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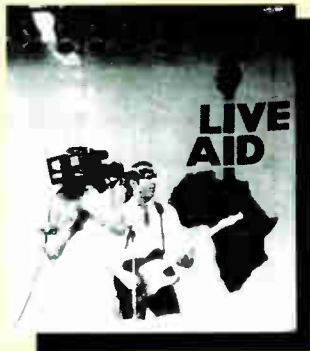
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This month's cover: Digital Services Recording in Houston, Texas. The facility is equipped with both analog (Otari MTR 90 II) and digital (Sony PCM-3324) 24-track recorders, a Solid State Logic 6000 series console, and the only Sony PCM-1610/DAE 1100 digital audio editing system in the state. The studio was designed by Russ Berger of the Dallas-based Joiner-Rose Group, and combines LEDE and RPG Diffusor technology. Photo by: John Henry Childs. Corner photo of Stevie Wonder by Mr. Bonzai.



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**A**t one time, recording schools

were looked upon by audio professionals as a second class way to enter the recording industry. The real prize employees were those who came in off the street with that surprising combination of talent and dogged persistence. Those were the ones who seemed to click with the artists and quickly rise to become the heavyweight engineers and producers.

Many studio owners used to think that recording schools and programs did more harm than good, giving the student an impractical education and presenting an unrealistic view of the industry and the job prospects.

Increasingly, though, the role of the educational institution in this industry has become more clear. As the technology of computers and digital audio has washed through the recording studios, that entry level engineering position (which might previously have required little more than the ability to answer a telephone, fetch sandwiches and learn quickly) now demands an arsenal of understanding. The job seeker who doesn't understand computers and programming, MIDI, basic acoustics, microphone techniques, music theory, audio and electronics, now finds a place much closer to the end of the line when it comes to applying for the "good" job openings.

As the professional stature and demands of our industry progress, this interdependence between schools and studios will increase, and it is essential that a strong dialogue continues between the two. Studios must let educators know what they need in the way of pretraining, so the schools can include future technologies of increasing importance in studio operations—such as advanced storage systems, CD-I and information management—and help to build the studio's ability base with well-prepared entry level employees.

In this, our annual education issue, we include listings of many of the training institutions that are supplying the talent pool for the engineers, producers and managers of tomorrow's industry.

Keep reading,

David M. Schwartz  
Editor/Publisher

# CURRENT

## **Philips/Polygram Form Joint CD-I Venture**

Polygram B.V. International and the Corporate Group Home Interactive Systems division of Philips International have formed a joint venture named American Interactive Media, Inc. (AIM) in order to initiate future joint venture relationships with companies to develop software for the new CD-Interactive systems.

AIM will be a primary early developer of CD-I, a format that can simultaneously integrate audio, visual and text/data functions for real time, interactive applications in areas of entertainment, education and training, and professional/industrial situations. The new company will seek out other organizations best equipped and technologically ready to produce original, marketable CD-I software. They will also assist in the design, development and production of software and consult on the marketing and distribution of CD-I titles.

Top management of AIM consists of Gordon Stulberg, chairman and chief executive officer, who also serves as president of PolyGram Corporation, USA, and of Balcor Entertainment Corp., and Dr. Bernard J. Luskin, president and chief operating officer, a former executive vice president and treasurer of the American Association of Community and Junior Colleges.

Other key vice presidential positions are held by Raymond C. Ashton, Susan R. Baker and Mark J. Fine. A former executive vice president of interactive videodisc specialists Systems Impact, Inc., Ashton will work with potential partners in the education, self-help and professional markets. Baker, who consulted on the production of prototype interactive videodiscs for North American Philips: Subsystems and Peripherals, Inc., will specialize in the commercial, training and professional markets. Fine has joined AIM to concentrate on entertainment applications for the CD-I system, after a stint at PolyGram Records as assistant to Russ Regan, the executive in charge of West Coast A&R.

AIM is headquartered at 11111 Santa Monica Blvd., Suite 700, Los Angeles, CA 90025, (213) 473-4136.

## **SMPTE Standards Group Formed**

A special task force composed of legal representatives from manufacturing and broadcasting companies has been set up by the Presidential Advisory Council of the Society of Motion Picture and Television Engineers to pursue the establishment of more timely domestic and international industry standards. Society President Harold J. Eady lauds the establishment of the task force as a step in the direction of hastening "the standards-setting procedures in light of all the new technology flooding the marketplace at such a rapid pace."

The most recent meeting of the task force considered issues including the Society's responsibility to the International Radio Consultative Committee (CCIR); the need for a composite standard; and the formation of one group to study small format recording and another to study cart machines. The task force can be reached for input through SMPTE offices at (914) 761-1100.

## **HDTV Clears EBU Committee**

The Technical Committee of the European Broadcasting Union (EBU), representing 28 countries, has unanimously adopted a position paper on the future of High Definition Television (HDTV). Their goal in establishing a single standard for the future of HDTV employs a specification in digital component form with a direct relationship to the parameters in CCIR Recommendation 601, which was agreed on by the CCIR (see above) in 1982. This potential worldwide standard is referred to as the 1125/60/2:1 system with 1920 samples/active line, as given in CCIR document 11/499, and specifies a 60Hz field frequency.

Two areas, beyond coping with the 50 Hz, 625-line European television transmission considerations, remain. The first is the feeling that an interlaced production standard may not

have sufficient headroom for the downstream processes associated with production or transmission which may be required for the television systems of the next 30 years. However, since a sequential studio standard is currently not practical without reducing the number of active lines below the 1000 considered as a minimum for HDTV production, the way forward with respect to this area of concern would be to plan for the production standard to evolve from an interlaced to a sequential member of a hierarchy as soon as this is both technically and economically practical.

The second area of concern arises from the plan of first establishing a production standard in isolation from the transmission standards. Until more is known about the precise nature of the means of broadcasting HDTV in Europe, it is not possible to assess fully the technical, economic or operational consequences which may result from a firm commitment to a production standard at this stage.

## **CompuSonics to Demonstrate Digital Video Recording**

CompuSonics Video Corporation, a partly owned affiliate of CompuSonics Corporation formed in August 1985, has announced their intention of demonstrating a prototype removable floppy disk-based digital video recording and playback system during the summer of 1986. Using the company's patented "CSX" digital video recording technology, CompuSonics anticipates the eventual development of a group of products that record, playback, edit and transmit digital video and audio data.

According to CVC president, John Stautner, the company is not currently planning to manufacture and market the systems. "Our plan is to demonstrate the validity of the technology in a number of applications, show it at major industry trade shows, and license it to those manufacturers who are equipped to manufacture digital video/audio recording and transmission systems."

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without 3-band EQ, plus mono mic/line inputs and master module with compressor/limiter. Other choices include a variety of monitor, talk-back, auxiliary, and communication functions. The 961 frame holds up to 14 modules, the 962 accepts up to 20.

Other new features in the 961/962 Series include improved extruded guide faders, balanced insert points, FET switching, electronic muting, Littlite® socket, and multi-frequency oscillator.

Thanks to its light weight, DC converter option, and sturdy transport cover, you can put a 961/962 mixer on the job anywhere. And, with Studer ruggedness and reliability, you can be sure the job will get done when you get there.

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# INDUSTRY NOTES

Bill Mead has been promoted to the position of director of special projects, Motion Picture Division of **Dolby Laboratories**. . . **Anne Whedbee** has been selected to fill the post of advertising manager at **Studer Revox America**. . . **Neil Muncy Associates, Ltd** has formed to consult in electroacoustic systems at 109 Fieldwood Drive, Scarborough, Ontario Canada M1V 3G3, (416) 298-3835. . . **Nakamichi U.S.A. Corporation** of Torrance, CA, has announced the appointment of **Michael Wuellner** as product specialist for the Professional Audio Division. . . **Invisible Products** of Cambridge, MA and the **Avedis Zildjian Company** of Norwell, MA has announced the formation of a joint venture to manufacture and market the patented line of Invisible keyboard and amplifier stands and accessories on a worldwide basis. . . **Stefan Kudelski** was presented with the Loren L. Ryder Award for outstanding technical contributions to the field of motion picture sound at the recent **Lyra Awards**. . . **Rick Hoffman** has been named operations manager of the **CFI Videotape Facility**, in Hollywood. . . **Abe Hoch** has been appointed to serve as vice president of marketing at **Audio Analysts USA Inc.**, in Plattsburgh, NY. . . The **University of Colorado at Denver**, College of Music has announced a **Media/Studio Orchestra Composition Contest**, seeking unpublished music composed for a contemporary studio orchestra. Winners get cash prizes and have their works performed by the **Denver Symphony Orchestra**. Call (303) 556-2727 for more details. . . **Ron Strom** has joined the **Music Source** recording studio in Seattle as marketing director. . . **Spectrum Planning, Inc.**, of Richardson, TX, has acquired the Washington D.C.-based **Pyramid Video, Inc.**, and installed **Dr. Indu Singh** as president of the operation. . . **Advanced Music Systems**, of Burnley, England, recently presented with The Queen's Award for Export Achievement 1986, has appointed **John Gluck** to take over sales coordination of the company's product range. . . At **Grace and Wild Studios**, in Farmington Hill, MI, **Mary Cleary** has been promoted to director of marketing, **Sheldon Brown** has been named technical operations supervisor and **Keith Neff** has been promoted to vice president and general manager. . . **Soundtracs**, of Surrey, England has added **Simon Phillips**, formerly with ITA, to their technical sales team. . . The **San Francisco Blues Festival**, which claims to be the country's oldest ongoing blues festival, will take place Sep-

tember 13 and 14 at Fort Mason. The **SFBF** employs a performer-sponsorship program that allows companies and individuals to sponsor a performer or act. Call (415) 826-6837 for details. . . **Electro-Voice, Inc.** has undertaken the distribution of **University Sound** commercial sound loudspeakers and accessories. . . **Pristine Systems, Inc.** has expanded the distribution system for its **Recording Studio Management System** computer software to include **Westec Audio/Video Ltd.** in New York City for the eastern U.S. and **Editron**, in Melbourne, Australia. . . **Modern Visual Communications** has opened a comprehensive electronic art museum designed to feature multi- and single-monitor video works, computer-generated art, holography and other forms of electro-art, located at 7229 Melrose Ave. in Hollywood. . . **New England Digital Corporation**, manufacturer of the **Synclavier Digital Audio System**, has appointed **Mark Terry** as director of marketing. . . **JBL Professional** has picked an artist advisory board to develop and test new products. Members include **Duane Eddy, Allan Holdsworth, Steve Howe, Chuck Rainey, Keith Emerson** and **Herbie Hancock**. . . The **Sony Video Utilization Service** has changed its name to the **Sony Institute** and is now offering a large number of television and video related workshops throughout the country. Call 1-(800) 662-7669 for info. . . The **Society of Motion Picture and Television Engineers (SMPTE)** has announced a call for technical papers for presentation at their **Technical Conference and Equipment Exhibit** to be held October 25 through 29 in New York City. Call (914) 761-1100. . . **Fred Muhl** has been appointed general manager for **ElectroSound's** West Coast facility in Los Angeles. . . **SHAPE Inc.** has announced the appointment of **William W. Peck** as division manager for **SHAPE Optimedia**, the Compact Disc manufacturing division of the company. . . **Shelley A. Herman**, formerly with **Coast Recording Equipment Supply** in Hollywood, has joined **BGW Systems, Inc.** as sales manager. . . **Pegasus Studios, Ltd.**, a \$1.5 million, 11,000 square foot sound recording studio is being built at **Gasden Station**, a new business park for the entertainment industry in construction near **Tallahassee, FL**. . . **Jim Rhodes** has been appointed audio product manager in **Lenco's** Electronics Division. . . **Collins and Lang Broadcast Productions** has opened a new recording studio and offices at 156 Battery St., in **Burlington, VT**. . .

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# S E S S I O N S

## NORTHWEST

At *Moonshine Studios* in Camptonville, CA the former Supertramp studio had **Keith Gaudette** laying tracks for the forthcoming *Anaconda* project, with **Chris Takacs** engineering and producing. . . **Cobalt Blue**, the working title of **Randy Hansen's** new band, finished recording 12 songs at **Steve Lawson Productions** in Seattle. **Terry Date** was the engineer. . . Activity at Sacramento's **SwingStreet Studios** included **Tommy Tutone** tracking his newest project with producer **Craig Livaich** and engineer **John Baccigaluppi**. . . **Chris Wilson** was in at **Jopheir 12 Studio** (Los Gatos, CA) working on new material for his upcoming LP with **Colby Pollard** at the board. . . The **New Santana Band** was in at **The Plant** (Sausalito) working on the final cut for their next album on CBS Records. Engineering the project was **Jim Gaines**, assisted by **Robert Missbach**; **Carlos Santana** producing. . . **Ducks Breath Mystery Theatre** began working on their newest comedy album engineered by **John Altmann** and produced by **Dan Koffee** at **Dave Wellhausen Studios** in S.F. Also, **Alex Dodkin** and **Nancy Vogl** both completed their latest projects, with **Woody Simmons** as engineer. . . **Non-Fiction** completed mixdown of their album project at S.F.'s **Sound & Vision** with engineers **Mike Molenda** and **Neal Brighton**. . . At **Fantasy Studios** in Berkeley, **Frankie Beverly & Maze** completed mixing their new album for Capitol Records. Beverly produced and **John Nowland** engineered, with **Dave Luke** assisting. Also there, the **Kantner, Balin, Casady Band**, recently signed to **Arista Records**, have started an album. **Jim Gaines** is co-producing the LP with the band. Gaines is engineering with **Bob Missbach** and **Dave Luke** assisting. . . Jeff Finder's **Syntonos Recording** in Berkeley had Bay Area composer **Josef Marc** mixing *The Nine Planets*, for a premiere in Madrid. . .

## NORTH CENTRAL

I.R.S. recording artists **R.E.M.** recorded their fourth LP, scheduled for August 11 release, at **Belmont Mall Studios** in Bloomington, IN. Producer was **Don Gehman**; engineer, **Greg Edward**. . . **ARS Recording Studio** (Alsip, IL), went mobile to Chicago's Civic Opera House to record the **Soul Children of Chicago** for a live album. Co-engineers were **Gary Cobb** and **Harry Brotman**. . . At **Sea-grape Studios** in Chicago, **Tom Baldacci**

and **Morris Foster** of **True Democracy** have begun work on an album with **Tom Haban** engineering. . . At **Sparrow Sound Design** in Chicago, **Bill Payne** completed his sound design for the **Body Politic Theatre's** latest production, *The HitchHikers*, with **Sparrow** as engineer/editor. . . Engineer **Goh Hotoda** was in at **Tone Zone** in Chicago with rising artists **Skylyne**, mixing tunes for the group's new album, which is being produced with the assistance of **Tom Tom 99**. . . At **Gnome Sound** in Detroit, Island/4th and Broadway recording artist **Mildred Scott** continued recording material for her *Prisoner of Love* album with producers **Bruce Nazarian** and **Duane Bradley**. . . Engineer **Barry Mraz** (engineer for Styx and the Ohio Players) was back at **Paragon Studios** in Chicago mixing **Sandy Torano's** latest project titled "Hollywood" . . .

## SOUTHERN CAL

I.R.S. artists **Timbuk 3**, a street-singing duo from Austin, TX, recently completed their first album, self-titled, at the **Dust Bowl Studio** in Hollywood. Producer was **Dennis Herring**. . . **Dan Fogelberg** was in **One On One Studios** in No. Hollywood tracking his new LP with co-producer **Russ Kunkel**; **Niko Bolis** engineering, with **Toby Wright** assisting. Also **Rod Stewart** was in tracking with **Bob Ezrin** producing and **Paul Lani** engineering. **Jeff Bennett** was assisting. . . **One Nation** has been in at **Devonshire Sound Studios**, No. Hollywood, recording their debut album. The group is being produced and engineered by the **Schmitt Boys**. . . At **Sunset Sound** in Hollywood, **Prince** has been mixing material for record singles and movie release, with **Coke Johnson** engineering. And protege **Sheila E.** was in laying tracks for an album with **Coke Johnson** and **David Rivkin** engineering. . . At **World Soundworks** in Burbank, **Fay Hill** was in recording her upcoming album with **Dale Atkins** producing, **Arthur Wright**, **Julian Morgan** and **Scott Ross** engineering. . . At **Monterey Studio** in Glendale, Motown artist **Chico DeBarge** was in recording vocals for his upcoming album; **Skip Drinkwater** and **Nick Munday** producing, **Larry Hinds** engineering with **Bruce Chianese** and **Gregg Scott** assisting. Also, Grammy winner **Ernie Watts** has been recording tracks for his upcoming Quest/Warner release, with veteran producer **Don Grusin** and **Geoff Gillette** at the board. Assisting is **Greg Scott**. . . MCA Records has three projects in the works at **Encore Studios** in Burbank: **Steve Dorff** producing *Dream*

*Team* with **Taavi Mote** and **Jim Dineen III** engineering; **Louil Silas, Jr.** and **Chuck Gentry** producing **Giorgio**; and the group **Love & Hate** producing themselves with **Jim Dineen III** engineering. . . At **Preferred Sound** in Woodland Hills, **A Drop in the Gray** has been working with producer **Gordon Fordyce** and engineer **Bill Thomas** on overdubs for the group's second LP. . . In at **Soundcastle** in L.A., was **Paul DeVilliar**, producing; **Scott Singer**, engineering/mixing **Mr. Mister** for Lorimar Pictures with **Marc DeSisto** assisting. Also in was **Jay Graydon**, producing; **Dennis MacKay**, engineering/mixing the **El DeBarge** project for Motown with **Bino Espinoza** assisting. . . **Con Funk Shun** (Polygram) was recently in at **Galaxy Sound Studios** in Hollywood mixing a new project with producer **Leon Ware** and engineer **Reggie Dozier**. . . At **Artisan Sound Recorders** in Hollywood, disk mastering engineer **Greg Fulginiti** recently mastered albums by **.38 Special** with producer **Keith Olsen** on A&M Records; **Krokus** with producer **Tom Werman** on Arista; two **Jimi Hendrix** LPs produced by **Alan Douglas** on Capitol; and more. . . Producer **David Kahne** was in at **Craig Harris Music** in Studio City for remixes on **The Bangles** "If She Knew What She Wants" single. . . **Roger Nichols** returned from Hawaii to add the finishing touches to the new **John Denver** album (RCA) recently recorded at **Amigo Studios** in No. Hollywood. . .

## NORTHEAST

I.R.S. artists **Beat Rodeo** completed their second LP, entitled *In the Heart of the Beat*, at **RPM Studios** in New York with producer **Scott Litt**. . . The **Le Mobile** remote truck recorded **Rush** live in concert at The Meadowlands in New Jersey, at the Nassau Coliseum on Long Island, and in Springfield, MA. The truck then moved on to Vermont to begin recording the second "reunion" album by **Deep Purple**. . . At **Quad Recording**, NYC, **David Sanborn** was in mixing a song for his new Warner Bros. album. It was engineered by **Mike Hutchinson**, produced by **Sanborn** and **Marcus Miller** on select cuts. . . At **Cove City Sound Studios**, Glen Cove, LI, **Joanie Peltz** did vocal overdubs for her Elektra LP with **Sandy Pearlman** producing and **Paul Mandl** at the console. . . Singer **Jane Ross** was in at Queens, NY's **Inner Ear Recording** with songwriter/producer **Pierre Hillaire** cutting two new tracks for Ross' reel. **Steve Vavagiakis** engineered. . . The biggest recent project for **Northeastern**

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And not just reverb, but a full range of studio effects. All very controllable. All in the new Yamaha REV7 digital reverb. And all for only \$1,295.\*

How did we do it? By analyzing the early reflections and subsequent reverberations of actual environments to see what gives reverb its natural character and richness. And then using specially developed LSIs to handle this immense amount of information and the high processing speeds required to effectively simulate natural reverb.

The REV7 has 30 factory preset programs permanently stored in its ROM. These presets include large and small hall, vocal plate, gated reverb, reverse gate, early reflections and stereo effects such as chorus, flanging, phasing and echo.

And each of the presets incorporates up to seven user-programmable parameters which can be edited and then stored in RAM.

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Programming is easy because of the REV7's logical front panel layout which gives you instant access to all functions and

the LCD readout panel which tells you at a glance the name of the program and the edit parameter selected.

So besides the 30 presets, you can store up to 60 of your own programs in the REV7's RAM. All available for recall from the front panel or the hand-held remote.

The REV7 features electronically balanced XLR input and output connectors. And balanced TRS phone jacks which will accept standard phone plugs. Both stereo and mono inputs can be connected producing, in either case, a simulated stereo reverb output.

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Realistically speaking, there's no finer digital reverb at the price on the market today than the REV7. Available now at your Yamaha Professional Products dealer.

For a catalog explaining all the features and capabilities of the REV7 digital reverb, write: Yamaha International Corporation, Professional Products Division, P.O. Box 6600, Buena Park, CA 90622. In Canada, Yamaha Canada Music Ltd., 135 Milner Ave., Scarborough, Ont. M1S 3R1.

\*Suggested U.S.A. retail price. In Canada, \$1,995 CDM.

Circle #005 on Reader Service Card



*Digital* in Boston was the mastering of ten Compact Discs of Frank Zappa's music to be released on the Rykodisc label. **Toby Mountain** handled the editing and formatting for CD. . . Ecologically-oriented Maine has mobilized its musical forces to oppose a federal proposal to consider Maine as a site for a nuclear waste dump. Recently, over 30 of the state's most popular musicians recorded "Yes We Can" at **EAB Studios** in Lewiston, in a "We Are The World"-style effort to raise money to finance publicity, legal and scientific research against the Department of Energy plan. Basic tracks were recorded by **Ed Boucher** and finished at Maine-native **Lou Gonzales'** 48-track **Quadrasonic Sound** studio in New York City. . . At **Sheffield Audio-Video** (Phoenix, MD) **Nils Lofgrin** has been working on some new material for his new album with **Bill Mueller** engineering. . . **Bruce Forest** was in **Power Play Studios** (L.I.C., NY) doing numerous re-mixes, one of which was the new *Princess* record for next Plateau Records. **Julian Herzfeld** engineered. . . Reggae artist **Freddie McGregor** completed his ninth album, *All in the Same Boat* at **Lion & Fox Recording** in Washington, D.C. It was produced by **Dr. Dread** and engineered by **Jim Fox**. . . **Blank Tapes Recording** in NYC has **Ashford & Simpson** doing vocals on their new album. **Stevie Wonder** stopped in to do a harmonica solo. **Joe Arlotta** engineered. . . At **Evergreen Recording** in NYC, **Rob Stevens** was in producing and engineering *Parr-3* for One Stone Productions. **Carol Martino** assisted. . . Singer/songwriter **Felix Cavaliere** (of Rascals fame) has been at **Sountec** in Norwalk, CT, working on some new material. **Alan Gorrie** (from the Average White Band) co-wrote lyrics and produced one of the three songs with **Ron Bacchiocchi** engineering the sessions. . . At **Joe's Recording Studio**, Trenton, NJ, clients have included **Heathens Rage**, a five-man power metal group. . . At **Recording Studios and Production Services** in Pittsburgh, audio post-production for video on five new shows for **Mr. Roger's Neighborhood** was completed. . . At **Dreamland Recording** in Woodstock, NY, King Crimson veteran **Tony Levin** produced initial tracks for the upcoming **Pamela Golden** album for Park Avenue Productions with **Mark Mandelbaum** at the board and **Dave Cook** assisting. . . **The Sun Group**, the NYC-based audio production company, has tagged **Curtis Hucks** as its new chief engineer. Curtis most recently handled engineering duties at the **Hit Factory** as well as **Big Apple** and **Celestial Recording Studios**. . . **39th Street Music** in NYC is up and running after complete renovation of the control room featuring the SSL 4000E. **Ashford and Simpson** continued recording an upcoming LP there, with **Tim Cox** engineering and **Sue Fisher** assisting. . .

## SOUTHEAST

"It's Time for a Change (Let's Do It)" b/w "It's

a Standoff" by **Allen Toussaint** was engineered and mixed by **Clarence R. Toussaint** and **Bob Kearney** at **Sea Saint Recording Studio** in New Orleans. . . At **New Age Sight & Sound** in Atlanta, soul man **Solomon Burke** recorded a new album, engineered by **Bill Allgood**. Also, **Vance Taylor**, former keyboard player for Peabo Bryson, will be coming out with his first 24-track digital solo album engineered and produced by **Elliott Glen**, assisted by Bill Allgood, **Mitchell Dorf** and **Jason Bonnette**. . . At **The Castle Recording Studio**, Franklin, TN, producer/engineer **Steve Churchyard** did overdubs and mixed tracks for MTM Records' artist **In Pursuit** with **Keith Odle** assisting. Also, producer **Barry Beckett** was in mixing **Hank Williams Jr.'s** new Warner LP with **Scott Hendricks** at the board and Odle assisting. . . Recent activity at **Southern Tracks Studio** included album tracks for a **Holly Woods** LP with **Sonny Limbo**, **Doug Johnson** and **Steve Nathan** producing, Johnson and **Greg Archilla** engineering. . . At **Hummingbird Studio** in Nashville, Reunion's **Billy Sprague** cut tracks, overdubs, and vocals for his new LP. **Reed Arvin** produced with **Mike Psnos** engineering. . . **Treasure Isle** in Nashville had **Louise Mandrell** in with producer **R.C. Bannon** and engineer **Bob Bullock**. **Paul Worley** and **Marshall Morgan** have also been producing the **Nitty Gritty Dirt Band** there. . .

## SOUTHWEST

Recent album projects at **Studio Southwest** in Dallas included **David Byrne's True Stories** soundtrack, the forthcoming album by **Johnny Nash**, Grammy nominees **Douglas Miller** and **Leslie Phillips**, and a Texas Blues Compilation album including such famed guitarists as **Willie Nelson**, **Jimmy Vaughn** and **Johnny Winter**. . . At **Rivendell Records** in Pasadena, TX, engineer **Paul Mills** and producer **Kemer Crabb** put the finishing touches on the *Man of Steel* album for **Dennis Welch**. . . **Martin Recording Company**, in El Paso has finished mixing tracks for country artist **Bucky Allred**. . . Goings on at **L.A.W. Studios** in Las Vegas included Warner Bros artist **Lynn Roman** in studio A cutting vocals and mixing her upcoming release with engineer **Lee Watters**, assisted by **Holly Sharpe**. . . **Rich Williams** and **Jim Abbott** recorded a live-to-digital 2-track project at **Goodnight Dallas** on the Sony 501ES PCM system. Williams composed original material for the session engineered by **Ruben Ayala**. . .

## STUDIO NEWS

**Juniper Recording Studios** in Burbank has now added video sweetening equipment to

its facility. They currently have the Adams-Smith controller, three synchronizers (to control three different machines), a Sony 5850 with address track head (full edit insert), and more. . . **Producers Color Service**, Southfield, MI, has opened their second audio post-production suite. The suite is built around the SSL 6000E Stereo Video System. . . **Music Annex**, the Menlo Park, CA-based studio complex, is opening two studios in San Francisco to augment their existing facilities. According to David Porter, president of Music Annex, "Music Annex San Francisco will cater to clients requiring top quality audio production for radio, advertising, and corporate presentations. In addition, our larger room, Studio One, will be configured to offer complete audio post-production for video with automated 24-track mixdown direct to one-inch C format video masters." . . **Gravity Recording** in Nogales, AZ, has taken delivery of a 36-input Neve "V" Series console. . . **Island Studios** in Richmond, VA, has recently changed format, from 16- to 24-track with the addition of a new MCI/Sony 24-track recorder with an AL-III Autolocator and an Allen & Heath EX-8, an 8-channel expander unit for the 2416 console, bringing the total number of inputs up to 32. . . **Studio A** in Dearborn Heights, MI, has expanded the Synclavier Digital Music System with the new velocity/pressure sensitive keyboard, MIDI and SMPTE. . . Fred Zarr and BiZarr Music, Inc. are pleased to announce the opening of **Z-Studio**, a 24-track recording facility in Brooklyn, New York. The studio was designed by Alan Fierstein from Acoustilog, Inc. The equipment includes a Studer A80 24-track recorder, an MCI 400B console (with automation) and an assortment of outboard equipment. . . **Studioeast** in Charlotte, NC, is delighted with their new Studer A-80 24-track machine. . . **Toby's Tunes** recently obtained the new Q.Lock Eclipse computer system for audio sweetening. . . **United Recording Studios** in Kansas City have taken delivery of a new Steinway Model L grand piano as well as a Yamaha REV7 digital reverb and Yamaha RX11 digital rhythm programmer. . . **TeleScene Audio** in Salt Lake City now boasts full post-production audio sweetening capability to augment its film and video divisions, with the addition of an Otari MTR-90 16-track and Audio Kinetics Eclipse synchronizer/editor. . . **Master Control** in Burbank has added a pair of Lynx TimeLine synchronizers to add 48-track capabilities to their newly SSL-equipped room. . . **39th Street Music** in NYC has just re-opened its newly renovated control room. The new installation includes the SSL 4000E Console, Publison's Internal Machine 90, Drawmer Gates, Lexicon's PCM70, and more. . . **Gate Five Studios**, a new 16-track recording studio and rehearsal hall has opened in Sausalito, CA. The building at #2 Gate Five Road, was completely renovated, rebuilt, and designed by Dr. Richie Moore. It features a 16-track Ramsa console, the Otari MX 70 deck, and a full array of outboard gear and microphones.

# The producer's choice . . .



AMEK ANGELA  
M42 OBJ 28/24

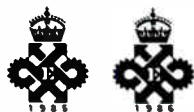
Maybe it is AMEK's reputation for reliability. Or maybe it's the ANGELA's wide variety of frame configurations and the ease of access to all of the console's controls. Or it could be the fact that an ANGELA gives you all of the features of a computerized console without the excessive cost. The real reason AMEK has supplied so many ANGELAs to today's leading producers is its outstanding sonic quality.

A truly talented producer realizes that the bells and whistles on a console do not make a hit. It is the sonic quality, ease of operation and the really usable features which allow you to reach your creative goals. All ANGELAs feature dual signal paths through each module, so with just a 28 input ANGELA, you can have as many as 68 possible line inputs. ANGELAs are available with up to 62 inputs with 48 track routing and full metering!

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ergonomic layout have also made them very popular with On-air broadcasters and post-production facilities. The availability of stereo modules and such standard features as the stereo analog sub-groups with three modes, in-place solo in the monitor and channel, and mute grouping give the ANGELA automation-like operation at no additional cost. And, any ANGELA is readily automatable, now or when the need arises, with any of the popular automation systems.

Audiophile performance, AMEK reliability and value, and configurations to fit any requirement have made the AMEK ANGELA the choice of the producers with the "golden ears." Drop us a line, or give us a call . . . we'll drop a few names of satisfied ANGELA owners. It really is the producer's choice.



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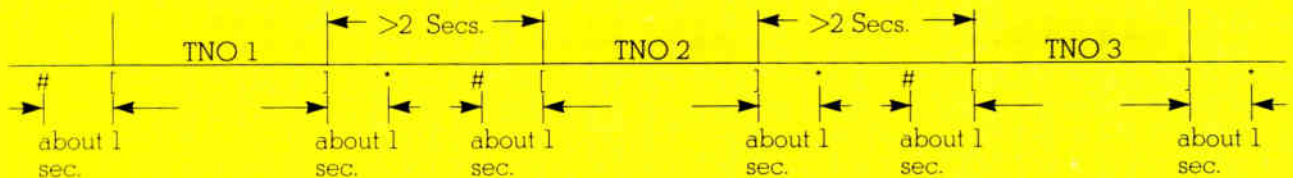
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# AMEK

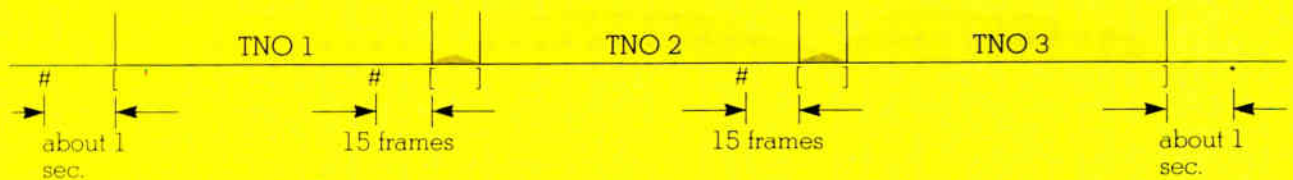
# INSIDER · AUDIO

# — Access-Begin Point  
 \* — Access-End Point  
 [ — Actual Begin Point  
 ] — Actual End Point

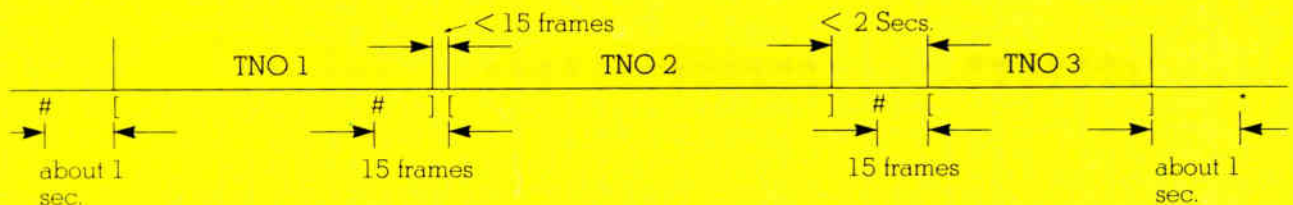
Track blank is over 2 seconds



Crossfade (No Access-end point on TNO 1 and 2)



Track blank is less than 2 seconds (No Access-end point on TNO 1 and 2)



**FIGURE 1**

## CD Pre-Mastering

by Ken Pohlmann

As everyone knows, CD-Audio, CD-ROM and CD-I are about the hottest properties in this part of the universe. Within a decade, the world's factories could be cranking out three or four million discs every day. Of course, any CD is only as good as its master tape. Which brings us immediately to this month's topic, by popular demand: a tutorial on CD-Audio pre-mastering.

Okay, you've got a tape recording, and you need 10,000 Compact Discs from your friendly U.S. pressing plant.

Before you even think about CD production, make sure your tape is up to the job. Always use the original master, not a version equalized for LP, or a safety copy. If the master is of poor quality, maybe you should consider remixing. If possible, locate the original equalization settings; if they were used to compensate for LP deficiencies, new equalization should be considered. If the master is digital, avoid any transfer to the analog domain; equalize digitally if possible.

Now, there are exactly two ways to proceed. You can send in a goofed-up

tape and wait forever, and pay extra. Or you can send in a properly-prepared tape and wait for only a very long time. Naturally, the latter is the lesser of two eternities, and cheaper. To achieve a properly-prepared tape, you must first remember the cardinal rules of CD pre-mastering:

1. Sampling rate must be 44.1 kHz.
2. Tape format must be 3/4-inch U-matic NTSC standard.
3. Time code must be SMPTE 60 Hz Non-Drop Frame time code.
4. Time code must be synchronized to the NTSC video signal.
5. Time code should run continuously and uninterrupted. Code should not cross over 00 hours,

—CONTINUED ON PAGE 16

# EARLY REFLECTIONS

Engineers talk about their new discovery: the Ibanez SDR1000 Stereo Digital Reverb



"The combination of performance and value is great! Rather than exhausting your entire reverb budget on one high-end unit, you can have a rack full of these. This puts many different environments at your disposal".

Jan Hammer: Jan literally has done it all. He came to public attention trading leads with John McLaughlin and the Mahavishnu Orchestra. Jan then released a series of LP's as a soloist and with his group "Hammer". Afterwards, Jan toured with the Jeff Beck Group, cut an LP with Neil Schon, and started composing for TV and movie soundtracks. Jan's most recent work for the "Miami Vice" TV series has won him even wider critical acclaim. Jan's soundtrack LP from the series won a Grammy in 1985.

"The SDR1000 is a great unit! To call it a digital reverb is too one-dimensional because of its across-the-board capabilities. It's the most cost-effective processor we have in the studio."

Lance Quinn/O.B. O'Brien: Lance and O.B. have been extremely busy since opening the Warehouse Studios. Some of their most recent credits include Bon Jovi's "7800 Degrees" gold LP, Lita Ford's "Gotta Let Go", Nils Lofgren's "Flip Ya Foot" and the first album by Cinderella.

"For today's mixes, where I use as many as 10 separate reverb units, the SDR1000 is an extremely effective, flexible tool for a wide array of effects. The reverb algorithms give smooth, fat sounds that work great, whether they're used for large chamber or small room sounds."

Ed Thacker: Ed is one of the most sought-after free-lance engineers on the west coast. Ed has worked on Glen Burtnick's "Talking In Code" LP and Glass Tiger's "Thin Red Line" album. Ed also engineered the soundtrack for the movie "Goonies", including Cindy Lauper's track "Good Enough".

The SDR1000 Stereo Digital Reverb is a true dual-processor that delivers strikingly warm, full reverb sounds. 30 factory presets, created by top-chart engineers, and 70 user presets put a virtual sonic universe at your fingertips. Fully programmable (there's even a programmable on-board EQ!), the SDR1000 has easy-edit sound

creation software and MIDI-controlled patch recall to make it the "friendliest" reverb processor with this much flexibility. So whether you need a true stereo processor or two distinct reverb sounds simultaneously, the SDR1000 deserves your serious reflection—at your Ibanez dealer now!



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World Radio History

# CLEAR REASON

**For the music studio owner, no decision is more critical than choosing a console.** Both financially and creatively, the success of your operation may well depend on the capabilities and quality of the system you select, and the company that supports it. Clear reason, we suggest, to consider the SL 4000 E Series Master Studio System from Solid State Logic. But certainly not the only reason.



plus switchable phantom power, patchfree audio subgrouping, AFL and PFL monitoring, fader start for external devices,

and stereo modules with balance and Image Width controls. Consider, for instance, that only SSL has built-in track remotes on every channel, integrated with the industry's most versatile monitor fader and foldback facilities. Or that SSL alone provides pushbutton signal processor routing for each channel's noise gate and expander, compressor/limiter, high and low pass filters, and parametric equaliser —

and stereo modules with balance and Image Width controls.

Consider that SSL makes the industry's only comprehensive studio control system — with integral synchronisation of up to five audio/video machines,



concise English commands, tape location by timecode, foot/frames, cue numbers or key words, and complete session list management. And that SSL alone offers extensive fader, group and mute automation and mix manipulation *plus* optional programmable parametric equalisation and panning, multi-repeatable Events Control, and Automatic Dialogue Replacement.



## —CONTINUED FROM PAGE 14

- 00 minutes, 00 seconds, 00 frames.
- 6. Time code should be recorded on analog track #2 of the U-matic tape.
- 7. Record digital mute with time code for a minimum of one minute before the first track and 1 1/2 minutes after the last track.
- 8. A minimum of two seconds must be allowed for emphasis changes between tracks.
- 9. Prepare a list that is frame-accurate to locate beginning and ending points.
- 10. Prepare a guideline of spurious noise information that indicates any unusual noises, or general notes regarding the quality of the recording.

While the pertinent facts are contained in the cardinal rules, some points merit reiteration or discussion. The *ex officio* standard equipment for CD mastering is the Sony PCM-1610/30 format, 44.1 kHz sampling rate, using a 3/4 U-matic video recorder such as the Sony BVU-800 or VO-5850. Before beginning, examine tape, and tape machine. Choice of tape is crucial; Sony KCA-60BRD and 3M Color Plus U-matic tapes have received high marks from users. Audition your re-

ording carefully, paying special attention to phantom drop-outs, caused by loose particles moving around the tape. Check the VCR for dirty heads or tape path, worn heads, and mechanical alignment.

Whatever the nature of your master, the CDs will be cut from a U-matic tape. To prepare your own tape, the time code should first be recorded on channel 2 of the analog track at 0 VU,  $\pm 3$  dB on the VTR meter, non-drop frame (i.e. full frame), on a blank tape. This provides a SMPTE code and video sync pulse for the duration of the tape; the digital audio program will be recorded as an insert-type edit, leaving the video control track and time code track intact. Time coding can be done using a 1610/30 set in dubbing mode, which produces a digital mute picture for the video transport. The processor automatically sets itself for 60 Hz, non-drop frame code.

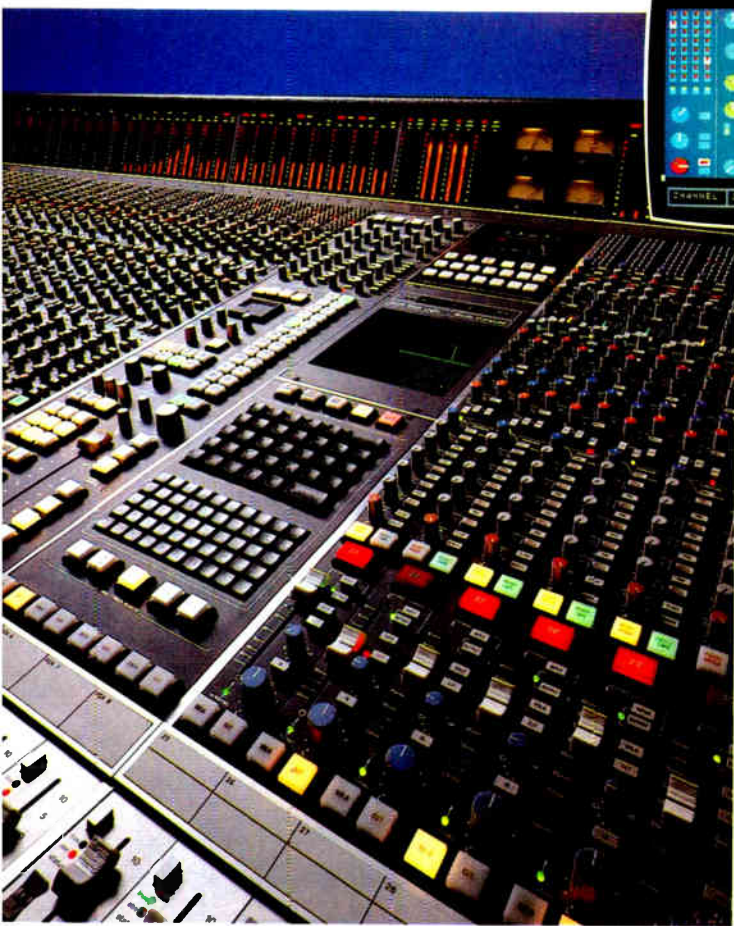
The original tape is copied to the time coded tape; the use of an editor such as the Sony DAE-1100 is recommended. Most importantly, at least one minute of lead-in (PCM data with no modulation) must be recorded at the beginning of the tape. This is easily achieved with the 1610/30 input set for dubbing, and the playback processor in pause. When the audio signal is transfer/edited through the

PCM 1610/30, watch the levels carefully, adjusting for a dB or two of headroom. Beware of any lapses in audio signal or clicks between tracks. Leave up to two minutes of lead-out at the end of the program. And of course, side breaks are no longer needed.

The tape can be recorded either with or without pre-emphasis, and may change between tracks, provided there is at least begin-access point of the track is placed at least two seconds after the end-access point of the previous track (see below).

The concept of using time code to select the proper begin-access and end-access points is critical in preparing a CD master tape, as well as its cue sheet. A major confusion appears to exist between begin-access, the end-access point, the actual begin point and the actual end point. The result is the dreaded "CD Offset" in which some players access a track after the start of program, when in random access mode. A begin-access point is the point where the access signal to the player is encoded. The begin-access point is not equivalent to the actual starting point of a track. The rule is this: the begin-access point should be placed at least 15 frames before each actual begin point. Among other things, this protects against the offset between the video and audio





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it faster than ever to recreate headphone and monitor mixes, equalisation, or entire console setups with quarter dB accuracy and rapid verification. And SSL alone offers data-compatibility with more than 300 installations — in over 80 cities around the world.

Finally, consider a company whose record of practical innovation, ongoing development and in-depth technical support has earned repeat orders from many of the world's toughest customers — a company that other manufacturers use as a standard for comparison. We join them in urging you to compare. Our 40 page colour brochure on the SL 4000 E Series is a good place to start. It's yours for the asking, and it just might make your difficult decision a whole lot easier. Clear reason, may we suggest, to write or call us today.

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heads in some VCRs. Sony's DADC even suggests that the begin-access point be played one second before the actual starting point for a comfortable margin. In the case of a crossfade between two tracks, use 15 frames before the beginning of the next track (not 15 frames after the previous track's end).

The end-access point is the point where the access signal to the player is encoded. It is not equivalent to the actual end-access point. The end-access point must be placed after the end of the program (including its decay ambience) otherwise the player will skip ahead to the next track when in random access mode. DADC suggests a full second after the end of program.

This procedure may be graphically represented, as shown in Figure 1. In the first example, the tracks (TNO) are separated by intervals of two seconds or more. If access-begin points are placed a full second before actual-begin points, and access-end points placed a full second after actual-end points, then a comfortable margin is assured. In the second example, the tracks are merged with crossfades. In this case, the first begin-access point and the last end-access point get their one second cushion. However, the begin-access points are placed 15

frames before the crossfade begins, and access-end points may be omitted after tracks 1 and 2. In the third example, the intervals separating the tracks are less than two seconds. The inter-track begin-access points must be placed 15 frames prior to the actual-begin points. Note that the begin-access point for TNO 2 is placed while TNO 1 is still playing.

Figure 2 illustrates a collection of pesky track scenarios, and the cue sheet that would accompany the tape to the CD pressing facility. A few specific caveats are worth pointing out. TNO 2 is recorded without Emphasis; the begin-access of the track should be placed at least two seconds after the end-access point of TNO 1. TNOs 3 and 4 are crossfaded; the individual duration of the crossfade should be between the begin-access point of TNO 3 and the begin-access point of TNO 4, and its end-access point. The interval between TNO 5 and 6 is less than two seconds; omit the end-access point for TNO 5. As in a crossfade, the individual time should be between the begin-access points of TNO 5 and 6.

Now that we've fully grasped this offset concept, I can mention that protocol varies from one pressing facility to the next. If in doubt, specify all time

codes without offset, and clearly and boldly state that fact in your documentation. Of course, in any event, all time codes must refer to the actual time of the program on the production master tape. Any error (e.g. using codes from a previous master) would result in errors in the disc's table of contents.

Every CD contains a PQ subcode which, among other unutilized applications, conveys the total number of selections on the disc, total time, start and stop times of tracks, index points, 2/4 channel select, pre-emphasis on/off, and even copyright information. Time code numbers are used to generate PQ subcode, using a cue editor such as the Sony DAQ-1000 or Philips LHH-0425. The code is recorded on audio track 1 of the VCR, 30 seconds prior to the start of the program. The subcode section may extend past the start of the program; this is okay. In lieu of a cue editor, the CD factory can generate the PQ subcode for you, provided you have supplied complete documentation, as described above. Incidentally, although index points have not gained wide popularity, they are easily included on a disc; one must only notate their time code numbers on the cue sheet.

Another important piece of documentation should accompany your tape to the factory. This is a spurious

noise information sheet. You should document the TNO, and description of any noises on the tape (e.g. "TNO 3, click at 25 mins, 34 secs, 12 frames"). This lets the mastering engineer know that you know that the tape has a problem, and that you have effectively decided to let it slide. Otherwise, the mastering engineer might contact you to ask about that click, thus causing delay and further expense.

Finally, make two copies of the master tape, and audition both of them for drop-outs, phantom or otherwise. Together with the documentation, forward them to the CD pressing facility, and set your alarm clock for 90 days or so.

Next month, we'll consider a new CD-ROM data pre-mastering system, called TOPIX, and take a look at the new CD-I format, as well as other late-

breaking news items.

### Audio Rumor Central

East Meets West Department: look for continuing fraternization between Sony and Ampex. West Meets West Department: look for joint ventures between Studer and Philips, including development of professional studio applications for the Compact Disc. To get the ball rolling, the Philips pro CD player LHH 2000 and subcode editor LHH 0425 will be marketed in the U.S. by Studer. Most Interesting Software of the Month: Audio Precision Inc.'s System One audio test set-in-an-IBM PC package. New Toys Department: TDK and others are passing around sample R-DAT cassettes—about the cutest thing since 8mm. But how quickly will the rotating head make mincemeat of the audio data?

Record Label Commiseration Department: first it was a disk shortage, then a blister pack shortage, and now even jewel boxes ain't so plentiful. What next? Anti-piracy Department: work continues on the spoiler system devised by CBS. RIAA moles report that the 100 Hz notch at 3 kHz is inaudible to about 99 percent of listeners. Don't throw away that pre-spoiler tape recorder—could be worth a tidy sum one day. Congratulations Department: to various tape machine manufacturers and synchronizer companies, for agreeing on an ATR protocol.

Do you have information or rumor for Insider Audio? Each month's hottest tip wins a special *Mix* prize. Contact Ken C. Pohlmann, University of Miami, P.O. Box 248165, Coral Gables, FL 33124, Telex 519308 or *Mix* at (415) 843-7901. ■



Example of a cue sheet:

TNO	TITLE	BEGIN END	EMPHASIS (ON/OFF)	SMPT TIME CODE			SMPT TIME CODE		
				ACCESS HR.MIN.SEC.FRAME	ACCESS HR.MIN.SEC.FRAME	ACCESS HR.MIN.SEC.FRAME	INDIVIDUAL HR.MIN.SEC.FRAME	INDIVIDUAL HR.MIN.SEC.FRAME	INDIVIDUAL HR.MIN.SEC.FRAME
1	XXXX	B E	ON	01; 30; : 04; 00; 09:			02; 30; 09:		
2	XXXX	B E	OFF	04; 03; 21: 08; 33; 13:			04; 29; 12:		
3	XXXX	B E	ON	08; 36; 14: : : : (Crossfade)			03; 51; 14:		
4	XXXX	B E	ON	12; 27; 28: 15; 38; 09:			03; 10; 11:		
5	XXXX	B E	ON	15; 42; 05: : : : : : :			02; 55; 10:		
6	XXXX	B E	ON	18; 37; 15: : : : : : :					
n	XXXX	B E	ON	56; 13; 18: 59; 21; 23:			03; 08; 05:		

FIGURE 2

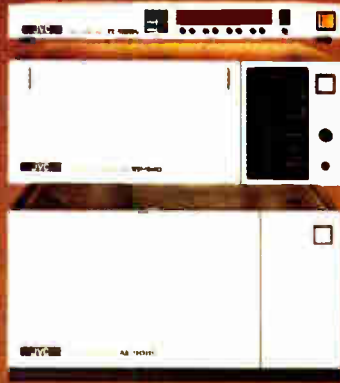
# JVC Digital Audio. The artist's editing system.

Digital audio editing takes on new speed, simplicity, and flexibility with JVC's 900 Mastering System. Anyone with a trained ear can learn to operate it in minutes and be assured of professional results of outstanding fidelity, accuracy, and clarity. And while sonic excellence is surely the 900's most persuasive

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## Audio Editor Control Unit.

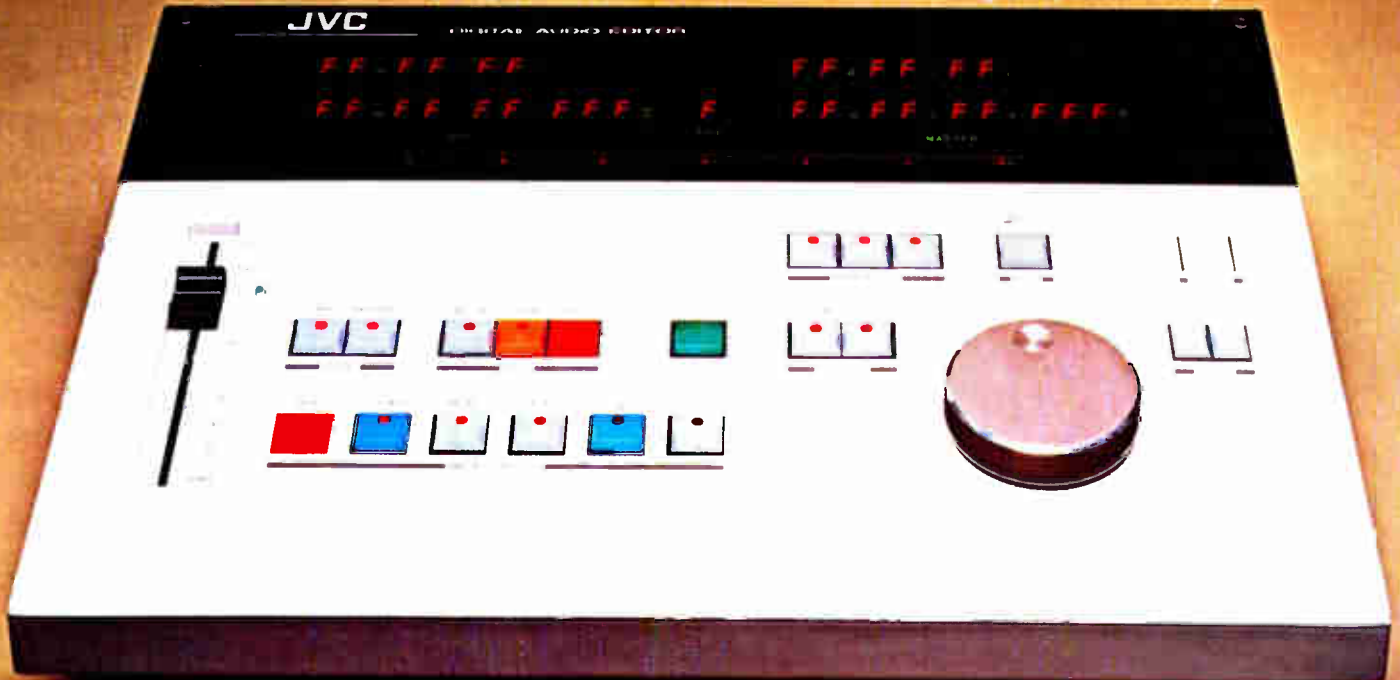
Electronic governor for routing, coordinating, and executing all edit functions, both automatic and manual. All commands, from digital dubbing of original to master for continuous programs, to repetitive point-to-point manual cueing are regulated here.

## TC-900V Time Code Unit.

Actually two time code units in one, this unit reads and generates SMPTE standard time code and synchronizes the JVC exclusive BP (bi-parity) time code. Thus, the DAS-900 will operate effectively with both time codes; a necessity when the System is to be synchronized with video equipment.

**AE-900V Digital Audio Editor.** Simplicity itself to operate, this little number puts editing right in the hands of the artist, if need be. Precise to within microsecond accuracy, edit search can be carried out by manual cueing, automatic scan, or direct address. It will confirm cut-in, cut-out points independently by recalling signals stored in memory. Digital fade control for adjusting relative levels

between original and master tape. Shift function for changing edit points backward or forward in 2-msec steps for super-fine adjustment. And variable-gradient cross-fading function for smooth continuity at the edit point, variable in 0, 10, 20, and 40 microsecond steps. Auto tape locate function enables the user to locate the desired address on the original tape automatically.



For a demonstration of the DAS-900 Digital Audio System, a Spec Sheet, or JVC's complete catalogue, call, toll-free

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**W**elcome, survivors of last month's thrilling adventure into the jungles of mic-math. There, we discovered an ideal world in which every microphone conforms to a strict mathematical equation. But meanwhile, back in the real world...

## More Fun With Math & MICROPHONES

by John M Woram

### Practical Microphones

Anyone who has talked into the rear of a uni-directional microphone knows very well that there's no such thing as a perfect cardioid response: one that is totally dead in the rear (that is, at 180 degrees), just like the cardioid equation says it should be.

As a quick review, if the sound arrives at the rear of an ideal uni-directional microphone, then the equation goes like this:

- 
- (1)  $X = A + B\cos(180)$ , which for a cardioid microphone is
  - (2)  $= 0.5 + 0.5 (-1.0)$
  - (3)  $= 0.5 - 0.5$
  - (4)  $= 0$
- 

where  $X$  is the microphone's sensitivity (not output level), and the numbers in the left margin are just for future reference below.

It looks good in theory, but not in the studio. Sounds from the rear are definitely heard, so the actual sensitivity can't possibly be zero. In fact, the actual values for  $A$  and  $B$  are probably unequal—say, 0.75 and 0.25 or vice versa. At 180 degrees, let's look at both possibilities. First re-write line

---

(2) as:

- (2)  $X = 0.75 + 0.25(-1)$ , which gives us
  - (4)  $= 0.50$ .
- 

The other sequence gets us

- 
- (2)  $X = 0.25 + 0.75(-1)$ , and this time,
  - (4)  $= -0.50$ .
- 

In comparing these two possibilities, the output sensitivity is the same, but in the second example the polarity is reversed, and this is indicated by the negative result in line (4). The first set of values produces a pattern that's midway between the perfect-circle omni-directional mic, and the perfect cardioid pattern. The next set is midway between the cardioid and the figure-8 pattern of the bi-directional mic.

If you go to the trouble of drawing these patterns, the first one looks more like a slice through the mid-section of an apple, and the second is a hybrid cardioid/figure-8; in other words, a cardioid-like pattern with a rear lobe pointing towards 180 degrees.

As for the appearance of that rear lobe, it begins to show up on mic polar patterns as soon as the pressure-gradient component ( $B$ ) is greater than the pressure ( $A$ ). As the rear lobe gets bigger, the front lobe of a pure cardioid pattern begins to collapse from the familiar heart shape towards a perfect circle. Eventually, when  $A = 0$  and  $B = 1$ , the front and back lobes

# *the handiers*<sup>™</sup>

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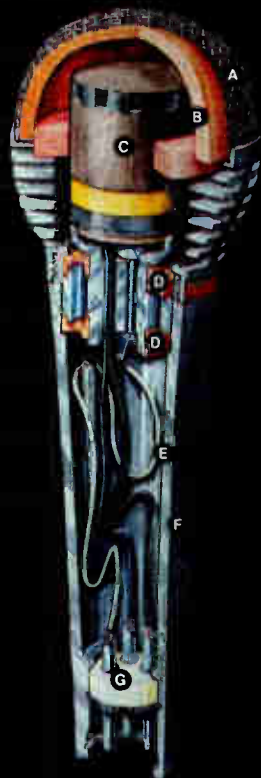
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World Radio History

## A comparison of three microphone polar patterns.

1. Cardioid response. Theoretically, it's totally dead in the rear.
2. Hyper-cardioid response. It's less sensitive at the sides, but the rear lobe indicates some sensitivity to sounds from the rear.
3. Bi-directional response. The two circles show it's even less sensitive at the sides, but the rear is just as sensitive as the front.

are both circles, giving us the figure-8 pattern.

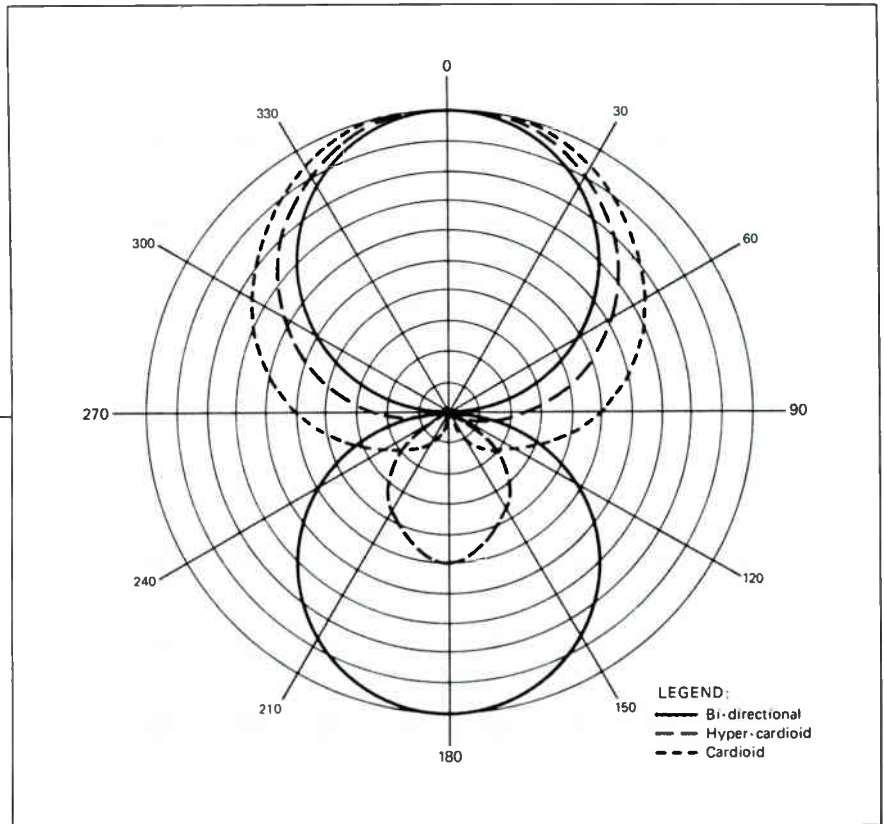
So what? Well, as the A:B proportion is varied and the cardioid pattern evolves into a front-lobe circle, the sensitivity at both sides is reduced. In other words, the mic's front-axis acceptance angle gets narrower and narrower. The mic gets "tighter" up front, at a tradeoff cost of a little more reverse-polarity sensitivity at the rear. So compared to an ideal cardioid, the hybrid mic is less sensitive to sounds arriving from the sides and more sensitive to those coming from the rear.

The advantage is that in many studio setups, it's reasonably easy to make sure nothing important is going on directly behind the mic, but almost impossible to place it so that nothing much is happening on either side.

Fortunately, such microphones are readily available, and the well-known Electro-Voice RE-15 is a good example of one. It belongs to the super-cardioid family whose polar response pattern may be plotted as  $0.375 + 0.625\cos\theta$ . By the way, that "super" adjective is not just ad-copy hype. That, and hyper-cardioid, are two commonly encountered terms. Hyper means over, so it describes an "over-cardioid" pattern. And since the RE-15 and its relatives are above the hyper pattern, calling them super-cardioids avoids such unlikely terms as hyper-hyper, over-hyper, and such. Maybe this table of the whole works will help (maybe not).

A + B	Description	polar pattern looks like this
0.000 + 1.000	bi-directional	a figure-8
0.250 + 0.750	hyper-cardioid	narrow front lobe, large rear lobe
0.375 + 0.625	super-cardioid	wider front lobe, smaller rear lobe
0.500 + 0.500	cardioid	heart-shape pattern with no rear lobe
1.000 + 0.000	omni-directional	perfect circle

It's not over yet. Take two cardioid microphones, place them back to back, combine the outputs, and what have you got? It's simple (almost). Just bear in mind that a sound arriving at the front (0 degrees) of one mic is also arriving at the rear (180) of the other.



Try following along with the math: But what if the output of Mic 2 is re-

second case, the A components cancel. So the first pair always produces

	<b>A</b>	<b>+</b>	<b>B</b>	<b>=</b>	<b>A</b>	<b>+</b>	<b>B</b>
Mic 1	0.5	+	0.5 cos(0)	=	0.5	+	0.5(1)
Mic 2	0.5	+	0.5 cos(180)	=	0.5	+	0.5(-1)
	<b>The result is;</b>				<b>1.0</b>	<b>+</b>	<b>0.0</b> an omni-directional pattern

versed in polarity? Again, nothing to it. We already know that a polarity

an omni-directional pattern, and the second always creates a bi-directional

	<b>A</b>	<b>+</b>	<b>B</b>	<b>=</b>	<b>0.5</b>	<b>+</b>	<b>0.5(1)</b>
Mic 1	0.5	+	0.5 cos(0)	=	0.5	+	0.5(1)
Mic 2	-0.5	-	0.5 cos(180)	=	-0.5	-	0.5(-1) (note - signs)
	<b>The result is;</b>				<b>0.0</b>	<b>+</b>	<b>1.0</b> a bi-directional pattern

reversal is indicated by a negative value, so:

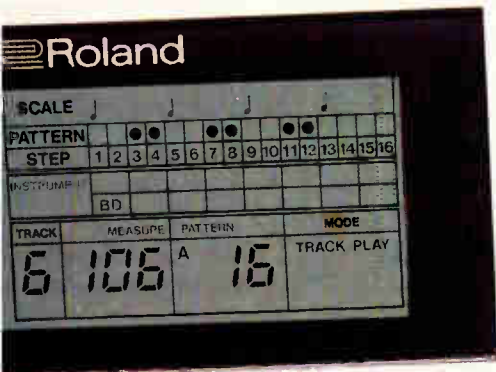
Okay, but what happens to sounds arriving at Mic 1 from some off-axis angle—say 37.43 degrees? That

pattern.

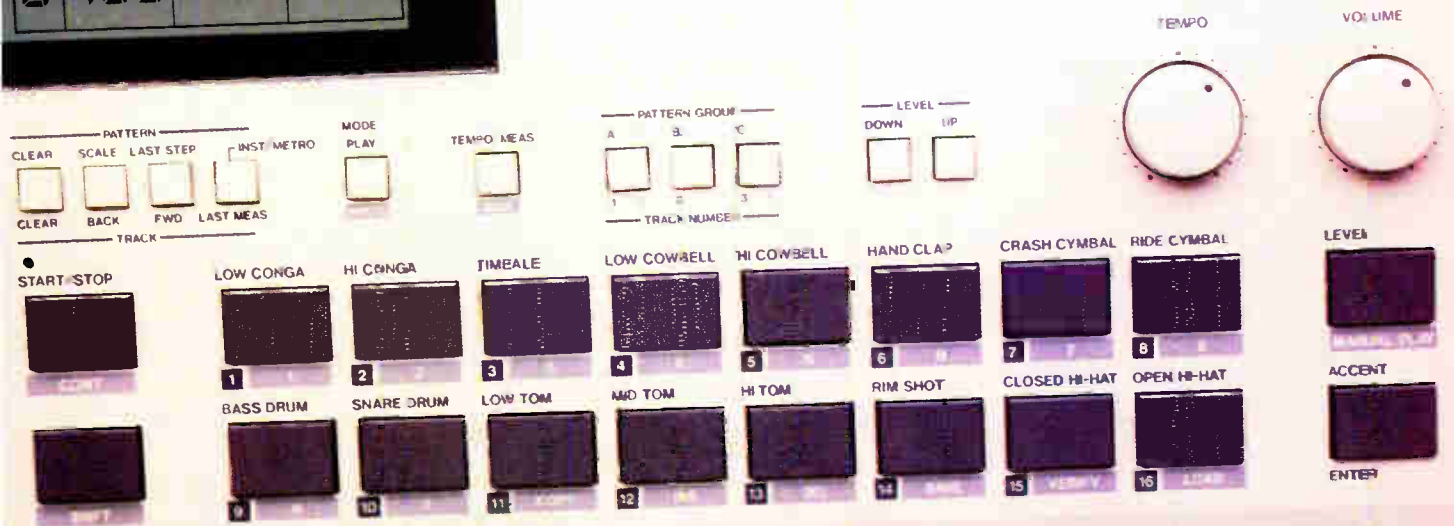
For that matter, any two identical cardioid-style mics produce the same results when combined. And that's a lot easier to visualize by following the math than it is from staring at polar patterns all day and trying to guess what will happen if...

After you go to the bother of working out a few examples on the calculator or computer, you'll see that the actual A and B values don't really matter. What matters is that one combination always cancels out both Bs and the other always does the same for the As. So you're left with either an omni-directional pattern or a bi-directional one, and never anything else.

It's worth reviewing all of the above until it makes sense, especially for those who don't have an unlimited



# RHYTHM COMPOSER TR-505



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number of all types of microphones on hand. Now and then something will come along that requires a microphone that doesn't exist, or at least not in your inventory. But with a little mic math, you can create it yourself.

For example, try to make a perfect cardioid-pattern mic out of a pair of cardioids of dubious pedigree. Since you have no idea what the A and B components are, just pick two numbers out of a hat. Keep it simple and use 0.4 + 0.6 for both of them. For a sound arriving at 180 degrees, the output of the first mic is:

$$0.40 + 0.60(-1) = -0.2$$

Now attenuate the relative sensitivity of the other microphone so that its output at zero degrees is 0.2 (which on paper is done by multiplying the A and B components by 0.2). Place it back-to-back with the first mic and combine the outputs. This gives us:

A	B	
0.40	+ 0.60(-1)	= -0.2 from above, and
0.08	+ 0.12(1)	= 0.2, when combined with the first mic is
0.48	- 0.48	= 0.0 zero output at 180 degrees.

Note that the resultant A and B components are equal—the sign of a perfect cardioid microphone (on paper at least).

Meanwhile, back in the studio, the producer is thinking about going elsewhere while you get your math worked out. But once you do, you'll see that any vaguely-cardioid mic placed back-to-back with an identical one can be worked up into a pure cardioid pattern by attenuating the amplitude of the rear-facing mic until it cancels out the rear lobe of the front one. In the example above, the rear-facing mic is way down in overall sensitivity (0.2 as opposed to 1.0), and its own rear lobe has a slight effect on the overall output sensitivity. That's why the A and B components are both 0.48 instead of 0.50 as before.

### Is All This Really Worth It?

Probably not—at least not in a real recording situation. But it does help to gain a better idea of what might happen when the outputs of two microphones are combined, intentionally or otherwise.

Even if everything is on a separate track, sooner or later the tracks (that is, the mic outputs) get combined. If two mics were both live in the same studio at the same time, then their outputs are combined, whether you meant it or not.

Of course, the mics were not sitting at the same location, so all of the above

gets watered down according to the actual distance between them. If two mics are reasonably far apart, there's little or no interaction. But if they're not, watch out. Better yet, listen. Combine the outputs in the monitor so that if there's going to be a disaster you can do something about it now, rather than "fixing it in the mix." More than one stereo piano has gone off into the great beyond when heard (make that, not heard) in mono later on.

### The KISS of the MS Microphone

One of the intriguing side effects of digital recording technology seems to be a re-examination of conventional recording techniques. Often the familiar multi-track mono pickups don't come off nearly as well as the KISS (Keep It Simple, Stupid) technique. For now I'll stay away from "we'll fix it in the mix" vs. "get it right the first time" arguments and just assume that a ster-

eo microphone technique is of interest.

From the above example of combining two cardioid microphones, with and without a polarity reversal, we can see that a pair of identical microphones can produce two entirely different outputs. Since the combination doesn't have to take place immediately, it's easy enough to record each mic on its own track. Then, later on, an omni-directional pattern can be produced simply by combining the tracks without a polarity inversion. At the same time, an omni-directional pattern can also be created by combining the same outputs with an inversion.

For experimental purposes, this technique will let you compare the effect of an omni-directional and a bi-directional pickup long after the session is over. And it leads us to the next logical step: if two identical microphones can be combined as described above, what about two non-identical microphones?

A stereo microphone is actually two microphone capsules mounted within a common housing. They are as close together as is possible, so that when their outputs are combined (one way or the other) the new outputs will be predictable. With a little careful planning, one combination can produce a left-oriented pattern, while the other combination produces a right-oriented pattern.

Tune in next month to find out how to do this. ■





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# GRP RECORDS

## A DIGITAL COMMITMENT



PHOTO: DAVID B. MOOGHE

Floor monitors—rather than headphones—brought a “live” feel to the project.

### Live In Session brings together a few of the label’s big guns.

by Dan Daley

“Owning a record company wasn’t something I always dreamed of doing. It was just something we found ourselves in the middle of one day.”

Dave Grusin’s laconic voice spills forth from a definitely non-hi-fi speakerphone in the New York headquarters of GRP Records, the label he co-heads with Larry Rosen, his long-time production and business partner. Rosen sits at his cluttered desk—on which CD disks are used as coasters—and listens, reacting to Grusin’s comment with a smile and a stifled laugh. “Dave doesn’t like to deal with the business aspects of all this,” he says. “He prefers making music.”

