

MARCH 1987
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THE RECORDING INDUSTRY MAGAZINE

Mix

Interview: Richard Thompson

**Directory:
Southeast Studios**

**Digital Recording
Supplement**

Brent Maher

Memphis Music

**Lunching With
Mark Hudson**

DMP's Tom Jung

SPARS' Nick Colleran

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Neve Electronics Int'l Ltd.
Cambridge House, Melbourn, Royston
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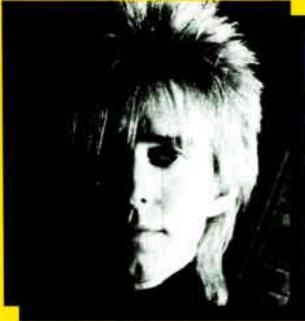
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MARCH 1987

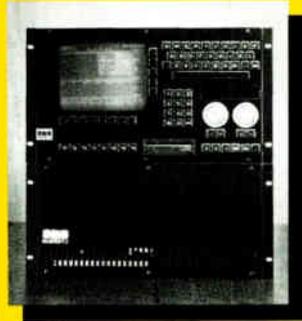
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Cover: Installed in January, the Neve V Series console at Quadracial Cinema Corp. in North Miami, Florida is one of only two in the state and features 48 inputs and Necam 96 automation. This year marks the facility's seventh anniversary as a 24-track studio for album and soundtrack work.

Photo by: Mark Bonanno



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or many in our industry the Grammy Awards are the meter that measures the quality of our efforts. The Grammys are intended to be a fair and informed appraisal of the recorded product that annually gets released to the public. Quality is the criterion, not sales and not trendiness. The voting is done by people who make their livings in the recording industry, not the critics, and not the common man.

On the other hand, the Grammys are also a very successful television program that thrives on viewership and public appeal. They have grown enormously through the years, fed by the record industry's promotional pipeline and the almighty power of the tube. The Grammys are now a cultural milepost, indicating who's happening musically and who's not. They are the ultimate pedestal on which to place any year's collection of musical darlings. And they depend on hit records and star power to provide a prestige television package. A Grammy show with no "hits" and no "stars" might as well appear on cable channel 78 in the 5 a.m. slot.

Many people find wide areas of fault with the process of selecting Grammy nominees and winners. Some say that even though the jury is composed of our industry peers, the voters have their special interests and frequently bias the awards with a kind of "insider trading." Others say that the credibility has long since left the awards and now it's just a case of how big the TV show can become and how much money it can generate for the winners. Still others criticize the categories and how fairly they segregate and represent the real quality and talent in our business.

The Grammy Awards is an easy target for potshooters. But though it can never satisfy all of its detractors, it can still be an important way for the music makers to influence the music consumers. There is nothing sacred about the structure of the Grammys. The membership of the National Academy of Recording Arts and Sciences is constantly reviewing methods and procedures to deal with its shortcomings. The critics are important to keep the process honest and to provide momentum for the process to improve. Above all, constructive criticism from those closest to the recording industry is valuable to the people who put on the Grammys.

Whether you join the Academy and participate from the inside, or just express your opinions as an interested professional, you can help to make the Grammys a more credible and valuable representation of the quality in our industry. You can write to the National Academy of Recording Arts and Sciences at 303 N. Glenoaks Blvd., Suite 140, Burbank, CA 91502. They'll listen to you.

Keep reading,

A handwritten signature in black ink, which appears to read 'David M. Schwartz'.

David M. Schwartz
Editor



CURRENT

CD-I Conference in San Francisco

Online International will be presenting a business strategy conference on the subject of the interactive compact disc (CD-I) May 11 through 13 at Moscone Center in San Francisco. Billed as "the world's first forum devoted exclusively to exposing the revolutionary technical, creative and business implications of CD-I," the conference will utilize several general sessions and two parallel tracks—one dealing with product development, programming and strategic marketing issues; the other with the important technical issues of CD-I technology. For registration information, contact Online International, 989 Avenue of the Americas, New York, NY 10018, (212) 279-8890.

SPARS Hosts Business Plan Conference

The Society of Professional Audio Recording Studios (SPARS) will offer a two-day conference April 25 and 26 on "Business Plans for the Studio." The sessions will be held at the UCLA Graduate School of Management, in Los Angeles, with attendance limited to 75 persons. Among the step-by-step business plan topics covered in the seminar sessions will be Opening a New Studio, Entry into Video, Expanding the Studio, Adding a New Location, Adding a Synthesizer Room, and Getting into the Rental Business. The cost of the conference for SPARS members is \$130 before April 6 and \$180 after; for non-members the cost is \$230 before April 6 and \$280 after. For further details, contact the SPARS office at PO Box 11333, Beverly Hills, CA 90213 or call (818) 999-0566.

AES Educational Grant Program

The 1987 educational grant program, for university study of audio topics by graduate students, has been opened by the Audio Engineering So-

ciety Educational Foundation. Applications must be submitted by May 1 to be considered for the 1987-88 academic year. Successful applicants may request a one-year renewal of their grants. Further information and application forms are available from the AES Educational Foundation, 60 East 42nd St., New York, NY 10165.

NSCA Contractor's Expo April 6-8

The National Sound and Communications Association Contractor's Expo '87 will be held April 6 through 8 at the Fairmont Hotel in New Orleans. Prior to the Expo will be a two-day session on Basic Sound System Design and Estimating for Salespeople, with classes in Basic Terminology and Theory; Microphone Types and Usage; Mixers, Preamps, and Input Devices; Combination Amplifiers and Power Amplifiers; Loudspeakers, Horns, and Other Radiating Devices; Signal Processors, Equalization, Compressors and Delays. Other features of Expo '87 include manufacturer exhibits, a tour of the Superdome and a keynote presentation by Larry Estrin on the audio visual production behind the Statue of Liberty Centennial Celebration. For more information, contact NSCA at 501 W. Algonquin Rd., Arlington Heights, IL 60005, (312) 593-8360

AES Hosts Conference on Music and Digital Technology

The Audio Engineering Society's 5th International Conference will be held May 1 through 3, at the Biltmore Hotel in Los Angeles, dealing with the topic of Music and Digital Technology. Conference Chair John Strawn has organized a program of lectures, demonstrations, concerts and panel discussion to "summarize the state-of-the-art of digital music-making and to point toward future developments." There will also be an exhibition of selected pro-

ducts relevant to the theme of the conference. For information about registration, contact the Audio Engineering Society, 60 E. 42nd St., Rm. 2520, New York, NY, 10165, or call (212) 682-0477.

San Francisco Music Fair

The Second Annual San Francisco Music Fair, hosted by the San Francisco chapter of the National Academy of Recording Arts and Sciences, will take place at the Concourse of Showplace Square, in San Francisco, May 29 through 31. This event is designed as a resource center of products and services for musicians and others in the music industry. The high-technology and music focus will be integrated throughout the exhibits, performances and seminars. For information on exhibiting or attending the Music Fair, contact Events West, Star Route 454, Sausalito, CA 94965, (415) 383-3249.

Counterfeit Seizures All Time High in 1986

The Recording Industry Association of America (RIAA) has released statistics showing that in 1986 more than 465,000 pirate and counterfeit cassettes were seized by law enforcement agencies with assistance from RIAA personnel throughout the U.S. This represents an 823% increase in confiscated tapes over 1984 and a 21% increase over 1985. According to Joel Schoenfeld, director of the RIAA Anti-Piracy Unit, "The comprehensive anti-piracy effort of 1985 at the retail level provided invaluable information which led to the elimination of major manufacturers of piratical product." While the Western and Southeast U.S. continued to lead the country in all forms of sound recording piracy, year-end statistics show that domestic markets are increasingly being threatened by illegal sound recordings manufactured abroad and exported to the U.S.

OPPORTUNITY KNOCKS.



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OTARI

INDUSTRY NOTES

The Grammy Awards, presented annually by the National Academy of Recording Arts & Sciences, will return to New York's Radio City Music Hall in February of 1988 for its 30th anniversary telecast. . . Toa Electronics president Sam Sakata will be leaving his post in late April, with Yoshiro Ishida taking over as new president and CEO of Toa-USA. . . New World Audio of San Diego, CA, will host Music Tech '87, its second annual electronic music and recording expo, in April. For more information, call Jim Scott at New World, (619) 569-1944. . . New officers at Passport Designs, Inc. include Denis Labrecque, vice president of operations; Don Dias, vice president of finance; and Tony Basile, vice president of sales. . . William W. Peck has been appointed president and general manager of CD replicator Shape Optimedia, Inc., of Sanford, Maine. . . James M. Frische has been named executive vice president, Digital Audio Disc Corporation, the Sony Corporation of America CD manufacturing subsidiary in Terre Haute, Indiana. . . Jason Farrow has been promoted to vice president, corporate communications of Sony Corporation of America. . . Pro Media of San Francisco has been appointed by Dolby Laboratories as its professional products dealer for Northern California. . . Fairlight of Australia has announced the appointment of two new distribution firms for their Computer Musical Instrument (CMI) Series III: Toronto-based Computer Music International as their Canadian outlet and Sistemas Midi, in Barcelona, to handle the Series III in Spain. . . William O. Rhoades has been named national sales director for Versadyne International's 1500 Series high speed tape duplicating systems. . . Photomag Recording Studios, in New York City, have signed on Rex Recker as mixer, Dominick Tavella as recording engineer, Terry Mader as post-production mixer and Gary Rotta as chief engineer. . . Publison has relocated to Suite 775 at 6464 Sunset Bl., Hollywood, CA 90028, ph. (213) 460-6355. . . NEOTEK Corporation has announced the appointment of Eileen Gormaly as its director of marketing design. . . Omni Technology's president Lutz H. Meyer has announced the appointment of Larry Sowder as vice president in charge of sales. . . Musician/producer Brett Sommer has been named production coordinator of Ciani/Musica, in New York City. . . Corya Kennedy and Gayle Vezina have been named sales representatives for Editel/Chicago's recently created Effects Animation Design Group division. . . At Editel/L.A.,

Larry Bracco has been appointed sales and marketing exec. . . Following the recent merger between AMS and Calrec, Nigel Branwell has been appointed sales and marketing coordinator for "Calrec by AMS" products in the North American market. He can be reached at (206) 633-1956. . . UCLA will be offering a Master Class in Recording Engineering with George Massenburg, beginning April 4. For more information, call (213) 825-9064. . . JRF/Magnetic Sciences, Inc. has relocated to Kennedy Road, PO Box 121, Greendell, NJ 07839, ph. (201) 579-5773. . . Steve G. Romeo has been hired as market manager at JBL Professional, overseeing the sound contracting, motion picture and broadcast markets. . . Peter Kehoe has been appointed Mid-Atlantic regional manager for Studer Revox America. . . Polyphonic FX has relocated to 3860 Hollypark, Los Angeles, CA 90039, ph. (213) 661-9740. . . Larry Kingen has joined the post-production center AME, Inc. in Burbank/Hollywood as president and chief operating officer. . . the 1987 California State University Summer Arts Workshop Computer/Electronic Music Program will feature Suzanne Ciani, Bo Tomlyn, Don Lewis, Terry Fryer and Dan Wyman. For details, call Allen Strange at (408) 590-5768. . . Cubicomp Corporation has appointed Douglas Harrison broadcast and video production product marketing manager, Issac Agam creative design product marketing manager, and Robert S. Rariseau vice president of engineering. . . Bill Prentice has joined the staff of musical instrument case manufacturer Jan-AI Innerprizes. . . Stramp USA has been established as the U.S. distributor for the products of West German firm Audio Vertrieb Peter Strueven GmbH. . . a new Ron Rose Productions audio post facility has opened at the video post-production house Postique, Inc. at 23475 Northwestern Highway in Southfield, MI. . . Invisible Products has announced the relocation and expansion of its warehouse, assembly and distribution operations. They can be reached at Box 341, Accord, MA 02018. . . Dynair Electronics has added Al Wilson as Central region manager, Bob McAll as Eastern region manager and Jim Moneyhun as Western region manager. . . Vinten Equipment Inc. has moved their U.S. headquarters to a new facility at 275-C Marcus Blvd., Hauppauge, NY 11788, and has added Greg Reilman as sales manager for their Western regional office in Sun Valley, CA. . . Roger Strukhoff has been appointed Editor-in-Chief of CD-ROM Review magazine. ■

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In sound reinforcement, there are no insignificant details.

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

Technical advances are raising audience expectations

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



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

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

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

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

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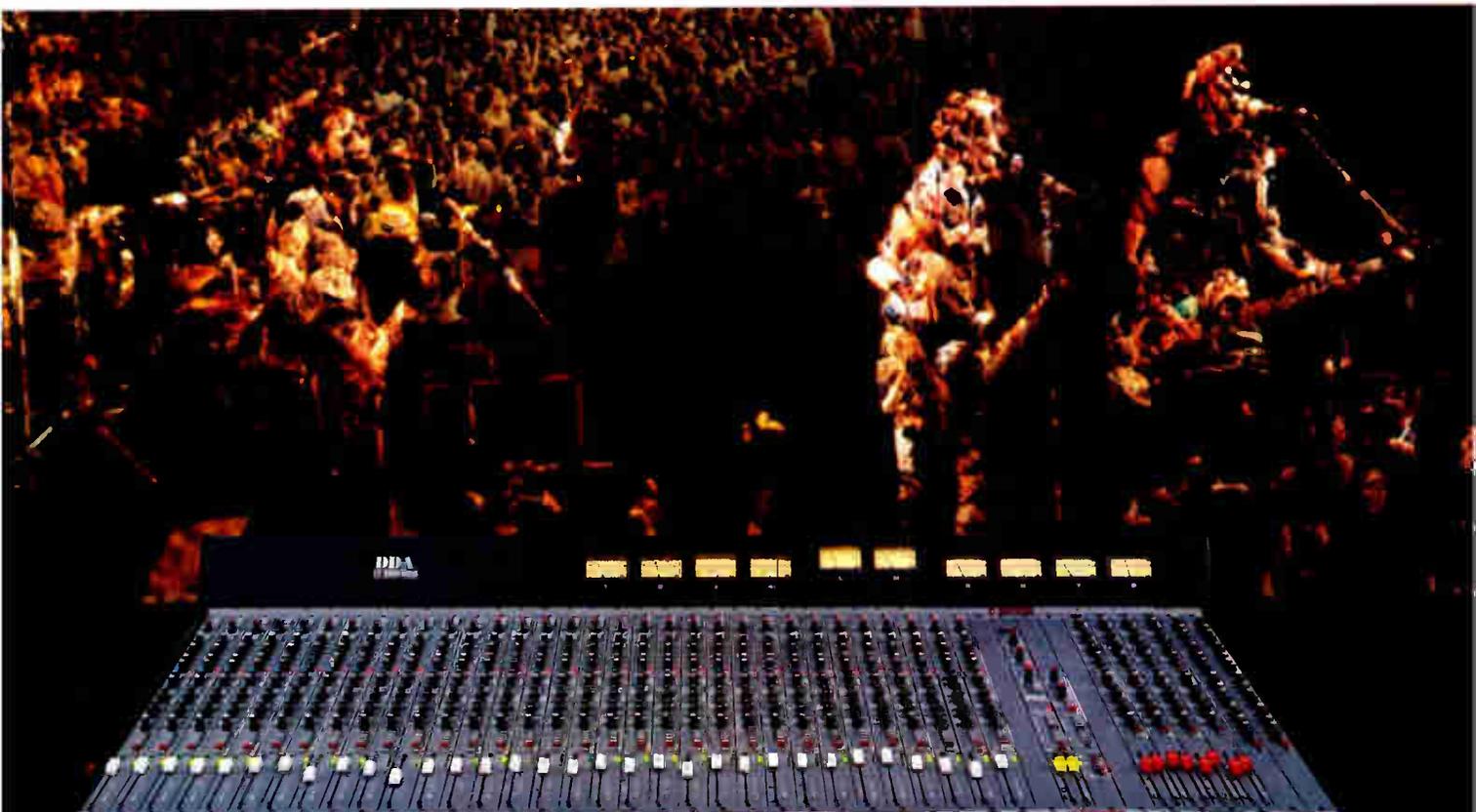
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SESSIONS

SO. CALIFORNIA

Jimmy Iovine mixed a 12-inch version of "I Found Love" by *Lone Justice* for Warner Bros. with *Gordon Fordyce* as engineer and assistant *Jeff Lorenzen* at *Larrabee Sound* in L.A. . . . *Lion* has been recording and self-producing their debut album for Scotti Bros./CBS Records at *Santa Monica Sound Recorders* with *Bill Freesh* engineering. . . .

