fresno, CA 93722
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(209) 227-2209

Contact: Mike King, Carnot Pease
SOUND REINFORCEMENT

Touring Radius: Local, regional, national.

Maximum Venue Size: Arenas up to 20,000.

Vehicles: Tractor trailer rig w/40' air ride trailer; (2) GMC 7000 Series diese automatic 24' bobtails w/liftgates and ramps; Ford C600 16' bobtail w/liftgate and ramp.

House Loudspeakers: (48) Eastern Acoustic Works KF-550s loaded w/JBL components, (8) Northwest Sound/Yamaha 5115H 3-way speakers, (4) Northwest Sound/Yamaha 6215 dual 15" bass bins, (16) JBL 4560 single 15" enclosure, (4) JBL 4550 dual 15" bass bins, (16) Northwest Sound 391A 2" throat radial horns.

Flying System Available: Yes.

Monitor Loudspeakers: (12) Northwest Sound 571A dual, twelve/2" throat monitors (JBL loaded), (12) Eastern Acoustic Works: SM222 dual twelve 2" throat monitors, (JBL loaded),

REMOTE RECORDING and SOUND REINFORCEMENT



SO. CALIFORNIA

(12) Speeda Sound custom built single 15" and 1" throat monitors (JBL loaded), (18) JBL 4602A Cabaret single 12" and Bullete tweeter monitors, tri-amped stereo side fills, dual 15" and 2" throat drum monitors.

House Consoles: (2) Wheatstone/Audioarts MTX-1080, 40 x 8 x 2 4-band parametric EQ 8-sends 8-mutes, Wheatstone/Audioarts MTX-80 40 x 8 x 2 3-band parametric EQ, 4-sends, (2) Yamaha MC2402 24 x 4 x 2 3-band EQ 4-sends. Monitor Consoles: Wheatstone/Audioarts M-16 32 x 16 4-band parametric EQ 4-mutes, 16 x 16 matrx, Wheatstone/Audioarts M-8, 32 x 8 3-band EQ quasiparametric, Wheatstone/Audioarts M-8 24 x 8 3-band EQ quasiparametric.

Outboard Equipment: (2) Yamaha Q1027 1/3-octave equalizers, (12) Yamaha Q2031 1/3-octave equalizers, (4) Audio Arts 2700 1/3-octave equalizers, (8) dbx 160X compressor/limiters, (8) dbx 166 compressor gates, (8) Rane GE-27 1/3-octave equalizers, (3) Vector Research cassette decks, (3) Yamaha REV7 digital reverberators, (2) Yamaha R1000 digital reverberators, Lexicon PCM41 digital delay, Lexicon Prime Time digital delay, Roland SDE-1000 digital delay, Roland SDE-3000 digital delay, (2) Yamaha GC2020 compressor gates, (6) Brooke-Siren FDS-340 electronic crossovers, (8) AB Systems 2400B electronic crossovers, (4) Yamaha SPX90 digital effects units.

Power Amplifiers: (26) AB Systems 1200A stereo amplifier, (16) AB Systems 205C stereo amplifier, (14) AB Systems 9220 stereo amplifier, (22) AB Systems 8120 monorual bi-amplifiers, (4) AB Systems 9130 monorual tri-amplifiers, (4)

AB Systems 105C stereo amplifiers.

Microphones: (12) Sennheiser 441, (36) Sennheiser 421, (4) E-V RE20s, (48) Shure SM58s, (60) Shure SM57s, (6) E-V PL80s, (12) Beyer M88s, (16) Audio-Technica ATM 31Rs, (40) direct boxes (Countryman, Stewart, Whirlwind, Sescom), (8) PZMs.

Other Equipment: Stage gear rentals: (2) Yamaha C-3 6' grand pianos, (4) Yamaha CP70/CP80 electric grand pianos (2 each), (3) Yamaha drum kits, Hammond B-3 w/2 Leslies, (24) guitar amplifiers (Fender, Yamaha, Peavey, Roland, Acoustic), (12) bass amplifiers (Ampeg, Acoustic, Peavey), (14) keyboards (Fender Rhodes DX7s, Arp-omni-Hohner-clavinet), percussion—congas, timbales, etc.

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Glendale, CA 91204
(818) 243-6165
Contact: John Falzarano

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Sound Reinf., Rental
9827 Oak St.
Bellflower, CA 90706
(213) 630-5949
Contact: Cortis

SOUND REINFORCEMENT
Touring Radius: Local
Maximum Venue Size: 500 seating cap., 10,000 sq.ft.
Vehicles: Truck and enclosed trailer, motor home.
House Loudspeakers: (2) Peavey FH-1 bass enclosures, (2) Peavey MB-2 mid-range enclosures, (2) Peavey MFL-X high frequency enclosures, (2) Peavey 1510-HT 3-way enclosures.
Monitor Loudspeakers: (4) Peavey 1245 enclosures, (2) Peavey 210-W wall mount enclosures (in studio).
House Consoles: Peavey Mark III 16-channel mixing console, (2) Peavey 701R 7-channel mixers.
Outboard Equipment: (2) DOD R-430 31-band graphic EQs, DOD dual delay, DOD R-825 compressor/limiter, Ross 16-channel stereo patch bay.
Power Amplifiers: Peavey CS-1200 1200-watt, (2) Peavey CS-800 800-watt, Peavey CS-400 400-watt, Peavey M-2600 260-watt.
Microphones: Nady cordless, Shure SM81, (4) Shure PL75s, (3) Shure PE65s, (3) Shure SM57s, BL-94.
Other Equipment: Korg Poly 800 synth MIDI, Roland TR-505 drum machine, MIDI software, interface, Commodore 128, rehearsal space.
Rates: \$300/night or negotiable, more if motor home is used

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Los Angeles, CA 90034
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Contact: Morris D. Golodner

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San Diego, CA 92115
(619) 287-4136
Contact: Dan Truscott
SOUND REINFORCEMENT
Touring Radius: Local
Maximum Venue Size: 2,500
Vehicles: GMC trucks.
House Loudspeakers: Custom-made enclosures using JBL and Gauss components, w/2" 2441 drivers and (8) 15" per side.
Monitor Loudspeakers: McCauley wedges w/JBL 15" and 1" drivers, Community PBLs w/15" and 1" drives, Yamaha 15" and 1", custom-made wedges w/15", 12" and 1".
House Consoles: Allen & Heath 24 x 8 x 2, Yamaha 24 x 4 x 2, Kelsey 16 x 3, E-V 12.
Monitor Consoles: Same as above.
Outboard Equipment: Lexicon PCM41, Yamaha SPX90, MXR 175, (3) Klark-Teknik DN 27 EQ, White 4000 EQ, Soundcraft 2, 10-band, (2) dbx 160s, Biamp quad limiter.
Power Amplifiers: (4) Carver PM 1.5, AB Systems 1210, Hafler 500, SAE P50, ESS 500, (2) Crown D75.
Microphones: (2) Sennheiser 421s, (10) Shure SM58s, (6) Shure SM57s, several assorted.
Lighting: ETA 8-channel w/16 CZNS.
Rates: Negotiable.

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Contact: Sam

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Contact: Mark Williams

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SOUTHWEST

ACTION SOUND

Sound Reinf., Rental, Audio Recording
10 Summit Dr. W.
Wimberley, TX 78676
(512) 847-3853
Contact: Marc Kingston

ADVANCED PRODUCTION SERVICES

Sound Reinf., Lights
Tucson, AZ 85719
(602) 884-8550
Contact: Mark Miceli, Mark Cowburn
SOUND REINFORCEMENT
Touring Radius: National
Maximum Venue Size: 15,000
Vehicles: Local 5-ton bobtail.
House Loudspeakers: (16) JBL/McCauley APS mid-high, (16) McCauley 18" APS subs.
Flying System Available: Yes.
Monitor Loudspeakers: (9) JBL bi-amped floor monitors, (4) JBL tri-amped side fill, (2) JBL bi-amped drum fill.
House Consoles: PM 2000 32 x 8, PM 1000 32 x 4, PM 1000 16 x 4.
Monitor Consoles: Yamaha 24 x 8.
Outboard Equipment: (4) White 1/3-octave EQs, (6) UREI 1/3-octave EQs, (2) Rane 1/3-octave EQs, (4) dbx 160s, REV7, MXR reverb.
Power Amplifiers: (8) Crown 300As, (12) Micro Tec 1200s, (2) DB 200s, (3) Rane MA-6s, Crown PSA11.
Microphones: (10) Shure SM57s, (10) Shure SM58s, (6) E-V DS35s, (6) AKG 451s, Sennheiser 441, Sennheiser 421, Shure SM81, (4) Crown PCC-160, stereo C-ducer, (8) Samson PR50 wireless.
Other Equipment: IBM PC 1/3-octave analyzer, Ivis IE-30 1/3-octave analyzer, Crown System 12 TEF analyzer, 100-amp PP, (2) 1-ton C-M Loadstar chain motors, truss, 36-pair snake, Jensen 24-pair isolation.

ALL NIGHT RECORDS

Sound Reinf., Audio Recording
208 1/2 N. Washington
Eldorado, AR 71730
(501) 862-0731
Contact: David Feinberg

ALTISSIMO

Audio Recording
10540 E. Wetherfield
Scottsdale, AZ 85259
(602) 391-0201
Contact: Bill Hammers

AMBASSADOR AUDIO

Rental, Audio Recording
PO Box 271
Euless, TX 76039
(817) 451-8967
Contact: Wah Beaulieu

ANTHONY SOUND

Sound Reinf.
6940 E. 97th St.
Tulsa, OK 74133
(918) 299-9950
Contact: Scott Anthony

ARARAT SOUND PRODUCTIONS

Sound Reinf., Audio Recording
23019 Tree Bright
Spring, TX 77373
(713) 443-6947
Contact: David Forbus

ARIZONA REMOTE RECORDS/ GABRIEL ENGINEERING

Sound Reinf., Rental, Audio Recording
833 W. Main
Mesa, AZ 85201
(602) 834-9511
Contact: Wayne Michel

ARTRONIX

Sound Reinf., Audio Recording
7544 N. 28 Dr.
Phoenix, AZ 85051
(602) 864-9761
Contact: Darrell DeMarco

REMOTE RECORDING and SOUND REINFORCEMENT



S O U T H W E S T

ATLANTIS AUDIO

Sound Reinf., Lights, Staging
8359 E. Cypress
Scottsdale, AZ 85257
(602) 994-9257
Contact: Will

AUDIO ASSOCIATES, INC.

Sound Reinf., Lights, Rental, Audio Recording
2913 NW 64th St.
Oklahoma City, OK 73116
(405) 840-3636
Contact: Greg Robertson

AUDIOVEND

Sound Reinf., Lights, Rental
PO Box 1366
League City, TX 77573
(713) 484-5112
Contact: Greg Stevens

AZBELL'S PRO AUDIO/VIDEO

Sound Reinf., Lights, Staging, Rental, Audio & Video Recording
1813 Speight
Waco, TX 76706
(817) 754-4689
Contact: Billy Azbell, John Wheeler

BENSBERG'S MUSIC STORE

Sound Reinf., Rental
330 Jackson St.
Camden, AR 71701
(501) 836-6844
Contact: Steve Clay

BRIGHT LIGHT SIGHT & SOUND

Sound Reinf., Lights, Staging, Rental
204 E. College
Beebe, AR 72012
(501) 882-5020
Contact: Bruce Jackson, Pam Jackson

BERNHARD BROWN LIGHT AND SOUND

Sound Reinf., Lights, Rental
11311 Indian Trail
Dallas, TX 75229
(214) 241-4334
Contact: Danny Brown, Jeff Palmer

SOUND REINFORCEMENT

Touring Radius: National
Maximum Venue Size: Arenas
Vehicles: Peterbilt 359 air ride tractor w/63" sleeper and 48' or 53' air ride trailers; Mercedes Benz 1316 w/22' box w/power lift gate.
House Loudspeakers: Turbosound TMS-3 w/sub bass.
Flying System Available: Yes.
Monitor Loudspeakers: Bi-amped wedges with (2) JBL 2204 12" and 2425 comp. driver, 3-way side fills w/JBL 2225s, 2220s and 2445s, 3-way drum monitor w/JBL 2225s, 2220s and 2245s.
House Consoles: Yamaha.
Monitor Consoles: Soundcraft.
Outboard Equipment: Yamaha, Kepex, Gain Brain, dbx, Lexicon, Aphex, Klark-Teknik, Brooke-Siren, Crown, UREI, loaded to specs.
Power Amplifiers: QSC 3800, QSC 3500.
Microphones: Sennheiser, Beyer, AKG, Shure.
Lighting: Thomas Engineering "Silver System" pre-rigged truss and par cans, Avab 96-channel, 2-scene, Soft Patch, digital console, Avab digital dimmers.
Other Equipment: Backline rental.

BT PRODUCTIONS, INC.

Audio Recording
5807-J S. Garnett
Tulsa, OK 74146
(918) 252-4779
Contact: Bret Teegarden

BUNS UP STUDIO

Audio & Video Recording
Box 2393
Page, AZ 86040
(602) 645-9300
Contact: Jerry Edwards

CALVARY RECORDS

Sound Reinf., Rental
1445 Mexico
San Benito, TX 78586
(512) 399-9531
Contact: Andy M. Mendiola

CEDAR CREST STUDIO

Audio & Video Recording
PO Box 28
Mtn. Home, AR 72653
(501) 425-9377
Contact: Bob Ketchum

CEREUS RECORDING

Audio Recording
1733 E. McKellips, #7
Tempe, AZ 85281
(602) 990-8163
Contact: Allen Moore

CHATON RECORDINGS

Sound Reinf., Audio Recording
5625 E. Nauni Valley Dr.
Scottsdale, AZ 85253
(602) 991-2802
Contact: Marie S. Ravenscroft

CHRISTAL SOUND

Sound Reinf., Lights, Rental
1410 Manford Hill
Austin, TX 78753
(512) 836-2577
Contact: Tim Kennard, Woody Woodard
Extras & Direction: Providing complete sound reinforcement needs for all varieties of concert tours in venues up to 3,000 seats. Offering complete Meyer Sound systems or conventional JBL components; 32-channel house, 24 x 8 stage; extensive outboard processing equipment and full microphone complement; lighting systems available on request; and most importantly, a responsible, skilled and experienced crew to provide a smooth and problem-free tour.

CISCO SOUND

Sound Reinf.
Box 16583
Lubbock, TX 79490
(806) 763-3537
Contact: C.K. Bucy

CPX SOUND & LIGHTING

Sound Reinf., Lights, Staging
Rte. 6, Box 200, Crystal Hill Rd.
North Little Rock, AR 72118
(501) 753-1406
Contact: Mike Cornell

CROSSROADS AUDIO INC.

Sound Reinf., Lights, Rental, Audio Recording
2623 Myrtle Springs
Dallas, TX
(214) 358-2623
Contact: Doug Hall

CUSTOM AUDIO RECORDING

Audio Recording
PO Box 1292
Bedford, TX 76021
(214) 306-7130
Contact: J. Reynolds, D. Rothlisberger

DB ASSOCIATES

Sound Reinf., Audio Recording
Box 14892
Austin, TX 78761
(512) 835-4572
Contact: Doran Bryson

D.C. SOUND
Sound Reinf., Rental, Audio Recording
 11352 Gatewood
 Dallas, TX 75218
 (214) 328-2491
 Contact: Dan Grogan

DJ'S SOUND/VIDEO PRODUCTIONS
Audio & Video Recording
 2712 Ave. M
 Nederland, TX 77627
 (409) 722-5383
 Contact: Wayne Dyess

DOCTOR AUDIO
Sound Reinf., Audio Recording
 6707 Willamette Dr.
 Austin, TX 78723
 (512) 926-6222
 Contact: Kenny Epstein

DYNAMIC SOUND CO.
Sound Reinf., Lights
 2675 N. Bronco Cir.
 Las Vegas, NV 89108
 (702) 645-3000
 Contact: Dale D. Dudley

FLETCHER SOUND COMPANY
Sound Reinf., Audio Recording
 PO Box 681613
 Houston, TX 77268
 (713) 873-2907
 Contact: Tom Fletcher

FORD AUDIO-VIDEO SYSTEMS
Sound Reinf., Lights, Rental
 5362 S. 129th E. Ave.
 Tulsa, OK 74134
 (918) 252-9581
 Contact: Bryan Burdick

GODEL PRODUCTIONS/GP STUDIOS
Sound Reinf., Audio Recording
 330 E. Main St., PO Box 604
 Nacogdoches, TX 75963
 (409) 560-4282
 Contact: Rick Smith, June Gentry

GOLDEN RECORDING
Audio & Video Recording
 9321 E. 27th St.
 Tucson, AZ 85710
 (602) 885-6132
 Contact: Ed Golden

GOOD SOUND SERVICES
Sound Reinf., Audio Recording
 8918 Bissonnet, Ste. 406
 Houston, TX 77074
 (713) 988-5750
 Contact: Alan W. Clarke

GRAND THEFT SOUND-PRODUCTIONS
Sound Reinf., Lights, Rental
 2607 N Britain Rd.
 Irving, TX 75062
 (214) 252-8628
 Contact: Jimmy Papa, Mike Reupp

THE GUITAR SHOP LTD.
Sound Reinf., Lights, Staging
 6830 5th Ave.
 Scottsdale, AZ 85251
 (602) 994-8749
 Contact: Neil

GULF COAST SOUND & LIGHTING
Sound Reinf., Lights, Staging, Rental
 5605 Bellaire
 Houston, TX 77081
 (713) 661-6690
 Contact: Dan Nordby

DUBBY HANKINS STUDIO
Sound Reinf., Rental, Audio & Video Recording
 2389 NW Military Dr., Ste 602
 San Antonio, TX 78231
 (512) 492-2011
 Contact: Dubby Hankins

HORIZON STUDIOS
Audio & Video Recording
 2015D E. 51 Pl.
 Tulsa, OK 74105
 (918) 749-4155
 Contact: R. Shank



IMAGE/AUDIO SYSTEMS
 Houston, TX

IMAGE/AUDIO SYSTEMS
Sound Reinf., Lights, Staging, Rental, Audio Recording
 1918 Antoinette

Houston, TX 77055
 (713) 957-3515
 Contact: Terry Harper
SOUND REINFORCEMENT
 Touring Radius: Regional
 Vehicles: 15' Hi-Cube Ford van w/sleeper.
 House Loudspeakers: Gauss horn-loaded 18', Renkus-Heinz and Gauss horn-loaded 10' horns.
 Monitor Loudspeakers: (6) Renkus-Heinz Gauss.
 House Consoles: Yamaha 1532 32-channel, Biamp 2442 24-channel, Yamaha 1202 12-channel, Yamaha EMX300 12-channel powered mixer.
 Monitor Consoles: Yamaha 2408.
 Outboard Equipment: Yamaha Graphics, Yamaha SPX90, Ashly limiters, Ashly notch filters, MXR delay, Yamaha EQ, Yamaha crossovers, MXR Graphics.
 Power Amplifiers: Yamaha PC2002s, Yamaha D2201, Yamaha PC1002, Crown DC300As, Crown D150A.
 Microphones: AKG, E-V, Shure, Cetec Vega wireless hand-held and lav., Audio-Technica.
 Staging: 12' draping.
 Lighting: Fresnels 6 x 9, 6 x 12, 6 x 16 Cekos, PAR 64 Scoops, PAR 54, Pin Spots, Ultra Arc spotlights, 1K and 3.6K dimmers, Weststar computer lighting manual control.
 Other Equipment: Harper Images low-watt laser system, computerized light curtain, Rosco fog machines, laser pointers, Clear-Com Communication Systems, 2-way radios, sound analyzers.
 Rates: Available upon request.

JOHNSON ENGINEERING
Sound Reinf., Lights, Audio & Video Recording
 3965 E. Foothills Dr.
 Sierra Vista, AZ 85635
 (602) 458-3208
 Contact: Jim Johnson

LARR COMPUTER CORP. KLARR SATELLITE RADIO & TV DIVISION
Audio & Video Recording
 PO Box 3842
 Houston, TX 77253
 Contact: Dr. L. Herbst

FLYING BLIND?

Visualize precisely where you are with a
3211 Video Based Metering System

OVERLOAD COLOR CHANGE — Selectable point where bar graph changes color, red for example.

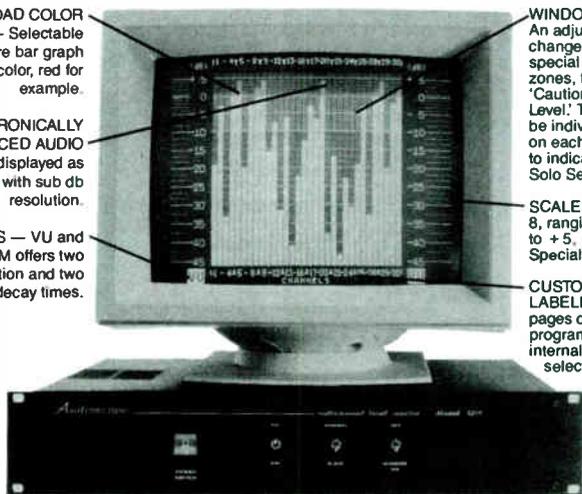
32 ELECTRONICALLY BALANCED AUDIO INPUTS displayed as vertical bars with sub db resolution.

BALLISTICS — VU and PPM offers two integration and two decay times.

WINDOW FUNCTION — An adjustable color change area to indicate special audio level zones, for example "Caution" or "Optimum Level". This function can be individually selected on each bar, for example to indicate "Channel Solo Select" or "Record."

SCALES — A choice of 8, ranging from $\pm 12\text{db}$ to $+5$, -50db full scale. Specials available also.

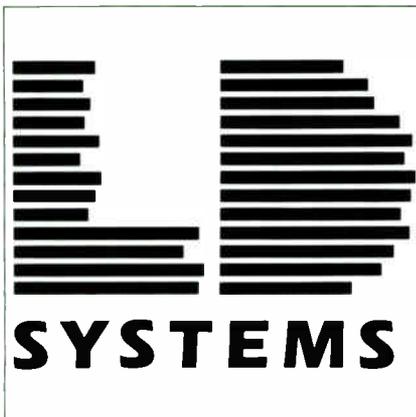
CUSTOM CHANNEL LABELLING — 16 different pages of four lines, programmable, stored internally, externally selectable with remote switch.



AUDIOSCOPE Model 3211 uses: Additional meters for console or multitrack, Amp racks, Cassette duplication, machine room remote metering.

For more information call or write:

APOGEE ELECTRONICS CORPORATION
 1517 20th St., Santa Monica, CA 90404 (213) 828-1930



L.D. SYSTEMS
Houston, TX

L.D. SYSTEMS

Sound Reinf., Lights, Rental
467 W. 38th St.

Houston, TX 77018
(713) 695-9400

Contact: Mark Howard

SOUND REINFORCEMENT

Touring Radius: Local, regional, national

Maximum Venue Size: 20,000

House Loudspeakers: L.D. Systems 2 x 4 speaker system, (4-way 2-box system), Turbosound TMS-3s, L.D. Systems 3 x 4 speaker system, (4-way 3-box system).

Flying System Available: Yes.

Monitor Loudspeakers: L.D. Systems Bi-amp wedge monitor (JBL 15" and JBL 2" driver), L.D. Systems passive wedge monitors (E-V 12" and Peavey 1" driver), L.D. Systems 3-way side fill monitors, Turbosound TMS-4s.

House Consoles: Soundcraft 800B 32 x 8 consoles, Soundcraft 500B 32 x 8 console, Yamaha PM2000 32 x 8 console, CAE 32 x 8 console.

Monitor Consoles: Soundcraft 800B 32 x 12 monitor console, Soundcraft 400B 24 x 9 monitor console, Interface 24 x 8 monitor console, Interface 4-mix monitor consoles (18 x 4 and 12 x 4).

Outboard Equipment: Lexicon 200s, Lexicon Prime Time II, Lexicon PCM60s, Eventide 9495 Harmonizers, dbx 900 racks w/assorted compressors, gates and parametric EQs, Barcus-Berry 202 R processor, Aphex Type C Exciter, Klark-Teknik equalizers, dbx 160X compressors, Brooke-Siren crossovers, UREI equalizers, UREI 525 crossovers, Lexicon PCM41s.

Power Amplifiers: QSC 3800s, QSC 3500s, Crest 3501s, Crest 5000s, Dynaco 400s.

Microphones: Shure SM58s, Shure SM57s, Beyer M-88s, AKG D-12s, direct boxes (Brooke-Siren AXE, Countryman, Sescor), AKG 451, AKG 460s, Sennheiser 421s, Sennheiser 441s, E-V RE20s.

Lighting: Thomas Preng w/polished aluminum cans (300 inst), Thomas Preng w/black aluminum cans (120 inst), up-right aluminum trussing w/180 lights

Other Equipment: CM Lodestar 627 1-ton chain hoists, CM Lodestar 626 1-ton chain hoists, CAE 2.4 dimmers, Spectrum 2.4K dimmers (OX-36/24), Digitrol 6K dimmers, Digitrol 3K dimmer, Celco 90-channel controller, Digitrol 48-channel 3-scene controllers.

Rates: Negotiable.

Extras & Direction: Professional sound reinforcement and lighting systems available for local, regional and national touring. System capabilities include showcase venues, rock and roll arenas, outdoor events and more. Services range from direct equipment rental to full systems with crews. On staff are experienced sound and lighting engineers. All services are supported by L.D. Systems' pro-audio sales and manufacturing divisions which are involved with full sound system, instrument system and recording system design, fabrication and installation. Lighting services include retail sales, system design and installation.

LOST PERSON PRODUCTIONS

Sound Reinf., Lights, Staging, Rental, Audio Recording

2102 Bayou Dr.
Lake Jackson, TX 77566

(409) 798-5462

Contact: Gregory R.H. Leach

LUXURY AUDIO WORKSHOP INC.

Audio Recording
2570 E. Tropicana, Ste. 17-19
Las Vegas, NV 89121

(702) 451-6767

Contact: Lee A. Waters

REMOTE RECORDING and SOUND REINFORCEMENT



S O U T H W E S T

MAGNUM SOUND

Sound Reinf., Lights, Staging, Rental
7522 E. 22nd St., Ste. 324

Tucson, AZ 85711
(602) 745-0377

Contact: Mark Gillis, Tom Dabielak

MARTIN RECORDING CO. INC.

Audio & Video Recording

120 W. Castellano

El Paso, TX 79912

(915) 532-2860

Contact: Scott Martin

MEDIA SOUND

Audio & Video Recording

6448 Hwy. 290 E., Ste. D-109

Austin, TX 78723

(512) 467-2788

Contact: Glenn Wolfe

METEX INTERNATIONAL CORP.

Sound Reinf.

4519 San Bernardo

Laredo, TX 78040

(512) 722-3941

Contact: Edward L. Fostex



MIDCOM, INC.
Irving, TX

MIDCOM, INC.

Audio Recording

3 Dallas Comm. Complex, Ste. 108

6311 N O'Connor Rd., LB-50

Irving, TX 75039

(214) 869-2144

Contact: Mike Simpson

REMOTE RECORDING

Vehicles: 1982 GMC 24' straight truck.

Control Room Dimensions: 8 x 20.

Mixing Consoles: Soundcraft TS-24 40-channel console w/custom, 8 stereo/16 mono submaster routing system, 32 x 24 x 16 x 2 x 1, Soundcraft Series 800B 32 x 8 x 2.

Audio Recorders: Otari DTR-900 32-track digital available on special request, (2) Otari MTR-9 11 24-track, Otari MTR-10 2-track w/center time code track, Otari MX-5050 BII 2-track, Studer AB10 2-track w/center time code track, Nakamichi MR1B.

Noise Reduction Systems: TTM 24-channel noise reduc-

tion system (Dolby, dbx or Telcom).

Synchronization Systems: Cipher Digital Shadow II w/Shadowpad, Cipher Digital "Cypher" Time Code generator/reader.

Outboard Equipment: Lexicon 224XL digital reverb, Lexicon 480L digital effects processor, Lexicon Model 95 Prime Time II, Eventide H910 Harmonizer, dbx Series 900 frames equipped w/903 comp/limiters, 904 noise gates, 905 parametric EQs, 906 flanger and MICMIX dynaflex/exciter cards, Lexicon PCM70 digital reverb, (2) dbx 160X compressor/limiters, (2) Aphex compellers.

Microphones: Neumann: U89s, TLM170s, KM84s; AKG: C414, EBP48; Schoeps: CMCS, MK5s; Sennheiser: MD441s, MD421s; Beyer: M69s, M88s, M500s, M201s, MC734s; Shure: SM58s, SM57s, SM81s, SD85s; Crown: P2M GPB30s, (2) LVs; Cetec Vega R42 handheld and lavaliere wireless microphone systems available at extra charge.