Fortunately for all concerned, Grusin is quite good at that. While best known in the pop realm for writing the

theme to NBC’s *St. Elsewhere*, he is no stranger to the pop and jazz fields, where his credits include arranging, performing and producing for and with artists like Quincy Jones, Paul Simon, Billy Joel and Dave Valentin. In Hollywood, he’s notched over 20 film scores on his belt, with four Academy Award nominations, including Best Original Song in 1984 for the film *Tootsie*. In addition to the aforementioned *St. Elsewhere*, Grusin has composer credits on nearly a dozen television shows, including *Maude* and *Baretta*. He’s also managed to create several solo LPs.

The partnership between the two began when they were working in Andy Williams’ band in the ‘60s, Grusin on keys and Rosen on drums. In 1966, Grusin went to Hollywood to become musical director for Williams’ network television show, while the Bronx-born Rosen headed back east where he worked on jingles and began producing and engineering in his own 8-track studio in his New Jersey home.

In 1972, Rosen produced Jon Lucien’s first LP for RCA and called Grusin to do string parts. That began a relationship which moved through a production company, then on to a label

deal with Arista Records, and finally to GRP as an independent entity.

Wanting to expand the available horizons for jazz, the two took a cue from legendary jazz producer Creed Taylor. Says Rosen, “Taylor was taking artists who years before might have been on [seminal jazz label] Blue Note, and who would have made their records live with a couple of mics set up the way their club acts were done. Creed developed the approach of taking jazz and putting it into a more orchestrated and produced setting and using more technology. Our thing was to take that approach further, overdubbing, leaving space for strings, percussion, horns, whatever, and creating a more produced product.”

GRP is a jazz label. It says so right on the front of the company’s catalog brochure. But to simply characterize what Grusin and Rosen have set out to do as that is misleading, according to Rosen. “The range of music we work with spreads over such a wide spectrum that it’s hard to pigeonhole things and say, ‘This is jazz.’ On one hand, that’s our common denominator, but on the other hand, it isn’t. The reason that the term ‘jazz’ is used here at all is because in this industry you need categories and classifications for radio and retail. So that’s where jazz fits in here.

“I would have to say that the real common denominators are artistic virtuosity and the sound quality that we strive for. We’re very concerned about the sound of the product. All through our records, whether they’re more jazz or more pop in nature, the quality level is high.”

All albums in the GRP inventory are digital masters, and all are available on Compact Discs, a technology the company embraced from day one, Rosen stresses. The roster of artists testifies to the virtuosity Rosen wants—names like Dizzy Gillespie, Tom Browne, Gerry Mulligan and Billy Cobham. And while all the records have the sonic qualities expected of digital recording, one in particular reflects both of Rosen’s criteria and also illuminates the sort of artistic cooperation that stylizes the company.

*GRP Live In Session* is a collaboration between Grusin and GRP artists

# Behind Every Synclavier<sup>®</sup> There's a Success Story



## Profile: Murray Allen

Accomplished musician, composer, engineer and businessman, Murray Allen owns one of the largest audio facilities in the world. Universal Recording offers every service in the field of audio from 24-track recording studios, film mixing theaters, and video sweetening rooms to remote sound crews and even a cassette duplication factory. Murray knows that every piece of equipment he purchases must not only provide the highest sound quality and operational flexibility available, but also be able to prove itself financially with a solid return on investment. He comments on Universal's recent completion of a dedicated Synclavier studio:

"We at Universal feel a studio cannot honestly call itself world-class nor can it claim to be state-of-the-art if it does not own and utilize a hard disk-based digital audio manipulation system. Now having said that, we have researched every such system on the market and some on the drawing board and have found only one system sophisticated enough, fast enough, with the kind of sheer computer power we need to serve our clients. That system is the Synclavier."



guitarist Lee Ritenour, flautist Dave Valentin and vocalist Diane Schuur, augmented by Carlos Vega on drums, Abraham Laboriel on bass and Larry Williams on keyboards and sax. The album came about almost as an afterthought to a tour of these performers arranged at the behest of component manufacturer JVC, which was seeking to promote its new line of CD players. "JVC chose jazz as the medium they wanted to use since they felt it represented a certain level of quality," recalls Rosen. "They came to us and wanted to put together a GRP package to tour across the United States. We ended up doing ten cities

in 1985, and at the end made a video of the tour."

"Right," chimes in Grusin with a laugh. "The tour, initially, was meant to support the *Harlequin* record Lee Ritenour and I had recorded. They shot the video, and then Larry decided we needed an album to support this video. We ended up making an album of a tour that was originally supposed to support another album. I guess you could say that we did it kind of backwards."

They considered a concert performance for the setting, but felt that there would be too many acoustic variables in such a situation. So it was decided

to record the band live in the studio and shoot a video of that performance as well. "We wanted the vibe you get from performing live," says Rosen.

The Record Plant in Los Angeles offered the kind of space needed to accommodate an audience and also provided the technical capability.

Pre-production was sparse since, as Rosen points out, the band had just come off the tour and was more than ready to record. A single day of rehearsal was set up primarily for the benefit of the video crew, who had to coordinate five cameras with a supporting remote truck outside the studio. "The whole rehearsal was ready for them to block out the shots and get comfortable with the room and become familiar with where the solos were," Grusin says. "And we also had to give our engineer a chance to get sounds happening."

The night of the recording, the audience filed in, surrounding the open floor area where the band had set up. Many of the participants had won their places in a promotional giveaway GRP had coordinated in conjunction with local jazz-format KBGO. "We didn't want a totally 'industry' crowd," according to Rosen. "We wanted people who were really fans out there listening and reacting."

Lee Ritenour was the producer on the session. Rosen says that this was quite standard for GRP: "We're the executive producers of all of our projects. It's beyond David and I to do all the productions, but we keep a hand in every aspect of it." A number of GRP records employ producers from outside the immediate family, but neither Rosen nor Grusin are ever far away. "It's not like a lawyer or an accountant who owns a record company," he says. "We basically come from a background of making records ourselves so we know the people involved and it's easier for us to sit down with our artists and talk to them... and understand their feelings."

The video (which like the album, cassette, and CD is slated for commercial release) is sequenced the same as the album, reflecting Grusin's desire to represent a live performance. Done in a straightahead *cinema verite* style, with no special effects, the result is effective in that it allows the virtuosity of the performers to maintain center stage. Diane Schuur's performance, in particular, is electrifying. Blind due to an accident at birth, the Seattle native's vocal control is nothing short of amazing. Both the recording and video reflect the substantial creative capabilities of the GRP artists.

"We tried to do it as we would a concert," says Grusin of the studio



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performance. "The only times we stopped and started was to give the video and crew a chance to change reels and to give Diane time to come up to the mic."

Engineer Don Murray was an easy choice for the project. "Don has been Lee's engineer for a long time," noted Grusin. "I've known Don for years; we did the *Harlequin* record (a collaborative Grusin/Ritenour effort) together."

Murray says his approach was to "deal with it as if we were in the studio making an album. I had to deal with the extra noise from the monitors used for everyone except Carlos. Luckily, I got away with having Carlos wear headphones. That helped avoid leakage into the overheads. The guitars were taken stereo direct and miked near field with AKG 452s on the EVs in the Bag End cabinets. The monitoring situation became easier because of going direct. The only leakage I had to worry about was the drum overheads, because I gated the rest of the drums except for the hi-hat. The only live mics were on the guitar amp and vocal mics. I used AKG 414s for vocals and on the flute. On sax, I used a Neumann tube U47, and I had to play with placement to get the best signal to 'room noise' on all the mics. The fact that we recorded digital was great. We



PHOTO: DAVID B. MOORE

*Guitarist/producer Lee Ritenour and GRP co-founder Dave Grusin listen to playbacks of the digital multi-track master during a mixing session.*

mixed down on the JVC digital machine and that kept a lot of presence in there, all the ambience." Murray mixed the record and then mastered it with Wally Traugott at Capitol Studios.

Grusin played a Kawai electric grand that was connected via MIDI to a Yamaha DX7 and a Roland Super Jupiter. The piano is not customized

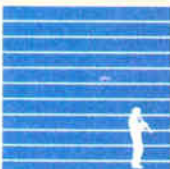
for Grusin *per se*, but he says that "the balanced output was a little flaky at first. Most instruments that come right from the factory aren't really balanced. You have to adjust them, and that was done on this one. I think the whole output level was adjusted downward."

Grusin's signature *St. Elsewhere* theme was included on the recording, but not because of its recognition quotient among listeners. "We did it because we had been doing it in the show," he notes. "It was part of the pacing of the performances we had been doing on the tour, and it was also the right length, we made it the closer."

The recording was done multi-track, onto a Sony 3324 24-track, which gave the performers some leeway afterward for corrections. "I think everyone had to fix a few things in terms of their parts," Grusin comments. "But still there wasn't a lot of overdubbing later. Lee fixed a solo here and there, and there were some static problems on some of my stuff so I had to fix that. But I think that the record, overall, does represent a live performance."

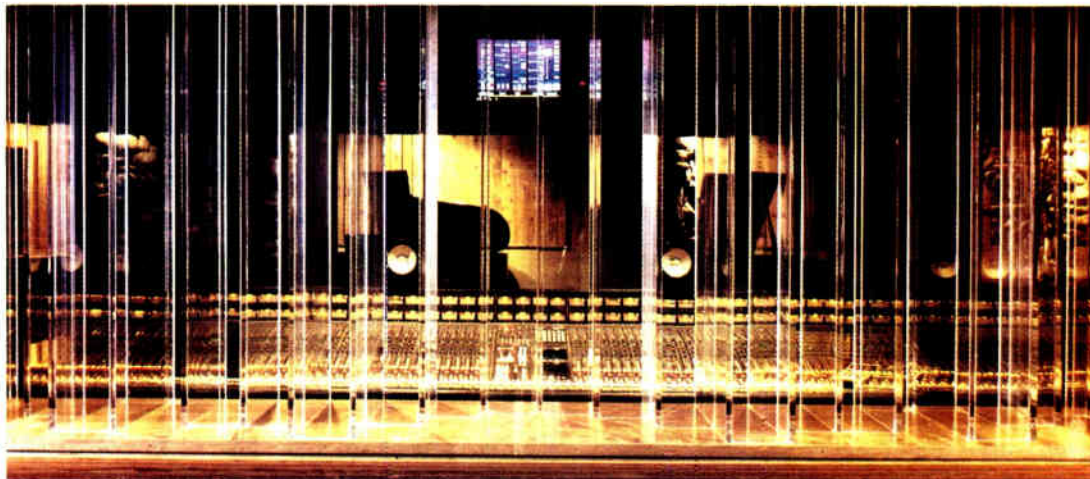
Editing was done on a JVC system and the record was mastered at Wally's at Capitol. According to Grusin, "In the past, we've done our mastering on JVC systems, but now we're beginning to rely more on the Sony sys-

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PHOTO: DAVID B. MOORE

*Keyboardist Dave Grusin double checks his MIDI setup (Kawai electric grand, Yamaha DX7, Roland Super Jupiter) during a rehearsal.*

tem," since the CD pressing facilities GRP uses also employ Sony equipment.

Larry Rosen points out that neither he nor Grusin ever expected GRP to grow so quickly; the company now boasts an office in Zurich, Switzerland, to handle European releases. One by-product of this success is the fact that GRP isn't totally reliant upon other studios: at the center of its two-floor group of offices in Manhattan is a control room with a Neve 8058 console and a Studer A80 24-track deck. Outboard equipment includes two Lexicon PCM 41s, four Kepex gates, a pair of Pultec EQP-1 equalizers, a Yamaha REV7, KEF 101 monitors, and Sony digital mixdown equipment, including the PCM1630 and DMR 2000 and DMR 4000 digital recorders 2-track, DAE 110 Digital Editor. The actual building of the room had the makings of a nightmare, though.

After clearing the floor of existing walls, the control room was designed to be at the heart of the operation, since, in Rosen's words, "it was the center of our lives." Every room in the suite is connected to the control room with audio and video tie lines. For instance, a drum kit could be set up in Rosen's office and recorded. Harry Hersh, who built Media Sound in New York, was the project coordinator. A British design firm, Allan Grove Associates, presented a low bid and work began. One of the big problems was soundproofing; normal isolation techniques like floor floating couldn't be

used since the building's floor couldn't handle the load factors. Grove developed plans to meet these and other restrictions, but after construction was a little over half done, the British firm decided its original estimate was too low and asked for more money, according to Rosen, who balked at paying, citing their contract. Grove then left the project altogether, leaving several subcontractors unpaid. There was nothing left to do but dig in and finish it themselves, which is what happened. Dave Smith, a wiring designer who Phil Ramone favors, did the wiring. A few months later, the project was finished, and overdubs and mixes are now routine.

With GRP currently making and releasing up to a dozen records a year, Rosen says he has his hands full running the company on a day-to-day basis, and doesn't miss being a working drummer or engineer.

For Grusin's part, he likes the fact that he can be associated with the label without having to deal with the nuts and bolts headaches that his partner handles with obvious relish. Continuing on with his film work, Grusin says that he tries to be selective about projects he chooses, pointing out that, "Film work is not so much to do with music as it is to do with drama or theater; it's the film that's the medium, not the music." But ultimately, to Grusin, "It's all interesting, and as long as it remains that way, it's worth doing." ■

Project engineer Paul Beliveau



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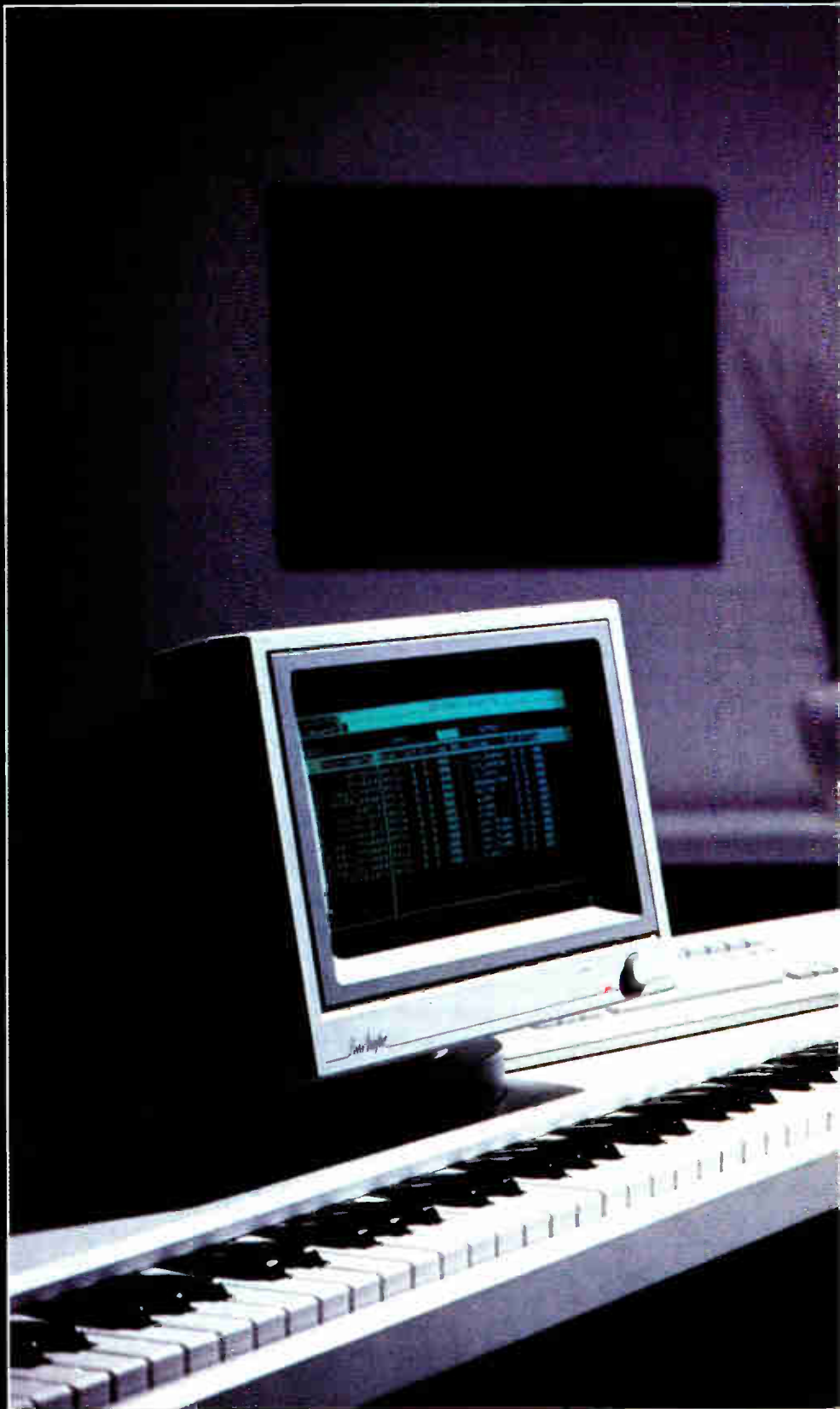
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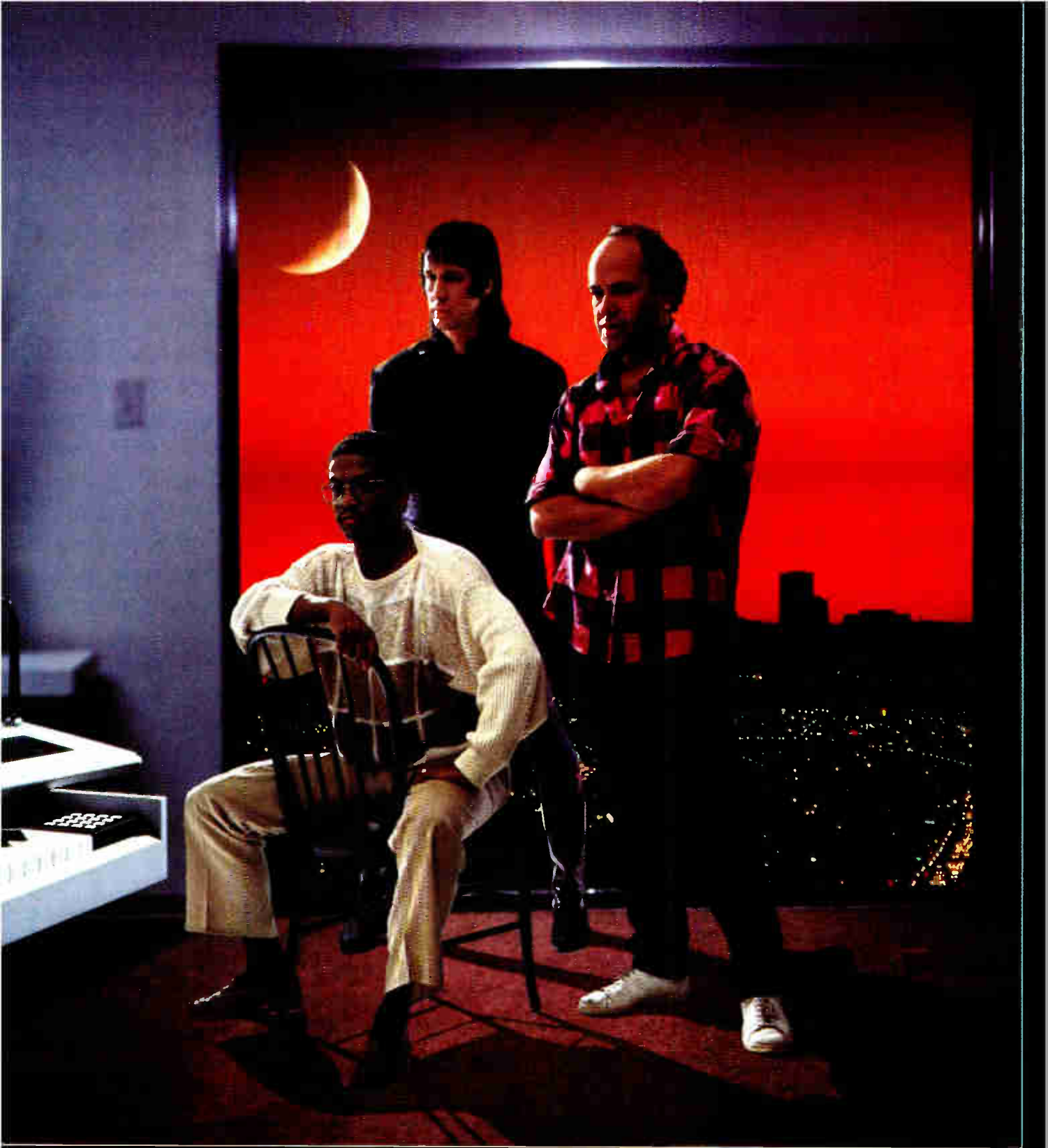


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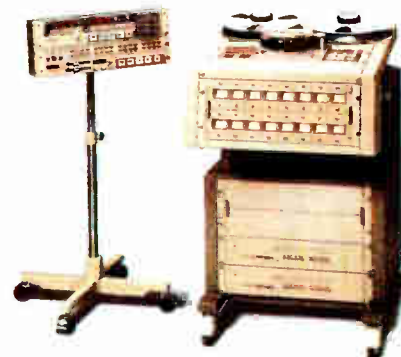
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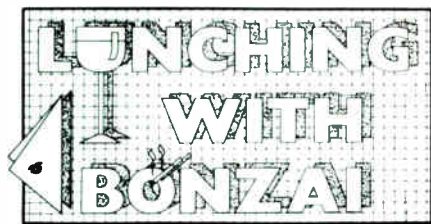
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# GARY in WONDERLAND

## An Interview with Gary Olazabal & Stevie Wonder



by Mr. Bonzai

I imagine the kings of old as operating like Stevie Wonder, surrounded by circles of friends, courtesans, visiting dignitaries, guards and jesters. Penetrating to the heart of the matter takes grace, persistence, luck, humor, and lots of time.

I first met Steve, as he is often called behind the smokescreens, while managing Lyon Recording, a comfortable little 24-track studio in Newport Beach, California. It was the late '70s and we had just gone into deep hock, rebuilt the studio and put in a computerized console. As an incentive to find a top artist, we offered a free day to the Wonder organization.

Curt Lyon, owner and chief engineer, and I went into temporary shock when they accepted. We began gearing up for the arrival. For the next three months, we would enjoy a rare treat—hanging around and seeing a living, and entirely unique, legend at work. We sat on the edges of our seats, terrified with the thought of a screw-up that would bury us instantly in studio history.

Stevie was preceded by cars full of engineers, assistants, roadies, friends and people with vague jobs. The system was a mystery, but when Steve went to work, everything went smoothly. As the engineer ultimately responsible for organizing and getting it on tape, Gary Olazabal was a focus of cool serenity in the spontaneous play. We never knew when they would arrive (which makes booking a one-room studio a master's education in juggling), or what they would need in the outboard rack, or when they would finish.

Stevie likes to keep things light with little practical jokes. He once called from his car and with a high, jivey voice asked for himself. "I hear Stevie Wonder is recording at your studio—is that true?" I was bound to secrecy.



PHOTO: MR. BONZAI

*Trying out some new material with Stevie.*

Since 1972, Gary has been the man at the board, explaining the knobs and showing Steve how to move them as a team. Their relationship is casual, yet exact and often wordless...

He said he was with Stephanie, his right-hand gal. This was inside info, so I just said if she didn't know where he was, I sure didn't. After hanging up, I realized I had been duped, but it was a pleasant joke.

When he arrived, I spoke of myself in the third person and told Stevie that after the phone call, Mr. Bonzai had become so excited that he took a walk and fell in the bay. He deadpanned, "Oh, really?"

From time to time since those days, I've had the fortune to further observe Gary and Steve working together. Their relationship is casual, yet exact

and often nearly wordless. Since 1972, Gary has been the man at the board, explaining the knobs and showing Steve how to move them as a team. In the course of his career, Gary "O", as he is known, has worked with Thomas Dolby, Frank Zappa, Neil Diamond, Paul McCartney, Dionne Warwick, The Four Tops, The Temptations, just about everyone at Motown, and for the Japanese artist, Miyuki Nakajima. His combination of technical expertise and extrasensory insight has taken him around the world of sound.

Gary came up to Cafe Bonzai recently for some homemade Japanese



PHOTO: MR. BONZAI

Gary Olazabal

shabu-shabu and a chat with Keiko and myself. Later, we would venture down into Hollywood for a session in Wonderland.

...

**Bonzai:** How did a 20-year-old kid end up in the Stevie Wonder camp?

**Olazabal:** Well, you see, I was born a poor black child myself (laughs). Actually, I was working at the Record Plant, going through the whole procedure of becoming an engineer: go-fer, janitor, and then assistant engineer. For some reason, people had faith in what I was doing and I started engineering very quickly. I was mixing Billy Preston and working with bands like Rufus, and I was also assisting Steve's engineers. When they split up, I was the next in line. I really admired him, liked him, and we got along pretty well. We've been working together ever since *Songs in the Key of Life*.

**Bonzai:** You've got a down home, C&W style about you—where did you come from?

**Olazabal:** I was born in downtown L.A.—does that explain it? My mother is Comanche and when I was young we moved to a ranch, and raised horses. Maybe that's where it comes from, but I didn't know I had a down home vibe.

**Bonzai:** Well, you've got a solid calmness and I've seen you working when a lot of people around you were getting frantic. Were you that way in the beginning?

**Olazabal:** I'm sure I was a little frantic on the inside. I got very anxious and couldn't understand all that was going on. After a while, I just wouldn't let the pressure get to me—I got sort of numb. Now, I just let things roll off. . .

**Bonzai:** It seems to be the only way to survive in such a hectic lifestyle. You've probably seen a lot of people come and go.

**Olazabal:** Yeah, a lot have come and gone, but there are many of us—like Bob Harlan and Mick Parish—who have remained through all the years. People are loyal to Steve, and he's very loyal to us. He backs us up when we need it.

**Bonzai:** What have you learned from working with Steve?

**Olazabal:** Patience—and I've obviously learned his style of production.

**Bonzai:** Is it different from most artists' workstyle?

**Olazabal:** I think it's very different. His way of working is very spontaneous. Lately, though, we've moved into nearly total synthesized recording. Steve does a lot of programming at

“I was working at the Record Plant, going through the whole procedure of becoming an engineer: go-fer, janitor, and then assistant engineer. . . I was mixing Billy Preston and working with bands like Rufus, and I was assisting Steve's engineers. When they split up, I was the next in line. . .”

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home now and quite often we just go into the studio, press a button and it just goes. The overdubs are still pretty spontaneous. We go for a sound, an idea—he never pre-plans. It's an interesting way of working—he leaves a lot to the magic of the time.

**Bonzai:** A lot of *In Square Circle* was done in Europe—why?

**Olazabal:** Because we had to finish it and he was booked on a tour. At times it was very complicated because we'd be in a different town every day—in France, Germany, Spain. It was a bit weird but we finally got a remote truck and achieved some normalcy.

**Bonzai:** Steve certainly gave you a lot of credit at The Grammys—What do you think he's learned from you?

**Olazabal:** I don't know. I know he's been really patient with me—we were both young when we started working together.

**Bonzai:** That's funny—I tend to think of him as born mature.

**Olazabal:** He seems that way a lot, but if you spend enough time with him you realize he's as much of a kid as most people in the entertainment business, if not more so.

**Bonzai:** Is he constantly sticking you with new technology to master?

**Olazabal:** He buys a new synthesizer just about every week. In the analog days, I had to study every synthesizer that came in, because he didn't really have a programmer. There was no one else to show him, so it would end up with the two of us fiddling with knobs for a long time. But now that we've moved into digital synthesizers, things are a lot more straightforward. Some of his instruments are pretty esoteric, but he doesn't buy things as whimsically as he used to. Things have cooled down in that area.

**Bonzai:** You have associate producer credits on the last two albums—was that a big change for you?

**Olazabal:** No, there's been no real change in my role. I'm more knowledgeable now as a producer, but we've always worked closely. There are just hours and hours of us alone in the studio, so quite often there's no one else to offer any feedback.

**Bonzai:** What are your long range goals?

**Olazabal:** To make good music, music that pleases me. And I'd like to branch out and take on some outside projects. I'm sure he wants me to do well on my own, and I'll always be there when he needs me.



PHOTO: MR. BONZAI

*Bob Bralove works with Stevie on some new synth programs for the upcoming tour.*

**Bonzai:** An interesting brotherhood—  
**Olazabal:** I guess I think of him as a brother, cause we've spent such a long time together.

**Bonzai:** You must have been at the Record Plant in the wild and wacky days.

**Olazabal:** Yeah—there was one night when I think it was Paul McCartney on drums, and Ringo, too. John Lennon and Harry Nilsson were singing. A Record Plant engineer was playing bass, and there was Bobby Keyes and Klaus Voorman. All these people playing instruments that they didn't normally play, and Steve called me from a hotel he used to stay at on Hollywood Blvd. I picked him up and took him to the studio where all these people were playing, and took him in and sat him down at the Rhodes. It was just a mad recording scene, roll after roll, with people saying it was a Second Coming. It'll never happen again, because the musicians in the room were just amazing. But after a while, I heard this, "Gary, Gary!!" It was Stevie screaming in the midst of it all for me to come and rescue him. It was pretty chaotic, with people looking for a song that

everyone could play. That was about the time that we were talking about working together. I was kind of glad to get out of the room anyway.

**Keiko:** The new album has such strong sound images—very clear natural sounds.

**Olazabal:** You know, it's very difficult to find a place for recording in nature where you don't hear planes and cars. That was one of the problems we had in recording the sounds for "Overjoyed." My assistant, Steve van Arden, and I drove up to Zaca Lake, north of Santa Barbara, up into the hills. We just got very lucky and got good recordings of the birds, and for the bass drum we got a big rock and threw it down into the sand. For the snare drum, we took a rock and threw it into a pond. We tried to make natural sounds that could work like normal percussion sounds that you would hear on a record.

**Bonzai:** How did you manipulate them for the song?

**Olazabal:** We took those sounds and then truncated them and put them into a computer. That became our drum pattern, but with that song we had trouble because we had recorded some of the music years ago in analog with an old Rhythm King before transferring to digital. The Rhythm King is ancient history—it wasn't completely steady so we couldn't get anything to follow it easily. Everything was done in stereo, which made it more difficult.

**Bonzai:** Were a lot of the songs for the new album done a long time ago?

**Olazabal:** Some of them were started years ago, but that was the only one that started out analog.

**Bonzai:** So, a new Stevie Wonder album means an accumulation of many elements—

**Olazabal:** Part of the reason is that we record so much, and I'm sure that we've forgotten some of the best songs. I was recently going through the library looking for tapes and it's amazing how many really good songs have been forgotten. I put a lot of them on cassettes to consider for the next album.

**Bonzai:** How do you keep track of everything?

**Olazabal:** Right now we're starting a computer cataloging system. We have all the tapes, so when Stevie goes on the road we're going to put everything in order. The problem is that in the early days we used to let the 2-track roll and he would sit and compose on the spot. A lot of the tracks are without

titles, just ideas, melodies, parts of songs. We have to listen to thousands of hours of material and then figure out some working titles.

**Bonzai:** Can you remember the most magical session?

**Olazabal:** One that comes to mind was "Love's in Need of Love Today." We were doing the vocal and at the time Jackie Wilson was dying in the hospital. Steve had just been with him and the song was very emotional. We started recording and after a few bars, Steve started crying because everything was hitting him at once. It made us all feel the same emotion, and I'd turn off the mic and wait until he signalled. The whole night went like that—very emotionally draining. I don't know why it sticks out in my mind, but it was very special. If you listen carefully to that song, and to the Martin Luther King birthday song you'll hear Steve breaking up. I can hear it very clearly because I remember the sessions. It always brings me right back to the time we were recording.

**Bonzai:** I remember people pulling jokes on Stevie—like telling him there was a call on line number four when the phone only had three buttons—

**Olazabal:** Well, he's really big on practical jokes himself. He's especially playful with his blind friends. One time we were recording Clarence Bell doing the organ on "Golden Lady." Blind people fold their paper money in certain ways to distinguish the different denominations. Clarence had done an overdub and while he was away from the room, Steve said, "Let's play a joke on Clarence. I'll tell him how much we enjoyed his playing and then slip him this bill." Steve had taken a one dollar bill and folded it like a hundred. Everybody had a hard time holding their laughter while Steve pulled it off.

He's got a lot of blind friends that have interesting stories—one time, two friends of his had agreed to meet at a certain corner and ended up waiting for three hours because they were on opposite sides of the street. Some of the stories are funny, but some of them are very terrible.

**Bonzai:** He has more power than most to do things with technology that can help the blind—

**Olazabal:** He really is extreme in trying to do just that. He's even talked about having breaks in his concerts where people can come and play with his special equipment. He wants to show people what the technology is capable of. It may not make for the most exciting concert, but it's extra-



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ordinary what he can do with his tools.

**Bonzai:** What do you love about him the most?

**Olazabal:** His positiveness. When he gets really down, it's only briefly, and the slightest thing can bring him up again. He knows a lot of people and for whatever reason, he hears a lot of their problems. He has to carry a lot of weight.

**Bonzai:** What is the most annoying part of your work?

**Olazabal:** It used to be the waiting, but now I don't wait—although, I can never really plan anything. It teaches moderation, because you can never enjoy yourself too much, or get too excited. You can plan something, like a real special evening with someone, but you might get beeped at any time. It's just something that you always keep in the back of your mind.

**Bonzai:** Looking back on all these years, how do you think Steve has changed?

**Olazabal:** He doesn't work as much. We both get tired sooner, whereas we used to be able to do a 24-hour session and come right back after an eight-hour break and do it again, and

again. One of the differences now is that he has a lot of other interests and public causes. He feels really strongly about his commitments, such as the work he did getting the Martin Luther King holiday, and apartheid. I'd say that music is still the center of his life, but he has branched out a lot.

A few nights later, Gary called and said he was mixing a song that Steve was producing for Eddie Murphy. Upon arriving, we were escorted through the reception area and then into a massive room stacked with synthesizers and instruments. I spotted Gary off in the control room and he invited us in. We sat and listened as he mixed from two digital multi-tracks, one a Sony and one a 3M. From time to time, Stevie would phone from his secret listening chambers elsewhere in the building. "Steve does a lot of his producing by phone these days," Gary told us.

When it came time for a critical digital edit on the DAE-1100, Steve came in and Gary directed his hands on the console. When a break came, I asked Steve what he had learned from working with Gary. He immediately stopped his work and motioned for me to follow him. Keiko and I followed him into

the synth room where Bob Bralove and the crew had programmed a repeating digital "meow." Steve laughed and barked at the imaginary cat. We continued through offices and game rooms until we found ourselves alone in a small back office.

**Bonzai:** What have you gained from this long relationship with Gary?

**Wonder:** Most of all, I think he's a person who has been eager in creating a marriage between music and technology—being able to record it on tape. He has the ability to understand what I come up with musically and I can share my ideas with him—he knows how I imagine it sounding and can make it a reality. It's like him watching my ears. And, of course, he's been a very best friend. We've grown a lot together and a lot of the time has been the most significant and precious time.

**Bonzai:** Do you encourage his other projects, experimenting with other artists?

**Wonder:** I encourage it because I feel that nobody can own another person. But I think we have such a great thing together that it would be difficult for us to do without each other. We both inspire each other in a way that would be difficult to achieve for someone else coming in to work with me, or for him with someone else. That isn't to say that we can't, because we have, and will.

**Bonzai:** What was the first song that you wrote?

**Wonder:** "Lonely Boy"—never recorded.

**Bonzai:** Your first instrument?

**Wonder:** Harmonica, and then piano.

**Bonzai:** How did your parents contribute to your life as an artist?

**Wonder:** Well, my mother sang in church, and both of my parents were singers. They were never recorded, but they could hold a note.

**Bonzai:** You spoke to me once about some dark premonitions you had—do you often have flashes of the future?

**Wonder:** Yes, I do, and I'm sure they'll continue. The interesting thing about the future is that even with premonitions, you live with faith and trust that whatever you perceive it as being, it is only a change to move on to another place for yourself, and those around you—loved ones, friends, acquaintances.

**Bonzai:** What fulfills your heart the most?



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**Wonder:** I love people. I love meeting people and I love knowing that those people who are special to me—those that are very close, but also just about everybody that I've met—I love bringing a smile, a positive feeling. I have been fortunate to do many things in this profession, which is something that I cherish very highly. And yet, as much as I love it, I want others with talent to have the opportunities. It's just not enough for me alone—I want it for other people as well.

**Bonzai:** In your opinion, who are some of the amazing artists?

**Wonder:** There have been a lot of amazing artists. Tomita is amazing—I've met him, but never worked with him. Chick Corea is an incredible musician and artist; Donny Hathaway was incredible; Herbie Hancock, Scott Joplin was a great musician. There's the music of Stravinsky and Moussorgsky. Ella Fitzgerald is incredible; Prince is an incredible artist; The Beatles, both as a group and as individuals. I think a lot of the rap groups are incredible artists and poets. Bob Dylan, Aretha Franklin, Benny Goodman, Duke Ellington, Count Basie. The young guitarist, Stanley Jordan. B.B. King, Marvin Gaye, Michael Jackson,

Lionel Richie, Sly Stone. I'm just naming a few.

**Bonzai:** When did the picture of your life come together and you knew your destiny?

**Wonder:** I think I'm still learning about my voice and my talents. I'm still growing and I hope to grow until the day I die. And then I hope that what I leave behind will grow through someone else and become better than where I was able to take it.

**Bonzai:** Will your children follow in your legendary footsteps?

**Wonder:** I feel that all three of my children are already great. I just hope to live and enjoy more of their greatness. But if I cannot, on this plane, I will enjoy knowing that they are just incredible. We spend a lot of time together, and it's quality time of special moments. As a parent, you perceive life differently than as just a person of this Earth. You have things that you want for your own life, and things that you want for your children's lives—to be able to wake up in the morning and see the sun shine, feel the breeze. In a new way, you want peace on the Earth. You worry about where the world is going, and what it means.

I recently wrote a song called "Children Still Do Live With a Dream." It's an interesting song, and very true. It begins with a Japanese name, "Sachi says that when he grows up, he'll invent the anti-war and he will if we let him, because children still do live with a dream."

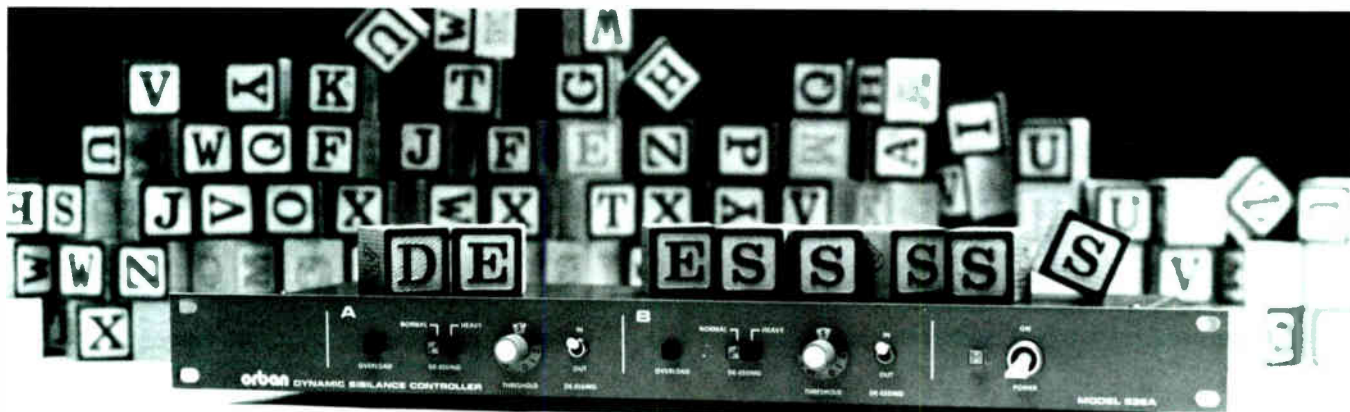
**Bonzai:** Why did you choose a Japanese name?

**Wonder:** Because I think of the atomic bomb and how much pain it must be to the people of Japan. I think about that and the pain of conscious people who understand the pain of war. And in a different way, I think of a bomb that was thrown on black culture many years ago—and it's still exploding. I relate to the pain that our culture has gone through. And I hope all people can get together and stop it.

**Bonzai:** Would you ever run for public office?

**Wonder:** Well, I can't say that I wouldn't and I won't say that I will, because I love saying it the way I say it, doing it the way that I do it. I have allegiance only to my heart and my feelings, and to the truth as I know it—not the bullshit.

—CONTINUED ON PAGE 42



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—CONTINUED FROM PAGE 41

**Keiko:** I remember a TV commercial in Japan where you were sitting alone in the desert and singing. Last year I was driving through Arizona and stopped in the wilderness and sat alone where there were no houses, or cars—just the sounds of birds and the wind. As I was sitting with my eyes closed, I felt like I was flying. I couldn't find myself, and I remembered you.

**Wonder:** It's a funny thing, because those feelings that you get have nothing to do with seeing or not seeing. They are just feelings that come to you when you are under the influence of nature, the magic of nature. You're

in God's hands. I've had the feelings many times, ever since I was little—just being there, smelling the breeze, the outdoors, the greenery. There is nothing like that feeling.

**Bonzai:** The sounds of nature have figured heavily in your work—*Secret Life of Plants*, and the latest album—

**Wonder:** I love natural sounds, playing with them and creating different sound statements through and with them. It's another expression with seeing, using sounds.

**Bonzai:** Do you have any other thoughts about your collaboration with Gary?

**Wonder:** Well, when I first met Gary he was assisting Bob Margouleff and Malcolm Cecil. He was still a child—learning, experimenting. The mind was still open—it wasn't stuck in one form, and I think Gary has always kept his mind in a very innovative state, which is difficult for some people. People fall into these ruts of time. I've shared with Gary trying to make things happen on time, but we know that they will happen in time, at the time when they're done. It's usually right on time—I really believe that. It isn't to say that I'll delay and drag it out, but I will do things based on feelings, based on what is right. You just can't rush it—it's a weird thing—you can, but that can mean settling for second best. When you say, "I know without a shadow of a doubt that this is it," you know, and you usually don't regret it. And there are certain things that you know are right there from the beginning.

**Bonzai:** I've never had the feeling that you were stalling. A lot of people are afraid of completion because that means they must face success or failure. They run away from it.

**Wonder:** And trip on it. I have an idea of what I want and sometimes I go one time and it may not be exactly how I imagined it. By having time, you're able to really feel it better and realize, "No, this isn't it—this isn't right." "Overjoyed" wouldn't sound anything like it does now if I had completed it based on what was available five or six years ago. It wouldn't have been right. "I Just Called to Say I Love You" wouldn't have been right, even though I had the beginnings.

**Bonzai:** What about the tight schedules of touring?

**Wonder:** Tours are a chance of actually recreating some of the emotions you have already had—but doing them live and sharing that as best you can—magical moments, those magical emotions again—with people.

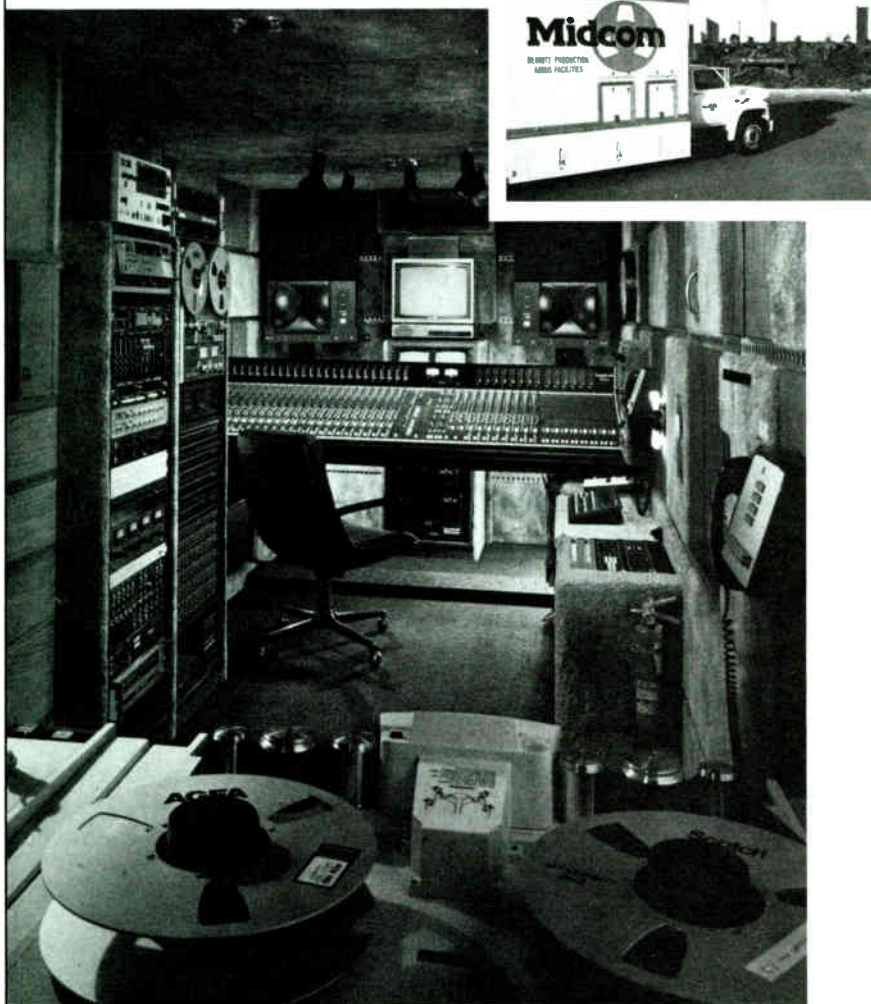
**Keiko:** In Japan, we have five ideas of nature—the wind, the fire, the water, the earth, and the sky—space. If you could be one—

**Wonder:** I like being the earth.

**Bonzai:** You're a Taurus, an earth sign, aren't you?

**Wonder:** I am a Taurus—I know I would want to be the earth. I would not want to change—I love the earth, but I think the sky would kiss me, the water would cool me, the fire would keep me warm, and the wind would blow away any of the wrong. And the earth would be me. ■

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# THE FUTURE OF AUDIO CONSOLE DESIGN

by Colin Sanders, Douglas Dickey and Chris Jenkins

## PART THREE

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**P**arts I and II of Solid State Logic's report on the Future of Audio Console Design [*Mix*, May and June 1986] detailed the pros and cons of programmable analog audio processing and fully digital audio processing. In this final installment, the critical issues of the human interface are discussed.

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### CONTROLS AND DISPLAYS

Programmable audio processors, whether analog or digital, require a new type of control architecture. Although freed from the restraints imposed by mechanical linkage, the designer must now develop an alternate yet equally reliable method of getting accurate control information to the audio processor, and accurate status reports to the displays.

Beyond satisfying the technical requirements of control processing, the designer must make careful choices about the ways in which controls and displays are presented to the operator. The freedom provided by programmability creates a number of exciting opportunities to improve the man/machine interface—and almost unlimited possibilities for getting this wrong!

Before discussing specific types of programmable control sets, it is important to understand two characteristics that they all have in common. When compared with a standard mechanical control set (such as a knob with a pointer on its cap and a scale around

its perimeter), a programmable control set providing comparable resolution will be larger and more expensive.

Since part of the comprehensive requirement for future consoles is that they must provide more facilities in less space at an optimum cost/per-

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“...part of the comprehensive requirement for future consoles is that they must provide more facilities in less space at an optimum cost/performance ratio...”

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formance ratio, these characteristics could spell trouble. This dilemma is one of the factors that brought about the concept of assignability.

#### Assignability

Assignability is an approach to control architecture based on the concept of “shared” control sets. A given control set may be used to perform the same function for a variety of channels, or different functions for a single channel, or some combination of these two. The term is derived from the need

to “assign” the control sets to the required audio processing prior to making the desired adjustment.

While programmable processors do not specifically require assignable controls, some form of assignability is a practical necessity in large systems.

In theory, assignability allows the designer to reduce the graphic density of the control surface by increasing the size of the individual control sets. It also allows the designer to reduce the total number of control sets required for a given number of functions and channels.

If properly implemented, the concept of assignability should thus result in a smaller control surface that provides both a greater number of functions and increased legibility—in other words, a console that is easier to understand and does more in less space than its standard analog counterpart.

The main drawback of assignability is betrayed by its name. Access to the audio processing is no longer instantaneous—it must be assigned. This applies not only to *control* access, but to *display* access as well. Great care must be taken to compensate for this limitation. If the control surface creates any real or psychological barriers between the human operator and the processes he or she is trying to observe and control, all of the theoretical advantages of the technology will be lost.

#### Control Surface Ergonomics

Ergonomics (also called “biotechnology” or “human engineering”) is the study of the relationship between human beings and machines, especially in terms of physiological, psychological and technological requirements. Fluency in this discipline is required to advance the state of the console building art.

The standard analog console has achieved a high degree of ergonomic integrity. The control and display conventions that have survived and evolved over the years are an extremely effective way of representing large amounts of information in an easy-to-assimilate fashion.

Several factors are at work here. The first, called pattern recognition, is what allows an operator to gaze across a properly designed control surface and acquire a quick grasp of the general situation. On a standard analog console, clusters of controls serving the same purpose on different channels are easily identified by their location and physical characteristics. For example, all of the equalizer controls are usually positioned in the same row. The spacing of the controls within the equalizer, the color-coding or grey scales of their knobs, and the positions and status indication of their switches is consistent. It is these patterns that make it easy to differentiate between an equalizer and a compressor, even on a high density panel.

Anomalies are the complement of patterns. In a room filled with a hundred businessmen wearing grey suits and blue ties, it is quite easy to pick out a gorilla—even if it has also been dressed in a grey suit. The gorilla is an anomaly that stands out from the pattern. In a similar fashion, the console operator glancing across the control surface effortlessly detects anomalies such as the presence of an EQ "IN" lamp. These anomalies serve as visual hooks, directing the operator's focus to a control that may deserve attention.

When the operator focuses on that equalizer, anomalies within its local pattern, such as a mid-range boost control set fully clockwise, instantly convey enough information for the mind to determine if a closer look is warranted. On closer examination, the scale surrounding the knob provides precise definition of the control's value.

Thus, the standard analog control surface provides the operator with many patterns and anomalies that enable large amounts of information to be selectively filtered in a single glance across the control surface. The process of acquiring more detailed information requires nothing more than focusing attention on a particular control cluster. Detailed information is available simply by taking a closer look at a specific control.

Finally, the standard analog console also scores high points on providing intuitive reaction to that information. Typically, nothing more is required than to reach out and adjust the control that one is already looking at. While greater effort is required both to read and to adjust controls on the

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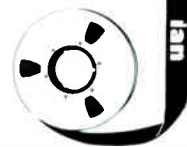
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far ends of larger consoles, the one-to-one relationship between control sets and processors, the integration of controls and displays, and the provision of patterns and anomalies in the design of the control surface all contribute to allowing most of the operating procedures to be accomplished subconsciously, freeing the operator to focus on intent rather than mechanics.

Programmable processors require the use of entirely different control/display components. Assignability eliminates the direct one-to-one relationship between processors and controls, and imposes an intermediate step to establish a temporary link. While it is not possible or even desirable for a programmable/assignable control surface to mimic that of a standard analog console, the basic mechanisms of human perception and reaction must still be accommodated.

### Local and Assignable Controls

One of the first decisions to be made is which controls must remain local, and which can be made assignable. While there is no technical reason why the entire complement of audio processors cannot be controlled from a single computer keyboard and VDU (video display unit), such a console would be unlikely to win any popularity contests.

It is generally agreed that each channel should retail a certain number of local controls that maintain a one-to-one relationship with their processors at all times. Typically, a "permanently assigned" local fader, cut button and pan pot per channel are considered the minimum requirements. It is also commonly held that some degree of local status display for all processing assigned to each channel should be provided on those channels at all times.

Beyond this, there are substantial differences of opinion between many mixing engineers with extensive experience and superb credentials. It appears that no single answer is correct in all cases. A great deal depends on the quantity and layout of the control sets and the clarity and definition of their displays.

### Assignable Control Sets

In addition to deciding which "permanently assigned" controls each channel should have, the console designer must decide how to bias the implementation of assignability. One approach relies on the concept of sharing "one-per-channel assignable control sets" between different functions. The other approach is based on the sharing of "full-function master assignable control sets" between different channels. Each approach may incor-

porate some aspects of the other, but the basic choice substantially determines the overall character of the console.

In making this decision, the console designer has to weigh the various aspects of the ergonomic equation. For example, the highly valuable "one-to-one" advantage of standard analog consoles weighs heavily in favor of "one-per-channel" assignable control sets, at least on first examination. However, assignability by definition dooms this approach to inconsistency. Moreover, it is at least as desirable to retain the advantages of pattern and anomaly recognition in the layout of controls as well as the nature of their displays. An example will clarify these points.

The sharing of per-channel local control sets between different functions provides the operator with a means of temporarily "locking" any desired function to a given channel, regardless of any adjustments required on other channels. The only requirement is that a sufficient number of controls must be provided on this local set to accomplish the necessary functions.

However, this arrangement denies the operator two of the most important pattern recognition "clues"—location and physical characteristics—that are normally used to differentiate between functions. The same controls in the same position could be performing any one of several functions. Identical controls on adjacent channels could be performing entirely different functions. If this approach is employed, it is imperative to substitute some other equally obvious method that enables the operator to readily distinguish which functions are selected on which channels.

The other approach is to provide two or more sets of full function master control sets that can be assigned to any channel. The assignable equalizer controls can then *look* like an equalizer, the assignable compressor controls can *look* like a compressor and so forth. Each master control set can have a fixed location and readily identifiable physical characteristics. The only display parameter that needs change is the one that indicates which channel has accessed the controls.

Rather than switching between a variety of small processing blocks on each local channel, these "full function masters" can provide the operator with simultaneous access to an entire channel's worth of processing. While a VDU might be used in conjunction with the earlier approach to provide a full channel *display*, the integration of controls and displays provided by the "full-function" approach is less physically and mentally taxing than a separated sys-

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tem that splits the operator's focus.

A number of other factors must be considered in determining which approach to use. The proximity of the "per channel" assignable control sets to each channel's "permanently assigned" controls is a definite plus. On the other hand, the removal of these assignable functions from the channel itself frees the designer from the restrictions imposed by the channel's width, which is typically either 35mm or 40mm. This allows control spacing to be increased to better suit the human hand, and to allow displays with greater clarity and definition to be employed.

Removing the locally assignable controls from their individual channels also frees channel real estate for the inclusion of a greater number of "permanently assigned" controls. For example, instead of simply indicating equalizer and dynamics In/Out status, local In/Out switches might be provided in each channel.

Finally, a decision needs to be taken as to which feature is more valuable: the ability to adjust all interacting parameters on a given channel simultaneously (such as fine-tuning two overlapping mid-band equalizer settings or adjusting compressor values against sidechain equalization); or the ability to simultaneously adjust certain

values of specifically pre-selected functions on different channels (such as equalizing two guitars to create space for each of them).

To answer this question, one needs to know how many parameters can be simultaneously controlled in the particular "per-channel" implementation, and how many master control sets can be provided in the "full-function" implementation.

#### Display Resolution and Clarity

As a general rule, the degree of variability provided in a particular processor must be matched by the display. This is an inherent property of mechanically linked control sets, but often overlooked in the design of digital controls.

If the control and its audio processing emulate continuous variability and the display resolution provides only a small number of discrete positions, a rather weird psychoacoustic phenomenon will convince even the most experienced listener that they are hearing "jumps" where none exist! For variable functions providing a smaller number of steps, display resolution should ideally be the same as step resolution. This is particularly true if the audio processors can be instructed by a reset or dynamic automation system. In a massive system, the need for auto-

mated functions to be self-indicating is critical.

The easiest way to accomplish this is to use numeric readouts as displays. Unfortunately, while such displays provide excellent discrete definition, they have an extremely low pattern recognition factor that makes it virtually impossible for the operator to glean meaningful information from a quick scan of the control surface. An example will illustrate this.

A 100 segment bargraph display is capable of much less definition than a four digit numeric readout—but the information from the bargraph is substantially easier to assimilate. Even if the readout is limited to displaying the identical number of steps, the difference between one tall column and another short one instantly conveys more useful information than one readout that says "30" and another that says "80." If the bargraph is given an adjacent illuminated scale, a closer look will reveal almost as much definition as the numeric readout—without the need for conscious interpretation.

Beyond specific control value displays, the programmable/assignable console must provide its operator with easy to grasp information about all established and available signal paths. The enormous flexibility promised by these consoles is of little use without



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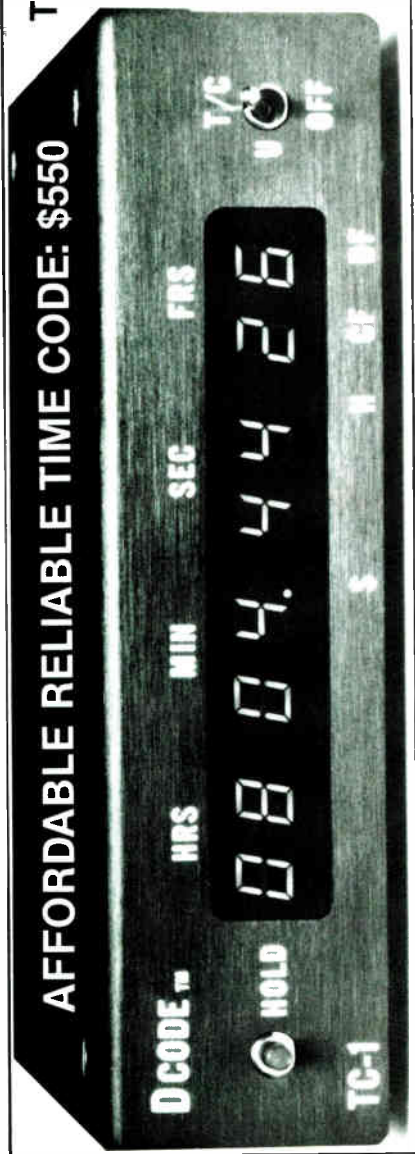
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the ability to confirm what's going on.

Part of this confirmation must be constantly displayed as an integral part of the console's topography. More precise details should be easily obtainable on a multi-purpose display device such as a VDU, a plasma screen or an LCD display.

The standard analog console allows the operator to cast a gaze across a dense attention on the general area of interest, to acquire specific and detailed information about a particular function, and to adjust its control settings—all in a simple, almost subconscious manner, frequently consisting of no more than a turn of the head and the near simultaneous reach of a hand.

While the creative potential of programmable/assignable consoles may be much greater than standard analog can offer, the biotechnical engineering to duplicate or surpass this operational ease is not a simple matter. Having discussed some of the man/machine requirements, it is time to move on to the technical implications of such control surfaces.

### CONTROL AND DISPLAY PROCESSING

Whether the programmable console employs analog or digital audio processors, the interface between the controls, their displays, the audio processors and the automation system is a major digital engineering exercise. The two primary requirements are those of any large-scale digital system—speed and flexibility.

When the operator turns a knob on a programmable console, the response of the audio processor must *appear* to be instantaneous. What is meant by this is that the expected audio effect must follow the operator's control movements in a natural fashion, with no perceptible lag. For psychoacoustic reasons, the update of the control's related display must also appear to be instantaneous, as the mind will inevitably superimpose any visual lag onto its impression of the audio. In the case of a pushbutton, the impression of immediate response is even more important.

The task of the control system is enormous. At a minimum, it must constantly scan every knob and switch, looking for changes. When it detects a control movement, it must first validate this data. (Is the control actually moving, or is this just spurious noise?) If it determines that the control data is valid, the control system must send it to the appropriate audio processor, confirm that it has been enacted, and pass this confirmation back to the originating control set's display, and any other relevant displays, so that they may be updated.

In addition to the speed and flexibility requirements of the control system, it must be absolutely reliable. There is no way to bypass it. The performance of the audio console is entirely dependent on the integrity of the control computer's hardware and software.

### Pre-Processing and Panel Scanning

While various architectures can be envisioned for realizing the necessary control loop, a discussion of a "typical" scheme will serve to illustrate the general requirements.

It is desirable to provide a certain amount of pre-processing as part of each individual control. This pre-processing serves to "clean up" the control's raw data output. Manufacturing tolerances of the control components may vary, and it is necessary to interpret and correct these, and to filter spurious noise.

Some system of scanning the various controls on each panel and feeding their codes to the central processor is required next. Each panel of control sets (such as a panel containing controls and displays representing an equalizer) may be serviced by a panel scanner.

Each individual panel scanner monitors all control changes within its panel. The panel scanner cards are microprocessor devices. Part of their function may be to validate raw data and to reject obviously erroneous data originating from any individual control set. Similar traps to detect and isolate malfunctioning components are desirable at each stage, to prevent gibberish from entering the main system, thus minimizing the possibility of catastrophic failure.

### The Central Control Computer

The control codes of all panel scanners are then fed to the Central Control Computer. In an assignable system, the same knob may perform different functions at different times, and these functions may require different control laws. The Central Control Computer keeps track of all of this, accessing look-up tables to provide the proper interpretation for each incoming code, depending on its assigned function.

Once the proper scales have been imposed, the central control computer translates all of this data into a uniform and efficient language. These instructions are then sent to the audio processors. As the processors confirm that they have performed the requested functions, these confirmations are fed back to the central computer, which formats and feeds this confirmation data to the panel scanners. These then allocate specific messages to the ap-



propriate control sets, and provide the signals necessary to drive the displays.

The central control computer thus provides the master interface between the panel scanners and the audio processors, and between these devices and any data storage and mix automation systems. While the elements discussed so far are typical of both programmable analog and digital consoles, the specific structure of communications between the central control computer and the audio processors differs depending on the type of audio processing employed.

### **Programmable Analog Implementation**

The capacity of programmable audio processors is rigidly fixed in hardware, requiring different types of processors for different functions. In a programmable analog console, two sets of control paths must be provided.

The first set of control paths is used to transmit data to and from the individual audio processors. There must be one audio processor of each functional type for each channel, up to the maximum number of channels on which that type of function may be simultaneously desired. The analog audio inputs and outputs for each of these processors must then be brought together in an elaborate digitally con-

trolled routing switcher.

The second set of control paths is used to transmit data to and from the audio routing switcher. This switcher must provide a sufficient number of crosspoints to handle all desired combinations of signal paths and signal flows. Care must be taken in both the audio processing rack and the routing switcher to prevent breakthrough of high speed digital data noise into the adjacent audio paths.

### **Digital Implementation**

In an entirely digital system, the central control computer transmits control data to the digital audio processor. Only one set of transmission paths is required, as this processor is common to all of the various "treatments" such as delays, equalization, compression, limiting and gating, which are defined in software and performed as mathematical calculations.

It is treatments such as these that require most of the processor's power—the digital equivalents of crosspoints and mixing buses are relatively cheap to implement in any desired quantity. The digital system's flexibility and maximum capacity are therefore defined strictly by processing speed and memory bandwidth. The control system architecture needs only to provide comparable transmission bandwidth to ac-

commodate any growth or changes.

### **Speed**

As stated at the beginning of this section, the entire control system must be capable of producing apparently instantaneous results. The processing architecture must therefore be capable of producing an audio result and confirming this on the displays within a very short period of time after the operator initiates a command.

The precise definition of "apparently instantaneous" is the subject of some debate. While the ideal is to eliminate the word "apparently" altogether, design for the real world must be concerned with both cost and feasibility. There is a minimum lag time that is practically attainable in a given system, and a maximum lag time that is operationally acceptable.

In a large scale system, acceptable delay between any sequence of command initiations and audio processor responses is in the region of four milliseconds, the exact number depending on the nature of the functions. Initial display response has somewhat more latitude, owing to differences in human auditory and visual acuity. The maximum acceptable lag appears to be in the region of 20 milliseconds.

Once a variable control movement has commenced, it is necessary to

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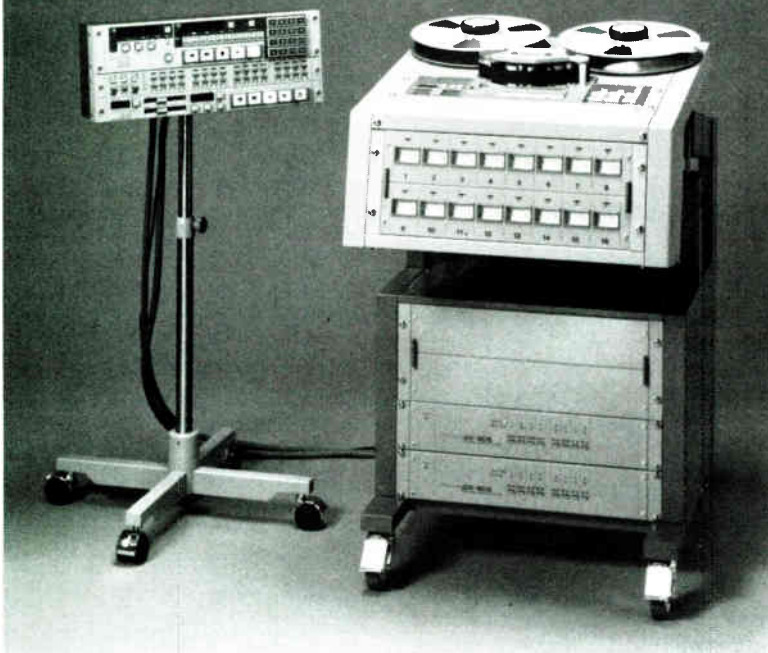
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maintain a minimum rate of data transmission to avoid the "missing bits" problem that we encountered in discussing programmable analog audio design. In either an analog or a digital system, failure to transmit sufficiently accurate code from the controls to the audio processors will result in similar glitch noise.

The magnitude of this problem varies with the maximum rate of change expected, the bit resolution of the particular controls, and the number of controls being simultaneously moved. The math involved is not of interest to the average reader, but the result is. If you turn four or five controls simultaneously and as quickly as you like, and the result includes glitches, the console designers have not done their homework.

Depending on the definition (bit resolution) provided by the displays, the display refresh rate requirements may be significantly higher than their corresponding controls' scan rate requirements. Again, the math involved to determine acceptable rates is quite complex—but the results are self-evident upon experimentation.

## AUTOMATION

Console automation systems perform many different functions. The two that are most relevant to fully programmable consoles are Reset Automation, which resets the controls to previously stored static values, and Dynamic Automation, which copies the operator's control movements. These movements can then be played back as many times as desired, with refinements added on each pass.

Reset automation is valuable to many classes of users, as it allows complex setups to be stored and easily re-created at any time. It thus helps to offset production costs, by allowing more efficient use of control room facilities. If the reset function is instantaneous, it becomes possible to switch between complex sequences of stored settings in real time—a boon to live production.

Dynamic automation is useful primarily in post-production situations. Current automation systems operate at roughly 0.25 to 1.0 EBU/SMPTE frame accuracy, storing information for approximately 100 dynamic functions and 100 to 200 events (switch closures such as mutes).

Total Dynamic Automation extends this approach to embrace the copying and subsequent manipulation of *all* control movements. For this reason, it is sometimes considered as a way of compensating for the restricted control access of some programmable designs. However, it must not be relied

on for this purpose unless the console is to be used solely for automated post-production.

Various attempts have been made to provide total dynamic automation. As an advanced console has upwards of 30 variable functions in addition to faders, and 60 to 70 switch functions in addition to mutes, the dimensions of this problem are readily apparent. A system that achieves control resolution and repeat accuracies similar to those provided by "fader only" dynamic automation systems will require somewhere in the region of 40 to 50 times the processing power and data storage of a single standard system.

Beyond the economics of this, the designer must also tackle the control implications. Automation systems have evolved over the years to give the engineer many sophisticated data editing "tricks," through a variety of control statuses such as Relative, Trim/Update and Autotakeover modes. These depend on dedicated status switches and/or specialized displays per function. It is left to the reader to envision a suitably self-explanatory and operationally efficient means of providing such facilities for all control functions of a large console.

Although automation systems may be closely coupled with their consoles, they are not a necessary part of the

console *per se*. We will have to leave a detailed discussion of their design for another time. But this subject should not be closed without some food for thought.

Current automation systems have developed to the point that many of the final creative decisions can be left until the last possible moment—and in some cases, to allow changes to the final product even *after* the project is finished. They have also undoubtedly added many creative capabilities to the recording artist's repertoire. But even with the achievement of total dynamic automation, something is missing.

In the days prior to automation, two of the audio engineer's most valuable creative tools were the razor blade and the splicing block. The principal drawback of this approach to creating a final product was that no matter how skilled the engineer might be, the final result of the manually edited mix could only be realized by audio copying, which resulted in signal degradation.

In an entirely digital system, with closely coupled random access audio storage and a properly designed editor's interface, this problem will no longer exist. The cycle from non-automated techniques to fully computerized processing, manipulation and editing will be completed. We believe

that this sort of "tapeless recording studio" will allow untold and unlimited possibilities for creative expression in sound. That—and nothing less—is the goal for the future of audio console design.

The authors wish to thank the entire staff of Solid State Logic, and the member studios of the SSL Network, whose support has made this research possible. In particular, we would like to thank the following members of the SSL Design Group at Oxford for their work and contributions to this report: Peter Barham, David Bell, Mike Carr, Andrew Cheyne, Steve Collier, Chris Cook, Phil Cork, Nick Critchley, Rod Densham, Buzz Diamond, Leigh Dyer, John East, Peter Easty, Sean Fernback, Paul Frindle, Crispin Herod-Taylor, Graham Hinton, Bill Kentish, Chris McCulloch, Colin Morley, Anne Parsons, David Prinold, Brian Redbone, Keith Shilton, Trevor Stride, Steve Williams.

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# REEL CAREERS

A look at the sometimes rocky road from recording school to the big, bad world of engineering...

by Blair Jackson

*Well the first days are the  
hardest days  
Don't you worry anymore  
'Cause when life looks like  
easy street  
There is danger at your door*  
—Robert Hunter

**W**hat's the best way to break into the recording business? Go to school to learn the tricks of the trade? Become a musician and learn through experience that way? Hang out by

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## SPARS Exam Update

Without a doubt, the most important step in anyone's audio career is finding that first job. However, a degree or resume may not adequately reflect your knowledge of studio procedures and equipment lore, and the SPARS Studio Exam may be just what you need to convince employers of your abilities.

The exam was conceived by the Society of Professional Audio Recording Studios, and with a considerable financial grant from Sony, became reality last year. The 200-question test covers everything an aspiring engineer needs to know, from session planning and setup, to acoustics, digital recorders, video, and equipment maintenance. "The reaction so far has been that it's very comprehensive," notes SPARS executive director Gary Helmers.

Steve Sergeant, a recent grad of the University of Iowa, with coursework in broadcasting, film, electrical engineering, computer sciences and music, took the exam last December in Minneapolis. "I have

no idea what the test scores *really* mean to employers in the broadcast, film sound, and recording studio community," says Sergeant, "but I'm just starting to look for work now, and I thought the test would be another thing I could use in my favor."

However, not all of the test takers are students and job seekers. Ron Diamond, an engineer at WNEV (Boston's CBS affiliate) who at press time was designing and building a new audio production suite for the station, took the test mostly out of curiosity. "Most of the people taking the test were students, but I took the test just to see how I stacked up against other audio engineers." Diamond was also somewhat surprised by the comprehensive nature of the exam. "I expected it to be pretty much mainline audio, but there were questions about VTRs, synchronizers, and reading music—these are things engineers need to know these days."

The SPARS Studio Exam will be given again this December, in various locations nationwide. For more information about the test, contact SPARS at Box 11133, Beverly Hills, CA 90213. —George Petersen

the back door of a studio until that fateful moment when the lazy go-ter gives you your first break by slipping you a buck and saying, "Here kid, the band needs some ciggies"? Kidnap the head engineer and then show up at the studio that afternoon with a resume? Use your inheritance to build your own studio? If there were easy answers, no one would be asking the question to begin with.