SOUTHWEST

At *Goodnight Dallas, Red Sky* recorded a new arrangement of Sugarloaf's "Green-eyed Lady." *Tim Orsburn* and *Ruben Ayala* engineered and produced the project. . . Voice artist *Luke Garrett* (Crescendo Records) was in Dallas' *Appletree Studios* doing a piece for Fourth Day Music Productions. Fourth Day is shopping the tape to major Gospel labels and artists. *Jonathan Cluts* engineered the sessions. . . The *Omega Audio* remote, which is based in Dallas, taped a 24-track recording for *Roy Orbison* at Rockefeller's Club in Houston. The concert was videotaped for a television special coinciding with Orbison's induction into the Rock & Roll Hall of Fame. . . Dallas guitar wizard *Craig Wallace* was in *Planet Dallas* re-mixing a demo of his latest sounds in preparation for a major upcoming studio project, *Rick Rooney* engineering. . . .

NORTH CENTRAL

At *Seller Sound Studio* in Sterling Heights, MI, the group *Ready for the World* was in recording some extras for the 12-inch version of "Mary-goes-round" for MCA records, produced by RFTW and *Gary Spaniola*. . . At *Studio A*, Dearborn Heights, MI, producer *Rick Callier* digitally mixed tracks on the *Bethesda Temple Choir* from Atlanta, for their first album; *John Jaszcz* behind the console assisted by *Peter Prout*. . . At *Solid Sound*, Ann Arbor, MI, *Young People's Theatre*, along with folk artists *Gemini*, cut a soundtrack for their show entitled *Riding on Stars*. The session was engineered by *Rob Martens*. . . *Lynn Allen* worked on their latest album with *Bill Peiffer* producing, *Harry H. Heath* engineering, at *Barn Burner Studio* in Annawan, IL. . . Chicago rockers *Personal Stranger* recorded their new four-song record project at *Paragon Recording* in Chicago. *Mark Richardson* was at the console, with *Tom Quinlan* and *Scott Barnes*

assisting. . . At *Seagrape* in Chicago, *Tony Mundaca* and *Rick Siepac* produced a new song for *Magic Keith* entitled "Solutions." The song is slated for release on Moondoor Records. *Tom Haban* engineered the dates. . . .

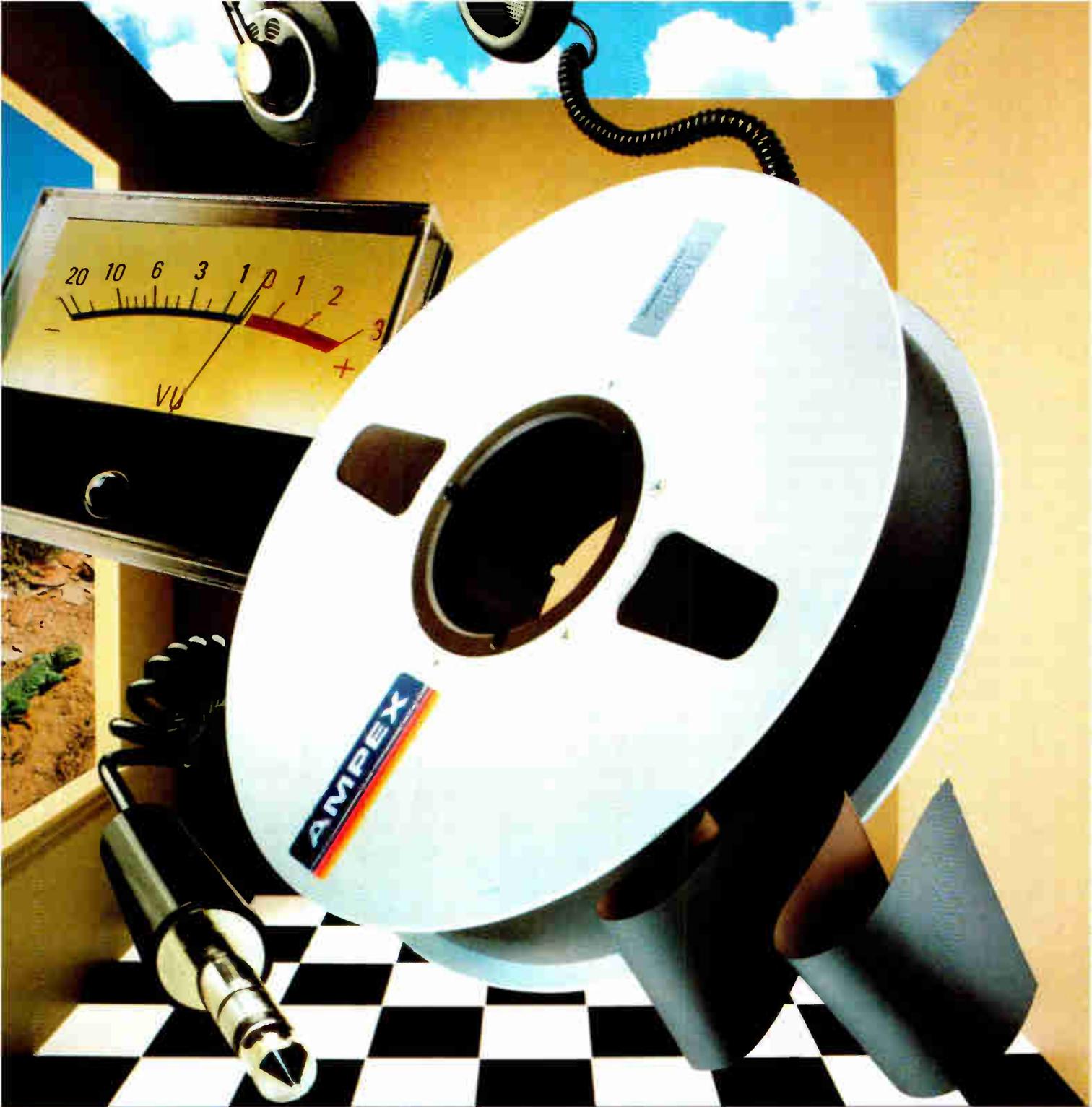
NORTHEAST

Producer *Fareed* was in working at *Evergreen Recording* in NYC with Tabu/CBS recording artist *James Robinson*. Engineering the sessions was *Hahn Rowe* assisted by *Andrea Bella*. . . At Philadelphia's *Modern Audio Productions*, in-house writer and arranger *Jack Ebbert* and engineer *Bob Schachner* took a break from album projects and put together original music for clients such as *McDonalds*, *DuPont*, *Vista Health Care*, and *Clover* department stores. . . *Rick Rubin* was in at Manhattan's *I.N.S.* recently to work with producer *Bill Stephney* and co-producer *Hank Shocklee* on the mix of "Sophisticated" by *Public Enemy*. *Steve Linsley* engineered. . . At *Shakedown Sound* in NYC, *Arthur Baker* worked with *Rose Royce* on three cuts entitled, "Bridges," "If Walls Could Talk" and "Listen Up," all for Omni Records. Engineers on the project were *Dave Sussman*, *Jay Burnett*, *Steve Peck* and *Andy Wallace*. . . Ex-basketball great *Earl "The Pearl" Monroe* was in at *Quantum Sound* in Jersey City preparing releases of *BBQ* and *Virgi Williams* on his new Elektra/Pretty Pearl label. *Butch Jones* engineered, with *Craig Johnson* assisting. . . At *Rawlston Recording* in Brooklyn, *Fred Paul*, noted Haitian band leader, worked on cuts for his soon to be released album. *Franklyn Grant* engineered, with *George Mayers* assisting. . . Ras recording artists *Black Uhuru* were captured live by *ASL Mobile Audio* from the Ritz, NYC, for a live CD and concert video. The performance was recorded and engineered by *Steven Remote*, assisted by *Jimmy Murphy* and *Dan O'Leary*. . . At *Secret Sound* in NYC, *Paul Simpson* mixed *Barbara Roy* for RCA, with *Jim Lyon* engineering and *Eric Behrend* assisting. And *Michael Zager* was in producing *Rochelle* with *Scott Noll* at the board. . . At NYC's *Secret Society/Chung King House of Metal*, two DeJ Jam albums were completed: the follow-up to last year's gold *Radio from LL Cool J*, and a new debut LP from *M.C. Breeze*. . . *Run DMC*, whose first records were made at *Greene Street* in Manhattan, returned there to cut the title track from their new movie, *Tougher Than Leather* for Profile, *Russell Simmons* producing, *Joe Blaney* engineering. . . At *Kajem* in Philadelphia,

Smash Palace cut tracks for Polygram, produced by *Steve* and *Bryan Butler* and engineered by *Joe Alexander* and assistant *Ryan Dorn*. And MCA's *Oak Ridge Boys* were in with *Patti LaBelle* cutting a track for their forthcoming LP, produced by *Eli Ball*, engineered by *Bob Bullock* and assisted by *Jim Campbell*. . . At *Beartracks* in Suffrin, NY, producer engineer *Jay Henry* finished mixes with *Rainy Davis* and *Pete Warner* for Rainy's upcoming debut album on CBS Records. . . The M&M production team of *Jon Morales* and *Sergio Munziba* were in at NYC's *Quad Recording* working on a pair of 12-inch releases for *Regina* for Atlantic Records. The sessions were engineered by *Brian Max*. . . At *Reel Platinum Studios* in Lodi, NJ, Atlantic Recording artist *Joshua* laid down tracks for a 12-inch for artist *Nozomi* of the group *Kilpig*. The single is described as an operatic/industrial remake of a disco/dance classic. . . Completed in *Sheffield Audio-Video's* studio was mixing for the PBS *Thelonius Monk Tribute*. The show is scheduled to air in March and features such jazz greats as Wynton Marsalis, Herbie Hancock, and Dizzy Gillespie, just to name a few. *Dave Glasser* engineered, *Bill Mueller* assisted, in the Phoenix, MD, studio. . . *Steve Jordan* and *Charlie Drayton* were in working at NYC's *Giant Sound* on their new project, *The Raging Hormones*. *Gragg Lumsford* engineered. Also, *Jennifer Rush* worked on her new CBS LP with *Desmond Childe* producing and *Arthur Payson* engineering. . . .

NORTHWEST

Recent sessions at *Alameda Digital Recording*, Alameda, CA, included pop/rock band *Ariel* cutting basics for their long-awaited *Par Ariel* CD project, with *Jim Jenkins* and *George Petersen* producing. . . A&M recording artists *UB40* were in at *Triad Studios* in Redmond, WA, to record and mix a song for Johnathan Demme's *Something Wild*. *UB40* produced with *Tom Hall* engineering and *Mike Tortorello* assisting. . . At *CD Studios* in SF, gospel singer *Tramaine Hawkins* has been working on her second LP for A&M Records, due in March. *Robert Wright* is producing the sessions with *Gary Hobish* engineering. . . At *L.A.W. Studios* in Las Vegas, the team of *Gladys Knight & the Pips* worked with producer *Howie Rice* and engineer *Curt Serrioli* on a single for their upcoming MCA release. Also, the group *Santa Fe* completed 48-track mixing on their new album for CIA Records with engineer *Lee Watters*. . . At *Gate Five Studios* in Sausa-



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AND THE BEAT GOES ON

lito, *Cory Lerios* (of Pablo Cruise fame) was in writing and recording new material for various projects. All work was engineered by chief engineer *Terry Chambers*, with *Dr. Richie Moore* assisting. . . At *Banquet Sound* in Santa Rosa, CA, *Dick Smothers, Jr.* and *Kamikaze* completed a sizzling five-song package, produced by *Kamikaze* and *Warren Dennis*, engineered by *Dennis*. . . *Bear Creek Studio* in Woodinville, WA, played host to *Heart* and producer *Ron Nevison*, who were in recording new material being considered for the group's next release. . . At *Steve Lawson Productions*, in Seattle, local heavy metal heroes are recording an LP in Studio A with engineer *Terry Date*. The album is being produced by *Dave Mustaine* of *Megadeth*. . . At *London Bridge Studios* in Seattle, *Huey Lewis & the News* were in doing overdubs and mix-down on a live version of "Jacob's Ladder." *Robert Missbach* engineered with *Rakesh Parashar* assisting. . . At *Sonoma Sound* (Sonoma, CA), *Arron Johnson* has been engineering sessions for a new group, *Somek*. . .



Working on a project at Salty Dog Recording were (L-R) Jeff Lynne, producer Bob Rose, Jim Keltner, Nigel Harrison, George Harrison and engineer Larry Brown.

Fort Lauderdale. Engineering the session was *Ted Stein* with *Teresa Verplank* assisting. . .

SOUTHEAST

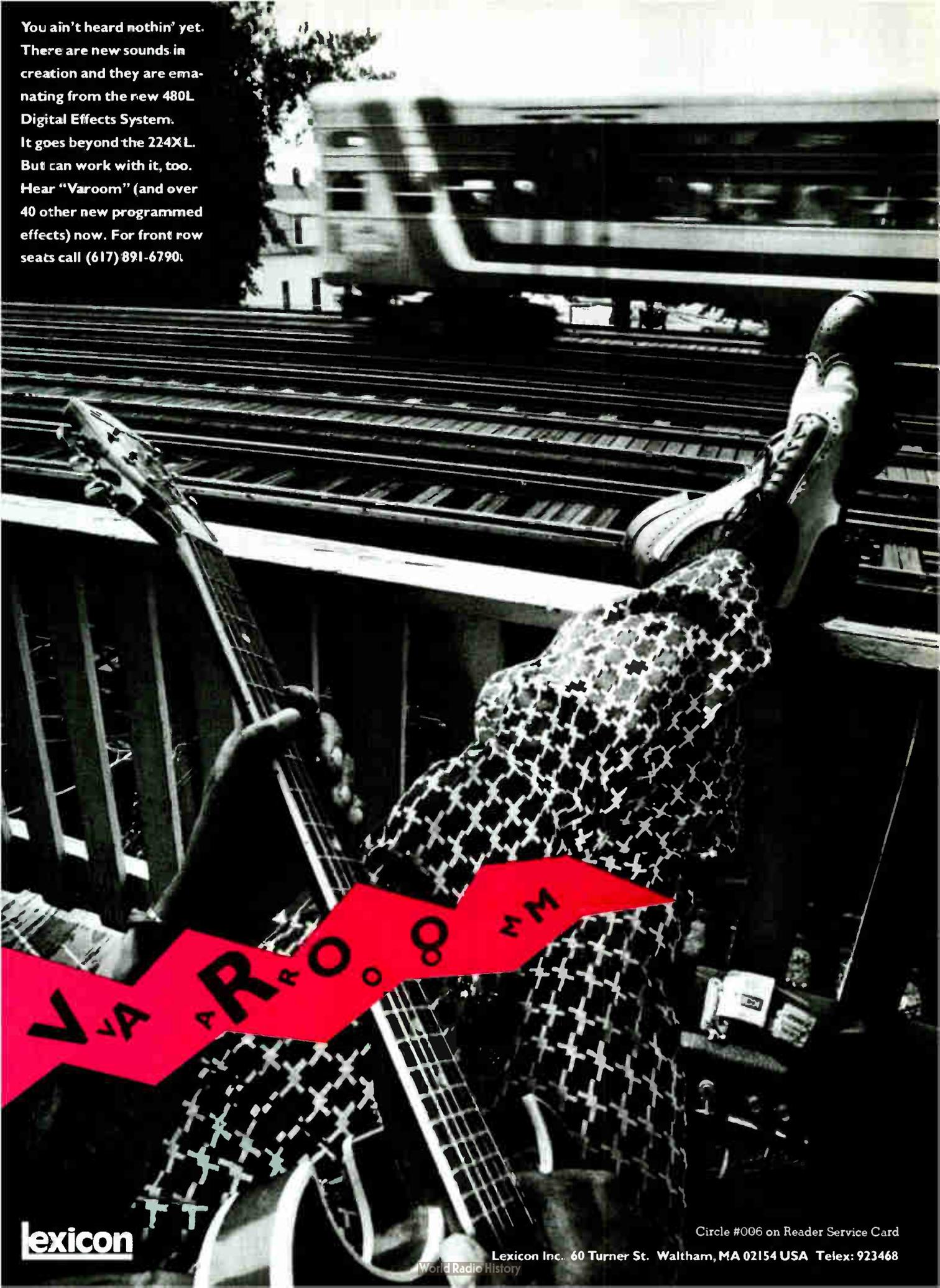
British superstar *Steve Winwood*, hot off the Number One pop single, "Higher Love," visited *Sixteenth Avenue Sound* in Nashville to mix a single for Island Records. He also mixed several radio spots. The Winwood sessions marked the debut of the brand new, all-digital studio. Engineering the project was *Tom Lord Alge* of New York. . . Sessions at *Sound Emporium* in Nashville included *Lee Greenwood* cutting tracks with producer *Jerry Crutchfield* and engineer *Billy Sherrill*, and *Penny Morris*, in with producers *Bill Rice* and *Johnny Morris*, and engineers *Sherrill* and *Gary Laney*. . . Projects at *New River Studios* in Fort Lauderdale, FL, included Atlantic Records group *G-Force* in recording their new LP, produced by *Peter Solley*, engineered by *Mike Couzzi* and assisted by *Dave Barton*. . . At *Traxion Studios*, Greensboro, NC, *Chuck Leak* finished up the mix on new material for Cooper Records. *Bill Jenko* engineered, assisted by *Bobby Gage*. . . At *Hummingbird* in Melbourne, FL, *Morningstar* has been recording original Christian songs, with *Wylie Johnson* on keyboards and drum programming, *Wayne Hodges* on guitar, and vocals by *Jill Harris* and *Kelly Kiley*. . . At *Morrisound Recording* in Tampa, FL, *Kevin DuBrow* of *Quiet Riot* has been producing an album for the rock group *Juliet* using *QR's* *Frankie Banali* on drums. Also, *Nasty Savage* recently completed its second album on Metal Blade Records. . . At *Tracks Recording* in Waycross, GA, *Ferrell Howell* finished recording his debut single, written by producer, engineer, and owner of Tracks Records, *Billy Ray Herrin*. . . *Yvette* and *Rene Barge* of *Music a La Carte* produced three 60-second jingles for Mexicana Airlines at *New River Recording Studio* in