Monitor Speakers: (2) JBL 4430 Bi-Radial monitors w/White Instruments 1/6-octave EQ, (2) Auratone 5C monitors for near field.

Power Amplifiers: Hafler P-505, Hafler P-225 operating in a bi-amped mode, BGW 150 for Auratones.

Video Recorders: Sony VO-5800 3/4" U-matic, Panasonic AG-6800 1/2" VHS Hi-fi.

Video Monitors: Sony CVM-1900 19" NTSC monitor/receiver, (2) Ball 9" B&W monitors.

Switchers: (2) Panasonic 12 x 1 routing switchers, (3) ADC "Humbuckers," (8) external inputs.

Other Major Equipment: Communications systems: RTS 3-channel dual listen intercom, Clear-Com 2-channel intercom, both interfaced to full duplex FM on-board repeater system w/business band and motion picture service frequency synthesized remote radios. 10-line key telephone system. RCC and cellular mobile telephones. RTS 414 and 416 distribution amplifiers, Primus distribution amplifiers, custom 1 x 1 buffer/distribution amplifier capable of driving at 28 dBm, Telco interface via 48 pair ADC Ultrapatch to dedicated patch panel, each pair w/separate resistive termination and/or capacitive coupling. (4) RDLs on board for auto answer, stand-by program feeds. 400' power and 42-pair snake on DC motor driven reels.

Extras & Direction: Past projects include: George Strait, MCA Home Video; 7th Van Cliburn Competition, American Public Radio; Benjamin Lees' Memorial Candles, American Public Radio; score for Texas, Dramalex production at Palo Duro Canyon; Fashion Hit Revue, Sanger Harris live TV special; Mary Kay Cosmetics 1985 and 1986 seminars; League of Women Voters, 1984 Democratic Presidential Candidates Debate, PBS network special; Bob Banner Associates' Face of the '80s syndicated TV special; ACTS TV Network, Country Crossroads, two 13-week series; Bob Stivers Productions' Stars Salute the U.S. Olympic Team, NBC prime time special; Bugs Henderson live LP project; two live albums for The Vocal Majority; Miss Texas USA Pageant, network special; Carman in Concert, Word Records/Word Home Video.

MILANOSOUND, S.P.A.

Sound Reinf., Rental, Audio Recording

1144 S. Xanthus St.

Tulsa, OK 74104

(918) 584-3561

Contact: Eric Kehr

MP PRODUCTIONS

Sound Reinf., Lights, Staging, Rental

1601 Westpark Dr., Ste. 8

Little Rock, AR 72204

(501) 664-2183

Contact: Scott Thompson, Mike Pope

SOUND REINFORCEMENT

Touring Radius: National

Maximum Venue Size: 60,000

Vehicles: 102' x 48' or 96' x 48' air ride trailers; Kenworth or Freightliner conventional air ride tractors.

House Loudspeakers: Two box 4-way electronic, (4) JBL low 15", (4) JBL hi 12", (2) JBL 2" horns, (2) JBL slots, three box 5-way electronic, Sub 18" JBL tuned bass, (2) JBL 15", (6) JBL Mid-hi 10"

Flying System Available: Yes.

Monitor Loudspeakers: JBL 15" wedges, JBL 2" horn, JBL 18" side/drum fill, Gauss 12", JBL 2" horn, (2) JBL 12" wedges, JBL 1" Bi-Radial horn, (2) JBL 15" sides, (3) JBL 10"

House Consoles: Yamaha PM3000 40 x 8 x 2 w/Matrix, Soundcraft 800B 32 x 8 x 2.

Monitor Consoles: Amek TAC Scorpion 40 x 12, Stevenson Series 300 custom-built 32 x 12, fully parametric EQ

Outboard Equipment: Lexicon 200, Yamaha REV7, Roland 2000 reverb, Yamaha SPX90, Roland 2500 DDL, Eventide 949 Harmonizer, Eventide 910 Harmonizer, dbx 900 rack, para EQ and comp cards, dbx 160, Valley People Dyna-Mite gates, Omni Craft 4-channel gates, Brooke-Siren FDS 340 crossovers, Brooke-Siren FDS 320 crossovers, Yamaha F1030 crossovers, UREI 525 crossovers, White 4000 EQs.

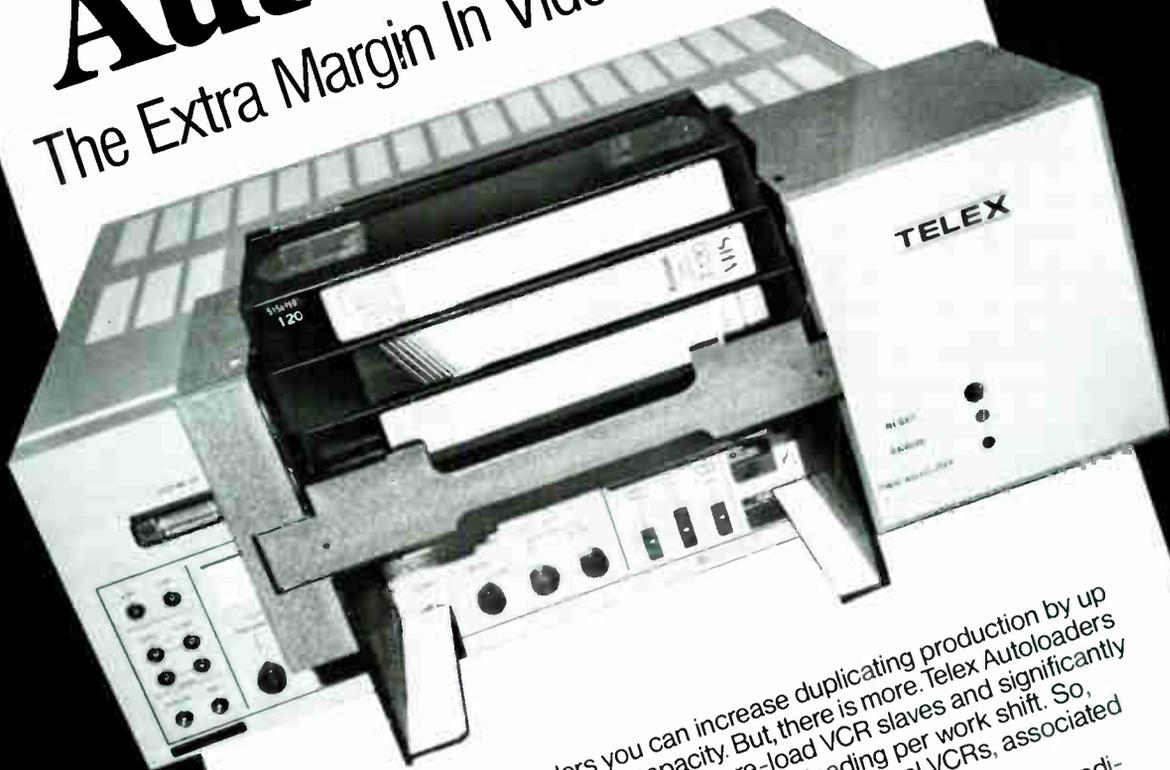
Power Amplifiers: Carver PM1.S, Crest 5001, Crown PSAII, Crown DC 300A.

Microphones: SM57, SM58, SM81, SM85, Astatic 64, Bey-

—LISTING CONTINUED ON PAGE 150

Telex Autoloader

The Extra Margin In Video Duplicating



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

To install Telex Autoloaders, you don't have to make any VCR modifications. In fact, you don't even need tools. The VCR controls and meters remain accessible. And, Autoloaders are so compact they fit the majority of equipment rack layouts. In most cases there's no need to widen the access aisles or change spacing between slaves.

Microprocessor controlled with built-in diagnostics, the Autoloaders operate off the VCR power supply and interface with the master command station via remote connectors on the same.

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

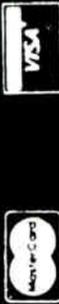
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JVC is a registered trademark of JVC Company of America

THE DALLAS RECORD PRESSING PLANT SINCE 1967!



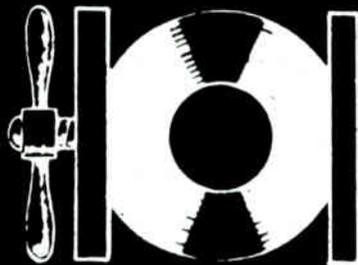
A+R RECORD & TAPE MFG. CO.
902 North Industrial Blvd.
Dallas, Texas 75207
214-741-2027
Toll Free: 1-800-527-3472



RECORD PRESSING IN HOUSE

TAPE DUPLICATION

- Custom Albums • 45 RPM Singles
- Stereo Mastering with Neumann VM570 Lathe & SX74 Cutter
- Plating with Europa Film Equipment
- 1000—7" 45 RPM Record Package • \$419.
- 1000—1 color • 12" Album Package • Records & Printed Covers • \$1372.
- Any quantity, large or small
- Custom Packaging
- Demo tapes (real time copies)
- Blank tapes—ANY length needed



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REMOTE RECORDING and SOUND REINFORCEMENT



S O U T H W E S T

—LISTING CONTINUED FROM PAGE 148

er 201, E-V RE20, Sennheiser 421, Countryman Isomax, Countryman DI, Crown P2M.
Staging: Stage any size required. Tops 60 x 40 and 40 x 40 rain tops.
Lighting: Aluminum double hung drop frame trusses 9'. Teatronic dimmers, Eclipse by Zero 88 consoles.
Other Equipment: Complete rigging systems for rental and in-house use. MP Transport offers the finest conventional, air ride trucks and trailers for transporting your touring systems. Full service equipment rental department.
Rates: Reasonable and competitive.

THE MUSICIAN-CONCERT SOUND DIVISION

Sound Reinf., Lights, Rental, Audio Recording
4595 Washington Blvd.
Beaumont, TX 77707
(409) 842-2224
Contact: Frank Halter

OB STUDIOS

Sound Reinf., Audio Recording
5932 N. Grove
Oklahoma City, OK 73122
(405) 721-3727
Contact: Larry G. O'Rear

O.K. SOUND AND LIGHTING

Sound Reinf., Lights, Rental
6040 Brittmore, Ste. "O"
Houston, TX 77041
(713) 896-1130
Contact: Jim Johnson, Rich Bunch, Charlie Carter
SOUND REINFORCEMENT
Touring Radius: Local
House Loudspeakers: (2) JBL twin 15" rear-loaded bass cabinets, (2) E-V twin 10" rear-loaded low-mid cabinets, (4) High-mid cabinets w/E-V 8-hd horns and 30-watt drivers, (4) High cabinets w/E-V 8-hd horns and 30-watt drivers, (2) Piezo cabinets w/16 ea., (4) Community long-throw horns w/60-watt drivers.
Monitor Loudspeakers: (2) E-V single 15" rear-loaded bass cabinets w/horns (sidefills), (2) dual 12" floor monitors, (2) single 12" floor monitors w/horns, (2) single 15" floor monitors w/horns.
House Consoles: E-V 5216 mixer.
Outboard Equipment: Ashly 4-way crossover, Crown VFX-2a stereo 2-way crossover, (3) Altec Passive crossovers, dbx 118 compressor/limiter, Ibanez AD-202 effects, Aural Exciter Type C, Yamaha REV7, (2) MXR dual 15-band equalizers, Altec 1/3-octave equalizer.
Power Amplifiers: (4) Crown DC-300A, BGW 7000B, BGW 750A, (2) QSC 1200, (2) QSC 1400, JBL 6233, SAE 2200.
Microphones: (4) E-V BK1, (4) Sennheiser MD-421, (3) SRO instrument mics, (3) Shure SM57, (2) Superscope condenser mics, (3) E-V PL20, E-V PL5.
Lighting: Consoles: EDI 24-channel 3-scene, Total control multiplexer 12-channel 2-scene, 8 presets, Teatronics 6-channel 2-scene Scenemaster, Dimmer packs: LSS-LC4a 6-channel 1.2k/ch., Teatronics Scenemaster III 6-channel, 1,000 per channel.
Other Equipment: Luminaries: (50) par 64 fixtures, (16) par 56 fixtures, (2) ellipsoidals, (2) Short throw follow spots, (2) 4' footlights; Support equipment: (5) Ultimate support stands w/crossbars, (2) truss towers, (2) 10' sections of truss, (2) 3' sections of truss, (4) 5' sections of truss, (2) 4' sections of truss; Special effects: Rosco log machine, 3' dia. mirror ball.
Rates: Negotiable.

OMEGA AUDIO AND PRODUCTIONS, INC.

Audio & Video Recording
8036 Aviation Pl.
Dallas, TX 75235
(214) 350-9066
Contact: Paul A. Christensen



OMEGA AUDIO AND PRODUCTIONS, INC.
Dallas, TX

REMOTE RECORDING

Vehicles: 1978 GMC Loadstar (35') w/crew sleeper and power tailgate. Refueling travel range: 850 miles. Power requirements: 220 vac; 100 amp; Power isolation transformers w/center tap neutral provided. 12.7 x 35 x 8.
Control Room Dimensions: 20 x 8 x 10.
Mixing Consoles: API 32 x 32 mixing console w/API 550A EQ, Soundtracs 24 x 24, Hill 16 x 8 x 4 x 2, Program busses equipped w/8 stereo VCA groups. Additional inputs available on request.
Audio Recorders: (2) Otari MTR-90 24-track, (2) Otari MTR-10 2, 4-track w/Center Stripe TC, Mitsubishi X-80 2-track digital, (2) Technics 2-track cassette.
Noise Reduction Systems: TTM Dolby/dbx rack 24 channels.

Synchronization Systems: BTX 4700 Shadow.
Outboard Equipment: Teletronix LA-2A limiter, dbx 165 limiter, (7) dbx 160 limiter, (2) dbx 162 limiter, ADR Vocal Stressor, (2) UREI 1176 LN limiter, Lexicon 224 XL digital reverb, MXR01A digital reverb, SPX90 special EFX processor, (2) DeltaLab Super Time Lane.
Microphones: (2) AKG C-12A tube, (8) AKG C-414 EB, (4) AKG C-451 EB, AKG D-12E, (6) Beyer 201, (4) Neumann U47, (2) Neumann U87, (2) Neumann KM84, (4) Shure SM81, (12) Shure SM58, (12) Shure SM57, (4) Shure SM53, (6) Crown PZM 315, (6) Sennheiser 421, (5) Sennheiser 441, (3) Sony ECM-22P, (2) Sony ECM-50, (3) E-V Re20, (7) Countryman DI boxes, (10) Heider DI boxes.
Monitor Speakers: (2) JBL 4430, (2) Auratones.
Power Amplifiers: (2) Yamaha P2200, Yamaha P1000.
Video Recorders: JVC 6600U.
Video Monitors: Sony Trinitron 14", RCA 26".
Other Major Equipment: 600' 54-pair snake system w/54 stage splits, truck wired for 90 inputs.
Rates: Call for rates. Varies with job requirements.
Extras & Direction: Omega has been supplying remote audio recording services to clients of the record, film and video industry since 1973. During that time, Omega Audio has worked with over 200 major recording artists, all major television networks and on numerous films. As a result of this vast and varied experience, Omega Audio is uniquely qualified to handle the challenging tasks that remote recording requires. Omega Audio has received four Gold Records, two Ampex Golden Reel Awards, two Grammy nominations, and three Dove Awards. Partial credits include: Fats Domino, Ray Charles, Paul Schaler, Prince, Cameo, Johnny Cash, WNET-PBS Great Performances, Dick Clark Productions, Pat Benatar, Joe Jackson, Hall & Oates, Anne Murray, Art Garfunkel, Al Jarreau, Molly Hatchett, Neil Young, Amy Grant, Ben Vereen.

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Contact: Gary D. Ballard

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(501) 562-2225
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Contact: David H. Poole

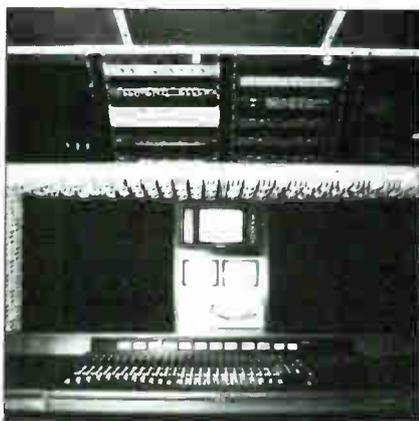
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 San Antonio, TX 78216
 (512) 340-9591
 Contact: Robert Herneck
SOUND REINFORCEMENT
 Touring Radius: Local, regional
Maximum Venue Size: Country/MOR 10,000, Rock: 5,000
House Loudspeakers: Renkus-Heinz "Smart System" MR/LR System, JBL/Community horn loaded system
Flying System Available: Yes
Monitor Loudspeakers: JBL custom foot monitors, Modular Sound TA 12 time aligned monitors, Renkus-Heinz "Smart System" monitors
House Consoles: Pulsar Matrix 80 Series 32 x 8 x 8, Soundcraft 400B 24
Monitor Consoles: Pulsar M-832 x 8, Soundcraft 400B 24 x 8 x 2
Outboard Equipment: Ashly limiters and equalizers, Ashly noise gates, Lexicon effects, ART effects, DeltaLab effects, Minicube and Countryman direct boxes, Ashly parametric notch filter
Power Amplifiers: Crest, Crown
Microphones: Shure, AKG, Sennheiser, Crown PZM

Lighting: PAR 64, Fresnel, Scoop, Leko, Teatronics DPI 24 and 48-channel Producer II, control.
 Other Equipment: C ducer piano pick-up



THE RANCH RECORDING STUDIO "MOBILE ONE"
 Duncan, OK

THE RANCH RECORDING STUDIO "MOBILE ONE"
Audio Recording
 Rte. 2, Box 53
 Duncan, OK 73533
 (405) 255-9037
 Contact: Mark Edwards
REMOTE RECORDING
Vehicles: 25' mobile audio production truck (1985 Ford) completely air conditioned and heated for your comfort
Control Room Dimensions: 12 x 7.5 x 7.5
Mixing Consoles: Yamaha RM2408 w/24 inputs, 8 groups, 24 direct outputs, 24 track monitor, Yamaha M406 6 input sub mixer
Audio Recorders: Tascam MS 16 16 track 15 ips, full function, autolocator w/10 presets, Tascam 38 8-track, Otari MX 5050B 2-track, Tascam 32 2-track, (2) Tascam 122 cassette decks

Noise Reduction Systems: dbx 16-channel, dbx 2-channel
Outboard Equipment: (2) Lexicon PCM60 digital reverbs, Yamaha REV7 digital reverb, Roland DEP5 digital effects processor, Lexicon PCM42 digital delay, DeltaLab ADM-256 digital delay, Orban 111/B1 stereo reverb, UREI 1173 limiter/compressor, (3) dbx 166 dual limiter/compressor, (2) Yamaha GC2020B dual limiter/compressor, Ashly SC-50 limiter/compressor.
Microphones: Neumann U87, (4) Shure SM81 LC, (2) Crown PZM, (2) Beyer M201, AKG D190M, (2) Sennheiser MD441, (4) Sennheiser MD421U, (6) Shure SM57, (4) Shure SM58, (6) direct boxes
Monitor Speakers: (2) JBL 4312, (2) JBL 4401, (2) Visonik Davids, (2) JBL 4333B
Power Amplifiers: (2) Yamaha 2100, Yamaha 2050
Video Monitors: (2) Panasonic B&W 9", Sony color 12" upon request
Cameras: (2) Ikegami B&W
Other Major Equipment: UREI 535 dual octave graphic equalizer, Yamaha Q2031 dual 1/3-octave graphic equalizer, Biamp 210 dual octave graphic equalizer, Omni Craft GT4 A 4-channel noise gate, RTS 2-channel intercom w/one belt pack, complete custom built headphone monitoring system, 27-pair microphone snake w/transformer splits, 9-pair high level snake for intercom, foldback, tie lines, etc.
Rates: Call for rates.
Extras & Direction: Mobile One brings the finest in remote recording to your doorstep. Live concerts, album projects, remote broadcast and audio support for television are no problem for our experienced crew. Credits: The Vocational Industrial Clubs of America (VICA), KOCO TV Five Who Care awards program, Straight Ahead Productions, St. John The Baptist Catholic Church Choir, Shekinah Gospel Singers (SGS Productions), Miller Studio, Southern Comfort. We are centrally located for quick access to any major city in the central U.S.

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Audio Recording
2304 Sheri Oaks Ln.
Austin, TX 78748
(512) 472-3325
(512) 282-0713

Contact: Malcolm H. Harper, Jr.

REMOTE RECORDING

Vehicles: 42' Sierra/Hidley tractor-trailer unit
Control Room Dimensions: 18 x 7 x 6.75. Over dub room:
7 x 7 x 5 x 6.75.
Mixing Consoles: MCI/Sony 636 LM automated, Hill, Ampex.

Audio Recorders: (2) MCI/Sony JH-24 24-track, (2) MCI/Sony JH-110C 2-track 1/4" and 1/2" heads, (2) Nikko cassettes, Sony PCM-3324 on request, Akai PCM 2-track.

Noise Reduction Systems: (8) Drawmer DS-201 gates.
Synchronization Systems: Qlock 4.10 3 machine, Audio & Design time code reader.

Outboard Equipment: (10) API 550A EQ, (2) Drawmer 1960 tube limiters, (4) Valley People Dyna-Mites, (4) UREI LA-3A limiters, (4) dbx 903 limiter, (2) dbx 902 DS units, DeltaLab DL-1, DeltaLab DL-2, Urso Major 8 x 32 reverb, AMS RMX-16 reverb, (8) Drawmer DS-201 gates.

Microphones: Neumann, AKG, Beyer, E-V, RCA, Shure, Sennheiser, Countryman, Crown.

Monitor Speakers: JBL 4430 bi-amped w/White 1/6-octave voicing and crossovers, Westlake BBS-6, Auratones small and large, Radio Shack.

Power Amplifiers: Crown PSA-2, Crown M-1000, Crown D-75.

Video Recorders: Panasonic.

Video Monitors: Sony pro-level 19"

Switchers: Sony

Cameras: Magnavox

Other Major Equipment: RTS intercom system 6-channel, Sola Power transformer, Jensen 48-input transformer split system, 400' snake 48 inputs, stage snake system w/fan outs for 48 inputs, 250' power snake, Yamaha SPX90, UREI LA-2A, Valley People DSP units, MICMIX reverb, Valley People mic pre-amps, API mic preamps.

Rates: Call, based on day rate, travel, tape, crew per diem.

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Garland, TX 75040

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Contact: Kevin Mauzy

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Tulsa, OK 74135

(918) 745-1156

Contact: Kevin L. Hulett, Mike Hulett

SOUND REINFORCEMENT

Touring Radius: Regional

Maximum Venue Size: 10,000

Vehicles: 22' truck, (2) cargo vans

House Loudspeakers: (8) Meyer MSL3, (4) Meyer USW1,

(8) JBL 4699, (8) JBL 4695.

Flying System Available: Yes.

Monitor Loudspeakers: (8) JBL 4604, (3) JBL 4699.

House Consoles: Yamaha 2404 24 x 4 x 2, Ramsa 8724 24

x 4 x 2 x 1.

Monitor Consoles: Yamaha 2408 24 x 8, Peavey Mark IV

24 x 8

Outboard Equipment: Yamaha REV7 digital reverb, (4)

Yamaha SPX90 digital reverb, (4) dbx 166 compressor/noise

gate, (2) Rane GE30 1/3-octave graphic EQ, (8) Rane GE27

1/3-octave graphic EQ, (2) Rane RA27 real time analyzers.

Power Amplifiers: (16) Crown MT1200, (6) Carver PM1.5.

Microphones: (10) Shure SM57, (10) Shure SM58, (4) Senn-

heiser MD421, (2) Sennheiser MD441, (4) Shure SM81, E-V

RE20, AKG D-12E, (8) Proco direct boxes.

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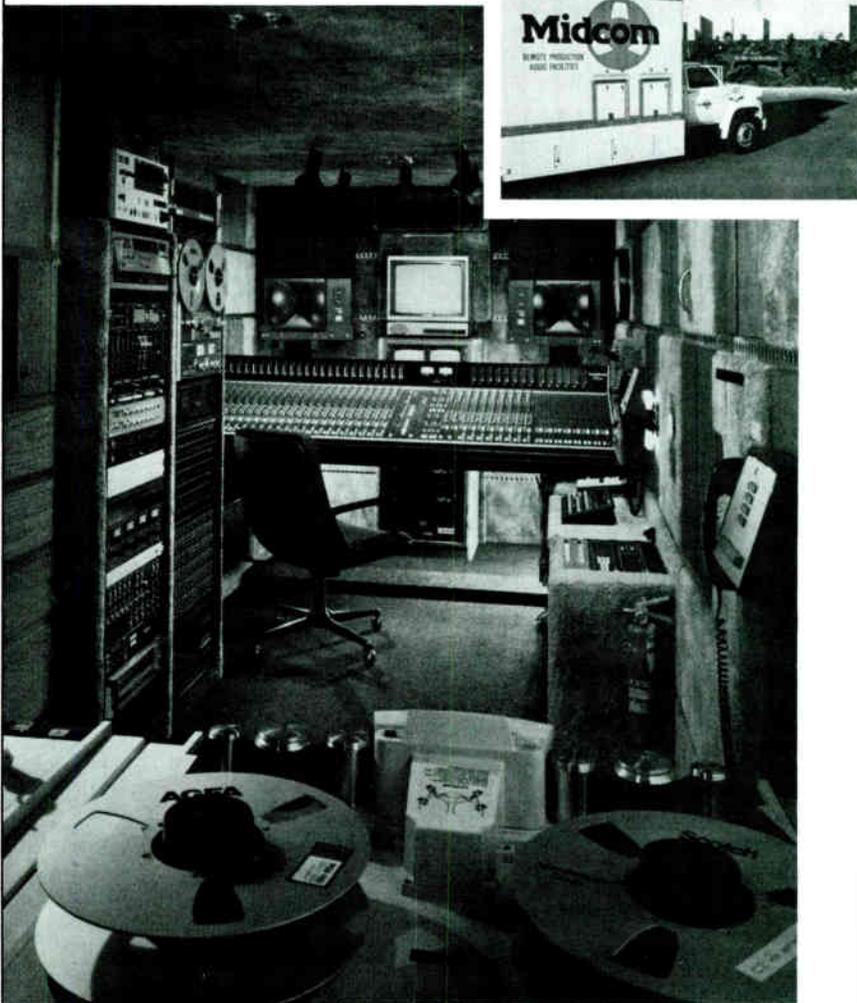
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Contact: Russell Jewell

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(313) 258-5602
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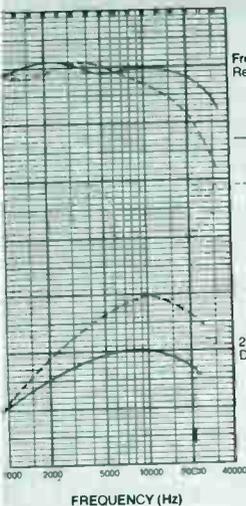
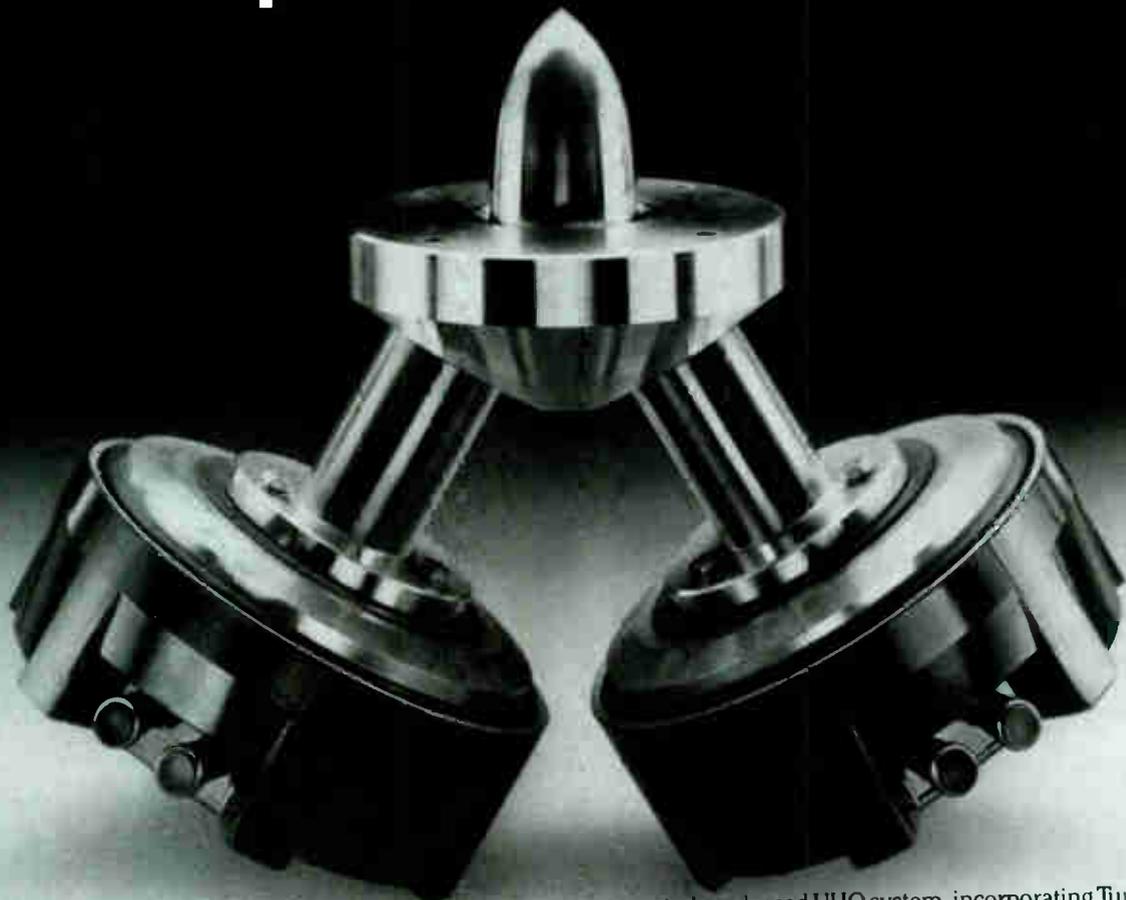
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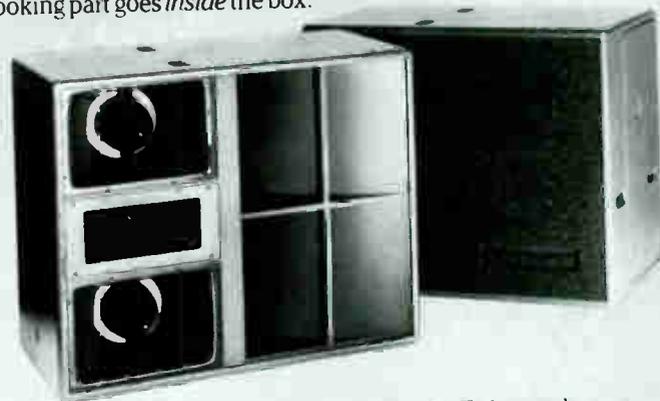
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*TurboMid™ and TurboBass™ devices are covered world-wide by Principle Patents, not simple design patents. Principle Patents covering V Series have been applied for. The concepts embodied in these designs are, therefore, entirely unique. See Turbosound literature for full information.