Let's face it: this is a strange business we're involved in. For all the mumbo-jumbo we're fed about "state-of-the-art" gizmos and "standard" studio procedures, the fact is there are a million approaches to everything in recording, including hiring. So to generalize about who is getting the plum entry-level jobs and why would be presumptuous, if not an exercise in outright fiction. In the end, it's always going to be a combination of elements that gets someone hired: personality, drive, technical background and—of course—being in the right place at the right time.

But let's step out on this limb over here—the one with the termite damage and a hairline fracture—and make a bold pronouncement: more and more studios are looking to men and women who have attended recording schools or programs when hiring time comes around. This doesn't mean that

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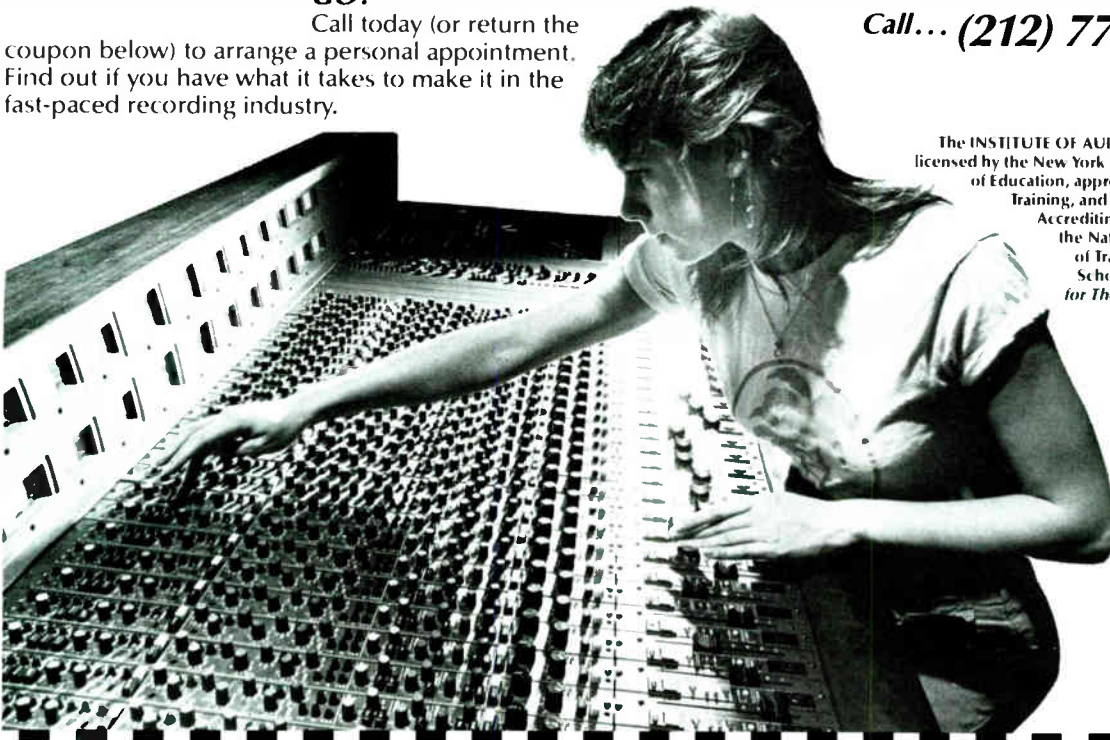
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**m**

you can't still get your foot in the door if you're a friend of the first cousin of the guy who used to do maintenance at the studio under its previous owners. But young people getting into engi-

neering; in fact, he found the training so valuable that he returned to the school for a third year when it upgraded its equipment.

"I wish I could go back there one

sure enough, a couple of months later, I got a call from them and I started working part-time for free at night. Then they put me on part-time in the daytime doing dubbing and some maintenance and things like that."

But his big break came when the studio's engineer quit. Kurt stepped in to become the studio's number one tech man. "It was quite a jump and I felt a lot of pressure," he says. "I had a solid, basic background from my schooling and what I'd picked up, but you learn the most on the job—tricks and shortcuts. One of the things I'm missing out on by being head engineer is I don't have a chance to work under someone who's more experienced. Sometimes I feel like I'm spending too much time learning things that someone could have taught me on the job in a much shorter time."

Kurt advises that aspiring engineers develop their maintenance skills, "especially if they're going to be working in a relatively small studio. If something goes wrong, you've got to fix it. That should be a challenge, not a nightmare."



*Joe Pass, shown here in a class session, is just one of a large number of industry luminaries (ranging from Joe Porcaro and Tommy Tedesco to Neil Peart and Eddie Van Halen) who have taught at the Musicians Institute in Los Angeles. This year marks the Institute's tenth anniversary, and one year programs in guitar, bass and percussion training are now offered.*

Pennsylvanian Richard Piatt says he knew what he wanted to do in life by the time he was 15. "I'd been in bands and everything," he recounts, "but I found that I was always more interested in sound systems and recording than in guitars and keyboards." And so, Richard decided to go to a college where he could learn more about the technical end of music. He read about different programs in a music magazine and ended up going to Ball State in Muncie, Indiana, where he got "a good, well-rounded education that mixed courses in music, music theory, physics, computer science and lots more."

neering are brighter and better qualified than they've ever been before, so the competition is much tougher.

To find out more about these great mysteries, we recently spoke with several recording school graduates to find out how their schooling helped them in landing jobs in the big, bad world of modern recording, and how their studies helped prepare them for the challenges of the profession.

Kurt Labenc faced a small dilemma. He knew he wanted to work in recording, but he also wanted to stay in his native Nebraska. Fortunately for Kurt, he found Northeast Technical Community College in Norfolk, Nebraska, offered a two-year program: perfectly suited to his needs. It included a good blend of music theory, math and hands-on training in different aspects of re-

more time," Kurt says with a laugh from Master Tracks, the Lincoln, Nebraska studio where he works as sole engineer. "They've developed the program even more since I was there and I'm sure I could pick up some new things there."

After Kurt earned his A.A. degree from NTCC, he "sent resumes to any place in Nebraska that had anything to do with sound. I found that you do best when you take the time to try to get to know people when you're applying. And I wasn't afraid to be persistent and bug people. Constantly. While I was looking for a job, I took a minimum wage job so I'd at least have some money to live on."

Before he graduated, he went to Master Tracks and took a tour "and I asked if I could just sit and watch things for a while. I told them I was willing to work for free to start and

In addition to the practical training he got through his course work, Richard augmented the school program by working for the college's Central Recording Office. "We'd record all the recitals put on by the music department students. It was great experience and I even managed to get paid while I was recording everything from brass bands to harp music and everything in between. I've talked to engineers who wish they'd been able to have exactly that kind of broad range of music to work with. Beyond the variety of the work, it also gave me a chance to make my mistakes early and not get my head chopped off for them," he adds with a laugh.

Richard admits that when he first graduated and began looking for a job, "I was hesitant to put my education on resumes because a lot of studio owners want you to come in and

be a go-fer and some are intimidated by your education. They think you're going to have a lot of pre-conceived ideas about how to do things, whereas they want to break you in to the way they do things and learn things their way—which of course I was willing to do.

"I ended up sending out 450 resumes while I was still in school," he continues. "Out of that, I got two letters saying 'Thanks for the resume,' and one phone call from Soundworks in New York City asking me if I wanted to come look at the place. I spent two days talking with them and they basically hired me on the spot and asked if I could start the next day. I worked at first as an 'assistant,' which meant answering phones and exciting things like that, but it was worth it just to be around the engineers who were working there—people like Roger Nichols, Gary Katz and Charlie Benanty—and to be at a place that was on the leading edge of recording. At that level, you spend a lot of time busting your butt doing things that have nothing to do with what you know, but the studio wants to see if you have the drive and personality to make it, plus you pick up so much just from watching and eventually you get asked to do little things that actually involve recording."

Working at a studio with such a good reputation led to Richard being able to do some freelance work at other studios around town, but eventually he left Soundworks to take a job (at age 22) as national technical sales rep for Eventide. For a number of reasons, that didn't work out, so he went through the resume grind one more time and this time ended up at Audio Innovators, one of Pittsburgh's top studios. "Working at Soundworks certainly helped me get that job," he says, "but I still think there's a tremendous amount of luck involved—handing a resume in to them on the day they're looking for somebody." He became chief engineer there working on commercials, post-production "and a lot of other things that allowed me to broaden my skills. There's a lot to be said for being a big fish in a small pond instead of a small fish in a place like New York."

Richard's dream is to build his own, state-of-the-art digital mobile truck. Don't bet against him.

Ethan Chase laughingly describes his current job at the Record Plant in Los Angeles as "go-fer/janitor, a peon first class," yet he describes himself as very happy in his work and he remains confident that there is an elevator waiting to take him from the ground floor. Like most people in similar jobs, he is

amazingly over-qualified and, at this point, under-utilized.

The road to this exciting career in the janitorial sciences started in seventh grade when he tested well in various ear training tests and was funnelled into an elite music program that finally led him to the Berklee College of Music to continue his music education. He left the program after three semesters, however, and, through a convoluted series of family connections, ended up working as a go-fer/janitor at Paragon Studios in Chicago, not far from his hometown of Highland Park. Recording was a long-time passion of his, but he felt that there was too much competition for what little hands-on recording time was

available to students.

While he was picking up bits of engineering skills at Paragon, however, Berklee was changing, and after about a year, he joined the first class in Berklee's Music Production & Engineering program. The four-year stint there started out with intensive work in mathematics, acoustics and theory, but he also got a lot of practical training on the way. "The great thing about Berklee," Ethan says, "is that the school's different programs are very well coordinated, so students in the MPE program are working with the music students, and so on. It's very well integrated in that way and it's a very helpful, cooperative atmosphere."

Equipped with a good resume, Ethan

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was lured to California by a trio of classmates who had successfully landed positions in recording at facilities there. "I had no idea of what to expect when I got there," he says, "but basically what I did was try to make it a point to check out at least one studio per day—talk to people, find out about prospective openings, check it out. I found that people in recording in Southern California are much nicer than they are in the East. They're more willing to listen to you, they're more relaxed, and I never had anyone literally sleep through my interview, which happened to me at a big Eastern studio I'd rather not mention.

"Basically, though, I got lucky. I only had to do the grind for 18 days before I heard about the job at the Record Plant through one of my friends." Things have been picking up—literally and figuratively—for Ethan ever since. "I never thought I'd get into a glamorous job right away," Ethan says philosophically. "But they're letting me do more and more. I'm actually allowed to touch things now and occasionally I'm called upon to do small assistant engineering-type things. I'm patient and as long as I feel like I'm learning things, it's worth it to me to be doing this. One of my Berkeley friends is already getting album credits over at Conway Recording,

and that's great. I'm sure that'll come for me, too, in time."

Steve Sharrott originally went to Berklee as a drummer but discovered that his heart was in recording and eventually enrolled in New York's Center for the Media Arts, which offers a nearly year-long program in audio arts that begins with recording theory and intensive electronics and then leads to work in mixing, recording, editing and even synchronization on a BTX Softouch system.

"The program is great for someone who doesn't know a lot about the industry," Steve says, "because it covers a lot of areas in a relatively short time. If you've already done a bit of studio work, though, you should probably go into a college or four-year program because they go into more detail."

Through the school's placement center, Steve was able to land a position at a small Manhattan jingle house, M & I Recording, as an assistant engineer. "It's worked out great for me," he enthuses. "In larger studios, you might spend the first couple of years just doing chores and maybe some tape copying and shipping, but really not get much hands-on experience. But here, I've gotten to do some mixes,

patch in the outboard gear, do set-ups and tear downs and help the musicians however I can. My responsibilities have probably grown faster here than they would at one of the big studios. Of course I do still empty the garbage," he adds with a chuckle.

Steve feels his recording education was very helpful in preparing for the real world of recording, "though I'm glad I went into the Center with a good background in music theory. I've found that's really mandatory. You have to have a good ear; you have to know when instruments are out of tune, when harmonies are wrong. But one thing school doesn't really teach you is the politics of the recording studio, the human relations aspect of it all. That's pretty much unteachable, but you'd be amazed how important that is."

Dave Gerbosi, too, spent two years at Berklee (he also was a drummer) soaking in information about theory and harmony, but was ultimately frustrated with the school's then-embryonic recording facilities (they've expanded greatly in the last few years). He transferred to the University of Colorado's respected College of Music in Denver and garnered what he terms, "the wordiest degree I've ever heard

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of: a Bachelor of Science in Music with an Emphasis on Sound Recording and Reinforcement."

He laid the groundwork for his first post-college job while he was still a student. Through Colorado, he landed an internship for a week at Chicago's well known Universal Recording. "I really didn't do much except watch that week," Dave says. "Later I did a paper on it and managed to get some credit for it. But I liked it so much that later I got permission to go back for three weeks and do more of a field study, which I also got credit for. Almost immediately, I started to assist a bit on things like vocal overdubs and assisting other assistants on bigger sessions with strings and horns. At the end of my first week, the assistant I had sort of been hanging out with there put in his two-week notice. At the time I was there, there were two other people doing longer internships who actually had more experience than I did, but they asked me if I'd stay and of course I said yes, because I hadn't really taken the time to explore what I might do after college."

Surprisingly, Dave advises students who are prospective engineers *not* to work for free in studios just to get experience. "I always got some kind of school credit from what I did," he says. "When you just go in there and say, 'I'll work for free,' management doesn't see you as an employee in any way. They get what they want from you and then it's 'Thanks a lot, see ya later.' I just don't think you get much respect in that situation."

He also cautions that a good attitude is paramount for novices. "I've seen people—real bright students—come in with know-it-all attitudes and they go nowhere fast. They think that because they have all this training from school that they should immediately be in there engineering big sessions, but it just doesn't work that way. Management people are sometimes impressed by these types, but the other engineers can spot that kind of attitude a mile away and they don't like it at all."

When John Bolt of Pinebrook Studios in Alexandria, Indiana, was looking to break into a career in recording, there were precious few places to study the trade. It's easy to forget that the boom in recording has really taken place within the past decade. "Nobody was seriously into recording at colleges in the late '70s," Bolt says, "and if you did find a program, you were lucky if they had a cassette deck or a 2-track." That wasn't a tremendous problem for John, though, a self-starter who was already building some of his

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The University of Lowell is a Full Member of the National Association of Schools of Music, an Associate Member of the Society of Professional Audio Recording Studios, and supports a Student Chapter Section of the Audio Engineering Society.

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own equipment and had a good grounding in both electronics and music by the time he was ready to look for a school.

A native of Ohio, he signed up for the first session of the now-famous Recording Workshop in Chillicothe, Ohio, "and what I was able to learn from that, though it was only a few weeks, really laid the foundation for my whole career." Though obviously more limited in scope just by virtue of its brevity, the five-week program (with advanced courses in things like maintenance and tape alignment also available), gave John "a real good look at the scope of the profession and an open attitude, which is very important.

"There are a lot of people who think that recording is exciting, fun and glamorous," he continues, "but if you start out with a relatively short course of study, like the Workshop, you'll find out quickly whether you're at all cut out for the business—without investing too much money or time. Rather than enrolling in a two- or four-year program and then bailing out midway, a shorter program will do fine letting you find out if engineering is all its cracked up to be."

John managed to parlay his time at the Recording Workshop into a maintenance position at the predominantly Christian-oriented Pinebrook, and

then he worked his way up to his current position as chief engineer. And that makes him the only one-time student in this survey to also be in a position to hire *new* engineers and assistants.

"At this point, we don't hire anyone without schooling of some type," he says. "The marketplace is just far too competitive and there are so many good prospects compared with when I was getting into it. Plus, I don't have two years to spend training someone in the job from the ground up. In most of the interviews I conduct, once I ascertain the level of technical knowledge, I look for a personality I can work with—someone who's going to make my clients feel comfortable. As a whole, I'd say the ones who become successful engineers are people who are easy-going and less likely to react emotionally too quickly. I have met some people who now make big bucks as engineers who are just impossible to get along with, but they won't get hired here."

Though John stresses the competitiveness of the hiring climate these days, he does not feel that the proliferation of recording programs at schools has created a glut of job seekers. "Fortunately, the explosion in stereo TV and music video has meant a big increase in the number of jobs

available right at the time a lot of these schools are turning out big classes," he says. "When I go back and lecture at the Workshop, I always take an informal poll to see what area of audio people are interested in. And I'm always surprised that less than half want to be recording engineers. The rest are into audio-for-video or sound reinforcement or any number of areas, and that's good. That's where a lot of the new jobs, and where the future of the business, lies."

"Even though I had a great time at the University of Miami, I worked *really* hard," says Mitch Dorf, a recent graduate of that university's prestigious school of engineering who now works as an engineer at Atlanta's New Age Sight and Sound. "All of my free time was spent in the studio. At U. of M it's easy to tell who's going to make it: it's the guys who are in the studio all the time instead of looking for girls at the beach."

Mitch was ideally equipped for Miami's comprehensive program, having worked extensively in an 8-track studio in his hometown of Milwaukee while still in high school. "I learned a lot about mic placement and signal flow and what different types of equipment could do," he says, "but beyond that I learned what the professional recording environment was like, and I learned that it was a career I wanted to pursue."

Miami's program requires that students first be accepted at the University, then at the School of Music, and *then* in the Music Engineering program, so the entrance requirements were quite rigorous. According to Mitch, it didn't get any easier once he was in, either. "You have to take a full 18-credit course load for the first three and a half years, and then I did a lot of playing [he's a tuba man] in different school groups on top of that."

Mitch's final semester was to be an internship with a recording studio, but he managed to kill two birds with one stone when he actually landed a job—listed through the University—at New Age Sight & Sound. "It's been tremendous so far," he says. "I've gotten to engineer a demo session and I've assisted the two other engineers on a wide variety of projects. When I was hired, they told me I was to be 'Bill Allgood II' [Allgood is the studio owner] and I really *have* learned a great deal from him. Now that I'm really in it, I can see I was right in my career choice, and the best part of it is that it's always changing. You can't sit still with what you know, because someone, somewhere, is always coming up with something new." ■

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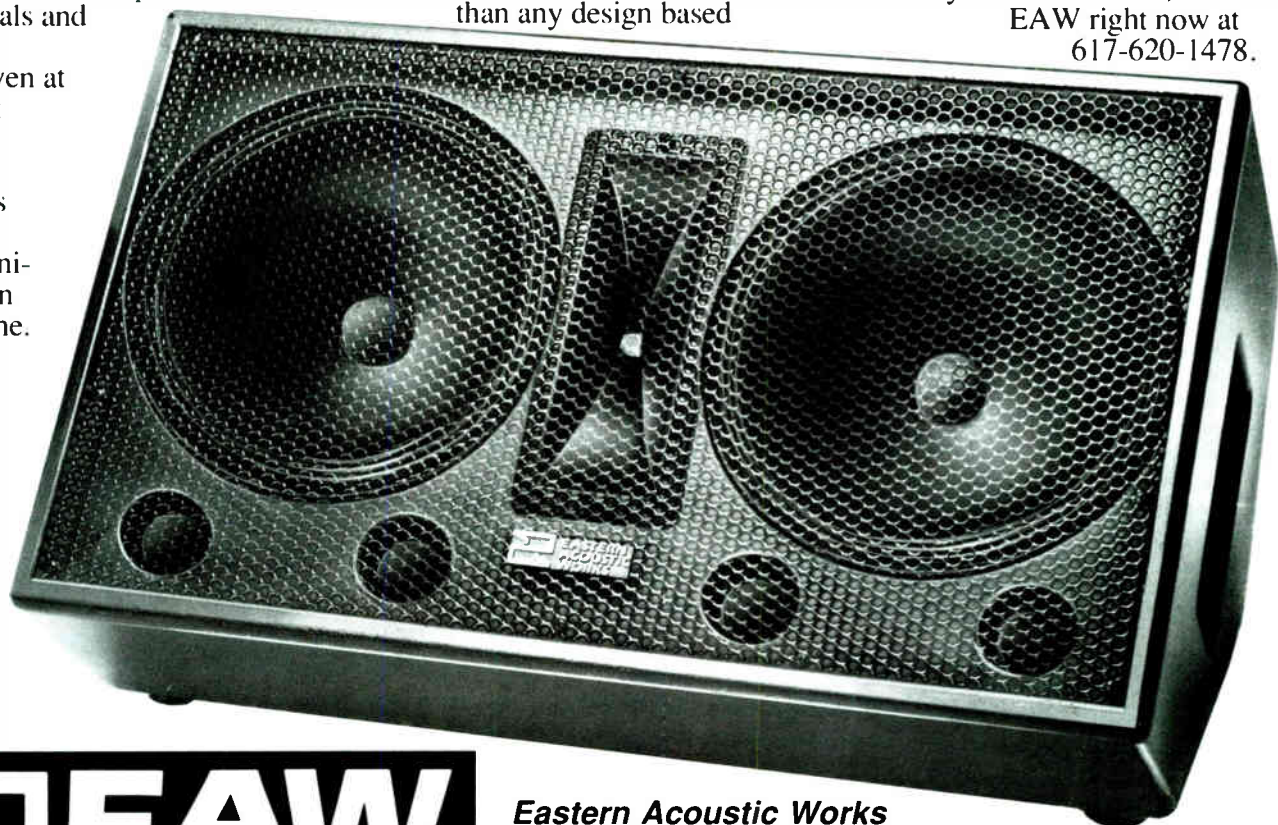
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# Directory

of

## Recording Schools, Seminars & Programs

## WESTERN

**THE ACADEMY OF RADIO BROADCASTING**  
8907 Warner Ave. #115, Huntington Beach, CA 92647  
(714) 842-0100  
Chief Administrator: Tim King

**THE ASPEN AUDIO-RECORDING INSTITUTE**  
Box AA, Aspen, CO 81612  
(303) 925-3254  
Chief Administrator: Dan Craik  
Program: An intensive full-time clinic workshop that helps prepare students for the occupation of recording engineer. Hands-on participation in recording the daily concerts and rehearsals of the Aspen Music Festival is emphasized. Students have full use of professional recording equipment. Conducted in (4) two-week sessions throughout the summer. Classes combine work experience with lecture demonstrations by a faculty drawn from noted representatives of the recording industry. Session 1: July 1-14 (Introductory Level) Session 2: July 15-28 (Intermediate Level) Session 3: July 29-Aug. 11 (Introductory Level) Session 4: Aug. 12-25 (Intermediate Level)

**AUDIO CONSULTANT COORDINATION**  
P.O. Box 865, Venice, CA 90291  
(213) 306-6736  
Chief Administrator: Claude Venet  
Program: ACC seminars cover topics dealing with acoustics, electronics and architecture, aiming to update the participants with state-of-the-art technologies in the areas of studio and theater design, sound system engineering, and electro and architectural acoustics. The seminars are offered every year in Los Angeles, Rio de Janeiro and Paris, other locations available worldwide in four languages on request. Each seminar, lasting 40 hours, includes class textbook, calculator and is sanctioned by a graduate certification diploma. The course instructor is Claude Venet, acoustical engineer, designer, and architect in authority recognized worldwide for his work with leading artists, theaters and recording studios besides teaching in internationally known universities.

**BAILIE SCHOOL OF BROADCAST**  
7416 212th S.W., Edmonds, WA 98020  
(206) 771-6200  
Chief Administrator: Ronald L. Bailie  
Program: Broadcaster/Video Production. Bailie School of Broadcast Seattle, Spokane, San Francisco, San Jose, Phoenix, Denver. Accredited member of NATTS offers Broadcasting 900 hours, 25 hours per week for 36 weeks; video production 600 hours, 25 hours per week, 24 weeks; total in each program \$3,600.

**KEARNEY BARTON'S AUDIO RECORDING SCHOOL**  
4718 38th Ave. N.E., Seattle, WA 98105  
(206) 525-7372  
Chief Administrator: Kearney Barton

Following is a briefly annotated list of schools and programs offered in the areas of audio and music education, compiled from questionnaires received from those institutions during April and May, 1986. The courses vary greatly in scope, intent and cost and we urge those interested in attending any program to investigate very carefully before making their decisions. *Mix* claims no responsibility for the accuracy of the information provided by the institutions.

**BLUE BEAR SCHOOL OF MUSIC**  
Bldg. D Fort Mason, San Francisco, CA 94123  
(415) 673-3600  
Chief Administrator: Carol Snow  
Program: Home recording and synthesizer classes

**BRIGHAM YOUNG UNIVERSITY**  
Dept. of Music, C-550 HFAC, Provo, UT 84602  
(801) 378-3083  
Chief Administrator: K. Newell Dayley  
Program: BFA program in music

**CABRILLO COLLEGE**  
Music Dept., 6500 Soquel Dr., Aptos, CA 95003  
(408) 479-6288  
Chief Administrator: Lile Cruse, Bob Beede  
Program: Audio Arts

**CALIFORNIA POLYTECHNIC STATE UNIVERSITY**  
Music Dept., San Luis Obispo, CA 93407  
(805) 546-2664, 546-2406  
Chief Administrator: Antonio G. Barata  
Program: Recording arts and electronic music

**CALIF STATE UNIVERSITY DOMINGUEZ HILLS**  
1000 E. Victoria St., Carson, CA 90747  
(213) 516-3543  
Chief Administrator: James Sudalnik  
Program: Video production, broadcasting, communications, audio recording



**CALIF. STATE UNIVERSITY DOMINGUEZ HILLS**  
Carson, CA

**CALIFORNIA STATE UNIVERSITY, LOS ANGELES**  
Music Dept., 5151 State University Dr.  
Los Angeles, CA 90032  
(213) 224-3348, 224-3448  
Chief Administrator: Michael Fruchter

**CASPER COLLEGE**  
Music Dept., 125 College Dr., Casper, WY 82601  
(307) 268-2532  
Chief Administrator: Terry Gunderson

**CITY COLLEGE OF SAN FRANCISCO**  
Broadcasting Dept., 50 Phelan Ave.  
San Francisco, CA 94121  
(415) 239-3525  
Chief Administrator: Phillip Brown  
Program: Video and audio courses.

**CLAWS-ON PRODUCTIONS**  
1355C Bear Mountain Dr., Boulder, CO 80303  
(303) 499-1144  
Chief Administrator: Lisa Clawson  
Program: Introduction to multi-track recording

**CMX CORPORATION**  
2230 Martin Ave., Santa Clara, CA 95050  
(408) 988-2000 x239  
Chief Administrator: Susan J. Dressler  
Program: Audio A101 (Cass I) Seminar

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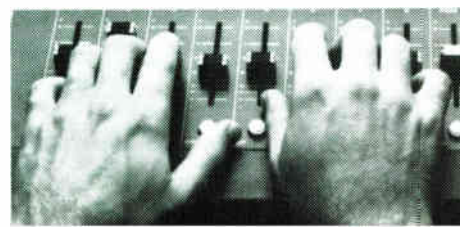
before, the hottest engineers will be those with the skills of both a technician *and* a musician. And now there's one place where you can develop your technical and musical awareness hand-in-hand—at the acclaimed Grove School of Music in Los Angeles.

Grove's new Recording Engineering Program is an intensive one-year course of study that gives you an exceptionally well-rounded approach to making music sound better. Grove instructors are working professionals based here in the entertainment capital of the world, where opportunities are at your doorstep in more studios and concert halls than you'll find anywhere else. Students from more than 30 countries have found the Grove School to be the most *practical* place to launch their music careers.

## 1. Meet the versatility challenge.

Every recording, mixing and sound reinforcement situation is different. That's why the Grove program gives you such a broad range of experience, getting you comfortable engineering everything from 5-piece rock bands to 18-piece big bands to 40-piece orchestras.

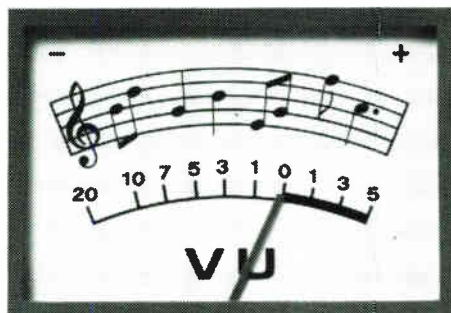
You'll work with a full spectrum of acoustic to electronic music, from Top 40 to film and television scores. And you'll learn sound reinforcement techniques for a wide variety of live music applications.



## 2. Get consistent hands-on experience.

There's no substitute for learning by doing. So you'll regularly have projects in Grove's two in-house studios, as well as taking advantage of the program's ongoing access to state-of-the-art 24-track facilities in the Los Angeles area.

To get the most from your time in the studio, you'll cover your technical bases with courses in acoustics, electronics, studio installation and equipment maintenance. You'll also learn studio management procedures to help prepare you for the business end.



## 3. Hear music through a musician's ears.

The most talented engineers are usually musicians as well. The Grove program is designed to insure that you'll *understand the music* you're recording, and that you'll be able to *effectively communicate* with musicians on their own terms. Grove's outstanding courses in eartraining,

harmony, sightreading and rhythm section arranging will result in some great advantages for you when you're behind the board.

## 4. Prepare for related opportunities.

Successful engineers often expand their careers into related fields like record production and music video. Grove offers professional workshops in both these areas, as well as many others ranging from Songwriting to Synthesizers to Drum Machine Programming. You can build these into a customized course of study, and we'll help you tailor a complete package to fit your personal career goals.

## 5. Get a competitive edge.

The Grove Engineering Program begins each January and July. You may qualify for financial aid. And if you're concerned about getting a college degree, our accredited courses can be part of your B.A. in Commercial Music through our affiliation with Laverne University.

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I'd also like more information on the other programs checked below:

- Songwriting Program
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- General Musicianship Program
- Vocal Program
- Keyboard Program
- Guitar Program
- Bass Program
- Percussion Program
- Composing and Arranging Program
- Film Video Composition Program

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**Chief Administrator:** Leo De Gar Kulka  
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**COSUMNES RIVER COLLEGE**  
 Communications Media, 8401 Center Parkway  
 Sacramento, CA 95823  
 (916) 686-7410  
**Chief Administrator:** Marc Hall  
**Program:** AA Degree

**EASTERN WASHINGTON UNIVERSITY**  
 Radio-Television Building, Cheney, WA 99004  
 (509) 359-2228  
**Chief Administrator:** Marvin Smith

**FRESNO RECORDING WORKSHOP**  
 (THE SOUND STAGE)  
 1615 N. Blackstone, Fresno, CA 93703  
 (209) 233-6531  
**Chief Administrator:** Poindexter

**FULLERTON COLLEGE**  
 Music Dept., 321 E. Chapman Ave.  
 Fullerton, CA 92634  
 (714) 871-8000 x336  
**Chief Administrator:** Alex Cima  
**Program:** 1985 Mix TEC award nominee. The college offers a one year certificate in Music Recording/Production encompassing two semesters of audio recording, two semesters of electronic music, one semester of music business, and other relevant music courses. The Music Dept has a fully equipped 24-track studio w/automated board, digital reverb, digital mixdown, and the usual complement of signal processors (Harmonizer, compressors, etc.) and microphones. Fullerton College is a public California Community College with minimal tuition for California residents. A great way to receive a college education and learn professional audio recording.

**GABRIEL SOUND & ENGINEERING**  
 833 W. Main St., Mesa, AZ 85201  
 (602) 969-8663  
**Chief Administrator:** Brent Gabnelsen  
**Program:** Recording seminars. Four week recording studio techniques seminar for beginning students. The classes meet twice a week for 2 1/2 hours. Topics covered in the class are: Introduction to the Recording Chain, Sound and Instruments that Produce Sound, Microphones and Speakers, Recording Consoles, Signal Processing, Tape Machines, Student Recording, Student Mixdown. Hands-on experience is stressed, enrollment is limited to ten students per class. The total fee for the class is \$175



**GOLDEN WEST COMMUNITY COLLEGE**  
 Huntington Beach, CA

**GOLDEN WEST COMMUNITY COLLEGE**  
 15744 Golden West St., Huntington Beach, CA 92647  
 (714) 895-8780



**Chief Administrator:** Evan Williams  
**Program:** A two-year recording engineering program is conducted in three multi-track recording studios. Students begin recording projects the third week. Advanced students make an annual record highlighting work of student songwriters, arrangers, producers and engineers. A well rounded understanding of the music industry is developed through courses in music theory, composition, arranging, business management, synthesizer programming and record production. The program has a ten year record of graduates fully prepared for entry-level jobs. Entrance to the program is by exam, given annually in August, with the top 80 students accepted. The exam covers basic recording theory, electronics and music theory.

**DICK GROVE SCHOOL OF MUSIC**  
 12754 Ventura Blvd., Studio City, CA 91604  
 (818) 985-0904  
**Program:** The Grove School of Music REM program is a one year course in audio engineering. Areas of study include recording theory, sound reinforcement, studio management, acoustics, electronics and maintenance. The program specializes in hands-on training in real world situations. A typical week includes recordings in our in-house studio ranging from five-piece rhythm section to 40-piece orchestra, video sessions and outside training in other Los Angeles area 24 track studios. Students graduate with the technical and musical abilities to work in this field. The course begins in January and July. Write for brochure and catalog.

**HORIZON RECORDING STUDIO**  
 1317 So. 295th Pl., Federal Way, WA 98003  
 (206) 941-2018  
**Chief Administrator:** Roger and Lorne Wood



**INSTITUTE OF AUDIO/VIDEO ENGINEERING**  
 Hollywood, CA

**INSTITUTE OF AUDIO/VIDEO ENGINEERING**  
 1831 Hyperion Ave. Dept. E, Hollywood, CA 90027  
 (213) 666-3003, x6  
**Chief Administrator:** J. Fred Munch, Larry Cook  
**Program:** Recording engineering. State approved eight-month program leading to a diploma in recording engineering. Program includes multi-track music production, video production, video editing, audio for video and film, telecine/broadcast engineering, sound reinforcement, and studio maintenance. Hands-on experience is stressed. Internships are available. In-house facilities include: 24-track recording studio w/automated console, 24-track audio sweetening room with CMI Fairlight music computer, video editing bay, film-to-tape transfer system (35 mm to one-inch videotape), and audio-video duplicating rooms.

Cost of entire program: \$4,965 to \$5,345, depending on choice of elective classes. New students may start in January, March, May, August or October. The Institute is approved by the United States Immigration and Naturalization Service to enroll foreign students (I-20 M-N Form). Also approved by the California Dept. of Education. All instructors are working professionals and have state authorization to teach. Call or write for a free brochure.

**LANE COMMUNITY COLLEGE**  
 4000 E. 30th Ave., Eugene, OR 97405  
 (503) 747-4501 x2371  
**Chief Administrator:** James Brock

**LONG BEACH CITY COLLEGE**  
 4901 E. Carson St., Long Beach, CA 90808  
 (213) 420-4308, 420-4233  
**Chief Administrator:** Alan Heywood  
**Program:** Telecommunications (TV & radio production)

**LOS ANGELES CITY COLLEGE**  
 855 N. Vermont Ave., Los Angeles, CA 90029  
 (213) 669-4000 x267  
**Chief Administrator:** Vaughn Obern

**LOS ANGELES HARBOR COLLEGE**  
 1111 Figueroa Pl., Wilmington, CA 90744  
 (213) 518-1000 x235  
**Chief Administrator:** Robert Billings  
**Program:** Recording Arts Certificate program.



**LOS ANGELES RECORDING WORKSHOP**  
 Hollywood, CA

**LOS ANGELES RECORDING WORKSHOP**  
 5287 Sunset Blvd., Hollywood, CA 90027  
 (213) 465-4254  
**Chief Administrator:** Christopher Knight  
**Program:** We offer three comprehensive certificate programs, each designed specifically to train you for a music industry career. A ten week recording engineering program, a ten-week record production program and a ten-week live concert engineering program. Each program offers 200 hours of instruction, each including 100 hours of state-of-the-art hands-on workshops in four different 24-track computer-automated studios. Each program includes synthesizer programming techniques and intensive ear training and critical listening analysis. Workshops are six to eight students. Payment plans and job placement are available. Our programs are intensive and comprehensive, and are approved by the State of California. Call or write for a free catalog and studio tour.

**LOS ANGELES VALLEY COLLEGE**  
 Dept. of Theater and Cinema Arts  
 5800 Fulton Ave., Van Nuys, CA 91401  
 (818) 781-1200 x354  
**Chief Administrator:** Dr. W. Milton Timmons

**LOS MEDANOS COLLEGE**  
 2700 E. Leland Rd., Pittsburg, CA 94565  
 (415) 439-0200  
**Chief Administrator:** John Mallester  
**Program:** Los Medanos College, a part of the California Community College system, offers a recording arts program based around a four-part series of semester-long classes: Intro to Recording, Acoustics, Studio Procedure, and Signal Processing & the Final Product. Additional classes are offered in Sound Reinforcement, Record Producing, Synthesizers and MIDI, and Systems Servicing. Course credits are fully transferable and a certificate of

completion is offered. For musicians who just want to get their "studio chops" together, the courses may be taken independently. The school has a completely equipped 16-track studio.

**LOYOLA MARYMOUNT UNIVERSITY**  
Dept. of Communication Arts  
Loyola Blvd. at W. 80th St., Los Angeles, CA 90045  
(213) 642-3033  
Chief Administrator: Don Zirpola  
Program: B.A. in Communication Arts. The Communication Arts Dept. of Loyola Marymount University is offering a Bachelor's program in Recording Arts. This program is designed to provide an intensive theoretical and practical knowledge related with sound recording for film, TV, video and disk. The department has state-of-the-art facilities that include 24-track studio, digital processors, 16-track studio to mix film in video, varieties of microphones and digital signal processing equipment. The department is also planning to offer a M.F.A. program in Video and Recording Arts for spring 1987. For more information contact Donald Zirpola, division head.

**MEDIA SCIENCES INSTITUTE**  
3465 El Cajon Blvd. P.O. Box 4678  
San Diego, CA 92104  
(619) 280-7454  
Chief Administrator: Richard Bowen

**MILLS COLLEGE**  
Box 9991, Oakland, CA 94613  
(415) 430-2191  
Chief Administrator: Maggi Payne  
Program: Sound Techniques 161-162, 261-262

**MIRACOSTA COLLEGE**  
Music Dept., One Barnard Dr., Oceanside, CA 92056  
(619) 757-2121 x446  
Chief Administrator: Dave Megill, John Gorrindo  
Program: Studio recording and music video

**MIXMASTERS AUDIO ENGINEERING SCHOOLS**  
4877 Mercury St., San Diego, CA 92111  
(619) 569-7367  
Chief Administrator: Garth Hedin

**MONTANA STATE UNIVERSITY**  
Film and TV Dept., Bozeman, MT 59717  
(406) 994-2484  
Chief Administrator: Paul Monaco

**MT. HOOD COMMUNITY COLLEGE**  
26000 S.E. Stark, Gresham, OR 97030  
(503) 667-7410  
Chief Administrator: John M. Rice  
Program: Radio Production Technology

**MUSICIANS INSTITUTE**  
6757 Hollywood Blvd., Hollywood, CA 90028  
(213) 462-1384  
Chief Administrator: Patrick Hicks

**NAVAJO COMMUNITY COLLEGE**  
Deans Office, Tsaile, AZ 86556  
(602) 724-3311 x248  
Chief Administrator: Roy B. Spurgeon

**NEW MEXICO STATE UNIVERSITY**  
Music Dept., Box 3F, Las Cruces, NM 88003  
(505) 646-2421, 646-5215  
Chief Administrator: Lee Richards, Warner Hutchison, Jim Bonevich  
Program: Electronic Music/ Audio Recording

**NORTHWEST INSTITUTE OF RECORDING**  
4230 Leary Way N.W., Seattle, WA 98107  
(206) 783-3869  
Chief Administrator: William Stuber

**PACIFIC LUTHERAN UNIVERSITY**  
121 St. & Park Ave., Tacoma, WA 98447  
(206) 531-6900  
Chief Administrator: Robert Holden

**PORTLAND COMMUNITY COLLEGE**  
12000 S.W. 49th, Portland, OR 97219  
(503) 244-6111  
Chief Administrator: James Van Dyke

**THE QUINCY STREET WORKSHOP**  
130 Quincy N.E., Albuquerque, NM 87108  
(505) 265-5689  
Chief Administrator: Eric C. Larson

**RADIO/TELEVISION ADVERTISING**  
9699 Follett Dr., Santee, CA 92071  
(619) 575-5750  
Chief Administrator: Al Taylor  
Program: Courses range from writing to production.

**SADDLEBACK COLLEGE**  
28000 Marguerite Pkwy., Mission Viejo, CA 92692  
(714) 582-5727  
Chief Administrator: Mark Schiffeiben

**SAN FRANCISCO STATE UNIVERSITY**  
Extended Education, 1600 Holloway Ave.  
San Francisco, CA 94132  
(415) 469-1372  
Chief Administrator: Mary Pieratt  
Program: Music/Recording Industry. An accredited music industry program for students and professionals, w/ courses that range from record engineering, mixing, artist management, publicity, concert production and booking, industry history, and field internships to seminars like music journalism, record distribution, and music video. Expand skills with one or two workshops, or earn a professionally recognized certificate with completion of a structured academic program taught by Bay Area pros. Formal university application is not required. Call (415) 469 1372 for information

**SAN JOSE STATE UNIVERSITY**  
1 Washington Square, Theatre Arts Dept. RTVF  
San Jose, CA 95192  
(408) 277-2763  
Chief Administrator: Charles Chess  
Program: Radio-Television-Film Program. Four year program toward BA. Management, Production and Theory. Half-inch and 3/4-inch video, 16mm film, production and editing 1kw FM station.

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Mix Directories are the most complete guide to facilities and services for the audio and video industries. When production professionals need equipment, studios, or other services, they consult *Mix* first. To receive a questionnaire for a FREE listing in any or all of the following Mix Directories, simply fill out and return the coupon below, or call the Directories Dept. at (415) 843-7901.

- OCTOBER: **Studios of the North Central U.S.**
- OCTOBER: **Canadian Studios** (Deadline: July 14)
- NOVEMBER: **New Products for 1986 (AES Special Edition)** (Deadline: August 1)
- DECEMBER: **Tape-to-Disc Issue: Directory of Manufacturing Services** (Deadline: September 3)
- JANUARY '87: **Studios of the Northwest U.S.** (Deadline: October 1)

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COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

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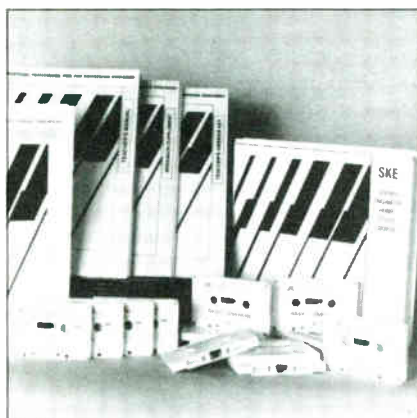
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Sedona, AZ

**SKE PUBLISHING**  
P.O. Box 2519-M, Sedona, AZ 86336  
(602) 282-1258

**Program:** Recording School Curriculum Service. We publish a complete curriculum for schools and recording studios wishing to teach sound engineering. Based on the book *Practical Techniques for the Recording Engineer* (400 pp., over 350,000 words), these course materials are already in use by over 75 universities, colleges, and studios throughout the world. The text (\$24.95), Teacher's Manual (\$45), Answer Key (n/c), Student's Workbook/Supplement (\$14.50), and three final exams (n/c) make up a 24 module course in three levels. Progressively intensive coverage. Homework questions in each module for verbal or written review. Suggested session content for hands-on studio work. Three comprehensive final exams. Course features real-world, practical, useful content. Text covers techniques and skills while Workbook/Supplement covers conventional subjects. Write for more information.

**Program:** Sound Engineering Correspondence Course. Study sound engineering with our correspondence course. This course covers it all: Acoustics, mics, consoles, signal processing, recorder alignment, tricks-of-the-trade, special effects, the psychology of working in an engineering environment, and much more are all covered in great detail. A lifetime of musical, technical, psychological and practical information is presented in clear, progressively intensive lesson format. Build your own streamlined sound engineering technique based on the one presented in the book and course. Written, corrected and graded homework, plus unlimited dialog via audio cassettes provides direct, private and personal feedback from the instructor. This is the only course available with all these features.

**Program:** Sound Engineering Home Study Course. A faster, more affordable way for the sound enthusiast to study the high powered sound engineering course offered by SKE. Our home study program works faster and costs less because it does not include the dialog feature. Work on your own to master the musical and technical concepts of sound engineering. The home study cassette packages for Basic, Intermediate, or Advanced levels require the student also have the P.T.R.E. text, and Workbook/Supplement. The cassette package contains the audio portion of an entire course level (Basic, Intermediate, or Advanced) on (12) 60-minute audio cassettes (\$145). Microphones, recorders, session and stage set-up and breakdown, alignments, noise reduction, sound and audio theory, acoustics, editing mixing techniques, tricks-of-the-trade, grounding, special effects, and much more all covered in great detail. The eight lecture cassettes expand on the information in the books while the four answer cassettes complete the learning experience.

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**SONOMA SOUND**  
P.O. Box 1623, Sonoma, CA 95476  
(707) 996-4363  
Chief Administrator: Arron Johnson  
Program: Engineering/Production course for beginners



**SONOMA STATE UNIVERSITY**  
Rohnert Park, CA

**SONOMA STATE UNIVERSITY**  
1801 E. Cotati Ave., Rohnert Park, CA 94928  
(707) 664-2324

**Chief Administrator:** Joann Feldman  
**Program:** Three semesters of recording studio plus tutorial. Career minor in Recording Technology also includes internship. One semester of Recording Studio Performance and Production and Commercial Songwriting. All programs incorporate hands on usage of a new fully outfitted one-inch 8-track multi track studio with two full isolation booths. Electronic music studio courses in sound synthesis with computers and digital, hybrid and analog synthesizers. All courses have hands-on work with the DX7 Juno 106, AlphaSyntauri, Decilhonix, DX11 drum machine, MSQ 700 keyboard recorder, and microcomputer controlled MIDI networking. Studio includes two 4-channel tape machines and outboard processing gear.

**SONY INST OF APPLIED VIDEO TECHNOLOGY**  
2021 N. Western Ave., Los Angeles, CA 90020  
(800) 662-SONY, in Calif. (213) 462-1982

**Chief Administrator:** Jeffrey Glasser  
**Program:** The Sony Institute of Applied Video Technology offers workshops and seminars in Hollywood and nation wide. Workshops are two to five days in length, from \$325 to \$995, covering such subjects as Basic and Intermediate Electronic Field Production, Camera Techniques, Directing on Location, Editing Hands On, Audio for Video, Location Lighting, Video Script Writing, Casting and Director Actors, Directing Non-Professionals, Computer Graphics, Career Opportunities in Video, Video Graphics, Producing Interactive Videodiscs, Fundamentals of Video Technology, Producing a Music Video. Custom tutorials and workshops also available. Call for a brochure or more information.

**SOUND INVESTMENT ENTERPRISES**  
P.O. Box 4139, Thousand Oaks, CA 91360  
(818) 991-3400

**Chief Administrator:** Vicky Stone  
**Program:** Sound Shop seminars. Sound Shop: a 1 1/2-day non-technical seminar designed to give the users of sound equipment a thorough overview of components, compatibility factors, and practical how-to's of microphone, mixing and troubleshooting techniques. Sound Shop II: nine hours of specialized audio training providing a more in depth look into mixing techniques, signal processing equipment, and sound system and acoustical design. No prerequisites. Suggested one to two years mixing experience for Sound Shop II. Both seminars are taught nationally. Registration ranges from \$75 for students to \$125 at the door.

**SOUND MASTER RECORDING ENGINEER  
SCHOOLS, AUDIO/VIDEO INSTITUTE**  
10747 Magnolia Blvd., North Hollywood, CA 91601  
(213) 650-8000

**Chief Administrator:** Barbara Ingoldsby  
**Program:** Basic Theory/Recording: a beginning course in multi track recording technology. Beginning Studio Workshop using equipment to perform duties of the recording process. Advanced Audio Theory: audio technology dealing with advanced recording techniques. Advanced Studio Workshop hands-on experience 24 track recording equipment and its operation. Disc Mastering: the basic principles of disc recording techniques. Recording Studio Maintenance: basic electronics and trouble-



## SOUND MASTER



### RECORDING ENGINEER SCHOOLS

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shooting studio equipment and maintenance of equipment. Sound Reinforcement: live sound mixing sessions held with live groups. Solving, setting up and operating equipment, mixing the live concerts and breakdown of equipment. Video Production: a live level course dealing with the technical operation for all phases of color video: pre and post production, including camera operation, editing, lighting, scenery, and special effects. Underwater video dealing with techniques for all underwater photography. Must be a certified scuba-diver. Call for free brochure. Sound Master Recording Engineer Schools is approved by the California State Department of Education/Superintendent of Public Instruction and the Department of Immigration.

**SOUTHWESTERN COMMUNITY COLLEGE**  
900 Olay Lakes Rd., Chula Vista, CA 92010  
(619) 421-6700  
Chief Administrator: John Hildebrand  
Program: Recording Techniques



#### TREBAS INSTITUTE OF RECORDING ARTS Los Angeles, CA

**TREBAS INSTITUTE OF RECORDING ARTS**  
6602 Sunset Blvd., Los Angeles, CA 90028  
(213) 467-6800  
Program: Record Producing, Sound Engineering, Music Industry Management, Music Video Production. Two-year programs (one year basics; second year specialization) Diploma in Recording Arts and Sciences with specialization in one of the four programs above. One entrance scholarship at each of the three campus locations, valued at \$3,500 to \$4,000 each. Dr. Peter C. Goldmark Memorial Scholarship for second year studies (value \$3,500 to \$4,000) at each location. Other awards of merit also available. Consult the Admissions Office of the Institute. Facilities: 24-track professional recording studio in each location. Electronic music studio, electronics lab, and disk mastering rooms in selected locations. Full-time day or evening studies. 140 courses offered in four programs of specialization. Limited number of internships available. Eighty percent of graduates placed.

**UCLA EXTENSION**  
10995 LeConte Ave., Los Angeles, CA 90049  
(213) 825-9064  
Chief Administrator: S. Ronnie Rubin, Van Webster  
Program: Professional Designation in Recording Eng.

**UNIVERSITY OF ARIZONA**  
Dept. of Media Arts, Modern Languages Bldg. Rm. 221  
Tucson, AZ 85721  
(602) 621-7352  
Chief Administrator: Caren Deming

**UNIVERSITY OF ARIZONA SCHOOL OF MUSIC**  
Tucson, AZ 85721  
(602) 621-1655  
Chief Administrator: Jeffrey Haskell  
Program: A recording studio production class is offered to Music and Radio-Television students. The class includes a basic overview of studio equipment use and terminology, in addition to music production and music law. Courses in computer and MIDI applications are offered. The recording studio features an audiophile quality 24-track facility with numerous signal processing equipment including Lexicon PCM70, Drawmer Gates, dbx 165A compressors, Pultec EQ-1A EQ, Prime Time delay, etc. The recording studio is very accessible to students for gaining experience in writing, producing, performing in professional quality recordings.

**UNIVERSITY OF CALIFORNIA**  
Media Resources Dept., Riverside, CA 92521  
(714) 787-3041  
Chief Administrator: Jerry Gordon

**UNIVERSITY OF CALIFORNIA, SAN DIEGO**  
Visual Arts Dept., La Jolla, CA 92093  
(619) 452-2252  
Chief Administrator: B.J. Barclay  
Program: Media

**UNIVERSITY OF COLORADO AT DENVER**  
COLLEGE OF MUSIC  
1100 14th St., Denver, CO 80202  
(303) 556-2727  
Chief Administrator: Roy A. Pritts  
Program: B.S. degree in Music

**UNIVERSITY OF NEVADA, LAS VEGAS**  
Dept. of Music, Alta Ham Fine Arts Hall  
4505 S. Maryland Pkwy., Las Vegas, NV 89154  
(702) 739-0819  
Chief Administrator: Curt Miller

**UNIVERSITY OF SOUND ARTS**  
AUDIO VIDEO RESEARCH CENTER  
6363 Sunset Blvd., RCA Bldg., Hollywood, CA 90028  
(213) 467-5256, 5257  
Chief Administrator: Raghu Gadhoke  
Program: U.S.A. Audio Video Research Centers offers three month, six-month and nine month full time certificate for both men and women who want a career in the music and video industry. Recording Engineering, Audio/Video Technology, Sound Reinforcement, Music Business Management, Studio Maintenance, etc. Small classes held at professional recording and video studios. Eighty seven percent of our graduates are working in the entertainment industry in U.S., Europe, and Japan. We also offer four week recording workshops and correspondence courses throughout the U.S.

**UNIVERSITY OF SOUTHERN CALIFORNIA**  
School of Music, Mus 401, Los Angeles, CA 90089  
(213) 743-2627  
Chief Administrator: Richard McIlivery

**VIDEO TECHNICAL INSTITUTE**  
2828 Junipero, Long Beach, CA 90806  
(213) 595-1660  
Chief Administrator: Scott Jucha  
Program: Video Technology. A career in video could be yours after only 14 months of training and you'll have a degree! VTI maintains a job placement rate in excess of 90 percent and we offer financial aid. Extensive hands on training is done in our Dallas, Texas and Long Beach, California studios, labs and on location. If you're interested in training to become a video technician or in hiring one of our grads (no employment fee) call (214) 263-2613 in Dallas or (213) 595-1660 in Long Beach. Call today!

**ROBIN WOODLAND**  
HANDS-ON RECORDING WORKSHOPS  
P.O. Box 22504, San Francisco, CA 94122  
(415) 861-3151  
Chief Administrator: Robin Woodland  
Program: For over five years, Robin Woodland has offered this unique 30-hour course: a 16 track music recording course that is entirely hands on. Class size is limited to only five students, so you'll get plenty of individual instruction and guided practice. You'll participate in all aspects of the recording of a band: setting up mics and equipment, editing, overdubs, mixing, etc. Formerly at Melon Studio, the new home of the Workshops is San Francisco's Duncan St. Studio, a high-quality 16 track facility. The total cost is just \$240. Call for more information.



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# CENTRAL

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Communications Dept.  
3110 Mustang Rd., Alvin, TX 77511  
(713) 331-6111 x388  
Chief Administrator: Cathy Forsythe  
Program: Complete (two year) Associate of Arts degree programs in multi-track recording and sound reinforcement, radio and television programs. Also (one year) certificate programs available. Basic, intermediate and advanced classes in recording. Internships in nearby Houston available. Accredited by: Southern Association of Colleges and Schools, Coordinating Board, Texas College and University System, Texas Education Agency.

## AMERICAN CONSERVATORY OF MUSIC

Jazz and Commercial Music Dept.  
116 S. Michigan Ave., Chicago, IL 60603  
(312) 263-4161  
Chief Administrator: Gregory F Shearer

## ANDERSON COLLEGE

1100 E. 5th St., Anderson, IN 46012  
(317) 649-9071  
Chief Administrator: F. Dale Bengtson  
Program: Bachelor's degree in Music/Business

## ARKANSAS COLLEGE

Box 2317, Batesville, AR 72503  
(501) 793-9813  
Chief Administrator: Dan C. West  
Program: Media Arts

## ASHLAND COLLEGE

Radio-Television Dept., Ashland, OH 44805  
(419) 289-4142 x5136  
Chief Administrator: Richard Leidy  
Program: Broadcast Technology

## BALL STATE UNIVERSITY

School of Music, Muncie, IN 47306  
(317) 285-5537  
Chief Administrator: Cleve L. Scott  
Program: The Bachelor of Music degree in Music Theory and Composition: option C, Music Engineering Technology combines courses in music composition, performance, electronic music and recording technology with a minor in applied physics. The goal of the program is to prepare an individual with musical and technological competencies, that are directed to the current and future needs of the music industry. Prerequisites for a music major: high school diploma, successful audition in performance, and music theory and mathematics placement exams. Creative people of dedication and excellence interested in performance, composition, computer applications, recording sound synthesis and analysis are encouraged to apply.

## BEACHWOOD STUDIOS MUSIC PRODUCTION WORKSHOP

23330 Commerce Park, Beachwood, OH 44122  
(216) 292-7300  
Chief Administrator: George A. Sipi

## CALVARY BIBLE COLLEGE

Kansas City, MO 64147  
(816) 331-8700, 322-0110  
Chief Administrator: Tom Bonine  
Program: Christian Radio Broadcasting

## CAPITAL UNIVERSITY CONSERVATORY OF MUSIC

2119 E. Main St., Columbus, OH 43209  
(614) 236-6474  
Chief Administrator: Larry L. Christopherson  
Program: Bachelor of Arts degree with a major in commercial music is a new, four-year program designed to provide undergraduates with a solid base of traditional and commercial musical training. This music core is supplemented with extensive studio recording techniques taught in conjunction with "the Recording Workshop" in Chillicothe, Ohio (see ad in this section) and a minor in business administration, computer science, or radio and television broadcasting.

## CASS TECHNICAL HIGH SCHOOL

Music Dept., Performing Arts Dept.  
2421 2nd Ave., Detroit, MI 48201  
(313) 494-2605  
Chief Administrator: Jeanette Wheatley



## CEDAR VALLEY COMMUNITY COLLEGE

3030 N. Dallas Ave., Lancaster, TX 75134  
(214) 372-8210  
Chief Administrator: Division of Communications/Humanities chairperson  
Program: Commercial Music Recording Technology (two year Associate's degree). This two-year program is designed to provide the technical and musical skills necessary in the field of recording technology. In addition to preparing the student in vocal and instrumental commercial music techniques, training is provided in basic recording skills such as microphone selection and placement, mixdown techniques, master tape production, studio techniques, troubleshooting, and session procedures. Emphasis is placed on the specific needs of the commercial musician in the field of recording.

## CENTER FOR MUSIC BUSINESS STUDIES

110 Schiller Ste. 205, Elmhurst, IL 60126  
(312) 279-8323  
Chief Administrator: Paul Kelly  
Program: Certificates in audio video production and music business, diploma in music business studies, work study, generous payment plans, approved by the Illinois Board of Education. Travel study tours to L.A., London, N.Y., internships, placement assistance worldwide; sponsors Chicago Music Expo and other seminars; (4) ten week terms, evening and Saturday classes; write or call for details and catalog.

## CENTRAL STUDIOS-CENTRAL HIGH SCHOOL

275 N. Lexington, St. Paul, MN 55104  
(612) 645-9217  
Chief Administrator: Ben James

## CHAPMAN RECORDING WORKSHOP

228 W 5th, Kansas City, MO 64133  
(816) 842-6854  
Chief Administrator: Chuck Chapman

## COLUMBIA COLLEGE OF CHICAGO

600 S. Michigan Ave., Chicago, IL 60605  
(312) 660-1600  
Chief Administrator: Al Parker  
Program: Columbia College has recently expanded its audio engineering curriculum, and installed a multi-departmental bachelor's degree in Recording Arts and Sciences. This degree is offered by three departments: Arts Management, Music, and Radio. Required specialist courses for the engineering degree are Sound Engineering 1, 2, and 3, and Acoustics for Microphones. Sound Engineering 1 is a classroom course in basic audio electronics, the technology and language of recording. Sound 2, held in an independent multi track recording and film studio, involves the explanation and demonstration of each link in the recording chain, as well as studio setup, basic maintenance, audio quality standards, editing, and so forth. Sound 3 is split into small teams, each of which is required to set up, record, and remix a live session. Optional courses offered to the engineering candidate are: Advanced Acoustical Design, Digital Audio Systems, Console Systems, Basic Sound Practices, Stereo Broadcast Techniques, and Recording Studio Management as well as production and music courses in other departments.

## EASTERN MICHIGAN UNIVERSITY

Dept. of Communication and Theater Arts  
129 Quirk Bldg., Ypsilanti, MI 48197  
(313) 487-0064  
Chief Administrator: Henry B. Aldridge, Louis C. Saalbach  
Program: Telecommunications and Film

## ELMHURST COLLEGE

190 Prospect, Elmhurst, IL 60126  
(312) 279-4100 x357  
Chief Administrator: Tim Hays  
Program: Music Business. Located in the metropolitan area, Elmhurst College is an accredited institution that offers both a B.S. and a B.M. in Music Business. In addition to classwork in music, business, and the business of music, students get hands-on industry experience through internships, industry speakers, and course tours to locations such as Los Angeles or New York City. Resources include a new 12-track studio facility, an artist faculty of over 30, and support from numerous music industry associations and corporations. Offering students individualized instruction in music business for over 15 years. Elmhurst provides a specialized career track integrated within a four-year degree.

## EL PASO COMMUNITY COLLEGE

P.O. Box 20500, El Paso, TX 79998  
(915) 594-2209  
Chief Administrator: Albert Mjares  
Program: Media Production Technology

## HENRY FORD COMMUNITY COLLEGE

5101 Evergreen Rd., Dearborn, MI 48128  
(313) 845-9634  
Chief Administrator: Jay B. Kornek  
Program: Mass Communication Degree (two-year AA)

## GOODNIGHT AUDIO RECORDING SCHOOL

2302 Joe Field, Dallas, TX 75229  
(214) 241-5182  
Chief Administrator: Ruben Ayala

## HOUSTON COMMUNITY COLLEGE SYSTEM

901 Yorkchester, Houston, TX 77079  
(713) 468-6891  
Chief Administrator: Aubrey Tucker  
Program: Commercial Music Program, Audio Engineering Technology. Fully accredited college offering two year Associate degree and certificate programs in Audio Engineering. Cost of instruction is extremely competitive in this field, consisting of normal tuition and fees. Great emphasis placed on practical hands on experience. Two fully equipped studios: Studio A features MCI JH 536 automated console, and JH 114 24-track recorder, Dolby A noise reduction, Lexicon 224 digital reverb, Scamp rack, digital processing, and full complement of professional microphones. Studio B contains Tascam 520 20-channel mixing console, Fostex 16-track recorder and similar outboard equipment and microphones. New inventory of keyboards, synthesizers, drum machines and sequencers.

## HUTCHINSON AREA VOCATIONAL TECHNICAL INSTITUTE

200 Century Ave., Hutchinson, MN 55350  
(612) 587-3636, (800) 222-4424  
Chief Administrator: Warren E. Macemon  
Program: Audio Technology. Two-year intensive technical audio program. Extensive hands-on training in audio electronics (analog and digital), studio and remote recording, systems design and installation, acoustics, signal processing, and sound reinforcement for pro sound market. Music television training option available. Heavy on lab and practical applications. Personalized instruction allows students to enter throughout year, receive credit for previous experience, and work at accelerated pace. Graduates available throughout year. Extensive cooperation with employers for internships and supervised work experience. Students active in AES State school, low tuition. Our graduates have the mix of technical and production skills for today's pro sound market.

## INDIANA UNIVERSITY SCHOOL OF MUSIC

Bloomington, IN 47405  
(812) 335-1613, 335-1900  
Chief Administrator: Ted W. Jones, David A. Pickett  
Program: The Associate of Science in Audio Technology offers training in audio recording, reinforcement, and media production. Courses in audio techniques, equipment operation-maintenance, acoustics, electronics, and musical styles stress practical experience and aural awareness. Professional equipment includes 2-track digital and up to 16-track analog. Over 900 concerts are produced annually in a 500-seat recital hall and the 1,460-seat Musical Arts Center, one of the most advanced opera and concert halls in the country. Audio Technology courses can be used also in the Bachelor of Science in Music and the Bachelor of Arts, Individualized Major. Apply to the Music Admissions Office.

**INTERLOCHEN RECORDING ARTS AND BROADCASTING INSTITUTE**  
 Interlochen Center for the Arts, Interlochen, MI 49643  
 (616) 476-9221, x 360  
 Chief Administrator: Harold Boxer, David Gail  
 Program: A full-time clinic workshop that will help prepare students for an occupation of recording engineer in radio, television, films, and theater. Participation in recording the daily concerts of the Interlochen Arts Festival offers a full range of experience including orchestra, concert band, chamber music, choral performances, opera, contemporary music, and jazz. Conducted in (3) three-week sessions throughout the summer. Each session is limited to 14 students. Radio programs will be produced for national broadcast. Academic credit is available through the University of Michigan. Tuition: \$400; housing/meals, \$315  
 Qualifications: 18 years of age or high school graduate

**INTERNATIONAL COLLEGE OF BROADCASTING**  
 6 South Smithville Rd., Dayton, OH 45431  
 Program: Associate Degree, Diploma, Certificate

**JEWEL SCHOOL OF AUDIO ENGINEERING**  
 1594 Kinney Ave., Cincinnati, OH 45231  
 (513) 522-9900  
 Chief Administrator: Rusty York

**KANSAS STATE UNIVERSITY**  
 Music Dept., Manhattan, KS 66506  
 (913) 532-5740  
 Chief Administrator: Hanley Jackson  
 Program: Composition and Electronic Music

**KELLOGG COMMUNITY COLLEGE**  
 450 North Ave., Battle Creek, MI 49017  
 (616) 965-3931 x348  
 Chief Administrator: Gene Andrews  
 Program: Recording Studio Technology

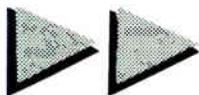
**LARR COMPUTER CORP.**  
 K-LARR Broadcasting Network Division  
 P.O. Box 3842, Houston, TX 77253  
 (713) 440-9224  
 Chief Administrator: Lawrence Herbst

**LBJ HIGH SCHOOL**  
 7309 Lazy Creek Dr., Austin, TX 78724  
 (512) 926-7983  
 Chief Administrator: James A. Albright III  
 Program: Video Technology

**LINCOLN INSTITUTE**  
 7622 Louetta Rd., Spring, TX 77379  
 (713) 376-9679  
 Chief Administrator: J.E. Lincoln  
 Program: Audio/Video Engineering Technology. The Lincoln Institute offers an intensive 18 month program in audio/video technology covering all facets of audio recording and television/filmmaking utilizing multi-track audio and three camera video production studios. Topics include digital synthesizers, A/V synchronization, MIDI interfacing, audio sweetening, ENG, EFP, special effects, and editing. Support courses offered in music theory, electronics, studio management, and music business. Additional hands on experience available through participation with LINX, the in house cable system providing daily programming through student interaction. Professional staff! Student financing! Reasonable tuition! Write or call for free brochure

**MEDIA ARTS WORKSHOP**  
 232 1/2 Main St., Ames, IA 50010  
 (515) 232-4331  
 Chief Administrator: Kent Newman  
 Program: Audio Production & Multi Track Recording

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Ohio State Board of School and College Registration #80-07-0696T

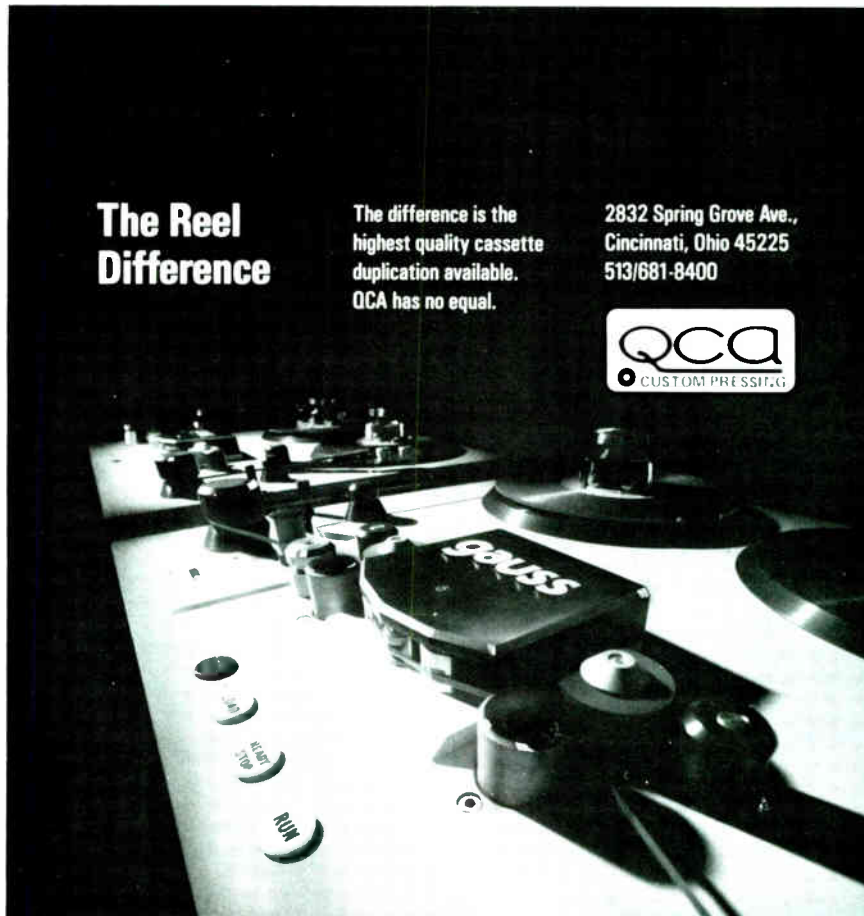


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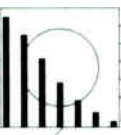
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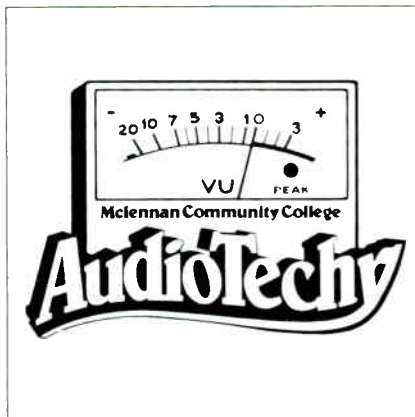
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**CONTACT:**  
**The Director,**  
**Electronic Systems for Music Synthesis**  
**Ball State University**  
**Muncie, IN 47306**

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McLENNAN COMMUNITY COLLEGE  
 Waco, TX

**McLENNAN COMMUNITY COLLEGE**  
 Commercial Music Dept.  
 1400 College Dr., Waco, TX 76708  
 (817) 756-6551  
**Chief Administrator:** David Hibbard  
 Program: Audio Technology A comprehensive degree program in Audio Technology, part of the McLennan Community College Commercial Music Program. Students will study all aspects of sound, acoustics, production, engineering and music business. Learn to work in our new state-of-the-art 24-track analog/digital studio, engineering and producing actual sessions with country, rock, jazz and classical groups. Fully accredited degree includes approximately 480 hours of studio experience, a portfolio of your recordings, music theory, performance and music business training. For more information contact Program Director, Commercial Music Program.

**MICHIGAN STATE UNIVERSITY**  
 School of Music  
 214 Music Bldg., E. Lansing, MI 48824  
 (517) 355-7674  
**Chief Administrator:** John T. McDaniel



**MILLIKIN UNIVERSITY**  
 Decatur, IL

**MILLIKIN UNIVERSITY**  
 Commercial Music Dept.  
 1184 W. Main, Decatur, IL 62522  
 (217) 424-6300  
**Chief Administrator:** A. Wesley Tower  
 Program: Millikin University School of Music is the first accredited university in the Midwest to offer a Bachelor of Music degree program in Commercial Music with a vocal and instrumental emphasis. In addition to the traditional aspects of professional music training, course concentration includes Commercial Music Performance, Commercial Music Arranging, Commercial Music Ensembles, Traditional and Commercial Studio Ensembles, Recording Studio Engineering, Record Producing, Jingle Writing and Producing, Commercial Vocal Styles, Commercial Music Theory, Improvisation Techniques, and Commercial/Jazz History and Forms. Scholarships, talent awards and financial aid are available.