STUDIO NEWS

L.A.W. in Las Vegas has installed the first Adams-Smith 2600 SMPTE sync/generator system in southern Nevada. . . Keyboard player, producer and arranger *Ernest Williamson* has set up a pre-production room at *Cotton Row Studios* in Memphis. . . The new *Gannett News Service* facility in Washington, DC is scheduled to receive Wheatstone A-500 "On-Air" consoles in early '87. The consoles will be installed in the main news production studios. . . *A/T Scharff Rentals* is the first company to offer Rupert Neve's new Focusrite equalizers. They were formally introduced at the AES show in November. . . *River City Studios*, Grand Rapids, MI, recently updated Studio A with a Sound Workshop 34-B console with 32 channels of ARMS automation, JH-24 24-track Sony recorder, and Urei 815 monitors. . . *Salty Dog Recording* in Van Nuys, CA, has again upgraded the digital synthesizer room with the addition of a Propnet digital vector synthesizer and a Roland S-50 digital sampling keyboard. This brings the room to a total of three digital sampling keyboards in addition to the many keyboards already available. . . *Unitel Video* of NYC announced it has purchased the assets of *Reeves Teletape's* mobile division. Included in the package are three trucks plus all hardware and equipment associated with the division. . . *Studio Masters* in Hollywood have added a new automated mixdown and post-production room which features the Neve 8128 48-channel console with *Necam* 96 automation. . . *Planet Dallas* in Dallas completed an upgrade and re-design in the control room. Expansion and design were

done by *Carl Yanchar* of *Lakeside Associates* of L.A. The new control room houses custom *Lakeside* monitors, an *MCI 528B* console with automation, a *JH-24 MCI*, *JH-110*, and new additions of outboard equipment by *Lexicon*, *Yamaha*, and many others. . . New additions to *Golden Goose Recording* in Costa Mesa, CA include another *Ampex MM1100* 2-inch 24/16-track recorder to be sync-locked for 40-channel recording. . . *GRC Studios* in Baltimore, an 8-track facility since 1980, has made the jump to the industry standard analog multi-track format with the recent acquisition of a *3M M-79* 24-track recorder. In addition to the 24-track, *GRC* also purchased a *SECK* mixing board, a computer *MIDI* sequencer and a *Yamaha SPX-90* sound processor. . . *Powerhouse Studios* (Camden, NJ) has installed a video editing suite featuring 3/4-inch *Sony VO5850* tape machines and a *Sony RM440* video editor. *Powerhouse* also installed an *MCI JH-24* recorder in their audio recording studio. . . *Manta Electronics Group* and *Little Mountain Sound* in Vancouver, British Columbia, announced the purchase of the first *AMS Audiofile* in North America. . . The *Dub Centre* of Baltimore completed the expansion of their audio duplication facility and is currently able to put out six million audio cassettes annually. Also added is high-speed labeling and packaging, as well as complete distribution services. The *Dub Centre* also has an addition to its sales staff, *Lee Shephard*, formerly of *Producer's Color*. . . *The Enterprise*, composer *Craig Huxley's* new studio in Burbank, CA, recently installed the first set of *Quested* control room monitors in the U.S. in its studios A and B. The cone-type speakers, made by *Roger Quested Company*, are currently popular in many top London recording studios. . . *Sixteenth Avenue Sound* in Nashville recently added engineer *Dave Parker* to its staff. . .

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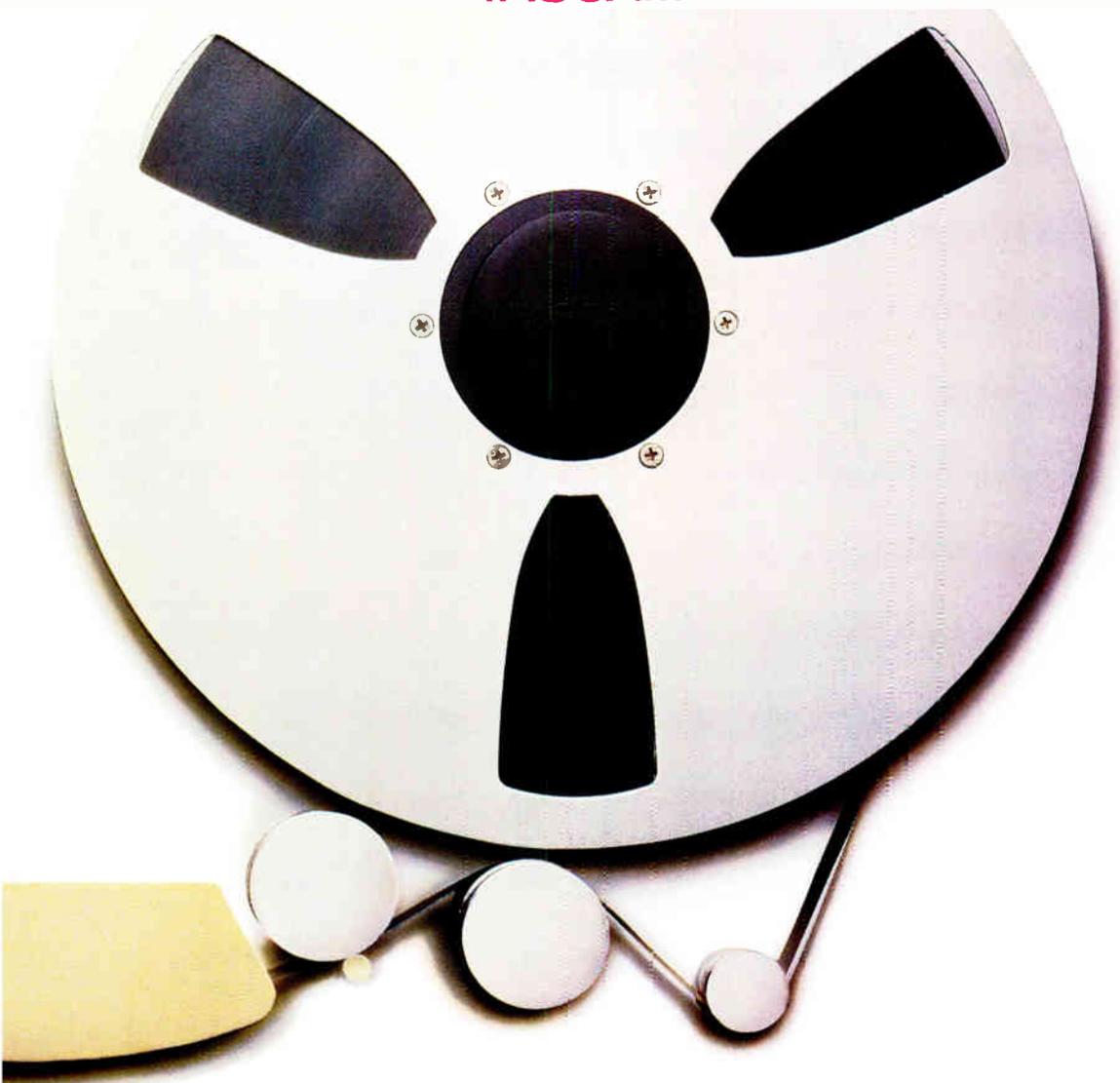
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B A S I C S

MAKING CENTS OUT OF MUSIC

by John M. Woram

Our last column went on about the harmonic structure of the musical scale. As a quickie review, here's a listing of the frequencies found in the just- and well-tempered keys of A Major:

tem with a little third-harmonic distortion. Unless the system is designed by B&R (Bach and Rameau) International, the distortion shows up at a just-tempered frequency. So, a little 3HD on a C-Major triad (C,E,G) produces just-

Interval Name	Note	Frequency	
		Well	Just
Unison	A	440.00	440.00
Minor second	A#	466.16	458.33
Major second	B	493.88	495.00
Minor third	C	523.25	515.63
Major third	C#	554.37	550.00
Perfect Fourth	D	587.33	586.67
Augmented fourth	D#	622.25	611.11
Perfect fifth	E	659.26	660.00
Minor sixth	F	698.46	687.50
Major sixth	F#	739.99	733.33
Minor seventh	G	783.99	763.89
Major seventh	G#	830.61	825.00
Octave	A	880.00	880.00

As was made clear (?) last month, and seen in the chart here, each well-tempered frequency is a slightly out-of-tune version of its just-tempered counterpart. The detuning allows the musician to freely move between keys, and as for the listener—you're not supposed to notice the difference. But some listeners say you can hear the difference, and this accounts for at least a little of the recent interest in just-tempered tuning.

To help confuse the issue a little more, consider what happens when an audio signal passes through a sys-

tempered frequencies at G, B and D. And of course the natural overtones of each note in the triad also occur at just-tempered frequencies.

But with respect to the C, the played notes of E and G themselves (especially the E) are slightly out-of-tune due to the design of the well-tempered scale. So, the listener is treated to a complex mix of well-tempered notes and just-tempered overtones and distortion.

Supporting the argument in favor of just temperament is the fact that it is the played notes themselves that are

out of tune, and certainly not the overtones and distortion. The well-tempered folks say that all the variations amount to are just a few cents here and there, and you can't hear the difference anyway.

A Few Cents?

Here, cents has nothing to do with dollars and—except that each cent is a one-hundredth part of a well-tempered semitone. And just like the interval of either a semitone or an octave, the physical size of a one-cent interval depends on the frequency from which it is measured. So you can't just divide the semitone interval by 100 to find the value of a cent.

You can calculate cents using the same approach taken last time to calculate semitones. Since there are 12 intervals in the octave, there are 1200 cents in that octave. So, if a one-semitone interval is found by multiplying any frequency by $2^{1/12}$, then it follows that a one-cent interval is found by multiplying any frequency by $2^{1/1200}$. In other words, measuring from any frequency, *f*, the next highest semitone and cent are found as follows:

$$f \times 2^{1/12} = f \times 1.059463 = \text{one semitone}$$

$$f \times 2^{1/1200} = f \times 1.000578 = \text{one cent}$$

In the key of A-Major, here's a list of a few cents-worth of intervals measured from E = 659.2551 Hz, along with the just-tempered E. Since the intervals are all quite small, four decimal places are given here.

Cents Frequency

0	659.2551 = well-tempered E in key of A-Major
1	659.6360
?	660.0000 = just-tempered E in key of A-Major
2	660.0171
3	660.3985
4	660.7800
5	661.1618

So, we see that the just-tempered E is almost 2 cents higher than the well-tempered E, and no one can perceive such a small increment.

Make that, almost no one. John R. Pierce¹ reports that Max Mathews conducted some experiments at Bell Laboratories in which listeners compared a series of equal- and just-tempered chords and intervals. Many lis-

teners couldn't tell them apart; however, one listener could always distinguish the difference between the two intervals described above—in other words, between two tones less than 2 cents apart. As for the rest of us, the difference between a just- and a well-tempered interval may indeed be all but imperceptible, but the difference is there just the same.

Well-Tempered Distortion

In a recent application note², Jeff Nelson reviews some of the implications of second- and third-harmonic distortion components in an amplifier. One of the charts in the application note shows that the difference between various harmonic-distortion components and the nearest equivalent musical frequency varies between 0 and about 30 cents.

But even 30 cents is still a very small part of a semitone, and besides, this error doesn't occur until the seventh harmonic. If your amplifier has a significant seventh-harmonic distortion component, perhaps it's time to think about buying a new one.

Calculating the actual number of cents within a small interval between any two frequencies, f_1 and f_2 , is easy enough to do, using a variation of the cents equation given earlier. For example, since

$$f_2 = f_1 \times 2^{K/1200}, \text{ and therefore} \\ f_2/f_1 = 2^{K/1200}, \text{ then eventually,} \\ K = 1200 \log(f_2/f_1) / \log(2).$$

So, if the well-tempered E is 659.2551 Hz and the just-tempered E is 660 Hz, the difference, K , between them is:

$$K = 1200 \log(660/659.2551) / \log(2) \\ = 1.9550 \text{ cents.}$$

One more time: Given a fundamental frequency, $C = 261.6256$ Hz, how many cents are there between its natural seventh harmonic, SH, and the nearest well-tempered frequency?

The first part is easy enough. The seventh harmonic, $SH = 7 \times C = 1831.3792$ Hz, and this natural harmonic obviously lies somewhere between two semitones in the well-tempered scale. But which two, and which one of them is closest to this frequency? To begin, find the semitone value, K , for the harmonic itself, by rearranging the following equation:

$$\text{Since } 1831.3792 = 261.6256 \times 2^{K/12}, \text{ then} \\ 7 = 2^{K/12} \text{ and therefore,} \\ K = 12 \log(7) / \log(2) \\ = 33.6682 \text{ semitones.}$$

So the nearest well-tempered frequencies must be 33 and 34 semitones

above 261.6256 Hz. That means they are at:

$$261.6256 \times 1.059463^{33} \\ = 1759.9950 \text{ Hz (A)} \\ \text{and } 261.6256 \times 1.059463^{34} \\ = 1864.6552 \text{ Hz (A\#)}$$

Another short BASIC program can be written to find these two frequencies:

```
100 INPUT F
110 INPUT H
120 K = 12 * LOG(H)/LOG(2)
130 A = INT(K)
140 B = A + 1
150 PRINT F * 1.059463^A, H, F * 1.059463^B
```

In lines 100 and 110, enter the frequency of interest and the number of the harmonic (respectively, 261.6256 and 7 in the example above). Line 120 calculates the semitone interval between the fundamental frequency and the selected harmonic. Next, lines 130 and 140 find the actual whole-number semitone intervals that lie immediately below and above the selected harmonic. Line 150 displays the frequencies of the adjacent low semitone, the selected harmonic, and the adjacent high semitone.