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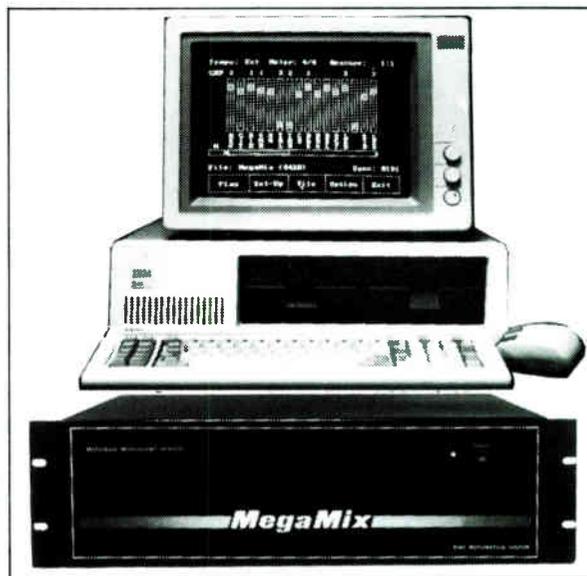
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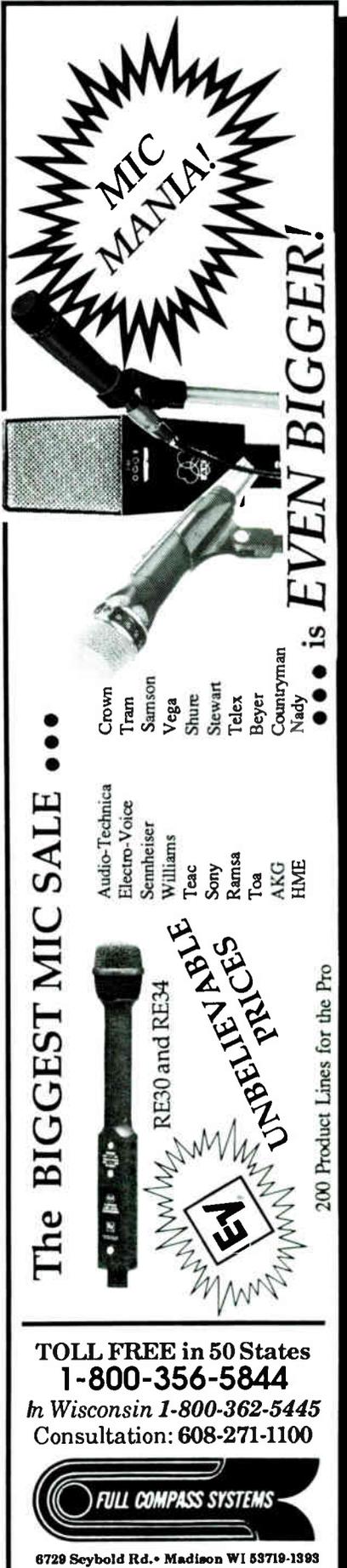
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Contact: Phil Maass

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(612) 546-4217
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Chicago, IL 60611
(312) 337-6000
Contact: Gene Cosentino

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(219) 295-7493
Contact: Sanford Swartzendruber

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(216) 749-7244

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Sound Reinf., Audio Recording
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Athens, OH 45701
(614) 593-8767
Contact: Alan Rollins



PRO AUDIO INC.
Grand Rapids, MI

PRO AUDIO INC.
Sound Reinf., Lights, Audio Recording
0-1640 Lake Michigan Dr. NW
Grand Rapids, MI 49504
(616) 677-5228
Contact: Kenneth Reinecke

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Reynoldsburg, OH 43068
(614) 927-5318
Contact: Dutch Plegler

PRO/STAGE LIGHTING CO.
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356 Celina Rd.
Columbus, OH 43228
(614) 878-6874
Contact: Gary Nahs, Jim Myers

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Sound Reinf., Lights
3014 S. 44th St.
Kansas City, KS 66106
(913) 677-0616
Contact: Joe Thoennes
SOUND REINFORCEMENT
Touring Radius: National

Maximum Venue Size: 10,000 seats
Vehicles: (2) 22' trucks.
House Loudspeakers: (16) E-V 4025 bass bins, (16) E-V 1225 mid cabs, (8) Community 264 60 x 40 horns w/Renkus-Heinz SSD-3301, (8) Community RH90 horns w/Renkus-Heinz SSD-1801, (12) Technical Audio Services 3-way multi-frequency cabs.
Monitor Loudspeakers: (10) 1-15 wedges w/Renkus-Heinz high end, (4) 1-12 wedges w/Renkus-Heinz high end, (8) Technical Audio Services 3-way side/drum fill cabs.
House Consoles: Soundcraft 8000 40 x 8, Yamaha 2402 24 x 4, (2) Sunn SPL 3424 24 x 4.
Monitor Consoles: (2) Yamaha 2408 24 x 8.
Outboard Equipment: (2) Yamaha REV7, (2) Lexicon PCM60, (2) Yamaha SPX90, (4) dbx 166, (2) dbx 160, Klark-Teknik DN360 EQ, asst. digital delay lines.
Power Amplifiers: Carver and BGW.
Microphones: (8) Sennheiser MD421, (3) Sennheiser MD-441, (3) AKG D12E, (4) Shure SM81, E-V RE20, (10) Shure SM57, (12) Shure SM58.
Lighting: (120) 1K PAR 64 instruments, 48 channels of 2.4K dimming, 24-channel, 2-scene controller w/Pin Matrix.
Other Equipment: Front and rear Truss w/lifts, (6) stations HME Communication system, 200-amp power distribution system, custom 40-channel, 3-way split Rapco snake—all on multi-pin connectors.

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Chicago, IL 60657
(312) 525-3109
Contact: Jerry Skora
Touring Radius: National
Vehicles: (2) mini-van production vehicle, 4-camera; Standard Cube van, 6-camera expandable to 8.

Microphones: .
REMOTE RECORDING
Vehicles: Mini-van production vehicle, 4-camera; Standard Cube van, 6-camera expandable to 8.
Mixing Consoles: Neve.
Audio Recorders: Studer.
Noise Reduction Systems: Dolby.
Video Recorders: (3) Sony BVH-2000, (2) Sony BVH-500A, (3) Sony BVW-25.
Video Monitors: (3) Ikegami TM14, (3) Ikegami TM10.
Switchers: (2) Grass Valley 100.
Video Effects Devices: Abekas still store.
Cameras: (3) Ikegami HL-79EAL triax or ADC, (2) Ikegami HL-95B triax, (2) Ikegami 323P triax or MCH.

PROFOUND SOUND
Sound Reinf., Rental, Audio Recording
4616 Clinton Ave.
Cleveland, OH 44102
(216) 281-0976
Contact: Paul Reynolds

PYRAMID AUDIO INC.
Sound Reinf.
450 W. Taft Dr.
South Holland, IL 60473
(312) 339-8014
Contact: Mike Acklin

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Omaha, NE 68106
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Wickliffe, OH 44092
(216) 944-6356
Contact: Bob Matzen

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Des Moines, IA 50316
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Contact: Doug Taylor

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Contact: Lyle Gillman

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Milwaukee, WI 53203
(414) 276-7787
Contact: Linda Radtke

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Contact: John Muzyka

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Contact: David Ruke

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Chicago, IL 60660
(312) 338-4992

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Contact: Tim Siml

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Contact: Joe Castrejon, Ed Chapa

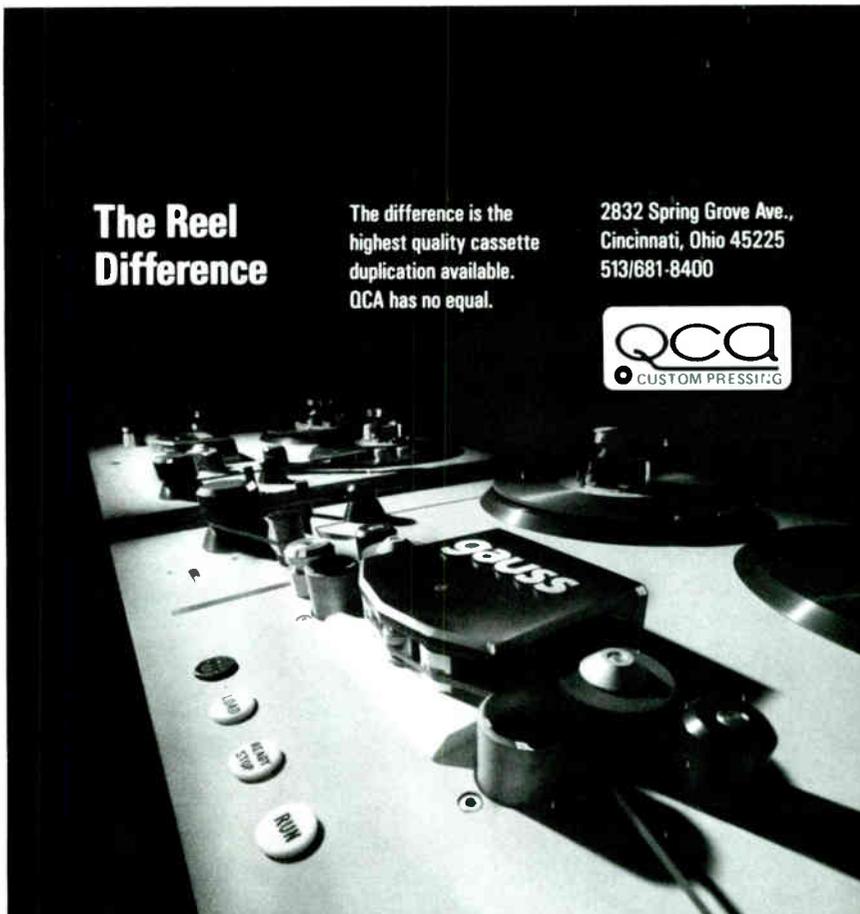
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(312) 846-8200

SOUND REINFORCEMENT

Touring Radius: Regional
Maximum Venue Size: 10,000 seats
House Loudspeakers: Low frequency: Hurler Bass bin, JBL 2225 drivers, Vega L36 Bass bin; Mid frequency: R&R CDL, JBL E130 drivers; High frequency: Emilar EH320, JBL 2441 & 2445 drivers.

Flying System Available: Yes.

Monitor Loudspeakers: R&R dual angle slant, Biamp, JBL 2225, JBL 2220, JBL 2425 drivers, Yamaha S2115H II.
House Consoles: Soundcraft 500 32 x 8, Hill J2 24 x 8.
Monitor Consoles: (2) Yamaha 1608 16 x 10, 32 x 10 configuration.

Outboard Equipment: dbx 160X limiters, White 4003 EQs, Brooke-Siren crossovers, Lexicon PCM60 & PCM70, Yamaha REV7, Yamaha SPX90, Gate noise gates, dbx 166 limiter/gate, Lexicon PCM41 & PCM42 delays and other misc. effects.

Power Amplifiers: Crown PSA 2, Carver PM 1.5, Crest 4000, Crest 3500.

Microphones: Shure, E-V, Sennheiser, Beyer, Crown PZM, Cducer, Countryman DI, Whirlwind DI.

Staging: Subcontracted.

Lighting: Subcontracted.

Rates: Available upon request.

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(312) 453-1829
Contact: Bruno Strapko

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Solon, OH 44139
(216) 232-7926
Contact: Paul C. Miller

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(913) 966-2682
Contact: Les Roediger

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St. Cloud, MN 56301
(612) 253-8652
Contact: Mitch Guseth

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Hays, KS 67601
(913) 625-9634
Contact: Mark Meckel

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(308) 384-6889
Contact: Larry Suhr

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Contact: Jeff Wormley

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(414) 241-5641
Contact: Todd A. Boettcher

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Contact: Tony Hugar

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Contact: Dave Tipton

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Contact: Rick Maly

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Contact: Harold Wolovitch

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Contact: Duane Clark

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Ft. Wayne, IN 46818
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Contact: Tom Tempel

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St. Paul, MN 55104
(612) 645-9281
Contact: Norion Lawellin

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11249 N. Riverland Rd.
Mequon, WI 53092
(414) 242-9010
Contact: Darrell Klompaker

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1910 Ingersoll Ave.
Des Moines, IA 50309
(515) 243-2125
Contact: Connie Seddon

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(701) 674-3242
Contact: Gary Cunningham, Leo Gaudeman

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Cambridge, WI 53523
(608) 764-8082
Contact: Daniel Gomez-Ibanez

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Sparta, IL 62286
(618) 443-2121
Contact: J.L. Scheper, Mike Arnold

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Sound Reinf., Rental, Audio Recording
415 2nd St. W.
Ashland, WI 54806
(715) 682-3505
Contact: Mark McGinley
SOUND REINFORCEMENT
Touring Radius: Regional
Maximum Venue Size: 3,000
Vehicles: Chevy 60 Series bus w/lounge; Ford Aerostar; (2) 1/2 ton trucks.

House Loudspeakers: (2) Peavey 3020 HT Mirror Image 4-way, (2) Peavey Project 2, (2) Yamaha S4115H, (2) Peavey SP-2, (2) Peavey 118 subs.

Flying System Available: Yes.

Monitor Loudspeakers: (2) Peavey 1245M, (2) Yamaha S2115H, (4) Peavey 112H, (2) JBL 15" horn.
House Consoles: Peavey Mark III Series 24-input, Yamaha RM1608 16 x 16, Peavey MD-16 16-input, Biamp 1221 12-input.

Monitor Consoles: Two separate monitor mixers available.
Outboard Equipment: Yamaha stereo 31-band EQ, Peavey 27-band EQ, Peavey 31-band EQ, DOD stereo 15-band EQ, Furman Parametric EQ, dbx 160 compressor, Symetrix 522 compressor, (2) Pandora LM 402 compressors, Omni Craft GT-4 noise gate, (2) DeltaLab Effectron II digital delays, ART DR-2 digital reverb, Peavey U4-X 4-way active crossover, dbx 10-channel noise reduction, (3) assorted snakes 150'-200' balanced.

Power Amplifiers: Peavey CS-1200, Peavey Deca 724, Peavey CS-800, Peavey CS-400, Crown DC-300A, Yamaha P2100, Peavey M3000, Biamp T-60.

Microphones: (5) Shure SMS8, (5) Shure SMS7, (7) Peavey PVM-38, (2) Sennheiser 421, (10) Peavey CD-20, (2) AKG C-60, AKG 414, AKG D-12E, Audio-Technica 813, (2) Tascam PE-150.

Lighting: Available. Please call for information.

Other Equipment: Otari MX-5050 MK8, Otari MX 5050B 1/2-track, Sony D-5 remote cassette deck, Harman Kardon CD 391 cassette deck, instruments/amps available for rent.

Rates: \$75 first hour, \$50 each additional hour.

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Audio Recording
1655 Wells St.
Fort Wayne, IN 46808
(219) 426-1655
Contact: Charlie Willer

WILLIAMS SYSTEMS

Sound Reinf., Rental
3005-1d Courthouse Dr.
West Lafayette, IN 47906
(317) 463-3301

Contact: Mark Williams
SOUND REINFORCEMENT
Touring Radius: Regional
Maximum Venue Size: 4,000
Vehicles: 22' van.

House Loudspeakers: (10) Eastern Acoustic Works BH-500 LAB, (4) Eastern Acoustic Works MR-102 LAB, (4) TAD

WILLIAMS SYSTEMS

WILLIAMS SYSTEMS
West Lafayette, IN

TD 4001 on JBL 2380 flares, (2) Eastern Acoustic Works MH-110, (4) Eastern Acoustic Works BH800L.

Monitor Loudspeakers: (2) Eastern Acoustic Works FR253, (6) E-V FM1202 wedge, (6) Eastern Acoustic Works SM120B wedge.

House Consoles: Soundcraft 500 32-channel, Yamaha MC2404 24-channel.

Monitor Consoles: Yamaha MC2408M 24 x 8.

Outboard Equipment: (2) Yamaha SPX90, Lexicon PCM60, DeltaLab Super Time Line, DeltaLab DL2A, (4) Valley People 430 Dyna-Mite, (2) dbx 166 comp/lim/gate, (2) Ashly EQ-231 stereo 1/3-octave, (5) Sundholm 3104 1/3-octave EQ, Symetrix 501 comp/limiter, (2) Symetrix SL400 Parametric EQ, dbx 163 compressor, (2) Brooke-Siren FDS340 4-way crossover, Brooke-Siren 8-channel line balancing unit, Tascam 225 cassette deck, Bonner 1232 RTA.

Power Amplifiers: (12) Carver PM1.5, Carver PM200.

Microphones: (2) Beyer M88, (2) AKG D12E, (2) Shure SM81, (2) AKG C-451, (9) E-V PL78, (6) Sennheiser 421, (15) Shure SM57, (3) Shure SM58, Shure SM10, (10) Brooke-Siren AR116 Phantom powered direct box.

Other Equipment: Whirlwind 24 x 3 transformer isolated splitter w/GND lifts, Whirlwind 24 x 2 parallel splitter, 300' 24 pr. cable (100' and 50') increments, custom-designed 12-channel output Matrix allows 12 mixes or crossover feeds to amplifiers, any amp can have any mix on push button control, 100 amp 220v single phase electrical distribution 150'.

Rates: Call

Extras & Direction: At Williams Systems we are anticipating higher quality standards for performances, as well as increased live broadcast and recording. Our fully isolated splitting system and custom-designed matrixing system allow the type of flexibility previously available from only the very large sound companies. Careful equipment selection and exceptional packaging make for rapid, reliable setups with a minimum amount of manpower. We are committed to providing the equipment and services necessary for a superior performance in any style of music.

JIM WILSON, INC.

Video Recording
PO Box 50521
Indianapolis, IN 46250
(317) 844-6418
Contact: Jim Wilson

WISE GUYS MUSIC CO.

Audio Recording
5000 Wyoming Ave., Ste. 121
Dearborn, MI 48126
(313) 582-5988
Contact: Greg Stevens, Dennis George

WIX MIX SYSTEMS

Sound Reinf., Lights
2442 Grand Ave. S.
Minneapolis, MN 55405
(612) 872-6815

Contact: Loren Wiklander
SOUND REINFORCEMENT

Touring Radius: National
Maximum Venue Size: 5,000 occupancy theaters, clubs, civic auditoriums.

Vehicles: 1984 GMC 6000, 20' box; other trucking is contracted thru different trucking companies.

House Loudspeakers: Welter System L2S bass cabinets, Welter System H34S 3-way cabinets, E-V cones, JBL horns, ten blocks=40,000 watts.

Flying System Available: Yes.

Monitor Loudspeakers: (16) Welter System concert wedges,



WIX MIX SYSTEMS
Minneapolis, MN

(4) custom 400-watt side fills, (2) custom 400-watt prum fills.
House Consoles: Soundtracs 32 x 8 x 2, Soundcraft 200a 24 x 4 x 2, Soundcraft 200B 24 x 4 x 2.
Monitor Consoles: Hill M3 32 x 10 mixer, Peavey MIC IV 24 x 8.
Outboard Equipment: Each rack has: (2) Yamaha SPX90, (2) Yamaha REV7s, Roland DEP 5, Roland SDE 3000, (4) Orban comp/limiters, (8) Omni Craft gates, (10) Yamaha 2031 dual 31-band EQs, (6) dbx compressors, (2) dbx gates.
Power Amplifiers: (8) Crest 5001s, (8) Crest 3501s, (8) Carver PM 1.5s monitor power.
Microphones: (2) E-V RE20s, (8) E-V 421s, (20) SM58s, (20) SM57s, (10) SM81s, (5) BK1s, (10) Toa RD-10s, (5) Toa RD-16s.
Lighting: (48) 1K PAR cans, (2) 40' Truss sections, (4) lifts (ground support) or flown.
Extras & Direction: Wix Mix crews are experienced professionals who will deliver, set up, and operate selected components in the most efficient and accurate way each time. Credits: Albert Collins, Asleep at the Wheel, Blues Busters, Cheaptrick, Crusaders, Fabulous Thunderbirds, Go Ahead, Fabian, Gregg Allman, Guess Who, Guthrie Theatre, Junior Wells, Lamont Cranston, Lonnie Mack, Long

John Baldrey, Little Anthony, Pat Travers, Frank Marino & Mahogany Rush, Mark Farner, Paul Butterfield, Ronnie Montrose, Rick Wakeman, Robin Trower, Roy Buchanan, Spencer Davis, Sun Ra, Wendy O, Willy Dixon, Suburbs.



WLF1-TV PRODUCTIONS
West Lafayette, IN

WLF1-TV PRODUCTIONS
Video Recording
 2605 Yeager Rd.
 West Lafayette, IN 47906
 (317) 463-1800
Contact: Ken Gardner
REMOTE RECORDING
 Vehicles: 36' straight truck.
 Control Room Dimensions: 12 x 12.
 Mixing Consoles: Yamaha 1532.
 Audio Recorders: Revox PR-99, Tascam 122B, (2) PD-2.
 Noise Reduction Systems: (4) dbx 165.
 Synchronization Systems: Gray Lab 3 x 1 time code.
 Microphones: (6) 635s, (6) CO-90s, (2) Crown PZM, (2) Parabs, (8) various Sennheiser and AT shotguns, (2) E-V

RE15s, (2) AT815s, (2) AT813s.
Monitor Speakers: (4) JBL 1401s.
Power Amplifiers: (3) Crown D-75s.
Video Recorders: (3) Ampex VPR-2Bs, (2) Sony Series 5, BVW-25 Beta, Sony VO-4800 3/4".
Video Monitors: (5) Icky color, (6) Panasonic color, (5) Sony color, (25) Panasonic B&W.
Switchers: Grass Valley 1680, (2) 400 Series routers A&V.
Video Effects Devices: Abekus A52, Abekus A42.
Cameras: (6) Ickigami HL-79s, Sony BVW-30 betacam.
Other Major Equipment: We are full service uplinks and crewing.
Rates: Call for quote.
Extras & Direction: We have provided facilities for teleconferencing, sporting events, concerts etc. (See client list.)

WONDER PUG PRODUCTIONS
Audio Recording
 2639 Bel-air Dr.
 Chicago, IL
 (312) 870-9517
 Contact: Pete Krampert

WOODMAN PRODUCTIONS
Sound Reinf., Lights, Staging, Audio & Video Recording
 1318 E. Algonquin Rd., Ste. 1A
 Chicago, IL
 (312) 397-0502
 Contact: Lowell S. Woodman

WORLDWIDE SOUND & VIDEO PRODUCTIONS
Sound Reinf., Audio & Video Recording
 202 W. Plum
 Robinson, IL 62454
 (618) 544-7898

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- SEPTEMBER '87: **STUDIOS OF SOUTHERN CALIFORNIA** (Deadline: June 12)
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NAME _____

COMPANY _____

ADDRESS _____

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STATE _____

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() _____

TELEPHONE _____

Mail to: **Mix Directories**
 2608 Ninth Street
 Berkeley, CA 94710

NOTE: Questionnaires for specific issues will be mailed five weeks prior to issue date.

NORTHEAST

A LA MODE VIDEO PRODUCTIONS

Sound Reinf., Lights, Rental, Audio & Video Recording
PO Box 325
Southeastern, PA 19399
(215) 853-2025
Contact: Sam Catanese, Mark Knight

ACOUSTIC SPACES INC.

Sound Reinf., Lights, Staging, Audio Recording
HUM Box 6219
Kingston, NY 12401
(914) 331-1726
Contact: Dave or Chris

A.D.R. STUDIOS INC.

Sound Reinf., Audio Recording
Skylight Run-Taxter Rd.
Irvington, NY 10533
(212) 486-0856
Contact: Stuart Allyn

ADVANCED MEDIA TECHNOLOGIES, INC.

Sound Reinf., Rental
12 Northway Rd.
Randolph, MA 02368
(617) 961-2617
Contact: Peter A. Kmiec

ALDEN VIDEO PRODUCTIONS INC.

Audio & Video Recording
80 Commerce St.
Glastonbury, CT 06033
(203) 633-9481
Contact: Ken Fisher

ANDERSEN MOBILE AUDIO/ NEVESSA PRODUCTION

Audio Recording
1 Artist Rd.
Saugerties, NY 12477
(914) 679-8848
Contact: Chris Andersen

ANDREWS AUDIO TOURS

Sound Reinf., Rental, Audio Recording
347 W. 39th St.

New York, NY 10018
(212) 736-9570
(718) 729-6007

IMC 758 Andrews D-US

Contact: David M. Andrews, Mike Sinclair

SOUND REINFORCEMENT

Touring Radius: National

Maximum Venue Size: Stadium and arena

House Loudspeakers: (40) Meyer MSL3.

Flying System Available: Yes.

Monitor Loudspeakers: (24) Meyer UPA1, UMI, 500, (8) custom 2 x 15, (10) custom 2 x 2-12.

House Consoles: Yamaha PM3000-40, Midas Pro 5-32, (3) Audioarts 40- and 32-channel.

Monitor Consoles: Audioarts M16-40, TAC Scorpion 30 x 12.

Outboard Equipment: Lexicon PCM70, Yamaha SPX90, dbx 900 Series, dbx 160X, dbx 166, UREI 539, Klark-Teknik DN360B, BSS FDS 320.

Power Amplifiers: Crown MT 1200LX.

Microphones: Shure SMS7, Shure SM58, Shure SM87, E-V NDYME, AKG 451, PZM all models, Sennheiser 421, Countryman direct boxes.

Other Equipment: Techtron TEF, Meyer SIM, Irie 30.

APPLIED ACOUSTICAL SCIENCES, INC.