**MINOT STATE COLLEGE**  
 Minot, ND 58701  
 (701) 857-3186  
**Chief Administrator:** Robert L. Larson  
 Program: Recording Arts minor, Division of Music

**NAVARRO COLLEGE**  
 3200 W. 7th Ave., Corsicana, TX 75110  
 (214) 874-6501  
**Chief Administrator:** Kenneth P. Walker  
 Program: Radio/Television

**NEC, BROWN INSTITUTE CAMPUS**  
 2225 E. Lake St., Minneapolis, MN  
 (612) 721-2481  
**Chief Administrator:** Donald W. Swanson  
 Program: Audio Technology and Studio Recording

**NORTH LAKE COLLEGE**  
 Video Technology Dept.  
 5001 N. MacArthur Blvd., Irving TX 75038  
 (214) 659-5340  
**Chief Administrator:** Jim Picquet



**NORTHEAST TECHNICAL COMMUNITY COLLEGE**  
 Norfolk, NE

**NORTHEAST TECHNICAL COMMUNITY COLLEGE**  
 801 E. Benjamin Ave., P.O. Box 469, Norfolk, NE 68701  
 (402) 371-2020  
**Chief Administrator:** Timothy Miller  
 Program: Audio and Recording Technology. Offering a two-year Associate of Arts and/or Associate of Applied Science in Audio and Recording Technology. The Audio and Recording Technology program is a balanced mix of music, audio theory, application and hands-on experience in a recently updated control room and sound studio. NTCC is accredited by the North Central Association of Colleges and Schools and the Nebraska State Department of Education.

**OHIO STATE UNIVERSITY**  
 College of the Arts, School of Music  
 1860 College Rd., Columbus, OH 43210  
 (614) 422-7899  
**Chief Administrator:** Robert B. Lackey  
 Program: Four-year undergraduate program leading to Bachelor of Science degree




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(312) 336-OPUS

**Chief Administrator:** Tony Pettinato  
**Program:** Recording, Engineering and Acoustics. Students will gain exposure to the latest advances in audio equipment, including Amek consoles, Ampex and Otari recorders, Celec-Gauss monitors, four reverb units, three digital delays, 7'4" Yamaha conservatory grand piano, over 50 microphones. Hands-on instruction on operational theory and application. Pro-audio showroom, 24-track and 8-track recording facilities on premises. College affiliated or private courses available. Topics include: multi-track recording, disk mastering, record pressing, audio/visual productions, acoustics, microphone techniques, tape recorder maintenance, peripheral equipment. Our students have graduated to become sound and broadcast engineers in radio, recording studio, and TV industry.

**FRANK PHILLIPS COLLEGE**  
Radio/Television Dept., P.O. Box 5118  
1301 Roosevelt, Borger, TX 79008  
(806) 274-5311  
**Chief Administrator:** Bob Ramsey

**PRODIGAL SOUND**  
1510 Malone, Denton, TX 76201  
(817) 566-5555  
**Chief Administrator:** Greg Ellenwood

**PURDUE UNIVERSITY**  
B-10 Stewart Center, West Lafayette, IN 47907  
(317) 494-8150  
**Chief Administrator:** Rick Thomas



**THE RECORDING WORKSHOP**  
Chillicothe, OH

**THE RECORDING WORKSHOP**  
Licensed by Ohio State Board of School & College Registration  
455 Massieville Rd., Chillicothe, OH 45601  
(614) 663-2544, (800) 848-9900  
**Chief Administrator:** Jim Rosebrook  
**Program:** Founded in 1971, The Recording Workshop is dedicated to teaching the creative operation of professional recording equipment. The Workshop's primary goal is to prepare qualified assistant recording engineers, but the training is also very useful for the aspiring recording artist or producer. The main program offered is the Recording Engineer and Music Production Workshop. Its curriculum is an effective combination of in-depth lectures and extensive hands-on experience in the Workshop's well-equipped, five-studio recording complex. Classes for this intensive program start seven times annually. To supplement the main program, two optional programs are available: The Studio Maintenance and Troubleshooting Workshop, and The Music Video Production Seminar. In addition, students can earn a Bachelor of Music/Commercial Music degree through the Workshop's association with Capital University, Columbus, Ohio.

**ROSE STATE COLLEGE**  
6420 S.E. 15th St., Midwest City, OK 73110  
(405) 733-7380, 733-7426  
**Chief Administrator:** Craig White  
**Program:** Introduction to Recording

**JAMES J. RUBINO**  
2524 Portage Mall, Portage, IN  
(219) 762-3169  
**Chief Administrator:** James Rubino, Jr.

**ST. MARY OF THE PLAINS COLLEGE**  
San Jose Dr., Dodge City, KS 67801  
(316) 225-4171  
**Chief Administrator:** Stephen Bovendam, Bill Christy  
**Program:** Bachelor of Science in Music/Business

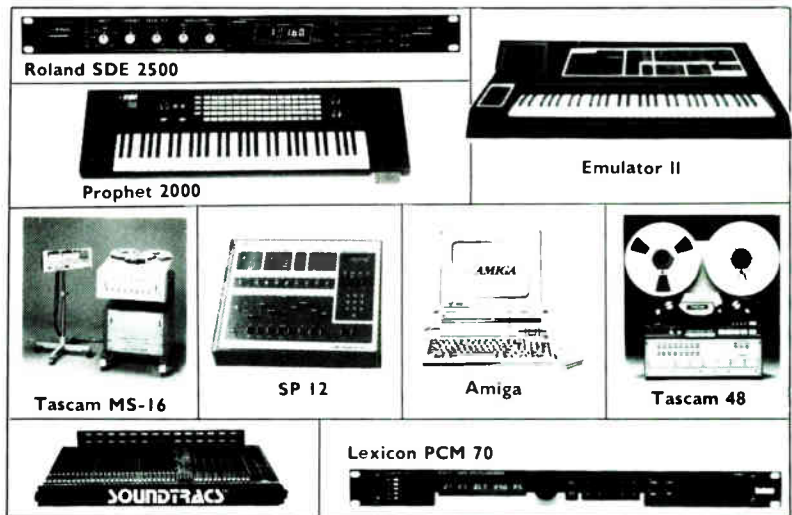
**SOLID SOUND RECORDING STUDIO**  
2400 W. Hassell Rd. Ste. 430  
Hoffman Estates, IL 60195  
(312) 882-7446  
**Chief Administrator:** Judd Sager  
**Program:** Recording Engineering

**SOUTH PLAINS COLLEGE**  
1401 College Ave., Levelland, TX 79336  
(806) 894-9611, x271  
**Chief Administrator:** Randy Ellis  
**Program:** Sound Technology. South Plains College's two-year sound technology program awards an associate in applied science degree. The program trains students in recording engineering, sound reinforcement, sound and recording equipment repair and maintenance. Facilities feature a scientifically designed control room and Waylon Jennings Recording Studio, a 16-track studio with the latest

MCI multi-track, 18-channel console and 2-track. On-line this year is a new 8-track mobile recording studio with 8-track Tascam gear and SMPTE synchronizer for video; and (2) 4-track studio learning modules. Studio is fully-equipped with other professional gear. Courses taught in fall and spring. New music video studio under construction. For information, contact South Plains College at the above address.

**SOUTHERN OHIO COLLEGE**  
Broadcasting Dept.  
1055 Laidlaw Ave., Cincinnati, OH 45237  
(513) 242-3791  
**Chief Administrator:** Gordon S. Johnson  
**Program:** Two-year Associate degree w/emphasis on hands-on learning of video and audio production skills. Accredited by North Central Association of Colleges and Schools and by Association of Independent Colleges and Schools. Video equipment includes Hitachi Z 31 cameras, Grass Valley 100 switcher, Convergence 195 editor w/AB roll and SMPTE time code. New audio labs are in the planning stage to include audio chasing video and audio for video sweetening. Fall quarter begins September 29, 1986.

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- studio business procedures
- audio equipment maintenance
- trouble shooting

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ESU  
Dept. of Educational Communications & Technology  
Rosenkrans Hall, E. Stroudsburg, PA 18301  
(717) 424-3737  
Chief Administrator: Terry Giffel  
Program: B.S. in Media Communication & Technology

EVERGREEN RECORDING ARTS AND  
SCIENCE SEMINARS  
1373 McLaughlin Run Rd., Pittsburgh, PA 15241  
(412) 221-2737  
Chief Administrator: Thomas J. Kikka  
Program: Evergreen offers a variety of courses dealing with recording arts and science. The three formats are: a 25-hour course dealing with basic recording theory and techniques, a 45-hour course geared for college communications and music majors, and a 150-hour course structured as a full-time seminar for preparation as a secondary engineer. All courses emphasize hands-on training in professional, fully-equipped 8-, 16-, and 24-track studios. Subjects include physics of sound, acoustics, transducer theory, music theory, microphone placement, console routing, tape recorder theory and operation and signal processing. College credit is offered through Duquesne University.

FERRUM COLLEGE  
Dept. of Music, Ferrum, VA 24088  
(703) 365-2121 x 340  
Chief Administrator: Wayne A. Nelson  
Program: Audio Engineering/Production

FITCHBURG STATE COLLEGE  
Dept. of Communications  
160 Pearl St., Fitchburg, MA 01420  
(617) 345-2151  
Chief Administrator: Gunther Hoos  
Program: Specializations in video, film, photo, graphics

FORT VALLEY STATE COLLEGE  
State College Dr., Fort Valley, GA 31030  
(912) 825-6212  
Chief Administrator: Luther Burse  
Program: Mass Communications

FULL SAIL CENTER FOR THE RECORDING ARTS  
660 Douglas Ave., Altamonte Springs, FL 32714  
(800) 221-2747, in Florida (305) 788-2450  
Chief Administrator: Larry "Cap" Spence  
Program: Full Sail offers seven training programs in the music/video fields ranging in length from two weeks to one year. The courses are: Recording Engineering, Advanced Recording, Sound Reinforcement and Remote Recording, Studio Maintenance and Trouble-shooting, Music Video and The Music Business. Each course is an intensive program emphasizing a practical, hands-on approach, excellent student to instructor ratios, and training by current professionals in state-of-the-art facilities. The one-year Comprehensive Course consists of all six workshops listed above, internships and class projects sponsored by Full Sail, plus personalized assistance with job placement. Prerequisites: inquire. Licensed by Florida State Board of Independent Postsecondary Vocational-Technical, Trade and Business Schools, #414.

GEORGIA STATE UNIVERSITY  
Dept. of Commercial Music/Recording of the College of Public and Urban Affairs  
University Plaza, Atlanta, GA 30303  
(404) 658-3513  
Chief Administrator: Carter D. Thomas  
Program: The Dept. of Commercial Music/Recording offers training that is both academically sound and respon-

sive to the industry needs. Students may pursue either an Associate of Science degree or a Bachelor of Science degree in the field of commercial music/recording with a concentration in business or recording/production. (The program has a 24-track recording studio.) A student may complete an A.S. degree and transfer directly to the B.S. degree program. These programs have won widespread support in the music industry and a vigorous endorsement by the National Academy of Recording Arts and Sciences. Day and evening classes offered. Telephone or write.

HILLSBORO HIGH SCHOOL  
Nashville Metro Schools  
3812 Hillsboro Rd., Nashville, TN 37215  
(615) 298-8400 x36  
Chief Administrator: Vic Gabany  
Program: Recording

HUMPHREY OCCUPATIONAL RESOURCE CENTER  
Boston Public Schools  
75 New Dudley St., Boston, MA 02115  
(617) 442-5200 x530  
Chief Administrator: Joseph Moscantolo  
Program: Audio-Television Production Students are trained to use television cameras, video and audio tape machines to produce their own programs. They learn to set lights effectively, mix different sound systems, and edit tapes for final productions. Students explore techniques of camera movement and remote location production. They may also gain on-the-job training through internships prior to completion of this one to three year program. The facility consists of 30 x 60 foot television studio equipped with (3) Hitachi FP60 cameras, an ISI 902 production switcher, and a Systems Concept Q7 character generator. Three editing suites have Sony 2860 and 5850 decks with Convergence ECS 90 and Sony RM 440 controllers. The audio studio has a 16 x 8 NEOTEK console, Otari 8-track and TEAC 4- and 2-tracks. Outboard equipment includes the Juno 106 synthesizer, and Oberheim DMX drum machine.



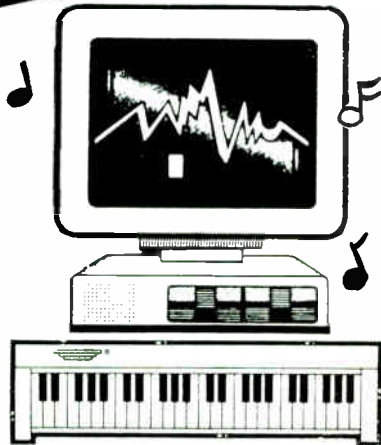
INSTITUTE OF AUDIO RESEARCH  
New York, NY

INSTITUTE OF AUDIO RESEARCH  
64 University Pl., Greenwich Village  
New York, NY 10003  
(212) 677-7580  
Chief Administrator: Philip Stein, Albert B. Grundy, Minam Friedman  
Program: Full nine-month program in recording engineering including: recording, mixing, studio technology, use and interface of outboard gear, post-production editing, signal processing, analog and digital circuit construction, and professional internships at studios in and around New York City. The Institute features an automated 24-track console and two control rooms/studio complex reserved exclusively for student use. The Institute also offers short courses in such subjects as: MIDI for Engineers and Musicians, Audio Sweetening for Video, Basic Audio Maintenance and Digital Audio Systems. In addition to the Multi-track Recording Program, the Institute gives a one-year program in video technology for training maintenance and repair technicians for the professional video industry. You may start the Institute any of four times a year: January, March, June or September. The Institute is fully licensed and accredited. Financial aid is available for those who qualify. Tuition varies by program and course.

JERSEY CITY STATE COLLEGE  
Margaret Williams Theater  
2039 Kennedy Blvd., Jersey City, NJ 07305  
(201) 547-3441  
Chief Administrator: Joseph Musco



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**JTM WORKSHOP OF RECORDING ARTS**  
Box 686, Knox, PA 16232  
(814) 797-5883

**Chief Administrator:** Frank T. Battista  
**Program:** The JTM Workshop of Recording Arts is located off I-80, Exit 7, in scenic Northwestern Pennsylvania, midway between Erie and Pittsburgh. It features eight five-week sessions. Tuition charge is \$1,650. Available are beautiful apartment rooms together with free recreation such as golf, swimming, tennis, raking, basketball. In addition to fun in meaningful bands on experience on multi 2-24 track equipment, professional instructors teach live sound reinforcement and music video. Two of our instructors are successful performers/composers (one formerly associated with a well-known group that sold 23 million albums). Our ratio is one instructor to six students.

**KLPI-FM RADIO TECH**  
900 Gilman St., Ruston, LA 71272  
(318) 257-4852  
**Chief Administrator:** Dan Hester

**LEBANON VALLEY COLLEGE**  
College Ave., Annville, PA 17003  
(717) 867-6200  
**Chief Administrator:** John J. Uhl  
**Program:** The Sound Recording Technology program at Lebanon Valley College is a comprehensive course of study combining the art, science, and philosophy of recording. The students follow a variety of disciplines involved in the field of audio engineering including recording technology, music, physics, electronics, mathematics, computer science, business administration, and selected courses in the liberal arts. Emphasis is placed on student usage of equipment in laboratory and over 500 courses. All applicants to the program must pass a musical audition for acceptance. The degree conferred is a Bachelor of Music Sound Recording Technology and meets NASM standards.

**LONG ISLAND UNIVERSITY**  
Dept. of Media Arts  
1 University Plaza, Brooklyn, NY 11201  
(718) 403-1052  
**Chief Administrator:** Joseph W. Slade

**LOYOLA UNIVERSITY COLLEGE OF MUSIC**  
6363 St. Charles Ave., New Orleans, LA 70118  
(504) 865-2773, 865-3750  
**Chief Administrator:** Sanford Hinderlie  
**Program:** Recording seminar

**MacCOLL STUDIO FOR ELECTRONIC MUSIC**  
Brown University, Providence, RI 02912  
(415) 863-3234  
**Chief Administrator:** Andrew Schloss  
**Program:** Computer Music Studio

**JAMES MADISON UNIVERSITY**  
Dept. of Music, Harrisonburg, VA 22807  
(703) 568-6197  
**Chief Administrator:** Richard Barnett  
**Program:** Music Production & Engineering

**MARYWOOD COLLEGE**  
Dept. of Communication Arts, Scranton, PA 18509  
(717) 348-6209  
**Chief Administrator:** George Perry  
**Program:** Major in Radio Television leading to B.A.

**MEMPHIS STATE UNIVERSITY**  
Music Dept., Memphis, TN 38152  
(901) 454-2559



**MEMPHIS STATE UNIVERSITY  
Memphis, TN**

**Chief Administrator:** Larry Lipman  
**Program:** Commercial Music Bachelor of Fine Arts in Commercial Music, concentrations in Recording/Engineering or Music Business Bachelor of Music in Commercial concentrations in Composition/Arranging or Studio/Live Performance. The CMUS faculty have been carefully selected to provide students with a balance between successful professionals actively working in the music industry, and dedicated, experienced educators with a broad knowledge of music industry practices. Modern production facilities include 24 track MCI studio, electronic music lab, and a complete video production facility. The Memphis music industry offers a dynamic, growing environment providing students with diverse internship opportunities. CMUS students can become involved in the University's own production and publishing companies. Enrollment is limited and based on selective procedures.

**MIAMI SUNSET SENIOR HIGH SCHOOL**  
Dade County Public Schools  
13125 S.W. 72 St., Miami, FL 33183  
(305) 385-4255 x248  
**Chief Administrator:** Daniel Sell  
**Program:** Sunset offers a three-year curriculum in television production and electronic music (recording engineering). Students in TV work in our four-camera color studio with computer-assisted editing, telecine, and interformat dubbing. Students produce commercials, live closed circuit broadcasts, daily news and record schoolwide events including some four-camera remotes. Students involved in audio use 8 channel Tascam/Tapco studio complete with dbx and many outboard effects. Students also study sound reinforcement using our Yamaha PA system. Most projects include combining the TV, recording, and sound reinforcement equipment. These programs are open to all full-time students in the school.

**MIDDLE TENNESSEE STATE UNIVERSITY**  
Box 21, MTSU, Murfreesboro, TN 37132  
(615) 898-2300 x2813  
**Chief Administrator:** Geoffrey Hull  
**Program:** Recording Industry Management. This four-year program leads to a Bachelor of Science in Recording Industry Management (RIM). RIM offers over 33 semester hours of specialized training in the industry. Courses include audio engineering, music publishing, copyright law, artist career development, merchandising of recordings, promotion and publicity, studio administration and others. It prepares students for entry level positions in audio engineering and all business aspects of the recording industry. Video applications are available through a minor in Mass Communications and extensive internship program. The program has an on-campus 16-track professional studio. Electronics, music and business courses are available through other departments.

**MUSIC BUSINESS INSTITUTE**  
3376 Peachtree Rd. N.E., Atlanta, GA 30326  
(404) 231-3303, 1-800-554-3346  
**Chief Administrator:** Meri Paul  
**Program:** Music Entertainment management. The Music Business Institute offers a 12-month program, focusing on careers in the music, recording, video or entertainment industry. Courses are taught by industry professionals. Employment assistance is available. Scheduled for completion in fall of 1986 are new audio and video production facilities. These facilities will be used for hands-on instruction and commercial projects. The Music Business Institute is accredited by the Southern Association of Colleges and Schools Commission on Occupational Education. Institutions MBI is approved by the U.S. Dept. of Education for Federal Financial Aid programs. Call for class schedules and information.



#### MUSICATION

1206 Bay Ridge Ave., Brooklyn, NY 11219  
(718) 680-5500

Chief Administrator: Iris Hershenson

Program: Musication offers seminars and in-depth sessions on computer, MIDI, technology. Topics include: Harnessing the Power of MIDI, Sequencing and Orchestrating via the Computer, Digital Sampling, Exploring Printing/Sequencing & Performance, Software Equipment includes our own IBM compatible and Mac computers, Emulator, Roland, Korg, Ensoniq, Casio, Akai; the latest MIDI software. Sessions are regularly conducted in Manhattan. For more information and/or a free catalog of products and services please call or write.

#### NEW YORK UNIVERSITY

Dept. of Arts Administration  
East Bldg. Ste. 300, Washington Sq.  
New York, NY 10003  
(212) 598-7791

Chief Administrator: Richard L. Brodenick

Program: Music Business and Technology. A four-year bachelor of science degree in music business and music technology is offered. Adjunct professors include Robert Liftin, President Regent Sound; Jeffrey Graubart, music attorney and other industry leaders. A masters program is offered.

#### NICKEL RECORDING

168 Buckingham St., Hartford, CT 06106  
(203) 524-5656

Chief Administrator: Jack Siang

Program: Modern Recording Techniques

#### NORTH CAROLINA A&T STATE UNIVERSITY

Laboratory Animal Science Learning Resources  
105 B.C. Webb Hall, Greensboro, NC 27411  
(919) 379-7635

Chief Administrator: Alfreda Webb

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Omega Recording Studios  
5609 Fishers Ln., Rockville, MD 20852  
(301) 946-4686

Chief Administrator: Bob Yesbek

Program: Omega Studios offers four curricula in professional recording engineering. The basic program is an eight week course consisting of 32 hours of lecture, work shop and hands on training in Omega's 24 track recording studios. The intermediate program is also eight weeks long and offers a more intensive hands on program. Omega Studios advanced program is ten weeks long and covers such advanced subjects as mixing automation, MIDI interface, audio for video interlock, and orchestral recording techniques. The tuition for these programs is \$595, \$695, and \$995 respectively. The fourth program is entitled "Recording Studio Techniques for Advertising" where the student actually conceptualizes, records, mixes, produces and voice-overs an advertising jingle. This program is six weeks long and costs \$695. The Omega courses are approved by the Maryland State Board for Higher Education, the Veterans Administration, and are available for accreditation through the American University, where Bob Yesbek, the course director and owner of Omega, teaches a program in studio techniques.

#### PEABODY INSTITUTE OF THE JOHNS HOPKINS UNIVERSITY

1 E. Mt. Vernon Pl., Baltimore, MD 21202  
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Students in the Audio Recording program study and practice skills in a recording studio environment while working towards an associate degree. Editing, session set-up, control room set-up and layout, microphone placement, basic room acoustic analysis, and studio operations are all part of the program. Interest and ability in music, as well as basic math and science, are brought together in the field of audio recording.

**Northeast Technical Community College**  
801 East Benjamin Avenue  
P.O. Box 469, Norfolk, NE 68701  
Phone: (402) 371-2020  
See School Listings

Circle #060 on Reader Service Card



**QUINNIPIAC COLLEGE**  
Dept. of Mass Communications  
Hamden, CT 06518  
(203) 288-5251 x405  
Chief Administrator: Raymond Foery

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**RUST COLLEGE**  
One Rust Ave., Holly Springs, MS 38635  
(601) 252-4661  
Chief Administrator: Sylvester W. Oliver, Jr.  
Program: Music Media

**SANTA FE COMMUNITY COLLEGE**  
3000 N.W. 83rd St., Gainesville, FL 32602  
(904) 395-5224  
Chief Administrator: Ron Slawson  
Program: Introduction to Multi-Media Communications

**SELECT SOUND STUDIOS**  
2315 Elmwood Ave., Kenmore, NY 14217  
(716) 873-2717  
Chief Administrator: Richard G. Bauerle  
Program: Recording Workshops I, II, and III (Music 250 and Music 350, State University of New York)

**SOUND LABS, INC.**  
School of Recording Technology  
5808 Columbia Pike, Bailey's Crossroads, VA 22041  
(703) 820-2025  
Chief Administrator: Roy E. Blair

**SOUTHEASTERN LOUISIANA UNIVERSITY**  
Hammond, LA 70404  
(504) 549-2184  
Chief Administrator: Robert Priez  
Program: Analog, Digital and Computer Synthesis

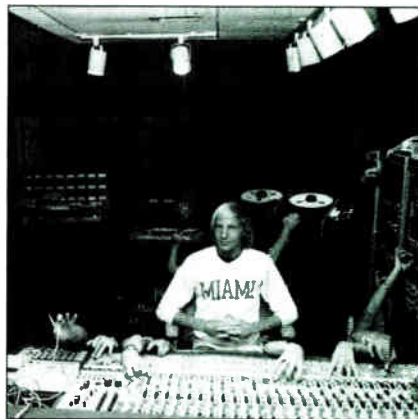
**STATE UNIVERSITY OF NEW YORK, FREDONIA**  
Mason Hall, Fredonia, NY 14063  
(716) 673-3221  
Chief Administrator: David Moulton  
Program: Sound Recording Technology. A unique four-year academic program offering hands-on experience in a 24 track recording studio. Students produce album recordings using an MTR-90 MKII 24-track recorder, Lexicon 224X/LARC digital reverberation unit, MCI console, SMPTE interfaced MIDI synthesizers, automated mixdown, etc. Courses include basic electronics, acoustics, computer science and music, as well as 22 credit hours of sound recording technology studies. The program, begun in 1975, features a senior internship and 95 percent job placement at the second engineering level in the industry. Graduates are awarded a B.S. degree in Sound Recording Technology.

**TIDEWATER COMMUNITY COLLEGE**  
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1700 College Crescent, Virginia Beach, VA  
(804) 427-7100

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10 George St., P.O. Box 57, Wallingford, CT 06492  
(203) 269-4465

**UNIVERSITY OF HARTFORD**  
Hartt School of Music/Sound Technology  
200 Bloomfield Ave., West Hartford, CT 06117  
(203) 243-4498  
Chief Administrator: Donald Harris, David Budnes

**UNIVERSITY OF LOWELL-COLLEGE OF MUSIC**  
Lowell, MA 01854  
(617) 452-5000  
Chief Administrator: William Moylan  
Program: Sound Recording Technology. Studies lead to the Bachelor of Music emphasis in SRT degree, a minor in SRT is also available for Electrical Engineering majors. Course sequence includes recording production, audio theory, audio industry, video, electronic music, music score, mathematics, physics and electrical engineering. Facilities include multi-track recording studio, 2-track recording studio, editing studio, video studio, electronic music studio, maintenance facility and sound reinforcement. The sequence of nine SRT courses culminate in an internship at a professional recording studio, TV or radio station, professional sound reinforcement company, or a video house.



**UNIVERSITY OF MIAMI-SCHOOL OF MUSIC**  
Coral Gables, FL

**UNIVERSITY OF MIAMI-SCHOOL OF MUSIC**  
Coral Gables, FL 33124  
(305) 284-2439  
Chief Administrator: Ken Pohlmann  
Program: The Music Engineering program at the University of Miami offers a four-year Bachelor of Music Engineering degree, with a minor in Electrical Engineering, as well as a two-year Master of Music Engineering degree. Courses in the undergraduate curriculum include recording engineering, digital audio, acoustics and studio design, studio maintenance, video production, film scoring, computer programming, circuit theory, music business, music theory, arranging, and performance. The graduate curriculum includes study in advanced digital audio, video, psychoacoustics, programming, hardware design, and a research thesis. The principle recording studio houses an automated MCI 528 console, MCI 24- and 2-track recorders, 3M 4-track digital recorder, Mitsubishi digital recorder, dbx digital audio processor, Audio Kinetics synchronization system, Sony 1/4 inch video recorders, and a Synclavier. Our graduates have engineered gold and platinum, and Grammy-winning albums.

**UNIVERSITY OF NORTH ALABAMA**  
Florence, AL 35632  
(205) 766-4100 x361  
Chief Administrator: James K. Simpson  
Program: Commercial Music, B.A., B.S. degree. A four-year program designed for the individual who wants to learn the business end of the music industry. Specific commercial music courses include: music publishing, the record company I and II studio techniques, production and commercial music practicum. A prescribed business minor of 24 hours is included as part of this program. Southern Association of Colleges and Schools accreditation.

**UNIVERSITY OF NORTH CAROLINA AT ASHEVILLE Music Dept.**  
One University Heights, Asheville, NC 28804  
(704) 258-6432  
Chief Administrator: Wayne J. Kirby  
Program: Four-year B.S. degree in Music with Audio Engineering Technology. Technical and non-technical recording (analog and digital), production, maintenance, digital synthesis and signal processing. Also MIDI, computerized music transcription, courses in arranging, improvisation, studio performance, and music industry industry internships available to qualified students. \$396/semester (in-state residents); \$1,647/semester (out-of-state residents).

**PHILIP J. WEAVER EDUCATION CENTER**  
300 S. Spring St., Greensboro, NC 27401  
(919) 378-1900  
Chief Administrator: Gerald Austin  
Program: Electronic music course for high school juniors and seniors.

# OUTSIDE U.S.

## CAPILANO COLLEGE

2055 Purcell Way, North Vancouver, BC,  
Canada V7J 3H5  
(604) 986-1911 x249  
Chief Administrator: Peter Thompson  
Program: Media Resources

## CHOPIN ACADEMY OF MUSIC

Sound Recording Facility  
Okolnik 2 00-368, Warsaw, Poland  
277241-83/277247  
Chief Administrator: Maria Lipiec

## COLUMBIA ACADEMY OF RADIO, TV AND RECORDING ARTS

5th Fl. 342 Water St., Vancouver, BC, Canada V6B 1B6  
(604) 688-8621  
Chief Administrator: Terry W. Nutt

## I.C.A. INSTITUTE OF COMMUNICATION ARTS

Unit 12-12840 Bathgate Way, Richmond, BC, Canada  
(604) 278-0232  
Chief Administrator: Shannon Barker, Niels Hartvig-Nielsen

Program: I.C.A. offers two-year programs in Audio Engineering/Production, Video Production and Commercial Music Performance. These programs include 700 studio hours (taught in groups of two and three) and 400 theory hours. Part-time studies are available in: Audio Engineering/Production, Video Production, Electronic Music, Entertainment Business, Sound Reinforcement, Music Theory and Arranging, Dance for Contemporary Musicians, Private Instrument Study, Communications, History of Pop Music. I.C.A. has six recording facilities, a video and live sound studio and electronic music lab. Financing available. For more information, contact the Office of the Registrar.

## LYDSKOLE, A.S. NORSK

Post Boks 9215, Vaterland, 0186, Oslo 1, Norway  
(02) 42-58-71  
Chief Administrator: Robert Jorgensen

## MCGILL UNIVERSITY

Faculty of Music  
555 Sherbrooke St. W., Strathcona Music Bldg.  
Montreal, P.Q., Canada H3A 1E3  
(514) 392-5776  
Chief Administrator: Wieslaw Woszczyk

## THE NOVA HEART WORKSHOP PROGRAMS

175 Hammersmith Ct.  
Burlington, Ont., Canada L7L 4N4  
(416) 634-2657

Chief Administrator: Nelson Gareau  
Program: Nova Heart offers workshop programs in recording and video. Courses are all hands-on experience. Practical skills are encouraged. Our motto is "You learn by doing." No prerequisites are required. Develop your skills and extend your knowledge by being taught by professionals who make their living in the music business. Jim Henderson, a graduate of Berklee College in Boston handles the audio programs. Nova Heart offers U.S. residents an extensive full-time program including accommodations. For further information write to the above address.

## ONTARIO INSTITUTE OF AUDIO RECORDING TECHNOLOGY

500 Newbold St., London, Ont., Canada N6E 1K6  
(519) 686-5010  
Chief Administrator: Paul Sleenhus

## PAPANTONOPOULOS

6 Veranzerou St., Athens 10677 Greece  
3616131  
Chief Administrator: Athanasios Palos  
Program: Cinema and TV school

## RECORDING ARTS PROGRAM

28 Valrose Dr., Stoney Creek, Ont., Canada L8E 3T4  
(416) 662-2666  
Chief Administrator: Nick Kela

Program: Our program provides individuals with an opportunity to develop practical skills in the recording arts. Theoretical instruction, music business seminars, and computer music studies are critical components of our program. However, the entire course revolves around developing the student's ability in the recording environment. Students enjoy full access to a complete multi-track studio and computer music studio. The course curriculum allows individual concerns to be addressed. As well, students may choose recording engineering or music production as their major. For more information please call or write.

## SCHOOL OF AUDIO ENGINEERING

Sydney—420 Elizabeth St. Surry Hills, New South Wales 2010 Australia  
(02) 699-7932  
Melbourne—80-86 Inkerman St., St. Kilda, Victoria 3182 Australia  
(03) 534-4403  
Adelaide—263 N. Terrace, Adelaide, South Australia 5000 Australia  
(08) 223-3535  
Brisbane—22 Heussler Terrace, Milton, Queensland 4064 Australia  
(07) 369-8108  
Perth—44 Wickham St., East Perth Western, Australia 6000  
(09) 325-4533  
Mid-Coast—3/11 Cook Dr., Coffs Harbour, New South Wales 2400 Australia  
(066) 52-8934  
London—89-97 St. John St., London E.C.1 England  
(01) 608-2420  
Manchester—10 Tariff St., Manchester M1  
(061) 228-1749  
Munich—Weinburger Str. 19 R.G.B., 80-Munich 8000  
(089) 48 3117  
Chief Administrator: Tom Misner, Steve DeFina  
Program: One-year diploma course

## TREBAS INSTITUTE OF RECORDING ARTS

1435 Bleury St. Ste. 301  
Montreal, Quebec, Canada H3A 2H7  
(514) 845-4141

Program: Record Producing, Sound Engineering, Music Industry Management, Music Video Production. Two-year programs (one-year basics; second year, specialization). Diploma in Recording Arts and Sciences with specialization in (one of the four programs above) diploma. One entrance scholarship at each of the three campus locations, valued at \$3,500 to \$4,000 each. Dr. Peter C. Goldmark Memorial Scholarship for second year studies (value \$3,500 to \$4,000) at each location. Other awards of merit also available. Consult the Admissions Office of the Institute. Facilities: 24-track professional recording studio in each location. Electronic music studio, electronics lab, and disc mastering rooms in selected locations. Full-time day or evening studies. 140 courses offered in four programs of specialization. Limited number of internships available. Eighty percent of graduates placed. Limited financial assistance available. Government approved, industry recognized.



TREBAS INSTITUTE OF RECORDING ARTS  
Montreal, Quebec

## TREBAS INSTITUTE OF RECORDING ARTS

290 Nepean St., Ottawa, Ont., Canada K1R 5G3  
(613) 232-7104  
Chief Administrator: David P. Leonard  
Program: (see Montreal listing)

## TREBAS INSTITUTE OF RECORDING ARTS

410 Dundas St. E., Toronto, Ont., Canada M5A 2A8  
(416) 966-3066  
Chief Administrator: David P. Leonard  
Program: (see Montreal listing)

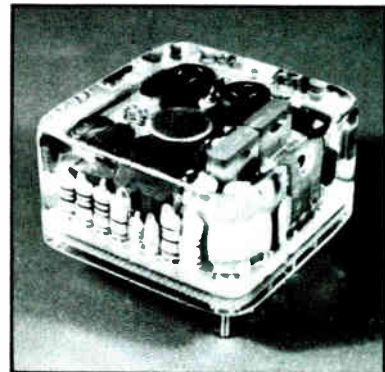
## TREBAS INSTITUTE OF THE RECORDING ARTS

34 W. 8th Ave., Vancouver, BC, Canada V5T 1M7  
(604) 872-2666  
Chief Administrator: David P. Leonard  
Program: (see Montreal listing)

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Chief Administrator: Donald J. Moisner

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# LEAD ME TO THE ROCK THAT IS HIGHER THAN I

(Psalms 61:2)



*Sparrow Records artist Steve Taylor*

## Contemporary Christian Rock Bears Its Cross and Examines Its Soul

by Dan Daley

The house lights come down and the murmur of the crowd suddenly swells and sustains, filling the college gymnasium like a Texas twister in April. The audience is a Benetton and Levi's ad, and there is the sound of Reeboks squeaking on the wood floor as kids vie for position. A drummer's count is heard faintly from the stage and in seconds the hall is filled with high-dB rock, the musicians illuminated by a sophisticated light show. Tune after tune rolls out from the stage. It's difficult to hear the lyrics over the roar, and the gymnasium acoustics

are of little help to ears already verging on tinnitus. Just another night of rock and roll, right?

But if you were unsure about the message during the show, the meaning becomes crystal clear when the music stops and the ministry begins. In the burgeoning subculture of Contemporary Christian Rock, a ministry can be limited to a few between-song remarks or it can comprise an entire sermon replete with an after-show altar call during which members of the audience make a public display of their faith, hands raised and Bics flicked in devotion. But either way, it's

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WELCOME

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*Rick Cua, Steve Camp and Rob Frazier*

apparent that a certain carpenter from Galilee has become as comfortable with a Stratocaster as a scepter.

And you thought you were just here to boogie.

"With CCR, the lights are just as bright, the lasers are just as active, the smoke is just as thick, the music's just as loud, the action onstage is just as lively," says Mike Atkins, tour and promotion director for Benson Records and its Christian Rock label, Power Discs, in Nashville, Tennessee. "But

the message is different. It's not something negative or satanic. It's a message of hope."

Contemporary Christian Rock is at a crossroads in its relatively young life. A direct descendant of the flowers-and-beads Jesus movement of the early 1970s, religious rock has developed a significant economic base, estimated by members of the industry to be in the area of \$80 to \$100 million per year and growing. A small handful of Contemporary Christian Rock

artists, like crooner Amy Grant and spandex spiritualists Stryper, have gained a degree of general public visibility (although perhaps as much for their novelty as for their abilities). But while this new wave gospel music has taken advantage of recording and performance technology to field slick pop records and shows that make it hard to differentiate from its secular counterpart, CCR remains a subculture, albeit a large one, and one not immune to criticism from within its ranks on a range of points from passive marketing approaches to being bland and preachy. Complicating matters, CCR is seen as suffering from negative public perceptions about the born-again movement as a whole and media evangelists in particular.

Kevin Cottrell, who hosts a Christian Rock video program aptly titled "Upon This Rock" on all-music channel U-68 in New Jersey and a radio version of the show on WDHA, believes that Christian record labels have been playing it safe for too long. "They don't know how to play in the big leagues," he says. "I look at them now as if they're a little club—they've got their own labels, they stay in areas where they know Christians are going to come out and see them. Before Amy Grant, the only place you could buy a Christian rock album was in a Christian bookstore. It was closed off to the rest of the world. The companies, if they want to get into the mainstream, have to learn all they can to do that. Either that or get involved with secular record labels."

Both of those options are being implemented, according to the religious labels. Experienced industry hands are being hired at some companies, and promotion and distribution (P&D) deals with majors have been struck. Amy Grant, who has functioned nominally as a media figurehead for CCR,

### CHRISTIAN ARTISTS' MUSIC SEMINAR

This year marks the 12th Christian Artists' Music Seminar, one of the most progressive and far-reaching annual events in the contemporary Christian music industry. Held from July 27 to August 2, 1986 amidst the stunning grandeur of the Rocky Mountains at Estes Park, Colorado, the seminar unites both established and aspiring musicians, songwriters, and performers, as well as label and management executives, theologians, music minis-

ters, and others interested in modern gospel music.

Besides the nightly concert series featuring an all-star lineup of top Christian performers (Sandi Patti, Leon Patillo, Deniece Williams, DeGarmo & Key, Larnelle Harris, and Steve Camp, among many others), the seminar offers talent competitions, and over 175 classes and workshops. Course topics range from songwriting, vocal and instrumental classes to sessions on multimedia, television, record production, advertising, publishing, and promotion. A conference focusing

on lighting, sound and synthesizers has also been slated, and will be taught by Sound Investment Enterprises. This special conference will cover all aspects of professional audio and lighting systems, along with synthesizer/electronic music production demonstrations by representatives of E-mu Systems, Kurzweil, and Roland Corp.

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is signed to Myrrh Records, a division of Word Records. But in a deal concluded in 1985, Grant's P&D in the non-religious market has been licensed to A&M Records. Grant was a likely candidate for this move, since she positions her evangelical message beneath a thin, somewhat ambiguous lyrical layer, allowing her love songs to have earthly as well as spiritual connotations. As Scott Pelking of the Waco, Texas-based company puts it, "Amy writes from a Christian world view, not a Christian theological view. It's a small but critical difference."

Sparrow Records, in Chatsworth, California, which claims to hold a 50 percent share of the CCR market with acts like The Rez Band, Steve Taylor, Rick Cua and Steve Camp, has recently concluded a distribution and promotion deal with Capitol Records after allowing an earlier arrangement with MCA to expire.

Heavy metalists Stryper, who toss New Testaments into the audience after shows, took another route. The four-piece Southern California group chose to go with new music rock specialists, Enigma Records. As drummer Robert Sweet said in an interview, "Most Christian bands aren't concerned about the production too much, and they're happy to play in front of an audience made up entirely of other Christians. We realized that we are a rock band... and we needed to be on a rock label."

However, Scott Pelking at Word/Myrrh says that attempts to crack the secular market are stymied at several levels. "You wouldn't believe the problems we have trying to get even a halfway serious review in a general market magazine," he claims. "It's as if these records do not exist. Amy Grant is selling over a million records; we have artists who sell up to 300,000 units. And *Rolling Stone* looks at it and says, 'So what?' It's real frustrating since we're selling upwards of \$34 million worth of Contemporary Christian Rock product a year."

Dan Brock is a personal manager whose client list includes DeGarmo & Key, a rock act on Power Discs. Brock learned his trade working at the secular rock band Styx's management company, and went on to manage Christian hard rock act Petra, and book Amy Grant's first tour. He agrees with Kevin Cottrell's "little club" reference, adding that, "It was even worse ten years ago. Then it was a little amateur club." He also agrees that an artist's record label is critical in accessing the promotional machinery needed to penetrate the secular market: "If Amy Grant's on Myrrh, it means one thing; if Amy Grant's on A&M, it means another. It could be the same record,

but just the change of logos on the album jacket changes the whole industry's attitude towards the product." Brock points out that even though the religious companies far outsell the majors in Contemporary Christian Rock, having the imprimatur of an A&M or a Capitol makes it easier to deal with mainstream video and radio program directors who might otherwise shy away from a religious company.

[While Christian videos are generally relegated to shows like "Upon This Rock," MTV has aired several Contemporary Christian Rock vids. And in an incident not devoid of irony, the 24-hour video channel initially refused to accept DeGarmo & Key's first

video on the ground that it was "too violent," in Brock's words. The track, "666," features what's called in Hollywood stunt language a "full body burn" of about five seconds in which an actor portraying the devil is immolated. MTV ran the video after the offending scene was cut, Brock says.]

Brock acknowledges the importance of Christian record labels becoming better versed in the politics of dealing with programmers and chain store buyers, citing his feeling that the so-called "little club" can expand from within. "I'm not so sure I'm trying to sell to the same guy who goes to see Van Halen," he says. "It's my philosophy that there's a huge Christian mar-



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ket out there that does not get serviced by the Gospel industry. A very small percentage of people who call themselves Christians buy products in Christian bookstores, which is where most of our records are sold." By making retailers of the potential Christian market, the industry can avoid "getting stuck back in a religious bin in the corner," as he puts it. "The consumers are there. It's the people with the power that need to be dealt with, the same way that a lot of 'new music' bands had problems in the beginning."

Beth Boyd at Power Discs reflects concerns that the religious labels have about entering mainstream markets: "Basically in Christian music, you have to be sensitive to who your buyers and listeners are, so we're cautious when we go into the secular marketplace; not because we feel we don't belong there, but because we don't want to lose the people who have made us what we are already."

As for any qualms that the secular end of the industry might have about carrying Christian product, Brock says pointedly, "It's a real simple business distribution question, and the lyrics and images of the groups are all very secondary."

Or are they? CCR has encountered resistance from the industry and the



Geoff Moore

general public, a resistance based on cultural and media perceptions, according to its proponents. "If you look at it logically," says Word/Myrrh's Scott Pelking, "there should be no reason why any publication or radio station that espouses artistic integrity would ignore certain Christian artists. But nonetheless, because of some po-

litical and cultural considerations—and I can't emphasize the cultural aspect enough; we're talking Elmer Gantry here—there is a mindset against it."

With an incipient populist/activist trend in music manifesting itself through the likes of John Cougar Mellancamp, Bruce Springsteen, Live Aid, Farm Aid and so on, the deleterious linkage of perception between conservative evangelism, conservative politics and Christian Rock hasn't escaped the industry's notice. "The evangelistic community is pro-life, pro-Regan, anti-Commie/pinko, anti-homosexual, anti-everything that (the liberal press) espouses or at least allows," Pelking says. "And we're guilty by association."

Among televangelists, Reverend Jimmy Swaggart has been particularly vociferous in his attacks on any sort of rock music, secular or otherwise, on his weekly video ministry. And when the genealogical solecism was brought up that Swaggart's cousin is Jerry Lee Lewis, a rocker known for his chronic skirmishes with the Ten Commandments, Pelking added a further irony: "And to pull a Vonnegut-type triple whammy, the premiere heavy metal Contemporary Christian Rock artists, Stryper, love Jimmy Swaggart."

While the strict adherence to scriptural values puts many CCR artists into what Pelking calls a "dead zone" as far as the secular market is concerned, he says the genre has a number who are commercially viable in a larger sense.

One of them might be Sparrow recording artist Steve Taylor, who also has strong feelings on the cultural perceptions of Christianity in its evangelical form. "I think most people get their image of Christianity from the media, especially from TV preachers," he says, "who preach doctrines like 'God is an American and He wants us all to be rich and conservative and Republican.' I think people characterize fundamentalists as right-wing and conservative and tied into a whole American agenda, and I'm definitely not coming from that point of view."

Taylor's records back him up on that last point. His religious references are oblique, couched in a sophisticated wit that avoids getting bogged down in its own cleverness. Heavily influenced by iconoclasts like The Clash and Elvis Costello, his lyrical observations are at once satirical and profound, and he doesn't hesitate to slip prosaic knives into the putative sacred cows of modern evangelism. From his "I Manipulate:" *Does your soul crave center stage/Have you heard about the latest rage/Read your*

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From cover graphics to production values, Taylor's most recent record, *On The Fritz*, would easily be at home in any new music rack. The LP was co-produced along with the Denver-born singer by ex-Foreigner Ian McDonald, an association Taylor says "came about kind of through the back door. We heard that Ian was looking for projects to work with and we called and asked if he was interested in doing a gospel record." Taylor laughingly recalls McDonald's initial response as being, "I don't know much about tambourines."

Along with how the Bible-thumping righteousness of TV evangelists is perceived by the public, Taylor sees much of the content of Contemporary Christian Rock as being its own worst enemy. "Both (the public and the media) have been led into the same dead end in that they tend to characterize all Christian rock by a few bland Christian groups," he says, adding that as the genre matures, more artists are breaking away from the repetitive dogmatism that has marked much of the music.



Amy Grant

Rather than strictly preaching the Gospel, Taylor thinks that Christian rock artists should address themselves more to issues viewed from a Christian vantage point, a la U2 and Bruce Cockburn, who he says "is articulating a lot of the concerns that Christians should have."

But Steve Taylor's barbs aren't aimed

solely at members of his own tribe. Even as he discusses the inherent dogmatic aspect of CCR, he points out that, "People treat this music as a kind of leprosy when they don't recognize the same sort of dogmatism that goes on in pop and rock and roll," alluding to the sexism he feels is rampant in heavy metal music. "To me that's appalling, but no one is not playing it because it's sexist. It seems to me that Christian rock is the only style of music that is (rejected) because of lyrical content. Some people toss it out for a lot of good reasons—some of it's lousy. But there's a lot of it that's good, too."

Geoff Moore, a Power Discs recording artist who characterizes his music as "straight-ahead hard rock," says he also feels the pinch of having musical roots planted in both secular and religious milieus. "You get it from the left and the right," he says. "You get it from Christians who are offended by rock music . . . and you get it from people who feel it's wrong to use rock and roll to talk about your faith."

Moore's theological side is more overt than Taylor's; his messages are tinted with the midwestern Everyman plaintiveness that hallmarks artists like John Mellencamp. His passion is to provide a musical alternative to some of the lifestyles promulgated in secular

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DeGarmo & Key

music. "Music plays such a big role in our lives," he says, "and I see heavy metal music having a grip on kids that goes far beyond just the music. It affects their emotions, their attitudes, their place in society, and it goes far beyond the vinyl or the tape. I see music as a powerful tool and I think it's being abused in this situation, and I want to do what I can to use it in its correct context."

That context is the Bible, says Moore, and his role as an artist is akin to that of the struggling sinner who tries to rise a bit higher after each fall.

How artists create images is a point Moore has especially strong feelings on: "I've read that Ozzy Osborne is into the macabre, but not into satanism. Well, I don't think that makes a difference to the audience. Whether the artist endorses this personally or for media purposes to sell records, we are what our media images paint us to be in the eyes of those who listen to our music."

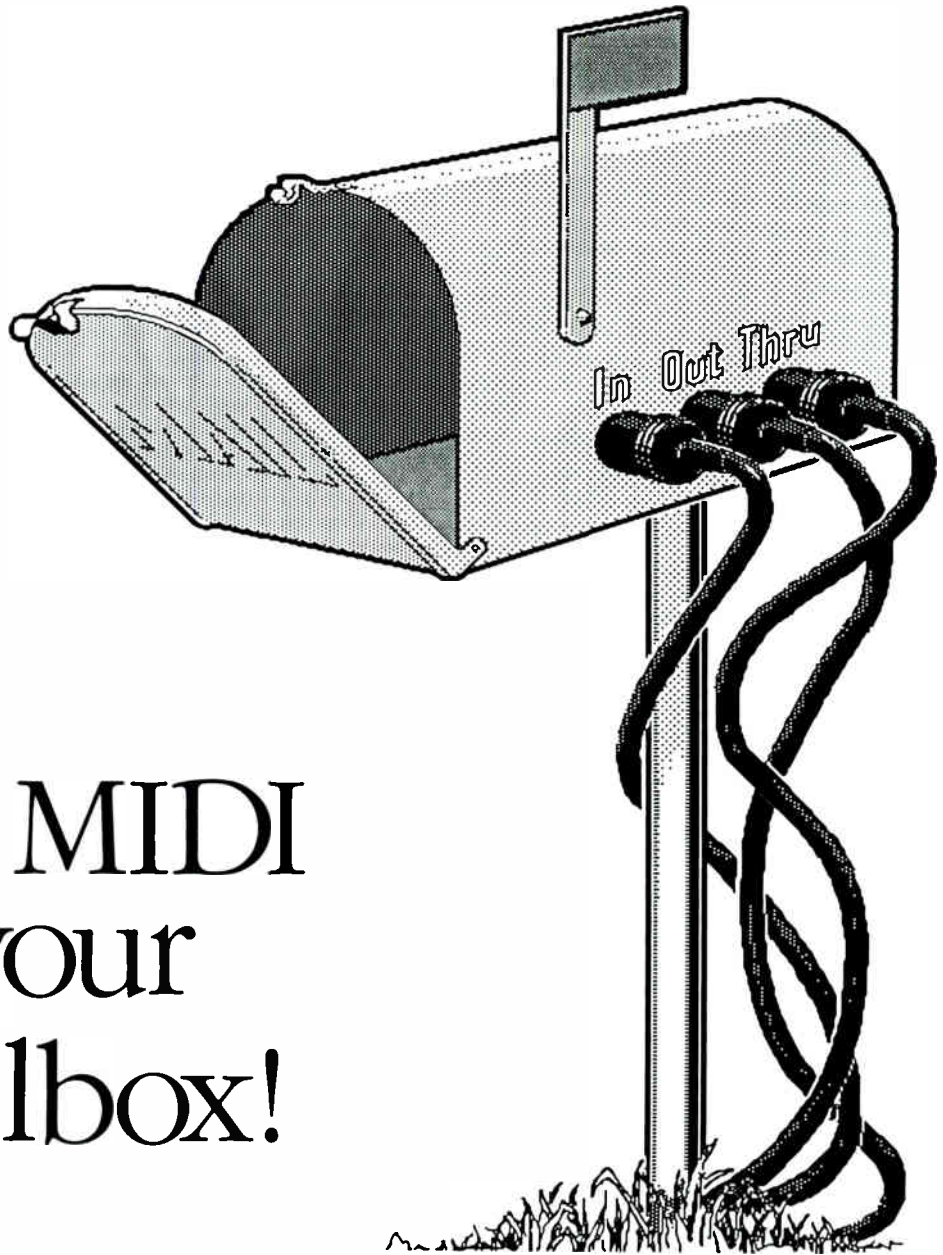
Moore has an after-show ministry, since he feels that simply to put on a show is not enough. "I feel I'd be compromising by doing a good old rock and roll ending and saying goodnight and just walking out. I believe that that relationship (with Christ) can change people's lives. At the concerts, we give people an opportunity to become a Christian, and that's the very

essence of what's happening."

However, this is the sort of interpretation that could keep Contemporary Christian Rock a subculture, Moore acknowledges. "Ultimately, the theme of this music is you're not OK, you're a fallen sinful person, and unless you get God in your life you're going to go to hell, and I think that's going to turn a few people off."

Rock and roll has always been a democracy; anyone with a guitar and a need to express something has always been allowed to participate, regardless of the content of that message. And, in light of that, whether or not Contemporary Christian Rock ever becomes a staple of mainstream airwaves or instead flourishes in a benign ghetto (as country music has for most of its life), is perhaps a moot point, to be decided by a synergism of social and economic forces beyond the control of any one group of people. But given the apparent shift towards activism and social awareness in music, and the positive moralism that is one emerging and salient aspect of CCR, the effect of this new wave of gospel music may be heard in the thematic fiber of American music sooner and more strongly than its force is felt in the marketplace. ■

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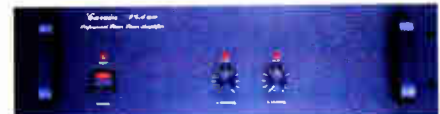
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## Making Beautiful Music Together



PHOTO: TONY THOMAS

(L to R) Studio owner Bill Cobb and Maranatha Music president Tom Coomes.

by Tony Thomas

Several years ago, long-term recording studio/label alliances were commonplace and they yielded some legendary recordings. Gold Star Studios (now defunct), for example, became synonymous with the often imitated but never duplicated "Phil Spector Wall of Sound," since much of his work for his Philles label and other labels was recorded there. Abbey Road became so identified with its most famous clients, The Beatles and their Apple label, that they eventually named their last studio album after that facility. In recent years, however, the ascendancy of the independent producer, coupled with the never-

ending quest for the biggest and best that technology has to offer, has loosened somewhat the cement that once bound labels to specific studios. As a result, basic tracks for a given project are recorded at one studio, overdubs done at several others, and the final mixdown completed at still another studio. It is now a rare occurrence for a label to decide to "lock itself" (literally) into a one studio for even a single project, let alone for several different projects.

Such an uncommon relationship exists between Maranatha Music's new "Colours" label and West Oak Recorders, a once-small studio that eventually evolved into a full service 24-track facility in the Camarillo, Califor-

nia home of owners Bill and Marsha Cobb. It used to be called Poiema—a Greek word meaning "creation" or "workmanship" found in Ephesians 2:10 in the Greek text of the New Testament. In fact, the studio took up so much of the Cobb's home that it gave new meaning to the term home studio: "Our first bedroom was the control room," says Marsha Cobb. "Our living room was the studio, our dining area was the drum booth and the kitchen was the work room. I enjoyed it and the people that came through. It was really a wonderful experience for the eight years we were there, but after eight years we were ready to make a move."

West Oak Recorders was the culmination of Bill and Marsha's desire to move into the spacious (4000 square feet) former home of Westwind Studios in the Los Angeles suburb of Westlake Village, when that building became available. The new building has a very large (40' x 35') studio and control room (22' x 20'), and is outfitted with a Soundcraft 2400 console (28-in x 24-out with 52-input mix capability) and a Stephens 821B 24-track deck with autolocator, Ampex ATR-100 half-inch analog and JVC EIAJ-digital format 2-tracks, JBL custom tri-amped monitors, and a full-range of effects and outboard gear. The studio also serves as a home to a recording school with a full curriculum that was founded by and is taught by Bill. The cream of the crop of graduates are hired as second engineers at White Oak. Although the studio has established a strong track record in the Christian marketplace, with projects from the likes of Jamie Owens-Collins, Steve Taylor, Chuck Girard, Noel Paul Stookey ("Paul," of Peter, Paul and Mary fame) and John Michael Talbot, they are eager to point out that they are not an exclusively Christian studio. They are geared up to provide any client, sacred or secular, with all of the ambiance and amenities of home.

Since transplanting their equipment into the new facility, West Oak has produced two of the newest releases of Colours, an all-instrumental inspirational label which is a subsidiary of Maranatha Music, a Christian record company that grew out of the "Jesus Movement" of the '60s and '70s. *The Hidden Passage*, by the Tom Howard Ensemble, was produced utilizing layers of acoustic and electronic instruments, and *Timeless*, by session vets Harlan Rogers and Smitty Price, fea-

tures a combination of synthesizers and acoustic piano.

Although both the Howard Ensemble and the Rogers/Price projects were recorded utilizing analog 24-track rather than digitally, they both benefit from the careful engineering of Bill Cobb and the transformerless environment of West Oak, facilitated by their combination Stephens recorder and Soundcraft console. At the mix-down stage, both 2-track analog and 14-bit EIAJ/PCM digital masters were produced, allowing the choice between analog and digital masters to be made for transfer to vinyl disk, Compact Disc and audio cassette.

Maranatha Music president, Tom Coomes says that working with engineer Bill Cobb is the primary reason that he is willing to make the lengthy commute to and from Maranatha's Orange County headquarters to utilize West Oak: "I heard the work tapes of Tom Howard's album (*Hidden Passage*) and came up for the first day of mixing to tell Bill what we were shooting for, which was really demanding. It was to be audiophile quality with real sophistication and finesse in the mixes. There are a lot of different schools of engineering, but I think that the best one is 'use your ears.' Bill always seems to use his experience which makes him really confident and relaxed at what he is trying to do, and very flexible.

"Also, from my perspective, if the people around the studio and the engineers get as excited about what you are trying to achieve as you do, you have a team feeling. I love that team feeling, I'm a team player. It's like that scripture says: 'How can two walk together unless they be agreed?' Well, Bill immediately fit into this whole Colours thing because it was a challenge for him to shoot for excellence. You know, a lot of times studios have to knock out things real quickly because budgets are restricted. It was not like we put a lot of money into this, but we wanted to do something that was extremely good for a limited amount of money. Bill and the whole crew just jumped in as much as we would."

The Colours/West Oak collaboration represents the reconstruction of a bygone era in the craft of music-making on a microcosmic level—an era in which people and not just machines were of paramount importance. An era in which composers, musicians and engineers all operated as equal partners in the creation of art. And as Maranatha's Coomes summed it up: "True art is from the hearts and minds of artists. These artists are filled with the heart of God." ■



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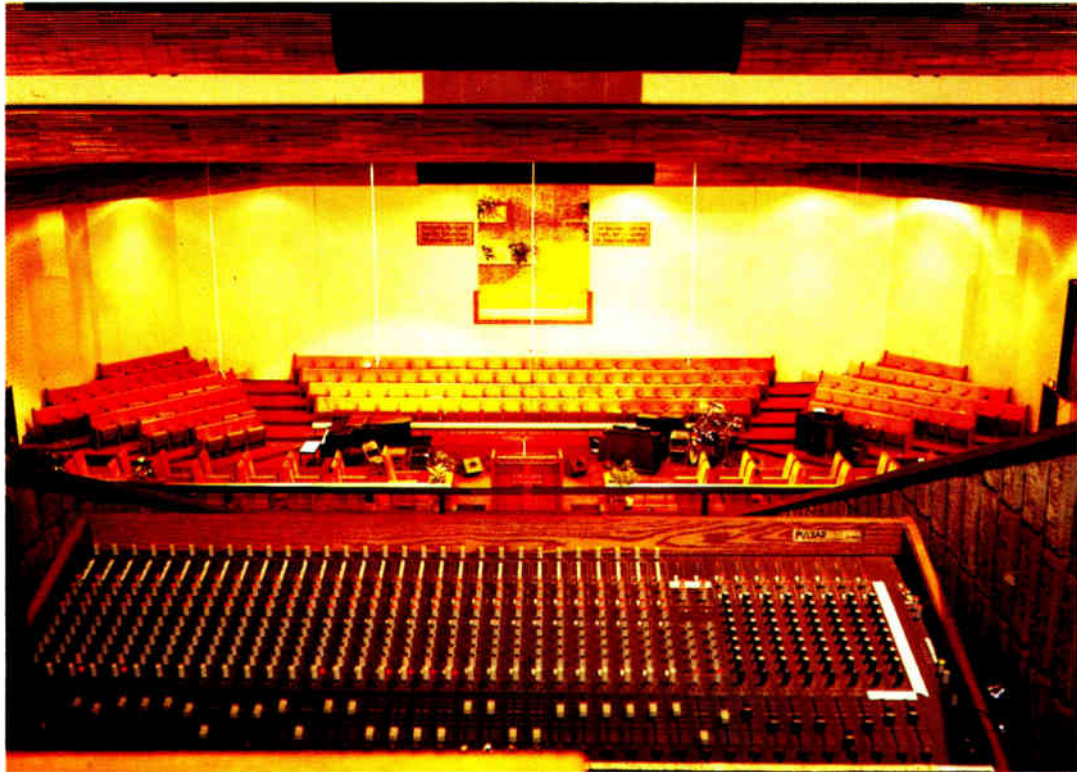
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## Greater Grace Temple of the Apostolic Faith Detroit, Michigan

by Alan Robertson

With his flowing white robe swirling around him, the Bishop David L. Ellis grabs a wireless microphone next to his pulpit and walks out toward the main floor where part of his congregation is seated. "Nothing comes easy . . . I don't care what you say, nothing comes easy today," he preaches. "Other preachers envy me and where I'm at today, and they say, 'See Ellis over there, he's got everything.' But the thing they're not remembering is how hard I had to struggle to get here, and that I'm still struggling today!"

A few "Amens" shoot through the air. Members of the 2,000+ congregation jam the temple, which rises five stories to the top of its upper balcony. White-gloved ushers stand in the aisles on the main floor and at the entrances to the balcony. Behind the pulpit, the rostrum is filled with a choir the size of a small army, and a band outfitted with a grand piano, organ, electric bass, guitar, trap set, and horn section.

Other church officials span out to the left and right of the pulpit, seated in high-backed chairs, and occasionally take calls from elsewhere in the sprawling church complex on phones next to their seats. Just in case someone gets too caught up in the emotional fervor of the service, a nurse sits next to the piano on a folding chair.

There aren't many who are more qualified to speak about struggling to achieve an end reward better than Ellis. As Bishop of Detroit's Greater Grace Temple of the Apostolic Faith, he took on his leadership role in September of 1962. What he inherited at the time was chaotic at best. Membership had declined to a mere 60 people, and foreclosure on the building's mortgage seemed imminent. By putting into action what he preaches, Ellis faced the problems before him and overcame them. Today, Greater Grace has over 2,000 members, and conducts its main Sunday services in an impressively modern cathedral that opened its doors in 1983 at the corner

of Schaefer and Seven Mile Roads. To further demonstrate the prosperity that has come with their hard work, the church additionally owns its own fleet of vehicles, has established a credit union, and maintains a private school for pre-schoolers through the eighth grade.

A Pentecostal Apostolic church, Greater Grace is an affiliate of The Pentecostal Assemblies of the World. Typical elements found in any Pentecostal service are far from subdued, and this church is no exception. Loud music, passion-filled exaltations, and full-submersion baptisms in a pool located behind the rostrum are normal occurrences on any Sunday. Services are also marked with an air of spontaneous energy. They start at a pre-determined time, and come to a close whenever the spirit moves them. To carry one off properly and give it a life of its own takes many hands, for on the scale of religious events, it is a grand production.

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key roles in the service. When the congregation first moved into their new cathedral, sound reinforcement was provided by two 15-inch conical drivers and two horns. Four-hundred watts of amplifier power was all that was on hand, and there were no routing capabilities to interface the system with the rest of the Greater Grace complex, which includes a fellowship hall and another temple. In itself, the system was a good one, it's just that the levels necessary for the worship service far exceeded its capacity. Before the possibility of a total meltdown of the system became reality, Greater Grace's administration decided to shop around for something that could better handle the workload. Based upon their work in other churches, Modular Sound Systems, Inc., of Barrington Illinois was asked to do a complete rebuild job. After initial feasibility studies were made by Modular Sound's Jim Wischmeyer and Henry Heine, the duo accepted the task from Greater Grace, which wanted the old system to be torn out and the new one to be operational in a space of time that ran between two Sundays.

"The biggest problem with installing this system was purely logistical," Heine says. "There was a lot to do in a seven day period. Major portions of the ceiling had to be cut out to facilitate the hanging of the arrays, and an extensive network of catwalks had to be built from scratch so that we could get to everything from inside of the ceiling."

Assisting Modular Sound in the installation were Charlie Mack, the Greater Grace team of sound engineers; Melvin Howard, Kenny Doss, David Ellis, and Reco and Tony Brown, and a host of other recruits from the congregation. Work began with the construction of the scaffolding that would be needed to install the two main arrays. Rising up from behind the pulpit and from in the middle of the floor, each stood two sections deep and four sections across. Building the catwalk alone required about four days out of seven. Once in place, the four-way system's two arrays could be hung using stainless steel aircraft cable attached to steel supports. The main floor array consists of 49 loudspeakers in all, which can be broken down into the following individual components: eight 15-inch drivers, five 12s, 32 5-inch speakers mounted in wedge-shaped cabinets for greater dispersion, and four horn/tweeters. All loudspeakers in this array, as well as the balcony array (with the exception of the horn/tweeters), are Modular Sound's proprietary Bag End models enclosed in Bag End cabinets.

The balcony, which is spread over a larger area, was reinforced with a time-delayed array composed of the same transducers as those chosen for the main floor, with one difference: 48 5-inch speakers mounted in wedge-shaped cabinets were employed to make up for the increase in the area of coverage.

As the project drew ever closer to

its scheduled completion date, the crew shifted into working night and day to bring it in on time. Frantically drawing upon hidden reserves of energy for the final eleventh hour push, on the Saturday night before the system was scheduled to be up and running, the crew was faced with gaping holes that were still visible in the ceiling, and a stack of electronic hardware that was nowhere near reaching a state of completion as far as wiring was concerned. By 9 a.m. the next morning, 2½ hours before the main Sunday service was to begin, Bishop Ellis showed up to see what progress was being made. He grabbed the microphone next to his pulpit, spoke into it, and nothing happened. Under the direction of congregation member Walter Pugh, crew members still scrambled about in their efforts to reassemble the ceiling that had been removed to install the balcony array. Fueled for the past 48 hours on large quantities of food for added strength and little or no sleep, Jim Wischmeyer shored up the final connections at the amplifier end just as the last piece of scaffolding was being cleared away from view. Outside, members of the congregation were beginning to assemble for worship services, unaware of what was going on inside. In minutes, the cathedral was packed with people, and the system received its initiation, which went without a hitch.

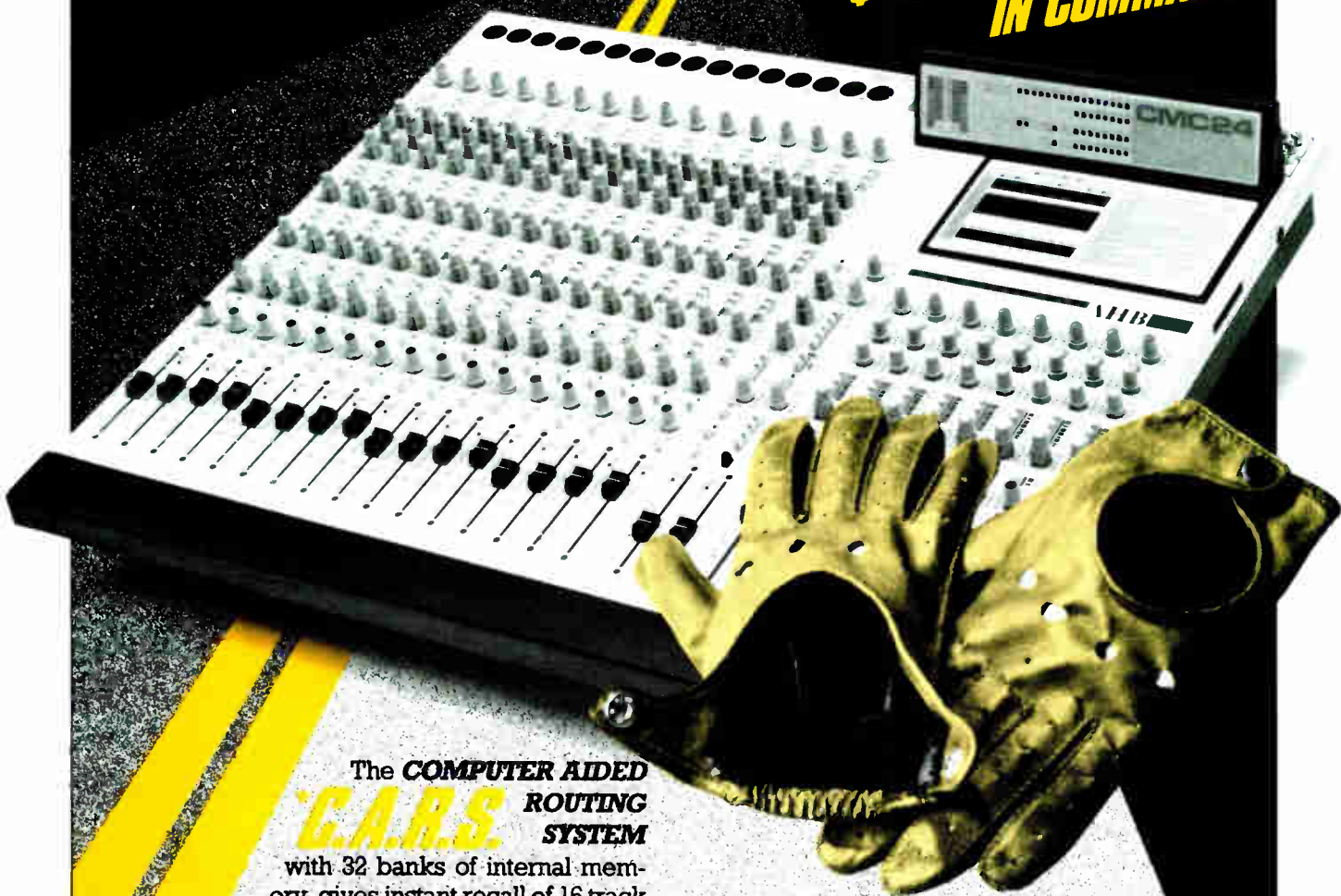
After a few more week-long visits to make improvements and install the permanent wiring, Modular Sound

*Part of the Greater Grace team of sound engineers. From left to right, Tony Brown, Melvin Howard, Kenny Doss, Reco Brown, and David Ellis, Jr.*



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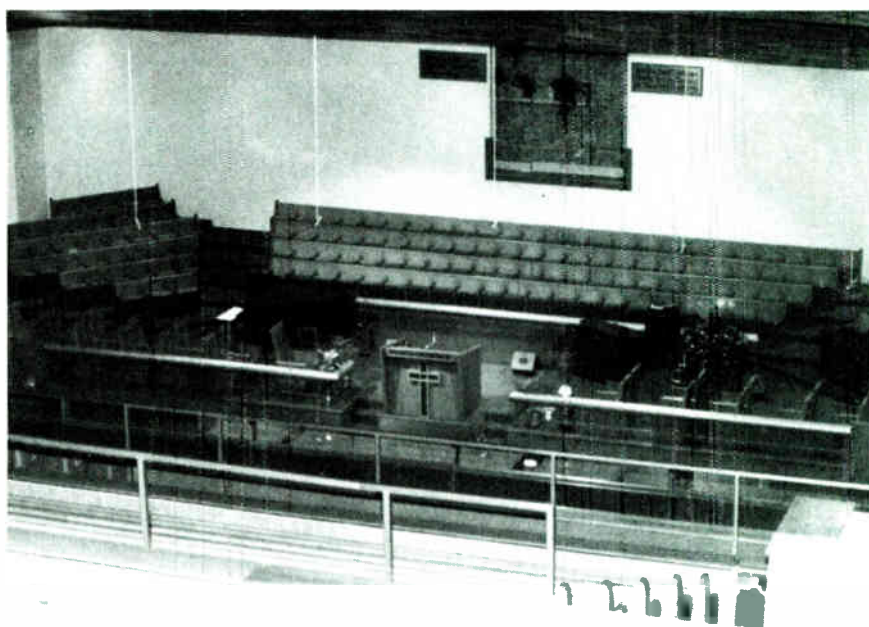
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*A closer look at the rostrum from the edge of the balcony (note full-submersion baptismal font recessed in back wall).*

declared the system to be in proper working order. With a total cost of well over six figures, it can safely be said that it is one of the most advanced designs ever utilized in a church. Presently, 27 inputs from the rostrum connect to the house's main board, which is a Pulsar with a 30-channel input with eight subgroups and an eight output matrix. Since live and taped radio broadcasts originate from the church for Sunday listeners on local AM station WQBH and FM station WMUZ, a second board is mounted atop the balcony in an isolated recording/broadcast booth which also houses the main equipment rack containing 15,000 watts of Carver power. Since a standard mixing console would sound proportionately inaccurate if used for live broadcast, a TAC Scorpion was picked for the chore with 32 inputs and eight subgroups. As a tool, this console has proven quite effective because of its ability to isolate soloists and instruments from the variety of other sounds in the mix, which makes live broadcasts sound more realistic when heard over the air.