Moving on to the big finale (finally!), if the seventh harmonic of C is 1831.3792 Hz, and the well-tempered

—CONTINUED ON PAGE 29

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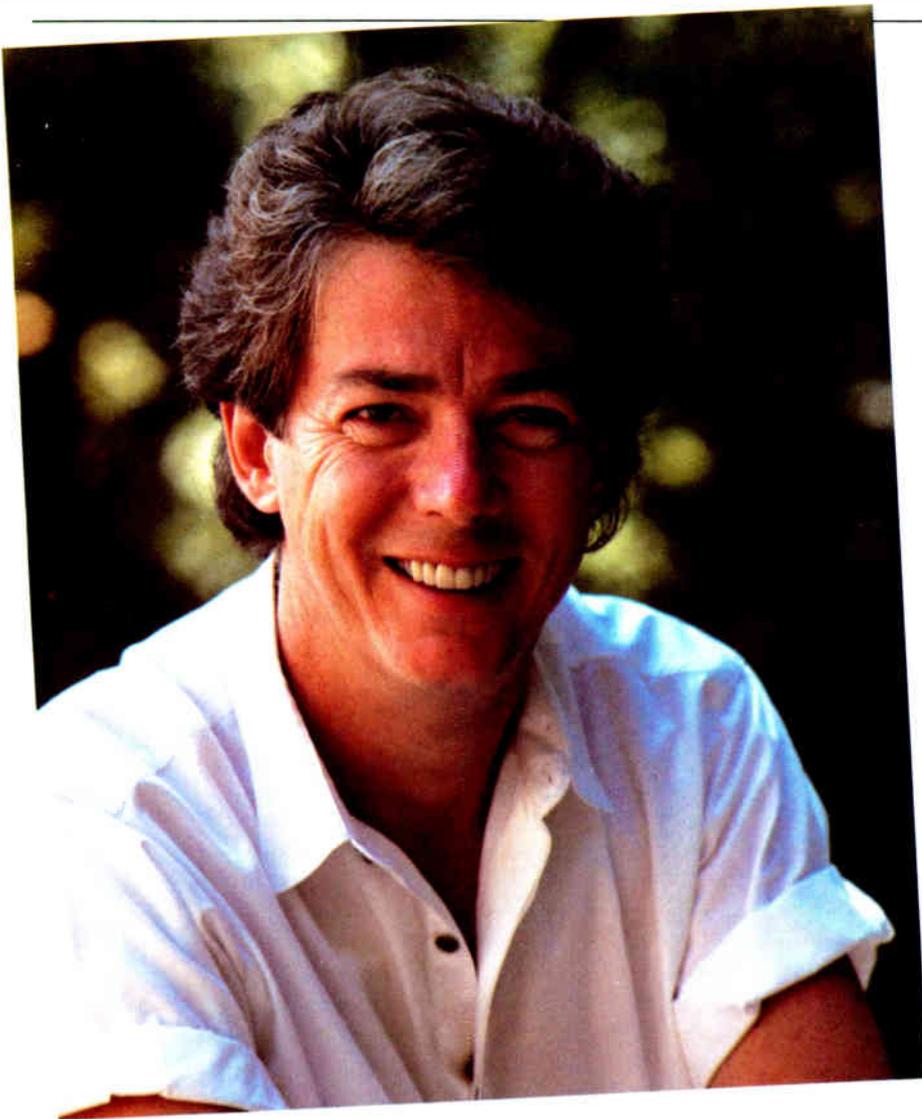
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BRENT MAHER

Behind Michael Johnson and The Judds

by Robyn Flans

"To Juddicize." You won't find it in the dictionary, but it is definitely the operative verb when talking about the Judds' music. To Wynonna and Naomi Judd and their producer Brent Maher, it's tongue in cheek, yet it describes this mother/daughter duo to a tee.

"Judd music was a term we came up with when, in the beginning, I was trying to explain to publishers what I was looking for," Maher explains. "They're acoustic.' 'Oh, they're like The Whites.' 'No, no, no, they're not like The Whites.' 'They're like Ricky

Skaggs.' 'They love Ricky, but they're not like Ricky.' 'Bonnie Raitt.' 'No, no, no.' Some people say they're traditional and some people say they're progressive. The only terminology that comes to mind is, 'Maybe we can Juddicize this.' It's if we can take a song and make it happen in our style."

It was a style that didn't crystallize for them immediately. Wynonna and Naomi sang together for years while they moved from Kentucky to Southern California to Northern California and finally to Nashville. While Naomi struggled to obtain her nursing degree so she could adequately support her

family, the women continued to accumulate a long list of influences from pop to swing. By the time Naomi presented their tape to Maher (whose daughter was a patient of Naomi's at the hospital) it was indeed a hodgepodge of styles.

"It didn't hit me like a tree falling down on top of me," Maher says of the tape. "The girls gave me a little cassette they had done in their living room. They had actually played on one cassette and had two parts down. They'd play that back and sing two more parts on top of that. Sometimes they'd bounce that back and sing two more on top of that. They had a couple of really class Bonnie Raitt songs they had worked up, and Naomi is a real gifted writer. She had written some songs that span everything from real '30s, Andrew Sisters things, like one called 'Dyin' to Dance,' to a lullaby. When I heard the tape, I got excited about it, but after every meeting I would leave with a different game plan. One time it would be, 'They're a country/Manhattan Transfer type group with be-bop and we'll dress them real crazy.' Then I thought, 'Well, that will be good for one record.' It was a process of my looking for songs and their honing the songs they were really fond of."

By finally stripping it down to the bare ingredients, just voices and guitar (played by Don Potter), Maher knew what kinds of songs to seek.

"He knew that he couldn't walk into the big publishing houses like House of Gold or Tree and get top-drawer material for an act that didn't even have an 8x10," Naomi begins. "He went to all these great songwriters like Harlan Howard and said, 'Guys, I have this really unique opportunity and if you want in on it, let's do it.' He brought Harlan Howard to our house because he wanted him to see us personally and people like that have become our friends."

It wasn't long before Maher was soliciting some of Nashville's finest writers to work with *him* on material. It was the first time Maher had been quite this involved with an artist.

During his engineering days at Las Vegas' United Recording, he did, for instance, write a song for Tina Turner, which he co-produced with Ike, but for the most part, he simply engineered such classics as "Proud Mary," Sly Stone's *Dance to the Music* LP, projects by Diana Ross, Gladys Knight &

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World Radio History



At Stargem Studio in Nashville, Terry Blackwood, Wynonna Judd, Naomi Judd, and Larry Strickland work on a Judds project.

the Pips and the Fifth Dimension. Later, when he returned to Nashville, he co-wrote a couple of songs on a Kenny Rogers LP (which he produced) and Dottie West's big hit, "Lesson in Leaving."

Also, upon his return to Nashville, (where he assisted in building Creative Workshop, he's still a consultant there), Maher met up with an artist by the name of Michael Johnson.

"Gene Cotton had found my first album, called *There is a Breeze* in a bargain bin and had recorded that song," Johnson remembers. "Then he wanted me to play on another song I had cut, 'Lucky Stars,' which he was also cutting, so I went in and played on the sessions and met Brent and Steve Gibson [at the time, Maher's constant co-producer] and a lot of the players I've worked with since. I asked Brent if they would be interested in doing some production on spec. I didn't have a deal, and having never worked in the studio with me as a singer, they didn't know what they were getting into, but they said yes. I borrowed \$18,000 and we cut three songs—'Bluer Than Blue,' 'Almost Like Being in Love' and another song. My manager shopped them around and we sold them as they were. We called them master demos, but EMI said, 'No, we'll release them just like that.' Immediately I knew Brent and I were right."

"The real clue on songs for the Judds is the first time you hear Wynonna start singing a verse. You know before she gets to the chorus whether it's happening or not."

Songwriter Randy Goodrum shared the publishing of "Bluer Than Blue" with Maher because he says he got the idea for the song from him. Maher pitched the song all over, including to Barry Manilow, who turned it down. Johnson loved it and it proved to be a turning point for him and he proceeded to cut three more albums with Maher and Gibson.

"We never had a falling out or anything," Johnson recalls, "but after those two hits and 'This Night Won't Last Forever,' we did two albums that didn't really do anything, so EMI decided it might be time to move on to a different production situation. I worked with some very talented people, but I could not understand why things weren't happening. Eventually it was a no-win situation and EMI dropped me. I called Brent back last year. That was where I knew my connection was. I asked him, 'If we were going to do something, what do you think it would be?' He told me he had recorded the Judds. I had heard some of their singles and I couldn't believe that stuff was coming out of Nashville. The girls are wonderful and with those guitar parts, the tight grooves and the way it was all saying something really fresh, I should have known it was Brent. A week later he called me and said he talked to his wife who said, 'You know that song 'I Love You By Heart'?' That's a duet with Michael and Sylvia.' It started my relationship with RCA also."

When it came time to record his first country album, *Give Me Wings* (which hit the top of the country charts in January) the transition from jazz/pop was a natural one, given his feelings about songs and production.

"I was a classical player and a little wespy folk singer singing chain gang

"Some day I might like to back out of the engineering, but it's so hard because that's how I broke into the business and I dearly love it."

songs as a teenager in coffee houses," Johnson says. "I was in the Mitchell Trio after Chad left and all that stuff is songs and stories, poetry set to music. That's what country music still is. Sometimes at first hearing, it's hard to tell the difference between a good rock song and a bad rock song until after you fight your way through the production enough. They're both loud, they're both well mixed and they both have good studio players on them. It takes a while to say, 'Ya know, that's really a turkey.' Jazz songs can be maudlin with insipid or falsely sophisticated lyrics that in the end don't say anything. And a bad country song really stinks because there's nothing gauging it or hiding it. But a great country song goes through you like a spear because it's the story, the singer and the production is not ornamental or overly embellished. It's all dedicated to the meaning of the song. That's why I'm in country music now. I can't say it's because of Hank Williams or Lefty Frizzell or the Grand Ole Opry. There are a lot of country fans who know a lot more about country music than I do, but there's room for me here because this is where songs live.

"This album was all based on my guitar parts, and I didn't play on any of the other records. It was so much more me. Working with Don Potter was great. He's a marvelous player and arranger, and he helped me a lot to simplify things and make them more direct and more creative at the same time. We built guitar duets and built the whole album on our two guitar parts. It took Brent to come up with some groove ideas and also a guitar sound, because I play gut string guitar, which is notoriously difficult to record with any edge to it. By the time you get an edge to it, it doesn't sound like a gut string guitar anymore, so why use it?"

"Gut string guitar with Michael is part of him, so it was imperative that I figure out how to make it work," Maher says. "What I found that worked was

AKG 414s, and the secret is to back the mic off the guitar as much as possible, sometimes as far as three feet away. I don't like to use a lot of EQ and by moving the mic either up or down, away from the bridge or closer to the bridge, I can change the sound. If I move it further away from the guitar or closer to the guitar and if I'm constantly monitoring pretty close to a correct mix, if I've got a problem with it, I know about it then and I can deal with it. A lot of guys concentrate so much on what they're overdubbing that they don't keep it in perspective. Then it comes time to mix and they can't figure out how it sounded so good when they were putting it down and why it now sounds so bad."

Maher doesn't concern himself with any of that when demoing the material, however. He demos everything simply with guitar, vocals, and a little knee pounding to see if it passes the test.

"The only thing we spend time on is getting the groove right and is this song going to work with the artist? I started it with the Judds, although I do this with Michael and some of my other acts where Don, the girls and I just sit down and sing it," Maher explains. "We work on the harmonies and the songs sound like records. I could play you the demo of 'Why Not Me' and it would scare you to death. It intimidated me as producer because everybody I played it for said, 'How can you beat this?' We just added bass, drums and a steel lick. We throw out songs like that, too. With some songs we've come in really excited about, we've put it down and listened to it back and it just didn't happen. If the songs don't stand up with guitar, vocals and harmonies, I'm not going to trick anybody by saying, 'It'll be great when we get the band in.'"

"The real clue on songs for the Judds, whether I write them or someone else, is the first time you hear Wynonna start singing a verse. You know before she gets to the chorus

whether it's happening or not. She is such a great singer, but she is so honest in her vocal that she can't kid herself, me or Naomi. It's painfully apparent if she's into a song. Some singers can sing a song, but Wynonna either takes it to heart and makes the hair on your neck stand up or she doesn't, which makes my job a lot easier. I can tell when we've really struck on something or whether we're just shucking and jiving."

"I'm such an attitude person," Wynonna confirms. "I struggled with 'Grandpa.' When that song came into our lives, I knew it was a very special song because I'm very, very close to my grandparents. One day I left in tears. I just wanted it to be so good. I was expecting more of myself than I could possibly give. One day, out of the clear blue, Brent said, 'Let's try Grandpa.' and sure enough, I got it. It's just amazing how the attitude dictates that. With 'Have Mercy' he said, 'Wynonna, take your shoes off, jump up and down, no one is here, go for it.'"

The Judds have used the same studio musicians on all four of their albums and while they use the demos as their guidelines, the musicians' input is always welcome.

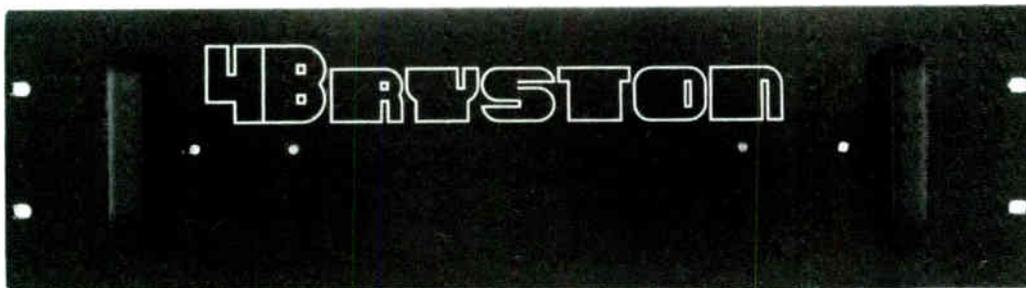
"I think it would be foolish not to tap this incredible resource, because these guys are masters of their particular instruments. Instead of going in and telling them to play this particular lick, they come up with some great ones. We call it the lick of the hour," Naomi laughs. "Sonny Garrish (pedal steel/dobro) consistently blows our minds with some magical, innovative things."

"Rarely do we have to labor on our rhythm tracks," Maher says. "Generally we get two songs in a three-hour session and rarely do we do more than three takes. 'Girls Night Out' and 'Mama He's Crazy' were first takes. One of the reasons we don't get stuck hammering something out is because the songs fit the artist. Normally when you get stuck it's because there's a mismatch somewhere. We do a little rehearsal, turn on the tape machine and the feel is there."

The production is never overdone. Even though there is a different production approach on Johnson's projects, with the utilization of strings and background vocals, economy is still the watchword.

"If anybody has an opportunity to learn that less is more, it's an engineer," Maher says. "I can't tell you the number of records I've heard where we had great basic tracks and all of a sudden it's, 'Let's double the acoustics, let's double the electrics.' It stands to reason that the more you put on a

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record in numbers, the less you hear of each one of those numbers. It's just mathematics. I heard an old Everly Brothers record on the radio the other day and it was louder and had more presence than anything that was on, in front or behind it. All you could hear were those big ol' Gibson guitars and voices. Of course the drums were mixed back further in those days, but the punch was still there."

As for the down side of simultaneously engineering and producing the records, Maher says, "Some day I might like to back out of the engineering, but it's so hard because that's how I broke into the business and I dearly love it. I would have a hard time sitting behind somebody because I constantly would want to reach over their shoulder to just bump the bass drum a bit, or bump this a bit. That's where this group of musicians really helps me. Say they're cutting the rhythm track and I'm consumed with trying to get the bass drum sounding a bit better. All of a sudden Jack [Williams] will say, 'Did you hear the way I changed the bass line in the chorus?' I'll say, 'Are you kidding? I didn't even hear you play. I didn't even know you were in this room.' Then they all smile and make a few jokes about me and we start over. Those guys have a lot of patience with me when I get involved in the engineering. They're very forgiving along those lines."

These days, though, Naomi and Wynonna are capable of adding their two cents worth.

"From a technical standpoint their growth is absolutely amazing," Maher says with a smile. "When we started out, the girls didn't know what earphones were used for, hardly. Now they are very sophisticated and knowledgeable. On this current album, [*Give a Little Love*] Wynonna has been absolutely the inspiration and practically the floor leader when we were cutting our basic tracks. There are a couple of tunes where she had a specific groove and a feel in mind and if we'd start to drift a little bit, before I could even hit the talk-back to make a suggestion, Wynonna was out there saying, 'Look guys, do this. . . .' Naomi had some very constructive criticisms and ideas during the tracking sessions, too. There's been a lot of maturity on everyone's side; a tremendous growth."