Sound Reinf., Rental
6805 Emerson St.
Riverdale, MD 20737
(301) 459-0913
Contact: Eric J. Maynard

ASL MOBILE AUDIO/VIDEO

Audio & Video Recording
PO Box 791
Flushing, NY 11352
(718) 886-6500

Contact: Steven Remote
REMOTE RECORDING

Vehicles: 1987 International turbo diesel w/4-door travel-crow cab, dual fuel tanks and air ride suspension.
Control Room Dimensions: 14'10" x 7'6" x 7'10", truck

REMOTE RECORDING and SOUND REINFORCEMENT



N O R T H E A S T



ASL MOBILE AUDIO/VIDEO Flushing, NY

length is approx. 33 1/2' long.

Mixing Consoles: Harrison MR-4 36/32 w/ARMS automation (additional sub-mixers available, 76 mic/lines total). **Audio Recorders:** Otari MTR-90 24-track (second machine available upon request), Otari MTR-10 24-track, (2) Otari 5050 BII 2-track, (2) Denon DR M4 cassette decks, (2) Nakamichi DMP-100 digital processor w/Sony SL-HF900 Super Beta Hi-Fi recorders.

Noise Reduction Systems: All types available upon request.

Synchronization Systems: Lynx TimeLine.

Outboard Equipment: (3) Yamaha SPX90, Yamaha REV7, Klark-Teknik DN-780, Ursa Major Space Station, MXR O1, (2) Brooke-Siren DPR-402 comp/peak lim/2 eq esser, (2) dbx 160X, (2) dbx 160, (2) UREI 1176LN, (24) noise gates by: Rebis, Valley People and Drawmer, Eventide 910, MicMix XL-305, Klark-Teknik DN-700, (4) Korg SDD 2000, (3) Korg SDD 3000, Korg DVP-1, Lexicon PCM41, Lexicon Prime Time, (14) various EQs by Klark-Teknik and Orban, plus additional de-essers, EQs, comp/line too numerous to list, but available onboard the mobile unit.

Microphones: Over 90 microphones by: Sennheiser, Shure, Sony, E-V, AKG, Beyer, Neumann, Crown, Realistic, Brooke-Siren, ASL

Monitor Speakers: (2) UREI 813, (2) K&H 902 (tri-amped), (4) Yamaha NS-10M, (4) E-V Sentry 100A

Power Amplifiers: (2) Yamaha P2200, Crown D-60 (head-phone amp in control room).

Video Recorders: (2) Sony SL-HF900 Super Beta Hi-Fi recorders, Akai VS-6C3S VHS Hi-Fi recorder.

Video Monitors: (3) 13" color monitors, (2) RCA B&W 9" monitors, (2) Panasonic 3" color monitors.

Switchers: Dynair 12-channel video switcher.

Cameras: Panasonic color camera (remote zoom, focus, pan and tilt), (2) RCA CCTV B&W cameras.

Other Major Equipment: (76) audio mic/lines (via 4 x 19 pair audio snakes) individual XL connectors also available, (4) individual communication lines to mobile unit, (8) video send and returns to mobile unit, (5) incoming Telco lines, (2) stereo signal feeds for telco and satellite links (additional feeds available), portable mobile cellular telephone (incoming/outgoing service), 1,000 point Baniam jackfield/24 point video jackfield, 76-channel 3-way splitter system. Rates: Available upon request.

Extras & Direction: Aura Sonic Ltd. (ASL Mobile A/V), established in 1977, is a full service audio/video facility handling a variety of mobile productions. From television and radio broadcasting (via satellite up-links and telco feeds) to dual analog or digital multi-track recording! Our philosophy is to bring the multi-media, multi-track control room to the concert hall, video facility, MIDI studio, rehearsal space, home and/or anywhere else desired, to develop the sounds and visions needed. The ASL Mobile Unit offers complete basic track, mixdown and pre/post-audio-for-vid-

eo to clients ranging from top audio and video backgrounds to local artists and bands. Here is a selected list of clients and artists who have used our mobile production facilities: A&M, Arista, BBC-TV, Black Uhuru, Blasters, Boggs/Baker, Boy George, CBS, Duke Ellington Orchestra, FM Tokyo, Frank Zappa, Geffen, Gene Simmons, Howard Jones, James Brown, Jimmy Iovine, Lena Lovich, Lloyd Cole, MTV, NY String Orchestra, PBS-TV, PMC, The Police, The Ramones, Simple Minds, Sound Works, Stevie Wonder, Talking Heads, WLIR-FM, WNEW-FM, WPIX-FM, and XTC to name a few.

A/T SCHARFF RENTALS

Rental
1619 Broadway
New York, NY 10019
(212) 582-7360

SOUND REINFORCEMENT

Outboard Equipment: ADR, AMS, Aphex, dbx, EMT, Eventide, Focusrite, Lexicon, Publison, Pultec, Roland, UREI, Valley People, White, Yamaha.

Power Amplifiers: Bonneville, Crown, Hafler, Rane, Shure, UREI.

Microphones: AKG, Beyer, Crown, E-V, Micron, Nady, Neumann, Schoeps, Shure, Sennheiser, Vega.

Other Equipment: Diversicom nationwide beeper, Kenwood walkie-talkies, Mitsubishi cellular phones, Motorola Maxar, NEC cellular phones, RTS intercom system, Studer Tel/Hybrid, HME wireless intercom.

REMOTE RECORDING

Mixing Consoles: Shure FP-32, Yamaha PM3000, Yamaha RM1608, Yamaha M406, Yamaha M512.

Audio Recorders: Nakamichi MR-1, Otari MTR-90, Otari MX-5050, Sony PCM-3324.

Noise Reduction Systems: dbx, Dolby, Dolby SR.

Synchronization Systems: Lynx TimeLine.

ATLANTA SOUND AND LIGHTING

Sound Reinf., Lights, Staging, Rental
500 Plasamour Rd. NE, Ste. 3
Atlanta, GA 30324
(404) 876-5600

ATOM AUDIO

Sound Reinf.
120 Donaldson Ave.
Rutherford, NJ 07070
(201) 935-5710
Contact: James O'Connor

AUDIO ANALYST U.S.A.

Sound Reinf.
13 Industrial Blvd. W.
Plattsburgh, NY 12901
(518) 561-5071
Contact: Bert Pare, Ab Hock

AUDIO INNOVATORS, INC./PRO COM SYSTEMS

Sound Reinf., Rental, Audio Recording
5001 Baum Blvd.
Pittsburgh, PA 15213
(412) 621-1950

AUDIO MIXERS

Sound Reinf., Audio Recording
215 E. 27th St.
New York, NY 10016
(212) 213-5335
Contact: Fred Venitsky

AUDIO PROMEDIA

Sound Reinf., Audio Recording
114 Old Amherst Rd.
Sunderland, MA 01375
(413) 665-7122
Contact: Art Steele

AUDIO RADIANCE

Sound Reinf., Lights, Rental, Audio Recording
34 Hockanum Rd.
Hadley, MA 01035
(413) 584-1272
Contact: Chris Dixon

Extras & Direction: High quality sound reinforcement for clubs, halls and outdoors. 24- and 16-channel stereo, 2-, 3-, and 4-way systems. Monitor systems up to 24 x 8. All top quality equipment. Various light packages and remote 4- and 8-track recording. One nighters and regional tours with truck and crew. Shows in the past year include: Outlaws, Emmylou Harris, Jerry Lee Lewis, Los Lobos, Chick Corea Electric Band, Richard Thompson Band, Robert Cray Band, Modern English, Romantics, Roy Orbison, Roy Buchanan, Elvin Bishop, Dave Mason, Gary U.S. Bonds, Mel Torme, Bill Monroe, Chieftains.

THE SOUND DECISION

Sound Image presents Phase-Loc: the ultimate sound reinforcement system.

Phase-Loc is an engineering breakthrough in quality acoustics and electronics. Full audio spectrum coverage over a wider area, flexible enough for any application, rugged yet compact.

Phase-Loc is the result of 15 years of professional touring sound experience, plus extensive research and development.

It's the sound choice for quality, and the sound choice for the touring professional.

Here's why.

A unique enclosure design allows cabinets to be splayed — for better area coverage



without sacrificing acoustic coupling. Trapezoidal design also minimizes lobing and phase cancellation at higher frequencies. Modular construction gives Phase-Loc the flexibility for top performance anywhere, any time. And its interlocking cabinets can fly four high, eliminating barriers between performers and audience, and making more seats available.

The system's state-of-the-art electronics delivers full frequency coverage, 40 Hz to 20 kHz, up to 1750 watts audio per cabinet, and zero-phase-shift frequency crossover.

Last, but not least, Phase-Loc's rugged, tour-proof construction and compact packaging conserve valuable truck space and shorten setup and strike time.

Phase-LOC[®]
SOUND IMAGE

The Sound Decision

388 ENTERPRISE, SAN MARCOS, CA 92069 - 619 744-8460

AUDIO SERVICES & DESIGN

Sound Reinf.
8 Meadow Pl.
N. Haledon, NJ 07508
(201) 427-6503
Contact: Frank Revi

AUDIO SUPPORT

Sound Reinf.
Trent Bldg.
Irvington, NY 10533
(914) 591-6667 (IMC 1708, 1710)
Contact: Sean McCormick, Simon Nathan, John Doerschuk
SOUND REINFORCEMENT
Touring Radius: National
Maximum Venue Size: 20K
Vehicles: As needed.
House Loudspeakers: Meyer MSL-3, 650-R2 systems.
Flying System Available: Yes.
Monitor Loudspeakers: 2 x 12, 1 x 15 (w/ JBL 2441), 2 x 15 subs, Meyer MSL/650 fills, Meyer UPA, Meyer UM1.
House Consoles: Midas, TAC Scorpion.
Monitor Consoles: Midas, TAC Scorpion.
Outboard Equipment: As needed.
Power Amplifiers: Crest 3000 and 4000.
Microphones: As needed.
Rates: Call.

AUDIO 300, INC.

Sound Reinf., Lights, Staging, Rental
3A Nicholas Dr.
Albany, NY 12205
(518) 869-1200
Contact: Mike Doss
SOUND REINFORCEMENT
Touring Radius: National
Maximum Venue Size: Up to 5,000 seats.
Vehicles: 14' 22' trucks.
House Loudspeakers: (8) Turbosound TMS-3 enclosures, JBL-loaded speaker enclosures.
Flying System Available: Yes.
Monitor Loudspeakers: (8) Toa SDM-38 floor monitors, (8) Yamaha 2115 floor monitors, (2) Turbosound TMS-4 enclosures.
House Consoles: TAC Scorpion 32 x 8, (3) Soundcraft 200 in various formats, AHB SR-424, Yamaha 916.
Monitor Consoles: Yamaha 2408.
Outboard Equipment: (2) Brooke-Siren FDS-340 crossovers, (4) Crown MX-4 crossovers, (4) Loft 602 crossovers, (3) dbx 166 comp./limiters, (3) Lexicon PCM41, (3) Yamaha SPX90, (3) Yamaha R1000, (2) Yamaha 1027 EQs, (10) Yamaha 2031 EQs, older signal processing gear.
Power Amplifiers: (14) Carver PM-1.5, (4) Carver PM-200, (5) Crown DC-300, (2) Crown D-150.
Microphones: (9) Shure SM81, (30) Shure SM57, (20) Shure SM58, (4) Sennheiser 421, (2) AKG D-12, (4) AKG D-1000e, (4) Telex wireless systems, hand-held/lapel.
Staging: Available upon request.
Lighting: (60) Par 64, (10) pinspots, (3) 1,000-watt follow-spots.
Other Equipment: Anything is available upon request.
Rates: Per job basis.

AUDIO VISUAL ARTS, INC.

Rental, Audio & Video Recording
110 Hudson St., 3rd floor
New York, NY 10013
(212) 925-5739
Contact: Jim Trapp
REMOTE RECORDING
Vehicles: 30' Airstream motor coach, Isuzu 4-wheel drive Trooper II.
Control Room Dimensions: 10 x 8
Mixing Consoles: Allen & Heath 1616 / expander 8 (24-channel), Tascam M-16 20 channels, Toa D4-D4E MIDI keyboard mixer (10-channel).
Audio Recorders: Tascam 85-16B 16-track 1", Fostex B-16 16-track 1/2", Technics 2600 2-track 1/4", Nakamichi MR-1 cassette, Nagra IV STC 2-track.
Noise Reduction Systems: (16) dbx.
Synchronization Systems: Fostex 4030 synchronizer, Fostex 4035 synchronizer controller.
Outboard Equipment: (3) Valley People Gain Brains (compressor), dbx 160 compressor/limiter, (5) Valley People Kex noise gate/duck, Klark-Teknik DN360 graphic equalizer, Orban stereo parametric equalizer, Lexicon PCM70 digital effects processor, (2) Yamaha SPX90 digital effects processor, TC Electronics (sampling delay), Valley People DSP (silence processor), Aphex Aural Exciter Type B.
Microphones: (8) Shure SM57, SM58, 545SD, (2) Neumann U87 w/ isolation and shock mount, (5) AKG 451 w/ isolation and shock mount, AKG C28A, (2) Sennheiser MD421, Sennheiser MD441, Sony ECM-377, E-V RE20, E-V RE11, AKG D-24.
Monitor Speakers: Yamaha NS-10 near field monitors, KET 103.2 reference monitors, Auratone near field monitors.
Power Amplifiers: Hafler DH-220, ASC 3200.
Video Recorders: (2) JVC CR 850 portable 3/4", JVC BR-

REMOTE RECORDING and SOUND REINFORCEMENT



N O R T H E A S T

7700 stereo hi-fi VCR, B&H SM11 VCR/monitor portable.
Video Monitors: JVC RM 9V monitor, Taxan KX-12 RGB.
Cameras: (2) JVC 210V.
Other Major Equipment: AVA custom 24-channel snake (250') w/ground lift and iso transformer splits, custom 50' 8-channel drum snake, custom 10-channel keyboard, snake w/Neve Transformers, NEC cellular phone, E-mu II sampling keyboard, (2) Macintosh 512 computer w/RTA software.
Rates: \$1,000-plus/day.

THE AUDIO WORKSHOP

Sound Reinf.
1728 Leishman Ave.
Arnold, PA 15068
(412) 335-7766
Contact: James N. Guzzo

AURA SONIC LTD.

Audio & Video Recording
PO Box 791
Flushing, NY 11355
(718) 886-6500
Contact: Steven Remote

A/V ALTERNATIVES

Audio Recording
440 Eden Dr.
Monroeville, PA 15146
(412) 325-1952
Contact: Kevin Dolan

THE A/V CONNECTION INC.

Audio & Video Recording
101 Westchester Ave.
Port Chester, NY 10573
(914) 939-1066
Contact: Carmine Riale

BACKTRACKS LOCATION RECORDING

Audio & Video Recording
3 1/2 Kent St.
Montpelier, VT 05602
(802) 223-2551
Contact: Mike Billingsley
Extras & Direction: Extras: Location and remote digital (SMPTe lock to video if desired) either direct-to-digital stereo or live mix to digital, or hi-fi tracks with two digital tracks (post/mix to digital master or layback to video). Extended portability with special DC package. Patented Stereo Ambient Sampling System (SASSim) for faithful reproduction of acoustic spaces and events. Wireless time code. Usual complement of mics and wild sound recorders, including shotgun. Direction: Specialized in highly realistic stereo reproduction, with low noise components and especially modified equipment. We record acoustic ensembles on-site (ethnic, folk, classical), symphonic and band arrangements, location sound effects, environment ambience in all locations, and live performances using proven imaging techniques for convincing special realism. House label (Straight Arrow Recordings) releases SASS-recorded music and effects. We also create auditory environments recordings and events loops for audience works, museum environments and stereo sampling digital synthesizers. Artist commissions are welcomed. We also engineer field re-sync lockups of studio music for music video, with wireless SMPTe for enhanced camera mobility.

BACKTRAX AUDIO/VIDEO STUDIOS

Audio & Video Recording
106 Roosevelt Blvd.
Oakland, NJ 07436
(201) 337-5203
Contact: Gregg Miraglia

BOB BALZARINI SOUND SVC.

Audio & Video Recording
48-51 Bell Blvd.
Bayside, NY 11364
(718) 423-7507
Contact: Bob

PARKER BANDY'S SOUND ADVICE

Sound Reinf., Rental
181 S. Central Ave.
Chambersburg, PA 17201
(717) 263-8289
Contact: Parker Bandy

BAY SOUND LTD.

Sound Reinf., Staging
100 Hiawatha Dr.
Brightwaters, NY 11718
(516) 665-7517
Contact: Bill Allen

BEE-VEE SOUND

Sound Reinf., Audio Recording
211 E. 43 St.
New York, NY 10017
(212) 949-9170
Contact: Bruno Vineis



BIG MO RECORDING
Wheaton, MD

BIG MO RECORDING

Audio Recording
12255 Viers Mill Rd.
Wheaton, MD 20906
(301) 946-7364
Contact: Ed Eastridge
REMOTE RECORDING
Vehicles: 1978 Ford C-700 w/air bag suspension.
Control Room Dimensions: 8 x 24.
Mixing Consoles: ESP custom console 40 x 24, Soundcraft 16 x 4 sub mixer.
Audio Recorders: MCI JH-114 24-track, MCI JH-12/14 24-track, Revox PR99 2-track, Mitsubishi X-850 32-track digital on request, Nakamichi and Sony cassette decks.
Noise Reduction Systems: Dolby A (32 channels), dbx 180.
Outboard Equipment: Lexicon 200, Lexicon PCM70, Lexicon PCM60, Yamaha REV7, (3) Yamaha SPX90, Lexicon Prime Time, (4) Gain Brain II, (5) Kexep II, dbx 900 rack w/compressor, gates, de-esser and EQ, Akai S900 digital sampler, Audioarts 4200-A parametric EQ, UREI 530 graphic EQ, Klark-Teknik 360 EQ, (5) dbx 160 compressors, (2) dbx 160X compressors, dbx 166 compressor/gate.
Microphones: (4) Neumann U87 and U89, (2) AKG 414, (6) AKG 451, (6) Sennheiser 421, (4) AKG 535, (2) E-V RE20, AKG D-12E, (4) Crown PZM, (8) Shure SM57, (6) Shure SM58, Sennheiser 431.
Monitor Speakers: UREI 811B, Yamaha NS-10M, JBL.
Power Amplifiers: Crown DC-300A, Crown D-150A, Crown D-75A.
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Mixing Consoles: Sound Workshop Series 34 40-channel, Sound Workshop Series 34 custom 64-channel (portable).

Audio Recorders: (2) Otari MTR-90/2 24-track, (2) Stephens 821-B 24-track (portable), (2) Otari MTR-12 4- and 2-track, (2) Studer B-67.

Noise Reduction Systems: Dolby SR 24-channel.

Synchronization Systems: Lynx.

Outboard Equipment: (2) Lexicon digital reverb system, (10) dbx limiters, (4) UREI limiters, (6) dbx gates, (4) Drawmer gates.

Microphones: AKG, Neumann, Beyer, Milab, Shure, E-V, Countryman, Crown, Sennheiser.

Monitor Speakers: (2) Gauss 3588, (4) Rogers Drums LS35A, (2) Spondor SP1, (2) Yamaha NS-10.

Power Amplifiers: (4) Hafler 500, (4) Quad 405.

Video Recorders: Sony HBD80.

Video Monitors: (4) Panasonic color.

Cameras: (2) Panasonic color.

Other Major Equipment: Jensen 500' 52-channel transformer isolated input splitter system, complete stereo head-phone system for location tracking projects.

Rates: Variable-per project and system configuration.

Extras & Direction: Effanel is unique amongst remote recording companies in that we provide systems ranging from our new Manhattan-based 45' mobile control room to our completely portable multi-track system for worldwide coverage. Credits and clients include: Paul Simon's "Graceland Live-Zimbabwe '87," U2-"Under A Blood Red Sky" and "The Unforgettable Fire," Pat Metheny's Grammy-winning *Travels*, Bryan Ferry's *Boys And Girls*, Bob Dylan, Bruce Hornsby, Bon Jovi, Bryan Adams, Peter Gabriel, Paul Winter, Robert Fripp, MTV, Kaminsky and Co., DIR Broadcasting, ABC, NBC, Westwood One, HBO and Showtime. Digital multi-track and stereo systems available. 1986 *Mix* magazine TEC award nominee.

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Mixing Consoles: (2) 2005 AD 17 x 5 custom, 2005 AD 20 x 5 custom.

Audio Recorders: (2) Revox A-77 high speed, (2) Technics 288 cassette.

Noise Reduction Systems: dbx 154.

Outboard Equipment: Yamaha REV7, (2) DeltaLab ADM 1024, ADR 769 Vocal Stressor, Orban 622B parametric EQ, dbx 900 rack (loaded), (2) White 4220 passive EQ, UREI 1176 modified peak limiter, Yamaha R1000, Lang PEQ-2, (2) MXR autolangers.

Microphones: (2) Schoeps CMT 54 consecutive serial #s, (2) Schoeps M221 B (tube), (5) AKG C-451, (3) Sennheiser 421, (2) Sennheiser MKH 805 shotgun, (2) Beyer 201, Beyer 743, Shure SM85, E-V RE20, AKG C12-A (tube).
Monitor Speakers: (2) Altec 604E, (2) KEF C-30, (2) ADS 300.

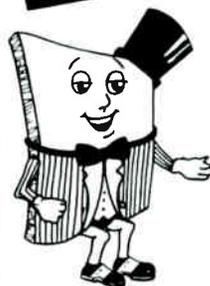
Power Amplifiers: McIntosh 2105, (2) McIntosh 240 (tube).
Other Major Equipment: 2005 AD distribution amp, 175' 27-pair snake w/Xformer splits, UREI 529 graphic EQ, UREI 545 parametric EQ, dbx 119 stereo compressor, dbx 120X subharmonic synthesizer.

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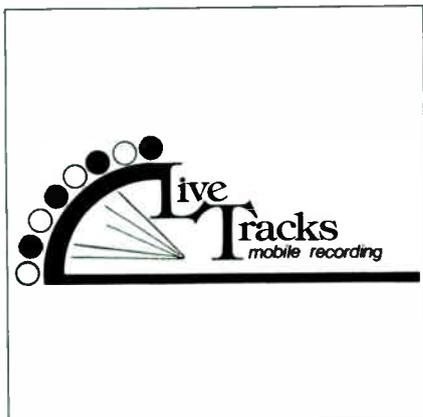
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Clarence, NY 14031
(716) 759-2600
Contact: Vincent S. Morette

MARTIN RECORDING STUDIOS
Sound Reinf., Lights, Audio & Video Recording
8710 Patton Rd.
Wyndmoor, PA 19118
(215) 233-1606
Contact: Niles Martin, Jr.

MARYLAND SOUND INDUSTRIES, INC.
Sound Reinf.
4900 Wetheredsville Rd.
Baltimore, MD 21207
(301) 448-1400
Contact: Ron Smith, Bob

MASQUE SOUND & RECORDING CORP.
Sound Reinf., Rental
331 W. 51 St.
New York, NY 10019
(212) 245-4623
Contact: Bob Bender, Tom Sorpe
SOUND REINFORCEMENT
Touring Radius: National
Maximum Venue Size: 10,000 people.
Vehicles: 45' semi.
House Loudspeakers: Meyer: MSL3s, UPA1s, USW, 650E; JBL Concert Series, AB Systems.
Flying System Available: Yes.
Monitor Loudspeakers: Meyer UM1s, P.A.S. 12" and 15" co-axial, Yamaha 2115.
House Consoles: Yamaha PM3000, Yamaha PM2000, Soundcraft 800B, Cadac custom 40-input.
Monitor Consoles: Yamaha PM3000, Yamaha PM2000, Soundcraft 800B, APSI 2200.
Outboard Equipment: AKG, Lexicon, Yamaha, dbx, Klerk-Teknik, UREI, JBL.
Power Amplifiers: Yamaha, Crown, UREI.
Microphones: AKG, Beyer, Shure, Neumann, Crown, Sennheiser.

REMOTE RECORDING
Monitor Speakers: Meyer, JBL, P.A.S.
Power Amplifiers: Yamaha, Crown, UREI.
Rates: On a bid basis.
Extras & Direction: Masque Sound has been providing outstanding service and pricing for 50 years. We offer design and consultation advice for Broadway shows, industrial shows and tours of all sizes. Masque has renowned expertise in R.F. problem solving. We have a full-time technical staff dedicated to providing the finest in technical advice and pre testing of all equipment. Recent work includes *Cats* NY, *Cats* LA, *Cats* SF, *Cats* National tour, *Les Miserables*, *Edwin Drood*, *Broadway Bound*, *Bilom Blues*, *Big River*,

REMOTE RECORDING and SOUND REINFORCEMENT



N O R T H E A S T

Little Shop of Horrors. NY Shakespeare Festival, Brooklyn Academy of Music, Next Wave Festival, Lincoln Center, Volkswagen 1986-1987. Oldsmobile show, BMW 1986-87, Bernadette Peters and many other venues.

MAX DECIBELS CO.
Sound Reinf., Audio & Video Recording
PO Box 1841
Rahway, NJ 07065
(201) 382-6877
Contact: John Kostick

MAX SOUND
Sound Reinf., Lights, Rental, Audio Recording
99 Maple Ave.
Rye, NY 10580
(914) 967-1148
Contact: Chris Greco

MCE RECORDING STUDIOS
Sound Reinf., Audio Recording
467 State St.
Schenectady, NY 12305
(518) 382-1762
Contact: Mark Ernst

MEGAPHONE
Audio Recording
45 Casco St.
Portland, ME 04101
(207) 772-1222
Contact: Patty Littlefield

MID SOUTH MUSIC & ELECT.
Sound Reinf., Lights
52 Bramhall St.
Georgetown, DE 19947
(302) 856-6031
Contact: Kevin H. Short

MIDDLE HOUSE SOUND INC.
Sound Reinf., Lights, Rental
63 Eleanor Rd.
Raynham, MA 02767
(617) 823-5127
Contact: Rick Washburn

JON MILLER PRODUCTION STUDIOS
Sound Reinf., Rental, Audio & Video
7249 Airport Rd.
Bath, PA 18014
(215) 837-7550

MIRROR SOUND STUDIOS
Audio Recording
1731 Cinnaminson Ave.
Cinnaminson, NJ 08077
(609) 829-9413
Contact: Ken Fordyce

MIXERS & FIXERS
Sound Reinf., Audio Recording
RD 2, Box 147
Germantown, NY 12526
(518) 537-4658
Contact: Judy Elliott-Brown

MOBILE RECORDERS LTD.
Audio & Video Recording
Berkshire Rd.
Southbury, CT 06488

(203) 264-2659
(203) 264-9923
Contact: G. Rothar

MORCILLA ON FIRE PRODUCTIONS W/VALDES INC.
Sound Reinf., Rental
439 W. 48th St., Penthouse
New York, NY
(212) 976-3737
Contact: Jorge Bendova Valdes

MUSKRAT PRODUCTIONS
Audio Recording
44 N. Central Ave.
Elmsford, NY 10523
(212) 409-1902
(914) 592-3144
Contact: Bruce McNichols

NATIONAL RECORDING STUDIO
Audio Recording
3016 Greenmount Ave.
Baltimore, MD 21218
(301) 467-7900
Contact: Eugene Mauro

NERAN PRODUCTIONS
Audio & Video Recording
55 Old Field Rd.
Huntington, NY 11743
(516) 673-7297
Contact: Ann Carpenter

NEW ENGLAND MOBILE RECORDING
Audio Recording
PO Box 409
Stow, MA 01775
(617) 562-2111
Contact: Alan Goodrich
Extras & Direction: New England Mobile Recording is a complete 24-track location recording studio. It is ideal for large concerts, albums, and radio broadcast work. The facility has an attractive and spacious interior that can accommodate an entire band as easily as a stationary studio would. Three isolation chambers provide recording possibilities unavailable from most mobile units. The Bus, a customized Eagle motor coach, is wired for 16 video and 52 exterior audio inputs, and 40 interior inputs. We presently use equipment by: MCI, Tascam, DOD, JBL/Augsburger monitors, Shure, AKG, Audio Technica, Sennheiser, Dolby Labs, Countryman Assoc., Sescorm, custom-made snake (200') and splitter (52 x 2), Crown, Phase Linear, Beyer, Roland, Auratone, E-V, Yamaha, Lexicon, Mesa-Boogie, and Neumann. Additional audio and video equipment can be brought in as required. Our friendly and knowledgeable staff would like to confer with you about your recording needs. Call for further information.