Also, to cut down on the problem of unwanted signals being picked up on the rostrum by crucial microphones used in delivering the sermon or a soloist's voice, signal gates were strategically employed at eight different points on the main house's board. Voice activated, the gates have greatly reduced feedback, added to overall gain, and the clarity of the mix.

Three effects were added to the house system: a Lexicon digital reverb unit, a DeltaLab digital delay, and an exciter from EXR. A Lexicon digital



reverb was also looped through an auxiliary send on the TAC mixing console for its obvious benefits in a recording and broadcast situation. For ambient sound to enhance broadcasts, a PZM was mounted underneath the balcony, along with twin directional shotgun microphones mounted on each wall of the main floor and pointed at the congregation.

Regardless of the tremendous amount of work that went into getting the system working on time, Greater Grace chief sound engineer Melvin Howard believes that what they went through was worth every moment of stress and sweat. "My suggestion to anyone else wanting to get into something like this for their church is to get involved with the process of installation," he said. "If you spend the amount of money we have here, you have to know what you're getting into, and at

times things can be complex. Jim and Henry gave us the hands-on experience in the beginning that gave us a better understanding, and followed it up with personal instruction. It was important that they worked with us in that way."

Other religious denominations have always leveled criticism against the Pentecostal church because of what they would term as an "excess" in their style of worship. This notion will obviously be reinforced when word gets around about Greater Grace's high SPL sound system. To their detractors, Charles Ellis, Jr., one of the church's administrative assistants, answers: "Everything we do must be looked at from the aspect that the Lord has blessed us to help get us where we are. Therefore, we should not thank Him lightly when it comes to our worship and His temple. If you went to a concert in the secular world, everything that you'd hear would be mixed, regulated, and controlled so that it sounded the best that it possibly could. Why should it be any different here? Maybe the Baptists and Catholics can do the job with one microphone and an organ, but in the Pentecostal church, we've always had drums, horns, large choirs, guitars, and so forth. Now, with the kind of sound system we have here, we can control the many elements that go into our services so that there is a melodious sound, not one that's harsh or distracting. We have much more freedom today, and after all, the sound is one of the most important things in our service." ■

*Greater Grace Cathedral, where Sunday services are held utilizing a 15,000 watt sound system costing over six figures.*



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“Our main goal was to get a very ‘warm’ digital recording,” says Danny Bennett, son and manager of Tony Bennett, and co-producer on his just released 89th album, *The Art of Excellence*, Tony’s first studio recording in ten years.

## Tony Bennett on CD: The Technology for Excellence

by David Schwartz



*Tony meets Sony at Olympic Studios*

Danny Bennett and his co-producer on the record, Etorre Stratta, carefully planned the recording project with a high digital consciousness. “He and I were talking about the reputation digital recording has gotten as having a ‘cold’ sound, not unlike transistor vs. tube—one’s warm, one’s cold,” he recalls. “We were saying that it has to be in how you handle the

medium. With this record, we said that Tony’s whole philosophy is the search for excellence. He’s always striving for the best, he’s determined to become the consummate singer. So we said that since this was the first time Tony has recorded in ten years, almost as an experiment, let’s not skip a beat with it. Let’s make this technically the best record we can get. And in the



*Ray and Tony work on their duet at Larrabee Sound in Los Angeles.*

process we decided to combine the best of both worlds. We said to ourselves, 'Let's take all of those 'warm' tube mics, and do a live digital date and stay as clean as possible, all the way down the line.' "

These recording sessions were special for many reasons, not the least of which was the father/son recording relationship. Says Tony, "Danny is very good at producing. He's got his own recording studio that's doing very well [Hillside Sound Studios in Englewood, NJ] and he's a perfectionist. We get along great. We understand one another."

The ten-year recess from studio recording allowed Tony to pursue both the heavy performance schedule that he is so fond of maintaining, and his other great love, painting, which he has developed simultaneously with his singing voice since age 5. The break also allowed certain other benefits in approaching this new record. "After waiting ten years, I didn't have to worry about a deadline," he says, or rush to find material and "do two or three inferior songs just to get one good one. I was able to accumulate 12 songs I really loved. They are all new."

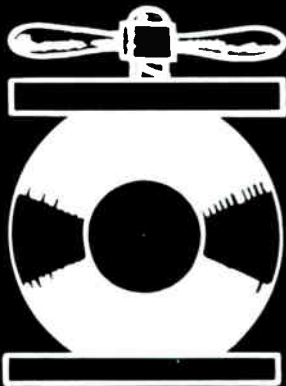
Most of the pre-production work on the album was done at Hillside Studios. Says Danny, "Then we went to London, to Olympic Studios, and we set up a nice live situation with Keith Grant, who had worked with Tony in the past. We wanted as close to a live performance as possible, so we recorded it all at one time, with the Ralph Sharon Trio [Sharon, piano; Joe LaBar-

bera, drums; Paul Langosch, bass] and the United Kingdom Orchestra with Jorge Calandrelli conducting. On the album we say Calandrelli 'orchestrated' and not 'arranged,' because Tony spent six years with his trio arranging this material. George was able to orchestrate around the trio. We didn't want to lose that core, which you can very easily do with a recording of this size. The record is pretty intimate, for the number of people playing on it."

The record was made specifically with the CD in mind, according to Danny. "We talked with CBS about marketing the CD first, before the album. The plan was to have the CD in stores a month before the LP, just as a marketing twist. Also, we used all 12 tunes on the CD. There are two fewer on the LP."

Outside of a duet with Ray Charles, which was recorded at L.A.'s Larrabee Sound, the rest of the tracks were recorded at Olympic. "Keith worked out wonderful systems for ambient microphones," Danny explains. "After we close-miked everything, we had Telefunken 251s that were hung about 35 feet up in back of the conductor, and one in back of the orchestra. And then we had U67s along the side, three on each, about 15 to 18 feet apart. These were the ambient mics. We used them for our reverb, with just a touch of AMS REV 16 concert hall sound on the final mix just to round out everything so it all matched."

Tony had always been frustrated about how to get "the nuances on tape, honestly, without compression. There



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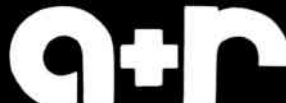
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was no way to do it without saturation," says Danny. "This recording was not unlike a classical date. He'd go from nothing to the limit—and he'd hit 22 dB over zero. Nothing was held back. We put Tony off to the side behind a baffle with an old U47 and recorded him with no compression and no EQ. It's a great warm sound, and we did absolutely nothing to alter it."

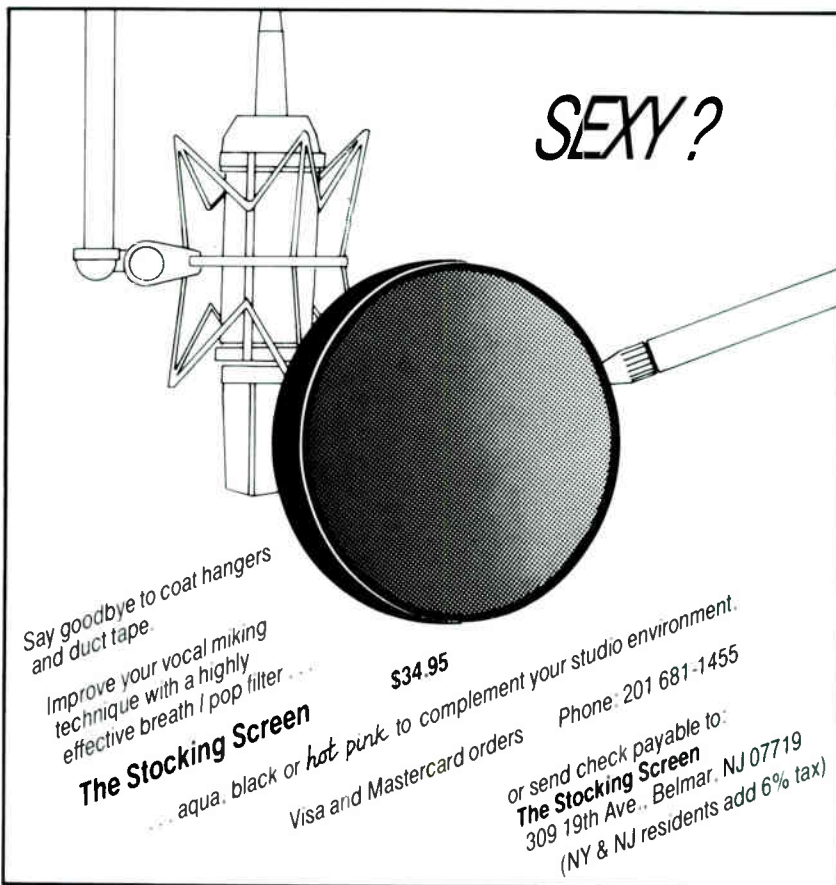
Tony's decade-long sabbatical from the studio also brought about a new appreciation for the tools of recording. "The mechanics of recording are ultimate now," he says. "I was amazed at digital editing. I think it's quite phe-

"The mechanics of recording are ultimate now...I was amazed at digital editing..."

nomonal that you don't have to cut tape and splice it just right, like years ago."

And, of course, The Voice is still there—sweet, strong, sincere. At 59, he's never sounded better. "I've always concentrated on my breathing," he says. "I studied yoga—I'm not that much of a fanatic with it, but just enough so that I keep my health. It's very important for a singer to stay healthy. Sleep and water are the other things I use to keep my voice in shape. Anything else is detrimental—unless you're Louis Armstrong. He told me, 'Don't listen to anybody! Do what I do!'"

As this team's first digital project, the Bennett's were presented with some novel challenges. "One problem that you run into with digital is that it picks up *everything*," Danny notes. "We had a problem at one point where we were getting these 'whoosh-ey' sounds and it took us a while to figure out that it was when 17 string



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*From left to right: Joe LaBarbera (drums), Tony, Paul Langosch (bass) and Ralph Sharon (musical director) at Olympic Studios.*

players raise their arms up to play . . . it was the brushing on their shirts and jackets! But the really hard part is to decide which sounds to leave in and which to leave off.

"If you listen to the record, you can actually hear Tony's tongue on his pallet at times. It adds to the intimacy. There was another one where pianist Ralph Sharon's wedding ring was banging on the keys, and we were

going crazy trying to figure out what that was."

Despite the newness of digital recording, the production team, which also included engineer Paul Mufson behind the desk at each of the studios, felt the sessions ran remarkably smooth. "It just went well," says Danny. "We recorded for two days. The third day we did a little bit of fixing up here and there and we layed the strings on

the Ray Charles song that we did in L.A."

The L.A. session took three hours. Says Tony, "It just all fell into place—it was a very nice experience—no headaches. Ray Charles is a genius. When we recorded James Taylor's tune, 'Everybody Sings the Blues,' he did it in three takes. I'd never seen anything like it. He hears so quickly."

The record was mixed in four days at CTS Studios, in Wembley, England, on a Neve DSP digital console. "When we mixed on the DSP, it was the first time I'd worked behind a digital desk," says Danny. "On the DSP you're thinking on a vertical plane, rather than a horizontal one. There's really not much to the face of it. I think that's what strikes people right off the bat. After getting familiar with the thing, your imagination goes wild, of course. Rather than having the EQ and the pan pots and everything over each channel, you're just looking at two 'soff' knobs on each channel, which you assign a little like the PCM 70. You could actually do all your mixing just sitting over to the left side of the desk by the keypad, with one fader, if you like. I love being able to sit in the sweet spot and adjust any channel without having to move from that spot."

Mastering began with Bob Ludwig at Masterdisk in New York City. "They had just gotten in the Direct to Metal so we decided to go with it," Danny notes. "We had a separate digital master for CD, LP and tape. Then we went out to Terre Haute, Indiana, to the CD plant [Digital Audio Disc Corp.]. We did some sequencing and final mastering out there."

The new CD market is something Tony welcomes to add new life to his rich catalog of hits. Many of those records are already in the process of making the transition to CD. "They stand up just fine. The records were made with top quality. We never take an obsolescent approach at all; they're made to be 'collectors' items.'"

Long acknowledged as one of the world's great singers, Tony still loves his craft as much as when he started, an attitude that is certainly inspirational to those around him. "I think it's a matter of being blessed with the ability to combine business with pleasure," he says with characteristic modesty. "If you've got that going, you don't get tired of it. Even if something doesn't work out, you get some rest and come back the next day and you start all over. But you have to like it. And if you don't like it, you're in a lot of trouble, because the hours never end and you can't go away for the weekend and run away from it all. I just never tire of it."

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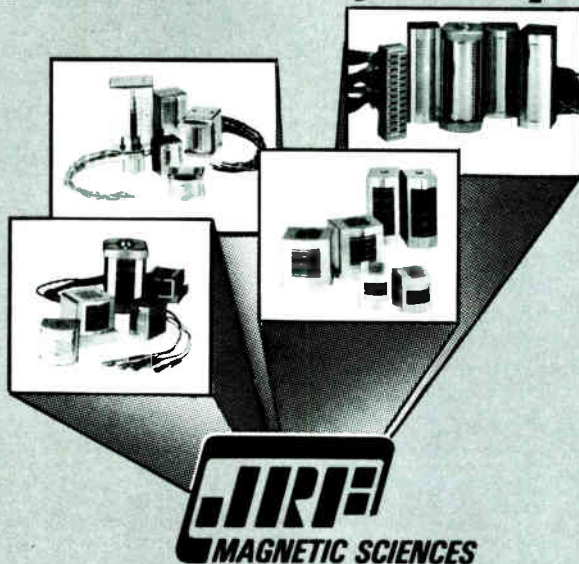
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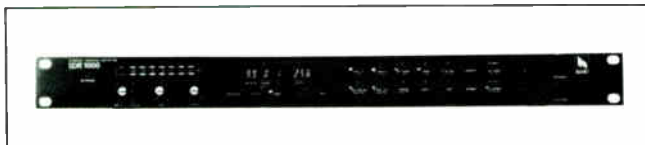
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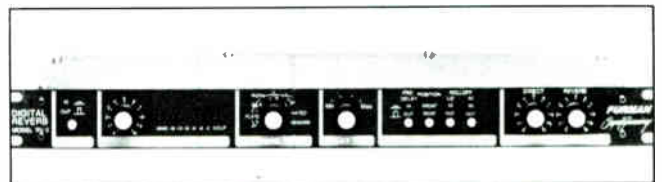
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## AKG D-112 Kick Drum Mic

AKG Acoustics Inc., of Stamford, CT, has introduced the D-112, a new microphone developed specifically for capturing the natural punch, quick attack, and high sound pressure levels of bass drums. The mic's frequency response (20-17k Hz) is tailored for kick drums, without the need for the MF and HF equalization usually employed in such applications. The D-112 has a balanced, low impedance (210 ohm) output with XLR-M connector, handles a maximum SPL (estimated) of 168 dB, and includes a SA 40 mic stand adapter.

Circle #134 on Reader Service Card



## Furman RV-3 Digital Reverb

Unveiled at last month's NAMM show in Chicago, the Model RV-3 from Furman Sound (Greenbrae, CA) is a digital reverb system offering two plates, two rooms, and two halls, along with gating and reverse effects. By varying front panel controls (reverb type, decay time, pre-delay, position and rolloff), a total of 512 distinct settings are possible. The RV-3 has a \$599 list price, and manufacturer specs include a signal-to-noise ratio of 79dB and a 14kHz bandwidth.

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## First Order Effects for SP2016

First Order Effects (New York City), an independent developer of effects software chips for the Eventide 2016 digital reverb/signal processor, has announced four new

programs: small room, inverse reverb, moving reverb, and sync'd repeats. The small room and inverse (backwards) reverb effects are included on a single EPROM priced at \$149.99. Moving reverb (causing reverberant echoes to move in selectable patterns across the stereo space) and sync'd repeats (a repeating delay line which synchronizes itself to a musical rhythm) are also combined on a single chip, but priced at \$89.99. Numerous other programs are slated for release in the near future.

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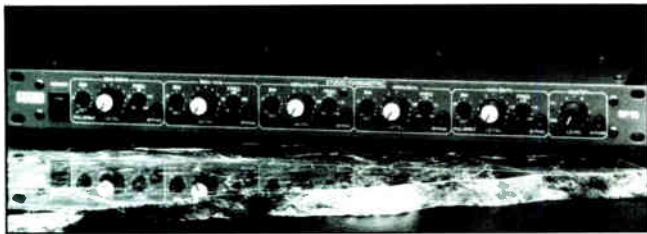


## Amek APC 1000 Console

Shown for the first time in prototype form in 1985, and now available for delivery, the APC 1000 Assignable Production Console from Amek (North Hollywood, CA) utilizes a new design approach which offers a maximum amount of control flexibility to meet a wide range of mixing applications. Rather than being locked into a fixed in-line or split monitor design, the APC 1000's channels can be dedicated to serve whatever functions desired by the operator. Other features include: centrally assignable (and stored in internal RAM) input channel switch functions, such as bus assignments and EQ in/out; on-board memory for storing entire board setups (expandable to hold up to 99 setups); standard VCA faders, which can be interfaced to the Audio Kinetics MasterMix computer (a GML moving fader system is optional); and eight mono and four stereo buses available from each input.

The APC 1000 can be ordered in a variety of configurations, and options include a "recall" system for the storage of rotary potentiometer settings, and individual dynamics control sections.

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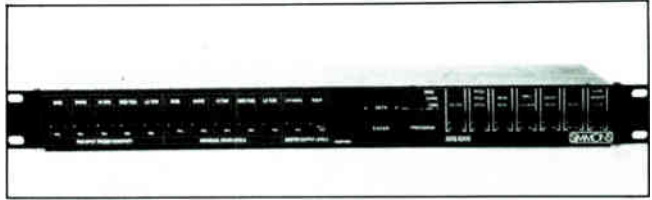


## Rane SP-15 Parametric/Notch Filter

The SP-15 Studio Parametric Equalizer and Notch Filter from Rane (Mountlake Terrace, WA) features five independent, fully parametric bands in a single rack space unit and provides a dynamic range of 120dB, THD under 0.009%, and bandwidth ranging as narrow as 0.03 octaves for deep notch filtering. According to the manufacturer, the SP-15 was designed specifically for the needs of digital

recording, utilizing Harris 5104-5514 and Analog Systems Super Audio op-amps, audio grade polycarbonate capacitors and 1% metal film resistors in a fully-symmetrical, minimum phase filter design. The SP-15 lists for \$598.

Circle #138 on Reader Service Card



## Simmons SDS1000 and TMI

Simmons Group Centre, Inc. (Calabasas, CA) has unveiled several new products in their expanding line of electronic percussion. The SDS1000 is a programmable five piece drum kit capable of producing both digital and analog sounds via the striking of Simmons latest "floating head" pads. Ten different drum kits (five factory, five user programmable) are available at the touch of a switch. A number of parameters (including filter, pitch, band, decay, noise and click/ accent) can be adjusted to suit individual tastes and a "second skin" control synthesizes the sound of either single- or double-headed toms. The SDS1000 is priced under \$1,000, including pads, cables and brain.

The Simmons TMI is an eight channel trigger-to-MIDI interface unit for electronic drums of all types (including the SDS1000), with up to 50 programmable patches for MIDI note, channel, and program number assignments. The TMI is priced under \$400.

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## Kawai Digital Wave Memory Synth

New from Kawai America (Harbor City, CA) is the K3, a 61 note, pressure and touch responsive synthesizer which uses stored digital waveforms as the primary source for its 100 programmable patches. The stored waveforms can be assigned in combination with the K3's two digital oscillators, or user-programmable waveforms can be entered and stored in internal memory or external RAM cartridges.

Programming features include low-and high pass filters, VCA and VCF envelope generators, and an LFO assignable to six parameters. Other features are: built-in chorus and delay, programmable portamento, and full MIDI implementation. The unit in the photo is shown with the optional Wave Table Editor/Tone Patch Editor-Librarian system designed by Hybrid Arts for the Atari 130XE computer, which is available through Kawai MI dealers. A system based on the Atari ST computers will be offered in the near future.

Circle #140 on Reader Service Card

# FIELD TEST



TOA K1, K2 and K3 condensers.



TOA J1, J2, and J3 dynamic microphones.

## TOA Microphones

by Michael J. Graphix  
and Kaj Kline

Microphones have always been considered the primary, as well as key link in any audio system. Each type: dynamic, ribbon and condenser, serve specific functions due to their inherent qualities. TOA Electronics, an emerging company involved in the manufacture of commercial and industrial audio products has introduced a new line of microphones to meet the high demands of the audio professional. These microphones fall into the medium-range price category.

Linear Sound Systems, Oakland, California, tested these microphones in live applications under a variety of conditions: rock and roll (Greg Kihn), heavy metal (Laaz Rockit), R&B/soul (Bo Diddley, Kendricks & Ruffin, Staple Singers), and vocalist with backing rhythm section and orchestra (Eartha Kitt). The microphones tested were the J1, J2 and J3 dynamic microphones designed for vocal applications, as well as electric musical instruments and acoustic drums; and the K1, K2, K3, K4 and KY condenser microphones.

Our overall favorite from the entire selection was the KY condenser microphone (cardioid pick-up pattern). The microphone itself is extremely small and unobtrusive, with the mic clip/electronics module integrated into a common unit. A miniature interconnect cable links these two components and a 15-foot extension is provided for separating the mic and electronics. The KY requires phantom power (12-52 VDC), and is activated via a switch on the electronics module. A red LED indicates a "live" mic status (a feature that we found extremely helpful).

### TOA Microphone List Prices

Dynamics:	Condensers:
J1 \$149.50	K1 \$149.50
J2 199.50	K2 249.50
J3 199.50	K3 249.50
	K4 429.50
	KY 499.50

All interchangeable capsules (KFV, KMV, YFV, YMV) are \$259.50 each.

The KY exhibits exceptionally flat response from 30Hz to 20kHz, with a slight presence peak centered on 8kHz, with an approximate bandwidth of two octaves. Our first application consisted of using this mic as an overhead on an acoustic drum kit. It exhibited similar characteristics to that of a higher priced condenser, such as the AKG 414. The resultant response was smooth and transparent. The KY is a very sensitive receptor, but will handle extremely high SPL levels at the capsule. We endeavored to try and overload the capsule without success. We also used the optional YFV capsule (which is easily changeable in the field), on the KY for a podium mic with fabulous results. The KY was able to handle speakers using the mic from a distance of up to six feet, and yet worked well when certain speakers jumped right on the mic, lips pressed to the capsule without resultant "P" pops or breathing noise. Handling noise with this microphone is nonexistent.

Our recommendations for practical usage of this microphone are: (1) as an overhead for acoustic drums in medium to low-level applications. In high SPL situations (e.g. heavy metal/loud rock and roll), the KY cardioid pattern was still too wide and tended to pickup off-axis signals (e.g. guitar amplifiers, stage noise, etc.) causing discoloration in the resultant output due to excessive bleed. A capsule with a hyper-cardioid pattern, used closer to the source would be preferable; (2)

as an acoustic piano mic; (3) for area miking for large orchestras, and/or horn sections; and (4) as an overhead for percussion sections.

The K1, K2, K3 and K4 condenser microphones are quite usable in those applications where condenser mics are considered standard (e.g. overhead, high-hat, strings, acoustic guitar). They can be considered as equitable substitutions for the likes of the Shure SM-81, AKG 452 or similar. They offered flat response throughout the audio bandwidth. Again, these mics require phantom power, and include an on/off switch and a red LED "status" indicator. The K1, which can be either battery or phantom powered, features a three-position switch to activate a LF roll-off at 100Hz. The K3 also has the same 100Hz roll-off preset within the microphone electronics. The K1, K2 and K3 all exhibit slight HF presence boosts between 6kHz and 8kHz, but are otherwise flat to 20kHz.

The K4 has interchangeable capsules for use under differing circumstances. The standard KMM capsule is flat down to 30Hz, with a presence boost at approximately 8kHz. The KMV and KFV capsules, designed for male vocal and female vocal respectively, have LF roll-offs at 300Hz. The K4 worked reasonably well as a vocal microphone, but is not wholeheartedly recommended for such applications. "P" pops and breathing noises were evident, and slightly off-axis response was mediocre. This microphone did lend itself quite well for medium distance horn miking applications, such as trumpet or trombone, but not as well for saxophone. It also worked well on acoustic piano and acoustic guitar. We also used the K4 in conjunction with a Crown PZM on a seven-foot concert grand piano with favorable results.

**TOA KY (left) and K4 condensers.**



The J1, J2 and J3 microphones had very similar characteristics compared to each other, and sounded remarkably like the Shure SM-57 and SM-58. Performers seemed to like the shape of the mics for handholding, and the non-reflective matte grey finish is quite pleasing and unobtrusive. Handling noise seemed nonexistent, and it handled various vocal requirements quite admirably. The windscreens included with the mics worked well, but are rather large and unsightly compared to the slim design of the barrel. A distinct advantage to the windscreens is that they are constructed of metal and plastic (without the foam insert that many other manufacturers employ) which facilitates easy cleaning without having extended drying time. Foam inserts have a tendency to retain odors (smoke, bad breath) from the previous vocalist, a less than desirable attribute. We did not have the opportunity to test these windscreens in an outdoor application to evaluate their rejection of wind noise, but the nature of the architecture would indicate that they would perform quite well.

The J2 performed well on snare drums, rack/floor toms, and electric guitar cabinets. The J3, though recommended for a kick (bass) drum, was too boomy for heavy metal or rock and roll applications, but would probably work fine for jazz drummers. Regarding miking drum kits for jazz applications, one of the nicest combinations found was using the J3 for the kick drum and the KY as an overhead. The result was a full-sounding drum kit, with a pleasing natural reverberant sound due to the distance of the mic from the tom heads. The low frequency response of the toms was solid and tight while retaining the crisp, airy resonance of the cymbals.

In conclusion, TOA can be proud of their current line of microphones. They all performed within reasonable expectation of the printed claims in the instruction manuals enclosed with each unit, with some performing exceptionally as noted.

One of the most positive attributes of the new TOA line actually has nothing to do with microphone performance. TOA has finally built a mic clip worthy of placing a mic on. The actual clip is made of a soft, but firm rubber-like material that is extremely resilient. The clip held the mic firmly, even after repeated stress on the clip. The screw-on base is finely machined metal, with a baked enamel finish matching the microphone and the TOA logo in relief. A clip of this construction should be almost impossible to break during the rigors of touring usage. Hats off the TOA for this minor but well overdue development.

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# SOUND ON STAGE



PHOTO: BARRY FOX

*Live Aid was, first and foremost, a global television event, where what went out over the air was more important than what stadium spectators saw.*

## ONE YEAR LATER: **LOOKING BACK AT BRITAIN'S LIVE AID**

Viewers and listeners were shielded from 99 percent of the local difficulties, which ranged from little or no rehearsal to total power failure.

by Barry Fox

This July sees the first anniversary of Live Aid—televised to 1.6 billion viewers in 156 countries, it earned nearly \$100 million for famine relief. Bob Geldof has been showered with music industry awards and nominated for the Nobel Peace Prize. The British public has been watching with interest to see whether its government will bite the bullet and give the feisty Irishman one of its quirky titles or “honors,” like OBE or MBE, or perhaps even make him “Sir Bob.” The official line so far has been no award, because Bob is Irish not British. But that excuse doesn’t wash. The Japanese boss of Sony’s TV factory in Britain has already been awarded the OBE.

The world has been watching and waiting for a Live Aid souvenir recording. Without doubt, this would generate considerable extra funds for Africa. On a purely technical level, however, it would present some daunting problems. A cool look back now at how Live Aid happened, or more accurately almost *didn't* happen, puts the question of a souvenir album in perspective. Already there are attempts at re-writing history.

What follows is based entirely on facts gathered first hand in London, from the BBC engineers and sound crews who made the apparently impossible happen. The BBC’s own in-house engineering magazine summed up the situation after the event. “Viewers and listeners were shielded from 99 percent of the local difficulties which ranged from little or no rehearsal to total power failure.”

The British firm Malcolm Hill Associates were responsible for the Wembley sound. MHA rigged and controlled the PA. The BBC engineers took their TV and radio mic feeds from MHA. Although only a few people knew it at the time, MHA and the organizers at Wembley Stadium were working under legal threat from local government health inspectors!

Bruce Springsteen had played concerts at Wembley the week before. Health inspectors warned Wembley ahead of Springsteen that there had been objections from local residents about concert noise. The limit for Springsteen’s concert was set in advance at an LEQ for 15 minutes of 96 dBA and peaks of 104 dBA. During the concert, local government watchdogs measured peaks of 112 dB and 15 minute LQ averages of up to 106 dB. The whole concert had an LEQ of 103.5 dB, which is 2.5 dB above the GLC LEQ limit.

The health inspectors told Wembley they would prosecute if Live Aid was too loud. So the Wembley management warned the Live Aid organizers that they had to keep the sound level down. The instruction that came down to Malcolm Hill wasn’t the usual “try to keep them happy;” it was an unambiguous edict. “Don’t ever let the sound level peak above 103 dB.” Unfortunately the bureaucrats also put a curfew on the concert of ten o’clock, with an eight o’clock curfew on the rehearsal day, Friday. This had unforeseen results.

Contrary to popular misconception, a lot of the bands working at Wembley did rehearse. MHA set up a monitor system in a film sound studio outside London for the Saturday, Sunday, Monday, Tuesday and Wednesday before





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the concert. The idea was to let the musicians familiarize themselves with the on-stage monitoring they would have at Wembley. Some groups, like The Who, were very businesslike. They were there half an hour before a ten a.m. start, all set up and ready to go. Others seemed to forget that the rehearsal service was free. "Get two monitors" their roadies would shout at the sound crew. The crew bit their tongues, thought of Ethiopia, and let it go.

On Thursday, the gear went out to Wembley and on Friday there were sound checks all day. By the time of the eight p.m. curfew, the 150 kilowatt PA system was equalized to the stadium. The engineers went home, leaving guard dogs on the site to deter anyone with less than charitable thoughts. After they left, the stage hands hung the Live Aid drapes over the side of the stage, in front of the loudspeaker stacks. And the trouble began...

The drapes were of coarse weave, to let the sound through. A team of volunteer artists helpfully painted the Live Aid logo on the open weave. Unfortunately, they used thick poster paint! When the sound crew arrived on the morning of the concert, they found a wall of paint, like an extra dead diaphragm, in front of their speaker stacks. After re-equalization, every amplifier for the HF units was running at maximum gain, well into the red. The cooling fans came on and stayed

on. A string of drivers needed refurbishing.

As the concert began, a team of local government health inspectors arrived. They stayed and continually monitored the live sound level.

The sound level stayed below 103 dB, so no one prosecuted Wembley for Live Aid. When I phoned the local government office after the event, their PR department put a rather different slant on things. "There was of course no intention of taking legal action on the Live Aid charity concert," they assured me with benign gloss.

The day started with five radio mics. But then, helpfully, bands brought their own. Inevitably, there were frequency clashes. There was also taxicab breakthrough. Engineers unfamiliar with radio mics switched them on and off without first checking that the mixing desk faders were down. There was one enormous clunk through the PA when a mic was switched off with the fader full up.

Even with the faders down, receivers left on caused problems. When a receiver hunts at maximum gain for no signal, it can unload up to one volt of garbage down the line which even with the faders down and 70 dB of crosstalk separation on the desk can generate 500 watts worth of background mush. The floating population of radio mics meant that there was no organized color coding. An artist would grab a mic and expect the

sound crew, as if by magic, to find the right fader by instinct. Mics died, as their batteries went down. The final singsong is marred by a chaotic scramble to find mics that worked. But as Bob Geldof said: "If you are going to cock things up, you might as well do it in front of two billion people."

Malcolm Hill recalls how, like Topsy, the event just grew. The first rumblings of Live Aid began in early June. Hill was approached on June 19. They told him it would just be a gig at Wembley Arena (an indoor hall)—a live version of the charity single with some big names doing party pieces, mainly with guitar and voice.

There was a plan to cover the cozy concert with BBC radio, and perhaps record it on video for later TV transmission. Then came the idea of a revolving stage. But even at that time, towards the end of June, the idea was still for a fairly relaxed event. What turned it into a megabash, was the decision by The Who to re-form. After that, everyone who had previously been rather disinterested, suddenly wanted to play.

The BBC had to struggle to get two outside broadcast vans, let alone the three that would have been ideal for a three-stage setup. The gaps between bands dropped from 15 minutes to ten minutes. As more groups joined in, the gaps dropped further to around nine minutes. Some people inside the BBC couldn't see what the problem was. They thought of it as a drama production, with several stages to pan across. Malcolm Hill admits that at this point he was desperate. "I almost backed out a few days before. It was getting ridiculous. They kept on adding more and more people," he recalls. "I said either we do it my way on the running order or not at all. They kept on wanting to put small acts on at the front of the stage while the main act got ready out of sight."

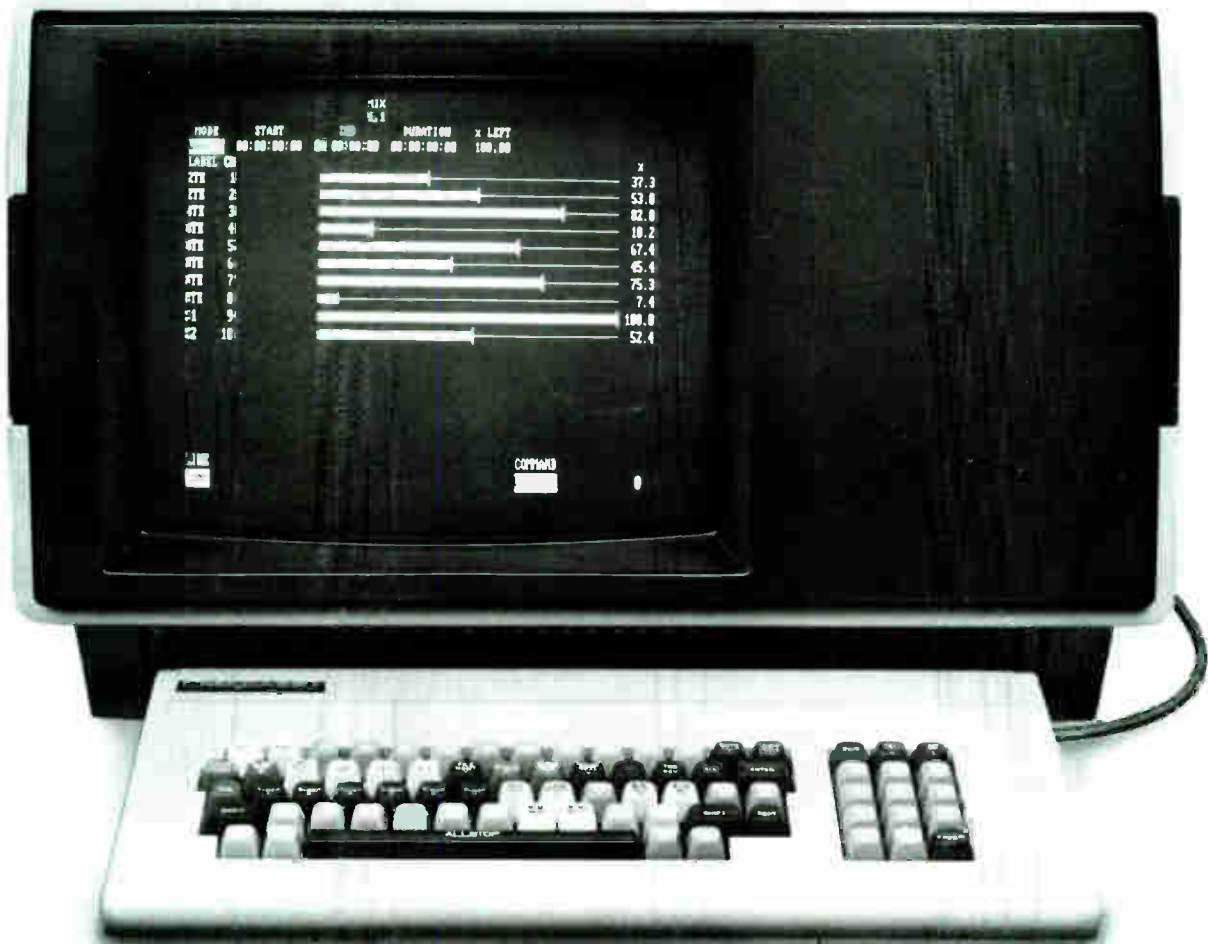
Hill got his way and took an Apple Mac XL computer to Wembley. It was the only way to cope with the ever changing running order and the complicated mic setups demanded by some bands. Some people did get out. Inside the BBC, a few people suddenly took leave. Quite a few engineers smelled disaster. They didn't want to be part of it. But most worked overtime, donated their pay and were embarrassed to hear how some of their efforts sounded over the air.

As The Who started playing, their image on TV froze into a digital skeleton. The sound died and both London and Philadelphia went into panic. The loss of pictures and sound was due to a power failure, with the local Wembley substation tripping under the load.

*Bob Geldof (left) helped pull the extravaganza together and played with both the Boomtown Rats and other performers.*



PHOTO: BARRY FOX



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PHOTO: BARRY FOX

*The painted stage backdrop was discovered early on to muffle the sound.*

Why, you may ask, did the stadium lights and the sound system stay running? When the MHA sound crew checked the Wembley mains before rigging their system, they found the two phases were of uneven voltage and the neutral line was 9 volts above earth. We're not using it, they said, and called in a generator. The lighting crew also used a diesel. The BBC decided that the mains was secure. As it turns out, they were wrong.

The pictures frozen on screen around the world were the images locked in the various digital frame stores routinely used along the transmission route. Nothing can repair the damage done by that five minute shut down. Every audio and video tape made of The Who's reunion has a chunk missing from the middle.

Incidentally, the BBC was thrilled by the way the SSL desk computer methodically reset itself when a standby generator cut in after the power cut had "unset" each channel. "I remember the old days," said one engineer, "when all the faders were mechanical and in a power cut, they stayed just where they were."

The revolving stage in Philadelphia was turned by 28 men with barge poles. The one at Wembley was turned by a motor and windlass. This meant that it could only turn 360 degrees and then had to go back again in a full circle. The point of the revolving stage was to cut down on the set up time between bands. With the stage area divided into three, one band could set up, while another performed and another quit the stage. This proved to be fine in theory, but not in practice.

The three sectors were too small for a full set of monitors. For larger groups this meant that the monitors had to be humped and balanced after the stage had turned. Ideally, each of the three stage sectors would have had its own set of microphone feeds. This wasn't possible because there were only two BBC OB vans. So two mic sets (40 each) were used, which meant continual re-patching in a leapfrog sequence.

The need to turn the stage one way full circle, and then the other, confused the leapfrog sequence. All this would not have been too bad, if the communication system, from stage to front mixing desk and roving engineers, had been reliable. It wasn't.

On the Thursday and Friday, all important crew were provided with VHF walkie-talkies. In the relative calm of the set up days, they worked perfectly. But come Saturday, things did not run so smoothly. Frequencies clashed, with too many people trying to talk on the same channel at the same time. To make matters worse, a local taxicab firm started to break through. As audio engineers tried to tell each other when the stage was ready to turn, and when the mic feeds were patched and the monitors set up, they would hear cabs or lighting engineers.

Quite frequently, the only reliable link between the stage and front mixing desk was a hard wire intercom, baby alarm style. But this could take agonizing minutes to raise a response. Lack of communication, together with the cramped stage setup, explains why Elton John went on stage with unbalanced monitors and had to solve feedback problems while playing. It also explains why Paul McCartney walked on stage in darkness, sat at the piano and started singing into a dead vocal mic. No one was ready, but no one knew it.

During the Sade set, viewers around the world saw a saxophone player trying desperately to find a microphone that worked. Spectators at Wembley may have noticed that at the end of the set, the sound engineers killed the PA altogether for a few minutes. It was the only time they had to do this. It was necessary, to replace a main 54-way multi-core cable. Someone, who is unlikely ever to own up, bent the multi-core patch to the BBC truck right back on itself. Inside the cable, half a dozen lines fractured. Six mics on stage went effectively dead. Finding that fault in the heat of the moment was no joke.

On other occasions, individual channels went suddenly and mysteriously dead, and then sprang back to life. That turned out to be caused by helpful stagehands plugging radio mics

into the same channels as fixed mics. The radio mic mutes the fixed mic. With a bit of bad luck, it also starts picking up taxicabs or background chat. It's something you heard during what should have been the delightful set by Freddie Mercury and Brian May of Queen.

The PA mixing engineer could not simply route an input to another channel. That would have thrown the BBC out back into confusion and left them hurriedly re-patching the SSL desk. What started off as a concert with priority for concert sound, ended up as a concert with 100 percent priority for the BBC and their broadcasts.

I asked Malcolm Hill whether he would do it again and if so what would have to be different. "Yes, of course I'd do it again," he said after moment's thought. "I have to say that if I'm honest. We could have done it the week after, smooth as silk, because of all we learned. But if ever it happens again, whoever does it, things would have to be different. A few hours rehearsal would have sorted everything out.

"Normally at a concert, we have minutes to spare," he continued. "At Wembley there was no time, just no time at all. When there was a panic, the wrong person would try and help, and usually make things worse. Thank heaven there wasn't much rain. No one was ready for rain. For instance, there was a gap in the roof just above the stage monitor mixing desk. All it needed was a chain of command and enough time for a few rehearsals."

Obviously, all the tapes of Live Aid made by recording TV or radio sound off-air, will be irreparably flawed with the feedback, interference, gaps, missing mics and poor balance that was heard live. Through sheer bad luck, some of the major acts (The Who, Elton John, Paul McCartney and the finale) suffered worst.

The official BBC line at the time was that, for contractual reasons, no tapes were made—and certainly not multi-track tapes. The organizers said the same. But it wasn't true. There were 24-track machines in the BBC vans, and they were used.

A week after the event, the BBC owned up. Stuart Grundy, one of the heads of BBC Radio, blew the gaffe, apparently unaware of previous BBC official denials. Like all big organizations, the left and right arms of the Beeb seldom know what the other is doing or saying. "The whole event was recorded in 24-track by the BBC," Grundy told a British magazine.

So there might just be a souvenir album someday. But if there is, it will need some pretty heavy overdubbing to repair the faults. ■

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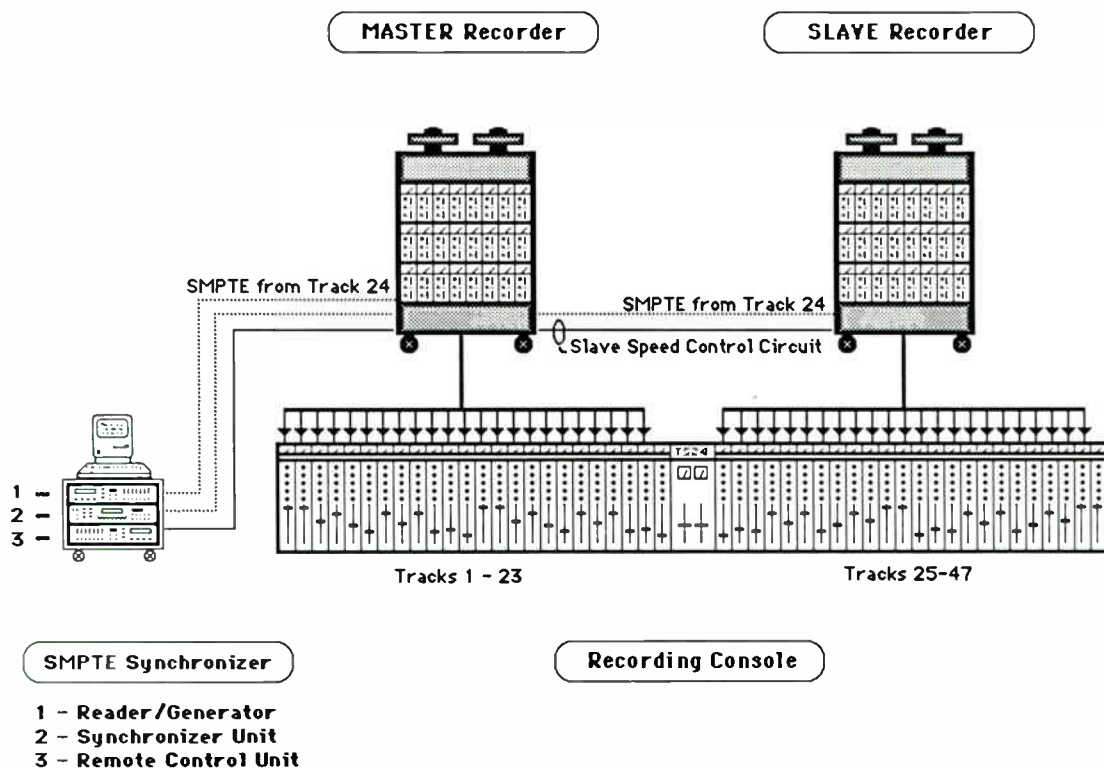


Fig. 1 Typical 48-track Synchronized Recording setup

# M-M-MEGATRACKS!

## Secrets of Multiple Multi-tracking

by Bruce Nazarian

Do you know there are records on the market that have been made with the equivalent of hundreds of tracks of audio? Records produced with multiple layers of doubled background vocals, stacks of keyboards, and fat, powerful guitar sounds that can only be achieved by multiple doubling. Even "We Are The World" was recorded with not one, but *two* 32-track recorders slaved together with SMPTE, to accommodate the large number of

tracks that were needed. For high-budget pop recordings, 48-track automated mixdowns seem to be increasingly the norm rather than the exception. This month, In Sync will unlock some of the multiple multi-track secrets that the hit-making producers and recording engineers have been using. We will explore how SMPTE makes this possible, and why these techniques have been developed.

To help provide technical details this month, I have enlisted the assistance of an old friend who is no stranger to

48-track recording: Steve Klein, former senior engineer of Miami's Criteria Recording Studios. Steve has had years of experience with 48-track procedures, gained while working with some of the most successful producers and recording artists. In the years he spent at Criteria, Steve has engineered sessions for the Bee Gees, the Bellamy Brothers, Eric Clapton, Rick James, The Police, Kenny Rogers & Dolly Parton, and more—a veritable who's who of the recording industry. Steve now lives in L.A. and pursues an active career as an independent engineer and producer.

### Some Basics

Before you can begin to utilize these techniques for your own productions, you need to understand what is actually being done. To help with this, let's define some terminology right away:

**Megatracking**—My term for any process involving a multiple multi-tracking technique, with any number of tracks as the final result. It may be 16-track using two half-inch 8-tracks, or even 64-track using two 32-track digital recorders. The nominal setup is 48-track, using two 2-inch 24-track machines. For clarification, I will refer to each megatrack configuration by the total number of tracks of both machines, i.e., 32-track, 40-track, 48-track, etc.

**Master Recorder**—The multi-track recorder that is designated as the *controlling* recorder in the system. The speed of this machine is constant at either 15 or 30 ips. The synchronizer will use this machine's SMPTE time code as the reference.

**Slave Recorder**—The multi-track recorder that is the *controlled* recorder in the system. The speed of this machine is controlled by the SMPTE synchronizer, and varied to keep the slave machine in perfect lock with the master machine at all times. (Note the capstan control line in Fig. 1.) Every two-machine configuration must have a designated master and slave.

**Master Reel**—The multi-track production reel containing the original rhythm tracks, as well as any SMPTE time code and/or computer sync tones used in the original production. This tape is recorded on and used by the master machine.

**Slave Reel**—The multi-track production reel that is generated by making a duplicate of some or all of the original master reel's audio tracks and SMPTE time code. These reels will be used to build layers of overdubs.

### Why Megatracking?

The recording industry has always been obsessed with the concept of

more. After Les Pauls' successful introduction of the 8-track recorder, it wasn't too long before someone figured out a way to narrow the head gap and put 12 tracks of audio on the same size tape. Twelve-track recording wasn't even really *in* before it was *out*, and 16-tracks on 2-inch tape became the industry standard. Later, after 24-track recorders were introduced, studios played yet another expensive round of the high-tech game called "follow the technological leader" (sometimes called "upgrade fever"). This is not to say that the larger recorder formats were without merit. More tape tracks allowed more use of separate miking, which helped to increase isolation. With more tape tracks, the producer's options are expanded giving him the flexibility to be more creative with the artist. More tracks allowed more experimentation before committing to a final performance on a part. The race for more tape tracks finally came to a screeching halt a few years ago. Steve Klein relates the story of how MCI (the South Florida pro audio manufacturer recently acquired by Sony) tried to develop a 32-track analog recorder using 3-inch tape. Although the idea was sound (no pun intended), the problems of structural rigidity, reel motor torque and size, and the sheer weight of a reel of 3-inch tape made the format impractical. The machine never went into production.

But the drive for more than 24 tracks did not diminish. Since it seemed that the practical limit for analog tape recorders had been reached, the answer had to be something else. With the advent of SMPTE, and the development of SMPTE-based chase-lock synchronization, it was just a matter of time before someone perfected the means to lock together two 24-track recorders. Megatracking (multiple multi-tracking) was born.

### SMPTE Locks 'Em Up

Megatracking takes place in a variety of different techniques, as we will see, but there is always one common link: at some point in each technique, two multi-track machines, usually 24-track, are locked together with a SMPTE synchronizer. This configuration is commonly called "48-track lockup." In actuality, only 46 audio tracks are available to use because one track of each machine is used for SMPTE time code. (Fig. 1 shows how the two machines are integrated into a system, using a SMPTE reader, remote controller, and chase-lock synchronizer.) In this system, the time code from both master and slave machines is fed into the SMPTE synchro-

nizer. The synchronizer calculates the difference between the two codes (called the "offset"). Since the synchronizer is in direct control of the slave machine's transport, it can speed it up or slow it down to keep the offset at zero. This activity happens every second that the tape is rolling, and, when the system is functioning properly, is transparent to the users.

### Master and Slave Reels

Regardless of which technique is being used, both master and slave reels must contain the SMPTE time code, so that the SMPTE synchronizer will have the means to lock the two machines together. This is usually recorded on track 24 on both the master reel and the slave. In the least complicated setups, the time code on both reels will be identical. Steve points out that this is the first area where problems can be avoided: "To be sure that all slaves are compatible with the master, time code for all master and slave reels should be recorded on the master recorder. Do not record the slave time code on the slave machine if it can be avoided."

This is subtle, but important—any slight differences between the master and slave time code may cause problems later on while trying to lock up. Worse, the problem may only surface after you are well into using that reel of tape. That is definitely the wrong time to discover a problem!

In addition, Steve cautions: "Don't dub the time code directly from the master reel to the slave reels. Regenerate it with a code re-shaper or jam sync some new code instead. The accuracy of SMPTE depends on the reader's ability to properly decipher the timing transitions encoded in the time code. Using anything other than first generation time code can make the SMPTE reader's job difficult, and may cause loss of lock."

It's been my personal experience that second-generation code may function adequately at play speed, or for use with a MIDI "clock box," but may not be suitable for the high-speed searching that is used in a lockup. Every additional generation that the code is dubbed down degenerates its integrity even further, rendering third-generation code pretty useless. Whether you are duplicating existing time code, or recording new numbers, take the few extra minutes that are necessary to record first-generation code. It'll be worth it in the long run.

### Multiple Slave Reels

In some cases, it may be desirable to use more than 46 tracks for the

—CONTINUED ON PAGE 170



*The new ADO 1000, from Ampex Corporation.*

by Elizabeth Rollins

## Shipping This Month: New Hardware and Software

Production facilities planning low to mid-end upgradable editing suites take note: the **CMX 336XL** introduced at April's NAB is being installed this month in several production and broadcast locations. For a base price of \$30,000, the system includes a controller and three VTR interfaces.

The 336XL bridges the gap between the company's least expensive 330XL, and the mid-level 3100. You're really buying one extra port; the 330 has five, while the 336 gives you six for control of another VTR.

CMX is also shipping their new EDL Optimizer software package at \$3,500. Christin Hardman, product manager and a former Hollywood television editor, says she helped design this edit decision list clean up and structuring tool with flexibility in mind.

Cleaning, sorting, text editing, look-back through multiple generations of

EDLs, and auto assembly optimization are the features Optimizer offers for both PC-compatible and CMX LSI-based systems. One good example of how an editor might want to use the sorting feature is this: when it comes time to do the on-line edit, you could tell the Optimizer to organize edits according to cuts only, or reel numbers, or whatever specific time saving pattern that may be appropriate for your piece.

CMX also bowed its new \$1500 audio console interface at NAB. The interface allows independent control of the Graham Patten audio mixer and the Harrison System Pro-7 console during video editing. (Edits are not video dependent—audio only and split edits are possible.) The company is currently working on interfaces for other consoles, according to VP of marketing Larry Weiland.

Now a mere \$39,500 will get you into the low-end of the spinning, flying, whirling world of digital video effects. Ampex broke out a low-cost ver-

sion of their ever-popular ADO-3000 at NAB. The base-priced ADO-1000 gives 2-D capability, but for \$67,000, the system is upgradable to 3-D with full perspective. Standard effects that we've all come to know and love in the base-priced package include: mirror, blur, mosaic, posterization, solarization, luminance reversal, soft key edges and border color generation. Features include 30 on-line effects with single key recall, controllable aspect ratio and key generator.

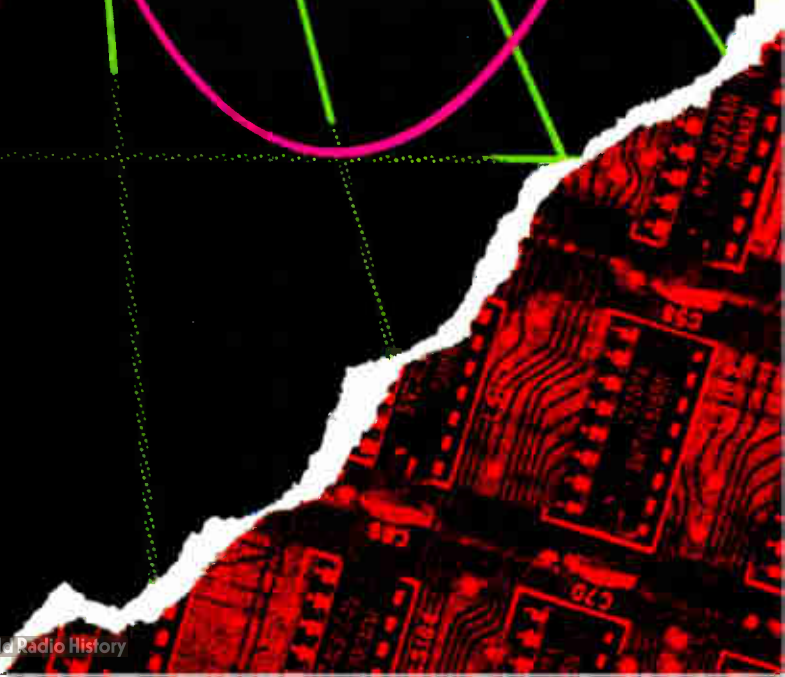
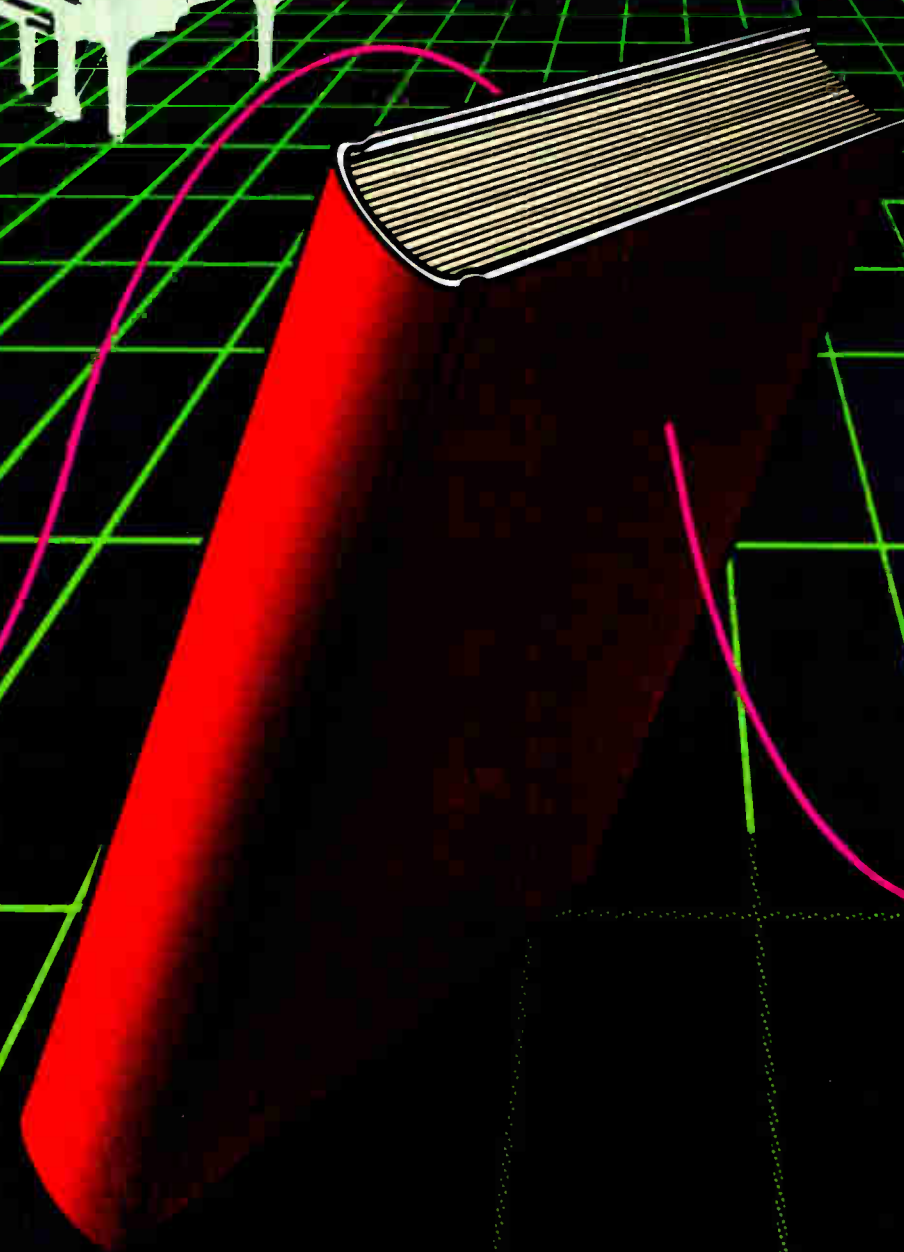
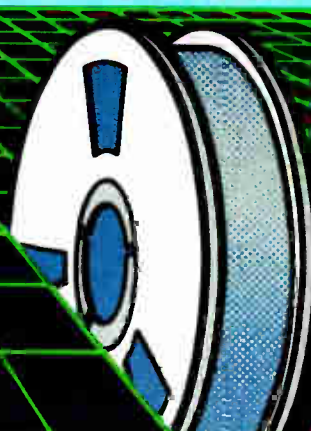
## New Age Video Coming of Age

Years ago, as Will Ackerman sat huddled over his acoustic guitar, he could never have known that his Windham Hill record label would end up a symbol of entrepreneurial optimism. But last year, when Windham Hill began releasing music videos to match that supposedly non-commercial sound, who'd have thought you'd see them on TV? (Maybe as background at parties on the redwood deck after a long day of keystroking at the



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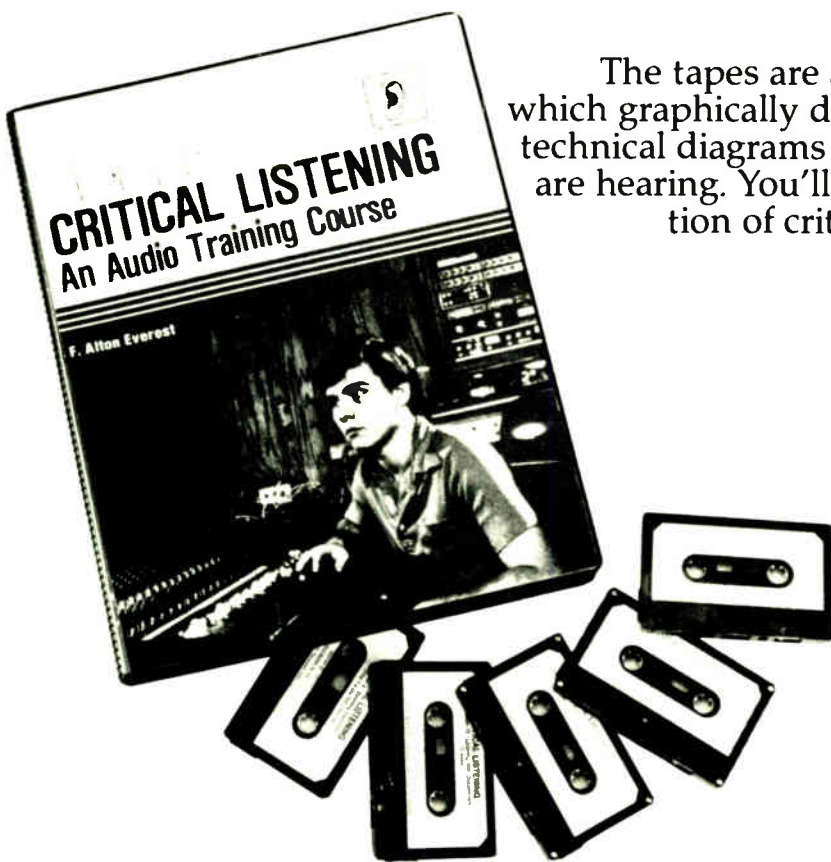
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# MUSIC

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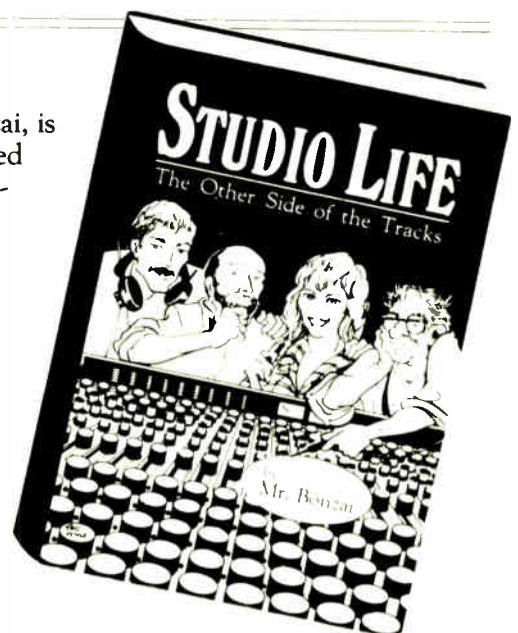
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**4110C) RICK DERRINGER: SECRETS** Features Derringer in an intimate setting giving invaluable pointers and tips on soloing, scales, endurance and chop-building exercises among other important aspects of guitar playing. Rick also performs several tunes with the band. This tape is ideal for beginning-intermediate guitarists. 40 minutes \$39.95

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**4112C) BILL BRUFORD AND THE BEAT** This is a fine portrait of Bruford which is entertaining as well as instructional. He demonstrates and discusses various aspects of his drum technique as well as his attitude toward music in general. Also featured is excellent footage of him with King Crimson and Yes with special appearances by Robert Fripp and Steve Howe. 30 minutes \$39.95

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**4201C) HOT COUNTRY LEAD GUITAR, Arlen Roth** This video contains some of the hottest country picking you'll ever learn. You'll work on country string bending, unique "pedal steel" licks, pick and finger technique, chicken pickin', false harmonics, double-note bends, rapid-fire picking, rockability, "claw" style, volume swells, and numerous other techniques. 60 minutes \$49.95

**4202C) SLIDE GUITAR, Arlen Roth** On this video, you'll learn proper slide technique, "box" patterns, blues, country, and rock styles in open E and G tunings, standard tuning slide, crucial right and left hand damping, slide tilting, hammer-ons, pull-offs, harmonics, vibrato, and the styles of Duane Allman, Elmore James, Robert Johnson, and Muddy Waters. This is the definitive study on slide guitar. 60 minutes \$49.95

**4203C) ADVANCED ROCK AND LEAD GUITAR, Arlen Roth** This video shows with pinpoint accuracy and detail how to play chromatic style rock leads, volume control effects, advanced single and double-note bends, Arlen's unique harmonic hammer-ons, advanced scales, tricks, and countless licks. 60 minutes \$49.95

**4204C) CHICAGO BLUES GUITAR, Arlen Roth** This tape is for the intermediate to advanced player and covers blue string bending, vibrato, improvisational skills, rhythm work, ninth chord licks, the styles of B.B. King, Buddy Guy, Otis Rush, Eric Clapton, and Mike Bloomfield, and countless blues licks and scales. 60 minutes \$49.95

**4205C) BASS GUITAR, MASTER CLASS, John Entwistle** This is your chance to learn with one of rock's all-time greats. You'll learn John's unique fingering, licks, octave style, chords, hammer-ons, pull-offs, picking techniques, harmonics, soloing concepts, walking bass lines, string bending, and phrasing. In addition, this video contains lots of useful tips and advice that will surely improve your style, technique, and overall approach to bass playing. 60 minutes \$49.95

**4206C) DRUM MASTER CLASS, Carmine Appice** This tape features one of the most dynamic drummers and best teachers around. Carmine discusses and demonstrates various rock patterns, hi hat accents and patterns, fills, double bass drum techniques and patterns, complex stick twirling for added performance "flash," substitutions and much more. Examples are performed several times at different tempos, and the patterns are shown on the split screen. 60 minutes \$49.95

**4207C) PROGRAMMING THE DX7, Ronnie Lawson** This video features Ronnie Lawson, player and programmer for such people as Edgar Winter, Steve Forbert, Deodato, Al Kooper, and others. This video teaches you to understand FM synthesis, algorithms, carriers and modulators, complete run-through of all DX7 parameters, programming sounds from scratch, envelope generators, and features many of Ronnie's original sounds. Excellent. 60 minutes \$49.95

**4208C) ADVANCED DX7 PROGRAMMING, Ronnie Lawson** This video, aimed at more advanced practitioners, discusses quick editing tips, provides understanding of DX7 keyboard scaling feature, voice initialization, edit recall, programming split keyboard sounds from scratch, DX7 performance features such as breath controllers, aftertouch, modulation wheel and modulation pedal, and includes many more of Ronnie's DX7 sounds. Get the most out of your DX7. 60 minutes \$49.95

**STAR LICKS MASTER SERIES VIDEO** presents an excellent lineup of players teaching in intimate settings. The students will be led step by step through each lick, once at tempo and once slowly. Each videotape is accompanied by a manual that corresponds exactly to the tape, and each manual contains easy to follow diagrams eliminating the need to read music and making these "private lessons" extremely accessible.

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**4303C) BRIAN MAY OF QUEEN** This excellent guitarist takes you step by step through a wide selection of his classic licks and solos featuring material from 11 Queen albums. Among the songs featured are "Brighton Rock," "Bohemian Rhapsody," "Tie Your Mother Down," "Crazy Little Thing Called Love," and much more. There is also a special section devoted to harmony soloing and techniques. 40 minutes \$44.95

**4304C) LOUIS JOHNSON OF THE BROTHERS JOHNSON** This Grammy Award-winning bass guitarist is one of the best in the business. His session credits include such people as Michael Jackson, Stevie Wonder, Michael McDonald, Stanley Clarke, and Stevie Nicks, among others. He takes you step by step through a wide assortment of licks, grooves, and solos featuring material from many of the Brothers Johnson hits. 40 minutes \$44.95

**4305C) ALBERT LEE, COUNTRY SUPER PICKER** Winner of Guitar Player Magazine's "Best Country Guitarist" award for the last four years in a row, Albert has been a session player for such stars as Eric Clapton, Emmylou Harris, Willie Nelson, Jerry Lee Lewis, Ricky Scaggs, and many others. He leads the student step by step through an assortment of his hottest licks, leads, and techniques. Learn flowing double stops, speedy scale runs, slick chicken pickin' and much more. 40 minutes \$44.95

**4306C) AL MCKAY OF EARTH WIND & FIRE** This Grammy Award winner focuses his instruction on his specialty rhythm guitar techniques. He carefully takes you step by step through an exciting array of tasty fills and funky rhythms from such EW&F hits as "In the Stone," "I'll Write a Song for You," "Shining Star," "Power," "Get Away," and much more. 40 minutes \$44.95

**4307C) JEFF WATSON OF NIGHT RANGER** In addition to discussing and demonstrating the licks and leads from numerous Night Ranger tunes, Jeff also teaches his techniques of articulated speed picking, arpeggio passages, eight finger tap ons, innovative interval lines as well as a special look at flat and finger picking demonstrated on an acoustic 12 string. 50 minutes \$44.95

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# MUSICOLLEGE CASSETTES

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TECHNOLOGY, PRODUCTION, BUSINESS & REFERENCE

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**MUSICOLLEGE CASSETTES**, from the BMI-sponsored Los Angeles Songwriters' Showcase. The following tapes are recorded lectures, forums, and workshops from the annual LASS Songwriter Expo held each fall in L.A. For more information on the annual Expo and other LASS services and weekly events, write P.O. Box 93759, L.A., CA 90093, or call (213) 654-1666.