"Everyone feels like it's an open forum," Naomi concludes. "And I just have a feeling it's going to get better and better. It's so darn much fun. After a woman has a baby, you have to expect what is called the post partum blues. We experience the post studio blues. When we finish the album, it's, 'Can't we put *another* song on it?' " ■

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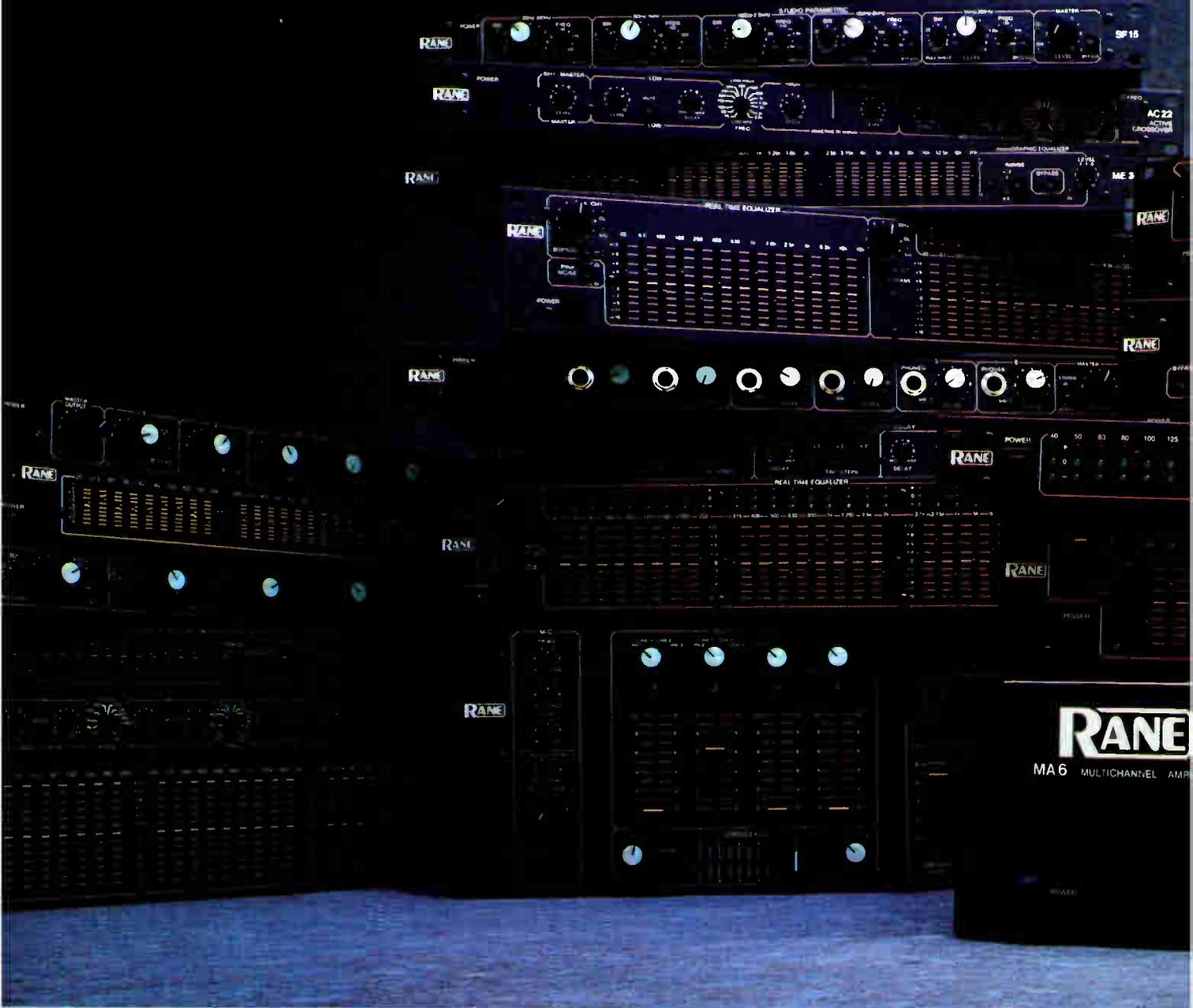
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—FROM PAGE 17, "BASICS"

frequency closest to that harmonic is now known to be 1864.6552 Hz (A#), then the error is:

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```
100 INPUT F1
110 INPUT F2
120 N = LOG(F2/F1)
130 D = LOG(2)
140 PRINT 1200 * N/D
```

Here, cents has nothing to do with dollars and—except that each cent is one-hundredth part of a well-tempered semitone.

If you decide to insert the actual value for LOG(2) in line 130 (in line 120 in the previous example), don't forget to use the natural log (0.6931), not the common log (0.3010), since most PCs use the natural log function for calculations. To verify that everything works, enter any two frequencies that are an octave apart. You should get a display of 1200, since there are 1200 cents in the octave. You should also get 100 cents between adjacent well-tempered frequencies, but not between adjacent just-tempered frequencies.

The just-tempered semitone intervals range between about 70 and 133 cents each; in other words, plus-or-minus some 30 cents compared to the constant 100 cent interval in the well-tempered scale. If you too can hear two-cents worth, that's a lot. ■

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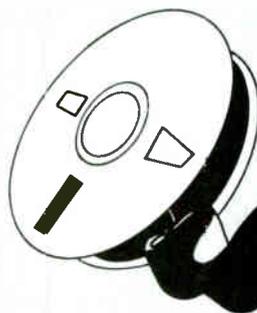
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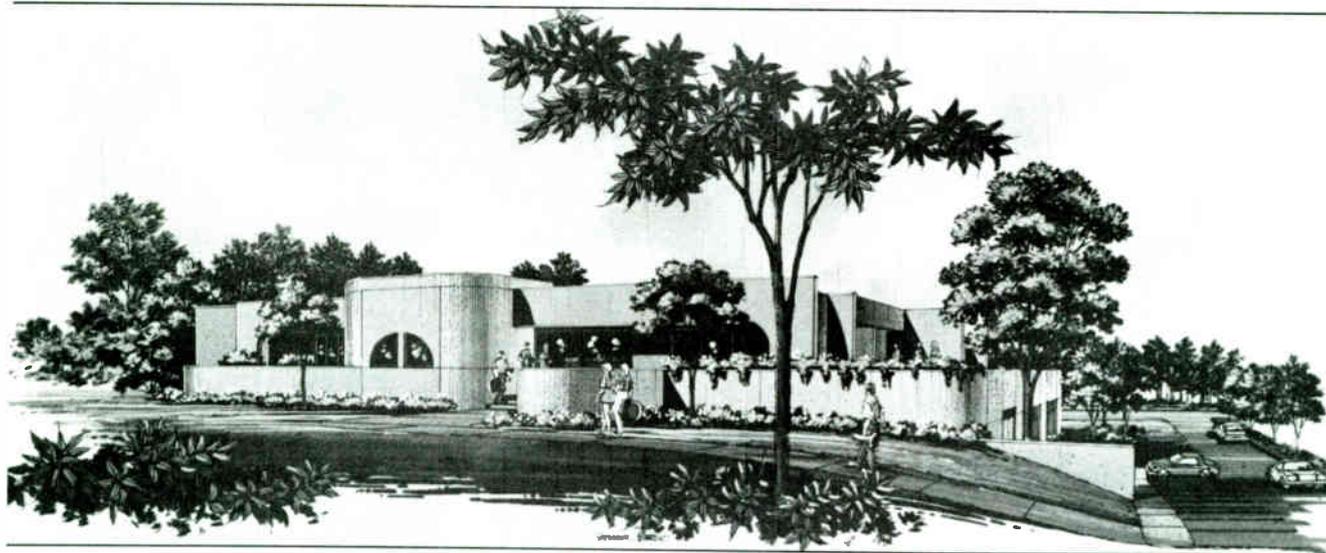
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BUTCH TRUCKS' PEGASUS STUDIOS

Film Scoring Comes to Florida

by Robert L. Steinback

What would possess a bunch of government bureaucrats to willingly—no, make that eagerly—give \$150,000 to a soft-twanging Southern kid who made his name by beating on a drum set for a bunch of long-haired rock and roll musicians?

Simple. The prospect that the drummer, Claude "Butch" Trucks of the Allman Brothers Band, is prepared to pump a shot of vigor into the Florida film and television industry by building the first recording studio in the state specifically designed to accommodate not only music recording but film scoring as well.

The vehicle is Pegasus Studios, under construction outside Tallahassee and scheduled to open within two months. It will be a 10,700 square-foot complex, designed by highly respected acoustic engineering consultant George Augspurger, financed by public and private money, and inspired by a musician with a vision.

"What I'm putting together, after all my years of experience, is an environment—the best facility and the best

Trucks and partner William Dunkle sold the investors—including the State of Florida—on the potential of Pegasus to become the heart of an entertainment industry professional complex.

people—so that you can record any kind of music you want to make," said Trucks, whose rhythms paced the chartbusting, million-selling albums *Live at Fillmore East* (1971), *Eat a Peach* (1972) and *Brothers and Sisters* (1973).

Trucks and partner William Dunkle sold the various investors—including the State of Florida—on the potential for Pegasus to become the heart of an entertainment-industry professional complex on a 550-acre field near Interstate 10 and U.S. 90 in Gadsden County, Florida, outside Tallahassee. Eventually, they hope advertising agencies, music, radio and television production companies and other related businesses will be drawn to the site.

"Having a state-of-the-art recording studio with the area for other supporting facilities to develop is a big advantage," says Ben Harris, head of the state's Bureau of Motion Pictures and Television. "I think the potential is great."

Florida's movie and television industry ranks a distant third behind California and New York. But the industry will top the \$200 million mark this year, Harris says, and it is growing.

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Butch Trucks

The success of television's *Miami Vice*, and of big budget films like *Cocoon*, *Stick*, and the not-yet-released Brenda Starr movie, is getting the attention of producers—who, not incidentally, like the state's relative freedom from labor unions.

But while welcoming the industry with open arms, the state lacked some of the hardware that producers needed to finish their pictures. Settling in the state's capital, it wasn't long before Trucks sensed that need.

"What I discovered is that the support facilities, the post-production facilities, are not here," Trucks says. "Producers are coming in, doing the filming, and going back to L.A. to finish."

Not only do *Miami Vice* and virtually all of the major film makers take their post-production work out of Florida, the state itself, when putting together promotional video material, takes its post-production work to New York, Harris says.

Enter Pegasus. Trucks realized he would have to go top-of-the-line to compete with the region's top music recording studios, such as Criteria Studios in Miami and New River Studios in Fort Lauderdale. He specified a \$250,000 Solid State Logic 6000E computerized stereo video console ("The best going," Trucks claims), which he figures will be the third one in Florida. He's also going with a Mit-

subishi X850 32-track digital recording machine.

Designer George Augspurger brought 15 years of consulting experience to Pegasus. He lists among his considerable credits design of the Yamaha recording studio, in Glendale, California, Philadelphia's Sigma Sound Studios, and the Skaggs Telecommunications Services studio in Salt Lake City.

According to Augspurger, Pegasus will have one thing many southeastern U.S. studios lack: space. "Even though film scoring does not imply full-fledged symphonic orchestras, there tend to be groups of musicians playing ensemble at the same time," he says. "You still need to be able to accommodate a large number of musicians at once."

In addition, all of those musicians, as well as the directors, engineers, conductors and assorted other support personnel, have to be able to clearly see video screens, Augspurger said. That must be done without compromising acoustics, he said.

"Everything starts getting much trickier than it does for a conventional recording studio," he says.

Augspurger added a large control room ("A great deal of recording today is done with enormous banks of synthesizers in the control room," he notes), a modest video recording capability, and three small isolation rooms for individual musicians and singers.

"Butch's studio places much stronger emphasis on no compromise in conventional recording than many other studios," Augspurger says. "We are trying to optimize for the kinds of things that can be done best in a large room with good natural acoustics."

The relatively quiet location of the studio, in largely rural northern Florida, is an added technical—and financial—advantage, Augspurger says. By not being in an urban area, or near a noisy industrial park, excellent insulation from outside sound could be achieved at reduced cost.

Holding down costs—getting the most for the least—was critical as the Pegasus idea evolved. Far from having truckloads of money on hand to splurge as his whims directed, Trucks spent four years patiently piecing together the financing to make the studio a reality.

The final \$800,000 financing package is a curious amalgam of public and private backers drawn together by little more than the tenacity of Trucks' dream.

Trucks and Dunkle formed a limited partnership, Trucks Entertainment, to raise equity. They put in \$90,000 of their own money, then sold chunks of

the partnership to raise another \$160,000.

That cleared the way for an equipment loan from ITT Small Business Finance Corp. for \$400,000, backed by a federal Small Business Administration loan guarantee.

That still wasn't enough, and that's where the State of Florida jumped in.

Trucks' wife Melinda had occasion to meet influential state Senator Ken Jenne, Trucks says. She managed to interest him in Pegasus, and Jenne arranged for Trucks to meet Harris, of the Bureau of Motion Pictures and Television.

Harris, in turn, introduced Trucks to Don DeLaney and Jim Fox of the Department of Community and Economic Development, the arm of state government that funnels federal money into programs that create jobs in economically distressed areas through stimulation of business investment. DeLaney and Fox already had broken the seasoned mold of putting such dollars into laudable but dull projects like housing construction and community centers—they had financed hairdressers, a clothing store, an antique shop and a tool rental business among others, Fox said.

The idea is to fund projects that make economic sense—that have the prospect of actually refunding the government's money as the business thrives—but just need a final boost to get over the top financially.

"The program will do anything that turns a buck for the locals," Fox says. "We'll fund just about any type of business that creates jobs. The state adds a middleman, but hopefully we're doing something that wouldn't have happened if the middleman wasn't there."

The state finally approved \$150,000 for Pegasus in economically struggling Gadsden County, and Trucks was in business.

"I don't think it would have been done without [the state money]," Trucks says, "at least not here."

A number of other elements fell into place to assure the Pegasus liftoff.

While studying classical piano at Florida State University, Trucks became acquainted with Bob Glidden, dean of the School of Music. He asked Glidden what he thought of the idea.

"He lit up," Trucks says. "Very soon I had the local base of support I needed."

FSU could provide a wealth of talented studio musicians for Pegasus clients. Further, the school has agreed to use the studio during morning hours as a training facility.

"I'll go into business with the hardest hours of the day booked," Trucks says. "Professional musicians just don't get up at that time of morning." Trucks also hopes the Florida government

itself will generate business for Pegasus, rather than taking it out of state.

He's also got early indications that popular groups like .38 Special and the Charlie Daniels Band are willing to bring their business to Pegasus. "If things are half as good as I know they are, I'll have to expand soon," he crows.

It's been 12 years since the Jacksonville native stepped off the rock and roll gristmill, escaping the drugs, the booze, the groupies and the hotels in strange cities. He settled down with his wife Melinda and began to raise a family. Trucks credits Melinda, who is studying at FSU for a Master's degree in painting, for turning his life around.

"I was a hard-drinking, hard-living hell-raiser," Trucks says of his touring

days with the Allmans. "People all around are glad-handing you and telling you how great you are. After a while you start believing it. You are indestructible. You can do anything."

"I finally met a girl who told me what an ass I was being. In some ways, I'm a lot more boring than I was, but I feel a lot better."

Trucks plays drums for a local band called River Breeze, and says he'll continue to play occasional reunion concerts with the Allmans, as he did in November at Madison Square Garden. But he's had enough of the musician's life on the road. Now, his life is his family, his studies and Pegasus.

"I don't say it can happen," Trucks says. "I say it's going to happen." ■



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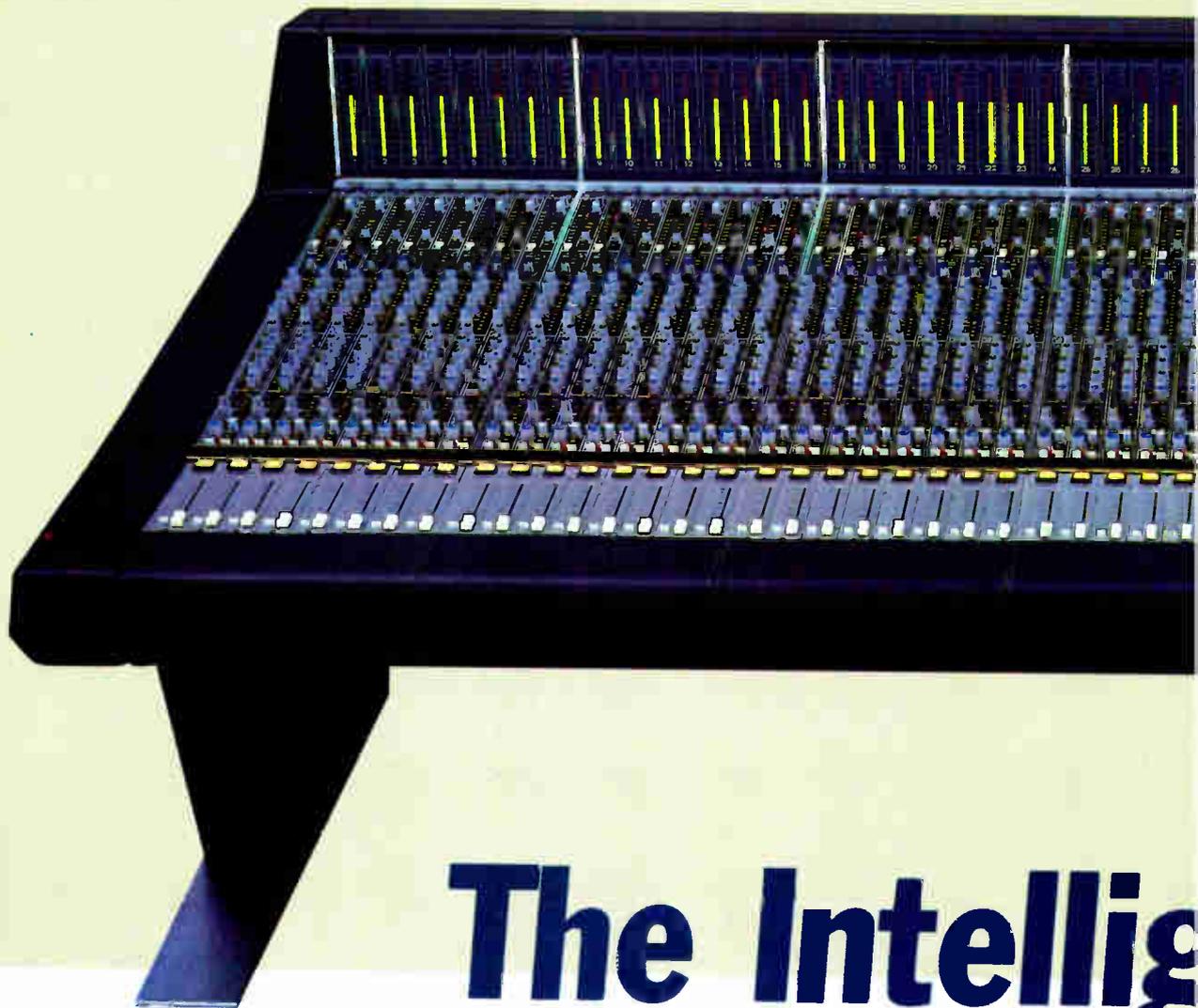
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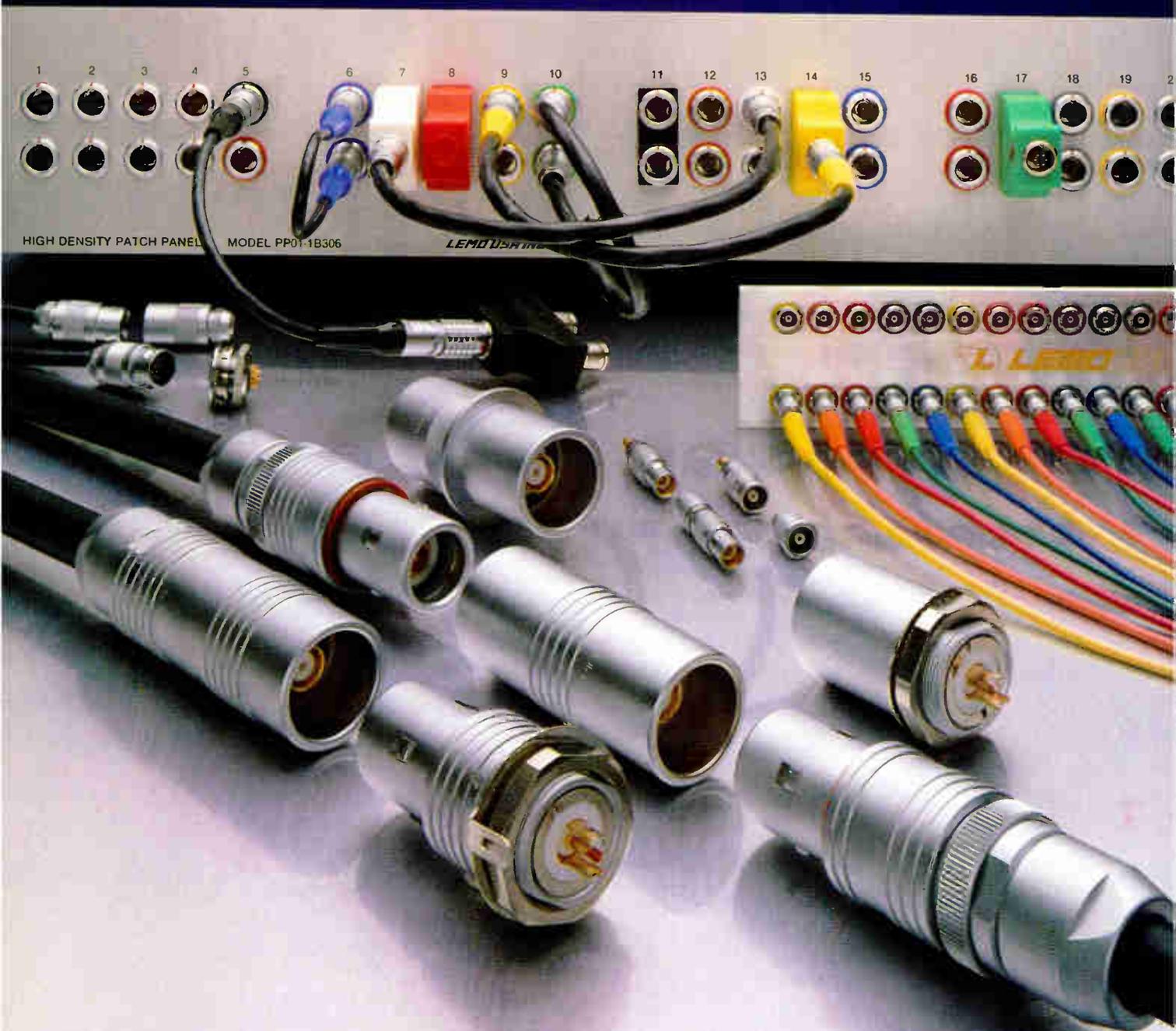
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NICK COLLERAN

On Alpha Audio's Success & SPARS' Hopes

by Ben Cromer

Nick Colleran believes success in the studio business comes from a simple credo—know when to change lanes. Colleran, owner of Alpha Audio in Richmond, Virginia, and president of SPARS, also says success comes from hard work and not from “artistic magic or some gadget.”

“Our big increase we’ve had recently in production work is a result of my traffic manager and my arranger getting out on the road and seeing people,” he says. “You don’t build a shoe factory and then see if anybody needs shoes.”

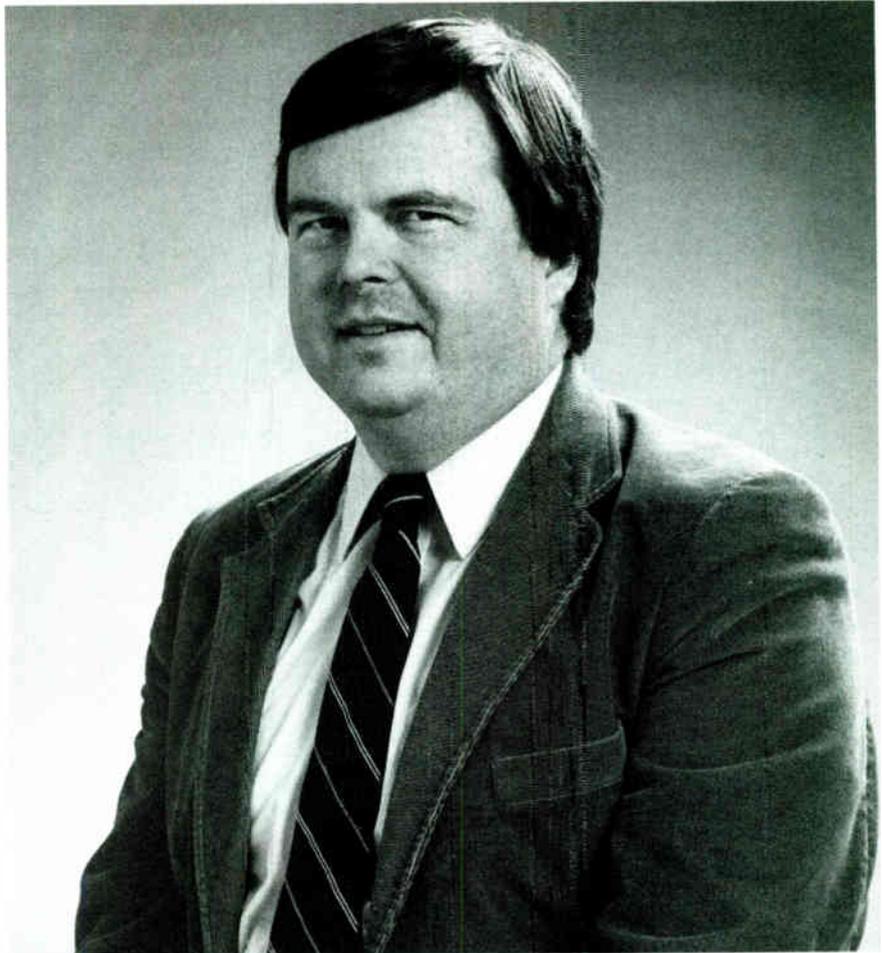
Colleran blames market saturation and lack of business sense for many of the problems facing studio owners. Colleran claims the studio business is largely a “mom and pop operation” with staffs “no larger than your local music store.” With the proliferation of studios that were started so the owners “could be in show business,” Colleran says competition has forced studio rates to remain low.

“In 1971 we were charging \$80 an hour (for 16-track) and getting it, and now you would have trouble in some markets getting that for 24- or 48-track.” The money today is in audio-for-video production. “You can get over \$200 an hour for audio and you can’t get that cutting records anymore,” Colleran mused.

Colleran saw the writing on the wall for the record business in 1980 on a visit to Atlantic Records. “Jerry Greenberg was in the other office and you could hear what was going on through the wall—he was firing acts. So we stayed in the recording business but we shifted the emphasis from records because there was no point in trying to sell records when the record companies had no more money. So we took the studio into audio-for-video production.

“To me it’s one of the most exciting places to be,” Colleran says, “because the technology is something that you can’t just go and buy. You can go buy a synchronizer but there’s very little written on how to do it and there are very few people who understand the process.”

In the early stages of Alpha Audio’s foray into audio-for-video, its engineers discovered they couldn’t easily lock sound-for-video, and still inter-



face its editing system with an Adams-Smith, Time Line or Shadow system. So Alpha designed its own editor: The Boss. With The Boss, you can watch the monitor, log events and trim them—all without involved keystroke programming.

“We’ve also interfaced the system to existing video editors like the CMX and the Montage without having to re-key,” Colleran explains. “We’ve put a MIDI interface in it so if you’re firing effects from MIDI, the audio editor will control that also.”

Alpha’s diversification began in 1977, contracting to design sound systems for theaters and restaurants. The sound contracting led to another lucrative side of Alpha’s business—the distribution of an acoustic material, Sonex.

“We tested it and discovered the company that made it didn’t know much about marketing to the professional audio business, so I went and

cut a distribution deal. Today you can’t turn on the television to anything that has to do with music and not see a piece of Sonex.”

Colleran believes studios must adapt to changing market conditions in order to survive. For example, he says studios are caught up in selling technology rather than results.