NEW ENGLAND SOUND
Sound Reinf., Lights, Rental, Audio & Video Recording
PO Box 75
Medfield, MA 02052
(617) 376-5619
Contact: Chris Johnson

NEW FITCHBURG MUSIC
Sound Reinf., Rental
171 Main St.
Fitchburg, MA 01420
(617) 342-8711
Contact: Dan, Dave

NEW LONDON COUNTY RECORDING ARTS
Sound Reinf., Audio Recording
229 Pequot Trail
Pawcatuck, CT 06379
(203) 599-5293
Contact: Ron Drago

NICKEL RECORDS
Sound Reinf.
168 Buckingham St.
Hartford, CT 06106
(203) 524-5656
Contact: Jack Stang

THE NINETEEN RECORDING STUDIO
Audio Recording
19 Water St.
South Glastonbury, CT 06073
(203) 633-8634
Contact: Robert Lancefield

NOISE UNLIMITED INC.
Sound Reinf., Rental
 104 S. Bridge St.
 Somerville, NJ 08876
 (201) 725-1700
 Contact: Mickey Allen, Audio Systems Group

NONCHALANT
Sound Reinf., Audio Recording
 PO Box 64
 Ardmore, PA 19003
 (215) 352-2755
 Contact: Bob McNamara, Frank Kurz

NORTHEASTERN DIGITAL RECORDING, INC.
Audio Recording
 12 Sadler Ave.
 Shrewsbury, MA 01545
 (617) 753-1192
 Contact: Toby Mountain
 Extras & Direction: We specialize in live to 2-track digital, using the Sony PCM-1610/30 system (PCM-F1 also available). We also have full digital editing and compact disc services available. Credits: Frank Zappa, Arlo Guthrie, Richie Havens, Rubber Rodeo, Kingston Trio, White Mountain Singers, Matt Glaser, Rykodisc, Rounder, Chrysalis, A&M, Folk Era.

NORTHERN RECORDING SERVICES
Rental, Audio Recording
 PO Box 404
 Fallston, MD 21047
 (301) 879-8054
 Contact: Stephen Palmieri

NOTCH PRODUCTIONS
Audio & Video Recording
 PO Box 282
 Center Valley, PA 18034
 (215) 965-4197

NOVA SOUND AND LIGHT PRODUCTIONS
Sound Reinf., Lights, Rental
 32 Miller Dr.
 Manheim, PA 17545
 (717) 665-4884
 Contact: Jeffrey S. Kline

OFF THE WALL SOUND
Sound Reinf., Lights, Staging, Audio Recording
 10 Howland Cir.
 West Caldwell, NJ 07006
 (201) 228-4099
 Contact: Dennis Wall

OMEGA ELECTRIC
Sound Reinf., Audio & Video Recording
 269 Progress St.
 Riverside, NJ 08075
 (609) 461-4813
 Contact: Scott J. Hasson

OMEGA RECORDING STUDIOS
Audio Recording
 5609 Fishers Ln.
 Rockville, MD 20852
 (301) 946-4686
 Contact: Betty Phelps

ONE HAND CLAPPING
Sound Reinf., Audio Recording
 58A Phelps Ave.
 New Brunswick, NJ 08901
 (201) 545-6533
 Contact: Terry Richards
SOUND REINFORCEMENT
 Touring Radius: Regional
 Maximum Venue Size: 1,000 seats/medium outdoors
 House Loudspeakers: (4) JBL 18" lows, (4) JBL 15" (low mids), (4) JBL 12" (high mids), (2) RCF N480 (highs), (2) RCF N481 (highs).
 Monitor Loudspeakers: (2) E-V wedges, Yamaha S2115 wedge, Yamaha S4115 verticle, extra wedges available 4/87.
 House Consoles: Yamaha MC2404 (24 x 4 x 2).
 Monitor Consoles: Yamaha MC2408 (24 x 8) available 4/87.
 Outboard Equipment: Yamaha REV7 digital reverb, Roland SDE1000 digital delay, (4) Yamaha GC2020 compressor/limiter channels, (4) Yamaha QC3102 1/3-octave equalizers, (2) UREI S21 crossovers, Furman power conditioner.
 Power Amplifiers: (8) Hefler DHS00, (2) Hefler DH220.
 Microphones: (12) Nakamichi CM300, (2) Sennheiser 421.

other microphones available on request.
 Other Equipment: (6) direct boxes.
 Rates: On request.
REMOTE RECORDING
 Audio Recorders: Nakamichi 2X-9 stereo.
 Noise Reduction Systems: Dolby B/C.
 Outboard Equipment: See P.A. section.
 Rates: Live stereo recording of your show for a small extra charge.

ONE-SHOT PRODUCTIONS
Audio Recording
 1863 Delabole Rd.
 Pen Argyl, PA 18072
 (215) 863-7706
 Contact: Dusty McCollum

OPEN EAR RECORDERS
Sound Reinf., Rental, Audio Recording
 373 Trapelo Rd.
 Belmont, MA 02178
 (617) 484-6938
 Contact: Paul F. Terrasi

OPUS I SOUND COMPANY
Sound Reinf., Lights, Rental
 56 Dutchess Ave.
 Poughkeepsie, NY 12601
 (914) 452-5726
 Contact: Kevin Farrell

PA DA RECORDING
Audio Recording
 27 Washington Sq. N., Room 4D
 New York, NY 10011
 (212) 228-1808
 Contact: Eddy Davis

PARAGON MUSIC COMPANY
Sound Reinf., Rental
 6 Alexander Dr.
 Wenonah, NJ 08090
 (609) 468-2454
 Contact: Victor Gehring

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 Digital transfers to PCM-1610/30 from other digital formats: PCM-F1, 701, or 501, DASH 1/4" (Sony PCM-3202), others.
 Digital Editing and Compact Disc tape mastering with the Sony DAE-1100 Digital Editor.
 Complete Compact Disc Services.
 Rentals.
- **Credits:** Frank Zappa, Arlo Guthrie, Rubber Rodeo, Ritchie Havens, Swimming Pool Q's, Matt Glaser, Lucio Dalla
 Soundtrack to Diva, A & M, Polygram, Rounder, Rykodisc, Musical Heritage Society, Centaur, Second Hearing, Titanic, Bose, CompuSonics, Polaroid, Wang
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N O R T H E A S T

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Sound Reinf.
14 First St.
Pelham, NY 10803
(914) 738-4800
Contact: David Moore

PAYNE CONCERT SOUND CO. INC.
Sound Reinf., Lights, Staging, Rental
138 N. Union St.
Burlington, VT 05401
(802) 863-3861
Contact: Stephen R. Payne

PEABODY RECORDING STUDIOS
Audio Recording
1 E. Mt. Vernon Pl.
Baltimore, MD 21202
(301) 659-8136
Contact: Alan P. Kelauer

PENNSYLVANIA PUBLIC ADDRESS
Sound Reinf., Rental
234 E. Main St.
Myerstown, PA 17067
(717) 866-4983
Contact: Glenn Adams, Larry Perini

PERSIA SOUND STUDIOS
Audio Recording
378 Bement Ave.
Staten Island, NY 10310
(718) 816-6384
Contact: Chris Vollar

PFISTERER SOUND ENGINEERING
Sound Reinf.
855 Mansion Dr.
Huntingdon Valley, PA 19006
(215) 947-5149
Contact: George Pfisterer

PHASE AUDIO INC.
Sound Reinf., Lights, Staging, Rental, Audio Recording
593 S. Cooper
Memphis, TN 38104
(901) 726-1900
Contact: Murphy Odom

PMA ENG.
Sound Reinf., Lights, Staging, Rental
2600 Commercial Dr.
North Providence, RI 02904
(401) 353-6221
Contact: Kevin Delaney
SOUND REINFORCEMENT
Touring Radius: National
Maximum Venue Size: 15,000 and up (specialize outdoor)
Vehicles: 22', 18', (2) 14', (3) vans and rental.
House Loudspeakers: PMH custom 15" w/bin, CLPS-BBH 2/18" etc. Mid: C.L. & S. MB60, PMA custom 2' 12", Emilar EC-600; Renkus-Heinz and Gauss drivers, RH CD chorus, Gauss horns.
Monitor Loudspeakers: PMA custom bi-amp wedge 15", 1", PMA custom side fill, Gauss 3588 coaxial w/4583, CLPS NC 12.
House Consoles: Audioarts / Wheatrone MX-8 32 x 8, (2) Audioarts 2000, (2) Allen & Heath SRM 248.
Outboard Equipment: Audioarts and Biamp 1/3-octave EQs, dbx and Audioarts comp/limiters, Audioarts and Toa X-overs, Yamaha REV7; Lexicon: PCM60, PCM41, PCM42, DeltaLab Super Time Line, Effectron etc., Klark-Teknik DN716B sparsyst delay, dbx and Omni Craft gates/limiters.
Power Amplifiers: AB Systems: Models 1100, 900, 600,

9220, 6220, and 1210; Crown MT 1000, BGW 750 and 250 etc.
Microphones: AKG: D-12, 451; Shure: SM58, SM57, SM53, etc; Sennheiser: MD 421, MD431, MD441; Audio-Technica: ATM63, ATM41 etc; Crown: PCC160, PZM; Samson wireless hand-held and laviers, Sony laviers.
Staging: Full production contractor.
Lighting: Oshiter fillers, Oshiter fillers, PAR 64 and ACL pre-wired mounted, Leprecon, Celco, JTS electronics.
Other Equipment: Clear Com, power distribution, generators, video equipment, remote broadcast equipment
Rates: P.O.R.

POMEROY (DIGITAL) AUDIO
Audio Recording
193 Baltic St.
Brooklyn, NY 11201
(718) 852-8505
Contact: Doug Pomeroy

POWER PLAY RECORDS, INC.
Sound Reinf., Lights, Audio & Video Recording
198 Bloomfield Ave.
Newark, NJ 07104
(201) 481-0972
Contact: Greg Furgason

PRAGMATECH SOUND CORP.
Sound Reinf., Lights
4516 Byron Ave.
Bronx, NY 10466
(212) 325-8888
Contact: Jim Salta

PRODIGAL, INC.
Rental, Audio Recording
3400 Pendleton Dr.
Wheaton, MD 20902
(202) 635-5588
Contact: Bill Burns, Alan Wonneberger

PRODUCTION MASTERS, INC.
Sound Reinf., Lights, Staging, Audio & Video Recording
321 First Ave.
Pittsburgh, PA 15222
(412) 281-8500
Contact: Susan H. Hartford, David Case

PROFESSIONAL MUSIC AUDIO ENGINEERING
Sound Reinf., Lights, Staging, Rental
2600 Commercial Dr.
N. Providence, RI 02904
(401) 353-6221

PROFESSIONAL SOUND & RECORDING
Sound Reinf., Lights, Audio Recording
3 Garfield Rd.
Monroe, NY 10950
(914) 783-4310
Contact: Herman Gluck

PROMIX INC.
Sound Reinf., Rental, Audio Recording
111 Cedar St.
New Rochelle, NY 10801
(914) 633-3233

PUSH PRODUCTIONS
Sound Reinf., Lights, Staging, Rental
90-40 184th Pl.
Hollis, NY 11423
(718) 454-1805
Contact: Eddy

QUICK SILVER SOUND
Sound Reinf., Lights
5 Squirrelwood Ct.
New City, NY 10956
(914) 634-0618
Contact: Joey Gottlieb

R&R CHRISTIAN SOUND RECORDING STUDIO
Audio Recording
8 Center St.
Fairhance, PA 15436
(412) 564-2581
(412) 564-2769
Contact: Randy Rhodes



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Audio Recording
420 East Ave.
Northvale, NJ 07647
(201) 767-6166
Contact: Joe Costantino

RAPID TRANSIT PRODUCTIONS
Audio & Video Recording
25-40 31 Ave.
Astoria, NY 11106
(718) 721-6077
Contact: Matt Melnick

RARE EARTH AUDIO
Sound Reinf., Audio Recording
603 Galahad Rd.
Plymouth Meeting, PA 19462
(215) 825-2298
Contact: Jeremy Birnbaum

RATMAN PRODUCTIONS
Video Recording
25-40 31 Ave., Apt 5B
Long Island City, NY 11106
(718) 721-6077
Contact: Matt the Rat

RAVEN SOUND
Sound Reinf., Lights, Staging, Rental, Audio Recording
2617 Peach St.
Erie, PA 16508
(814) 456-0331
Contact: Phil Papatnik

RCI SOUND SYSTEMS
Sound Reinf., Rental, Audio Recording
8550 Second Ave.
Silver Spring, MD 20910
(301) 587-1800
Contact: Carl Trost

REMOTE RECORDING



RECORD PLANT

RECORD PLANT STUDIOS
New York, NY

RECORD PLANT STUDIOS
Audio Recording
321 W. 44th St.
New York, NY 10036
(212) 581-6505
Contact: Kooster McAllister
Touring Radius: National
REMOTE RECORDING
Vehicles: Chevrolet C60.
Control Room Dimensions: 8 x 15.
Mixing Consoles: Trident Series 80 custom 48-input 32 buss, API 16-input 8 buss.
Audio Recorders: (2) Ampex MM 1200 24-track, (2) Ampex ATR 102 2-track, (2) Ampex ATR 104 4-track, Sony 701 2-track digital, Sony 3324 24-track digital available.
Noise Reduction Systems: Dolby M-16, Dolby 361 2- and 24-track.
Synchronization Systems: BTX Shadow, Lynx Time Line.
Outboard Equipment: (4) BTX 160 limiters, (2) BTX 160X limiters, (2) UREI 1176 limiters, Yamaha REV7, Lexicon PCM60, (11) API custom distribution amplifiers, (2) Kenwood cassette decks. Extensive selection of outboard is available from our studio.
Microphones: Shure, Neumann, AKG, Sony, Sennheiser, E-V, Beyer.
Monitor Speakers: (2) UREI 813, (2) B&W EM-100, (2) Ya-

maha NS-10, (2) ROR.
Power Amplifiers: Bryston 4B, Crown DC-300A.
Video Monitors: NEC 20" color monitor, Sony 20" B&W monitor.
Video Effects Devices: Video Humbuck coil, Video Patchbay.
Cameras: Sony AVC-1400, Panasonic color camera.
Other Major Equipment: Input box 54-input 3-way splitter w/Jensen JE-MB-D transformers, (3) 12-channel line level auxilla box w/three video lines, main snake 500' Belden 54 mic, 12 line level, 3 video, wide assortment of mic stands, 6- and 12-channel subsnakes, Chaos Audio intercom system.
Rates: Available upon request.
Extras & Direction: In the past, this truck has provided audio for: *Live Aid*, *Farm Aid*, Stevie Wonder, Billy Joel, Alabama June Jam, MTV *Live at the Ritz* and Bob Dylan, to name a few. From video and film, to live satellite broadcasts, all can be handled with ease. With four independent auxiliary snake systems and a comprehensive video and code/sync patchbay, combined with our custom API line distribution network, signal quality is kept at the highest possible standards throughout.

RECORDINGS
Audio Recording
336 Belmont St.
Watertown, MA 02172
(617) 926-0546
Contact: Sam Negri, Dean Cappello

REDLINE AUDIO
Sound Reinf., Lights, Staging, Rental, Audio Recording
664 Manor Rd.
Staten Island, NY 10314
(718) 761-2440
Contact: Stephen Anagnostis

REEL PRODUCTIONS
Audio Recording
PO Box 427
Allston, MA 02134
(617) 576-2872
Contact: Ted, Kathy

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Flushing, NY 11352
(718) 886-6500
Contact: Steven Remote



REMOTE RECORDING SERVICES, INC.
Monsey, NY

REMOTE RECORDING SERVICES, INC.

Audio Recording
20 Kennedy Pkwy.
Monsey, NY 10952
(914) 425-8569

Contact: David & Dusty Hewitt, Phil Gitomer

REMOTE RECORDING

Vehicles: 36' custom Peterbilt tractor van, tandem axle air-ride w/on-board generator.

Control Room Dimensions: 8 x 9 x 24.

Mixing Consoles: API 44 x 32 mixing console 96 mic, Studer 962 14 x 4 mixing console available, Studer 961 10 x 2 mixing console available, (3) Yamaha PM160 6 x 2 rack mount mixers.

Audio Recorders: (2) Ampex MM 1200 24-track, (2) Sony 3324 24-track digital (available), (2) Studer A-810 2-track w/time code, Sony PCM-1610 digital w/BVU-820 available, Sony PCM-701 digital w/Beta SLHF-900.

Synchronization Systems: Lynx TimeLine modules available for each recorder.

Outboard Equipment: (4) UREI LA-3A limiters, (4) UREI 1176 limiters, (8) dbx 903 compressors, (4) Valley People Dyna-Mite gates, (2) Dynaflex noise filters, Yamaha REV7 reverb, Lexicon PCM60 reverb, Ursa Major 8 x 32 reverb.

Microphones: AKG: D-12, 414EB, 451 Systems (CK-1, CK-5, CK-8, CK-9, VR-1, ASI); Beyers: 88, 160, 500; Countryman Type 85 DIs; E-V: RE15, RE16, RE20; Neumann U86; Sennheiser: 421, 441, 431; Shure: SM17, SM53, SM54, SM57, SM58, SM59, SM77, SM81, SM85; Sony: 535, 536, C-48, ECM-50; Wahrenbrock P2Ms, plate and LAV.

Monitor Speakers: (2) Westlake w/TAD drivers, (2) CSI MDM-4s, (2) Yamaha NS-10, (2) Auratone.

Power Amplifiers: (2) Bryston 4Bs on Westlakes, Bryston 4B or Crown D-150 on small speakers.

Video Recorders: (2) Sony HF-900 Beta VCRs, (2) Sony BVU-800 3/4" VCRs.

Video Monitors: (2) Sony 19" monitors, (3) Sony 5" monitors available.

Cameras: (2) CCTV cameras for stage use.

Other Major Equipment: Extensive cable and splitters available for the really big remotes.

Rates: Call for quote.

RESOLUTION

Sound Reinf., Lights, Audio & Video Recording
1 Mill St.
Burlington, VT 05401
(802) 862-8881
Contact: Linda Citro

RIEDEL AUDIO SERVICES

Sound Reinf., Audio Recording
109 Commack Rd.
Islip, NY 11751
(516) 277-9418
Contact: Rich Riedel

REMOTE RECORDING and SOUND REINFORCEMENT**N O R T H E A S T****ROADWAY RECORDERS INC.**

Audio & Video Recording
104 N. Ashby Ave.
Livingston, NJ
(201) 994-9695
Contact: Richard Dior

ROAR PRODUCTIONS INC.

Audio Recording
6655-H Dobbin Rd.
Columbia, MD 21045
(301) 596-2600
Contact: Steven Rosch

ROCK SYSTEMS AUDIO

Sound Reinf.
29 Werman Ct.
Plainview, NY 11803
(516) 454-8008
Contact: Leon Esker, Joseph Light

ROCKIN ROBIN SOUND & LIGHTING

Sound Reinf., Lights, Staging, Rental
3239 Overlook Dr.
Liberty, PA 15133
(412) 673-4678
Contact: Chuck Gilchrist

BILL RODITSKI MUSIC SERVICES

Audio Recording
404 Park Ave.
Clarks Green, PA 18411
(717) 586-2605
Contact: Bill Roditski

RTM AUDIO

Sound Reinf., Lights, Staging, Rental
710 North Ave.

Garwood, NJ 07027
(201) 789-9352

Contact: Tom Mathews

SOUND REINFORCEMENT

Touring Radius: Regional

Maximum Venue Size: 6,000 seats.

Vehicles: 14' Chevy van, 22' GMC truck.

House Loudspeakers: (12) 2 x 15" bass bins in RTM custom enclosures w/JBL speakers, (12) 2 x 12" mids in RTM custom enclosures w/JBL speakers, (12) 2 x 2" HF packs w/JBL tweeters in RTM custom enclosures.

Flying System Available: Yes.

Monitor Loudspeakers: (12) RTM custom wedge monitors w/JBL loudspeakers, (5) RTM custom sidefill/drumfill enclosures w/JBL loudspeakers.

House Consoles: Soundcraft Series 400B 32-channel, Audiodarts Series 4000 32-channel, Yamaha PM1000 24-channel.

Monitor Consoles: Yamaha MC2408 monitor console, Yamaha PM1000 16 x 6 w/monitor modification, MOMS 2005AD 20 x 4.

Outboard Equipment: (6) dbx 160X comp/limiters, (12) Klark-Teknik DN300 and DN27A 1/3-octave EQs, (8) Ashly SC22 and SC80 crossovers, (2) Lexicon PCM42 DDL, (8) Valley People Kepex II noise gates, DeltaLab ADM 512, Eventide 910 Harmonizer, (2) UREI S25 electronic crossovers, Lexicon PCM60, Yamaha REV7, Yamaha SPX90.

Power Amplifiers: (18) Crown PSA-2, (10) BGW 750B, (8) Crown DC300A, (6) Crown D150A.

Microphones: (12) Shure SM58, (12) Shure SM57, (8) Sennheiser 421, (4) Sennheiser 441, (4) AKG D-12E, (2) E-V RE20, (2) Beyers M88, (2) Beyers 201, (2) AKG C460, (4) Shure SM81.

Staging: 48 x 36 RTM custom stage w/aluminum scaffold supports, adjustable in height from 3'10" to 6'3/4", plywood reinforced deck.

Lighting: (100) 1 K PARS w/40' aluminum truss, (4) Gene air towers, (2) Gene super lifts, (4) follow spots.

Other Equipment: TAMA drum set, Yamaha CP80 piano, misc. guitar and bass amplifiers.
Rates: Please call for rates.

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Port Jefferson Station, NY 11776
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New York, NY 10016
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Contact: John Sadler

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SHEFFIELD AUDIO/VIDEO PRODUCTIONS

Audio Recording
13816 Sunnybrook Rd.
Phoenix, MD 21131
(301) 628-7260
Contact: Richard Van Horn
Touring Radius: National
REMOTE RECORDING
Vehicles: 30' custom-built diesel Mack truck with heated and air conditioned control room.
Control Room Dimensions: Spacious oak and carpeted control room.
Mixing Consoles: Neve 8068, Amek
Audio Recorders: (2) Sony 3324 digital multi-track recorders, (2) Otari MTR-90 multi-track analog recorders, Studer Revox PR99.

Noise Reduction Systems: Dolby A 24 channels.
Synchronization Systems: BTX Cypher Time Code generator/reader/insertor.

Outboard Equipment: (2) UREI 1176, UREI LA3A, Ashly stereo gates, (2) dbx 160X, dbx 162, Parametric equalizer, Lexicon 200, Lexicon Prime Time II, Yamaha SPX90s, 350' of 52 pair audio cable w/48 channels of Jensen, transformer isolated mic split.



SHEFFIELD AUDIO/VIDEO PRODUCTIONS
Phoenix, MD

Microphones: Shure, Sony, Beyer, AKG, Crown PZM, Sennheiser, Neumann.
Monitor Speakers: UREI 811B, Yamaha NS-10.
Extras & Direction: Multi-track digital recording, audio for video. Credits: PBS New Year's Eve jazz special, Mr. Mister MTV special, National Symphony, Ella Fitzgerald and Oscar Peterson and others. Services: In-house packages with SSL 4000E and video post-production.

SHOESTRING AUDIO
Sound Reinf., Audio Recording
Belchertown, MA 01007
(413) 323-4930
Contact: Rusty

SHOWTIME SOUND SERVICES
Sound Reinf., Lights
PO Box C-372
Westport, MA 02790
(617) 636-6040

Contact: Lloyd Jacobsen
SOUND REINFORCEMENT
Touring Radius: Regional
Maximum Venue Size: 15,000 seats.
House Loudspeakers: Modular 2-box system, 4-way active.
Monitor Loudspeakers: JBL 15", Renkus-Heinz 2" floor wedges, EVM 12", EAW 1" floor wedges.
House Consoles: Matrix custom console 24 x 8 x 6, Allen & Heath, Tangent, Kelsey.
Monitor Consoles: Allen & Heath, Kelsey.
Outboard Equipment: Compressors: dbx, Loft; noise gates: Loft; EQs: Yamaha, Ashly; reverb: Ursal Major, Yamaha, ART; DDLs: DeltaLab, ADA, Korg; crossovers: Loft, Crown.
Power Amplifiers: Crown, QSC.
Microphones: AKG, A.T., Beyer, Shure, E-V, Sennheiser.
Staging: 48 Kw 24-channel.

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Valley Stream, NY 11581
(516) 791-2985
Contact: Bob Shuster

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Contact: Brian Mitchell

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Contact: Tom Heinisch

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Contact: Mike Skinner, Dave Costa

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(301) 465-0856
Contact: Gary Zeichner

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RD #2

Pottstown, PA 19464
(215) 469-6082
Contact: Bill Fitch Jr.
SOUND REINFORCEMENT
Touring Radius: National
Maximum Venue Size: 30,000.
Vehicles: Three 45' semi tractor-trailers.
House Loudspeakers: (32) Turbosound TMS-3, (8) Turbosound TMS-4, (8) CLS Levi, (20) CLS RH90s.
Flying System Available: Yes.
Monitor Loudspeakers: (14) Turbosound TMW-215, (6) CLS PBL5, (6) CLS NC-12.
House Consoles: (3) Yamaha PM1000, Soundcraft 800-40.
Monitor Consoles: Soundcraft 400B-24, Studiomaster 24-channel.
Power Amplifiers: (16) OSC 3500-3800, (10) BGW 750, (4) Yamaha 2100.
Microphones: (8) SM85, (3) SM98, (3) SM91, (4) SM81, (60) SM58, (40) SM57, (4) SM87, Sennheiser: (8) 441, (8) 421, (40) E-V and Beyer.
Other Equipment: (2) CD players, (2) headset systems, (2) TEAC cassette machines.

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(718) 837-6237
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Contact: William Barton



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(301) 242-3192
Contact: Frank Kiss

SOUND REINFORCEMENT
Touring Radius: Regional
Maximum Venue Size: 6,000.
Vehicles: 24' Box trucks.
House Loudspeakers: (24) custom Soundcrafters JBL-loaded, Turbosound in the works.
Flying System Available: Yes.
Monitor Loudspeakers: Custom Soundcrafters JBL-loaded.
House Consoles: Yamaha custom.
Monitor Consoles: Yamaha custom.
Outboard Equipment: (4) Lexicon 41-42 DDLs delay, Lexicon PCM70 reverb, (2) ART 01 A reverb, (10) dbx 166 gated comp, dbx 160X comp, Brooke-Siren 360 X-over, (12) Klark-Teknik 1/3-octave EQs, Goldline 30 1/3-octave analyzer R.T.A., Brooke-Siren DPR402 comp/lim.
Power Amplifiers: Crown PSA-2.
Microphones: Shure 57, 58, and 78, Sennheiser 421, 431, and 441, E-V RE20, Audio-Technica AT1 and ATM, AKG D-12 and 461.
Staging: Call for info.
Lighting: Call for info.
Other Equipment: Multi-pin power disto. systems, multi-pin racks, patchbays.
Rates: Call for info.
Extras & Direction: Electronic repairs, custom guitar work. Specializing in touring club bands.

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 (215) 868-6063
 Contact: Keith Stacy

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 (212) 595-4065
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 Contact: John Stadelmann

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 Contact: Price Stevenson
SOUND REINFORCEMENT
Touring Radius: Regional
Maximum Venue Size: 12,000 seats.
Vehicles: Step van; 18' Box 2/LG, 40' trailer.
House Loudspeakers: (20) Woodworx/Roadworx full range, (8) Woodworx/Roadworx subs, (8) Community Light & Sound MB60s, (16) Community Light & Sound RH60s, (4) JBL 4550s, all JBL and TAD loaded.
Monitor Loudspeakers: (8) Woodworx/Roadworx, (4) Community Light & Sound, (4) E-V, (8) custom.
House Consoles: TAC 32, Soundcraft 15, (2) Sunn, (2) Yamaha.
Monitor Consoles: Yamaha 2408, Troupier 20 x 4.
Outboard Equipment: Roland 101, Roland 1000, (2) Roland 2000, Lexicon PC60, Yamaha SPX90, (2) Ibanez 2000.
Power Amplifiers: (12) Crest 4000s - 400s, (4) Crown Microtech 300s, (2) JBL 6290, (4) BGW 750, (4) Peavey 800.
Microphones: (8) Sennheiser 421s, (30) Shure 58 and 57s, (12) E-V RE11s, (20) assorted types.
Other Equipment: Hammond B-3, Marshall, Ampeg, wide variety of P.A. equipment available.
Rates: Single piece to full system, call for info.
Extras & Direction: Chubby Checker, Bobby Rydell, Dovells, Marvellettes, Joey Dee, Charlie Gracie, Carmen

Dee Orcha, Dead End Kids, Money, Puzzle, Numbers, Little Buddy, Chill Factor, Secrets, Stand, Turnstyles, John Eddie, Portrait, Thin Ice, Sovereign, Uptown Swing Band, Pin Ups, Ken Kuierter, Psychopath, Crank, Steel, Desoto, Redtones, Sleeper, White Fox, Ambush, Position, China Club, Copcabama, NY Marriott Marque, Heebeegeebees, Max's Kansas City, Vets Stadium pre-game show, The Stage, Koloa Church, Kauai, Hawaii, Kenny Marks & The Remarkables, Dave Meese, Pulsations (M.S.O.E., R.I.A., Syn-Aud-Con, A.E.S., D.V.A.S.A.) Phila. Civic Center, Trumps Castle, NJ.