**5110C) NEGOTIATING SINGLE SONG CONTRACTS** Entertainment attorney Neville Johnson covers performance rights societies, co-publishing, performance and mechanical income, "free goods" clause, "controlled composition" clauses, synchronization income, print income, advances, reversions, administration fees, division of royalties between co-writers, accounting period, foreign arrangements, registration of translations, infringement actions, changes in the lyrics, responsibility to pay royalties, demo costs, choice of law, choice of forum. 45 minutes \$10.00

**5120C) RAISING MONEY FOR MUSIC PROJECTS** Musician, personal manager and financial consultant Roger North covers many topics; know yourself and the project, confirming validity of project, setting goals, budgets, getting investors, deal points, i.e. 1) what you intend to offer, 2) description of project, 3) what your involvement is, 4) minimum investment, 5) what you are putting into the project, 6) your requirements from partners, 7) the actual deal—limited vs. general partnership, dissolving partnerships, movie projects, how an investor qualifies, business plans, market description of project, marketing image, marketing ideas. 90 minutes \$10.00

**5130C) A&R: WHAT IT IS—WHAT IT ISN'T** Neil Portnow, V.P. of A&R for EMI/America Records, provides an in-depth study of how record company A&R departments operate, getting your foot in the door, importance of a video, what he looks for in a tape, getting songs to an artist on the label, the artist/producer hook-up, importance of a club following, getting started in A&R, and more. 45 minutes \$10.00

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how to prove ownership of your songs, copyrighting a collective work, and infringement. 50 minutes \$10.00

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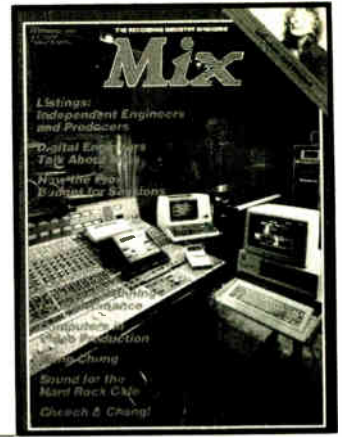
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CRT, but back-to-back with fast food franchise commercials? Never.)

By now you may have seen or heard of VH-1's *New Visions* program, which runs from 9 p.m. to midnight Saturday nights with the unlikely Frankie Crocker as host. VH-1 producer Ellen Goosenberg launched the show March 1 with a lot of questions about how it would go over. Apparently the show's mix of new instrumental, jazz and avant-garde programming has caught on well with the network's 25-plus demographic.

Of course, Windham Hill artists are only one programming ingredient. Videos from artists such as Jean-Luc Ponty, David Sanborn, Chick Corea, Pat Metheny, Philip Glass, Laurie Anderson and Kate Bush also define the rich texture of the show.

"It's all of these artists with various musical backgrounds," says Goosenberg. "They come from classical, jazz, pop, art rock. They're making music that is not single- or chart-oriented. It's free from those kinds of commercial restraints," she explains.

The videos themselves rarely feature the musicians in any conventional video sense. Goosenberg thinks that will change: "In the next wave of videos, the artists *will* be in the videos. These videos are evolving, too—but not in the same way as those in the mainstream at all. Rarely will you find an artist who will want to act in a story in his video. But I think people still get a thrill out of *seeing* the person who is creating the music," she concludes.

If you sat the Wham and Honda Scooter crowd in front of a Paul Winter video, what would happen? "I think they'd probably be a little bored. It's

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## When Windham Hill began releasing music videos last year, who'd have thought you'd be seeing them on TV?

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not what they're used to," says Goosenberg.

The so-called "new age" genre also seems suited to another growing programming outlet: the franchise lounge/restaurant. Roberta Perry, president of El Segundo, CA-based E.T. Video, says she gets two or three calls a day from customers requesting this type

of video. E.T. supplies programming for hundreds of bars that are part of restaurant and hotel chains such as Marriott, The Velvet Turtle, Houlihan's, Spoons, The Rusty Scupper, and many more.

"These videos are good for this environment because the customer is usually a little older, and we need material that is not in any way offensive to the dining customer," says Perry. "We especially have to watch excessive use of sex and violence, which can alienate the dining customer who just might be walking through the lounge.

"One source of these videos that are getting popular with my clients is a small label called Private Music," according to Perry. This New York independent has issued one 25-minute video compilation of five artists, produced and directed by president Peter Bauman.

Private Music national sales manager Stuart Wagman says the videos "don't tell a story. They're pleasing to the eye while moving along with the music. We're really interested in the artform of music and visuals." Some artists on the label include Lucia Wong, Sanford Ponder, Jerry Goodman and the newly signed guitar virtuoso Leo Kottke.

### New Entertainment Biz Database

Since last February, show biz executives, producers, researchers and writers have been able to tap into a huge computerized information source in New York called **Baseline**. The subscription service offers computer and phone service to answer questions regarding more than 34,000 films, television shows and theatrical productions, plus data on more than 200,000 people who have been involved in making them. Founder James Monaco's goal is to eventually compile details on films dating back to the silent era, although right now Baseline only traces back to 1970 in film, and 1934 in television. The sign-up fee is \$97, with a monthly subscription charge of \$75. Right now, most of the major film studios, agencies and television networks are members.

### Northern California Media Resource Guide

From the people who brought you the *Media Encyclopedia* comes *The Northern California Media Resource Guide* in November of '86. San Jose-based Inter-Sight Communications plans to document services in the Bay Area, San Jose/South Bay, Sacramento, plus smaller metropolitan areas such as Monterey Bay and Eureka. If you want to list your company, the

deadline for space reservation is August 30, 1986.

### Facility Notes

**The Dub Center** in Owings Mills, Maryland (right outside of Baltimore) has expanded its audio and video duplication facilities. The upgrade includes (100) VHS decks, (25) ¾-inch, (6) 2-inch Quads, (6) Beta 1s—all operating on a 24-hour basis. The company has also recently opened a new facility in Bayshore, Long Island, which also operates around the clock with a 35,000 cassette capacity per day. The Dub Center offers free pickup of your master from anywhere in the United States.

**Allied Film and Video**, with locations in Dallas, San Francisco, Orlando, Washington, D.C., Chicago and Detroit, announces standards conversion capability in each of their facilities. Materials on either film or video can be converted to NTSC, PAL, or SECAM, using a bi-directional digital standards converter that also includes image enhancement, noise reduction, 2-channel audio and three base correction.

If you're looking for a facility to convert your old black and white TV or film programming to color, you might want to check out the **American Video Factory** in Marina Del Rey, California. This year the facility has made a name for itself by colorizing old programs for home video release featuring Roy Rogers, John Wayne, Charlie Chaplin, and The Little Rascals.

**One Pass Film & Video**, a division of Scanline Communications in San Francisco has recently committed itself to interactive video disk production by forming a new department, headed by Andrea Merrim.

### AFI Announces New Grant for Music Video Artists

Aspiring composers and directors—here's a new chance to get your foot in the door of the industry. Music video producer and artist **Michael Nesmith** is sponsoring an award (to be presented by the American Film Institute) that will provide a cash production grant and access to the state-of-the-art video facilities at the AFI, Los Angeles. A winning video director/musician team will get the chance to create an original music video work. You have to submit examples of your music and media work with a one-page concept for your proposed music video collaboration.

The deadline is August 15, 1986, and you can get an application form by writing to: The Michael Nesmith Award, The AFI Television Workshop, PO Box 27999, 2021 N. Western Ave., Los Angeles, California 90027. (213) 856-7743. ■



*The Steadicam in action on the set of **Rendezvous**. (L to R) producer Ken Caillet, Al Feurbach, Brett Leonard, Steadicam owner/operator Erich Sommers and actress Rae Dawn Chong.*

# CONCERTS ON FILM

by Lou CasaBianca

## OVERVIEW

**T**he development of the long form concert film is experiencing a renaissance in creative growth and commercial success. The 90-minute length puts the program time in feature film territory. Charlex's *Yes Concerts*, Sting's *Bring On the Night*, Tom Petty and the Heartbreakers' *Pack Up the Plantation*, *The Eric Clapton Concert* and *The Talking Heads' Stop Making Sense* are good examples of music films that have captured the imagination of the public and thus been successful in different formats.

## PRE-PRODUCTION

### Planning

The logistics of live concert production can be awesome. When you add in the myriad factors connected with film and/or video coverage to the regular requirements of a live concert, the complexity takes a quantum leap. The key pre-production decisions are the type of film, cameras, crew and shooting locations. Most concert videos are photographed on 16mm or 35mm film. Basic coverage can be shot with as few as three to five cameras, but generally use five to eight cameras, and some productions employ as many as 12 cameras to document the production from every angle.

In most cases, the artists and their management prefer filming or taping to take place at the end of the concert tour. The band knows the music inside out, the sound and lighting crews are totally tuned into the show, and presumably the artists are in better physical shape for the workout of being on tour.

### Rehearsal

The first level of planning includes attending a concert by the principal production team: producer(s), director, director of photography, and lighting director, ideally. In some cases, this is not possible, and rehearsal for an upcoming tour or performance can serve the purpose of the preview or become the production venue itself.

The use of computers in pre-production planning and during the production process can help make the post-production logging virtually transparent. Storyboarded and scripted shot lists used in pre-production meetings would be based on each song as a scene and the framework of the songs in the concert structure. A timed script run down, keyed to music and lighting cues, is set as the road map of shot requirements from each of the camera positions. Tones, slating, SMPTE time code standards, and camera direction and switching instructions are also prepared and implemented by the staff and crew at this point.

## Cameras

Cameras should be ideally suited to the conditions of a rock concert environment. The hot and low light level conditions of a concert require equipment that is rugged enough to work under field conditions. A combination of handheld, tripod-mounted, dolly and crane-mounted units are located at camera positions determined on prior checkouts of the concert performance. Film selection is usually based on the look and feel the producers and director are shooting for. Hard edge color or black and white film can be used for a specific effect. Mag film loading and reloading logistics and coordination are a critical element in keeping cameras loaded for wall to wall coverage. An overhead camera with a 25mm to 250mm zoom lens located between 17 and 21 feet above the stage can provide a unique overview picture of the action. Sting is part owner of the "Hot Head," a computer-controlled camera that can operate overhead or at the end of a crane. A 16mm military camera helmet was worn by Heartbreakers drummer Stan Lynch for the band's film shoot, providing an unusual perspective on the interaction among band members. The ability to read frame lines in the dark and the use of a device that automatically defogs the viewing lens under higher than usual temperatures are production tactics that are considered at this stage. Panaflex, Arriflex and Mitchell are among the manufacturers who have set the standard in this field.

The use of 300, 400 and 600mm lenses is typical to provide broad coverage. Close-up head and shoulder shots are captured by the 600mm lens; 25 to 250 zoom lenses would be used on dollies located in front of the stage for close-ups. Lenses by Cannon, Angenieux and Panavision have become standard tools in this kind of production. Communications between the technical staff and crew is essential. The talk-back systems operating characteristics can contribute directly to the success of the production effort.

## Lighting

The set can be an elaborate thematic construction, or simply an ambient environment created with lighting effects. The use of rear screen projection, scenery screens, scrims and lighting variation can allow the backdrop to change with each song. Riser design and placement may have to be adjusted to accommodate film/video requirements.

Perhaps the single most critical factor in the look of a finished production is the lighting direction. The effect of computerized lighting systems can be extremely dramatic. The mood or "feel"

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of a piece is set by the lighting. Live concerts have been shot with the lighting exactly as designed for the live concert show, but the result in most cases has been inadequate lighting for film or video. Dark areas with almost no light contrast sharply with well lit areas, and the artists are often back-lit. Deferring to the requirements of the film medium is the only way to assure that the proper time and consideration will be given to this important production parameter. Usually, the entire set is brightened and band member risers and stage locations are reinforced. Lighting systems are generally controlled by a 96-channel console interfaced with a personal computer running lighting production software programmed to the concert performance. The unit can control as many as 400 lamps with preset positions and levels.

### PRODUCTION Video

Most live concert coverage is shot on film. Video delivers a much cooler image and precludes film distribution to domestic or overseas film distribution. One-inch, 3/4-inch and Betacam half-inch VTRs can be used independently or in combinations. High-definition and digital television will eventually provide the resolution, and approach the distribution coverage of film. However, 35mm film is the de facto standard for quality and format delivery in concert as well as feature film production. The expanded use of computer and video technology in filmmaking has resulted in film production techniques that can incorporate digital audio recording and feature film-quality computer-controlled cameras, lighting and editing.

### Time Code

Any combination of slates, film code, film edge numbers, crystal tones and/or SMPTE time code can be used to sync the production. In general, production companies establish their own methodology, usually based on experience. The editor, if consulted in advance, will have constructive suggestions about how the footage should be coded to conform to his or her operating methodology. Whichever approach is taken, it is critical that the synching method work and be reliable not only on the day or dates of the shoot, but also, when footage is synched up for editing. Potential problems can be created when: converting 24 frame per second film production to 30 frame per second video, the so-called three to two pull down; drop frame vs. non-drop frame; from a defective time code track; or from a slow motor on one or more cameras or video decks, etc.

The Steadicam is a "servo-system" designed to provide total portability and mobility, while recording extremely smooth images. The camera becomes an extension of the body and the operator can shoot while walking, running or at a standstill.

### Production Tools

There are a number of tools that are essential to creating the final look of the production. Cranes, dollies, steadicam and computer-controlled overhead cameras are all devices that add a distinctive style to a production. Long moving shots with the camera operator and camera on a crane floating over the audience "trucking" in toward the stage have provided a new look to what in many cases has been a fairly static photographic vocabulary for concerts. Dollies can be used to cover the down stage action.

### POST-PRODUCTION Editing

Typically the assistant editor(s) is assigned the opportunity to experience the agony and ecstasy of logging the camera footage. If the production is shot on video 3/4-inch or half-inch time code, window dubs are made. If shot on film, in most cases, the film is converted to one-inch video on the Rank Cintel and 3/4-inch or half-inch video time coded window dubs are made from the one-inch. The kind of shot, the duration and the "quality" or production value of the shot are all logged for the editor and director to review. The use of computers in the pre-pro-



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duction planning and during the production process can help make the post-production logging virtually transparent. A storyboarded scripted shot list used in pre-production meetings would be based on the unit song structure and the framework of the songs in the concert. The timed script run-down keyed to the music and lighting cues used as the road map of shot requirements from each of the camera positions, becomes the check list for shot decisions in post-production. We have covered the advantages and disadvantages of editing film work prints vs. off-line half-inch or 3/4-inch video in other MVP articles. This is a decision usually made based on the personal preference of the director and editor, sometimes driven by the economics of the shoot. Slating, SMPTE time code standards, logging procedures and tasking requirements are all uniform procedures structured in pre-production meetings and evolved from one production to the next.

## Distribution: New Vistas

U.S., European and Japanese home video markets can often be pre-sold, and for more established artists there is also the potential for U.S. and International theatrical release. An *ad hoc* circuit of video clubs across the U.S., Canada and Europe can serve as promotional outlets for an album and/or movie soundtrack, as well as the theatrical release.

Concert footage can be enhanced by the addition of segments from band home movies, previous concerts, interviews, backstage and on-the-road sequences and still photography. The Charlex production of Yes concert footage has set a standard in the use of animation and computer graphics as visual narrative connective links used to move through the music and on stage visual images.

The capabilities provided by digital recording and half-inch stereo, 8mm digital and laser Compact Disc playback, as well as big screen home video viewing, represent a new level of home entertainment delivery. Cable and broadcast stereo television are able to deliver quality audio to an advanced home entertainment center. The new Pioneer 900 series laser unit plays audio Compact Discs and video disks in sync. Stereo movie houses, video mini-theaters and cinema restaurants with high quality sound systems are all venues designed to keep people going to the movies. Between the technology at the production front-end and the technology available to the consumer at the playback-end of the process, there is a chain of technologies linked to deliver new standards in live sound and film concert recording. ■



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# M . I . U P D A T E

by Craig Anderton

**I**t's accessory time. Whether you want to increase your synth's memory, hook a computer up to your sampling machine, or protect your sensitive gear from electrical nasties, there's an accessory for the job.

One of the most ambitious accessories is the E! board for the DX7, from Grey Matter Response (15916 S. Haven Ave., Tinley Park, IL 60477). A \$399 circuit board that retrofits fairly painlessly into the DX, E! expands internal memory from 32 programs to 256. It also adds several new keyboard modes (including one that isolates the highest note on the keyboard and sends it out the MIDI port, and a "split" that assigns upper split voices to the DX and lower split voices to the MIDI port), improves the MIDI implementation, adds MIDI data filters, provides new keyboard velocity curves, and so on. There's even a limited MIDI merge function.

You say you don't have a DX7 because you hate punching all those little buttons in order to program the thing? Then check out the "Knob Monster" from the Monster Memory Company (5757 Kirkwood Pl., Seattle, WA 98103). For \$1,195, you get a control panel that plugs into the MIDI ports and enables all parameters to be changed by turning knobs and flicking switches—just like the oh-so-easy to program analog synths of yore. Monster Memory also offers the SPX-2 retrofit circuit board that increases the DX7 memory from 32 slots to 512 slots, and the MEX-1, a rack mount mass storage device for Yamaha data that provides 96 banks of patches for a total of 3,072 sounds. (To put that figure in perspective, if you changed patches every 15 seconds, it would take just under 13 hours to hear all the available patches.)

In other expansion news, Music Technologies Group (10204 107 Avenue, Edmonton, Alberta, Canada T5H

4A5) offers expansion kits for the JX3P, Poly 6, Poly 61, Jupiter 6, Linn, Drumulator, and Oberheim DX. And if you wish your LinnDrum had MIDI, you don't have to wish any more... just plunk down \$325 for the J. L. Cooper (1931 Pontius Avenue, West Los Angeles, CA 90025) LMR kit. This small circuit board mounts in the Linn to give send/receive capabilities for MIDI sync, MIDI note commands, and system exclusive dumps. The big news is that with this retrofit, the Linn can also receive song position pointer information. This feature is ideal for use with SMPTE/MIDI conversion boxes.

One of the more interesting accessories for sampling machines is visual editing software. The problem with sampling machines is that they all have limited memory, which means you can't just sample a sound in all its 26-second glory. Instead, you sample until the waveform settles down into a repetitive pattern. Then you loop that pattern to conserve memory. This sounds easy in theory, but loops have to be carefully set so that the beginning and end of the loop (which end up getting spliced together) exhibit no level shift. Otherwise, you'll hear clicks, ticks, pops, and various other noises.

Visual editing software displays the sample on a computer screen and lets you set the loop beginning and end points very precisely. Although this process can often be done by trial and error, where you change loop points in tiny increments until the sound is just right, being able to see a visual display greatly speeds up the operation. Some of the more sophisticated programs provide waveform drawing functions, where you can either create your own waveforms (generally acknowledged to be not all that useful) or modify existing waveforms (now we're talkin'!). With the latter, you can actually "erase" hiss, clicks, and other imperfections from samples.

The Mirage, which has a reputation for being hard to loop, has at least seven available visual editors. For the Apple II, you have the original—Ensoniq's VFS. Mac owners have a choice of "Sound Designer" from Digidesign (920 Commercial, Palo Alto, CA 94303) or "Sound Lab" from Blank Software (2442 Clay St., San Francisco, CA 94115). Commodore 64/128

enthusiasts also have two choices: "Sonic Editor" from Sonic Access (P.O. Box 4024, Santa Clara, CA 95054) or "VDS" from Enharmonik Productions (P.O. Box 22243, Sacramento, CA 95822). Atari owners can use "Oasis" from Hybrid Arts (11920 W. Olympic Blvd., Los Angeles, CA 90064). Finally, for the IBM-PC we have "Synthasist" from Northeast Visions (68 Manor Drive, Glenmont, NY 12077). I haven't had a chance to check out all of these, but the ones I've seen do indeed make life easier for creative Mirage owners. In fact, if you have a Mirage and a computer that supports a visual editor, it really makes sense to get one of the available packages.

Although it doesn't yet support waveform editing, Akai S-612 owners might like to know about the "Soundfiler" librarian from Drumware (12077 Wilshire Blvd. #515, Los Angeles, CA 90025). Soundfiler uses standard 5.25-inch floppy disks, which can store two to eight separate sounds depending on sample length. Each sound sample can be named, and all disk files can be printed out for hard copy reference.

Our final accessory is one that might prevent costly damage to your gear. I never really took AC line problems all that seriously until lightning hit about a quarter-mile from my house, and my answering machine was permanently trashed. If the thought of a fried computer or synth doesn't sound too good to you, look into some of the available surge suppression/filter AC barrier strips. The cost, complexity, and price varies greatly; for example, a six-outlet surge suppressor strip from CPS Electronics (4151-112th Terrace North, Pinellas Park, FL 34290) lists for \$99.95 and stops surges on all three electrical lines (hot, neutral, and ground) in less than three nanoseconds. Other companies offer products that also include additional line filtering, circuit breakers, and so on. Computer supply stores are usually well-stocked with these types of accessories (inexpensive computers are very sensitive to electrical surges, and you know what's inside most musical instruments these days...) so check around for the most features at the best price.

Out of space, out of time, and out of news on accessories—at least for this month. See you in the August issue. ■

# MUSIC NOTES

## Stan Ridgway Makes His Own Heat

by Dave Zimmer

One thing Stan Ridgway knew for sure: his debut solo album was going to be *his* baby, his creation. After breaking free from the "set musical patterns" of Wall of Voodoo in 1982 and collaborating with Stewart Copeland on the jittery "Don't Box Me In" for the *Rumblefish* soundtrack, in mid-1984 Ridgway worked out a solo deal with IRS Records.

"IRS wanted product very quickly," Ridgway remembers, "but they wanted the right *kind* of product. Was I going to sound like Devo to the tenth degree? Was I going to rewrite 'Mexican Radio' [WOV's biggest hit]? Was I going to be Elmore James? I wasn't in the position of being able to tell them, 'This is what my music is going to sound like.' I just knew it would be *my* sound, whatever it turned out to be."

A unique amalgam of angst-riddled synth rock and wacky spaghetti western was Ridgway's trademark in Wall of Voodoo. "On my own," he says, "I wanted to stretch out and experiment with some new instrumental and vocal textures while letting some of my old jazz and blues roots rise to the surface."

He pursued his plan first in several top southern California studios, but quickly realized "I was sinking too much of my record advance money into studio rental costs, and I wasn't completely happy with the results."

He got a call from Stewart Copeland, who had just purchased a new console for his studio in England and wondered if Ridgway had any use for a used Allen & Heath Syncon 24-track mixer. As it happened, Stan and his partner in crime, producer/keyboardist/techno-whiz Louis Van den Berg, had been talking about building a studio of their own.

"I was skeptical at first," Ridgway admits, "thinking, 'God, I don't know anything about electronics. I wouldn't know where to begin.'"

Van den Berg, a friend of Ridgway's since 1980, had designed a couple of broadcast studios and "learned a lot about recording studio construction



PHOTO FRANK DELIA

from reading." He was able to convince Stan that, despite their limited experience, they would be able to handle the job as long as they used their ears and bought durable rather than trendy equipment.

"I saw that if we pulled it off I'd have a facility that was all mine—tuned to my ears and for my music—where I could realize a lot of ideas very efficiently."

Ridgway and Van den Berg set about laying the groundwork for their studio—dubbed the Clubhouse—in a seedy office building on Hollywood Boulevard. "Glamor was out," says Van den Berg. "That slick Hollywood attitude is something we wanted to avoid."

"We wrote out many proposals, documenting costs and potential savings, and we sold the studio idea by proving that it would save money and enhance creativity," says Ridgway. "We found out pretty quickly that when you're dealing with the money people, technical talk and a lot of paperwork tend to move things along at a rapid rate."

They managed to convince IRS that an 8-track recorder was "unavailable in Los Angeles" and that a 16-track machine "did not meet the specifications of the office building" and thereby got the necessary budget to acquire an Otari MTR-90 24-track. "That's what we wanted in the first place,"

Ridgway chuckles conspiratorially.

"We also were able to convince IRS that we are responsible," he adds. "Nobody held our hand."

"When we started shopping for equipment," says Van den Berg, "we had many shuck-and-jive sessions with so-called experts who just hyped the Flavor of the Month, claiming we *had* to have this or that brand in order to have a contemporary studio."

"Even though I didn't know what the hell anybody was talking about," adds Ridgway, "I'd fix this knowing look on my face. If anybody asked me a question I'd just nod and say, 'Yep, I know.' Then as soon as we got outside I'd grab Louis and ask, 'What'd he say?'"

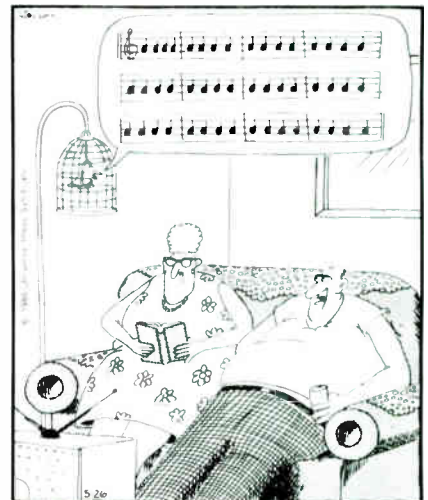
"Of course, with my institutionalized way of thinking, I believed some of these guys and thought we really did need some of the hottest brands, even for cable. That's when Louis would slap me around and say, 'Stan, it's just *cable*.'"

Ridgway and Van den Berg were able to agree on most of the other key studio purchases, which included: JBL 4330 and Auratone T-20 speakers, a Nakamichi DMP-100 digital mastering unit; an Akai S612 sampler; a Klark-Teknik 760 graphic equalizer; AKG 440, Shure SM81 and Sennheiser 421 microphones; an Aphex Aural Exciter; Roland SDE 3000 and Korg SDD 300 digital delays, a Lexicon 200 digital reverb, an Eventide 949 Harmonizer and an MXR flanger.

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### THE FAR SIDE

By GARY LARSON



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one-of-a-kind carpet remnants and fitted with a portrait of Elvis Presley and a water cooler complete with a pressure zone microphone for sampling.

"We thought it would take us about six weeks to get everything together," says Stan. "It ended up taking six months. But hey, it was worth it."

Ridgway is happy with the "kind of Spartan" setup. "In all the state-of-the-art studios I'd used before, I'd always be messing with all kinds of things and get distracted. I find it much easier to get down to work in my own studio, where I have a set group of tools to work with. If someone gives an artist one piece of clay and says, 'Make me something,' he'll make something right away. Give the same guy a whole art store and he'll waste most of his energy deciding what to work with first."

Once the Clubhouse was in order, Ridgway had no trouble getting down to the business of finishing *The Big Heat*. Van den Berg and engineer/mixer Andy Waterman were constant companions, sharing production duties with Hugh Jones, Mitchell Froom, Joe Chiccarelli and former Voodoo guitarist Bill Noland. "Welder" Mark Lewis and Mark Cohen of Fostex also pitched in frequently. L.A. musicians such as keyboardist Richard Gibbs, Fibonaccis drummer Joe Berardi, violinist Richard Greene and Minutemen bassist Mike Watt laid down tracks with Ridgway, who handled the lion's share of the instrumental work.

His collection of instruments is "pretty primitive and cheap," he admits: a late-model Fender Stratocaster, a '67 Fender electric 12-string, a Telecaster, a Music Man bass, "a 90-dollar banjo," more than 30 different harmonicas, and a one-dollar plastic flute that produced the spooky "woo-woooooo"s that pervade the title track. Nonetheless, Ridgway and his helpers created some distinctive musical tones on *The Big Heat*, particularly the jagged guitar on "Can't Stop the Show" and the spongy synth sounds throughout the LP. Among the machines imported for the latter purpose were the Yamaha DX7, a Prophet-5, Prophet 600 and a Roland Jupiter 6 keyboard, all driven in most cases by a Roland sequencer. "That machine," says Van den Berg, "gave us the song skeleton. Then we'd start hanging the flesh on."

This "flesh" included Ridgway's voice, a quavery and often conversational bray. "I have a very limited range," he claims. "When I first started out, I sounded like a chicken with its head cut off. I still do, a lot of the time, so I just make the most of what I have."

With vocal influences as diverse as Ethel Merman, Howlin' Wolf, Nina Simone and Danny Kaye, Ridgway often had to be jolted by Van den Berg

into finding the right voice for certain songs. Stan explains: "During the sessions, Louis could tell when I was getting lax. He'd sit me in the corner and yell, 'Where's that man? WHERE'S THAT MAN?!"

Louis elaborates, "The 'real Stan' did not sing all of the songs on *The Big Heat*. Sometimes a character in a lyric had a certain personality quirk that required transformation. That's when I'd tell him, 'Okay, Stan—bring The Man out!'" —CONTINUED ON PAGE 129



Dan Moretti behind the board at Celebration Sound.

## Celebration Sounds and Dan Moretti:

Staying Put in Pawtucket

by Bill Milkowski

Sophisticated recording studios seem to be popping up in out-of-the-way places all over the country these days. The Violent Femmes cut their latest album for Slash/Warner Bros. in Milwaukee, for example, and Minneapolis stands to become the recording capital of the midwest with Prince's new state-of-the-art facility.

But few artists have ever turned to Pawtucket, Rhode Island, as an alternative to the coasts. Until now, that is.

Pawtucket, R.I. That's right, the tiny state. Just 45 minutes south of Boston, at 26 Summer Street (next to the YMCA), Dan Moretti and partner David Correia are masterminding something of a regional recording revolution in their studio, Celebration Sounds.

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With the recent acquisition of a 24-track Otari MTR-90 (replacing an Otari 8-track), Moretti and Correia have succeeded in persuading area clients to take their business to Celebration Sounds rather than make the trip to Boston or New York. Nowadays Celebration is heavily booked with jingles, soundtracks, voice-overs and a host of record dates for local bands.

One of the albums recently produced at Celebration was Moretti's own *Some Time Inside*, contemporary fusion on par with such current stand-bearers as Don Grolnick, Andy Narell and Bill Evans. Moretti is a gutsy, expressive sax player in the vein of Randy Brecker and David Sanborn, yet he hasn't felt compelled to move to Los Angeles or New York in search of fame and recognition (skip fortune — fusion players *never* make fortunes). Instead, he's content to develop a recording scene and keep his hand in the music at home in Pawtucket.

"Sure, I've dreamed of going to New York," says the 33-year-old reedman. "A lot of my friends have gone to New York or L.A.—and a lot of them have come back, because, as far as the studio scene goes, it seems that synths are taking over horn parts.

"As far as my own project goes, there's no reason why you can't do it wherever you are. I really wasn't willing to move to New York and starve while I waited for it to happen. I just said, 'Why can't I do it on my own?' There's no rule, after all, that an album has to be produced in New York or L.A. So I gave it a try."

Moretti's album features credible players, good production and quality packaging—and that project was completed *before* Celebration got its 24-track. Needless to say, the artist is anxious to get the next project under way.

"We've started working on some things already," he says. "This time we're going to feature vocals on some cuts. In an 8-track setup, you really can't deal with vocals, so I'm anxious to get into that a little bit on the next one."

When he can find the time, that is. Being a full-time producer, jingle writer and all-around utility man at Celebration Sounds keeps Moretti pretty busy, but "I try to keep a balance between the music and the production work. I practice my horn every day, I perform a few times a week with various local bands, and I book my album band a couple of concerts a month.

"It has to be hand-in-hand, though. I could let the business overrun the artist/musician part of me, but I pretty much maintain that balance thanks to my partner, David Correia, who's an engineer, and his wife, Kathy, who does the booking for the studio. That frees me up to be a little more creative

with my time."

Moretti's background in music includes gigs with such noted R&B acts as Little Anthony and the Imperials, the Coasters, the Temptations and the Four Tops. He also had the pleasure of performing on stage at the Newport Jazz Festival in the late '70s with Aretha Franklin, a show he regards as a highlight of his career.

Moretti and Correia founded Celebration in 1980, and they've made a quantum leap since their humble beginnings. "Getting the Otari 24-track in here has made all the difference," he says. "The automation capability is an especially attractive feature. It really gives a lot of the creativity to the engineer and producer that wasn't there before. Suddenly you're able to do things that you'd never think of or try with a lesser machine."

Word has gotten around Massachusetts and Rhode Island about this new 24-track facility. Local bands the Probers, the Schemers, MX, Dance in Colors, and others have recently recorded

albums or singles there, and Moretti maintains there's plenty of advertising and industrial recording work right there in Rhode Island. "People were traveling to New York and Boston to do their production work, and now they're starting to hear what's available around here. We recently did a jingle for the local newspaper, *The Providence Journal*; that was a pretty good way to get the word out."

Moretti seems to have settled into a comfortable niche in Pawtucket. "We're not totally booked yet, but it's something I feel is going to grow," he says. "We're not booked like 14 hours a day, but we are booked every night, which is real exciting. And we haven't stopped yet."

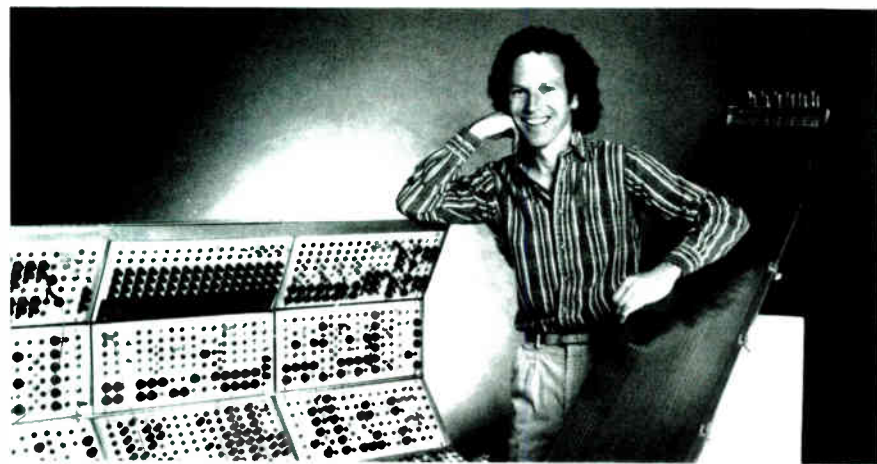
Of course, he hasn't put down his horn yet, either. The man is still blowing with a vengeance. Between his studio and his own fusion projects (which he's ambitiously pitching to the majors at the moment), it's a safe bet we'll be hearing more from Dan Moretti. ■



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Michael Stearns with Modular Synth and the Beam.

## Michael Stearns' Magic Carpet Ride

by John Diliberto

The path connecting surf music, psychedelia, Sufism and synthesizers is long and circuitous, but Michael Stearns has traveled it with the exploratory zeal of Einstein seeking the Unified Field Theory. Over the last decade, Stearns has created a symphonic merger of synthesizers, Gregorian chant, environmental sounds and new stringed instruments such as the Lyra and the Beam. The sound is as grandiose as Mahler, yet as subtle and deep as a meditative trance.

Sitting on an ergonomic chair in the middle of his surround-sound stu-

dio in Santa Monica, California, Stearns confides, "I like music that takes me on a magic carpet ride. I like the music to travel, weaving electronic and new instruments into the environments that I've recorded."

It's no wonder, then, that his synthesized dreamscapes, *M'Ocean*, *Planetary Unfolding*, and *Ancient Leaves*, have been embraced by the new age culture even though his electronic journeys are more probing than the acoustic ramblings of the likes of George Winston and Will Ackerman.

"I've never particularly cared for the term 'new age,'" Stearns claims. "I understand that it helps the marketing people if they can put a name on something. But everybody has such an incredible uniqueness to offer..." He would rather not see music "shoved into categories, stereotyped."

However, Stearns is in accord with the professed goals of much new age

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music. "I think it's very important, particularly in the frequency that we live in today, because it helps people to relax, let go and get inside something—whether it's inside themselves or inside the sounds they're hearing."

Michael Stearns has been getting inside sounds since he first picked up a guitar at the age of 12. He confesses his initial motivation wasn't quite as cosmic as his current music would suggest: "I got into it because a friend of mine had a guitar and I noticed that all the girls would gather around him at the swimming pool."

His voracious appetite for the guitar (and girls?) sent his grades plummeting, compelling his parents to pack him off—sans guitar—to a private school. His grades eventually improved, and he began playing in surf bands, among them the Breakers. But it was the psychedelic consciousness of the late '60s that set him on his current path. Once again, his education took a back seat when he tuned in, turned on and dropped out of college in 1967 while playing in an acid rock band.

Burying himself for three months in a room with guitars, a Farfisa organ and an echoplex, Stearns began shaping his personal inner-space music. "I created a piece of music that's very similar to what I do now," he recalls. "I played it for people at the school who loved it, although they didn't know quite how to relate to it. But since drugs were in then, they said, 'Wow! We'll just get stoned and listen to it.' That was the explosion in my life, and the fallout has been affecting me ever since."

It was several years, however, before his sonic mutations were fully realized. In between came a four-year stretch in the Air Force, a few years of bar-band gigs, and a near departure into the spiritual life of Sufism. Immersed in the writings of Baba Ram Dass, Stearns was ready to trade his synthesizer for Sufism when he met Susan Harper, the woman who would become his wife, at a dance workshop. The workshop's interpolations of sound and dance inspired Stearns to return to music and move to Los Angeles, where he started his own record label, Continuum Montage, in 1977.

It was no Windham Hill, but Continuum Montage was among the pioneers of independent new age labels in providing an outlet for this exotic, studio-oriented music. Stearns began a feedback loop between dance movement and music that continues to this day and helped create his epic recording, *Planetary Unfolding*. "I recorded with the dancers in real time, and took those moments that were happening to create *Planetary Un-*

*folding*."

Stearns combines analog and digital synthesis, and has worked with the Synclavier II, although at times there are no electronics at all. "Ocean," from *Sustaining Cylinders*, uses the sounds of nothing more sophisticated than pots and pans. "I found that if you put a little water into pots and pans, struck them and then tilt them to the side, you get these interesting, changing harmonic structures. There are a lot of great instruments in kitchens just waiting to be discovered," he laughs.

Stearns' most imposing work has been done with a large Serge Modular synthesizer with 16 modules and two touch-sensitive keyboards that can control up to four parameters per key. The Serge is the centerpiece of his sweeping sound. "It takes a lot of preparation," says Stearns, "but if you spend the time you can get a lot of unusual things out of it. It has no memory, so you have to write down the patches—but chances are you'll never quite get it the same way again."

Stearns also has an Oberheim system (OB-8, DMX and DSX), a Yamaha DX7, Roland Drum Machine, digital delays, and an Apple Macintosh computer system with Mark of the Unicorn's "Professional Performer" and "Professional Composer" programs giving him up to 200 tracks of digital memory.

Although all of his instruments except the Serge are MIDI'd together and synchronized through a Garfield MIDI-Doc, Stearns' music eschews the relentless beat and infinite sequencer patterns of much electronic music. "I like to play with time," says Stearns. "A lot of the music we listen to now is synchronized to a click track. In electronic music, you're working with sequencers that are synchronized to that click. We've gotten away from biological time; the heart speeds up and slows down, and your brainwave patterns aren't fixed in time."

Instead of click tracks, Stearns sometimes synchronizes his machines with an experimental device called an Ear Probe. "It clips to your ear and outputs your heart rate; you can control the clock so it's feeding back as biological model instead of a mechanical one."

—CONTINUED ON PAGE 173

## Tony Williams Writes His Own

by Robin Tolleson

Tony Williams knows Time so well that he must have some kind of deal going. It makes sense—he never loses track of Time, even in the midst of the most bombastic flammings or subtle



flourish. And because he has kept Time so well ever since he started copying Max Roach and Philly Joe Jones at the age of nine, Time is rewarding Williams by keeping the drummer's playing and his attitude very youthful.

Williams was busy last year, his 39th. He became more visible showing up on albums by Yoko Ono, George Cables, L. Subramaniam, John "Rotten" Lydon and Artists United Against Apartheid. He diversified his sound and batterie, adding electronic drums and drum machine. He also wrote an album of lovely material, *Foreign Intrigue*, and recorded it with a sizzling acoustic band.

"It was a great feeling to tell myself that I wanted to make a record and then be able to write the songs and complete them as easily as I had hoped to...to have done it in such a different manner than I'd done any other record, so quickly, and then get the kind of response I'm getting about it from people. It's a new experience for me," the drummer says. "I'm getting fan mail."

*Foreign Intrigue*, Williams' first solo record since 1979, features Art Blakey alumni Donald Harrison (alto sax) and Wallace Roney (trumpet). Exciting young pianist Mulgrew Miller does the melodic shading, along with vibist Bobby Hutcherson, who played on the drummer's first solo album (*Lifetime*) back in 1964. *Foreign Intrigue* is the first record Williams has done with trumpet and sax; it's also, he says, "just straight-ahead, more listenable material" than earlier efforts under his name.

As the cornerstone of his band for *Intrigue*, Williams chose bassist Ron Carter. The two had played together behind Davis in the 1960s, with V.S.O.P., and on session dates including Devadip Carlos Santana's *The Swing of Delight*, Terumasa Hino's *May Dance*, and Jackie McLean's *New Wine in Old Bottles*. Carter had played some of Williams' current material last year, which according to the composer made the recording of *Foreign Intrigue* a bit easier. "I knew I wanted to go in and make the record cleanly and quickly," says Williams, "so it helped to have the bass player already know some of the music. The bass player has the hardest parts on all those tunes. 'Arboretum' has a lot of counterpoint, and the bass plays a lot of it."

*Foreign Intrigue* was recorded at M&I Studios in New York City on June 18 and 19, 1985. Williams produced the record with Michael Cuscuna, and Peter Darmi was engineer for the recording and remix. "Acoustic jazz music is best done live—it's easy to do it that way," Williams says. "Playing with

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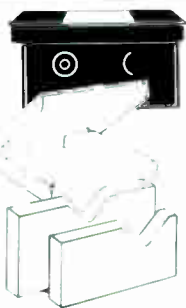
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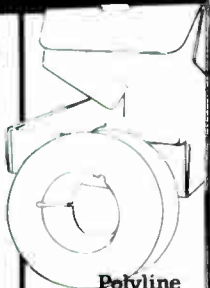
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people is what makes it what it is—the fact that you played it on the spot. What you played was because someone else played what they played, rather than going in and laying down a track, and then going out to eat and think about it. The interaction is what makes this kind of music work. I was on some records on Blue Note in the '60s that we made in one day. We'd just go in and play all our tunes, one or two takes, as if we were on a gig. It would take six hours and we'd have a record."

In the 1970s, Williams put out a slew of high-voltage electric records that separated him a bit from jazz purists. His "Lifetime" bands with guitarist John McLaughlin, former Cream bassist Jack Bruce and organist Khalid Yasin (Larry Young) were startling and brash fusion forerunners. *Believe It* and *Million Dollar Legs*—with guitarist Allan Holdsworth, bassist Tony Newton and Alan Pasqua on keyboards—were classics of mid-'70s fusion mania.

Williams' 1979 album, *The Joy of Flying*, saw some truly unique groupings of musicians, with Jan Hammer, George Benson, Michael Brecker, Ronnie Montrose, Stanley Clarke, Mario Cipollina, Cecil Taylor and others making appearances. Williams fell victim to a CBS Records housecleaning after the album was released, but he was more hurt by the fact that there were none of his compositions on the record. "On *Believe It* I had one tune, on *Million Dollar Legs* I had three, and on *Joy of Flying* I had none. I said to myself, 'This is ridiculous. This is the last time this is going to happen.'"

He began studying composition with Dr. Robert Greenberg, who teaches at the University of California at Berkeley. Williams calls his learning process "taking the mystery out of the tools. It's becoming less of a numbing experience for me. When you learn how to do something, the more you do it the more you're able to produce things from knowledge rather than just from inspiration. When you have to deal from inspiration all the time that becomes very draining and, in a sense, less creative. When you have knowledge you can create from a wider range of areas. You can make your inspiration grow." Williams' studies paid off: all seven songs on *Foreign Intrigue* are his compositions.

*Foreign Intrigue* was also the first time the drummer used electronic drums and drum machines in an acoustic music context. He overdubbed Simmons SDS5 tom slaps weaving in and out of the fills on several songs, finger-tapped a computer tambourine softly behind the beat on "My Michele," and tossed in some drum machine handclaps to spice up

the intro to "Life of the Party." "I'd wanted to add the drum machine and electronic drums in that context for a while," Williams says, "like a straight-ahead, acoustic jazz sound. It seemed like the next step for that type of music. There were places where the acoustic drums and the electric drums kind of meshed together like a gear instead of just being on top of each other. I didn't have the acoustic and electronic drums set up at once and keep going back and forth, but I tried to make it sound like it could have been done that way."

As it becomes more difficult in recorded music to tell man from drum machine, Tony Williams seems to retain a sound all his own on the drum kit. With the attack that Williams lays into his Gretsch toms, the kick he puts into his bass drum, he sometimes sounds like he's being driven by a stack of Marshalls. At times on *Foreign Intrigue*, the acoustic drums have so much presence they sound deceptively electronic. "I've gotten that sound on my acoustic drums through playing with electric bands," says Williams, "and that sound has gotten into my head. I'm able to use that sound whether I'm playing with an amplified group or an acoustic group. I try to keep them very tonal, where each drum is distinctive. You can hear that I'm playing seven drums. I try to keep them tuned so there's a spectrum from high to low, and I like the drums to sound round and warm. That's why I play with two heads on all of the drums, even the bass drum. The combustion that you get when you have two heads on the bass drum is a real nice sound. It's not a flat, floppy sound; it's a very round tone."

Williams acknowledges that the recording engineer and drummer sometimes differ over the question of what the drums should sound like. "See, I'm a drummer, so I like the drums to sound like drums." He has enjoyed working with engineer Phil Kaffel recently at Fantasy Studios in Berkeley, on albums by George Cables and L. Subramaniam. "The couple times we've worked together, he's known what sound I like," the drummer says. "The last time, as soon as the drums were set up I played something, went into the control room and listened back, and he had already tweaked the board. The sound was there. So we don't have any problems."

"But a lot of engineers can't function unless they have that 'studio sound,' and I think things are supposed to be different. I think you're supposed to have a musical sound, and the engineer is supposed to capture that on tape."

Small concessions must be made

in the studio from time to time. Williams uses the internal mufflers on his drums, which he doesn't do in concert because he prefers a wide-open sound. "I just muffle them a hair so there's no ring," he says. "When I play live, I take the mufflers off. For recording, it's good to muffle them so that when you mix you can put delay or things on it so it can sound wide open. The tone isn't muffled out—it's just the ring that's dampened."

On his recent session with John Lydon, Williams got to go for a wide-open sound with help from producer Bill Laswell. "The drums weren't set up in the studio," he explains. "They were set up in this big, empty indoor garage, right in front of an elevator shaft. They took the elevator down one floor so that when you looked into the shaft you saw the top of the elevator. They put microphones inside the shaft, then they put mics around the drums themselves. Then they put microphones in the garage itself, which was about 90 feet by 120 feet. That was a lot of fun."

"The Struggle Continues," from the *Sun City* album, was another interesting recording experience for Williams. On the liner notes it appears to be a studio reunion of Miles Davis and for mer bandmates Herbie Hancock, Ron Carter, and Williams (who first joined Miles at age 17) —but that's not exactly how it happened. "I was in New York to play at the Village Vanguard with Ron and Herbie," Williams explains, "and they asked us to come and do a couple of tracks [for *Sun City*]. When we got to the studio to do it, Miles' track was already done, and so was the rest of the melody. It's the first time I've ever done a record where the last thing to be put down was the rhythm track. We weren't even in there with Miles, but it worked out well. It's nice, because it just reflects the technology of the day, the way things are done today."

Williams is currently studying voice with noted vocal coach Judy Davis in Oakland, California, and has plans to start making some pop music of his own. "It's going to be a lot of sampling and all electric, very pop-oriented and very drum-oriented."

As he begins to fiddle with the end of a cigar, the drummer laughs that his radio is set mostly on news-talk radio. He acknowledges a liking for some contemporary music, citing Scritti Politti, Kool and the Gang, Sting, Prince, Ready for the World, Simple Minds, and Tom Waits as examples. He's grown to love such classical composers as Brahms, Stravinsky, Mozart, Mahler and Schoenberg. Williams is tickled to be working with a handful of other jazz stars on *Round Midnight*, a

full-length film about expatriate American jazz musicians in the '50s.

He has been moved by a lot of television and movie music. "Do you remember the theme to the *Allred Hitchcock Hour*? I remember thinking when I was a youngster, 'Wow, that's nice music.' It makes you feel something," says Williams as he hums a bit of the theme. "I wanted to be able to do that. That's the kind of thing that drew me into the music world. I didn't get into music just because I loved the drums. I do love the drums, but I also love music. I'm happy with music even if I'm not playing the drums." ■

—FROM PAGE 123, RIDGWAY

"Yeah, I have to be able to get underneath the skin of some of those people I create, especially in 'Salesman' [a nervous look at the frantic life of a traveling salesman] and 'Camouflage' [an epic tale of how a ghost-like Marine saves the life of a soldier in Vietnam]. I feel like I'm going to the Lee Strasberg School of 'method acting.' In a lot of ways, I become the people in my songs. It's like I'm an actor at the mic. Of course, I'm also the director, lighting man—and yes, I run the lunch wagon."

Like many of his Wall of Voodoo creations, all the songs on *The Big Heat* are bizarre slices of life starring colorful lunatics ("Twisted"), laborers ("Pile Driver"), carnival barkers ("Can't Stop the Show"), and losers ("Walking Home Alone"). The songs are very cinematic and often filled with wry and/or black humor, "a product," he says, "of me reading too many bad pulp novels."

His songs are generally easy to follow because "I'm a pretty natural enunciator. It's actually hard for me to sing and not be understood. Sometimes I think, 'Gosh, I wish I could garble so I wouldn't have to write so much.' Because of the way I sing, though, I just can't write a throwaway line." An example: "You're twisted, that's what you are/Just like a bee buzzing in a jar—frayed and ragged, spent and strained/Watchin' that water spin down the drain."

With a studio to experiment in whenever he chooses, Ridgway predicts on the next record "We'll really go hog wild and tear down a few more fences. I've broken free from the formulas that were developed in Wall of Voodoo, and now I have no limitations. I've been through periods where I've been a blues man, a jazz man; then, in Wall of Voodoo, I took anxiety to the outer limits. Now I can do whatever I want, and be—"

"Stan," Van den Berg interjects, "can just be The Man." ■

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## RAPPIN' WITH RICK RUBIN



*Rick Rubin (second from right) with The Beastie Boys.*

by Havelock Nelson

Rick Rubin, the 23-year old co-owner of Def Jam Recordings and ring leader of rap's newest brat pack—L.L. Cool J, the Beastie Boys, and the Original Concept Crew—is a fan of hardcore rock and roll. He grew up in Long Island, N.Y., "and it was almost impossible to grow up there without being a heavy metal fan," he says. So how come the thing for hip-hop? "The high school I attended was racially mixed," Rubin explains, "and the black kids were into music I found much more exciting and accessible. White kids were into Led Zeppelin, the Stones, and The Who—groups that were easy to like, but who rarely toured, so there was no energy to be involved in; whereas the black kids were always waiting for the next rap or scratch record to come out by groups you could actually go and see. To me, rap was a lot like hardcore, except that white kids never quite got a scene going for that type of music, and black kids accepted their own version of hardcore, and supported it. And I did too!"

Years afterward, while attending New York University, Rubin produced "It's Yours" by T.L.A. Rock and Jazzy J, for a small New York based company.

The record was "stupid"—huge in the street vernacular. "But I never got paid," recalls Rubin. "So I said, 'This isn't the best way to go about doing things.'" Later, this ex-film major met Russell Simmons, who manages, and at times, produces, just about everybody who can rhyme behind a beat, including Run-DMC and Whodini; he wasn't rich either. It was then that Rubin began contemplating forming a label with Simmons. "That way we could promote our groups the way we wanted to, and use the money we made to make them bigger—what labels that are only interested in fast money won't do," he observed. The label, Def Jam, would be an artist-minded one.

Started in an N.Y.U. dorm room that Rubin occupied several months following his graduation last year, Def Jam's initial signees were L.L. Cool J (the Ls are for Ladies Love, the Js for James) and the Beastie Boys. L.L.'s first 12-inch, "I Need a Beat" sold over 100,000 copies with little airplay and virtually no promotion. Sales for The Beasties, metal-directed white rappers, however, were a little harder. "It'll take a lot of promotion and video money to put them over," Rubin concedes.

Luckily, Columbia Records took no-

tice of Def Jam, and inked a distribution deal with the fledgling outfit. To prevent becoming one-dimensional, Def Jam will also be releasing albums by Juice, a smokey-voiced R&B singer; Slayer, rough heavy metaloids; and the Junkyard Band, a go-go band whose members range in age from ten to 13. Despite go-go's failure to catch on nationally, Rubin claims he can take the best element of go-go—the hyperactive percussion—and make the D.C. funkform commercial. He feels that his group's beginner's energy will seduce radio programmers to test their debut, due in the latter part of 1986, even though they passed on established groups like Trouble Funk.

For the moment though, L.L. Cool J's sturdy, electro-fattened *Radio* is an across the board smash, and Rubin's remixes for Big Audio Dynamite, among others, have become hits. We spoke with Rubin as he was simultaneously putting the finishing touches on albums for the Beastie Boys and Run-DMC. The former contains a remake of Aerosmith's "Walk This Way," and the veteran rock band will be featured on the track. "This album will be less commercial than Run's previous ones," Rubin says. "But it will probably sell a whole lot more."

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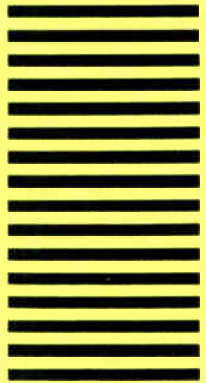
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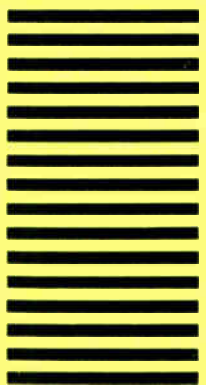
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## ...YOU'RE IN THE MIX

**Mix:** To me, Aerosmith was actually a sort of rap group. Years before "Rock Box," they were harnessing James Brown-ian funk grooves to hard guitar crunch. And it wouldn't surprise me if some DJ slid "My Fist Your Face" under the Beastie Boys' "She's On It." Is Aerosmith the actual source of your appreciation for rap?

**Rubin:** Aerosmith was the first group I actually went out and bought all the albums for. So it's probably related. I also listened to James Brown, and AC/DC, which is beat-oriented rock.

**Mix:** Your first production was Jazzy J and TLA-Rock's "It's Yours," one of the streetest records till now. How'd you and them hook up?

**Rubin:** I knew Jazzy J for a long time. He was an important person in the hip-hop scene. Having an idea of what these type of records *should* sound like, I approached him about doing one.

**Mix:** Even though Run-DMC sold gold, did you feel even their records could've been done better?

**Rubin:** I did actually. That was the idea. I heard Run-DMC's record and thought, "This is really good, but it still seems a bit polished." They were a little too R&B-ish. I'm really a fan of rock music—beat-oriented rock.

**Mix:** Since rap and rock are best live, are you spontaneous in the studio or

do you go in with things mapped out?

**Rubin:** Both ways. Sometimes I have solid ideas about how I expect to hear something. Then I'd go in and try and get it. But a lot of the times, on the way I'd come up with something better. I spend a lot of time in the studio, and sometimes we do things from scratch, but the studio really isn't the best place to be creative. I prefer to go in with strong ideas. If they change along the way, though, that's cool!

**Mix:** How long does it take you to produce the tracks for hardcore, minimalist acts like L.L. Cool J and the Beastie Boys?

**Rubin:** They're hardcore and minimal, but it's very important how the records feel. You can't just sit down at a drum machine—like I know a lot of producers do—make up a beat, and say "O.K., this how it's gonna go." It's much more than that. Sometimes I'll take off months between songs where I'll just think about beats that'll feel right and make the most sense. I'll vary tempos and use different, interesting textures on each cut; L.L.'s album took about six or seven months to make.

**Mix:** How about actual recording and mixing time?

**Rubin:** Most of those songs were put down and mixed in one or two sessions. Some of them took more time because we redid them. "Rock The Bells," one of the earlier songs, didn't sound the way it does now. By the time the LP was near completion, we decided it needed to be updated; L.L. rewrote all the lyrics, and I rewrote all the music. And it's probably the most exciting and up-to-date song on the album.

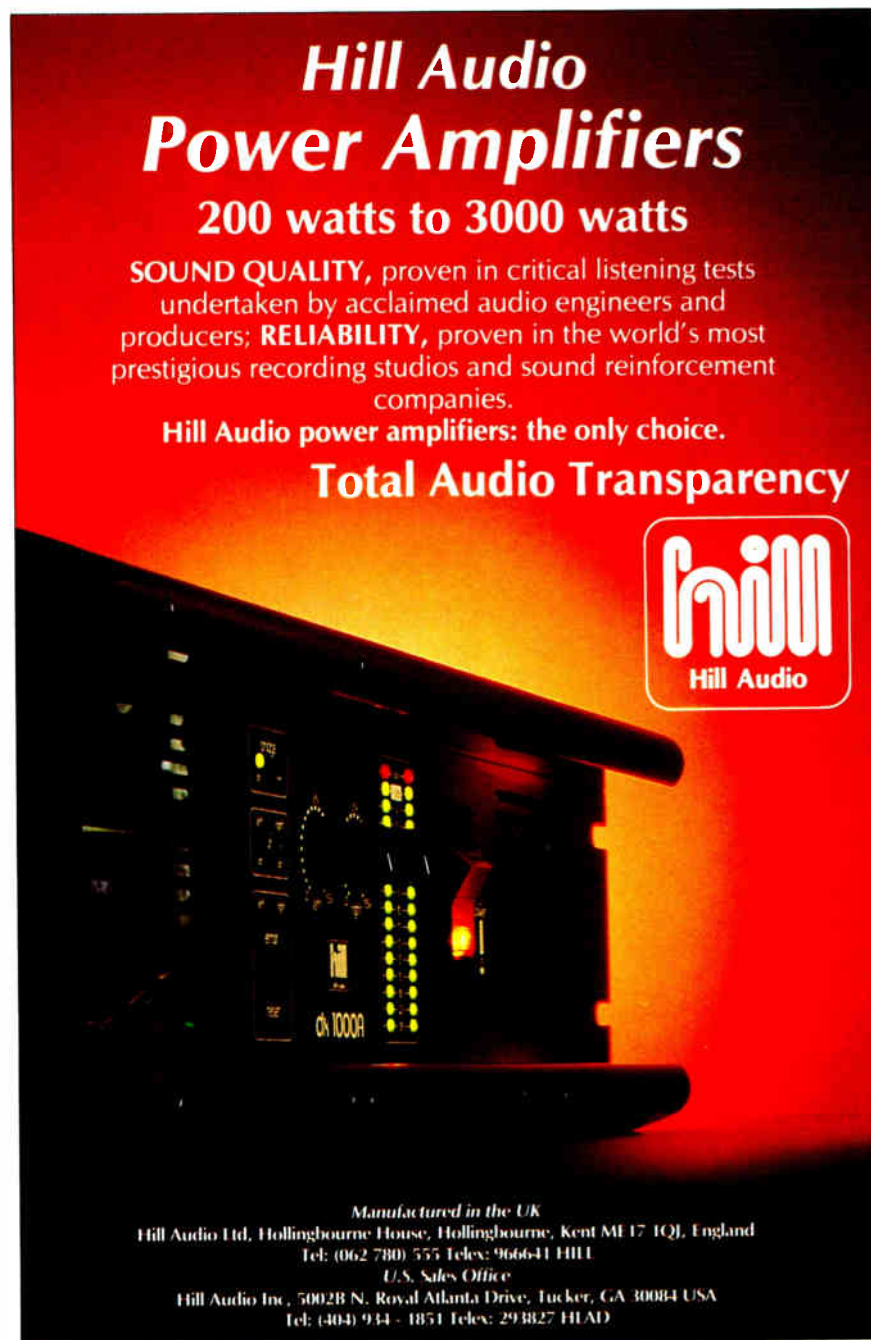
**Mix:** How are the guitars on a Beastie Boys record, and on the new Run-DMC record recorded?

**Rubin:** I use Marshall amplifiers, and I mic them in three places in the room. Then I mix them together until it sounds good.

**Mix:** The hard sound of your records is most responsible for their popularity. What other sorts of equipment do you use on them?

**Rubin:** I used gated reverbs on the drums. I'm really not a fan of equipment, so I don't care about specifics. I don't even care what studio I use. Of course the quality of a studio and its equipment affects your final product, but I don't nitpick. I would never say "Run it through *this* machine or *that* machine." I'd just say, "I want it to do this." I have engineers who are very helpful. I'm more concerned with being feel-oriented rather than equip-

—CONTINUED ON PAGE 171



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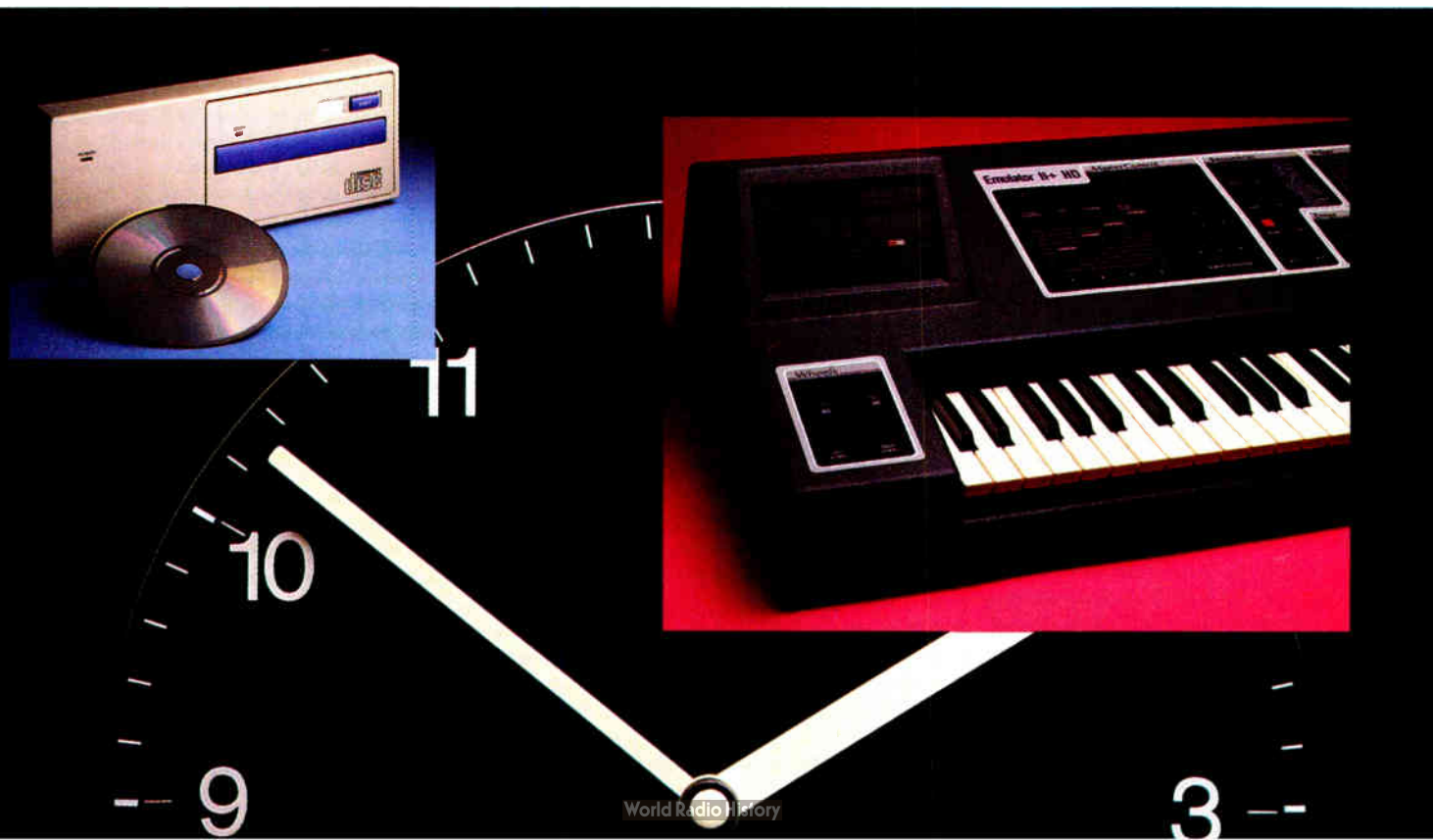




PHOTO: DAN QUATROCHI

Producer Steve Bray

## Steve Bray's Saturn Sound

by Brooke Comer

Downtown Manhattan is becoming an increasingly popular area for home studios. More available spaces and lower rents make it easier for artists/writers/producers to install basic recording equipment for private or public use. But even amid tough competition, Steve Bray's Saturn Sound (lodged in a bedroom of his small apartment) is unique. The compact, \$250,000 studio makes the most of its 12- x 17-foot space. And Bray, who made industry news when he produced "Into The Groove" for Madonna on an 8-track

recorder in his bedroom, is known for making the most out of his equipment.

"The success of 'Into The Groove' amazes me," admits Bray, who also co-wrote and produced with Madonna half of her third LP, scheduled for release in June, 1986. "We didn't even record the track in a studio. The demo, which went directly into the movie *Desperately Seeking Susan*, was done in my previous apartment on a Tascam-38 8-track tape recorder and a 16-channel Ramsa board. I didn't do anything special or elaborate in terms of recording technique, and the success of that track changed my whole outlook. We used Shure 58 mics on the vocal and no headphones. The keys were Oberheim OB 8s, a Prophet 5, Roland JX 3, and a Casio CZ101. It was a simple and direct process, and if you listen carefully, you can probably hear radiators thumping in the background."

Now that Bray's upgraded to a Soundcraft 24-track specially wired for keyboards, the possibilities are limitless. Not only his board, but Saturn Sound as a whole, has evolved from various levels of home studios in Bray's past. "Before I even got up to the 4-track stage, I had two cassette machines going back and forth. To record a drum part, I'd run the cassette and play drums to it, then I'd run that cassette while playing guitar to another machine. By going back and forth between the two cassette machines I had so much tape noise that all you'd hear was 'Shhhhhhh' with faint music in the background."

Getting a stereo mix of Bray's "Into The Groove" was a problem, "because of the way I work with machines," he explains. "I record all the music in stereo on 2-tracks so you can't really mix it again. The only separate tracks are the vocals. To remix it for high quality MTV stereo, we took the 8-track and dubbed it to a 24-track 2-inch tape, re-did the drums, bass and main keyboards, and mixed those new tracks with the keyboards and vocals from the original 8-track. MTV and radio airplay made the song so popular that Warner Brothers decided it was time to put it on vinyl. That's how the song became a single, and I became a producer." Bray, in addition to his work with Madonna, writes and plays with Madonna's ex-group, The Breakfast Club.

While some of his contemporaries

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prefer to work away from home in order to be able to escape their work, Bray is pleased with his in-house studio. "Before I had my own studio, I worked in friends' lofts when no one was around. I figured out that what I needed was a little 4-track studio. If you can make an initial investment, a home studio is the most efficient way to work. It'll definitely pay for itself, saving you \$100 an hour of studio time. It allows you the freedom to erase things, creating an ideal learning environment, free from pressure."

Playing with different bands was another good learning experience for Bray, giving him plenty of exposure to a variety of equipment. When it came time to furnish Saturn Sound, he already had ideas. "There's a plethora of information available on 48th Street in New York, where you can find 20 high quality music retail stores in a one block radius," he notes.

Bray's Macintosh has also helped to keep him on the cutting edge of technology. "I have a modem now that I can access to a musical network, PAN," he explains. "Through PAN, I can call for instant information from all over the world. Manufacturers and engineers on line tell you all they know about the equipment, and you can ask specific questions. There's a bul-

letin board for special interest groups like Kurzweil or sampling. Not only can you access information on sequencing, but you can actually buy a variety of equipment on line by placing your order via computer. During scheduled conferences, you can have real time dialog with as many as seven people. You might be on-line with a software designer who can tell you if his product is in fact what you're looking for."

Macintosh helped Bray select new software and Soundcraft's Phil Wagner was instrumental in the selection of a console. "The Soundcraft board is the most affordable in its size, and it offers the most flexibility," he notes. "It also uses a disk-based automation system, which no other board in its price range has. One of my friends, Alec Head, engineers for Kashif [who also owns a Soundcraft] and he gave me a good report. If it's good enough for Kashif, it's good enough for me.

"The Otari machine was another fairly easy decision. I know people who work at Unique Recording, where they use Otari exclusively, and they had positive feedback. I know Jellybean [Benitez] cuts on them at Sigma, and that was another incentive."

Saturn Sound's keyboards are permanently wired to the patch bay so

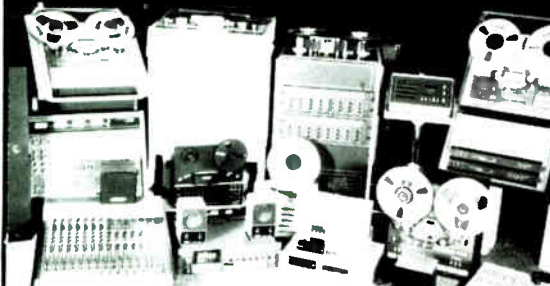
that sessions save the time they'd ordinarily spend patching. "In my studio, everything is there already," Bray explains. "When you wheel your gear in, you don't have to go one by one, patching this keyboard here and that keyboard there. You walk in and turn on the board. Everthing's already hard wired to the patch bay. The only time I have to patch anything is when I want reverb on something. Even though it's a very small room, the space is workable because there are no wires anywhere. Everything goes around the walls from the keyboards to the patch bay, so there's nothing in your way."

The complexities of hardwiring his keyboards to the patch bay aside, electricity posed the biggest obstacle for Bray. His residence did not have enough electrical volts to accommodate a recording facility "and in order to bring in an additional 220 volts, we had to drill downstairs through a doctor's office and into a basement to the main electrical room." The drilling required red tape and permits from the building owner, and Con Edison. Though the process was expensive, "It was the only way we could be sure the studio would always have enough power for whatever was in there. I wanted to know that I could take a Synclavier system in and not have to worry about the kitchen or the refrigerator and air conditioner going on and off on tape. They can draw a lot of unwanted hum."

Jim Taylor, who designed Kashif's studio, impressed Bray so much that he hired Taylor to work on Saturn Sound. "Soundproofing was also a major concern," Bray says. "We floated the ceiling and walls about six inches out, so I could move without having to do anything except re-plaster the walls, which are reinforced with dry-wall and plasterboard. The only other problem we had was bringing the board up to my fourth floor apartment." Observant bystanders may have witnessed the Soundcraft console as it was hauled up by crane into Bray's window, in true New York fashion.

Bray believes his studio is part of a trend that will make the competition between studios tougher as technology becomes more affordable. "Home studios are becoming so cost effective that writers need them to compete," he says. "Portastudios and keyboards make writers and producers virtually synonymous now, as production values and techniques are the criterion for good music. And with a greater base of high quality material in the marketplace, people will have to work much harder to stand out from the rest."