“Sometimes you have to educate your clients that they’re paying for results,” he says. “In the old days when you were growing and you went through all those formats, you had your 8-track lying around when you went to 16-track. You could sell studio time for a little less because it’s an old machine and it’s written off. But when you reinvest in 1987, it’s not economical to buy another machine to charge less,” he says.

Colleran also suggests that studios should try project-pricing rather than charging by the hour. When major corporations experiment with new

technology such as video, "they aren't going to try new technology while the clock is running because they have no idea how long it's going to take." Charging a flat rate requires extensive preparation, Colleran admits, but the profits are greater—if everything goes as planned. "When things go wrong, we eat it," he says.

"You have to not be afraid to tell clients that when they change the script, it's going to cost them money. You don't pay the carpenter by the hour, you pay the carpenter for finishing your house and you know darn well that if you add another room on the back of the house he's going to come to you and say 'This ain't the

house I quoted on.'"

Why don't more studios use project-pricing? "Most of them aren't thinking ahead," Colleran says. "It's the old 'small studio because they think small.'"

Colleran says SPARS is needed to help studios run better businesses and to lobby for owners on issues such as the sales taxes on studio rental imposed in some states. "SPARS can tell you where you can get your insurance cheaper, it can tell you how to deal with the sales taxes, and it can offer a philosophy on how to market your services," he says.

Colleran wants to see more SPARS members participating in the yearly

business conferences "because that's where the real information is traded." Membership has increased 250% in the past two years, but Colleran wants to see that growth slow for the present. The organization's top projects are the industry-wide census that's being partially funded by 3M, and the Sony-financed SPARS test for recording engineers. He also hopes the business conference will expand to twice a year.

Colleran, 42, began his career in the early '60s as guitarist of The Escorts, a band from his hometown of Richmond, Virginia. The Escorts signed with CBS Records in 1961, but when the band's singer got drafted shortly after the release of its first single, the band folded. Colleran remained under contract to CBS until 1969, doing miscellaneous production and engineering. He also found time to attend the University of Virginia to study accounting—skills that would aid his later business ventures.

After graduation from UVA, Colleran worked as an accountant but continued to produce records. He formed Alpha Audio in 1971, beginning with a single 16-track studio. Housed in a renovated building in Richmond's historic Fan District, Alpha has grown to four studios: two 24-track rooms with audio-for-video capability, a 2-track room for commercial voice-overs, and a studio for editing and dubbing.

Why hasn't Alpha Audio increased its track capacity to 32- or 48-track? Colleran says 24-track is more than adequate for his clients—plus it's cheaper. "It makes no sense at all to spend \$12,000 for an extra set of heads so you can charge less. If you rent a 747, they don't give you a cheaper deal if you don't use the last 20 seats," Colleran says.

Colleran says he entered the studio business "because I had been a musician for so long and I saw too many people who were miserable doing something they didn't like for the rest of their lives. Most everybody I knew who tried to stay in the music business, doing the same thing they were doing, had to get out of it. And it's somewhat sad to see these people at 38, 40 years old, who are trying to start beach music bands and go on the road."

Ultimately, Colleran enjoys his work. "When you leave the studio, you can actually play your work on the cassette deck on the way home." What other business can you say that about? ■

Ben Cromer has written about music and audio for more than seven years. This is his first article for Mix.

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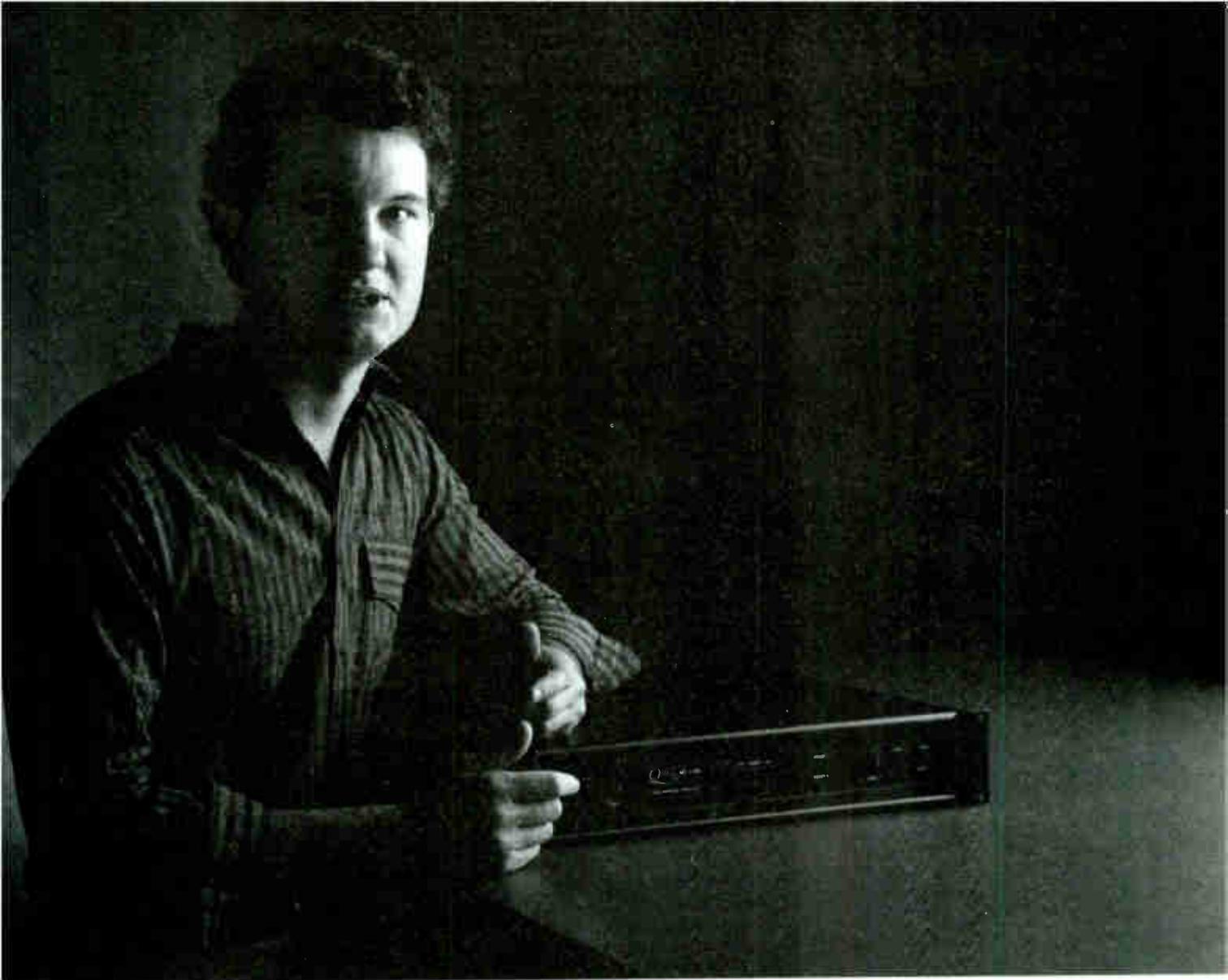


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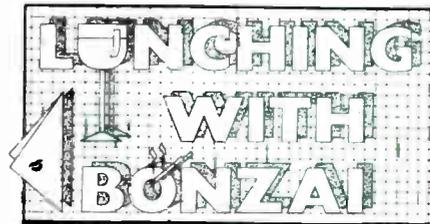
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The
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with

MARK HUDSON



by Mr. Bonzai

Fox Square in Hollywood is a three-ring circus during the live broadcast of "The Late Show Starring Joan Rivers." On stage right, Joan is hopping around as guests stream by on the celebrity conveyor belt; centerstage has rapid scene changes as singers and comedians belt out their best; and to stage left we have Mark Hudson, musical director for the show, cracking jokes and the whip on one of today's tightest and biggest TV bands ("The Party Boys and The Tramp"). There is a wild party atmosphere, but one with a split-second schedule rivaling mission control in Houston.

The flamboyant Mark Hudson is no newcomer to showbiz. With "The Hudson Brothers" he survived many years on the road, a network variety show, "Razzle Dazzle"—a kid's variety show, and "Bonkers"—a syndicated half-hour seen in 52 countries. He's written and produced songs for feature films from *Flashdance* to *Gremlins* and composed hits for artists from Asia to Europe.

During our lunch at Raydion, a burger joint with rock music blasting out non-stop, we shouted...

Bonzai: Tell me about your television band...

Hudson: We are a very good rhythm section with horns—that's the way I like to see it. We have to be able to cover a wide range of material, to work with artists ranging from Vic Damone to Rita Moreno to Wendy O. Williams

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World Radio History



Joan Rivers (L) with Mark Hudson.

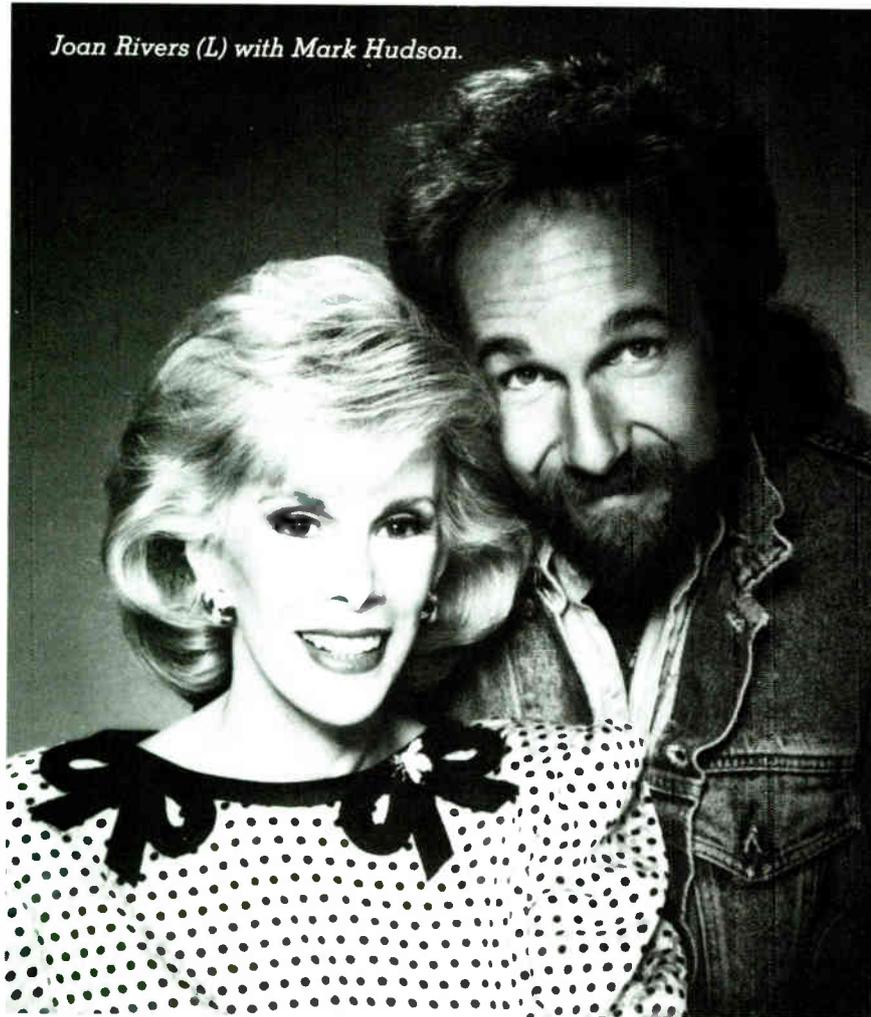


PHOTO: HARRY LANGDON PHOTOGRAPHY

to Michael McDonald to Run-DMC. Personally, I love rock and roll with a passion, and I love working with a big live band. I think pop music has become over MIDI-ed, too full of synthesizers and too thick. I believe that great songs, like "Gimme Some Lovin'," which we did last night, are going to be great songs forever, and we do our best to bring a new approach to TV. If you take the basics of rock and roll and embellish with the technology available today—like gated drums, for instance—that's what makes it progressive. I'm just picking tunes that I've loved all my life.

Bonzai: How did you pick the musicians?

Hudson: I wanted utility players, people who can cover different areas. Vinnie Colautta is one of the best drummers in the country. There are guys who can read the book, and guys who really write the book—Vinnie has written the book; he's a creator like Hal Blaine. Vinnie was trained with Frank Zappa and if you play with Zappa, you've gotta know your music. He's played with Billy Joel, Ray Charles—on and on. Brandon Fields,

on sax, has a record in the jazz charts now. Dave Boroff, sax, did *St. Elmo's Fire*, works a lot with David Foster. Steve Dudus, on guitar, is just blasting rock, with hints of Clapton, Jimmy Page.

I wanted guys who could cover different fields. We've got some great players and I hope we can keep them all. Part of my job as bandleader means being a politician. I have to make sure everyone gets their solo. We spent three weeks in rehearsal before the show started, so we've had a chance to sort out all the egos.

Bonzai: Will you and the band go on tours with Joan?

Hudson: That may happen. We're batting a thousand in the reviews—one critic even called us the greatest band on television. I've had some nice comments from Doc Severinson and Paul Shaffer. We've got a pretty good thing happening—it could go many places.

Bonzai: The acoustics in the studio for the audience are great.

Hudson: I have to give credit to our engineer, Thom Wilson. We'd worked in the past on some projects—the

Gremlins theme with Michael Sembello. Thom did "Maniac," and has worked with greats like Phil Ramone. When I was first offered this job, I told the top brass that television sound is generally antiquated. They usually say that it ends up on a two-inch speaker anyway, so who cares? They give you a limiter and some bad echo and that's it. Thank God for MTV and shows like *Miami Vice*. Great sound can be done for television, and I asked for a new level of quality.

Phil Ramone came out from New York and we sat down and planned things out. Phil gave us specifications, like stuffing the stage with fiberglass so that it's completely dead. He told us to get some good monitors for the audience, in addition to a separate mix and monitors for the band. I went to Fox and they told us to make up a list of equipment we wanted. It ended up being a very expensive request—things like stereo limiters, a Neve console and the new Yamaha board, ten SBX-90s from Yamaha with gated echo and harmonizer, AMS reverb. We asked for tools that we use in the recording studio. We've got good echo, effects, and a good assortment of mics. We move quickly from one style of music to another and the pre-set parameters on the SBX-90s really allow a lot of change and creativity. One night we did "Night and Day," the Cole Porter song, with gated echo on the drums that had a Phil Collins touch—a new approach to Porter. And we want the classic rock to sound true and fresh—the audience loves hearing tunes like "Lady Madonna" or "Twist and Shout."

Bonzai: What's your daily schedule like?

Hudson: I get in early. I'm a utility player, too, but I'm also involved in some of the comedic writing and concepts. Musically, I look at the lineup for the night's show and if there are no musical guests, it's an easier situation—we can work up some new material for the band. I go to Sam Jacobs, our librarian/researcher and say, "Can you find 'More Today Than Yesterday,' Spiral Staircase, 1967?" In two hours he's got the record, the lead sheets. He loves his job and he gets off on the music. Now we have about 100 tunes fully arranged for the band, some arrangements by me, some by members of the band. I look for moods that will fit the guests. Last night we had Mike Tyson, the fighter, so we worked on "Give it Your Best Shot." For Dr. Ruth, we played "Why Don't We Do it in the Road?"—which got a few comments. For Joan Collins, we played her on with "That's Why the Lady is a

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Tramp." Sometimes I get shot down for my ideas, but generally we're having a good time and making good music.

Bonzai: What about those instantaneous musical cues?

Hudson: Well, you've got to have a quick rapport with the band and sometimes it's scary. I've gotten in trouble a few times, because the show is live and there's no turning back. We had Tracy Scoggins, from *The Colbys*, on one night and she was doing a lasso trick so we played "I'm an Old Cowhand." Joan thought it was a cue for commercial and we broke—I got some bad stares from people. But we're working the bugs out—Joan trusts me and my instincts. It usually works, but sometimes it doesn't.

Bonzai: Seems like a plum job for musicians.

Hudson: It's highly visible, which is great. It's also a great opportunity to play live with a big band. We've got some great musicians, with senses of humor—which helps a lot—like Beverly Dahlke, "The Tramp."

Bonzai: Has calling her the "tramp" brought criticism?

Hudson: There's been nothing negative, because she's obviously not a tramp. It's not offensive, it's just something for Joan and us to joke with. Joan asked for a woman in the band and you wouldn't believe the auditions we had—it was cleavage for weeks. I told Joan I would try to find the right woman, but that I wouldn't sacrifice a chair in the band for a mediocre player. She backed me up and it wasn't until the last week before going on the air that we found her. I remembered a video for Glen Frey's "The Heat is On." There was a woman playing great sax, but I didn't know if she was a real player. I called John Rosenberg, the contractor, and she was for real. Bev played baritone sax, which is just what we needed.

During the interview, I got fairly rude, because I wanted to see if she could take it. Joan can get pretty outrageous, but she really likes Beverly, so it's worked out very well.

Anyway, we all get together around five o'clock, and go over the evening's show. I don't always tell my whole plan for the show, because I try to get away with as much murder as I can. I'm in constant trouble, but I figure it gives an edge to the show. It's a wild show, because it broadcasts live. Joan has said "shit" four times on the air—anything can happen. Wendy O. Williams came out and a major mammary slipped out of her outfit. During the

break I told the band to strip down to the waist (not Beverly), so when we came back it looked like the band was nude. I try to keep it loose. The best thing about Joan is that she's not fake. She isn't Mother Theresa, that's for sure.

Bonzai: I've noticed a change in the show. She doesn't seem so keyed up, so frantic—there's some confidence.

Hudson: It's a scary position to be in. She's the first woman to have a prime spot like this, and it's all live. And the press hasn't always been kind to her. I directed her HBO special, and we have a lot of trust in each other. It's different every night and she's getting better every night. It's live TV and you gotta keep going.

Sometimes it's just nuts—I've got the director yelling in my earphone about Wendy, "My god, her boob is out!" One night we were planning to go to commercial with "In the Mood," and we had "Eye of the Tiger" waiting for Hulk Hogan's exit. Out of a clear blue sky, he just got up and left. The director is yelling in my ear, "Jesus Christ, he's just leaving!" I held up a chart and half of the band broke into "In the Mood" and the other half played "Eye of the Tiger." It was a perfect fusion—sounded like a train wreck.

Sometimes I'll get an idea during the show and I'll go to Joan with a suggestion, because she's willing to play around. Edgar, her husband and producer of the show, knows exactly what he wants, but if the audience gets off, he's pleased. He just doesn't want the audience to be bored. We're getting a lot of support for the band—Elton John said we were the best television band he'd played with.

Bonzai: Do you have a musical hero?

Hudson: I had a hero—I still do. John Lennon. The day he was murdered, I was in a recording studio with Harry Nilsson. He got a bit hysterical and ran out of the building. My brothers and I had just finished an album for Elektra, and John was working on *Double Fantasy*. I had asked for special thanks to John on our album, because he had been such an inspiration to me.