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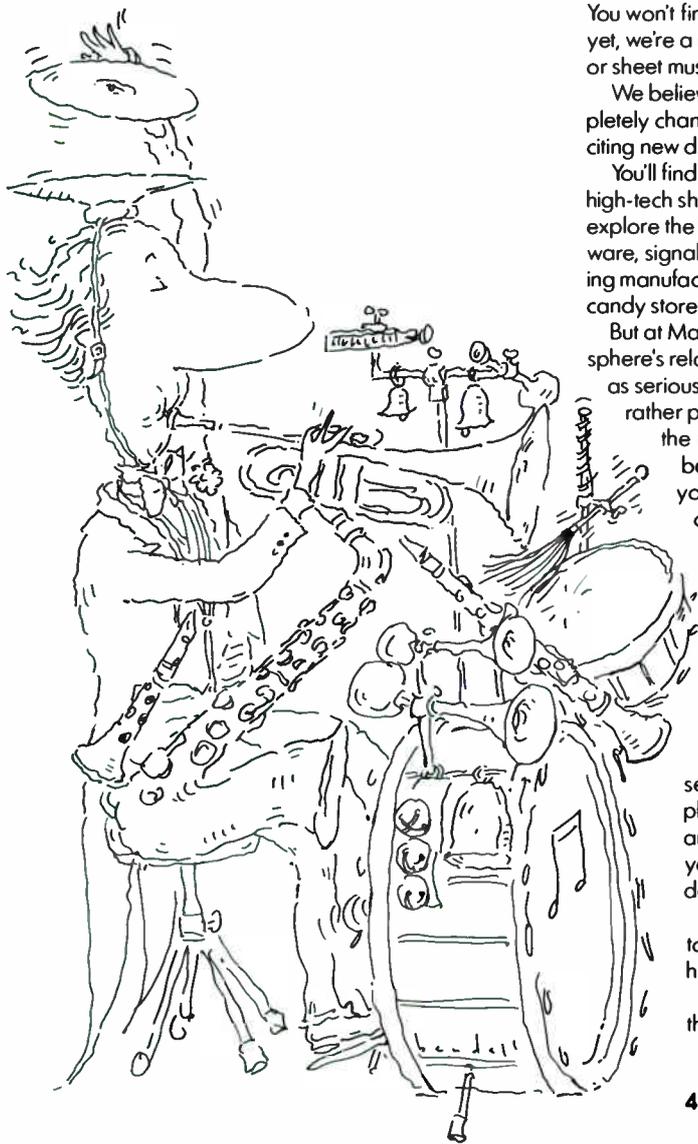
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 (413) 967-3402
 Contact: Rene Peterson
REMOTE RECORDING
Vehicles: Ford Econoline E-150.
Mixing Consoles: Soundtracs "T-Series" 16 x 8 x 2.
Audio Recorders: Otari MX5050 8SD 8-track, Otari MX5050 2HD 2-track, Nakamichi BX-100 cassette.
Noise Reduction Systems: (8) dbx 150X Type I 8-channel.
Outboard Equipment: Symetrix 525 comp./limiters/gates, Yamaha SPX90 digital effects processors, Ashly GQ-215 dual 15 EQ, 16-channel transformer isolated mic splits, 16 x 4 x 150 multicore.
Microphones: E-V "N/D" Series, Shure, Beyer, Audio-Technica.
Monitor Speakers: JBL, Auratone 5Cs.
Power Amplifiers: AB Systems 600.
Other Major Equipment: All above equipment is modular and portable, offering the convenience of recording directly from mobile unit or within the concert or event. 16-track and video available on request.
Rates: 8-track \$25/hr. (plus tape). Contract/event rates available, please call.

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Control Room Dimensions: 6 x 9.
Mixing Consoles: Audiotronics 110-8 12 x 8.
Audio Recorders: Otan 5050 8SD 8-track, Otan 5050 2-track, Ampex 440B 2-track, Nakamichi DMP-100 processor w/Sony SL-2000 VCR, Pioneer 707 1/4-track.
Noise Reduction Systems: dbx Type I on all channels.
Outboard Equipment: (3) dbx 903 compressors, (2) dbx 905 parametric EQ, Yamaha REV7, Ecoplate III, Klark-Teknik DN-3030 graphic EQ, Aphex Type B Exciter.
Microphones: (2) Neumann U87, (2) AKG 414EB, (4) AKG 451E, (2) AKG 224E, (5) Shure SM57, (2) Shure SM53, Beyer M-500, (2) Countryman Type 85 direct boxes.
Monitor Speakers: JBL 431L.
Power Amplifiers: Crown D-150, SAE 2200, SAE 3100.
Other Major Equipment: (10) Nakamichi BX-300 cassette decks.
Rates: Recording \$35-\$50/hr.; mixing \$25/hr.

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Contact: Richard P. Robinson

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Contact: Dennis Villiers, Patrick Schneider

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Buffalo, NY 14204
(716) 853-6500

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New York, NY 10108
(212) 247-5678
Contact: John Cacciatore
REMOTE RECORDING
Vehicles: Dodge Caravan or larger as needed.
Mixing Consoles: Soundcraft 200 16 x 4 x 2.
Audio Recorders: Sony PCM-501ES digital audio processor, Sony SLHF 1000 Super Beta Hi-Fi deck, Sony SLHF 900 Super Beta Hi-Fi deck, VHS back-up deck, Audio & Design Propak 2 CTC unit.
Microphones: AKG 414EB, Neumann KM84, Sanken CU-41, RCA 77-DX, Beyer M-88, Sennheiser 421, Sennheiser 431, Shure, Countryman Type 85 direct boxes.
Monitor Speakers: UREI 809, Visonik David 9000, Auratone.
Power Amplifiers: Bryston 3B.
Extras & Direction: United Cine & Sound specializes in direct to 2-track digital recording on location. All wiring is high quality Gotham Audio cable to reduce high frequency loss over long runs, and all connectors are Neutrik gold-plated XLRs. Many concert halls, barns, lobbies are available through us for recording sessions. Equipment is quiet and very portable. UC&S can travel anywhere for sessions. Multi-track digital available on request. Rates vary with size of orchestra, etc. Also capable of live mixes for video or film shoots.

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East Windsor, NJ 08520
(609) 448-5889
Contact: Hans Schneider

WIZZ SOUND
Audio & Video Recording
237 Prospect St.
Ludlow, MA 01056
(413) 583-4272
Contact: Wizz

WMRG STUDIOS INC.
Sound Reinf., Rental, Audio Recording
PO Box 73
Cheltenham, PA 19012
(215) 635-4815
Contact: Bill Gellhaus

ZALMO SOUNDS
Sound Reinf., Audio Recording
Ditmas Ave. & E. 8th St.
Brooklyn, NY 11218
(718) 633-4166
Contact: Sherman, Zalman

ZAX TRAX
Sound Reinf., Lights, Audio Recording
20 Franklin St.
Frederick, MD 21701
(301) 663-0241
Contact: Zak Mabie

SOUTHEAST

ABBEY MUSIC, INC.
Sound Reinf., Lights, Rental
109 S. Witchduck Rd.
Virginia Beach, VA 23462
(804) 497-7187
Contact: Eric D. Burgess

ADL CONCERT PRODUCTION SERVICE
Sound Reinf., Lights, Staging, Rental
3131 Campbellton Rd.
Atlanta, GA 30311
(404) 349-5682
Contact: Roy Drukenmiller

ADVANCED AUDIO OF ALABAMA
Sound Reinf.
3055 Leeman Ferry
Huntsville, AL 35805
(205) 881-1065
Contact: Scott Carpenter

ADVENT PRODUCTIONS
Sound Reinf., Audio Recording
2518 Southview Dr.
Lexington, KY 40503
(606) 278-5852
Contact: Don C. Morgan

AIRSHOW, INC.
Audio Recording
5727 N. 25th Rd.
Arlington, VA 22207
(703) 237-8312
Contact: David Glasser
Extras & Direction: Airshow specializes in location recording, engineering coordination, and technical direction for remote recording and broadcast. Recent projects have included: *Tribute to Theonious Monk* (featuring Dizzy Gillespie, Wynton Marsalis, Gerry Mulligan, and others—PBS special—digital recording and mixdown); National Folk Festival (Liberty Weekend NYC); Hands Across America; American Jazz Radio Festival (live New Year's Eve broadcast for national public radio); The Franz Liszt Centenary Celebration (Kennedy Center, Washington, DC); and The Bob and Ray Show. Airshow has extensive experience recording classical and jazz music, including: The Count Basie Orchestra, Christopher Parkening, Charlie Byrd, Shirley Horn, Jean-Pierre Rampal, the Canadian Brass Ensemble, and the Modern Jazz Quartet. We can supply a high quality portable recording system featuring Calrec/AMS console, Audio & Designs Pro-701, Ampex ATR-100, and KEF monitors, all packaged for efficient on-site set-up. Please give us a call to discuss your next remote recording or broadcast project.

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Sound Reinf., Lights, Rental
6161 Memorial, Apt. 401
Tampa, FL 33615
(813) 888-6172
Contact: Bryan Haggerty

ALPHA SOUND & LIGHT
Sound Reinf., Lights, Staging, Rental, Audio Recording
1824 Freedom Dr.
Charlotte, NC 28208
(704) 372-1264
(704) 865-8160
Contact: Al D. Forbes

SOUND REINFORCEMENT
Touring Radius: Local, regional, national
Maximum Venue Size: 15,000
Vehicles: (3) 22' bobtails (owned), 40' trailer (leased).
House Loudspeakers: Custom 4-way stacks.
Flying System Available: Yes.
Monitor Loudspeakers: (16) custom-built 15" speaker and horn, (6) custom-built 12" and tweeter.
House Consoles: Midas PR-004 32 x 8, Audioarts 8000 32 x 8, Tycobrahe 24 x 8.
Monitor Consoles: (2) Audioarts 24 x 8.
Outboard Equipment: (4) UREI LA-3A, (4) UREI LA-4A, (2) dbx 165, (2) dbx 163, (4) Loft Quad gate/limiters, (4) Klark-Teknik DN-300 EQs, (4) UREI 530 EQs, (2) Lexicon PCM60, Lexicon Super Prime Time, Lexicon PCM41.
Power Amplifiers: 20 kW Peavey, Crest.
Microphones: All popular models in stock.

REMOTE RECORDING and SOUND REINFORCEMENT



S O U T H E A S T

Staging: Available, call (stage top).
Lighting: Available: trusses, trees, spotlights.
Other Equipment: Everything else available. Please note: three complete systems available, all in stereo.
Rates: Call.

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Contact: Fran Fiman

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(305) 781-9901
Contact: Peter Archer

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(404) 873-6495
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6902 Mountain View Rd.
Greensboro, NC
(919) 668-1392
Contact: Jim Reece

AUDIOIMAGE RECORDING
Sound Reinf., Rental, Audio Recording
110 N. Jefferson St.
Richmond, VA 23220
(804) 644-7700
Contact: John Valentine

AURORA SOUND
Sound Reinf., Lights, Rental
300 E. Second St.
Lafayette, LA 70501
(318) 232-1135
Contact: Bill Peyton Jr.

A. V. CONCEPTS, INC.
Sound Reinf.
1359 S. Third St.

Louisville, KY 40208
(502) 635-2663
Contact: Jim Hillenbrand

AVID REMOTE RECORDING
Audio Recording
39 Spring Hill Park
Chapel Hill, NC 27514
(919) 929-0551
Contact: Jeff Anderson

BACKSTAGE INC.
Sound Reinf., Lights, Staging, Rental
3100 W. Broad St.
Richmond, VA 23220
(804) 644-1433
Contact: Cameron Grainger

BAKER AUDIO INC.
Sound Reinf.
2195 Norcross Tucker Rd.
Norcross, GA 30071
(404) 441-2000
Contact: Al Keeler

BARNETT GERSTEIN ASSOC.
Audio Recording
4420 Dunwoody Pl.
Orlando, FL 32808
(305) 290-5747
Contact: Bruce Gerstein

BEAVERWOOD AUDIO-VIDEO
Sound Reinf., Lights, Audio & Video Recording
133 Walton Ferry
Hendersonville, TN 37075
(615) 824-2820

BEECHTREE RECORDING STUDIO
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2804 Beechtree Dr.
Sanford, NC 27330
(919) 774-8926
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226 30th St.
New Orleans, LA 70124
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Contact: Terry Bickle

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Contact: Norbert Stovall

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(404) 922-1513
Contact: Randy Card

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 Greensboro, NC 27401
 (919) 379-1943
 Contact: Kenneth M. Carey

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Sound Reinf.
 #2 Music Circle E.
 Nashville, TN 37203
 (615) 259-0900
 Contact: Rich Carpenter

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Audio Recording
 1001 Neville St.
 Follansbee, WV 26037
 (304) 527-1758
 Contact: Lou Casini

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Sound Reinf.
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 Johnson City, TN 37601
 (615) 928-8821
 Contact: Jeff Cates



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 Memphis, TN

CETACEA SOUND INC.
Sound Reinf., Lights, Staging, Rental
 2850 Lamb Pl., Ste. 5
 Memphis, TN 38118
 (901) 363-3856
 Contact: Chip Benson
SOUND REINFORCEMENT
 Touring Radius: Local, regional, national.
Maximum Venue Size: 15,000 indoor, outdoor festivals up to 100,000.
House Loudspeakers: Turbosound TMS-3, TMS-4 System, JBL Concert Series system.
Flying System Available: Yes.
Monitor Loudspeakers: Turbosound sidefills, JBL custom wedges, all biamped or tramped.
House Consoles: DDA 40x8x2, Soundcraft 400B 32x4x2, Soundcraft 400B 24x4x2.
Monitor Consoles: DDA 40x8x2, Soundcraft 32x8x2.
Outboard Equipment: Lexicon 224, Lexicon 224 XL, (2) Lexicon PCM60, (2) Lexicon PCM41, (2) Yamaha SPX90, dbx 900 w/4 gates and 4 comps, Symetrix 525, Klark-Teknik stereo 1/3-octave, Eventide 949 Harmonizer.
Power Amplifiers: QSC 3500s, QSC 3350s, QSC 1400s, Carver Pro-1s.
Microphones: Shure: SM57s, SM58s, SM81s, SM85s; Sennheiser 421s, AKG D-12s, E-V RE20s, Beyer diversity wireless systems.
Staging: Available upon request.
Lighting: Available upon request.
Other Equipment: Smaller systems available for business meetings, conventions or clubs.

CHERRY GROVE PROMOTIONS
Sound Reinf., Lights, Audio Recording
 404 7th Ave. N.
 Myrtle Beach, SC 29577
 (803) 448-6730
 (803) 626-3415
 Contact: Ron Thompson
SOUND REINFORCEMENT
 Touring Radius: Regional

REMOTE RECORDING and SOUND REINFORCEMENT



S O U T H E A S T

Maximum Venue Size: 2,500
Vehicles: Sportscoach; truck and trailer.
House Loudspeakers: (8) a.d. 3-way speaker systems, (8) a.d. 115 bass bins.
Monitor Loudspeakers: (6) a.d. 112 monitor speakers, side fills upon request.
House Consoles: Studiomastrer 24-channel (4-bus).
Monitor Consoles: Magna (Sunn) 16-channel.
Outboard Equipment: (3) Alesis Microverbs, (2) Alesis II MIDlverb, Alesis MIDlfix, ADA 2.5 second delay, DOD Audio Logic stereo compressor/noise gate, Roland GE 810 22-band, Sundholm 2103 stereo 10-band EQ-notch filter, Symetrix 522 stereo compressor, Aria SQ 520 analyzer/EQ, Washburn 700 digital delay, complete Commodore 64 computer system and software (Passport), Rocktron Hush II noise reduction, Symetrix 501 compressor.
Power Amplifiers: (6) AMP 2000 750-watt each.
Microphones: (3) Shure SM57, (3) Shure SM58, Shure SM78, (2) Shure PE85, Shure PE545, (2) AKG D-1000E, Pearl DX65, Audio-Technica Pro 5, (2) Audio-Technica SM11, Audio-Technica SM21.
Staging: Carpentry crew will build per event upon request.
Lighting: LSS 4-scene system, (4) LSS 3,000-watt dimmer; assorted: PAR-64, PAR-56, PAR-40, one follow spot, stands.
Other Equipment: (2) 15 pr. snakes, Casio CZ1 synth, Casio CZ101 synth, Roland Juno 1, Korg Poly 800, ARP 16-voice piano, Casio RZ 1 drum machine, Yamaha 150 II 6-channel, Dynamix 16-channel (mxr only).
Rates: Sound only: \$350/night plus travel; sound and lights: \$600/night plus travel; keyboards: add \$200/night; mobile recording: \$500/day plus travel.

REMOTE RECORDING
Control Room Dimensions: Space required to set up: 12 x 12.
Mixing Consoles: Studiomastrer Series II 24 x 4 x 2.
Audio Recorders: Fostex E-8 8-channel w/integral noise reduction, Cutec 4-track, Sony SLO-1400 Beta, Sony 501-ES digital processor, Technics 1500.
Noise Reduction Systems: Rocktron Hush II stereo noise reduction.
Synchronization Systems: Fostex 4030 w/remote, Fostex 4050 SMPTE system.
Outboard Equipment: (3) Alesis Microverb, (2) Alesis MIDlfix, Alesis MIDlverb I, (2) Alesis MIDlverb II, ADA Pitchtrac, 2.5 second delay, Symetrix 522 stereo compressor, Audio Logic stereo compressor/noise gate, Aphex Aural Exciter, Aphex Compellor.
Microphones: (2) Sennheiser 421, E-V RE20, (3) Shure SM57, Shure SM7, (2) AKG 1000E, (2) Audio-Technica SM-11, Audio-Technica SM-21, Audio-Technica ATM 41, Audio-Technica 91R, Audio-Technica 31R.
Monitor Speakers: Toa 22E, a.d. 3-way.
Power Amplifiers: AMP 2000, 750-watt RMS, Cutec: 902 60-watt.
Video Recorders: Realistic Model 22 Super Beta (stereo), Sony SLO-1400 Beta II (stereo), Fisher VHS (mono).
Video Monitors: (2) Archer 13" color monitors, Archer 19" color monitor.
Switchers: Realistic.
Cameras: Rent as needed.
Other Major Equipment: Casio CZ1, Casio TB1, Casio CZ101, Casio RZ1, Roland Juno 1, Korg Poly 800, ARP 16-voice piano, Akai S900 sampler, Korg DDD-1 drum machine, Yamaha FB01 expander.

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 Contact: J.W. Wagner

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Audio Recording
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 Bristol, VA 24201
 (703) 466-8675
 Contact: Bandy Brownlee

WALLY CLEAVER'S RECORDING SERVICES
Sound Reinf., Rental, Audio & Video Recording
 1518 Princess Anne St.
 Fredericksburg, VA 22401
 (703) 373-6511
 Contact: Lorie M. Stannard

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 4220 Amnicola Hwy., PO Box 5126
 Chattanooga, TN 37406
 (615) 622-1193
 Contact: James L. Webster

CUSTOM RECORDING & SOUND, INC.
Sound Reinf., Rental, Audio Recording
 1225 Pendleton St.
 Greenville, SC 29611
 (803) 269-5018
 Contact: Jere Davis

DESTRUCTION PRODUCTIONS
Sound Reinf., Lights, Audio & Video Recording
 PO Box 152
 Williston, SC 29853
 (803) 266-3662
 (803) 266-4257
 Contact: Barry Keel

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Audio Recording
 516 E. Pine St.
 Florence, SC 29501
 (803) 669-8600
 Contact: Charlie Speed, John Opal

DOGWOOD PRODUCTIONS, INC.
Sound Reinf., Rental, Audio & Video Recording
 PO Box 7751
 Mobile, AL 36607
 (205) 476-0858
 Contact: Tad Denson, Kevin Wicker

DONOVAN AUDIO/THE PROPER AUTHORITIES
Sound Reinf., Rental
 14811 N. Iris Ave.
 Tampa, FL 33613
 (813) 961-8984
 Contact: Joseph J. Donovan

DRAGON PATH MUSIC
Audio Recording
 1451 Piedmont Ave. NE
 Atlanta, GA 30309
 Contact: Frank French

THE ENTERTAINMENT GROUP
Sound Reinf., Rental
 1329 Wilkie Dr.
 Charleston, WV 25314
 (304) 345-9953
 Contact: Jon Steele

ENTERTAINMENT SERVICES UNLIMITED
Sound Reinf., Rental
 5151 Oak Hill Dr.
 Winter Park, FL 32792
 (305) 657-6675
 Contact: Charlie Rigsbee

F&M SOUND PRODUCTIONS
Sound Reinf., Rental
 PO Box 381562
 Germantown, TN 38183
 (901) 756-9443
 Contact: Scott Fuelling

FANTA PROFESSIONAL SERVICES
Audio & Video Recording
 1213 16th Ave. S.
 Nashville, TN 37212
 (615) 327-1731
 Contact: Johnny Rosen

FBN AUDIO
Sound Reinf.
 6512 Baum Dr., Ste. 15
 Knoxville, TN 37919

(615) 588-3209
Contact: Mike Sullivan

FIDELITY SOUND REINFORCEMENT
Sound Reinf.
1405 Linlier Dr.
Virginia Beach, VA 23451
(804) 428-7794
Contact: Jay Meagher

FLORIDA PRODUCTION CENTER
Audio & Video Recording
150 Riverside Ave.
Jacksonville, FL 32202
(904) 354-7000
Contact: Tony Kennedy

FORCE 1 PRODUCTIONS/PROSOUND S.E.
Sound Reinf., Lights, Rental
828 Mtn. Leaf Dr.
Tunnel Hill, GA 30755
(404) 673-6472
Contact: J. Ross

FX SOUNDE COMPANY
Sound Reinf., Lights, Staging, Rental
6247 Holly Bay Dr.
Jacksonville, FL 32211
(904) 744-4663
Contact: Stuart Neal

GALAXY SOUND
Sound Reinf., Lights, Staging, Rental, Audio Recording
1508 Harlem, Ste. 203
Memphis, TN
(901) 274-2726
Contact: Dominic Herron

GARDEN SOUND STUDIO
Audio Recording
PO Box 4870
University, MS 38677
(601) 236-1246
Contact: Britt A. Fitts

GEMINI CONCERT SYSTEMS, INC.
Sound Reinf., Lights, Rental
209 Louisville Ave.
Monroe, LA 71201
(318) 325-9940
Contact: Rick Ponthieux



GARY HEDDEN LIMITED
2807 Azalea Place ■ Nashville, Tennessee 37204

GHL AUDIO ENGINEERING
Nashville, TN

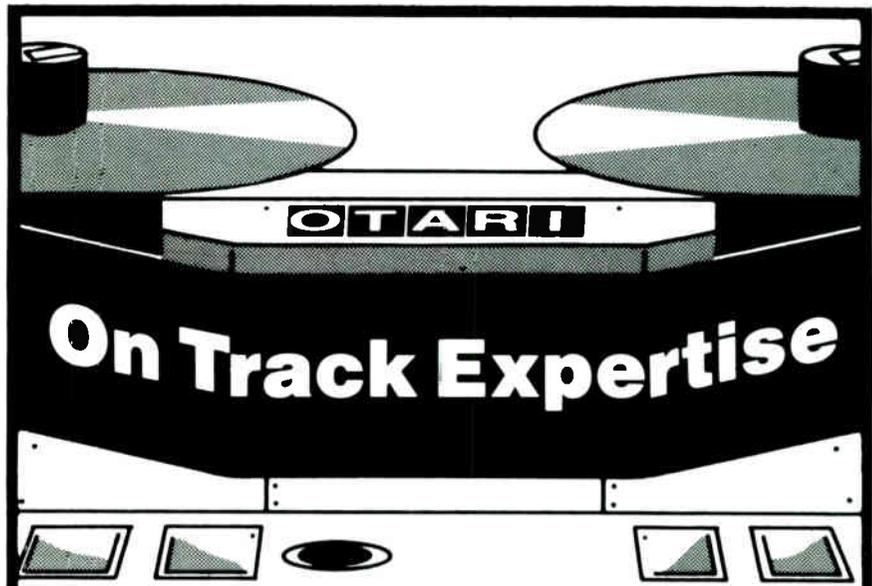
GHL AUDIO ENGINEERING

Audio Recording
2807 Azalea Pl.
Nashville, TN 37204
(615) 269-5183

REMOTE RECORDING

Vehicles: 40' custom-built Great Dane facility.
Control Room Dimensions: 8 x 8.5 x 22.
Mixing Consoles: Harrison MR-4 36 x 24 w/automation and grouping.
Audio Recorders: (2) Otari MTR-90 Mark II, Otari MTR-12

—LISTING CONTINUED ON NEXT PAGE



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REMOTE RECORDING and SOUND REINFORCEMENT



S O U T H E A S T

—LISTING CONTINUED FROM PAGE 185

2- or 4-channel ½", (2) Otari MX-5050 B II ¼", (2) Nakamichi MR-1 B cassette recorders.

Noise Reduction Systems: (8) Dolby 361 w/Type A cards, dbx 180 stereo Type I.

Synchronization Systems: BTX Softouch, (2) Shadow II, Cypher generator.

Outboard Equipment: (2) Lexicon 200 v1.3, (2) Lexicon PCM42, Marshall 5402 Time Modulator, Quantec room simulator, Eventide 910 Harmonizer, (2) UREI LA-3A compressors, (5) dbx 903 compressors, (2) dbx 902 de-essers, dbx 906 flanger, (6) Valley Dyna-Mites, (4) Aphex EQF-2 parametric EQ, (6) Aphex CX-1 compressor/expander.

Microphones: (2) AKG 414, (4) AKG 460 cardioid, (2) AKG 460 shotgun, (4) Neumann U89, (8) Neumann KM84, Neumann SM2, (3) Beyer M-500, (8) Sennheiser 421, (4) Shure SM58, (2) Shure SM57, E-V RE20, E-V PL10, (2) Altec M-49, (2) Crown PZM-6S, Sony C-38.

Monitor Speakers: (2) Fostex LS-3 modified, (2) Fostex RM-765, (2) Fostex G-7000, (4) Minimus 7, (2) Auretones, (2) CSI MDM-4.

Power Amplifiers: (2) Hafler P-500, (3) Hafler 220 Video Recorders: JVC CR-6650 ¾" U-matic.

Video Monitors: Panasonic 13" broadcast monitor, RCA B&W 9".

Cameras: (2) RCA remote controlled B&W for surveillance. Other Major Equipment: dbx 700 digital processor, Sharp photocopy machine, microwave, coffee pot, fridge.

Rates: \$2,500/day, plus mileage at \$1.20/mile. Discounts for additional days.

Extras & Direction: GHL recently moved to Nashville, where we also operate a small but sophisticated studio for overdubs and mixing. Although the facility is new, our crew has extensive experience in all areas of music production and audio for video. Recent credits include Ricky Skaggs, Huey Lewis, Oak Ridge Boys, Montreal Jazz Festival and Cirque du Soleil.

GSC SOUND AND LIGHT

Sound Reinf., Lights, Rental, Audio Recording

1922 27th Ave. S.

Birmingham, AL 35209

(205) 870-8828

Contact: Dan Gainey

GVB PRODUCTIONS

Sound Reinf., Lights, Rental

3221 N. George Mason Dr.

Arlington, VA 22207

(703) 237-0646

Contact: Eric Steenstra

GYPSY STUDIO

Audio Recording

3039 Hazelton St.

Falls Church, VA 22044

(703) 241-7445

Contact: Mike Rivers

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Audio & Video Recording

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(504) 469-7963

Contact: Marcelle Hardy

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Pensacola, FL 32505

(904) 432-2076

(904) 438-1011

Contact: Barry Chandler, Tim Lechner

HI SEA MUSIC CO

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Boca Raton, FL 33431

(305) 994-3555

Contact: Wm. Cramer

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Norton, VA 24273

(703) 679-4182

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Fairfax, VA 22033

(703) 378-5409

Contact: Ivan Beaver

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Raleigh, NC

(919) 851-0767

Contact: Doug Llewellyn

JAG STUDIO, LTD.