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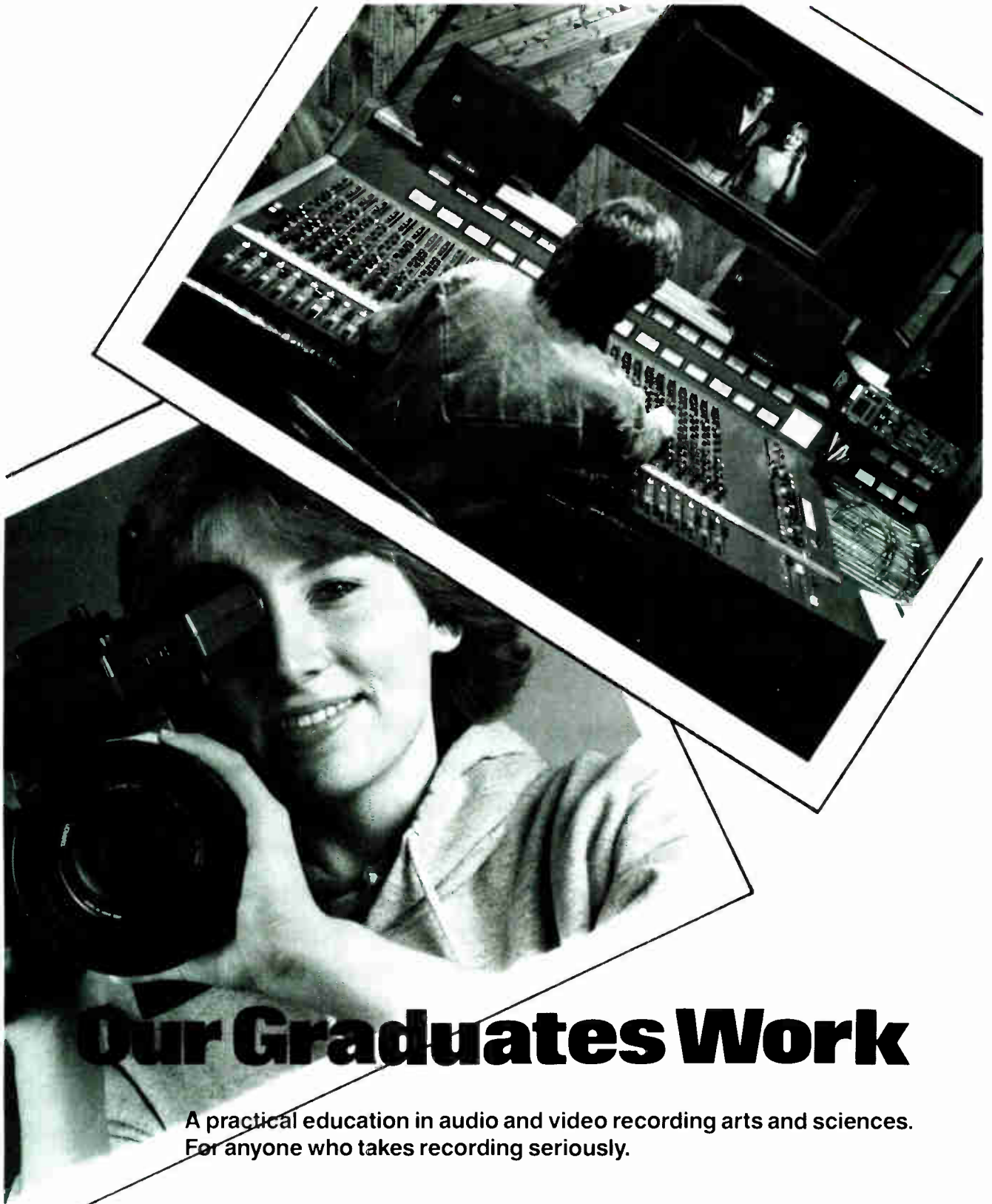
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by Philip De Lancie

As I indicated last month, many of those with a stake in the survival of the phonograph record manufacturing industry are hopeful that technical improvements in record quality will arrest the downward trend in record sales. While Direct Metal Mastering has been perhaps the most publicized of the efforts in this direction, various other developments have also surfaced in response to the challenge of higher record quality. Among these is Ni-Fi, a recently unveiled method of lacquer master processing in which silvering is replaced with direct nickel coating. The process is claimed by its developers, Hal Chemicals of Chicago, to greatly increase record fidelity.

"We've been selling silver to the record industry since 1957," says Hal

Ellison, president of the company. "We got into nickel because we saw that something had to be done for the vinyl record business. We saw cassettes taking hold, and we saw CDs taking hold, and we asked ourselves: 'Why aren't we getting the fidelity out of vinyl records? What is wrong?' And we found out what was wrong."

To better understand the conclusions reached by Ellison and his research team, it might be opportune to review the conventional method of preparing lacquer masters for the formation of metal parts [metal masters, mothers and stampers]. Firstly, as described by Ellison, "the lacquer is immersed in a vessel with an aqueous solution containing either Wisk [the laundry detergent] or Liquinox. It's left in the vessel for about 15 minutes to get rid of any fingerprints and

responding to the lacquer's grooves] is itself electroplated to produce mothers, which are in turn used to form the stampers for pressing records.

As a supplier to metal parts makers of the silver compounds used in the silvering process, Hal Chemicals has an active interest in the continued popularity of the vinyl record. "When we saw that our sales were dropping, and that the record industry was dropping in sales," says Ellison, "we knew that something had to be done." What Hal Chemicals did was to embark on a four year experimental effort in the small plating facility the company has operated since 1960 for research and quality control. Ni-Fi is the end result of that effort.

"We found," Ellison continues, "that silver and nickel is not a good combination. By that I mean that after you silver the lacquer and immerse it in the nickel plating bath, there is an interference because the molecular structure of the nickel is not the same as the molecular structure of the silver. The alloy in the nickel tends to pull the silver away from the groove. We determined that by placing it under an electron microscope. We would call it a millimicron pull."

With the nickel pulling the silver away from the groove, the shape of the silver no longer exactly conforms to the shape of the lacquer surface upon which it has been deposited. "We found that that was the big reason for the lack of real fidelity," Ellison says. "Regardless of what sort of record you buy, everybody [except DMM] uses the conventional silver spray process. By using that process, you cannot get the fidelity."

"The reason we tried to deposit nickel is because we felt that if we could eliminate the silver and get rid of that pull, we would get full fidelity if we could get the nickel to stay in the groove. We tried to deposit many commercial nickels that are on the market, with no success. We did deposit the nickel on the lacquer, but we found that the grain was too large. Consequently, we could not get a clean, undistorted record."

"We found a company from which to purchase a very fine nickel mesh, the nickel salt itself. We dissolve it into our own medium. The nickel solution is sprayed [instead of silver solution] and deposited on the lacquer. When it's put into the nickel plating bath, we

## Ni-Fi: The Nickel Approach

Ni-Fi's ease of implementation may appeal to those who seek the aura of premium quality without investing in new disk cutting technology...

to solulize some of the castor oil that the nitro-cellulose lacquer has on it. [Sulfanated castor oil is used in making the lacquer].

"Next, the lacquer is taken out, rinsed and put into a spray booth. A solution of stannous chloride is sprayed on the lacquer for ten to 15 seconds and then rinsed completely. This treatment tends to react with the silver [which will be sprayed on the lacquer in an aqueous solution] and bring it down as silver metal."

Just after the stannous chloride treatment comes the silvering, which is performed with a two-headed spray gun. "On one side of the head," Ellison explains, "is the silver solution and on the other is the reducing compound [which separates the non-metallic elements from the silver spray]. It mixes in the air, and when it hits the lacquer it deposits as pure metal."

The lacquer is then put into a plating bath containing nickel sulfamate, and the metal master is electroformed on its silvered surface. When separated from the lacquer, the metal master [a negative with modulated ridges cor-

get no pull at all because it's all in the nickel family. The nickel stays in the groove, so whatever is cut in mastering is exactly what you get."

Apart from its claimed improvement in audio fidelity, one aspect of Ni-Fi that might ease its acceptance by the industry is its closeness to the silvering process it was developed to replace. Ellison describes the similarities: "The cleaning of the lacquer master is still there, using the Wisk or the Liquinox. The next step is what we call the 'pre-treat.' This is the same as using stannous chloride, but ours has to be a different aqueous compound for reducing nickel. For the pre-treat you use a sensitizer gun, which everybody already has. [For depositing the nickel] you use the double headed spray gun. So, as far as equipment, there is absolutely no change at all. What we are doing is just substituting the nickel for the silver. The only thing they have to do with Ni-Fi is to work closer to the lacquer with the spray gun."

For the time being, Hal Chemical's main activity related to Ni-Fi will be the sale of materials it has developed and patented for the process. "We will be selling the aqueous nickel solution, a reducing compound and a pre-treat solution," says Ellison. "As of today, everything will be purchased from us directly. Six months or one year from now, we don't know. We've had people who are very interested in whether we want to sell the patent or sell the process outright. But as of today, we are not thinking about that."

Ellison estimates that the Ni-Fi process is currently in use at 13 metal parts facilities. Some prefer to remain unidentified for fear of possible client apprehension over the use of an unconventional method. But Ellison cites MFP Inc. and Ingram Records, both of Nashville, as examples of Ni-Fi's acceptance. "These two companies are the biggest in Tennessee, and they are turning out thousands and thousands of records a week. You'd be surprised how many people have said: 'What have you done to the record? It sounds so much better!' Ingram Records, for example, is so happy with it they are using it exclusively. He told clients about it after they asked what he was using, and now they specify in their orders 'Ni-Fi records only.'"

Ellison hopes eventually to extend awareness of his process beyond record industry insiders to the general buying public. "We're working awfully slow with it," he cautions, "because we want to make sure that everything is done right. When it is right, every jacket that has a Ni-Fi record in it will have a label on it specifying 'Ni-Fi Process'."

The use of labels to encourage consumers to differentiate between self-proclaimed high quality records and conventional product is reminiscent of Direct Metal Mastering. But while DMM proponents may be further advanced in their bid to capture the premium record market, Ellison seems quite unworried. "The reason we don't see it as a threat is this: When we walk into a plant that has all the equipment available that they have worked with using silver, and we come in with our Ni-Fi process, and they don't have to make any changes, and they find that the record, after it's pressed using good quality vinyl, has the same quality as DMM, why should they spend the money for DMM?"

Asked what effect Ni-Fi might have on the current record sales slump, Ellison is unhesitatingly positive: "That's precisely why we went into it. We feel that with this quality, it will be a shot in the arm for the vinyl record industry." Still in its infancy, Ni-Fi is currently far from achieving the kind of industry acceptance that could make Ellison's prediction a reality. Should more industry professionals have an opportunity to evaluate Ni-Fi's claims of improved fidelity, however, its ease of implementation may well give it great appeal to those who seek the aura of premium quality without investing in new disk cutting technology this late in the expected life span of the phonograph record.

...

In a move billed by Electro Sound of Sunnyvale, California, as "a major breakthrough in the spoken word duplication area" and a reflection of "heightened quality awareness," the Nightingale-Conant Corporation has invested "around \$300,000" in an Electro Sound 8000 Multi Master tape duplication system with ten slaves. The system, which includes Dolby HX Pro, triples the company's production capabilities to 90,000 units daily over three shifts. Nightingale-Conant is a leader in the \$100 million spoken word cassette industry, claiming nearly 30 percent of the market with its line of best selling books on tape.

...

Eastern Standard Productions Inc. has recently expanded the production capacity of its Real Time cassette duplication facility. Its newly acquired three head, three motor, dual capstan audiophile decks have been "specially modified sonically." ESP has also entered the video duplication field. Masters can be accommodated in the one-inch, 3/4-inch, Beta and VHS Hi fi formats. The service features color correction, time base correction and noise reduction systems. ■



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# ENGINEERING

## DEEP IN THE JOBS OF TEXAS

by Linda Johnson

In the following article, we could move on in the normal Studio Round-up fashion and tell you all about various recording studios and how they're holding up in this milieu we call the recording industry. But we decided to look beyond the various projects and the new equipment purchases and instead focus on the guys and gals behind it all who are turning the knobs, changing the reels, fiddling with wires, and generally just helping to maintain a sense of sanity in an environment that can be—and quite often is—insane.

We approached representatives from eight Texas studios and asked them where they find good engineers, and what criteria are involved in actually hiring one. Read on and discover what these facilities believe it takes to become a part of the sometimes exciting, occasionally dull, but always unpredictable music industry.

### Studio Southwest, Jimmy Wallace

"We really enjoy doing contemporary Christian work," says owner Jimmy Wallace of Studio Southwest in Sunnyvale, TX. And after three years in business, Wallace reports that contemporary Christian music continues to be his primary source of business. But with David Byrne of the Talking Heads recently working on his movie, *True Stories*, it is obvious that Studio Southwest is open to a variety of music projects.

*What are the criteria involved in hiring a new engineer?*

The main thing, besides technical abilities, is how he interacts with people. You can be the greatest engineer in the world, but if you have no "bed-side manner," and don't make the client comfortable, then the client may never come back to your studio. It's an emotional, personal thing to record music, so the client has got to be at ease with the surroundings. For instance, when someone like David Byrne comes in, you can't be jumping all over him, nagging him. In other words, they just want to be treated like people too. And David got along really well with our engineer Mike McClaine, which I think was a factor in his recording here.

*How would you go about actually bringing someone new onto your staff?*

If I were to pick up an engineer off the street, I'd look at his resume, see what his background was, and I'd listen to his demo tape. I'd then have him come in and second on a session, and then get an opinion from the other engineer on how the new guy handled



*Studio Southwest, Dallas, was used by Talking Head David Byrne, back left, for the bulk of the Dallas recording for his movie True Stories. Mike McClaine, foreground, was the engineer. At right is Steve Jordan, an accordion player from Bandera, TX who has a part in the movie. Byrne says: "Studio Southwest is as good a studio as anywhere I've ever worked; it's top notch. And McClaine was a very versatile engineer; he could handle anything from a pedal steel sound to a children's chorus."*

himself; what his attitude was like. If I was really considering hiring him, I'd bring him in to be the primary engineer on a session. Mainly, I just want to watch how he works.

What it all really boils down to is can they use what they know? It's kind of like a musician: he can know every lick in the world, but if he doesn't have

the *feel* for how to play, then he's useless. So with these new engineers—the ones who *do* have all the technical expertise—it's mainly knowing when to open their mouths and when to keep it shut. They've got to have a lot of common sense. There are a million engineers, but there are only a few who have the common sense, the technical background, the musical background and who can just deal with people. An engineer has to be kind of chameleon-like.

*What advice can you give to engineers out there looking for work?*

Get as much technical expertise as you can. One way to get that technical expertise is to get a gig with one of the live sound companies. Any experi-

ence you can get doing live sound or recording is really important.

### Rivendell Recorders, Chuck Sugar

Material ranging from contemporary Christian music to the tunes of B.B. King, Sammy Hagar and Ray Charles keeps everyone down at Pasadena's Rivendell Recorders busy. Studio manager Chuck Sugar reports that the eight-year-old facility plans to continue with various album projects, as well as expand into the jingle market a bit more.

*If you were going to hire an engineer, what qualities would you look for?*

Someone with a good attitude and good sounding product. I'm personally looking for people who are great people to begin with and have the potential to be an engineer. Then we can teach them whatever they need to know. A college education is not



that big of a deal. I'd rather have someone who's been doing sessions with people in the studio for the last five years.

*What would an engineer have to present to you in hopes of getting hired?* He'd have to bring me a great sounding demo tape and a resume with some people I can call and talk to. And basically, they should just have some experience that I can hear on the tape. Usually you can just tell within 15 to 20 minutes of sitting there explaining the board to them how much they know and have done. I need someone who can come in and know what they're doing. Still, if there's someone eager to learn, I'll spend the time with them if I feel it's going to be worth it.

*Where do you start out new engineers?* I put them in the studio with some old tape and let them mess with the board, and just spend time with them. Usually I have the engineers spend time doing sessions with each other to see if they are compatible.

*How do you maintain good quality in the performance of your engineers?* Personality has a lot to do with it. They have to have the ability to work well with the client and to keep the reputation of the studio friendly and helpful. Usually my clients will tell me if they're satisfied or not. A lot of times I'll sit in and screen sessions because the interaction with people is as important as the sounds being recorded.

### **Digital Services, John Moran**

In May, Digital Services in Houston relocated to a larger facility four blocks from its previous location. Owner John Moran says that the move was necessary to accommodate the arsenal of digital gear his studio has to offer. Some recent projects at Digital Services included a film soundtrack for *For All Mankind* done by Brian Eno and Joe Ely, an LP for Willie Nelson, and a video for Carl Lewis, which was produced by Quincy Jones. With the soundtrack credit for *Stop Making Sense* under his belt, Moran says that he plans to further expand into audio-for-video and film.

*Where do you look for new engineers?* God, right now they're coming to us in droves. There are a lot of people looking to locate in Texas. I've had several very good people get in touch

with us, and I'm very happy to talk to them.

*What qualities do you look for in those people?*

The first thing I like to see in an engineer is a decent amount of live experience. I want studio experience too, but live is so important because you get pressures that you wouldn't get in the studio. In a live situation, if it's not happening *right now*, you're dead, and the show is down the tube. Being able to be intuitive to the needs inherent in these kinds of situations is something live engineers learn or they don't survive.

*How often do you hire new engineers?*

Right now, I have three on staff and a growing roster of people on call. So in terms of picking up new engineers, I want people on an independent basis, an on-call type of situation. I want to be able to tailor things to the client. I'm looking for engineers with specific areas of expertise. I want someone who is good at, say, black funk. Conversely, I've got different engineers for classical sessions. I want to fill in the holes to serve different markets.

*What's your advice to engineers looking for work?*

I wish I could tell them the job prospects are great, but the biggest problem in finding a job is there are so many people out there who want to do this.

Tenacity really counts. If you hang in there and are really good at what you do, sooner or later you'll end up with some ringer gigs that you'll remember for the rest of your life.

### **El Adobe Recording, Robert Hernandez**

Though perhaps not part of the

"who's hip" buzz in the L.A. or N.Y. recording scene, El Adobe Recording in El Paso, TX is successful in its own right. With several gold albums by international superstar Juan Gabriel to its name, the eight-year-old studio has obviously found a niche of its own in the Latin music market. But chief engineer Robert Hernandez is quick to note that he's open to recording music of all types at the huge, fort-like facility. "We've got tons of room here!" he says.

*What do you look for in a new engineer?*

Actually, we haven't really hired any engineers! I do it all pretty much myself. I've got one guy in here with me. He's young, he's real eager, and he's willing to learn. He took a few courses in college, but mainly he's just a young kid with a good ear, and he learns quickly.

*Where'd you start him out?*

I just put him on the board to see how he'd respond, and he did very well. I don't like to treat him like my second. He's just another engineer like me—I respect that. We work as a team. He's been here a year now.

*What convinced you to keep him on?*

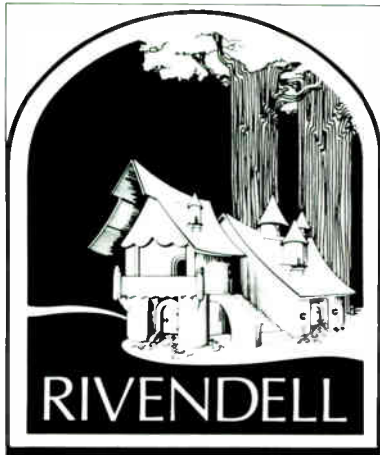
Heart. He's really got heart. He gets into the projects and he makes the clients feel good. He's a trumpet player so he reads well and has a good ear. And he's enthusiastic. We picked up a new 224XL, and he read the manual even before I got to it.

*What makes an engineer good?*

I have mixed emotions on that. School is very important because of the digital technology coming in, and I even think I should go back to school for that. My advice would be to go to



*Omega's interns have the opportunity to work on remote recording projects in the company's 24-/46-track remote facility.*



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school first and then get your experience, but man, it's hard.

### **Martin Recording Studios, Scott Martin**

Another successful facility in El Paso is Martin Recording Studios, where owner Scott Martin says an abundance of advertising and LP work is keeping them on their toes. Now in his ninth year of business, Martin says he'd like to start bringing in more audio-for-video projects, noting that his 24-track room was specifically designed for such work. Recent visitors at the studio included the Fabulous Thunderbirds, John Brannon, and Bucky Allred.

*Where do you find good engineers?*  
We usually train them. Occasionally someone will come in who has lots of experience, but normally we just find someone who is really interested in it, and we let them hang around for a while to see if they catch on and have a good ear.

*What if someone had musical and technical knowledge, but absolutely no college training in engineering?*  
I'm a college drop-out myself! And I've had people come in with a college degree who didn't know anything.

*Where do you start out new engineers?*  
We send them out with our established crews as a helper: running cords, placing mics, EQ-ing stuff, putting leader in between cuts, taking the trash out, getting burgers, and just hanging around to get the feel of studio work and to learn how to interact with clients. A large majority of the job is just getting along and making the clients feel relaxed.

*Once an engineer is hired, what makes you really believe in his work?*  
I like to get people who are more interested in the final product than just punching the clock and taking the paycheck home. They should be willing to put in extra hours, stay all night and not worry about missing dinner with their girlfriend. I go for the people who have a lot of pride in their work, and they don't care how long it takes to get it right, as long as they get it right.

### **Dallas Sound Labs, Johnny Marshall**

What do Phil Collins, B.B. King, Miami Vice and Stevie Ray Vaughn have in common? All were recently in at Dallas Sound Labs for one reason or another, be it for video/film post-production, an album project, or a Frito Lay commercial. Needless to say, Dal-

las Sound Labs is doing just fine, and studio manager Johnny Marshall says that they plan to continue on with lots more film and video work. In May, a full-blown Synclavier system was installed to cater to such projects.

*What do you look for in an engineer?*  
A big consideration for the next engineer we hire will be getting someone who has interlock experience. There seems to be an abundance of engineers who have just straight audio recording experience, but there's a lack of engineers with interlock knowledge. If I was an engineer trying to get work, that's what I'd be concentrating on. And since you're dealing with computer-oriented interlock systems, computer knowledge is very helpful.

*Where do you expect to find people with this sort of experience?*  
Well, that's the big problem. Like the cart before the horse, it's hard for an engineer with no interlock experience to gain interlock experience. A lot of times—at least at our facility—when an outside engineer comes in to work on a TV project or whatever, he invariably has to hire one of our engineers to run the interlock system. So the difficult thing is, how do you gain experience?

*Would you be willing to train people?*  
That's a difficult situation. It depends on the individual. There are certain benefits to training somebody from the ground up. One of the assistants we now have on staff we trained from the ground up. The first six months were a bit frustrating. Now, two years later, he's an excellent assistant engineer.

*Where do you start out new engineers?*  
Assisting our staff, where they can't get into any trouble. We put them with our own staff so that any frustration is only amongst our own people.

*What tasks would the new engineer be assigned?*  
The main duties of the assistant would be session setup and session teardown, and catering to the client in between. From there, they'd progress into getting to know the board, start getting transfer responsibilities, eventually moving to simple 2-track voiceover work, and then into multi-track. They've got to be real proficient before we'll throw them in with an outside client.

*How long does the training go on?*  
Forever! In this field, training never stops. With technology progressing as fast as it does, the learning process for

—CONTINUED ON PAGE 177



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# SOUTHWEST

## STUDIO DIRECTORY



The information in the following listings section was supplied by those listed. *Mix* claims no responsibility for the accuracy of this information. People and equipment change, so please verify critical information with the studios.

Rivendell Recorders, of Pasadena, Texas, has attracted a large following of top contemporary Christian artists over the past few years, including Petra, Farrell & Farrell, and Joe English, as well as secular bookings with performers ranging from Air Supply to Ray Charles. The studio features an automated Trident Series 80 32x24 console, Studer A80 Mk III 24-track, UREI 813 monitors, and a selection of vintage tube microphones. Photo by: Charles McGrath

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156	24+ TRACK STUDIOS

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

#### Upcoming Directory Deadlines:

North Central/Canadian Studios: **July 7, 1986**

New Products Directory: **August 1, 1986**

Mastering, Pressing and Tape Duplication: **September 3, 1986**

Northwest/Hawaiian Studios: **October 1, 1986**

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The **2nd Annual Technical Excellence & Creativity Awards** are underway! The awards process began with the publication of the Nomination Ballot in the April issue of *Mix*, and will culminate with the TEC Awards Celebration in Los Angeles, CA in November, 1986 (during the AES Convention).

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## WHAT ARE THE **TEC** AWARDS?

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The TEC Awards were established in 1985 by the publishers of *Mix*, to honor both outstanding achievement in audio/music technology and creative excellence in recording and sound production. TEC Awards are given in three major categories and 20 sub-categories. Their purpose is to recognize the technical innovations and behind-the-scenes contributors—as nominated and voted upon by the subscribers of *Mix*—who make the modern music and sound experience possible.

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## WHO BENEFITS FROM THE **TECs**?

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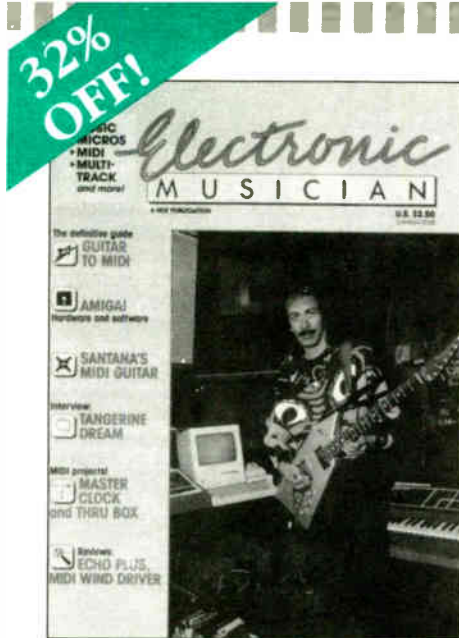
The TEC Awards are special, not only because of their uniqueness, but because *all* the proceeds from ticket sales of the Awards Celebration are donated to three worthy causes: the House Ear Institute, which conducts research into the causes and cure of deafness and hearing impairment; the scholarship fund of the Audio Engineering Society; and the winner of the TEC Award in the category of Recording School of the Year, to assist in the education of a deserving student.

For more information on the TEC Awards, tickets to the Awards Celebration, or advertising in the TEC Program Guide (closing August 15th), please call *Mix* Publications at (415) 843-7901. If you're a *Mix* subscriber, watch for the Voting Ballot in the August issue.

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- YES!** Send me 12 issues of **Electronic Musician** for just \$14.95.
- Save me more!** Send me two years (24 issues) for only \$27.95.
- Bill me     Payment enclosed  
(Outside U.S. add \$10/year)

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

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off the ~~\$22~~ basic rate

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Name \_\_\_\_\_

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City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

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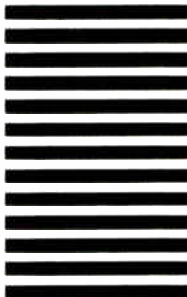
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# SOUTHWEST



# 4 & 8 TRACK

[8] **ABALONE STUDIO**  
2217C Michigan, Arlington, TX 76013  
(817) 277-1617  
Owner: Billy Herzog  
Studio Manager: Billy Herzog

[8] **ACCUTRAK**  
2614 Aspen N.W., Albuquerque, NM 87104  
(505) 247-1001  
Owner: Doug Clifton  
Studio Manager: Doug Clifton

[4] **AD DALLAS, INCORPORATED**  
912 Sleepy Hollow, Cedar Hill, TX 75104  
(214) 291-2886  
Owner: R.E. Gain  
Studio Manager: Humble Billy Hayes

[8] **ALLNIGHT RECORDS**  
*also REMOTE RECORDING*  
208½ N. Washington, Eldorado, AR 71730  
(501) 862-0731  
Owner: David Feinberg  
Studio Manager: David Feinberg

[4] **ALTIM PROFESSIONAL SERVICES**  
*also REMOTE RECORDING*  
P.O. Box 330271, Ft. Worth, TX 76163  
(817) 346-1012  
Owner: Tim Hood  
Studio Manager: Larry Brownfield

[8] **ALVERA**  
*also REMOTE RECORDING*  
402 S. Broadway, Skiatook, OK 74070  
(918) 396-1333  
Owner: Al Clauser  
Studio Manager: Al Clauser

[8] **ARARAT SOUND PRODUCTIONS**  
*also REMOTE RECORDING*  
13206 Joliet, Houston, TX 77015  
(713) 455-2576  
Owner: David Forbus  
Studio Manager: David Forbus

[8] **ARTRONIX**  
*only REMOTE RECORDING*  
7544 N. 28th Dr., Phoenix, AZ 85051  
(602) 864-9761  
Owner: Darrell Demarco  
Studio Manager: Darrell Demarco

[8] **ATTIC STUDIOS**  
Star Route Box 87, Clovis, NM 88101  
(505) 763-5663  
Owner: Gary L. Martin  
Studio Manager: Katy Jones

[8] **AUDIO CONCEPTS RECORDING COMPANY**  
P.O. Box 1206, Elk City, OK 73644  
(405) 243-0557  
Owner: Gregory D. and June Pendleton  
Studio Manager: Gregory D. Pendleton

[8] **AUDIO-TECH**  
*also REMOTE RECORDING*  
1708 Central S.E., Albuquerque, NM 87106  
(505) 842-5989  
Owner: Doug Blakely  
Studio Manager: Doug Blakely

[4] **AUDIO GENICS**  
*also REMOTE RECORDING*  
Box 141325, Dallas, TX 75214  
(214) 634-2024  
Owner: Rick Peeples  
Studio Manager: Rick Peeples

[8] **AUDIOVISUAL CENTER SOUND STUDIO**  
*also REMOTE RECORDING*  
Oklahoma State University, Stillwater, OK 74078  
(405) 624-7236  
Owner: Oklahoma State University  
Studio Manager: Jerry D. Harris

[8] **AUSTIN CUSTOM RECORDING**  
*also REMOTE RECORDING*  
4922 Burnet Rd., Austin, TX 78756  
(512) 452-6441, 452-5050  
Owner: Scott Ross  
Studio Manager: Scott Ross

[8] **AVALON SOUND RECORDING STUDIO**  
314 Valley Ridge Dr., P.O. Box 2691, Ft. Worth TX 76113  
(817) 483-4722  
Owner: David Hughes  
Studio Manager: David Hughes

[8] **AYER PLAY RECORDING & PRODUCTION**  
131 E. 57 St., Tulsa, OK 74105  
(918) 749-9225  
Owner: Chuck Ayers  
Studio Manager: Chuck Ayers

[8] **BAND FACTORY**  
*also REMOTE RECORDING*  
1414 W. Rosedale, Ft. Worth, TX 76104  
(817) 877-3391  
Owner: Edward R. Stradley  
Studio Manager: Edward R. Stradley

[8] **BILINGUAL JINGLES REC. STUDIO**  
5604 Drake N.W., Albuquerque, NM 87114  
(505) 898-6761  
Owner: Fred & Tere Baca  
Studio Manager: Fred & Tere Baca

[8] **BOSS MOSS PRODUCTIONS**  
1720 W. Clarendon, Phoenix, AZ 85015  
(602) 279-4160  
Owner: Tom Mossburg  
Studio Manager: Rande Mossburg

[8] **BPL'S BANJO BRASS STUDIO**  
*also REMOTE RECORDING*  
8088 N. 15th Ave., Phoenix, AZ 85021  
(602) 870-0351  
Owner: Bruce P. Leland  
Studio Manager: Bruce P. Leland

[4] **BRANDY/SWANN PRODUCTIONS**  
*also REMOTE RECORDING*  
2609 River Hills Circle Ste. 1515, Arlington, TX 76006  
(817) 461-1691  
Owner: Randy D. Bryant  
Studio Manager: Randy D. Bryant

[8] **BROOKSHIRE SOUND**  
3839 Maple, Odessa, TX 79762  
(915) 362-8777  
Owner: Gary Brookshire  
Studio Manager: Gary Brookshire

[8] **BUNS-UP STUDIO**  
*also REMOTE RECORDING*  
Box 2393, Page, AZ 86040  
(602) 645-9300  
Owner: Jerry Edwards  
Studio Manager: Jerry Edwards

[8] **CALVARY RECORDINGS**  
Rt. 1 Box 11, Weslaco, TX 78596  
Owner: Enrique Garza  
Studio Manager: Elias Garza

[8] **CARUMBO RECORDING**  
1301 Magnolia St., Norman, OK 73072  
(405) 329-1765  
Owner: Michael McCarty  
Studio Manager: Michael McCarty

[8] **CEDAR CREST STUDIO**  
*also REMOTE RECORDING*  
P.O. Box 28, Mountain Home, AR 72653  
(501) 425-9377  
Owner: Bob Ketchum  
Studio Manager: Susan Ketchum

[8] **CENTER STAGE PRODUCTIONS**  
*also REMOTE RECORDING*  
301 Linda, Burleson, TX 76028  
(817) 295-7654  
Owner: Wes and Debra Redden  
Studio Manager: Wes Redden

[8] **CHANNEL 8**  
15350 Peachmeadow, Channelview, TX 77530  
(713) 452-7477  
Owner: Noris Enterprises  
Studio Manager: Bulord Nons

[8] **CHATEAU PRODUCTIONS**  
P.O. Box 13802, Arlington, TX 76013  
(817) 261-5097  
Owner: Jeff G. Peters

[8] **CREATIVE AUDIO PRODUCTIONS**  
326 Santa Isabel Blvd., Laguna Vista  
Port Isabel, TX 78578  
(512) 943-6278  
Owner: Ben McCampbell  
Studio Manager: Ben McCampbell

[8] CRYSTAL RECORDING STUDIOS  
P.O. Box 733 #19 Tanglewood, Bryant, AR 72022  
(501) 847-8215  
Owner: Ray Brooks  
Studio Manager: Ray Brooks

[8] THE DEMO STUDIO  
555 Cicero, San Antonio, TX 78218  
(512) 656-1382  
Owner: Jim Waller  
Studio Manager: Jim Waller

[8] DINOSAUR TRACKS  
*also REMOTE RECORDING*  
Rt. 4 Box 706, Flagstaff, AZ 86001  
(602) 774-0474  
Owner: Dan Costello

[8] EAR LEVEL RECORDING  
14214 N. 42nd Ave., Phoenix, AZ 85023  
(602) 978-3234  
Owner: Kyle Earle  
Studio Manager: Kyle Earle and Ric Robertson

[8] EIGHTRAX  
*also REMOTE RECORDING*  
1441 E. Edgemont, Phoenix, AZ 85006  
(602) 266-5513  
Owner: Sam Esparza  
Studio Manager: Sam Esparza

[4] FIMECO STUDIOS  
*also REMOTE RECORDING*  
P.O. 43543, Tucson, AZ 85733  
(602) 881-2073  
Owner: Jeff Robins  
Studio Manager: Jeff Robins

[8] FIRST VIDEO PRODUCTIONS  
*also REMOTE RECORDING*  
4235 Centergate, San Antonio, TX 78217  
(512) 655-1111  
Owner: Odey Crabtree  
Studio Manager: Manuel Corales

[8] FOXFIRE STUDIOS  
1220 Cedarbrook, Lancaster, TX 75146  
(214) 227-2727  
Owner: Keith Croxton  
Studio Manager: Dennis Armstrong

[4] G & E STUDIOS  
2901 Tower Dr., Marshall, TX 75670  
(214) 938-2081  
Owner: Eddie Hobbs  
Studio Manager: Eddie Hobbs

[8] G.O.D.T.E.L. PRODUCTIONS (GP STUDIO)  
*also REMOTE RECORDING*  
330 E. Main St., P.O. Box 604, Nacogdoches, TX 75963  
(409) 560-4282  
Owner: Brother June Gentry  
Studio Manager: Rick Smith

[4] GOLD LENA SOUND PRODUCTION  
*also REMOTE RECORDING*  
P.O. Box 555, Monticello, AR 71655  
(501) 367-2630  
Owner: Jimmy D. Orrell, Don Orrell  
Studio Manager: Jimmy D. Orrell, Don Orrell

[8] GOOD SOUND SERVICES  
*also REMOTE RECORDING*  
8918 Bissonnet St. Ste. 406, Houston, TX 77074  
(713) 988-5750  
Owner: Alan W. Clarke  
Studio Manager: Alan W. Clarke

[8] BOB GREEN PRODUCTIONS, INC.  
*also REMOTE RECORDING*  
7950 Westglen, Houston, TX 77063  
(713) 977-1334  
Owner: Bob Green  
Studio Manager: Marilyn Fee

[8] HEADROOM AUDIO PRODUCTIONS  
*only REMOTE RECORDING*  
1710 E. Missouri St., Tucson, AZ 85714  
(602) 889-4759  
Owner: R.D. McIntyre  
Studio Manager: R.D. McIntyre

[8] HEAVENLY SOUND PRODUCTIONS  
*also REMOTE RECORDING*  
3300 W. Camelback Rd. Ste. 252, Phoenix, AZ 85061  
(602) 973-9941  
Owner: Rex Myers  
Studio Manager: Rex Myers

[8] HIDDEN FOREST STUDIOS  
*also REMOTE RECORDING*  
421 Hidden Forest North, Longview, TX 75605  
(214) 663-1817  
Owner: Gary and Pam Boren  
Studio Manager: Gary Boren

[8] HIS PLACE RECORDING STUDIO  
9301 Meldrum, Houston, TX 77075  
(713) 946-6690  
Owner: Bruce Cole  
Studio Manager: Bruce Cole

[4] HORIZON STUDIOS  
*also REMOTE RECORDING*  
1913 W. Easton Pl., Tulsa, OK 74127  
(918) 587-7522, 749-4155  
Owner: Larry Baker and Ray Shank  
Studio Manager: Larry Baker and Ray Shank

[8] JIHAD STUDIOS/IDA PRODUCTIONS  
*also REMOTE RECORDING*  
419 Willard Ste. 2, Houston, TX 77006  
(713) 529-0039  
Owner: Harry Leverette  
Studio Manager: Harry Leverette

[2] JR PRODUCTIONS  
Ste G-7 2551 S. Texas Ave., College Station, TX 77840  
(409) 696-8822  
Owner: Jeff Cowan  
Studio Manager: Jeff Cowan

[8] JUNIPER PRODUCTIONS  
2726 E. Juniper, Phoenix, AZ 85032  
(602) 867-7354  
Owner: John Benson  
Studio Manager: John Benson

[8] JUS-FRESH STUDIO  
1106 Brenford, Houston, TX 77047  
(713) 433-1276  
Owner: Clay V. James  
Studio Manager: Dell Thomas

[2] KASK-FM  
*also REMOTE RECORDING*  
120 1st National Tower, Las Cruces, NM 88001  
(505) 522-8829  
Owner: Doug Matthews  
Studio Manager: Lisa Hardesty

[4] KBE/FIREHAZARD  
*also REMOTE RECORDING*  
5800 Eubank Blvd. N.E. Ste 2533  
Albuquerque, NM 87111  
(505) 292-3225  
Owner: Karl Baehr  
Studio Manager: Karl Baehr

[8] KKBQ RADIO  
11 Greenway Plaza Ste. 2022, Houston, TX 77046  
(713) 961-0093  
Owner: Gannett Broadcasting of Texas  
Studio Manager: Christopher Jensen

[4] KPLX-KLIF  
411 Ryan Plaza Dr., Arlington, TX 76011  
(817) 461-0995  
Owner: Susquehanna Broadcasting  
Studio Manager: Norman Philips

[8] LAMBCHOPS  
*also REMOTE RECORDING*  
323 W. McDowell, Phoenix, AZ 85003  
(602) 254-3849  
Owner: Rick Lamb  
Studio Manager: Shelley Standing

[8] LAZER PRODUCTIONS  
2518 Rolling Hills Dr., Greenville, TX 75401  
(214) 454-7334

Owner: Sam Loy  
Studio Manager: Sam Loy  
Engineers: Sam Loy, Jim McMeans.  
Dimensions of Studios: 16 x 20.  
Dimensions of Control Rooms: 16 x 20.  
Tape Recorders: Tascam Model 38, 8-track; Tascam Model 32, 2-track; Nakamichi MR-1, cassette.  
Mixing Consoles: Tascam M-308, 8 x 4 x 2; various submixers.  
Monitor Amplifiers: Crown MT-600.  
Monitor Speakers: UREI 809 Time Aligned.  
Echo, Reverb & Delay Systems: Lexicon PCM70, Lexicon PCM41, ST Sound REV-2, Roland SDE-1000.  
Other Outboard Equipment: LT Sound comp/limit/exp. CLX-2, LT Sound parametric EQ, IBM PC, Tascam MH-40, DX-40 NR, Pro-Co Direct, (3) PB-32, Crown PH-4.  
Microphones: Toa K-4, (2) E-V PL20, (2) Audio-Technica ATM-11, Beyer M-500, Shure SM57, PZM 31S.  
Instruments Available: LinnDrum, Roland TR-909, Roland JX-3P, Tobias Signature bass, Gallien Krueger 400 RB, Fender Equire Strat, Yamaha classical, Ibanez AS2000, Dean Markley Signature L20, Baldwin Acrosonic.  
Video Equipment & Services: 3/4-inch Panasonic NV 9500 editor/recorder, JVC KY2000 color video camera, Sony Trinitron monitor, Sony SL-HF550 Beta, Canon VR-HF600 VHS.  
Rates: \$25 to \$65, depending on project.

[8] LONG CANYON SOUND  
7415 Long Canyon Tr., Dallas, TX 75249  
(214) 298-2973  
Owner: Ron Walthall  
Studio Manager: Ron Walthall

[8] MASTER-TRAK RECORDING STUDIO  
*also REMOTE RECORDING*  
220 N. Muskogee Ave., Tahlequah, OK 74464  
(918) 456-3221  
Owner: Bob Martin, Glenn Stepp  
Studio Manager: Bob Martin

[4] MEDIA SERVICES VIDEO/AUDIO STUDIO  
Southwest Texas State University  
San Marcos, TX 78666  
(512) 245-2398  
Owner: Southwest Texas State University  
Studio Manager: Bill Jennings

[8] MEDIA SOUND  
*also REMOTE RECORDING*  
6448 Hwy. 290 E. Ste. D-109, Austin, TX 78723  
Owner: Glenn Wolte

[8] MIX MEDIA PRODUCTIONS  
7628 Mabelvale Dike, Little Rock, AR 72209  
(501) 565-5632  
Owner: Joe Gillespie, Randy Gillespie  
Studio Manager: Joe Gillespie

[8] MONKEY ISLAND RECORDING  
*also REMOTE RECORDING*  
Rt. 3 Box 1625, Afton, OK 74331  
(918) 257-5842, 257-4763  
Owner: Ace and Carolyn Moreland  
Studio Manager: Ace Moreland

[8] MUSIC LANE RECORDING  
*also REMOTE RECORDING*  
Austin Opera House, P.O. Box 3829, Austin, TX 78764  
(512) 447-3988  
Owner: Wayne Gathright  
Studio Manager: Wayne Gathright

[4] THE MUSIK FACTORY  
1812 Procter St., Port Arthur, TX 77640  
(409) 982-7121  
Owner: Lois & Floyd Badeaux  
Studio Manager: Floyd Badeaux

[4] NESMAN STUDIOS  
*also REMOTE RECORDING*  
3108 York Ave., Wichita Falls, TX 76309  
(817) 696-1629  
Owner: Lewis Nesman  
Studio Manager: Sally Nesman

[8] NESTONE STUDIO  
6801 N. 30th Dr., Phoenix, AZ 85017  
(602) 433-2923  
Owner: Joe "Crow" Corrao  
Studio Manager: Joe "Crow" Corrao

[8] NORWEGIAN WOOD STUDIOS  
also REMOTE RECORDING  
P.O. Box 110, Arroyo Seco, NM 87514  
(505) 776-8242  
Owner: Morten Nilssen  
Studio Manager: Morten Nilssen

[8] O B STUDIOS  
also REMOTE RECORDING  
5932 N. Grove, Oklahoma City, OK 73122  
(405) 721-3727  
Owner: Larry G. O'Rear  
Studio Manager: Larry G. O'Rear

[8] OAKRIDGE MUSIC RECORDING SERVICE  
2001 Elton Rd., Haltom City, Ft. Worth, TX 76117  
(817) 838-8001  
Owner: Homer Sewell  
Studio Manager: Homer Sewell

[4] ON-SITE RECORDING  
also REMOTE RECORDING  
1555-B Latrium Pl., Arlington, TX 76010  
(817) 275-4253  
Owner: Gary D. Ballard  
Studio Manager: Gary D. Ballard

[8] OPUS ONE  
only REMOTE RECORDING  
Box 3341, Fayetteville, AR 72702  
(501) 521-OPUS  
Owner: Richard Rew  
Studio Manager: Kim Martin

[8] ORANGEWOOD RECORDING  
2626 N. Horne, Mesa, AZ 85203  
(602) 835-7605  
Owner: Morris Coleman  
Studio Manager: Mike Coleman

[8] PARALLEL IMAGES LTD.  
also REMOTE RECORDING  
15215 Berry Trail #706, Dallas, TX 75248  
(214) 490-3613  
Owner: John L. Hurd  
Studio Manager: John L. Hurd

[8] PARHAM SOUND STUDIO  
Rt. 3 Box 243-B, Stephenville, TX 76401  
(817) 965-4132  
Owner: Carroll Parham  
Studio Manager: Carroll Parham

[8] PARROT TRACKS STUDIO  
5201 Meadow Creek Dr., Austin, TX 78745  
(512) 441-4314  
Owner: George Coyne  
Studio Manager: George Coyne

[8] PEAK RECORDING STUDIO  
42 Caddo Peak, Joshua, TX 76058  
(817) 645-8385  
Owner: Yvonne Mann  
Studio Manager: Gary Mann

[4] PHANTOM PRODUCTIONS/HSC  
also REMOTE RECORDING  
P.O. Box 4870, Austin, TX 78765  
(512) 288-1044  
Owner: Martin Theophilus  
Studio Manager: Chris Theophilus

[8] PLA-BACK RECORDING  
2404 Salerno Dr., Dallas, TX 75224  
(214) 942-1387  
Owner: Lew Blackburn  
Studio Manager: Lew Blackburn

[8] PLANET DALLAS STUDIO  
3515 Dickason, Dallas, TX 75219  
(214) 521-2216  
Owner: Richard B. Rooney  
Studio Manager: Leesa R. Bowman  
Engineers: Rick Rooney, Leesa Bowman  
Dimensions of Studios: Two rooms 20 x 20  
Dimensions of Control Rooms: 10 x 20  
Tape Recorders: Tascam 38, 8-track; Tascam 32, 2-track;  
Tascam 42, 2-track; Tascam (2) 122, cassette decks  
Mixing Consoles: Yamaha RM1608 16 x 8  
Monitor Amplifiers: Yamaha PC2002, Crown DC300A,  
Nikko Alpha 130  
Monitor Speakers: Altec 604-Es, Auratones  
Echo, Reverb & Delay Systems: Yamaha REV7 reverb,  
Lexicon PCM60 digital reverb, Lexicon Prime Time, Delta-  
Lab DL-4 DDL  
Other Outboard Equipment: Orban 622B stereo para-  
metric EQ, Biamp 210 stereo EQ, Dietz parametric EQ,  
UREI 1176LN compressor limiters, Dyna-Mite Valley Peo-  
ple stereo noise gates, dbx 160X compressor/limiter, Tas-  
cam DX40 noise reduction  
Microphones: Neumann 87, Sennheiser 421, Sennheiser  
441, AKG 414, AKG C460B, AKG D-12E, Beyers 500,  
Shure SM57, E-V DS-35  
Instruments Available: Baldwin Acrosound piano, Ya-

# SOUTHWEST



## 4 & 8 TRACK

maha Recording Series 8-piece drum set w/ cymbals and snare, Oberheim DMX drum machine, Simmons SDS7 electronic drums, Rockman X100 guitar preamp.  
Rates: \$25/hr.

[8] PM SOUND PRODUCTIONS  
also REMOTE RECORDING  
Rt. 5 Box 612, Orange, TX 77630  
(409) 886-3891  
Owner: Ben Meadows, Jerry Parris  
Studio Manager: Jerry Parris

[8] POSTING BROTHERS STUDIOS  
6800 Gateway E. #5, El Paso, TX 79915  
(915) 775-1401  
Owner: P. Newell and B. Mayfield  
Studio Manager: John A. Weitz

[4] PRESIDIO FILM GROUP  
only REMOTE RECORDING  
P.O. Box 27790, Tucson, AZ 85726  
(602) 884-6976  
Owner: David Wing  
Studio Manager: Cynthia Wing

[4] THE PRODUCERS STUDIO  
also REMOTE RECORDING  
1909 Abrams Parkway, Dallas, TX 75214  
(214) 823-7137  
Owner: Dave Yonley  
Studio Manager: Dave Yonley

[8] THE PRODUCTION CO  
also REMOTE RECORDING  
510 N. Mt. Olive, Siloam Springs, AR 72761  
(501) 524-4626  
Owner: Ken Flory  
Studio Manager: Ken Flory

[8] R. HAMP STUDIO & LOST PERSON PROD.  
also REMOTE RECORDING  
2102 Bayou Dr., Lake Jackson, TX 77566  
(409) 798-5462  
Owner: Gregory Richard Leach  
Studio Manager: Chuck Balczco and Cory Heckler

[8] RAGUSE RECORDING CO.  
(EVOLUTION STUDIO)  
Box 470507, Tulsa, OK 74147  
(918) 250-9749  
Owner: Craig and JoAnn Raguse  
Studio Manager: JoAnn Raguse

[8] REED STREET STUDIO  
also REMOTE RECORDING  
6707 Willamette Dr., Austin, TX 78723  
(512) 926-6222  
Owner: Kenneth Epstein  
Studio Manager: Kenneth Epstein

[8] ROCK CLIFF AUDIO  
2764 Ivandell, Dallas, TX 75211  
(214) 337-0227  
Owner: Michael Andrew  
Studio Manager: Michael Andrew

[8] R.O.K. STUDIO  
also REMOTE RECORDING  
Rt. 1 Box 144G, Gladewater, TX 75647  
(214) 984-4146  
Owner: Dennis McDonald  
Studio Manager: Ken Tolbert, J.R. Johnson

[8] J. ROX RECORDING STUDIO  
1407 E. Golfcourse Rd., Midland, TX 79705  
(915) 685-0675  
Owner: Siningo Ray aka Sidney C. Jackson  
Studio Manager: Mr. J.

[8] SALT RECORDING  
P.O. Box 3041, McAllen, TX 78502  
(512) 631-9170  
Owner: Micriel  
Studio Manager: Sonny Salinas

[8] SCRATCH AN SNIFF STUDIO  
also REMOTE RECORDING  
200 Timbercreek Ste. 705, Richwood, TX 77531  
(409) 265-1127  
Owner: Chas. F. Balczco  
Studio Manager: Chas. F. Balczco, Cory Heckler, Greg Leach

[8] SEASHELL SOUND STUDIOS  
Tempe, AZ 85283  
(602) 820-8413  
Owner: Karl Miller  
Studio Manager: Karl Miller

[4] SELLERS COMPANY  
Box 1087, Van Alstyne, TX 75095  
(214) 482-5110  
Owner: Jack Sellers  
Studio Manager: Jack Sellers

[8] DAN SESSIONS PRODUCTIONS, INC.  
also REMOTE RECORDING  
202 Knox St. Ste. D, Houston, TX 77007  
(713) 863-0056  
Owner: Dan Sessions  
Studio Manager: Dan Sessions

[4] SNOWBIRD JUNCTION RECORDING STUDIO  
only REMOTE RECORDING  
4423 N. 23rd Ave. #A, Phoenix, AZ 85015  
(602) 265-6663  
Owner: Mike and Tina Craig  
Studio Manager: Mike Craig

[8] SOUND CUBE STUDIOS  
401 Willow Dr., Converse, TX 78109  
(512) 658-4172  
Owner: Ronald Thomas  
Studio Manager: Ronald Thomas, Jeff Gesch

[4] SOUND IDEA PRODUCTIONS  
also REMOTE RECORDING  
1620 W. Surrey, Phoenix, AZ 85029  
(602) 942-7363  
Owner: James G.G. Larson  
Studio Manager: James G.G. Larson

[8] SOUTHERN RECORDING & PHOTOGRAPHY  
also REMOTE RECORDING  
56 E. 53rd Pl., Tulsa, OK 74105  
(918) 747-7380  
Owner: John Southern  
Studio Manager: John Southern

[8] STELLAR WINDS STUDIO  
also REMOTE RECORDING  
2501 Sublett Rd. #995, Arlington, TX 76017  
(817) 465-4780  
Owner: Joe and Mira Shaw  
Studio Manager: Joe E. Shaw

[8] STUDIO B., INC.  
also REMOTE RECORDING  
3405 Mercer, Houston, TX 77027  
(713) 622-1948  
Owner: Mike Scott  
Studio Manager: Mike Scott

[8] STUDIO 10  
8411 1/2 Rannie #10, Houston, TX 77080  
(713) 462-9375  
Owner: R.W. Boyd, D. Allen  
Studio Manager: T. Kerley

[8] STUDIO WORKS  
also REMOTE RECORDING  
2058 Western Village, Houston, TX 77043  
(713) 461-1961  
Owner: Danny Erdeljac  
Studio Manager: Danny Erdeljac

[8] TALLY-HO PRODUCTIONS  
107 E. Fairlane Dr., Longview, TX 75604  
(214) 759-6799  
Owner: Walt Tally  
Studio Manager: Walt Tally

[8] TANDEN PRODUCTIONS  
P.O. Box 382, Gainesville, TX 76240  
(817) 665-6756  
Owner: Bobby Dennis  
Studio Manager: Bobby Dennis

[8] **TEMPEST RECORDING**  
*also REMOTE RECORDING*  
 P.O. Box 1007, Tempe, AZ 85281  
 (602) 968-9506  
 Owner: Andy Baade, Clarke Rigsby  
 Studio Manager: Andy Baade, Clarke Rigsby

[4] **TORNADO MAGNETICS**  
 5739 Belmont Ave., Dallas, TX 75206  
 Owner: Steve Powell  
 Studio Manager: Steve Powell

[8] **TRASH BAGGS**  
 12 Walnut Hill Rd., Flint, TX 75762  
 Owner: John Lasater  
 Studio Manager: Shannon Lasater

[8] **TSB RECORDING**  
 3013 Fountain View #210, Houston, TX 77057  
 (713) 974-7481  
 Studio Manager: Tom Wollenberger

[8] **TURN AROUND SOUND**  
*also REMOTE RECORDING*  
 P.O. Box 5923, Norman, OK 73070  
 (405) 366-1948  
 Owner: Edward Barrett  
 Studio Manager: Edward Barrett

[8] **THE 25TH TRACK**  
*also REMOTE RECORDING*  
 309 E. Vicksburg, Broken Arrow, OK 74011  
 (918) 455-2459  
 Owner: Walt Bowers  
 Studio Manager: Walt Bowers

[8] **TWIN PALMS RECORDING STUDIO**  
 8814 Reamer St., Houston, TX 77074  
 (713) 771-1877  
 Owner: Russell Lewandowski  
 Studio Manager: Russell Lewandowski

[8] **UNREEL RECORDERS**  
*also REMOTE RECORDING*  
 P.O. Box 426, Decatur, TX 76234  
 (817) 627-6841  
 Owner: Barry Eaton, Kenneth Wilson  
 Studio Manager: Barry Eaton, Kenneth Wilson

[4] **VOICEOVER STUDIOS**  
 8625 King George Dr. Ste. #335C, Dallas, TX 75235  
 (214) 688-0600  
 Owner: Chuck Webster  
 Studio Manager: Wanda Webster

[8] **WEE NEVER QUIT MUSIC**  
 1817 N. 15th, Broken Arrow, OK 74012  
 (918) 355-2144  
 Owner: Jack Brady  
 Studio Manager: Jack Brady

[8] **WHITE ROSE STUDIO**  
*also REMOTE RECORDING*  
 1901 Crested Butte, Edmond, OK 73034  
 (405) 282-2729  
 Owner: Craig White  
 Studio Manager: Scott Minor

[8] **WING AND A PRAYER MUSIC**  
*also REMOTE RECORDING*  
 1200 S. Gary, Monahans, TX 79756  
 (915) 943-6524  
 Owner: Walter L. Black  
 Studio Manager: Walter L. Black

[8] **DANA WOODS RECORDING**  
 P.O. Box 2509, Nacogdoches, TX 75963  
 (409) 569-1485  
 Owner: Dana Woods  
 Studio Manager: Robbie Lee

[4] **WORLD RADIO NETWORK**  
 P.O. Box 3333, McAllen, TX 78520  
 (512) 787-9700  
 Owner: World Radio Network  
 Studio Manager: Kent Abendroth

[4] **XAVIETRONIX**  
 555 E. Garcia, Santa Fe, NM 87501  
 (505) 983-7217  
 Owner: Frank X. Cordero  
 Studio Manager: Pix Aranda

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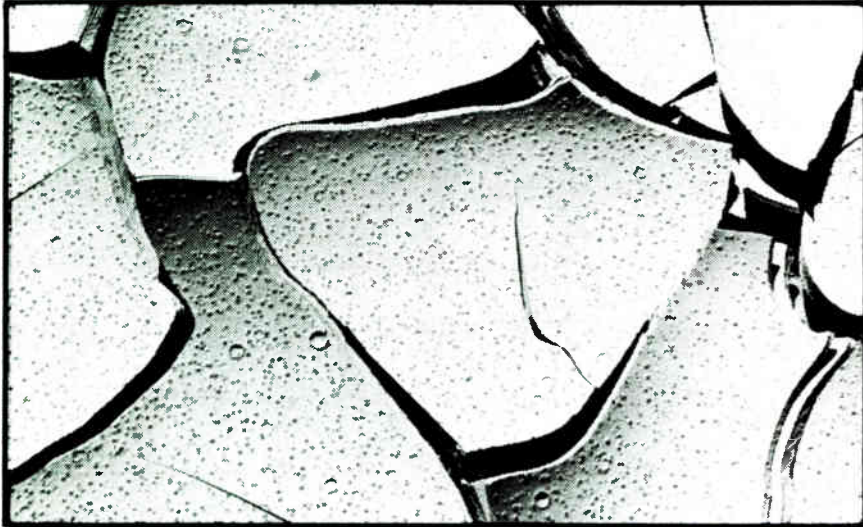
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# SOUTHWEST



# 12/16 TRACK

[16] ACTION SOUND STUDIO  
also REMOTE RECORDING  
Rt. 2 Box 213, Wimberley, TX 78676  
(512) 847-3853  
Owner: Marc Kingston  
Studio Manager: Skyvan Kingston

[16] APRIL RECORDING STUDIOS/PRODUCTIONS  
also REMOTE RECORDING  
827 Brazil Pl., El Paso, TX 79903  
(915) 772-7858, 565-4692  
Owner: Harvey Marcus  
Studio Manager: Del Marcus  
Engineers: Harvey Marcus  
Dimensions of Studios: Main room: 10 x 18 x 9, isolation vocal booth: 4 x 7 x 9  
Dimensions of Control Rooms: 6 x 7 x 9  
Tape Recorders: Tascam/TEAC MS16, 16-track; Tascam/TEAC 80-8, 8-track; Dokorder 7140, 4-track; MCS 3551 cassette  
Mixing Consoles: Peavey MC-12, 12 x 2 x 1; Peavey MK-IV, 24 x 4 x 1  
Monitor Amplifiers: Peavey CS-800  
Monitor Speakers: Peavey SP-3, ESS Performance Series monitors  
Echo, Reverb & Delay Systems: Roland SRE-555 Chorus/Echo  
Other Outboard Equipment: MXR dual  $\frac{1}{4}$  octave EQ, dbx 150, dbx DX-8, Tascam VS-88 speed control  
Microphones: Entire Shure line available  
Instruments Available: ARP OMNI 1, Fender Rhodes Mark-1 Stage 88, Yamaha MR-10 drum machine  
Rates: \$10 for 2-track, \$25 for 4 track, and \$50 for 8-, 16-track recording.

[16] ARCA (AUDIO RECORDING CORP. OF ARKANSAS, INC.)  
100 N. Rodney Parham Rd., P.O. Box 5686  
Little Rock, AR 72215  
(501) 224-1111  
Owner: Dick Marendt, Clyde Snider  
Studio Manager: Clyde Snider

[16] ARIAS RECORDING INC.  
also REMOTE RECORDING  
1970 N. Hartford St. Un. 82, Chandler, AZ 85224  
(602) 899-3316  
Owner: Marty Zacharias  
Studio Manager: Ian Zacharias



AUSTIN'S RIVERSIDE SOUND  
Austin, TX

[16] AUSTIN'S RIVERSIDE SOUND  
also REMOTE RECORDING  
7617-A East Riverside Dr., Austin, TX 78744  
P.O. Box 33207, Austin, TX 78744  
(512) 385-4060  
Owner: Herschel E. Cunningham, Richard Mullen, Bill Johnson  
Studio Manager: Herschel Cunningham  
Engineers: Richard Mullen, Layton DePenning, Eddie Habib, Andy Salmon, Bill Johnson  
Dimensions of Studios: Main cutting room 30 x 40; live corridor 30 x 30 (30-ft. ceiling); live sound room 14 x 30  
Dimensions of Control Rooms: 15 x 20  
Tape Recorders: MCI JH-24-16, 16-track; MCI JH-110B-14-2, 2-track. Sony PCM-701, 2-track digital  
Mixing Consoles: Ramsa WR-8816 16 x 16  
Monitor Amplifiers: Crest, Biamp  
Monitor Speakers: E-V Sentry 500, Yamaha NS-10M, JBL 4311  
Echo, Reverb & Delay Systems: Lexicon 224, MXR digital delay  
Other Outboard Equipment: Dyna-Mite noise gates, EXR Exciter, dbx compressor and de-essers, (2) UREI 530, (3) UREI 535, (2) UREI 1176LN peak limiter, LA 4 UREI compressor, (2) parametric EQ  
Microphones: Neumann U87, U47; AKG 414; Sennheiser 421; E-V RE20; Shure SM81, SM57; Beyers M88, 201; AKG 451; Countryman; Shure SM 5B  
Instruments Available: Yamaha acoustic grand piano.

Hammond organ w/ Leslie, other instruments available for rental.  
Rates: Available upon request (call, ask for Herschel)

[16] BT PRODUCTIONS  
also REMOTE RECORDING  
5807-F S. Garnett, Tulsa, OK 74146  
(918) 252-4779  
Owner: Bret Teegarden  
Studio Manager: Beth Teegarden

[16] C AND L PRODUCTIONS  
1511 N. 11th, Lamesa, TX 79331  
(806) 872-7933  
Owner: Collin and Lyle Roberts  
Studio Manager: Collin Roberts

[16] COMMUNITY VIDEO SERVICES  
also REMOTE RECORDING  
4500 W. Davis St., Dallas, TX 75211  
(214) 263-8485  
Owner: CCSD  
Studio Manager: Tom Matasso



COPESETIC SOUNDS  
Midwest City, OK

[16] COPESETIC SOUNDS  
403 E. Kerr, Midwest City, OK 73110  
(405) 737-7024  
Owner: Dave Copenhaver  
Studio Manager: Lisa Copenhaver  
Engineers: Dave Copenhaver  
Dimensions of Studios: 15 x 9  
Dimensions of Control Rooms: 6 x 9  
Tape Recorders: Fostex B16D, 16 track; TEAC 3340, 4-track. Pioneer cassette; Technics cassette  
Mixing Consoles: Tascam M-35 w/EX, 16 input; Peavey Mark II, 12 input  
Monitor Amplifiers: McIntosh 1900  
Monitor Speakers: JBL, Auratone  
Echo, Reverb & Delay Systems: Fostex 3180, Ibanez HD 1500, Boss DM-2, Yamaha SPX 90  
Other Outboard Equipment: MXR dual limiter, BSR graphic EQ, Boss Play Bus  
Microphones: Shure SM57, Sennheiser 441  
Instruments Available: Fender and Alembic basses, Gibson Fender guitars, LinnDrum, DX7, Wurliizer piano, ARP strings, Ovalton guitar, Drumulator, Mesa Boogie amp  
Video Equipment & Services: Hitachi portable VHS  
Rates: \$20/hr.

[16] MIKE DE LEON PRODUCTIONS  
14146 Woodstream, San Antonio, TX 78231  
(512) 492-0613  
Owner: Mike De Leon  
Studio Manager: Mike De Leon

[16] THE DEMO SHOP/  
ALLEN DAVID SCHRAM MUSIC CO.  
also REMOTE RECORDING  
1505 Ronne, Irving, TX 75061  
(214) 790-8700  
Owner: Allen David Schram  
Studio Manager: Allen David Schram

[16] ECR SOUND STUDIOS  
also REMOTE RECORDING  
4048 Summerhill Sq., Texarkana, TX 75503  
(214) 793-1486

Owner: Eddie Bell  
Studio Manager: Eddie Bell

[16] FISH STUDIO  
P.O. Box 1, Austin, TX 78767  
(512) 476-7596  
Owner: John Fish  
Studio Manager: John Fish

[16] GABRIEL ENG/  
ARIZONA REMOTE RECORDERS  
also REMOTE RECORDING  
833 W. Main St., Mesa, AZ 85201  
(602) 969-8663  
Owner: Brent Gabnelsen  
Studio Manager: Chet Kendrick

[16] GOOD VIBRATIONS  
11410 Harry Hines #6, Dallas, TX 75229  
(214) 247-1537  
Owner: Jim Cleek, Ken Hergenraider  
Studio Manager: Tommy Stewart

[16] DUBBY HANKINS STUDIO  
also REMOTE RECORDING  
P.O. Box 16762, San Antonio, TX 78216  
(512) 492-2011  
Owner: Dubby Hankins  
Studio Manager: Dubby Hankins

[16] HONEYBEE RECORDING STUDIO  
417 E. Crosstimbers, Houston, TX 77022  
(713) 694-2971  
Owner: Freddie Kober  
Studio Manager: Claudia Kober

[16] HOUSTON SOUND PRODUCTIONS  
also REMOTE RECORDING  
15519 Meadow Village, Houston, TX 77095  
(713) 550-1710  
Owner: Douglas L. Morrison, Gregory L. Morrison  
Studio Manager: Douglas Morrison

[16] ITTI STUDIOS  
also REMOTE RECORDING  
4305-A South Mingo, Tulsa, OK 74146  
(918) 663-7700  
Owner: Mendith R. (Sonny) Gray  
Studio Manager: Judy A. Pendergrass

[16] KEYLIGHT RECORDING STUDIO  
also REMOTE RECORDING  
6608 Krollton Dr., Austin, TX 78745  
(512) 441-5527  
Owner: David Johnson  
Studio Manager: David Johnson

[16] LAKE SOUND  
Rt. 2 Box 552, Roanoke, TX 76262  
(817) 431-1405  
Owner: Rex A. Lake  
Studio Manager: Rex A. Lake

[16] LINCOLN INSTITUTE  
7622 Louetta, Spring, TX 77379  
(713) 376-9679  
Owner: Lincoln Foundation  
Studio Manager: J.E. Lincoln

[16] LITZMAN PRODUCTIONS  
3712 Pictureline Dr., Dallas, TX 75233  
(214) 331-2371  
Owner: Terry Litzman  
Studio Manager: Bob Shadix

[16] LONE STAR RECORDING  
also REMOTE RECORDING  
1204 N. Lamar, Austin, TX 78703  
(512) 478-3141  
Owner: Ed Guinn, Stan Coppinger  
Studio Manager: Bill Anderson  
Engineers: Joe Gracey, Randy Kirchhof, Jay Hudson, Stuart Sullivan, Andy Murphy, Mark Tester.  
Tape Recorders: MCI JH24-16, 16-track; MCI JH-110B, 2-track; Sony PCM-701ES, 2-track; Tascam 38, 8-track; Tascam 122, cassette, Nakamichi MR-2, cassette.  
Mixing Consoles: MCI 600, 16 x 16 x 2.  
Monitor Amplifiers: McIntosh, NAD.  
Monitor Speakers: E-V Sentry 500, Tannoy NFM-8, Yamaha NS-10M, AKG 141 headphones.

Echo, Reverb & Delay Systems: Lexicon 200, Lexicon PCM70, Yamaha REV7, Lexicon Prime Time II, DeltaLab Effectron II, Lexicon PCMA41.

Other Outboard Equipment: Eventide H910, Aphex Aural Exciter, Drawmer DS-201, Aphex EQF-2, Aphex CX-1, dbx 160X, Valley People 610, UREI 535, Dyna-Mites, Drawmer 1960 tube compressor, API 550A, API 525.

Microphones: Neumann: U47; AKG: 414B, 460B, C451E; E-V: PL-20; Sennheiser: 421; Shure: SM57; Countryman: Isomax II, D.I. box, AXE: DI-100; RCA: 77-DX.

Instruments Available: Synclavier II, Yamaha RX-11, Yamaha grand piano.

Video Equipment & Services: Audio Kinetics Q.Lock synchronizer, 3/4-inch video, 1/2-inch Beta, audio sweetening, SMPTE lock, post-production via Synclavier.  
Rates: Call for rates.

[16] MARSOUND  
915 N. Main, Tucson, AZ 85705  
(602) 628-1554

Owner: Mike Reinhard  
Studio Manager: Mike Reinhard  
Engineers: Mike Reinhard, Pat Heimann.  
Dimensions of Studios: 27 x 42.  
Dimensions of Control Rooms: 12 x 20.  
Tape Recorders: Tascam 85-16-B, 16-track; Tascam 25-2, 2-track; Tascam A3340S, 4-track.  
Mixing Consoles: Trident Series 65, 32 x 8 x 16.  
Monitor Amplifiers: Hafler 500, Carver PM1.5.  
Monitor Speakers: Fostex RM 780s, JBL 4612s, JBL L100s.  
Echo, Reverb & Delay Systems: ART DR-1, (2) DeltaLab Acoustic Computers.

Other Outboard Equipment: (2) Valley People 610s limiter/exp, Symetrx 525, E-V 2230 1/3 octave EQ.

Microphones: Neumann, E-V, Shure, Beyer, Crown.  
Instruments Available: Yamaha 410 guitar amp, Hamilton upright grand, Fisher space expander, Yamaha synthesizers (prior notice).

Rates: 16-track \$40/hr.; 4-track \$30/hr. Block rates available, please call.

[16] PATRICK MCGUIRE RECORDING  
also REMOTE RECORDING  
1402 Rockdale, Arlington, TX 76018  
(817) 467-1852

Owner: Roy B. Watson  
Studio Manager: Patrick A. McGuire  
Engineers: Patrick A. McGuire.  
Dimensions of Studios: 20 x 22.  
Dimensions of Control Rooms: 10 x 12.  
Tape Recorders: Fostex B-16, 16-track; Fostex A-2, 2-track; Tascam 122, 2-track.  
Mixing Consoles: Ramsa WR 8118, 18 x 4 w/ 18-track monitoring.

Monitor Amplifiers: Crown 150.

Monitor Speakers: JBL 4411 and Auratones.  
Echo, Reverb & Delay Systems: Art 01A digital reverb and DeltaLab 1024 digital delay.

Other Outboard Equipment: Tascam PE40 parametric EQ, Aphex Type B Aural Exciter, dbx 160X comp./lim.

Microphones: AKG 414 EB P48, AKG D12-E, AKG D1200, (3) Audio Technica ATM 63, (2) Audio Technica ATM-11R, (2) ATM-10R, E-V RE11, (2) Crown PZM 30GP, Shure SM57.  
Instruments Available: Yamaha G-3 6-ft. grand piano, Yamaha DX7 synthesizer, Yamaha RX11 digital drum synth, Yamaha FG 335E electric/acoustic guitar, Alembic bass guitar.

Rates: \$35/hr. plus tape.