Audio Recording

3801-C Western Blvd.

Raleigh, NC 27606

(919) 821-2059

Contact: Joy Cook, Byron McCay

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(305) 731-3850

Contact: Wally Watkivs

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Rental, Audio Recording

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Memphis, TN

(901) 728-6271

Contact: Jeff Rust, Keith Tomes

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Sound Reinf.

RR#1, Box 461

Hardin, KY 42048

(502) 354-6394

Contact: Kenneth Darnell

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Sound Reinf., Audio & Video Recording

3116 Metairie Rd.

Metairie, LA 70001

Contact: Traci Borges

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PO Box 1622

Athens, GA 30601

(404) 237-6540

Contact: Woody Nuss

LOCATION RECORDING SERVICES

DIV. ERF ENTERPRISES, INC.

Audio & Video Recording

320 W. Franklin St.

Chapel Hill, NC 27514

(919) 933-5751

Contact: Richard Fox

REMOTE RECORDING

Vehicles: Ford E350 chassis w/15x8x8 box w/cab over

Control Room Dimensions: 7.5' x 15' x 7.5'

Mixing Consoles: Yamaha RM2408 customized, Hill

Multimix.

Audio Recorders: Fostex B-16 16-track, Fostex E-16 16-

track, Fostex E-2 2-track ½ 30 ips, MCI JH24 24-track and

Otari MTR-90 available, (8) Yamaha cassette decks.

Synchronization Systems: Fostex 4030 w/4035 controller.

Outboard Equipment: (2) Valley People Dyna-Mites, Delta-

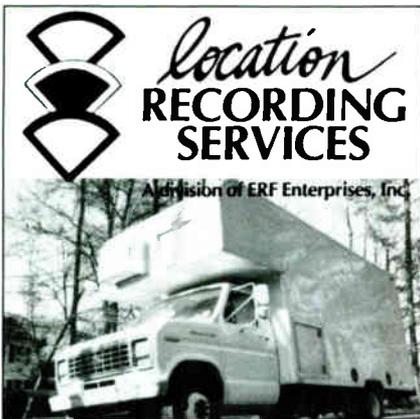
Lab ADM-1024 delay line, ART DR1 digital reverb, Yamaha

SPX90, Symatrix 522 comp/limiter, US Audio GateX 4-

channel gate, Orban 674A stereo EQ, Aphex Type C Aural

Exciter, outboard gear by AMS, Lexicon, Drawmer, etc.

available locally at very reasonable rates.



LOCATION RECORDING SERVICES
DIV. ERF ENTERPRISES, INC.
 Chapel Hill, NC

Microphones: Neumann U87, (2) AKG 414, E-V RE20, (6) Sennheiser 421, Sennheiser 441, (2) Shure SM81, (6) Shure SM57, Shure SM58, AKG D-112E, (10) Radio Shack PZM. Monitor Speakers: (2) Fostex RM865, (2) Yamaha NS-10M, (2) Auratone cubes, (2) KEF 101. Power Amplifiers: Hafler X1-280, Carver receiver. Video Recorders: NEC 3/4" deck, Sony 3/4" deck, (4) Sony Super Beta Hi-Fi decks w/PCM501. Video Monitors: Proton 13". Cameras: JVC KY120.

Other Major Equipment: Quiet and effective HVAC system, 25' 27-channel Mogami snake w/lens X-former splits, 2-channel 4-station intercom. Rates: Beginning at \$500/day.

Extras & Direction: In less than three years of operation LRS has proven that high quality, cost-effective location recordings are possible. With the addition of co-ownership of The Cat's Cradle nightclub, LRS is ready to offer the industry perhaps the best value in live recordings. We're young and we're hungry. You will be hearing about us and from us. Recent credits include: The Golden Palominos, Al Stewart, Badfinger, Modern English, 10,000 Maniacs, Don Dixon, Let's Active, Felchin Bones, Marti Jones, Burning Spear, Walter "Wolfman" Washington, The DB's, Guadalcanal Diary, Hege V, The Super Grit Cowboy Band, numerous gospel records, projects for GE, Glaxo, Spin magazine, Entertainment Radio Inc. We can be reached on the ESI St. network (FOX-US). Full video services available through Insight Video Productions.

MARIAH RECORDING
 Audio Recording
 337 N. 25th Ave.
 Hattiesburg, MS 39401
 (601) 545-1886
 Contact: Vaughn Wilson

MARTIN AUDIO
 Audio & Video Recording
 2936 Stockton St.
 Winston-Salem, NC 27107
 (919) 788-0921
 Contact: Frank Martin

MASTERSOUND, INC.
 Audio Recording
 7425 Buckland Rd.
 Charlotte, NC 28208
 (704) 588-2491
 Contact: Jim Deal

MEDIA CENTER SOUTH, INCORPORATED
 Audio & Video Recording
 777 Lambert Dr.
 Atlanta, GA 30324
 (404) 874-3500
 Contact: Craig Crissman

MEDIA PRODUCTIONS
 Audio Recording
 125 Miller Ave.
 Oak Hill, WV 25901
 (304) 465-5786
 Contact: W. Doug Gent

MERCANTILE RECORDING
 Sound Reinf., Audio Recording
 Rt. 4, Box 302,

Saundersville Ferry Rd.
 Mt. Juliet, TN 37122
 (615) 754-2444
 Contact: Kent Fox

METROTAPE PRODUCER SERVICES, INC.
 Sound Reinf., Rental, Audio Recording
 3423 South Blvd
 Charlotte, NC 28209
 (704) 525-2251
 Contact: Mike Robinson

MIGHTY MOUTH SOUND & LIGHTS, INC.
 Sound Reinf., Lights, Staging, Rental
 1401-C Millgate Dr.
 Winston-Salem, NC 27103
 (919) 768-2191
 Contact: Mike Cook, Jeff Cranfill

SOUND REINFORCEMENT
 Touring Radius: National
 Maximum Venue Size: 14,000
 Vehicles: Two straight trucks.
 House Loudspeakers: (16) custom-built 4-way boxes (full range w/subwoofers), (8) E-V SH1810 w/8 matching subwoofer boxes.
 Flying System Available: Yes.
 Monitor Loudspeakers: (10) E-V FM1202 floor monitor, (5) JBL slant monitor, custom-built drum monitor, (2) E-V SH1810 for sidefills.
 House Consoles: Soundtracs M Series 24 x 8, Walker 24 x 4, Tascam M320 20 x 4, Biamp 1642.
 Monitor Consoles: Yamaha M2408 24 x 8, Allen & Heath 18 x 6.

Outboard Equipment: (2) Yamaha SPX90, Alesis XT digital reverb, Effectron II digital delay, Yamaha GC2020 comp/limiter (dual), (2) Symetrix 501 comp/limiter, (2) Ashly GQ131 equalizer, Toa RV14 crossover, (2) Biamp MX2 crossover, (4) Yamaha Q2031 dual 1/3-octave equalizer, (4) Yamaha GC2020 dual comp limiter, (2) Sunholm 2103 dual octave equalizer w/notch filters, Sunholm 3104 1/3-octave equalizer w/notch filters.
 Power Amplifiers: (18) QSC MX-1500, (4) QSC 1400.

Microphones: (6) AKG 330 BT, (8) Beyer M201, (2) AKG D-112E, (7) E-V PL80, (7) Shure SM57, (4) Shure SM58, Crown PZM, (2) Sennheiser 441, (2) E-V PL77, (2) Toa RD-16.
 Staging: (2) 8' x 8' x 30" aluminum drum risers, custom needs also available.
 Lighting: Systems from 16 to 120 lamps available to fit act and venue, Altman Satellite followspot.

Rates: Call for quote.

MILLER RECORDING STUDIO
 Audio Recording
 2513 S. Scales St.
 Reidsville, NC 27320
 (919) 349-8911
 (919) 342-1892
 Contact: Robbin Miller

MOBILE SOUND SERVICE
 Sound Reinf., Rental, Audio Recording
 1010A Dorothea Dr.
 Raleigh, NC 27603
 (919) 834-3158
 Contact: Ted E. Bissette

MOBILSOUND CORPORATION
 Sound Reinf.
 107 Crossfield Dr.
 Versailles, KY 40383
 (606) 873-4999
 (800) 354-9362
 Contact: Lewis M. Werford

MOONDANCE AUDIO
 Sound Reinf., Lights, Audio & Video Recording
 c/o Video Stereo Inc., PO Box 1460
 Roanoke Rapids, NC 27870
 (919) 537-9724
 Contact: Mark Civen

MOONLIGHT SOUND
 Sound Reinf., Rental
 3136 Hunters Hill Rd.
 Nashville, TN 37214
 (615) 889-7201
 Contact: Sharon Ferrara

MR. O AUDIO
 Sound Reinf., Lights, Rental, Audio Recording
 2035 S. Lumpkin
 Columbus, GA 31903
 (404) 687-6221

Contact: Maurice Owens
SOUND REINFORCEMENT
 Touring Radius: Local, regional
 Maximum Venue Size: 8,000
 Vehicles: Rental trucks for dependability.
 House Loudspeakers: (12) OAP DP-118 (18", 15", 12" and 2" comp. driver w/bi-radial), (4) JBL dbl "scoops" w/2 JBL 2225s each, (4) Mr. O W25Hs (2 15", 1" JBL comp. driver w/bi-radial EQ), (8) Mr. O 52Ts (15", 1" JBL comp. driver w/60-degree horn each).

Flying System Available: Yes.
 Monitor Loudspeakers: (4) OAP 3-way passive wedges (15", 5", piezo horn tweed each), (4) OAP 2-way Biamp wedges (15", 1" comp. driver w/90-degree horn each), (4) Mr. O 52Ts (side fill), Mr. O KA 1 drum monitor (two 15", 1" comp driver w/90-degree horn each).
 House Consoles: Soundcraft 500 32 x 8, Canary 32 x 8, Studiomaster 20 x 4, Yamaha EM300 12 x 4.
 Monitor Consoles: Studiomaster 20 x 8.
 Outboard Equipment: Lexicon Prime Time II 95, Yamaha REV7, Yamaha SPX90, Effectron III, Roland Space Echo, Ibanez HD-1500, (2) UREI 539 1/3-octave EQ, (3) Yamaha 2031 1/3-octave EQ, (2) Valley People Dyna-Mites (comp/lim./gate/de-esser), UREI 525 crossover, (2) Furman TX4 crossovers, Furman TX3 crossover, (4) dbx 163X compressors, Rocktron 300 (comp/lim./Hush II), (4) Crown VFX-2A crossovers.

Power Amplifiers: (8) Crown DC-300As, (4) Yamaha P2200s, (4) BGW 750s, (2) Crown D-75s, (2) QSC 1400s.
 Microphones: (8) Shure SM58s, (8) Shure SM57s, (8) PE 56s, (2) Sennheiser 431s, AKG 414.
 Lighting: (72) PAR 64s w/2 40' trusses, 24 channels of Leprecon (2.4K) and Scrimmer (4.8K) dimming, 10 channels of non-dim 30 amp circuits.

Other Equipment: Oberheim DX drum machine, Korg Poly 61M, Minimoog Model D, Akai 612 sampler, Acoustic 370 bass head and Ampeg B-25 cab ((2) JBL 2225s), Fender Twin w/IBLs, Ampeg V-4 amp and cab., Rene HC-6 head-phone amp.

Rates: Call for rates.
REMOTE RECORDING
 Vehicles: Modified Ford E-100 van. (Mixdown in studio)
 Mixing Consoles: Same.
 Audio Recorders: Tascam 38 8-track, TEAC 3300 2-track, Tascam 32 2-track, (4) Nikko 350 cassette decks, TEAC V-385 cassette deck.

Noise Reduction Systems: (2) DX-4D Type I.
 Outboard Equipment: Same.
 Microphones: Same.
 Monitor Speakers: (2) JBL 4312s, (2) JBL L-36s, (2) Auratone 5Cs.
 Power Amplifiers: (2) Crown D-75s.
 Rates: Call for rates.

MURDOCK PRODUCTIONS, INC.
 Sound Reinf., Lights, Audio & Video Recording
 Rt. 1, Box 95
 Dry Prong, LA 71423
 (318) 640-4992
 Contact: Dennis Murdock

MUSIC ARTS ENTERPRISES, INC.
 Sound Reinf., Lights, Rental, Audio Recording
 2320 Davis Blvd.
 Ft. Lauderdale, FL 33312

NATIONAL CASSETTE SERVICES, INC.
 Audio Recording
 613 N. Commerce Ave., PO Box 99
 Front Royal, VA 22630
 (703) 635-4181
 Contact: Mike McCool

NATIONAL SOUND
 Sound Reinf.
 7301A Lockport Pl.
 Lorton, VA 22079
 (703) 550-7090
 Contact: Tom Linthicum
SOUND REINFORCEMENT
 Touring Radius: National.
 House Loudspeakers: (24) Martin 2 x 15 split boxes, (2) JBL 2225H speakers, (24) 4552 Style mid cabinets, (2) JBL E-120 speakers, (24) JBL 60-degree and 90-degree radial horns w/TAD 4001 drivers, (4) Woodworx WXS-218 w/2240B JBL, (4) Woodworx WXS-FR2, (2) 2240B, (2) E120, DDS-265, TAD 4001.
 Monitor Loudspeakers: (8) National Sound/Woodworx WXM212, JBL 2-E120, TAD 2001, R/H CBH-1600, (8) National Sound/Woodworx WXM 112, JBL L-E120, Altec 902, R/H CBH 1600, (2) National Sound drum monitor, (2) JBL K-140, (2) JBL E-120, JBL 2425, R/H CBH 1600, (4) National Sound side fills, (2) JBL E-140, (4) JBL K110, NWS340, TAD 4001.
 House Consoles: (2) Soundtracs M-32 32 x 8 x 2, 6 aux

—LISTING CONTINUED ON NEXT PAGE

—LISTING CONTINUED FROM PAGE 187

send 4 matrix outs, Hill B-3 24 input 24 x 2, 3 aux send 8 effects returns, (3) Tapco /E-V C-12/CBE 20 x 4 x 2, Soundtracs T-16 16 x 4 x 2, 4 aux send, Soundcraft 500 Series 24 x 8 x 2, 8 aux send.

Monitor Consoles: AFSI M-2000 32 x 8 w/4-band semi para. EQ, Yamaha MC2408 24 x 8, AH&H 1806 18 x 6, Hill Stagemix 12 x 6.

Outboard Equipment: (6) Ashly GQ-231 dual 31-band EQ, (8) MXR/ART 271 31-band EQ, (3) Klark-Teknik DN-360, (2) White 4004, (5) Brooke-Siren MDS 200 Series, (6) Brooke-Siren FBS 340, (2) Yamaha REV7, Yamaha SPX90, (2) Roland SDE-3000, Roland SRV-2000, Roland SDE-1000, (3) DeltaLab ADM-1024/64, (6) Allison 700 Gain Brains, (4) Ashly SC-50, (3) Ashly SC-33, Ivie IE-30.

Power Amplifiers: (4) Crown MT-1200, (8) Crown PSA-2X, (12) Crown DC-300A, (6) Crown D-150A, (12) Crest P-3501S, (8) Crest P-2501.

Microphones: (12) Sennheiser MD-421, (15) Shure SM58, (10) Shure SM56, (10) Shure SM57, (4) Shure SM81, (2) AKG C-535, (2) AKG D-224E, (4) AKG D-12E, (6) E-V 666, (15) E-V D535, (2) E-V RE20, (4) Countryman F-85, (2) Brooke-Siren A-116, (6) Whirlwind directors, (8) E-V RE11, (4) E-V RE15, (6) Shure SM53, (4) Shure SM54.

Other Equipment: 50 K.V. universal export transformer 190-480 volt in, 240-120 volt out.

NEW VIRGINIANS

Sound Reinf., Lights
321 Patton VPI
Blacksburg, VA 24061
(703) 961-6456
Contact: Spencer Allen

NOMAD PRODUCTIONS, INC.

Audio Recording
PO Box 6868
Mobile, AL 36660
(205) 479-2769
Contact: Barry L. Little

NORTHERN KENTUCKY UNIVERSITY

Sound Reinf., Audio Recording
331 Landrum Center
Highland Heights, KY 41076
(606) 572-5703
Contact: Clarence Woods

REMOTE RECORDING and SOUND REINFORCEMENT



S O U T H E A S T

NORTHRIDGE SOUND

Sound Reinf., Lights, Rental, Audio Recording
35 Deerwood Dr.
Aiken, SC 29801
(803) 649-2889
Contact: Geof Northridge

NOVA SOUND INC.

Sound Reinf., Rental, Audio Recording
270 Sunset Park Dr.
Herndon, VA 22070
(703) 471-0041

OHMEGA SOUND

Sound Reinf., Lights, Rental
PO Box 11674
Montgomery, AL 36111
(205) 269-3700
Contact: Susan Beard

OSHEA RECORDS-D.B.A.-MID ATLANTIC SOUND

Sound Reinf., Lights, Rental, Audio Recording
2109 Maywood St.
Greensboro, NC 27403
(919) 292-1419
Contact: Phil Jackson

PARADISE SOUND

Sound Reinf., Lights, Staging, Rental
436 Dunraven Dr.
Winter Park, FL 32792
(305) 657-0333
Contact: Larry Epstein

PENGUIN AUDIO

Sound Reinf.
Rt. 1, Box 345
Fort Pierce, FL
(305) 466-1285
Contact: Shayne O'Neill

PENGUIN STUDIO

Rental, Audio Recording
1305 Cedar Keys Ct.
Stone Mountain, GA 30083
(404) 299-2614
Contact: A. Ayers

PEPPER PRODUCTIONS/WAITES & WAITES CONSULTANTS

Sound Reinf., Lights, Staging, Rental, Audio Recording
4201 4th Ave. S., Ste. 3
Birmingham, AL 35222
(205) 591-2004
Contact: Terence Waites, Pepper Brown

PHASE AUDIO INC.

Sound Reinf., Lights, Staging, Rental, Audio Recording
593 S. Cooper
Memphis, TN 38104
(901) 726-1900
Contact: Murphy Odom

PLATINUM PRODUCTIONS OF CENTRAL FLORIDA, INC.

Sound Reinf., Rental, Audio Recording
6427 Undine Wy.
Orlando, FL 32818
(305) 298-3917
Contact: Michael Creamer

PLATINUM RECORDERS MOBILE SERVICES

Audio Recording
658 Douglas Ave., Ste. 1120
Altamonte Springs, FL 32701
(305) 788-2450
Contact: Gary Platt
Touring Radius: National.
Maximum Venue Size: Any size.
Vehicles: GMC motor coach.
REMOTE RECORDING
Mixing Consoles: Sphere Eclipse 32 x 24 w/8 Super Graphic.
Audio Recorders: (2) Otari MX-80 24-track, Otari MTR-10 2-track, Otari MTR-12, (2) dbx 700 digital recorders.
Synchronization Systems: Adams-Smith Zeta III SMPTE synchronizer/reader/generator.

Outboard Equipment: Lexicon 480XL reverb/effects, Roland 2000 reverb, Lexicon 200 reverb, (2) Lexicon PCM41 delay, (2) Roland SDE-3000 delay, (3) Roland SDE-2000 delay, DeltaLab Compueffectron 1700, ADA stereo tap delay, Aphex Studio Dominator (stereo), Aphex Type B Aural Exciter, Barcus-Berry phase aligner, (6) UREI LA-4s, (5) dbx 903 compressors, (3) dbx 904 gates, (4) dbx 905 equalizers, (4) dbx 902 de-essers, UREI LA-2 compressor, Aphex Compellor, (2) Aphex EQ, (2) Aphex gates, (4) Omni Craft gates, Eventide flanger.
Microphones: (2) AKG 414/Pe 48, AKG C24 stereo (circa 1969), (6) Sennheiser MD421, (8) Shure 57, (5) Neumann KM84, Neumann U87, (2) Audio-Technica ATM 31R, (2) Audio-Technica ATS 15R, (2) AKG 451, E-V RE20, Sony EMC-50, (8) Countryman DI, (6) AXE active D.I., (2) P2M.
Monitor Speakers: Fostex LS3, Fostex RM-780, Auratone, Fostex and AKG headphones.
Power Amplifiers: (2) Hafler DH-500, (2) Hafler DH-220.
Video Recorders: (2) Sony 5800 3/4" VCR.
Video Monitors: (2) RCA TC-2011, NEC 19" color monitor.
Cameras: (2) RCA TC-1109.
Other Major Equipment: Full Telex communications, full array of audio/power/cue snakes.

POSSUM PRODUCTIONS

Sound Reinf.
1211 Ducharme Rd.
Opelousas, LA 70570
(318) 948-1217

PROF. AUDIO SALES & SERVICE

Sound Reinf., Rental
7906 Wrenwood Blvd., Ste. E
Baton Rouge, LA 70809
(504) 928-4757
Contact: Darrel Hayes

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Audio Recording
2116 Southview Ave.
Tampa, FL 33606
(813) 251-8093
Contact: Ken Veenstra

PROJECT 70 AUDIO SERVICES, INC.

Audio Recording
777 Lambert Dr. NE
Atlanta, GA 30324
(404) 875-7000
Contact: Jerry L. Connell

PROLINE AUDIO INC.

Sound Reinf., Lights, Staging, Rental
PO Box 799
Chalmette, LA 70044
(504) 279-1124
Contact: Ray Garofalo Jr.

PROPAGANDA PRODUCTION LTD.

Sound Reinf., Lights
5609A Crawford St.
Harahan, LA 70123
(504) 733-8211
Contact: David Humphreys

PROTECH PRODUCTIONS

Sound Reinf., Lights, Audio Recording
Rt. 1, Box 339-D #4
Marrero, LA 70072
(504) 689-4556
(504) 341-2454
Contact: Rick Naiser, John Sauer

PROTOLOG INC.

Sound Reinf., Lights, Rental, Audio Recording
PO Box 41438
St. Petersburg, FL 33743
(813) 345-8836
Contact: Michael Petruzzi

QUALITY SOUND & VIDEO

Sound Reinf., Lights
833 Bragg Blvd.
Fayetteville, NC 28301
(919) 483-1212
Contact: Mark Lynch

RADIO ACTIVE AUDIO

Sound Reinf., Lights, Rental, Audio Recording
9 W. Grace St.
Richmond, VA 23220
(804) 643-2022

RAINBOW RIVER STUDIOS

Sound Reinf., Audio Recording
PO Box 1708
Auburn, AL 36830
(205) 821-4876
Contact: Larry L. Barker

RAM SOUND

Sound Reinf., Lights, Staging, Rental
10 Arlington Dr.
Tuscaloosa, AL 35401
(205) 759-5284
Contact: Bob McFeyre

RAVEN AUDIO

Sound Reinf., Lights, Rental
1918 Wise Dr.
Dothan, AL 36303
(205) 793-1329
Contact: Jerry Wise

REAL TO REEL

Audio Recording
PO Box 4164
Hollywood, FL 33083
(305) 583-5094
Contact: Gary Willhoite, Angelo Ennquez

RECYCLED SOUND

Sound Reinf., Lights, Rental
Rt. 1, Box 5
Alton, TN 37616

REMOTE RECORDING and SOUND REINFORCEMENT**S O U T H E A S T**

(615) 639-8569

Contact: John D. Brown

REELSOUND RECORDING CO. (EAST)

Audio Recording
3400 Spring Brook Dr.
Nashville, TN 37204
(615) 385-0220
Contact: Dave Perkins
REMOTE RECORDING
Vehicles: 1948 Flexible bus.
Control Room Dimensions: 18 x 7.
Mixing Consoles: MCI 428LM, Ampex.
Audio Recorders: MCI JH-114 24-track, Ampex 440B 2-track, Akai cassette, Akai PCM.
Noise Reduction Systems: Drawmer.
Synchronization Systems: Audio & Design time code reader
Outboard Equipment: Teletronix LA-2A, dbx 160X, (2) dbx 160, API 525 limiter, (4) Gain Brains, (4) Kepex, (6) Drawmer DS-201 gates, Yamaha SPX90, AMS RMX-16 reverb, MIC-MIX 305 reverb, RTS intercom system, (3) API 550A EQ units, UREI stereo 9-band graphic, (32) Jensen transformer splitter system.
Microphones: Neumann, Beyer, E-V, RCA, Shure, AKG, Sennheiser, Countryman, Crown.
Monitor Speakers: JBL 4401, JBL 4313, Yamaha NS-10.
Power Amplifiers: Crown DC-300, Crown D-75.
Video Monitors: Sony.
Switchers: Sony.
Cameras: Toshiba.
Rates: Based on day rate, mileage, tape, crew per diem.

REMOTE AUDIO PROD. SERVICES

Audio & Video Recording
4410 Park Ave.
Nashville, TN 37209
(615) 297-0513
Contact: Al Craig

RM REMOTE RECORDING

Sound Reinf., Lights, Rental, Audio Recording
2528 Chamblee Tucker Rd.
Atlanta, GA 30341
(404) 458-6000
Contact: John Tyler, Lou Simmons

ROADDUCKS INC.

Sound Reinf., Lights, Rental
PO 2340
West Springfield, VA 22001
(703) 471-7612
Contact: Jay Nedry

ROADWORK PRODUCTIONS INC.

Sound Reinf., Lights, Rental
A5 135 Space Park Dr.
Nashville, TN 37211
(615) 331-0226
(615) 331-0229
Contact: Mike Morrison

ROSEMONT RECORDING STUDIO

Sound Reinf., Lights, Staging, Rental, Audio Recording
222 N. Tonti St.
New Orleans, LA 70119
(504) 821-8611
Contact: Al Taylor

ROXY PRODUCTIONS

Sound Reinf., Lights, Staging, Rental, Audio Recording
325 NW 99th St.
Miami, FL 33150
(305) 541-7699

(305) 758-3418

Contact: Ulises Otero
SOUND REINFORCEMENT
Touring Radius: Local, regional
Maximum Venue Size: 50,000
Vehicles: Several.

House Loudspeakers: 3-way/4th way Passive (proprietary cabinet design).

Flying System Available: Yes
House Consoles: Soundcraft, Yamaha.
Monitor Consoles: Yamaha, Soundcraft, Rane.
Outboard Equipment: Klark-Teknik/Rane EQs, Lexicon, REV7, dbx 160X and 166X.

Power Amplifiers: Crown Micro-1200 LX, Yamaha.
Microphones: Sennheiser, Shure, AKG.

Staging: All sizes.
Lighting: Lepracon, Zero 88 boards, high density dimmers w/ prengged trussing.
Rates: Call for quotes.

SAM'S TAPE TRUCK

Audio Recording
2785 Osborne Rd. NE
Atlanta, GA 30319
(404) 237-9075
Contact: Ruth Neil

SANDCASTLE RECORDING STUDIO

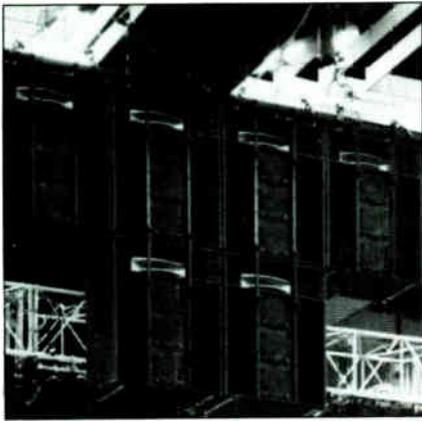
Sound Reinf., Lights, Rental, Audio & Video Recording
Wade Hampton Mall, Ste. 109
Greenville, SC 29609
(803) 235-1111
Contact: Christopher Cassels

SCENE THREE INC.

Audio & Video Recording
1813 8th Ave. S.
Nashville, TN 37203
(615) 385-2820
Contact: Dan Ross, Nick Palladino
REMOTE RECORDING
Vehicles: 45' semi-trailer w/ Peterbilt tractor, 18' Chevrolet step van
Control Room Dimensions: Audio 12 x 8, production 16 x 8, equipment 14 x 8.
Mixing Consoles: Harrison TV3 46-input, 8 stereo groups, 8 VCA groups, 4 stereo outputs, 4 mono outputs, 48-track assignment matrix.
Audio Recorders: (2) Studer A80s 24-track, (2) Studer A810s 2-track w/ center track time code, Revox PR99, digital upon request.
Noise Reduction Systems: Dolby A, dbx I and II.
Synchronization Systems: Adams-Smith 2600 AV audio editing system, (4) Adams-Smith 2600 synchronizers.
Outboard Equipment: (8) Valley People Gain Brain II, (8) Valley People Kepex II, (4) Valley People Maxi-Q, Vocal Stresser, (4) Valley People Dyna-Mite limiters, (4) dbx 160X limiters, (2) Lexicon Prime Time II, Eventide 969 Harmonizer, Lexicon 224XL, Lexicon 224, (3) Orban de-esser.
Microphones: (8) Shure SM58, (12) Shure SM57, (6) AKG 460, (2) AKG 451 including "V" tubes, (2) Neumann KM84, (4) Countryman direct boxes, (6) Sony ECM-50, (2) Sennheiser MK2, Sennheiser wireless system, (2) Vega wireless systems, various shotguns and capsules, 4-channel IFB.
Monitor Speakers: JBL 4312, Yamaha NS-10.
Power Amplifiers: Crown, Haller
Video Recorders: (3) Sony BVH-1100A, Sony BVH-2000, (2) Sony BVH-500.
Video Monitors: (2) Ikegami TM 20-8 RHN 20" color, (2) Ikegami TH 14-8 RHN 14" color, (2) Panasonic CT-1310 13" color, (8) Panasonic WV-5410 13" monochrome, (25) Panasonic WV-5300 9" monochrome.
Switchers: Ampex 4100 16-input, (2) M/E switcher.
Video Effects Devices: Ampex ADO, Ultimate 5 w/ Faroudja encoders and decoder.
Cameras: (4) Ikegami HK-302 w/ pedestals 20X and 25X lenses, (2) Ikegami HL-79 w/ Canon 13 x 9 lenses.

SERIOUSLY SOUND INC.

Sound Reinf., Lights, Staging, Rental
550C Amsterdam Ave.
Atlanta, GA 30324
(404) 872-0346
Contact: David Lowell, Paul MacDonald
SOUND REINFORCEMENT
Touring Radius: National
Maximum Venue Size: 15,000.
Vehicles: Van, truck, semi.
House Loudspeakers: Hill M-3 4-way, Renkus-Heinz Smart Systems.
Flying System Available: Yes.
Monitor Loudspeakers: Renkus-Heinz Smart 15/horn, Renkus-Heinz FRS Senes.
House Consoles: Hill I Series, Soundmix, Soundcraft, Yamaha.
Monitor Consoles: Hill M Series, Soundcraft, Yamaha.
Outboard Equipment: Yamaha REV7, Yamaha SPX90,



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Yamaha 1/3-octave EQ, Lexicon 200, Lexicon PrimeTime, Klark-Teknik graphics, Effectron 1024, 256, dbx 166, Valley People, Nakamichi cassette.
Power Amplifiers: Hill: 511, 701, 901, DX: 300, 500, 1500, and X1000, Crown Microtech 1000, Yamaha, QSC.
Microphones: Shure: 57, 58, 81; Sennheiser: 421, 441; AKG: 451, 460; E-V: RE20, PL88; wireless: Ne-Ty, Sampson, Catec Vega, Telex.
Lighting: Front and rear truss ISO instruments followspots and communications.
Other Equipment: Full inventory of stage equipment: CP70, 80 DX7, 21 TX rack, Mirage, Prophet 5; bass rigs: GK, SVT, Acoustic; guitar rigs: Gallin-Kreuger, Roland, Boogie, Fender; percussion: Yamaha, Tama, Simmons, Ludwig.
Rates: Call.

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Flying System Available: Yes.

Monitor Loudspeakers: (10) biamped floorwedges w/(2) Gauss 12" and JBL 239; horn each, (2) JBL 4663 sidefills w/15" JBL, JBL 237C and 240S.
House Consoles: Soundcraft 800B 32-channel 8 x 2 w/8 x 8 output matrix, various backup consoles available, Soundcraft and Trident.

Monitor Consoles: Soundcraft 500B 24 x 8 x 2. Various backup consoles available. Soundcraft and Trident.
Outboard Equipment: Orban 414A, (4) Klark-Teknik DN301 EQs, dbx 900 Series rack w/(4) 903 comp./limiters and (4) 904 gates, (2) Brooke-Siren 4-way X-over, cassette and CD decks, Lexicon PCM42 digital delay, Alesis digital reverb, Lexicon PCM7D, EXR Exciter, Harmonizer, 1/3-octave Real Time spectrum analyzer, (2) Klark-Teknik DN 360 1/3-octave EQs, (2) Left 602SK 2-way X-overs, Left stereo 3-way X-over.

Power Amplifiers: Crown Micro-Techs, ICGW 750s, QSC 3300, QSC 3500.
Microphones: Shure SM11, Shure SM57, Shure SM60, E-V RE20, Sennheiser 421, Sennheiser 431, Sennheiser 441, AKG 451, Crown P2M, HME SM57, 58, 85, ECM 150 wireless, C-ducer instrument pickup.

Staging: Top available for outdoor staging up to 50' x 40'.
Lighting: Consoles: (5) Rainbo 48 x 24, (5) Leprecon 36 x 12, EDI 36 x 2 etc., (72) EDI dimmers, (12) 8' section aluminum box truss w/(12) Alper 64s each, (16) 10' sections 30" triangular truss w/(6) Alper 64s each, (12) 10' sections triangular unloaded 24" truss, (6) bars of PAR64s also available.
Other Equipment: 250' 40-channel house snake w/50' 40-channel monitor rail, 100A power distributor w/lit Woodhead stage power outlet, Clear Com Communication System, full CM Loadstar rigging, (4) Spotlights/Altman and Ultra arcs, Leko, ACLs, backdrop, Cyc lights, special effects, Genie Super lifts, Super towers, and 30' steel towers.
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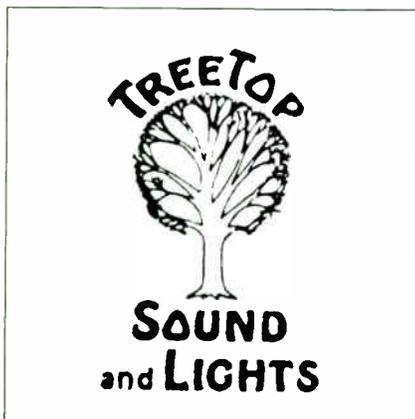
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 Flying System Available: Yes.
 Monitor Loudspeakers: Single 15" or dual 12" w/3" throat driver on lens or open JBL or DDS horn.
 House Consoles: Midas, Soundcraft, Yamaha, Audioarts.
 Monitor Consoles: Midas, Soundcraft, Yamaha, Audioarts.

REMOTE RECORDING and SOUND REINFORCEMENT



S O U T H E A S T

Outboard Equipment: REV7, dbx 900 racks, Klark-Teknik EQs, UREI EQs, Clear-Com, just about anything needed.
Power Amplifiers: Yamaha, SAE, Brooke-Siren X-overs, Crown.
Microphones: Shure, AKG, Sennheiser, Pro-Line and studio.
Staging: Would sub out.
Lighting: Double truss systems.
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 Touring Radius: National.
 Maximum Venue Size: 8,000-10,000.
 Vehicles: Semis and straight trucks.
 House Loudspeakers: (32) Front-loaded full range boxes w/JBL components, (2) 18", (2) 12", (2) bi-radials.
 Flying System Available: Yes.
 Monitor Loudspeakers: (24) E140 - 2425 biamped floor wedges, triamp drum side fill.
 House Consoles: Soundcraft 800B 40 x 8, Soundcraft 800B 32 x 8, Soundcraft 400B 32 x 4, Soundcraft 200D 24 x 4.
 Monitor Consoles: Soundcraft 800B 32 x 10, Hill Audio M Senes Three 32 x 10, Audioarts M44 24 x 8, Yamaha PM1000 16 x 6.
 Outboard Equipment: (2) Crown 1/3-octave Real Time analyzer, (2) UREI 537 1/3-octave graphic equalizers, (2)

UREI LH4 compressor/limiter, 10 dbx 160X compressor/limiter, Lexicon Stereo Prime Time, Yamaha REV7 digital reverb, (2) Yamaha SPX90 multi-effects processor, (4) Roland SDE-3000, Eventide H910 Harmonizer, Eventide FL201 flanger, (4) Loft 400 series noise gates, ART Q1A digital reverb, Roland SRE 555 chorus echo, Yamaha R1000 digital reverb, (8) Klark-Teknik DN-300 1/3-octave graphic EQs.
Power Amplifiers: (18) QSC Series Three 3800, (6) QSC Series Three 3500, (21) Crown DC-300 Series II, (4) Crown PSA-2.
Microphones: E-V RE20, Sennheiser 421, AKG C451, Shure SM57 and 58.
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Other Equipment: 40 x 30 roof.

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Touring Radius: Local, regional, national.
Maximum Venue Size: 10,000 seater
House Loudspeakers: Meyer, Martin.
Flying System Available: Yes.
Monitor Loudspeakers: Martin LE200, Biamp 2 x 12 + horn, JBL 4602.
House Consoles: Midas Pro 4 32 x 8 x 2, Yamaha PM2000, Yamaha PM700.
Monitor Consoles: Midas Pro 2 24 x 8, Soundcraft 400B 32 x 10.
Outboard Equipment: Yamaha REV7, Yamaha SPX90, Yamaha D1500, Lexicon PCM41, Lexicon PCM70, Eventide 910 Harmonizer, Roland S55 space echo, Yamaha R1000, Roland S2000 etc., Klark-Teknik DN27, DN30, 30, DN60, dbx 160X, 160, 165, 166X, BSS crossovers, Yamaha crossovers, UREI crossovers, JBL crossovers.
Power Amplifiers: Crown DC300A, Crown DC 750A, BGW 750, BGW 250, H&H FET 800V, H&H 5500D.
Microphones: AKG, Shure, E-V, Sennheiser, Calrec, Beyer.
Lighting: (120) PARS on bars of six, (12) Lekos, (8) ACL on bars of four.
Other Equipment: Rehearsal studios, A: 48 x 40 (20' ceiling), B: 24 x 12.

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Microphones: AKG C414EB, E-V RE20, (4) Sennheiser 421, (3) Sennheiser 431 ProflPower, (2) Sennheiser 421, (2) Shure SM57, Shure 565SD.
Monitor Speakers: Philips DeForest, Yamaha NS-10M, ART Audio BA-400 MKIII.
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—FROM PAGE 23, AMPHITHEATERS

neath the stage, from side-to-side and front-to-back, to run cables, so they don't have to run across the deck. Madonna's production manager was here last week. He walked out to the mix position and was surprised it was big enough, because traditionally, that doesn't happen. Usually it means you have to lose seats by making it bigger. The money people involved usually don't like that, but that's not what this place is all about.

"We don't follow the uniform building code which says you only need about 7½-square-feet of lawn space per person, because someone can't sit comfortably in that space. It just can't be done, so ours is based on over 11 square feet per person. It's important to Bill that this place be everything he wanted it to be, which is for the people and the act."

Providing amenities to touring companies and artists also rates a high priority at Starwood, a 15,000 capacity amphitheater co-owned by Pace Productions of Houston and Belz Investments of Memphis, and located just 15 minutes from downtown Nashville. "There are a lot of

things we do to accommodate the touring industry," beams executive director Stephen Moore. "We have a loading dock that can handle six semis simultaneously, six full dressing rooms with showers and lavatories, and two production offices with phones so guys on the road can do their work. Our maximum capacity for rigging is 80,000 pounds, with unlimited points. The performance area is 60 by 50 feet, with a 60 by 25 sprung wood stage, and the wings are 34 by 12 feet on each side.

"We're power crazy here," Moore adds. "We have over 1,200 amps of three-phase power immediately off stage right, and we have additional power we can pull to. We also have shore power available for the artist buses with four or five convenient parking areas with hookups. We're always trying to upgrade our facilities here: the artist is our most major concern."

At press time, Sandstone, near Kansas City, was in the process of adding another 3,600 seats to their already 16,000+ capacity, and amphitheater spokesman Dan Mayo agrees adequate electrical power is a major factor in the success of

any facility. "Our electrical service here is three 600-amp three-phase, transformer-isolated services, which means that when the David Lee Roth, Van Halen and Prince shows come in here, we don't have to go somewhere else for auxiliary power. We generally break up the power, putting lighting on two of the services and audio on the third, so we've got all the noisemakers isolated from the audio. There's an additional 200 amp service at the mix position, 119 feet out from center stage."

Mayo also feels the importance of well-designed loading facilities cannot be overemphasized. "We can back 45-foot trailers up to the back of the stage—which is loading dock height—and unload as many as six at the same time. On a couple of shows, we've had to do that, due to time restrictions. We did David Lee Roth's show, which played in La Crosse, Wisconsin the night before they played here, and his trucks arrived at 11 a.m. for an 8 p.m. show. Their normal call would have been six in the morning, but because of our access to the stage, they were able to get the show up and happening on time."

—George Petersen

—FROM PAGE 95, MUSIC NOTES

you'd be hoarse. What you heard was really it.

Mix: Did you look at recording as an art form back then, or was it just a means to get your songs out?

Little Richard: It was both. Music has always been an art form to me. It's my craft and it's an art. It's also a vehicle to show people the way they should live or could live. You can show people through music that you can get victory over drugs and that people should be more loving and kind towards each other. You're in a very vicarious position when you do what I do, and therefore you must use it for the right.

Mix: Did you use your own band back then or did you use session musicians?

Little Richard: Sometimes I used my own band and sometimes I used studio cats, and sometimes we mixed them.

Mix: Were all the early hits recorded at Cosimo Matassa's J&M Studio in New Orleans, or did you use other facilities?

Little Richard: We used different studios. Mostly in New Orleans, but we also recorded in Los Angeles and Washington, DC.

Mix: What were those early road tours like?

Little Richard: Most of it I can't even remember (laughs). Some of those things have really left me because my life has changed so. But I was never like people thought I was. I was never into a lot of what people thought I did. You know, people would see me dancin' and jumpin' all over the stage, but that was not my life. Back in those days my life was changed by the Lord and I've been with Him for many, many years. Most of those years are described in the book that I put out: *The Life & Times of Little Richard*. That book tells the whole truth about Little Richard.

Mix: Jimi Hendrix's first professional gig was in your band. What was it like having him as your guitarist?

Little Richard: Jimi was a great musician and a great person. He, too, was a God-fearing man. He would come to me and sometimes we would pray together. He was one of the greatest musicians I had ever seen. All of the technology that you see today with different effects and pedals, he did that with his hands. He was a genius in his own lifetime. He was the king of the guitar. He told me he wanted to

make his guitar sound like Little Richard sings.

Mix: Were you and Jimi friends after he became famous?

Little Richard: Yes, but I couldn't see him that much. They wouldn't let me get backstage and talk to him that much. I felt an impression from God to give him a message, but I couldn't get to him.

Mix: Will you tour again soon?

Little Richard: Yes, I'm getting ready now to tour all over the world.

Mix: Can we expect to hear the old hits like "Tutti Frutti"?

Little Richard: My band plays all my old tunes. They play everything. But I'll present the new. What I did in the past, that's been proven. Now I want to try something new. Have you ever wanted to attack something different in life? I want to see now if I can do this. The band is called The CIA and they are under the direction of Jesse Boyce and Travis Womack. They'll play everything. The people will be in for a surprise, and it'll be a good show. It will be an inspiration to everybody. Remember, Little Richard's music is what this generation needs to hear. ■



PHOTO: TODD ANDREWS

(Left) Westwood One engineer Biff Dawes mixing last year's Amnesty International benefit concert in the Concert Master mobile. (Above) Interior view of the Concert Master from the airlock position.



PHOTO: GEORGE PETERSEN

forward. Our engineer, Biff Dawes, has it completely worked out. As far as signals to and from the video truck, such as time code, sometimes they give us code, sometimes we give them code. Ultimately it's up to the video editor, how he wants to use audio. While the interface is a normal, routine part of our job, we don't take it for granted—we make damn sure that everything is right between us and the video truck. Some gigs are difficult because of the size, such as the Conspiracy of Hope shows at Giants Stadium, or Live Aid, or both Us Festivals. An enormous amount of work goes into making sure all interfaces go smoothly, which means a lot of pre-production work. We talk with the video people beforehand, to make sure our signals are straight; we're in the communications business, so we should communicate. Problems arise only when you don't communicate. We let them know what we're doing, and make sure we know what they're doing, because it all has to benefit the artist.

"For example, we carry our own snakes and stage boxes, but using them depends on what's the most beneficial to the show, such as from whom do we take our split. As a rule, we take it from the monitor mixer on stage, he gives us all the inputs from the mics. The thing is there are no schools that teach mobile recording techniques. It's real hard work, it's eating a lot of bad food, it's yelling at stage people, it's getting up early and staying up late, it's flying into some strange towns. Otherwise, all audio people should have a good working knowledge of how video operates, and the way video and audio operate together."

better sound. The video guys just don't understand how sophisticated you can get with the mix. Sometimes it's tough to convince them that you need more time for sound check. You wait all day while they set up and tweak the damn cameras, then you have 20 minutes to get a sound. I've found that sometimes, although you come off as a little harsh, you've got to fight for a decent check. It's better than having the client call three weeks later and say, 'We should have taken more time with the audio.'"

Westwood One

Based in Los Angeles, Westwood One has been recording on wheels since 1982 to complement their radio syndication business. Vice president of remote recording, Richard Kimball, says, "We have seven syndicated concert programs, so we record 200 to 225 shows each year. About 75% of our jobs involve interfacing with video. Many video shoots we do never see light of day, because the video producers run out of money along the way. We make our deals directly with the artist, or artist's representative. If video's involved, so be it."

Westwood One runs two large remote units—Concert Master One, a 45-foot semi based in L.A., and Concert Master Two, a 40-foot bus based in Cleveland. A smaller audio distribution unit, Concert Master Three (a restored GMC army bus), resides in Boston, and joins the crew for live-satellite broadcasts.

"The technical interface itself," notes Kimball, "is fairly simple and straight-

Midcom

"In the beginning, there were grounds. And then the world discovered that not all grounds were created equal." So intones Mike Simpson, owner of Midcom. The Midcom truck, based in the Dallas Communications Center, records 48-track audio around the country and was built specifically to handle audio for video. Simpson remembers, "In the past, video people pretty much hated to see an audio truck drive up. They knew as soon as that audio truck hooked up to them, they would not only have hum in their audio, but hum in their video. So when we built our truck, we went through a meticulous process of eliminating those problems. It really came down to one area: grounding."

"In any installation, you must consider at least three separate grounds: earth ground, truck or chassis ground, and signal ground. The trick is to keep them separate. When currents circu-

—FROM PAGE 125, FORUM

We brought in another of our monitors and our closed-circuit camera so we could see their video feed and also our overall shot of the stage. So if the cameraman changed shots, we still had something to look at.

"Another problem is ground loops. We provide all interconnection cables between the trucks, because sometimes the video trucks have their mic cable wired so the shield is tagged to the case of the XLR connector. That doesn't help when you're trying to maintain independent grounds between the two trucks. You can't lift the ground on the connector. The video guys aren't always as sophisticated about audio as they should be.

"Big video trucks have an audio person, who takes our feed and sends it to the VTRs. Typically the guy's fairly hip, but most of those trucks stay busy doing sports, not music, so they're not as critical about the sound quality. On location you always have to fight for

Mix Words

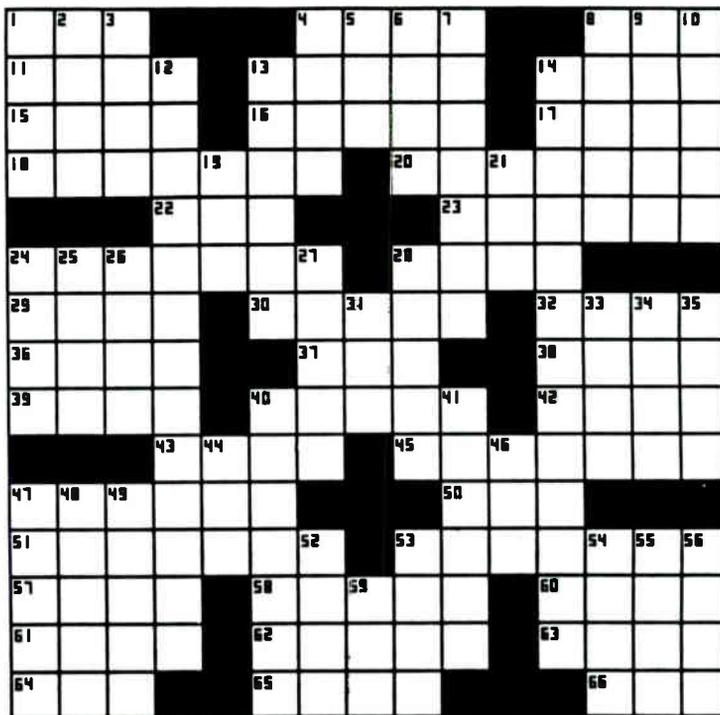
late on grounds, they manifest in the form of audio hum, or video hum, which shows up as a slowly creeping bar in the video. That drives any video person crazy. When we built the truck, every time we sunk a screw to hold in a panel, we touched an ohm meter to the head of that screw, to make sure it hadn't pierced metal and tied whatever we were screwing to the chassis ground of the truck. In addition, we also kept all the grounds in our truck—AC, chassis, signal, and earth—separate from a wiring point of view. We brought all these grounding 'paths' to a patch panel on the outside of the truck. So we can tie or lift any ground in any combination.

"In our typical setup, the video truck generates time code, since they have to feed their machines anyway. We take their code, run it through our distribution amps, if necessary clean it by reshaping or regenerating it, and then it goes to both 24-track machines and our 2-track machines. It also goes to our video machines, a 3/4-inch U-matic and a logging machine, which is a hi-fi VHS. We print the program feed coming from the video truck, and print our stereo or scratch mix on the two hi-fi tracks. It has two auxiliary tracks—on one we print time code, and on the other we print the intercom production party line from the video truck. When we've gotten called back for missing something, they'd say, 'You missed a cue!' and we'd play it back and say, 'Wait a minute, you never gave it to us!' We log all of our performances that way on the VHS, which we call our CYA recorder—for 'cover your ass.'

"We also carry three video monitors, two switchers, and video distribution amps, so we can access cameras, and various program or iso buses from the video truck. It lets us look at every camera individually, so we can see three different scenes at once, and we're not dependent on whatever they're switched to. We also carry our own closed-circuit video camera, usually for a wide shot of the stage for back-up. It's real useful in rehearsals.

"Finally, we carry humbuckers, which usually are found only in video trucks. It's a black box with a BNC connector in and a BNC connector out. We can patch any incoming video; in case there's video hum already being sent to us, we can strip it out.

"We do all of our troubleshooting before we get to the production, so we spend more time producing and less time tracking down problems," concludes Simpson. "The end result is, when we pull up at a venue, all we do is crank down our stairs, turn on the truck, run half a dozen cables to the video truck, and we *are interfaced!*"



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"FOLD THE SONE"

- ACROSS**
- Embassy pers.
 - Cartoonist
 - Record speed
 - Star-gazer
 - ___ del Sol
 - Ear storehouse
 - Wine town
 - Stellar movie company
 - Caucasus language
 - ___ power
 - In a lively manner (music)
 - ___ about
 - Pay wages
 - ___ from (originated)
 - Of an epoch
 - Guthrie
 - Rockabilly is this kind of music
 - Down ___ (Maine)
 - "___ Lange..."
 - Profit
 - Choir voice
 - ___ Geste
 - Hebrew holy scroll
 - ___ Islands
 - Ogle
 - Fixes wiring
 - ___ value
 - Laugh syllable
 - Synthesize
 - Like a synch track
 - Famed Yugoslav
 - One not welcome home
 - French composer
 - Sooner
 - "Take Me to the ___"
 - Resist dessert
 - Draft org.
 - Plant part
 - Papal ___
 - Leather workers
 - One to joust with
 - Republic writer
 - Eel
 - Synth circuit with complex output from 2 inputs
 - Ry
 - A circuit which stores an voltage for a brief time input
 - Highland headgear
 - One of the Hoggs of Texas
 - Scandinavian car
 - Correctly aligned
 - Fitzgerald
 - Organ ___
 - Ms. James and namesakes
 - Poetic above
 - Shipboard direction
 - "Shining ___"
 - Big rocks
 - Sits on the brink
 - Harmonica moniker
 - High note
 - Varnish component
 - Church practices
 - Arab princes
 - Locl
 - Theater sign
 - Type of sch.
 - Platform
 - Robert ___
 - ___ on (adore)
 - "___ Got a Crush on You"

Solution to May Mix Words



- DOWN**
- Quickly
 - Work well together
 - VCR format
 - Standard
 - "___ was saying..."
 - Greek portico

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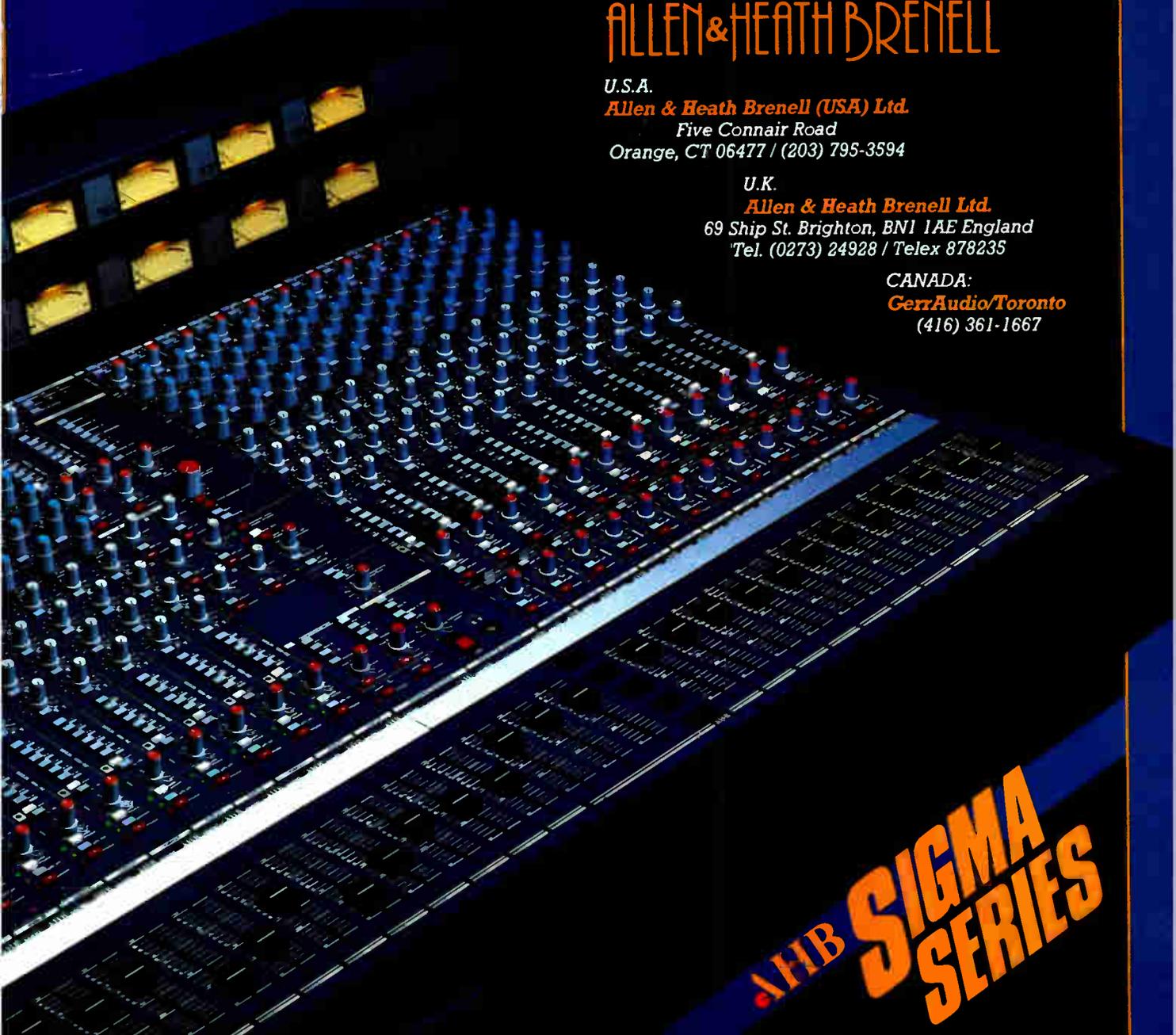
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