[16] MECA 3  
Vicente Guerrero No. 608 2 do. Piso.  
Chihuahua, Mexico 31000  
(0115214) 154749  
Owner: Adolfo Trespalacios  
Studio Manager: Adolfo Trespalacios

[16] MESQUITE RECORDING STUDIO  
3129 N. Hwy. 67 Ste. H-1, Mesquite, TX 75150  
(214) 270-7453  
Owner: Don McKnight  
Studio Manager: Don McKnight

[16] MIRACLE RECORDING STUDIO  
1514 Mercury Dr., Houston, TX 77029  
(713) 673-6385  
Owner: Pat Cusimano  
Studio Manager: Ronn Russ

[16] MUSHROOM STATION STUDIOS  
also REMOTE RECORDING  
1913 Hoskins, Houston, TX 77080  
(713) 868-9724  
Owner: J.C. Freeman  
Studio Manager: J.C. Freeman

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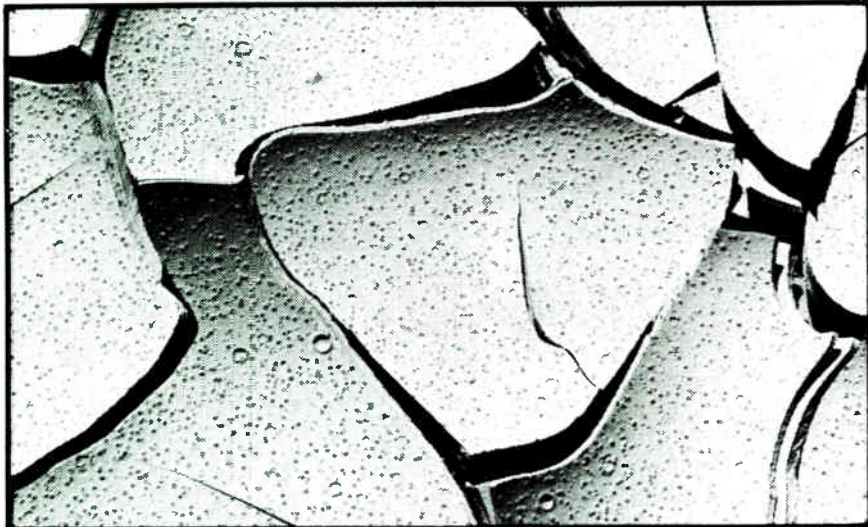
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# SOUTHWEST



## 24+ TRACK

[24+] **ACCESSIBLE SOUND**  
5146 Kingfisher, Houston, TX 77035  
(713) 723-2777  
Owner: Kenneth Bujnoch  
Studio Manager: Margaret Henry

[24+] **ARLYN RECORDING STUDIOS**  
also **REMOTE RECORDING**  
200 Academy Ste. A, Austin, TX 78704  
(512) 447-2337  
Owner: Arlyn Studios, Inc.  
Studio Manager: Fred N. Fletcher  
Engineers: Dave McNair, Stuart D. Sullivan, Kevin Sorrells, Vince McGarry, Steve Mendell  
Dimensions of Studios: 37 x 26 w/ vocal booth, 10 x 11, piano booth.  
Dimensions of Control Rooms: 22 x 24 w/ tape iso room.  
Tape Recorders: MCI JH-24, 24-track, MCI JH-110, 4-track; MCI JH 110, 2-track; Studer 2-track  
Mixing Consoles: Automated Process Inc. (API) 2343, 26 x 26 x 8

Monitor Amplifiers: McIntosh 2105, McIntosh 2300.  
Monitor Speakers: Steve Durr & Assoc. custom design, (2) 15-inch JBL, TAD drivers, Emilar horns.  
Echo, Reverb & Delay Systems: Lexicon 224XL, Lexicon 224, Lexicon Prime Time, Roland SDE 1000, Ursa Major Space Station, Harmonizer 910, (2) DeltaLab DL-2.  
Other Outboard Equipment: (2) API 525 comp, (2) LA-2A, LA-3A, (3) 1176, (2) dbx 165 Overeasy, (2) Dyna-Mites, (2) UREI 520 graphic, EXR Exciter, Lange EQ, API 550A, 554 EQ  
Microphones: Neumann U48 (tube), U47 (FET), (3) U87s, 84, AKG-(B) 451 D 12E 224, Sony (2) 37-A (tube), Beyer (3) 88, PZM, Shure 56s, 57, 58, Sennheiser (3) 441s, (3) 421s.  
Instruments Available: Schimmel 9 foot grand piano, Hammond B 3 w/ Leslie, Slingerland drum kit, Fender concert amp, Sralocaser  
Video Equipment & Services: Video and multi-track audio lines to ballroom and main hall of Austin Opry House  
Rates: \$55/hr w/o engineer, block rates available.

[24+] **AUDIO VIDEO RECORDERS OF ARIZONA**  
also **REMOTE RECORDING**  
3830 N. 7th St., Phoenix, AZ 85014  
(602) 277-4723  
Owner: Floyd Ramsey  
Studio Manager: Tim Ramsey

[24+] **AUSTIN RECORDING STUDIO**  
also **REMOTE RECORDING**  
4606 Clawson Rd., Austin, TX 78745  
(512) 444-5489  
Owner: Wink Tyler  
Studio Manager: Wink Tyler

[24+] **BENSON SOUND, INC.**  
3707 S. Blackwelder, Oklahoma City, OK 73119  
(405) 634-4461  
Owner: Larry R. Benson  
Studio Manager: Ric Duncum

[24+] **BOYD SOUND STUDIO**  
P.O. Box 682, Wylie, TX 75098  
(214) 442-1620  
Owner: Anthony D. Boyd  
Studio Manager: Anthony D. Boyd  
Engineers: Anthony D. Boyd, Gary LeCroy, Joel Burch.  
Dimensions of Studios: 28 x 22 x 10.  
Dimensions of Control Rooms: 20 x 14 x 10.  
Tape Recorders: Studer A80-VU, 24-track; Ampex 351, 1/2-track; Pioneer RT-701, 1/4-track; Mitsubishi DT-30, cassette; Aiwa WX110, cassette; Hitachi D-550, cassette.  
Mixing Consoles: MCI 400, 24 inputs.  
Monitor Amplifiers: Crown DC-300, Bamp TC120.  
Monitor Speakers: JBL 4311B, Sansui SP-5500X, Minimus 7.  
Echo, Reverb & Delay Systems: DeltaLab DL-2, Yamaha REV7, Master-Room 3.  
Other Outboard Equipment: (2) dbx 165 limiter/compressors, (2) UREI LA-4 limiter/compressors, (4) Dyna-Mite multi-function dynamics processors, (8) dbx 157 noise reduction, (4) Blake-McDonald line amps, UREI 539 EQ.  
Microphones: AKG 414, AKG 451, AKG D12, Crown PZM, Beyer M500, Electro-Voice RE20, Electro-Voice RE15, Shure SM57, Shure SM54, Sennheiser 421.  
Instruments Available: Kawai UST-6, Yamaha drums, Fender Jazz Bass, Yamaha 12 string guitar.  
Rates: \$50/hr. plus tape.

[24+] **JIM BRADY RECORDING STUDIOS**  
25 E. Glenn St., Tucson, AZ 85705  
(602) 791-3884  
Owner: F. James Brady  
Studio Manager: Diane J. King

[24+] **BRASSWIND RECORDING STUDIO, LTD.**  
2551 Texas Ave., Shiloh Place Ste. F,  
College Station, TX 77840  
(409) 693-5514  
Owner: David O. Cooper  
Studio Manager: David O. Cooper  
Engineers: David O. Cooper, Pat Brownlow.  
Dimensions of Studios: 18 x 28.  
Dimensions of Control Rooms: 13 x 16.  
Tape Recorders: (2) MCI JH-24-24, Nakamichi MR-1 cassette deck, MCI JH 110B-VP, 2-track; (2) Telex 6210 stereo cassette duplicator; Sansui PC-X1 Tricorde PCM 2-track.  
Mixing Consoles: MCI 536-28 LM automated

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Monitor Amplifiers: Crown PSA-2 and D-75.  
Monitor Speakers: JBL 4430, Auratone cubes.  
Echo, Reverb & Delay Systems: Lexicon 224 XL, Ursa Major 8 x 32 digital reverb, AKG BX10, DeltaLabs Effectron ADM 1024 digital delay  
Other Outboard Equipment: Eventide H949 Harmonizer, dbx 160X and 161 compressors, Valley People stereo Dyna-Mite, Ashly parametric EQ, White 1/3 octave EQ w/ active electronic crossovers.  
Microphones: AKG, Beyer, C-ducer, Crown PZM, Electro-Voice, Neumann, Sennheiser, Shure, Sony.  
Instruments Available: Kurzweil 250, Yamaha DX7, Roland Juno 60 synthesizer, LinnDrum, Fender Precision bass, Gibson-Les Paul Artisan guitar, Princeton Reverb II amp, Sonor-Signature Series drums (8-piece kit).  
Video Equipment & Services: Audio post-production for video Adams-Smith 2600 SMPTE synchronizer.  
Rates: Rates available upon request.  
Direction: Our engineers have experience recording various musical styles that include contemporary Christian, classical, country, reggae, Latin and heavy metal. With the music industry expanding rapidly in Texas, we feel that Brasswind is in an excellent location for bands and musicians looking for a new and exciting sound. Brasswind Recording Studio invites you to become a part of a growing tradition . . . excellence.

[24+] **BRIAN SOUND PRODUCTIONS INC.**  
Box 5026, Waco, TX 76708  
(817) 829-2604  
Owner: Brian Konzelman  
Studio Manager: Sherry Konzelman

[24+] **BROADWAY STUDIOS**  
1713 Broadway, Lubbock, TX 79401  
Owner: Broadway Studios Inc  
Studio Manager: Craig Alderson

[24+] **BUFFALO SOUND STUDIOS**  
910 Currie St., Ft. Worth, TX 76107  
(817) 335-7733  
Owner: Jim Hodges  
Studio Manager: Buff Haskin

[24+] **CASTLE MUSIC, INC.**  
2520 E. 25th Pl., Tulsa, OK 74114  
(918) 745-2331  
Owner: Ben Ferrell  
Studio Manager: Chris Fuqua

[24+] **CECCA SOUND**  
3198 Royal Lane Ste. 104, Dallas, TX 75229  
(214) 350-6945  
Owner: Charley Pnde  
Studio Manager: Bob Pickering  
Engineers: Bob Pickering, Rick Webb  
Dimensions of Studios: 20 x 30.  
Dimensions of Control Rooms: 28 x 16.  
Tape Recorders: MCI JH-24, 24-track; MCI JH-110B, 4-track; Studer A810, 2-track.  
Mixing Consoles: MCH JH 538D w/ JH 50-500 automation.

Monitor Amplifiers: UREI, Crown.  
Monitor Speakers: UREI 813, JBL 4313  
Echo, Reverb & Delay Systems: (3) large custom-made plates, Lexicon 224 digital, Lexicon Prime Time, Ursa Major Space Station, Marshall 5402, Lexicon 200.  
Other Outboard Equipment: Allison Research Kepexs and Gain Brains, EXR Exciter, Valley People Dyna-Mite, UREI LA-4 comp and 1176 comp, dbx 162 stereo comp

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**Instruments Available:** Steinway nine foot concert grand; Hammond B-3 w/Leslie; Linn Drum, Linn 9000; Yamaha DX7 (DX Pro software), TX-816, TX7, Qx-7, RX-21, CS-50; Kurzweil 250; Prophet V w/1005 sequencer; Oberheim Xpander; Korg Poly 800, Hohner clavinet, Mini-Moog

**Video Equipment & Services:** BTX Softouch computer interlock system, Audio Kinetics Q.Lock 3 10 Interlock System, Sony 5850, JVC 8250, JVC 8200, MCI JH-110 1 inch layback, Sony monitors, MCA monitors, NEC projection system, 16/35mm high speed projectors, dubbers, and master recorders by MTM. Services include up to 48 track digital/analog recording to video or film, scoring to picture, ADR (looping), SFX assembling, Foley EFX, mixing to picture

**Rates:** \$50-\$235/hr. Specific rates available upon request (block/bulk rates available)

**Extras:** Studio A: Up to 48-track digital/analog recording capability with video or film interlock. Services include 40 piece capacity orchestra scoring to picture, ADAR, SFX assembling, video sweetening, and album/jingle production with tie lines to three sound stages (15,000/6,000/3,000 sq ft) for live TV shows, concerts, etc. Studio B: Up to 24 track recording capability with iso-booth for voice over work, overdubs, and mixing. Studio C: Up to 24 track digital/analog recording capability to video or film with large iso-booth. Services include synthesizer scoring to picture, ADR, SFX assembling, video sweetening, and mixing to picture

**Direction:** Dallas Sound Lab is designed to meet the complete needs of clientele dealing with any aspect of audio production from simple voice over production to complex 48 track digital/analog recording to video or film.

**[24+] DIGITAL SERVICES RECORDING**  
5805 Chimney Rock Rd., Houston, TX 77081  
(713) 664-5258

Owner: John A. Moran

Studio Manager: Chris Smith

Engineers: Trent Burns, Gary Moon, John Reed, David Kealy, Bill Hollford, independents

Dimensions of Studios: Studio A: 35 x 30 x 20 w/iso booth

Dimensions of Control Rooms: Studio A: 22 x 25 (Russel Burger design) B/truck: 30-foot 50 truck.

Tape Recorders: (2) Sony PCM-3324, 24 track digital; Otari MTR 90, 24-track analog, Sony PCM 1610, 2-track digital, with DAE 1100 digital editor; Otari MTR 12, 1/2 inch, 4 track and 1/4 inch 2 track; (2) Sony RTW F1 digital 2-track, Otari 5050B 2-track, Sony cassette decks.

# Digital Services

**DIGITAL SERVICES RECORDING**  
Houston, TX

**Mixing Consoles:** Studio A: SSL Series 6000E, 48 x 32 w/Studio Computer and Total Recall, Studio B: MCI 636 36 x 24 (automated) and Neve 5442 8 x 2 submixer

**Monitor Amplifiers:** Crown PSA2s, QFC 3500s

**Monitor Speakers:** Meyer 833s, UREI 813s, JBL 4411, JBL 4311s, MDM-4s, MS-10, Auratones.

**Echo, Reverb & Delay Systems:** Lexicon 224 w/LARC, PCM70, Sony DRE 2000, Lexicon Prime Time II, Eventide 969 Harmonizer delay, Scamp delay, Master Foom 30

**Other Outboard Equipment:** Scamp Rack (8) noise gates, (4) compressors, (2) sweep EQs, (2) De-essers, ADR Vocal Stresser, dbx 160X comps, dbx 166 stereo comp DeltaLab 1020 digital delay, SAE tuner and much more

**Microphones:** Neumann 87 tube, 67 tube, 47 FET, 89 and 69 stereo, AKG, Sennheiser, Shure, Crown, E. V., lots of all of them.

**Instruments Available:** E-mu SP 12 drum machine, Yamaha DX7, KX88 (keyboard controller), Yamaha MIDI rack seven-foot grand piano. Anything available upon request

**Video Equipment & Services:** Complete audio for video and film post-production 72-track mix to picture, Adams Smith 2600 S machine sync. under control of SSL computer.

**Rates:** Available upon request

**Extras:** Complete remote services w/our TEC nominated

remote truck complete turn key audio for records, video and film. We are the only CD master tape prep facility in the Southwest.

**Direction:** Credits Films—*Stop Making Sense*, *Yentl*, *For All Mankind*, *Digital Dream* Videos—Culture Club for Cinemax Cable, Carl Lewis for Quest Records, ADC/Capital Cities Sesquicentennial broadcast of Willie Nelson and Houston Symphony. E&D Digital Services—Van Cliburn international piano competition for PBS, Gallagher Live for Showtime Cable Records/Compact Disc—Neil Young, Frank Zappa, Barbra Streisand, Talking Heads, Willie Nelson, Meryl Haggard, Winton Marsalis, lots more of all of the above.

**[24+] EAGLE AUDIO, INC.**  
911 So. Main St., Ft. Worth, TX 76104  
(817) 877-4338

Owner: Mike McCole, Curtis Butts, David Peloubet  
Studio Manager: Mike McCole

**[24+] EDENWOOD RECORDING STUDIOS**  
7319C Hines Pl. Ste. 201, Dallas, TX 75235  
(214) 630-6196

Owner: Jerry Swafford  
Studio Manager: Jerry Swafford

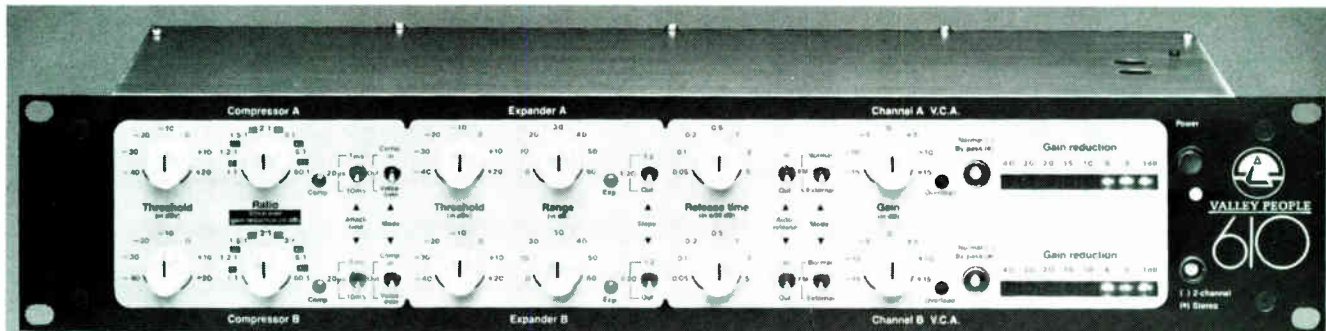
**[24+] EL ADOBE RECORDING**  
5301 El Paso Dr., El Paso, TX 79905  
(915) 772-7333

Owner: J. O. S. Enterprises  
Studio Manager: Robert Hernandez

**[24+] EMMIT BROOKS RECORDING STUDIO**  
115 E. Idaho Ave., Las Cruces, NM 88005  
(505) 524-1889

Owner: Emmit H. Brooks  
Studio Manager: Emmit H. Brooks

**[24+] EUROPA SOUND CENTRE**  
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101 W. 38th St., Austin, TX 78705  
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[24+] MIDCOM

only **REMOTE RECORDING**

Three Dallas Communications Complex Ste. 108  
6311 N. O'Connor Rd. LB50, Irving, TX 75039  
(214) 869-2144

Owner: Mike Simpson

Engineers: Mike Simpson, Jeff Jones, Jim Kirkpatrick, Jim Reese, Richard Avery, Bob Singleton, David Roberts, Don Worsham

Dimensions of Studios: Remote facility

Dimensions of Control Rooms: 7.5 x 23.5 x 8

Tape Recorders: (2) Otari MTR 9011 24 track, Otari MTR 10C 2 track w/center track timecode, Studer A810, 2 track w/center track timecode, (2) Otari MX5050B II, 2 track, Otari DTR 900 digital multi track (available July, 1986), 32 track Nakamichi MR 1B, cassette recorder, dbx model 700 digital mastering processor

Mixing Consoles: Soundcraft TS 24 custom version, 32 x 24 x 16 x 2 x 1, Soundcraft Series 800B 32 x 8 x 2

Monitor Amplifiers: Haller P 505 and P 225 BGW Model 75 driving Auratetics

Monitor Speakers: JBL 4430 Bi Radial w/White instruments 7/6 octave EQs bi amp'd w/White instruments 4430 crossover Auratonic 5C monitors for near field

Echo, Reverb & Delay Systems: Lexicon Model 480 digital audio main frame, Lexicon 224XL digital reverb both w/LARC Lexicon Model 200 digital reverb, Lexicon PCM 70 digital reverb, Lexicon Model 95 Prime Time II digital audio processor, Eventide Model H 910 harmonizer

Other Outboard Equipment: 24 channel ITM noise reduction frame (accepts Dolby, dbx or Telcom), dbx Series 900 frames equipped w/903 comp/limiters, 904 noise gates 905 parametric EQs 906 flanger and MICMIX dynamic filter cards dbx 160X comp/limiters Aphex Compressor Communications systems RTS 3 channel/dual listen intercom, ClearCom 2 channel intercom, both interfaced to full duplex FM on-board repeater system w/business band and motion picture service frequency synthesized remote radios Ten line key telephone system RHC 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 Four RDLs on board for auto answer stand by program feeds 400 ft. power and 42 pair snake on DC motor driven reels

Microphones: Neumann U89s, TLM170s, KM84, AKG C-414 EBP 48, Sennheiser, MD441s, MD421s, Beyer M69s M88s, M500s M201s MC734s, Shure SM58s, SM57s, SM81s, SD85s, Crown PZM GPB30s, 2LVs, Catec Vega R 42 handheld and lavalier wireless microphones systems available at extra charge.

Video Equipment & Services: Cipher digital (BTX) Shadow II and Cypher SMPTE timecode synchronization system interfaced to our MTR 90s MTR 10C and Studer A810 We also carry a Sony VO-5800 Umatic 1/4 inch video recorder/player, a Panasonic AG-6800 VHS Hi-fi recorder/player, a Sony CVM 1900 monitor/receiver, (2) 9 inch B&W monitors, (2) CCTV cameras, (2) 12 input routing switchers, (3) ADC "Humbuckers," (8) external inputs

Rates: Call for rates Very competitive

Direction: Credits: Seventh Van Cliburn International Piano Competition for American Public Radio "Rostropovich" - Meadows Award Recipient for Bob Banner Associates, Dony and Reba Rambo in concert for Trinity Broadcasting Fashion Hit Review - Sanger Harris/Spindletop Productions, Benjamin Leo's "Memorial Candles" for American Public Radio/KERA Radio, "Applause, Applause Seminar 85 for Mary Kay Cosmetics "Carman" in concert for Word Records Additional credits upon request. Midcom's 48 track remote audio facility specializes in on-location audio recording for video, teleproduction, and live music events Recently updated to include the latest digital recording equipment Midcom prides itself in staying on the leading edge of audio technology. Midcom offers the finest remote audio truck and crew to be found



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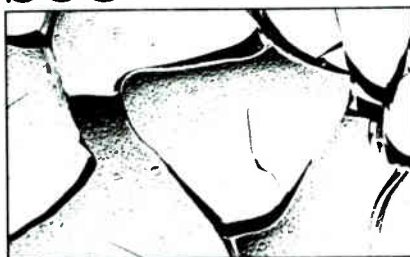
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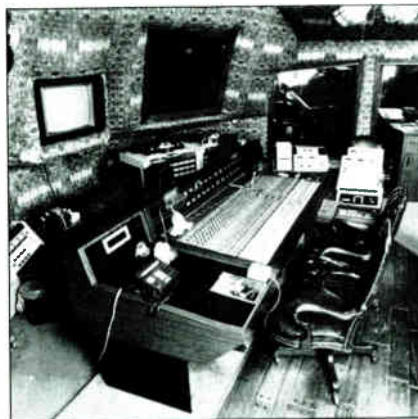
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## 24+ TRACK

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Studio Manager: John Williams

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1614 Hampton Rd., Texarkana, TX 75503  
(214) 793-4116  
Owner: VE. Howard  
Studio Manager: Chuck Richardson



OMEGA AUDIO & PRODUCTIONS, INC  
Dallas, TX

[24+] OMEGA AUDIO & PRODUCTIONS, INC.  
also REMOTE RECORDING  
8036 Aviation Pl., Dallas, TX 75235  
(214) 350-9066  
Owner: Paul A. Christensen  
Studio Manager: Paul A. Christensen  
Engineers: David Buell, Hassell Teekell.  
Dimensions of Studios: A 35 x 40, B 12 x 15, remote recording truck: 8 x 20.  
Dimensions of Control Rooms: 22 x 20.  
Tape Recorders: (3) Otari MTR 90 24 track; (3) Otari MTR-10, 2/4 track; Otari MX 5050-B, 2 track, Studer/Revox A-77, 2 track; Eumig cassette; Panasonic cassette; Autogram stereo cart.  
Mixing Consoles: Amek M2500 36 in x 24 out; Custom 30 in x 24 out; API 2098 32 x 16 x 24  
Monitor Amplifiers: Crown PSA-2, (4) Crown D 150A, Crown D-40, (2) Yamaha 2200.  
Monitor Speakers: JBL 4435 B; Radial, JBL 4313, JBL 4311, Auratone and JBL 4430  
Echo, Reverb & Delay Systems: Lexicon 224X digital reverb w/LARC remote control, LP140 reverb plate, Ecoplate II, Master-Room reverb, ADA stereo tapped delay, DeltaLab DL2 digital delay, (3) DeltaLab 2048.  
Other Outboard Equipment: BTX 4600 5 machine controller w/Shadow interlock, BTX 5100 time code generator, Eventide H 949 Harmonizer w/DeGlitch Card, Scamp rack w/17 modules, Gotham TTM NR rack w/dbx K9-22 cards, UREI 565T Little Dipper, UREI digital metronome, RTS stereo phone preamp, Denon DP110 turntable, EXR Exciter  
Microphones: Varied selection of over 95 mics including Neumann U87, U47, AKG 414, 451, CKB; Shure SM81, 57, 53, 58, Beyer M201, Sennheiser 441, E V RE20 Sony 22P ECM50, ECM 21, AKG D12E, Crown P2M  
Instruments Available: Baldwin seven foot grand, Ham-

mond 34BV organ, or full range of instruments available by special arrangement.

**Video Equipment & Services:** Co-located and interlocked with Video Post & Transfer, state-of-the-art one-inch CMX video editing and film transfer facility, Omega offers 32 track interlock to picture for computerized audio editing and mixing to picture.

**Rates:** Studio: audio only 24 track \$110/hr., 48-track \$175/hr.; audio/video interlock 24 track \$135/hr., 48-track \$200/hr., remote recording \$2400/day for 48-track, plus expenses.

**Extras:** Through an association with Clearwater Teleproduction of Dallas, a network live color camera one-inch video mobile unit, Omega Audio handles video music projects from concept to completion.

**Direction:** Partial credits: Johnny Cash, Prince, Bob Hope, Helen Reddy, Anne Murray, Al Jarreau, Spyro Gyra, Willie Nelson, the Oak Ridge Boys, Randy Meisner, Quarterflash, Hall & Oates, NBC TV (Silva Caranchini, producer), CBS TV (Joseph Cates, producer), MTV (Growers, Fields & Flattery, producer), PBS TV (WNET), Commodores, Russ Kunkel.

[24+] PANTHEON RECORDING STUDIOS  
also REMOTE RECORDING  
6325 N. Invergardon Rd., Scottsdale, AZ 85253  
(602) 948-5883  
Owner: Dennis Alexander  
Studio Manager: Tony Di Maria



POWERHOUSE RECORDING  
Las Vegas, NV

[24+] POWERHOUSE RECORDING  
3111 S. Valley View Bl. K101, Las Vegas, NV 89102  
(702) 871-6200  
Owner: Paul Badia, Don Turner, Vanda Milligan  
Studio Manager: Paul Badia  
Engineers: Paul Badia, Randy Gunn.  
Dimensions of Studios: 35 x 22, iso 22 x 11.  
Dimensions of Control Rooms: 22 x 17  
Tape Recorders: Stevens 821 A, 24 track; Scully 280, 2-track; Ampex ATR 700, 2-track, Pioneer F850, cassetts (2); Revox A77, 2 track  
Mixing Consoles: API 2085 24 x 16, 32 returns.  
Monitor Amplifiers: BGW, Crown.  
Monitor Speakers: Fostex LS3B, Auratones.  
Echo, Reverb & Delay Systems: EMT 240 Gold Plate, Yamaha REV7 (2) AKG BX 10, Lexicon Prime Time.  
Other Outboard Equipment: ADR compressor/limiters (2), auto panner, noise gates, Spectrasonic 610 comp/limiters, Fairchild limiters, Eventide Harmonizer, MXR auto flangers, dbx 500 sub harmonic generator, Eventide instant phaser, Dyno-My-Electronics Tri Stereo Chorus, and more.  
Microphones: U87s, U47s, AKG 414s, Sennheiser 421s, 441s, RE20s.  
Instruments Available: Kawai 6'8" grand, Dyno-My Piano, Rhodes, Memorymoog, Korg MS 20.  
Rates: On request  
Extras: Our clients include the Frontier, Riviera, and Sands hotels; advertising agencies and independent producers including Steve Dorfl and Lou Medel  
Direction: Powerhouse is a young, aggressive studio dedicated to producing the finest possible product. Associated with some of Las Vegas' finest musicians, writers and producers. We specialize in very personal and individual service to our clients.

[24+] PRECISION AUDIO, INC.  
1171 Harry Hines Ste. 119, Dallas, TX 75229  
(214) 243-2997  
Owner: Precision Audio, Inc.  
Studio Manager: Rick Sheppard

# BACK ISSUES

- 1985 January, Northwest Studios. Superbowl Sound. Springsteen on Stage. Ray Parker Jr. Leon Russell.
- 1985 February, Independent Engineers & Producers. Brian Eno. The Art of Touring. Roger Powell on MIDI. Les Paul.
- 1985 March, Southeast Studios. Loudspeaker Technology. Martin Rushent. *Cotton Club* Sound. John Fogerty.
- 1985 April, Video Production Supplement with Facilities Listings. Compact Power Amps. Radio Recorders' Harry Bryant. Eurythmics.
- 1985 May, Northeast Studios. Digital Reverb. Flo & Eddie. Holophonics. Emmylou Harris. Humberto Gatica.
- 1985 June, Sound Reinforcement & Remote Recording Listings. Location Recording Tutorial. Grateful Dead Sound. Weird Al Yankovic. Synthesizer Oriented Studios. David Sanborn.
- 1985 July, Recording School Listings and Southwest Studios. Mixing Consoles. Dr. Demento. Kashif's Studio. Roger Nichols and John Denver.
- 1985 August, Studio Design Issue: Listings of Designers & Suppliers. Control Room Acoustics. Thomas Dolby. *Orchestral Recording*. On the Road with Prince. Neil Young.
- 1985 September, Southern California Studios. Film & TV Sound. Frank Zappa. Digital '86 Supplement. *Mishima* Sound. David Foster.
- 1985 October, New Products for AES. Maintenance & Testing. Abbey Road Studios. Ambisonics. Ben Burtt on Imax. Nile Rogers.
- 1985 November, North Central & Canadian Studios. George Massenburg. Video Supplement. Alligator Records. Women in Media Production.
- 1985 December, Tape-to-Disk Listings. Mastering, Pressing & Duplication. TEC Award Winners. Sound for the *Twilight Zone*. Tom Waits.
- 1986 January, Northwest Studios. Equipping Home Studios. Paul Winter. SMPTE-MIDI Connection. Yoko Ono.
- 1986 February, Independent Engineers & Producers. Microphone Special Report. Laurie Spiegel. Budgeting for Sessions. Joni Mitchell.
- 1986 March — SOLD OUT
- 1986 April, Video Production & Post Production Facilities. Video Supplement. Al Kooper. Wireless Mics. Alan Parsons.
- 1986 May, Northeast Studios. Digital Supplement. Sampling Primer. CD Facilities. Future of Console Design. Steve Lillywhite.
- 1986 June, Remote Recording & Sound Reinforcement Listings. Roadability. Russ Titleman. DC-ROM & CD-I. Ry Cooder.

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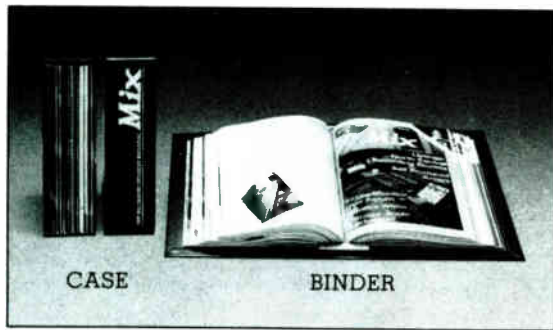
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# STUDIO SOUTHWEST

**STUDIO SOUTHWEST**  
Sunnyvale, TX

**Dimensions of Studios:** Main room 27 x 23, isolation booth A 10 x 11, booth B 10 x 12, booth C 7 x 6  
**Dimensions of Control Rooms:** 25 x 17  
**Tape Recorders:** MCI JH24, 24 track, MCI JH 110B 1/4 inch, 2 track, MCI JH 110B 1/2 inch, 2 track, Studer A 820, 2 track, Techniques 1500, 2 track, Tascam 122B, cassette recorder  
**Mixing Consoles:** MCI 556 automated 48 in x 32 out (spectra VU)  
**Monitor Amplifiers:** (2) UREI 6500, UREI 6250, (3) Crown 300  
**Monitor Speakers:** UREI 813s, Yamaha NS 10s, Auratone T6s, Auratone cubes  
**Echo, Reverb & Delay Systems:** AMS reverb, Lexicon 200, Lexicon PCM70 reverbs, Audi Ence 7-foot plate reverb, Lexicon PCM42 delay, (2) DeltaLab DL4 delays, Eventide H910 harmonizer  
**Other Outboard Equipment:** (2) UREI LA 4 compressor/limiters, dbx 900 rack, dbx 160 compressor/limiter, (2) Valley People Dyna Mite stereo limiters, UREI 535 graphic EQs, Aphex Aural Exciter, 24 channels Dolby A  
**Microphones:** Neumann, AKG, Sennheiser, Beyer, Shure, Electro Voice, Crown PZM  
**Instruments Available:** Yamaha conservatory 7 foot

grand piano, Yamaha CP70 and CP80 electric grand pianos, Fender Rhodes piano, Hammond B-3 organ w/ Leslie, Prophet 5, Prophet 600, Yamaha DX7, Yamaha TX 8-16 DX7 rack, LinnDrum, Ludwig (wood) drum kit, Simmons drum kit, Marshall 50 and 100 watt amps, Fender Twin Reverb, Latin Percussion congas, full percussion kit and Seymour Duncan amps

**Video Equipment & Services:** (2) Sony 1/4-inch video machines, Sony monitors, custom audio to video dubs (24 hour turn around in most cases)

**Rates:** Available upon request Exceptional block rates  
**Extras:** In house production JP Productions—commercials, syndicated TV radio, and album production, Southwest Music Company, Inc.—music production and publishing, M.G. Audio voiceover and commercial production Sound Southwest rental, design and installation and retail sales facility

**Direction:** Recent album products include David Byrne's *True Stories* soundtrack, Johnny Nash, Grammy nominees Douglas Miller and Leslie Phillips, Texas Blues Compilation LP with Willie Nelson, Jimmy Vaughn, Johnny Winter, Van Wilkes and Bugs Henderson and Seymour Duncan Nationally syndicated programs "Dallas Cowboys Weekly," "NBA Weekly," "Celebrity Motor Sports," "Today in Music History," and Gabriel Award winner, "Gospel America" Custom radio packages for KLTU and KPBC Dallas, WYCA, Chicago, WDCN, New York, WMJZ, Detroit, WCTN, Washington, D.C. and KBRT Los Angeles

## [24+] STUDIO WEST

4010-1 Hwy. 6 So. Ste. 457, Houston, TX 77082  
(713) 530-7298

**Owner:** Tom Pena, Steve Headley, Mike Teague, J.R. Kuzniar

**Studio Manager:** J.R. Kuzniar

**Engineers:** J.R. Kuzniar

**Dimensions of Studios:** Large room 22 x 16 x 11, drum booth 11 x 10 x 8, vocal booth 10 x 7 x 8

**Dimensions of Control Rooms:** 20 x 12 x 8

**Tape Recorders:** Otari MTR 9011 (w/autolocator), 24 track, Otari MTR 12 1/2 track (w/autolocator), 2 track Tascam 32 1/2-track, 2-track, TEACA 3440, 4 track, TEAC U 850 stereo cassette deck, 2 track, TEAC V 4RX stereo cassette deck

**Mixing Consoles:** Soundcraft 2400 w/bargraph metering and spectrum analyzer, 28 x 24 52 inputs in mixdown

**Monitor Amplifiers:** Crown PSA 2, HMA 6500

**Monitor Speakers:** JBL 4430s, Minimus 7s

**Echo, Reverb & Delay Systems:** Lexicon 200 Yamaha REV7 and Lexicon PCM60 digital reverbs, Korg SDD



**STUDIO WEST**  
Houston, TX

3000, Effectron II, AEM 1024, and Roland SDE 3000 digital delays

**Other Outboard Equipment:** dbx 180A type 1 noise reduction system on multi track and half tracks, Aphex Aural Exciter, Orban 536A de-esser, (2) dbx 150X compressor/limiters, Ashley SC-55 stereo peak limiter/compressor, Hush IIC noise-reducer system, 8 channels of Gatec noise gates, Roland Dimension 'D', Yamaha 31 band graphic EQ (2 channels), Reme cue amps

**Microphones:** (10) Sennheiser MD421s, AKG C414s, AKG C452 EBs, Electro-Voice PL 70As, Shure SM57s, SM58s

**Instruments Available:** Emulator II, Roland Juno 106, ARP Odyssey Synthesizer, 360 Systems MIDI bass, Oberheim DMX drum machine w extra cards including custom Linn kick card, complete Tama drum kit, Fender "Elite" Stratocaster and Gibson Les Paul guitars, Gibson acoustic Hofner and Rickkenbacker basses, Fender, acoustic and Marshall amps, complete percussion section including Roto toms, bell trees, triangles, etc., S. Wolz Rock man and Bass Rockman

**Rates:** Please call

**Extras:** Located in West Houston, Studio West has complete live-in accommodations including cable TV and full kitchen facilities. Studio musicians, jingle writers, and record publishing are also available

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**Studio Manager:** Laura Calderon  
**Engineers:** Marius Perron, Robert Bruce, Terry Osborne, Patrick Joseph, Ken Ashe, Mike Bowie.

**Dimensions of Studios:** A: 35 x 34 x 20; B: 20 x 15  
**Dimensions of Control Rooms:** A: 23 x 25, B: 20 x 15  
New mixing room designed by Lakeside Associates  
**Tape Recorders:** Studer A80 MKIV, 24-track; 3M M79, 24-track; Ampex ATR100, 4-track; Ampex ATR 100, 2-track, 1/2-inch mastering; Ampex ATR100, 2-track, Scully (six ea.) 280B, 2-track; Scully 280B, 4-track

**Mixing Consoles:** A Spectra Sonics w/Valley People automation, model 1124-24, 24 in x 24 out; B Interface Electronics 100, 16 in x 4 out.

**Monitor Amplifiers:** Crown, Spectra Sonics, BGW  
**Monitor Speakers:** UREI 813B Time Aligned, Auratones, E-V Sentry 100, Yamaha NS-10M.

**Echo, Reverb & Delay Systems:** Eventide Harmonizer, Lexicon 224 digital, Ursa Major Space Station, Lexicon Super Prime Time, Eventide SP-2016 digital effects processor

**Other Outboard Equipment:** UREI 1178 limiters, LA 4 compressors, Universal Audio LA-2 compressors, Allison Gain Brains and Kepex, dbx 165, UREI graphics 1/3 octave, Orban parametric, Orban De-esser, UREI notch filter set

**Microphones:** Neumann U87, U86, U47, KM84, KM88, KM86, TL 170; AKG C414, C451; E V RE20, RE16, RE15, RE55, CS15, Shure SM81, SM77/57, Sennheiser 441, 421, Beyer, Crown PZM

**Instruments Available:** Baldwin grand piano, Rhodes 88, Baldwin tackler piano, Sequential Circuits Prophet 5 synthesizer, Oberheim, Ludwig tympani, Hammond B3 w/Leslie, orchestra bells and chimes, wind chimes, bell tree and other percussion instruments, Ludwig drum kit  
Other instruments available on request

**Video Equipment & Services:** Ampex VPR80 one inch mastering system w/computer editing Ikegami HL79 cameras Arriflex film cameras New 45 x 40 sound stage JVC 1/4-inch recording and manual editing system off line One-inch and 1/2-inch remote facilities Our video facility is state-of-the-art and interfaced with both our audio studios We do music video production

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[24+] UNIVERSAL MUSIC AND POST INC.  
also REMOTE RECORDING  
5840 S. Memorial Ste. 210, Tulsa, OK 74145  
(918) 622-6444

**Owner:** Rod and Sallie Slane  
**Studio Manager:** Bruce Randall

[24+] VERSATRONICS GROUP  
also REMOTE RECORDING  
1118 S. 41 St., Temple, TX 76501  
(817) 773-4000

**Owner:** Lester G. Boutwell  
**Studio Manager:** Larry L. Brown

[24+] VINTAGE RECORDERS  
4831 N. 11th St. Ste. D, Phoenix, AZ 85014  
(602) 241-0667

**Owner:** Billy Moss  
**Studio Manager:** Billy Moss  
**Engineers:** Billy Moss, David Brown, Paula F.T. Wolak, Andy Barrett

**Dimensions of Studios:** Main studio 26 x 20, drum booth: 12 x 8, iso room 9 x 9, reception: 16 x 11.

**Dimensions of Control Rooms:** 16 x 21  
**Tape Recorders:** Studer A-80 MKII w/updates, 24-track additional 16-track heads; Ampex ATR-104, 1/2-inch, 1/4-inch, 2-track, 1/2-inch 4-track; Ampex ATR-700, 1/4-inch 1/4-track; TEAC 3340S, 1/4-inch 4-track; Revox B-215, cassette, Sony PCM-701-es, digital, TEAC 122, cassette.  
**Mixing Consoles:** Trident "B" range (The Davlen Trident) 28 x 16 x 24; Studer 189-080, 20 x 16

**Monitor Amplifiers:** UREI 6500, Crown DC300, Crown DC150, Yamaha P-2200

**Monitor Speakers:** UREI 813 (original), Westlake BBSM-6, E-V Sentry 100, Magnapan MGIII, Dahlquist DQ-9  
**Echo, Reverb & Delay Systems:** Yamaha REV1, REV7, EMT-140 Plate (tube stereo); Lexicon PCM70, Prime Time 93 (gold mod.); DeltaLab Acousticcomputer DL-2, UREI Cooper time cube, MXR 01 digital reverb, Eventide 910 Harmonizer.

**Other Outboard Equipment:** EQ-ITI (Massenberg) ME-230 parametric (2), Aenqus graphic (2), Pultec EQP-1 (2) Pultec EQH-2 (2), Klein and Hummel UE-100, Crown EQ-2, Aphex Aural Exciter (original model 602), compressors and gates, Drawmer DS-201, Roger Mayer (7) gates, dbx 160 (2), dbx 161 (2), Aphex CX-1 (4), API 525 (2) Teletronix LA-2A (orig.) (2), Studer comp. (4), EMT-PDM-156 stereo comp/limiter.  
**Microphones:** Neumann, M-496 (4), U67 (2), U47 FET,

KM64 (6), AKG, C-12 (3), D-12, C-451e (2), Sony, C-37a (4), C-57, ECM-50, C-22 RCA; 44BX (2), 77DX (2), 77A (2), 44 Jr. (2), M1 3045, Sennheiser, 441 (2) 421 (2); Shure SM57s, 58s, Altec 633 salshtaker (2)

**Instruments Available:** Yamaha C-7v (ivory keys) 7'4" grand piano, Fender Rhodes, Hammond B-3 w/Leslie 122 RU, Roland Jupiter-8 synth, Simmons SDS-5 drums, '55 Fender Strat, '61 Fender Esquire, Gretsch Country Gentleman, early Kay country western guitar, '64 Rickenbacker 12-string, Fender Vibrochamp, Fender champ amp (tweed), '71 Marshall 100 1/2 stack, '57 Precision Bass (Tele-Style), '59 Precision Bass, '64 Precision Bass (2), '68 Tele bass (hippie flowered pattern), Fender Bullet bass, large Gretsch drum set w/ten year old snares, Ludwig copper tympani.

**Rates:** \$55/hr special demo rate, \$45/ does not include engineer

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**Direction:** Mick Fleetwood, Richard Dashut, Christine McVie, Billy Burnett, George Hawkins, Glen Campbell, The Crusaders, Terry Becker, Wilton Felder, Tom Kendzia, Dan Consiglio, Lucien Diness, Peter McLan, Paul Ray, Dear Enemy, Alice Cooper, Dick Wagner, Gentlemen Alter Dark, David Brown, Steve Ross, Lindsay Buckingham, Steve Smith, Jimmy Iovine, Gregg Edwards, Stevie Nicks, The John Colter Band, The Tubes, Tim Manion, Goose Creek Symphony, Ocean, Huey Lewis, Entertainment Tonight, Friday Night Videos, Making it Big, Joe Jackson Productions, Charlie Harwood, Rocket 88s, Lovel Allen, Tim Scott, Norbert Putnam, Lewis Story, Sheila Roberts, Kim Robert son, Peter Kater, James McElroy, Eric Scott, Craig Hull.

[24+] JOHN WAGNER RECORDING STUDIOS, INC.  
12000 Candelaria N.E. Ste. I, Albuquerque, NM 87112  
(505) 296-2766

**Owner:** John Wagner, Laura Lee Zachery  
**Studio Manager:** John Wagner

[24+] WESTWOOD RECORDING STUDIOS  
also REMOTE RECORDING  
964 W. Grant, Tucson, AZ 85705

(602) 622-8012

**Owner:** Fred Porter, Roger King  
**Studio Manager:** Roger King

**Engineers:** Fred Porter, Roger King

**Dimensions of Studios:** A: 20 x 35, C: 12 x 16

**Dimensions of Control Rooms:** A: 16 x 20, C: 12 x 16

**Tape Recorders:** MCI JH-16, 24-track; MCI JH-110, 8 track; MCI JH-110, 2-track (2); Revox PR-99, 2-track, Ampex AG440, 2-track; Tascam 40-4, 4-track

**Mixing Consoles:** MCI JH-636 automated 28 x 28, Tan gent 3216 18 x 18; Speck Speckmix 16 16 x 16.

**Monitor Amplifiers:** Crown

**Monitor Speakers:** JBL 4333, JBL 4313B, JBL 4401

**Echo, Reverb & Delay Systems:** Ecoplate, Master Room XL-305, Lexicon PCM42 (2), Lexicon PCM70 digital reverb.

**Other Outboard Equipment:** UREI LA 3s, LA-4s, Orban stereo synthesizer, de-esser, dbx 900 rack w/compressors, parametric EQs, de-essers, flanger, ITI parametrics (stereo), UREI parametric, Allison Seven, Gain Brains.

**Microphones:** Neumann U87

**Instruments Available:** Baldwin seven foot grand, Hammond B-3, Leslie, guitar, amps, basses, Emulator II, Roland Juno 60, drums, SP-12 w/Turbo

**Video Equipment & Services:** BTX synchronizing system  
**Rates:** On request.

## Need equipment, jobs, services? Turn to the industry source: Mix Classifieds on page 174.



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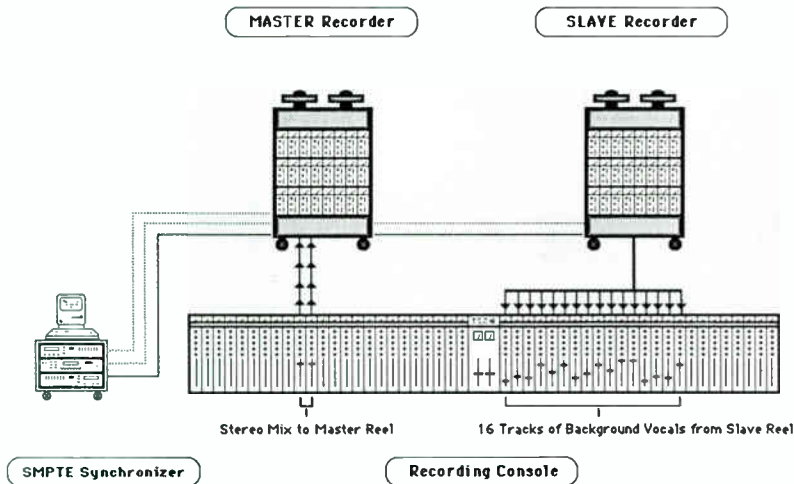


Fig. 2 Mixing Multiple Tracks To A Stereo Pair On Master

—FROM PAGE 113, MEGATRACKS

production. (I can remember when everyone thought it would be hard to fill up 24 tracks. So much for the good old days!) For those projects, multiple slave reels are created, each containing a reference mix of the original rhythm session, as well as a first-generation copy of the original SMPTE time code.

What happens to the slave reels next depends on what the producer has in mind. Some producers use slave reels so that they can keep multiple passes of solos or alternate vocal takes, to expand their decision-making possibilities at mix time. For example, one slave reel may contain only multiple tracks of a lead vocal which may then be composited into one complete, perfect take. The vocal tracks can either be composited to one track of the master reel, or left on the slave reel and locked up live in a 48-track mixdown. (Now you know why there has been an increase in the number of 56-input consoles sold in recent years.) Some slave reels are used to create multi-tracked layers that are then mixed down to a stereo pair of tracks on the master reel. (See Fig. 2) For example, it is not uncommon for one slave reel to contain 15 or more tracks of doubled background vocals. "Working with Barry Gibb on his solo album, *Now, Voyager*," says Steve, "we would sometimes use as many as 19 tracks of Barry singing vocal harmony parts. The depth of the 19-track vocal sound was amazing. . . and Barry's sense of pitch and timing are so well developed that he could dub each new track

without monitoring the previously recorded tracks in his 'phones. He's got great ears."

SMPTE helps once again during the subsequent transfer of the completed slave tracks back to the master reel. To insure the optimum fidelity, it is preferable that the slave reel's tracks be played back to the master reel from the slave's repro head, rather than the sync head, yet the master machine must remain in sync to record the incoming tracks. This creates a timing difference between tracks on the two machines. SMPTE allows an *offset* to be programmed into the synchronizer to compensate for this difference, restoring the correct timing relationship between the master and slave. The slave's tracks can then be bounced into the master in perfect sync. Contrast this to compositing multiple tracks on a single 24-track machine where, if they are to remain in sync, the tracks must be bounced down from the sync head. The fidelity difference is noticeable, if not obvious.

#### 48-Track for Music Remixers

In recent years, the phenomenon of remixing and post-production for records has become widespread, especially in contemporary dance music. But remixing for dance music has put a whole new twist on things—the remixers often become producers after the fact—post-producers, if you will. Post-production is the process of adding additional music, vocals, or effects that were not on the original recording. Much of the work that goes on in remixing dance records involves cre-

ating these additional parts, or adding sound effects and other special tricks that are appropriate for the genre. Usually, there is no room left on the original multi-track master tape to record this additional music, so adding a slave reel is a natural solution. Musical differences aside, the technical principles are identical to other slave reel techniques we have shown. If SMPTE does not already exist on the original master tape, it is recorded on it and then a slave reel is created with identical time code. This allows up to 23 tracks to be used to record new musical parts or special effects that the remixer may create.

I recently talked with Bobby Nathan, owner of Unique Recording, the triple 48-track facility in New York, to get some further information on this. "A lot of our 48-track bookings are dance music related. Faced with a full 24-track master tape whose tracks could not be erased, remixers like Arthur Baker and Chris Lord-Alge use a 24-track slave reel to overdub additional music and effects. The slave is also a great place to record replacement drum sounds created with the AMS. [See last month's In Sync for more on the DMX-1580S.] In addition, the slave makes it possible to rearrange the songs by flying in parts of the song to different places. Lately, there has been an increasing demand for 48-track for pop and rock projects as well. Now, I'm not saying you need 48-track to make a hit record, but having all those tracks gives the producer and artist some security: they don't have to worry about running out of tracks."

Steve Klein echoes Bobby's thoughts: "The extra work needed to prepare for the 48-track format is justified the first time that you need just one more track to capture the magic overdub and, because you're 48-track, you still have one available!"

#### Other Uses

There are other reasons to use megatracking besides the large numbers of tracks made available. Some producers and engineers believe that the original rhythm session master tape should be copied immediately after the session has been completed and put away. They maintain that the fewer times the original master tape is played prior to mixdown, the less wear and tear the master will be subjected to, and the better the fidelity of the rhythm tracks will be on the final mixdown. To accomplish this, the overdubs are recorded on a slave reel which contains a reference mix of the original rhythm tracks. Only during mixdown are the original rhythm tracks from the master

reel used, when they are mixed with the overdubs from the slave reel for the final product. This idea may have merit, but it is a difficult thing for the average recording studio to accomplish with only one multi-track machine.

There are also producers and engineers who believe that the ideal megatracking combination includes a 2-inch 16-track machine; perhaps a 16-track for the original rhythm tracks and a 24-track for the overdubs, or possibly two 16-track machines. Even with two 16-tracks, the 30 usable tracks (allowing one on each for SMPTE) are a net increase from 24, and it is claimed that the wider head gap on a 16-track machine lends itself to a punchier sounding recording overall. The sonic advantage of all this may be offset by the fact that it's hard to find a studio that has an up-to-date 2-inch 16-track recorder any more, and harder still to find one integrated into a SMPTE synchronizer setup. A project started in this manner may be destined to stay at the studio where it began.

This prompts another comment from Steve, about budgets: "Although it's exciting to have 48 tracks all playing at once, studio charges for a two-ma-

chine lockup are higher, and tend to burn up the recording budget that much faster. To conserve the funds, it's a more usual practice to work on one slave reel at a time, 24-track style, and then lock master and slave machines together only when needed to bounce a finished pair down to the master, or to make the final mix." This minimizes the financial drain on the budget while maximizing the power of the recording process.

### To Be Continued . . .

This month, we've had a pretty thorough look at the various uses of the many megatracking techniques used in contemporary recording. But you don't have to own a facility like Unique or The Power Station to make use of some of these techniques. Next month, I'll show how you can perform similar magic in your own studio, even if you only have one multi-track recorder. My thanks to both Steve Klein and Bobby Nathan for lending their professional expertise to this month's discussion. Hopefully we'll have them both back in future columns.

### It's Official!

In the very near future, In Sync will begin to appear online as a part of

SynthNet on the IMC Computer network, now called Esi Street ("Ee-Zee Street"). If you are a subscriber to Esi, you will be able to call in from practically anywhere in the world, access the In Sync database, read past and present columns and download them to your personal computer. Both *Mix* and *Electronic Musician* magazines will be providing additional information services for your convenience. This is a unique experiment in electronic publishing. We at *Mix* and *EM* hope that you will get online and share it with us! For further information on how you can become a subscriber to Esi Street, contact an Esi representative. In the Los Angeles area: (213) 937-0347. In New York: (212) 757-0320. (Tell them the Gnome sent you!)

### And Don't Forget . . .

In Sync now has an online mailbox on Esi Street (IMC). Once you're online, sending in your comments or suggestions is easy. Just address your Email to GNOME-US. If you're not into computers yet, for just 22 cents, a U.S. government employee will still hand-deliver your letter to us. Write In Sync c/o *Mix* magazine, 2608 Ninth Street, Berkeley, CA 94710. See you next month! ■

### —FROM PAGE 132, RICK RUBIN

ment-oriented. I'd say "I'd like this a little rounder," instead of, "If we run it through that, that'll make it round." Equipment is a very funny thing, and I don't like to depend on it too much.

I don't like synthesizers that much, either. I prefer using scratching [the back-and-forth manipulation of a record], guitars, and other acoustic instruments. They're a lot more emotional; you can feel the stroke of a play in a way you can't with something electronic.

**Mix:** Any other production preferences?

**Rubin:** On drums, there's a lot of excessiveness. I never worry about them sounding wrong, though. The engineers I work with never tell me, "you're not allowed to do that." I've been in situations before where that's happened. I was mixing a Beastie Boy's record the same way I do now. And the engineer was telling me, "That's not the way drums are supposed to sound!" I tend to bury the track with the kick. But it always works out. You have to use the right frequencies of all the other stuff. The snare has to be sharp if it's gonna be small against the kick. The high hat's gotta be really bright and unusually loud, also. Though the vocals aren't as loud as on other

records, when they play my records on the radio they sound more correct. They use compression on the radio, and the music usually ends up being less important than the words. My vocals come out more—the way they should've been in the first place. In a club, where they have the bottom and the high-end really pumped-up, you lose the middle—you don't hear the vocals. Which is fine. You go to a club to just dance and hear the beat, anyway.

**Mix:** What about pre-production?

**Rubin:** I listen to a lot of records. I also tune in [New York's oldies-hits station] WCBS-FM to get ideas. If you listen to a lot of successful songs, it helps you get into the frame of mind of what hit records sound like.

Record companies want to sign records that sound like whatever's hot at the moment. They want to hear things that are familiar; to them, familiar means good. I don't agree with that. Why would anyone buy something that sounds like Prince when he could buy Prince? But, again, if you listen to a station like WCBS-FM, you hear so many different types of music back to back—a doo-wop song, next to a pop song, next to a disco song—you get used to hearing what makes a record good, what's good about all of them, and what made them all hits. It's

an overview, instead of machinations of current formulas.

**Mix:** In your hardcore productions, since there isn't a melody to play with, a contour to traverse—the way "conventional" pop songs do—what are some of the tricks you use to create movement?

**Rubin:** You do it the same way—with parts; you create a song structure. This is the thing I might have brought to rap music. A record like [Run-DMC's] "Sucker MC's" had a hard, strong minimal beat that was great, but it didn't have a song structure. That's one of the things that prevented it from being commercial. "It's Yours" was the first record like "Sucker MC's"—hard, minimal and straightforward—that had a hook. I try to make rap records with something you can leave with. I also change beats in the chorus. On Cool J's "Rock the Bells," for example, whenever the line "I need a beat" came up, the high-hat left; the beat appeared harder. When he started rapping again, the high-hat would come back, and you felt you went somewhere!

Also, I use scratching a lot. A scratch either introduces a break or exits a break. A scratch can emphasize lyrics, too, and propel a beat forward to make it more exciting. ■

# F E E D B A C K

## Dear Mix:

I would like to bring to your attention the article on Bearsville in which Steve Bramberg was quoted as saying "We're the only major residential live-in studio in the country."

Not so, Cougar Run/Lake Tahoe has been open since October of 1984 and is rented as a private four-acre estate overlooking Lake Tahoe. We are a Neve/Necam/Studer facility designed by Carl Yanchar of Lakeside Associates.

Thank you for your attention to this matter.

Respectfully,  
Jody Everett Peterson, Sr.  
Managing Partner

## Dear Mix:

We have recently upgraded from a small 4-track studio to a medium sized 16-track studio designed for advertising music production. The \$150,000 we spent on the upgrade was mostly for new equipment. Even though this would not be considered a large investment by most big studio owners, to us it certainly was!

For digital drums and MIDI sequencing, we decided to purchase a Linn 9000 drum computer with disk drive and sampling option for around \$5,000. From the moment we started using the 9000, we have had nothing but problems. Not only did they release a product with bugs, but they continued to manufacture and sell it! The last information we received was that we have no warranty, Linn has gone out of business and there is no "factory support," making service and repair very difficult if not impossible due to the complexity of the hardware/software of the Linn 9000.

The bottom line to this whole mess is we have a piece of equipment that cost a lot of money, is not reliable and has cost us considerable loss in studio revenue. Where does this leave all the 9000 owners out there who thought they had purchased a fully functional, reliable piece of equipment? It leaves them one place... stuck!

Yours Truly,  
Glenn Finerman  
Advanced Media Productions

## Dear Glenn:

We at *Mix* shared your shock and dismay when we heard that Linn Electronics had gone out of business. There are several qualified

service/repair/modification facilities that we know of, although unfortunately none of them are offering warranty service. They are Forat Electronic Service (Studio City, CA), (818) 763-3007; Gand Music-Excelandt Service (Northfield, IL), (312) 446-4263; and Hi-Tech (Venice, CA), (213) 822-1983.

## Dear Mix:

After two years in college with an undecided major, I have recently and finally committed to a recording engineer major. However, I have had difficulty in finding a list of schools that have this program. I am interested in all schools ranging from the six-week to four-year programs, as long as they all have excellent music/recording engineer facilities. I'd like to be enrolled by the fall season, and any help from you would be greatly appreciated.

Thank you.  
Ken Eckland  
Hull, MA

## Dear Ken:

You're in luck. It just so happens that this issue of *Mix* lists over 100 recording schools both in the U.S. and abroad. Happy studying!

## Dear Mix,

Your article on Allen Toussaint (March '86) was excellent. The only thing I missed was more of it.

I had the honor of working with Allen when I first started my mixing and engineering career at Cosimo's Recording Studios in the New Orleans French quarters in 1961. His musical abilities always amazed me, and his production ideas were never-ending.

Whenever I mention Allen's name to anyone in the music industry, I'm usually very shocked that so few people recognize his name. Personally, I think the man deserves much more credit and recognition. However, knowing Allen, I know he wouldn't want it.

I haven't seen him in years, unfortunately, so your article was well-received. It brought back some very good memories. Thanks for taking me back to my "roots" in the music business.

Sincerely,  
Bert Fritel  
chief engineer,  
Gilleys Recording Studio

## Dear Mix:

Unfortunately my parents aren't rich, I'm not related to anyone in the music business, and not one of my friends is a famous rock star. I am presently recording and producing my own music in my Tascam 8-track studio, and I need somebody to take the time to listen to my music.

Where can I find business addresses of record companies, or representatives dealing with these companies? Are there any books, magazines, publications, bathroom walls or anything else that might steer me in the right direction, and if so, how can I get my hands on it?

Sincerely,  
Michael Rolla  
Maynard, MA

## Dear Michael:

Our *Mix* Bookshelf catalog contains a good selection of titles that are applicable to your situation. You may want to begin with *The Platinum Rainbow*, by Bob Monaco and James Riordan; it's an excellent overview of the record business. Other publications available through Bookshelf, such as *The Canadian Music Directory*, *Tunesmith*, *Songplugger* (which now includes quarterly updates of record label names/addresses), and the *Augie Blume & Associates Database* are a few address/contact sources worth investigating. Our Bookshelf catalog is inserted in this issue of *Mix*.

## Dear Mix:

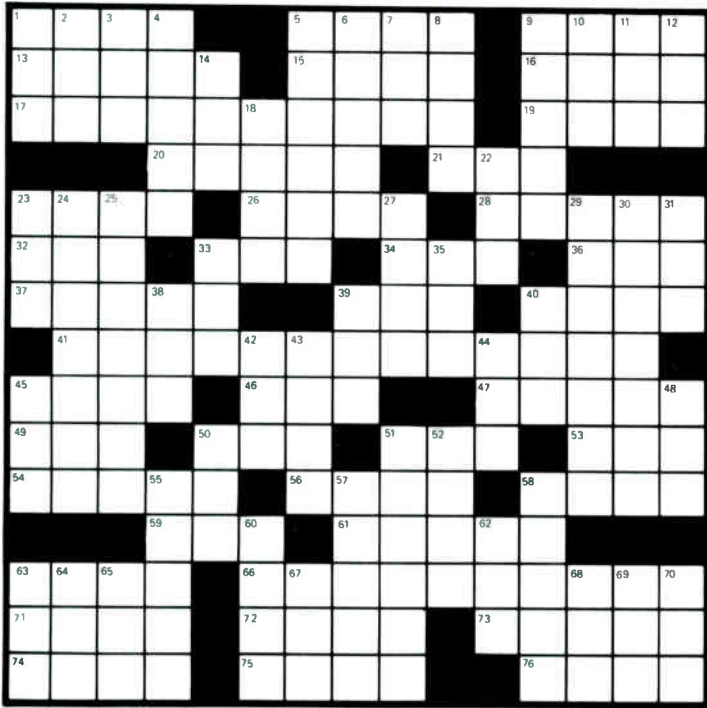
I'm writing in regard to your March, 1986 article "International Record Licensing." The story was informative, and I'm now seeking more information on the subject, since I'm considering sending some of my own independent label pressings overseas. Where can I find addresses of record licensing companies in Europe and Japan?

Sincerely,  
Jack LeTourneau  
Madison, WI

## Dear Jack:

Listings of record and tape manufacturers, distributors and importers worldwide are included in the 1986 *Billboard International Buyer's Guide*, available from *Billboard*, 9107 Wilshire Blvd., Beverly Hills, CA.

# Mix Words



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## "LEADING THE EDGE"

### DOWN

1. Bird call
2. Military address
3. Stock word
4. Brilliance
5. Nab
6. "Any time \_\_\_\_\_"  
Beagle song
7. People with a 2D
8. Being
9. Full-length
10. Speedwagon
11. Fogelberg
12. Vase-like receptacle
14. New York time
18. Contend with
22. Ric Ocasek is one
23. Campus org. of the '60s
24. Every studio needs one
25. Every record needs one

27. "\_\_\_\_\_ Horizon"
29. Goal of rockers
30. Another way of saying 41A
31. Ending with phant- or org-
33. Table scrap
35. Residue
38. Dine
39. Ship section
40. Crown of creation
42. Environmental prefix
43. Mrs. Chaplin
44. "I'm a \_\_\_\_\_" Spencer Davis hit
45. Disturbed
48. Soul group
50. "Chance \_\_\_\_\_ word void of sense . . ."
51. Extra song
52. Quantec \_\_\_\_\_ simulation
55. Corn and oat, e.g.
57. Edible tuber, colloquially
58. Go in

60. Sortie
62. Joplin opus
63. Question
64. Society page word
65. American string instrument maker
67. Actress Hagen
68. Adjective ending
69. 34A homonym
70. "\_\_\_\_\_ Kelly," 1970 Mick flick

### ACROSS

1. Horn of theater
5. Modern composer
9. Asian language
13. Keeping up
15. Late singer Redding
16. Come close
17. Adjective for top studios
19. Elkart, Indiana name
20. Coral island chain
21. Old French coin
23. Singing style
26. Word with malt
28. Confused
32. Johnny's bandleader
33. "\_\_\_\_\_ the land of the free . . ."
34. 33A homonym
36. Troops (abbr.)
37. Facial gesture
39. Donkey
40. Hurt
41. Overused studio description
45. Castle defense
46. Portable bed
47. Make a gift of
49. Height prefix
53. Charged particle
51. Sea bird
53. Disease ending
54. Judges
56. "\_\_\_\_\_ time" (Never)
58. Professor's adj.
59. Something to play by
61. \_\_\_\_\_ Sound, Oak Ridge Boys' studio
63. "Tonight Show Theme" writer
66. Useful console feature
71. Navy special team member
72. Roman road
73. Type
74. Pocket percussion
75. Challenge
76. Wind instrument

—FROM PAGE 126, STEARNS

This could add a new dimension to riding the Life-Cycle at the health club. . .

Time is the main factor in a recent film project, *Chronos*, produced by Ron Fricke, the cinematographer for *Koyaanisqatsi*. Using the same high-speed film process as the IMax (four-story screen) and Omnimax (planetary) formats, *Chronos* is the flip side of *Koyaanisqatsi*'s chronicle of dehumanization, following Western civilization from Egypt through Europe and North America. Fricke edited the film to Stearns' expansive, pulsating score, orchestrated for surround-sound theaters. The two are currently working on a short feature on the night sky of Australia and Halley's Comet.

*Chronos* isn't Stearns' first film work—he's engineered for Maurice Jarre's *Firefox* and *Dreamscape* soundtracks—but this one has been closest to his heart. "I like to think of this film as if someone from another planet just zapped down to Earth and we're seeing it through their eyes and nervous systems."

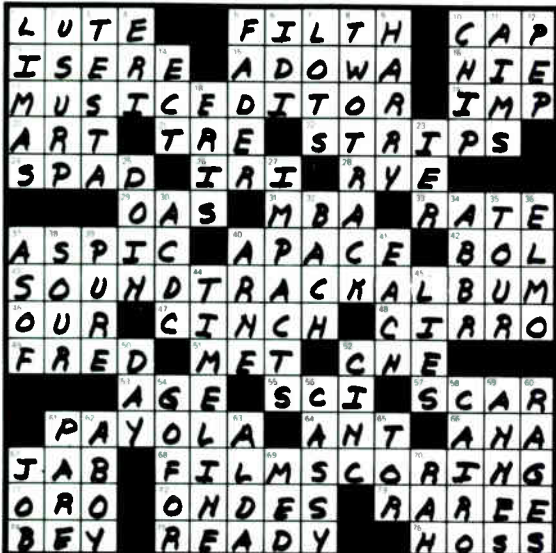
Perhaps those aliens might be comfortable with Stearns' more exotic instruments, the Beam and Lyra. The Beam is a 12-foot aluminum platform strung with 24 piano strings, which when amplified create the reverberant, cascading growls that emerge on many of Stearns' recordings.

The Lyra is more formidable—a massive harp with 154 strings, strung 35 feet across and 25 feet high and bolted to the floor and ceiling. It was designed by George Landry, with an electronic pickup system and tuning mechanism created by Stearns himself. "We designed the floor as a giant subwoofer, so if you walked to the center and played one of the larger strings, the floor would actually shake like an earthquake, deep and rumbling." The Lyra was featured on *Ripley's Believe It or Not* and can be heard on Stearns' *Lyra-Sound Constellation*, although without the earth-shaking results.

Stearns continues exploring new directions and taking chances with his audience on the forthcoming *Plunge*, for Craig Huxley's Sonic Atmosphere label. On *Plunge*, the guitar makes a comeback in the form of electric and acoustic 6- and 12-strings, and Stearns collaborates with other musicians including harp, voice and reeds. He also experiments with short-form compositions for the first time on record.

Stearns' music is unbound by time or culture, using technology to plug into the global network. "Because it is so intimately involved with technology," he says, "I think the music is going where the technology is going. Technology is becoming the nervous system of the planet." ■

## — Solution to June Mix Words —



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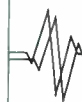
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—FROM PAGE 142, ENGINEERING

anyone in the audio field is a never-ending battle.

### January Sound Studios, Dennis Lowe

After 14 years in business, January Sound Studios in Dallas is alive and well, according to Dennis Lowe, who says that their 32-track digital and 48-track analog machines have been busy as of late with an abundance of record projects and commercial work. Some recent activity included album projects for Allen Ginsberg, Lou Anne Martin, and James Rivers, and national radio/TV spots for Miller, Blue Ribbon, and Chevrolet.

*What do you look for in a new engineer?*

We haven't hired anyone for two years.

There are plenty around, but all the good engineers want to stay freelance. They have their own client base, and they come to me and say, "We want the studio this weekend." So the good engineers pretty much have their choice on where they want to work. All I do is make sure that their job is easy by providing them with what I can as far as equipment goes.

*What specific qualities do you look for in an engineer?*

I like engineers who are specialized. Every type of music demands a different type of engineer. For instance, my record engineers don't do commercials because they aren't geared for a faster pace, and they're usually the kind of guys who come in with jeans on and aren't ready to meet with corporate clients.

*How do you know if an engineer will work out or not?*

It's very easy to put someone behind one of these consoles and see what they can do with it. And I can ask a few questions and know real quick if they know what they're doing. Also, an engineer better have a positive attitude. Seeing an engineer under pressure is a great way to see who they are and what they're capable of. How they work around a problem is very important.

*Is it pretty grim out there for engineers looking for work?*

Yeah. It's real slim. The young ones who make it are the ones who work all the time. They have to start out doing anything they can get. It takes a person who really wants to do it. An engineer, to get going, has to sell himself.

Once he gets a client or two, it's just a matter of word of mouth.

### Omega Audio, Paul Christensen

On the road and behind the glass, Omega Audio in Dallas is healthier than ever in its 13th year in business. Owner Paul Christensen says he plans to continue catering to all needs of the recording market, covering everything from remote projects such as the recent Texas Sesquicentennial, to album work for soul group New Edition.

*What do you look for in an engineer?* Firstly, I want them to have the ability to serve. If there were two engineers side by side, one with better engineering chops than the other, I'd still choose the one with the better attitude and willingness to serve. I believe you can always teach engineering chops, but you can't teach attitude.

I'm not big on going out and trying to find some heavy duty person who's had ten years experience. I would rather have someone who's real hungry and motivated, and I'd rather bring them along and train them. Sometimes that ten years experience can set them in their ways. I really believe in letting people grow, and stretching themselves.

*Once an engineer is hired, what do you expect from him?*

A good attitude. This is a crazy business. I would tell anybody they're stupid to get into it unless they're absolutely hooked. You're going to work your rear off. You've got to be incredibly determined. If you don't live music, to where you just feel like you're on a high when you're in that studio, you're really in the wrong business.

*Would you let an intern or a newly hired engineer work on a session with, say, New Edition?*

Sure. A lot of times I think we take ourselves and this business way too seriously. There's no reason why an intern, after a couple of months with me, can't second engineer anybody. All of it is just common sense, and if you have the technical know-how and the right attitude, that's what it's all about. You could tell me someone has been in the business 40 years, and that wouldn't guarantee he's a good engineer. A perfect example: one of my interns was second engineering, and he actually knew more about the equipment than the first engineer because the first was an independent. This out-of-house engineer didn't know how to edit on our Mitsubishi X80, so my intern showed him how to do it, and he was on his own. ■

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