Ever since the murder, I've had trouble listening to his albums. I can't get through more than a few cuts. The loss—I really feel that he was a prophet, but still a man. I even quote him regularly—"How can we go forward when we don't know which way we're facing?" He said things that still make a difference in people's lives.

Last year I wrote a Christmas song that was inspired by my feelings about John. It came out of me in about five

minutes and I think it's the best work I've ever done. I loved [Lennon's] "Happy X-Mas." For my song, I went into the studio, played all the instruments and when I finished, the second engineer—Jay Willis—broke down in tears. It was the anniversary of John's death. I can't compare my work to John's, but he was my total inspiration.

You know, I've talked to all of them since—Paul, George and Ringo are talking about The Beatles a bit more now. McCartney is dealing with the power that was John.

I could never get over my awe of John, but we did have some interesting conversations. We were in a club one night and he was just coming up with wells of information. I asked him what was their worst song—which one do you hate? I had to know. He looked at me and said, "Run For Your Life"—it was a piece of shit." In conversation he would toss in thoughts that were so simple, but so surprising.

That night he was doodling on a napkin, and I was thinking, "It's a Lennon drawing!" I started out as an art student on a scholarship to Reed College in Oregon. I was just thinking, "Oh my God—he's drawing!" I wanted to ask him for it, but I felt that if I asked I would have been crossing a line in our friendship. He was my major mentor. We got up and he just crumpled it up and tossed it.

Bonzai: Can you remember your first performance?

Hudson: Yes. I'm from an Italian family. My real name is Salerno—we changed it for show business because "The Salerno Brothers" sounded like a juggling act. To go way back, my first performance was alone in front of a mirror holding a broom like a guitar and singing "Don't Be Cruel." I had the Elvis lip, the waterfall pompadour, and I was about 9 years old. I was really going for it. Elvis was my early inspiration.

Bonzai: What did your folks give you?

Hudson: They were emotional, musical Italians. You could come to my house and you would find people weeping, people dancing, somebody playing the piano or a bad accordion. My mom and my uncle had a dance act. I grew up with all this emotion around me and I couldn't change.

Bonzai: Can you remember the first piece of music you wrote?

Hudson: Yes—I wrote it with my brother Bill in the kitchen. It was called "All in a Day, Girl" and it was heavily Beatles influenced. I was 13, and John had already done some damage to me. It was so simple—"All in a day,



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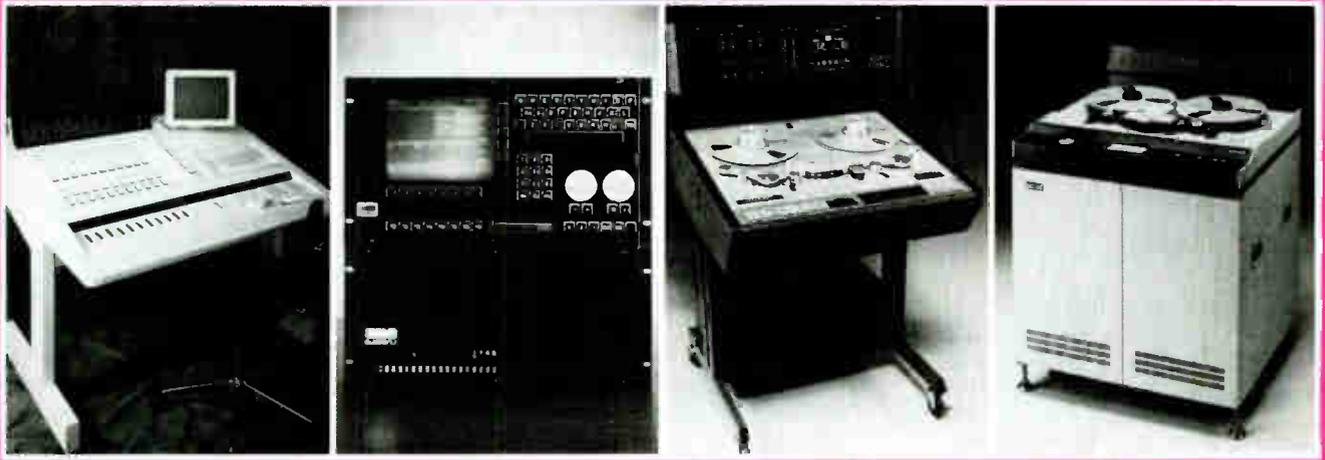
Best of all, the D-112 sounds terrific. We've built in emphasis at 100 Hz and 4 kHz, to capture those special frequencies that give a bass track punch. EQ is unnecessary; your sounds will stay clear and clean in the mix.

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Four different approaches to digital recording technology
(left to right) Lexicon Opus workstation, AMS Audiofile, Studer D820X DASH 2-track,
Otari DTR-900 PD format 32-track.



DIGITAL '87

NEW DIRECTIONS IN AUDIO

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Mitsubishi on the March

With U.S. orders for over 80 units received, and initial deliveries slated to begin last month, it looks as if the Mitsubishi X-86 digital 2-track is off to a strong start. This second generation design machine, which is the first 2-channel recorder introduced under the Professional Digital format, features 14-inch reel capacity, tachometer or SMPTE counter, built-in autolocator, two analog cue tracks, time code and auxiliary digital track, and both razor blade and electronic editing. Three different versions are offered: X-86 standard (15 ips, 44.1/48 kHz sampling frequency) X-86 archival and storage (7.5 ips, with up to four hours recording time); and the X-86 HS, a 96kHz sampling rate, 15 ips model with 35kHz bandwidth. Fifteen orders for the latter have been taken so far in the U.S., and deliveries are expected sometime this summer.

Also expected to be available this

summer will be the Mitsubishi XE-2 digital audio editor, offering complete digital-to-digital editing between two X-86 recorders.

On a related note, the research and development phase on a fully digital console is now underway at Mitsubishi Pro Audio Group facilities in the U.S., although no specifics as to possible delivery dates were available at press time.

AudioFrame Digital Workstation

WaveFrame, a Boulder, Colorado firm, has begun beta testing of AudioFrame, a complete workstation system incorporating digital recording, mixing, synthesis, and signal processing functions. The hard disk-based AudioFrame utilizes true 16-bit architecture (with 32-bit internal processing of arithmetics), a 176.4kHz playback sampling frequency, and the application of new proprietary techniques that are said to allow a 108dB dynamic range with negligible distortion specs. Any number of tracks can be configured

—up to 48, depending on user needs.

Initial test unit deliveries have been made to Christopher Franke (of Tangerine Dream fame), and several top video/film composers. AudioFrame begins full production in the third quarter of this year, and will be shown at this October's AES Convention in New York City. On a related note, music software wizard/synthesist extraordinaire Roger Powell joins the firm as full-time software engineer, beginning next month.

Otari Digital Deliveries

Officially unveiled a year ago at the AES Convention in Montreux, Switzerland, the Otari DTR-900 digital 32-track is now making headway into U.S. studios. Recent deliveries include two machines to the Power Station in New York City, two for Nashville's Masterfonics, as well as sales to two other Nashville facilities, MasterMix and Ronnie Milsap's Groundstar Laboratory, with another recorder going to the White Field recording complex

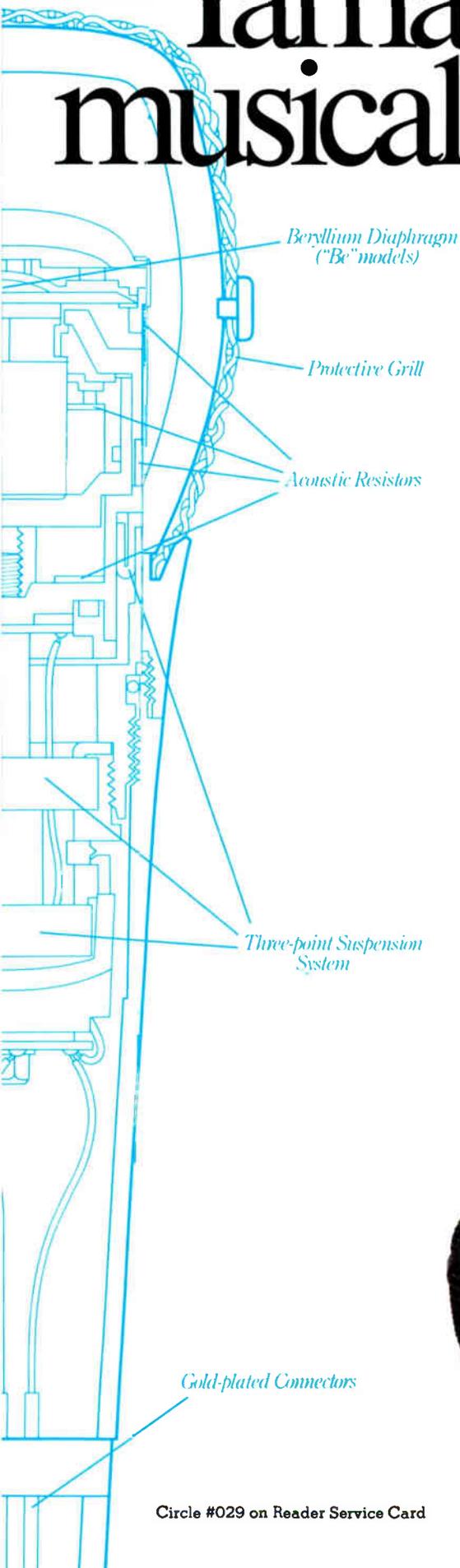
Mitsubishi X-86.



Sony PCM-3402 DASH two-speed recorder.



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A tight cardioid pattern provides excellent off-axis rejection for superior feedback suppression.

To reduce handling noise, all MZ mics have a unique three-point floating suspension system. And a special windscreen with three times the impact resistance of conventional types. So you know it can take a pounding.

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But when you listen to Yamaha MZ mics, you hear more than the result of advanced technology. You hear a one-hundred-year tradition of making music.

For complete information, write Yamaha International Corporation, Professional Audio Division, P.O. Box 6600, Buena Park, CA 90622.



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Otari DTR-900 digital 32-track.

capabilities. Dyaxis features over 250 standard software-selectable sample frequencies including 44.1kHz and 48kHz.

The heart of the Dyaxis system is contained in 1¾-inch rack mount box, the PCM Processor, containing stereo A/D and D/A conversion circuitry, a master clock system and the micro-processor-controlled SCSI data transfer circuits. An optional enclosure can house up to two 5¼-inch standard height computer storage systems. Storage systems can be either Winchester hard disks (providing up to 1.5 Gbytes of on-line storage) or a combination of hard disk, optional disk or streaming tape back-up.

The PCM Processor front panel provides control of input and output level, and monitoring of important system



Synclavier Direct-to-Disk system in operation.

in Santa Ana, California.

The DTR-900 is based on the PD (Professional Digital) format, offering 32 tracks on one-inch tape, and two configurations are available: a standard 32-track version, and a 24-channel model (upgradeable to 32-track). The DTR-900 features include: 45 total channels (32 digital audio, eight parity, two auxiliary analog, two auxiliary digital, one time code); powerful CRC (Cyclical Redundancy Check) and RSC (Reed Solomon code) error correction and detection circuits; razor blade and electronic editing capability; and switchable 48/44.1 kHz sampling rate.

Otari has not announced any dates for the introduction of a 2-track digital recorder, although the company is currently also actively working on a disk-based recording system.

IMS Dyaxis Digital Audio System

Shown for the first time at last month's SMPTE Conference in San Francisco, the Dyaxis Digital Audio System from Integrated Media Systems of San Carlos, CA, is a powerful 16-bit sampling, editing and disk-based storage system designed to provide studio-quality digital audio record/edit/playback capabilities to computers equipped with the SCSI port. Dyaxis is designed to be operated in conjunction with a host computer. At present, the system is configured to operate with the Apple Macintosh Plus computer. Other computer interfaces will be available.

User interface is very similar to many Apple Macintosh software packages. The software features mouse-driven high resolution graphics employing pull-down menus and multiple window displays providing audio mixing, editing and signal processing

parameters. LED status indicators monitor power, CPU run, SCSI active, RS-232 active, RS-422 active, and current mode (stop, play or record). Rear panel connectors include stereo XLR balanced audio inputs, stereo XLR balanced outputs, RS-422/232 port, SCSI port and remote start convert trigger.

Designed as an inexpensive peripheral (projected price is in the \$3000 to \$3500 range) for SCSI computers, Dyaxis provides the functionality of higher-priced workstations in an economical desktop package. The system can be purchased with computer as a complete workstation, or as a stand-alone audio I/O package. Applications include 2-track disk-based digital recording, high-resolution sound sampling, post-production sound editing, and acoustics/speech/computer music research. Initial deliveries are expected to begin in the next 60 days.

The Studer Commitment to Analog and Digital Technologies

"For Studer it's not a question of either/or," says Thomas E. Mintner, vice president and general manager of Studer Revox America, Inc. "It's more a question of achieving a proper balance between emerging digital technology and a suddenly revitalized analog technology.

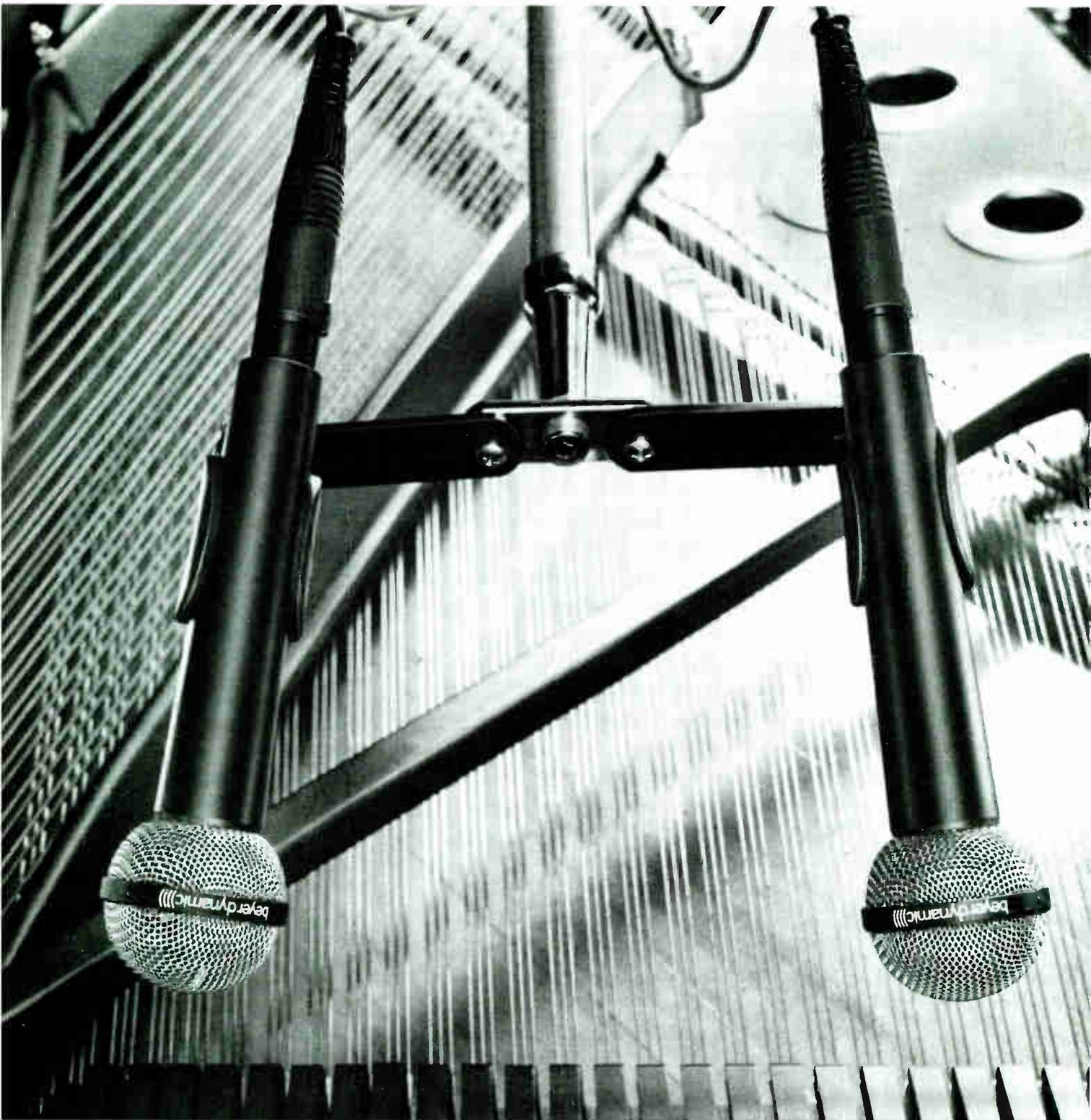
"The foreseeable future will bring a healthy, creative coexistence of analog and digital," Mintner predicts. "The D820X embodies our belief that the time for a true state-of-the-art 2-channel digital machine has arrived. The advanced transport design along with improved cueing, auxiliary data, and monitoring features make the D820X much more than simply a sound storage device. Studer is also committed

to the future of DASH format digital multi-track recording. But here we have to look beyond the immediately foreseeable future to see any clear-cut dominance of digital technology. The introduction of innovations such as Dolby SR underscore Studer's wisdom in developing a new generation of analog multi-track machines. A Studer digital multi-track will come, but only when format standards are widely accepted, costs are realistically competitive, and the broader marketplace clearly expresses a demand for it."

Carlton Communications Acquires DAR

Carlton Communications has recently acquired Digital Audio Research Limited, a London-based company specializing in the design and manufacture of advanced products for the professional audio industry. Word-

BEYER RIBBON MICROPHONES AND



THE DYNAMIC DECISION

THE DIGITAL RECORDING PROCESS

Digital technology holds forth the promise of theoretical perfection in the art of recording.

The intrinsic accuracy of the digital system means any recorded "event" can be captured in its totality, exactly as it happened.

Naturally, the ultimate success of digital hinges on the integrity of the engineer and the recording process. But it also depends on the correct choice and placement of microphones, quite possibly the most critical element in the recording chain. This can make the difference between recording any generic instrument and a particular instrument played by a specific musician at a certain point in time.

The exactitude of digital recording presents the recordist with a new set of problems, however. The sonic potential of total accuracy throughout the extended frequency range results in a faithful, almost unforgiving, recording with no "masks" or the noise caused by normal analog deterioration. As digital recording evolves, it places more exacting demands on microphones.

Ribbon microphones are a natural match for digital because they are sensitive and definitively accurate. The warm, natural sound characteristic of a ribbon mic acts as the ideal "humanizing" element to enhance the technically perfect sound of digital.

Beyer ribbon mics become an even more logical component of digital recording due to an exceptional transient response capable of capturing all of the nuances and dynamic shifts that distinguish a particular performance without the self-generated noise and strident sound generally

attributed to condenser mics.

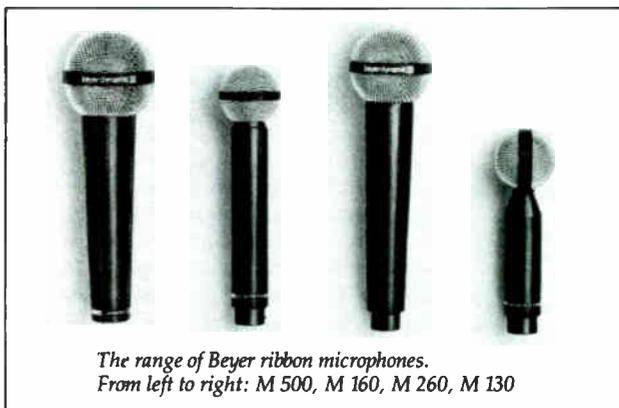
Beyer is committed to the concept of ribbon microphones. We manufacture a full range of ribbon mics for every vocal and musical instrument application.

The Beyer M 260 typifies the smoothness and accuracy of a ribbon and can be used in stereo pairs for a "live" ambient recording situation to record brass and stringed instruments with what musicians listening to a playback of their performance have termed "frightening" accuracy.

Because of its essential double-ribbon element design, the Beyer M 160 has the frequency response and sensitive, transparent sound characteristic of ribbons. This allows it to faithfully capture the sound of stringed instruments and piano, both of which have traditionally presented a challenge to the engineer bent on accurate reproduction. Axis markers on the mic indicate the direction of maximum and minimum pickup. This allows the M 160 to be used as a focused "camera lens" vis a vis the source for maximum control over the sound field and noise rejection.

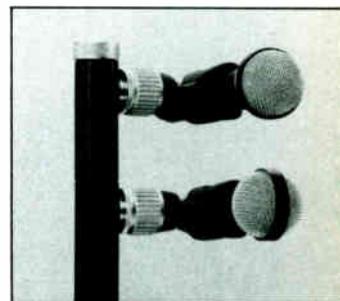
Epitomizing the warm, detailed sound of ribbon mics, the Beyer M 500 can enhance a vocal performance and capture the fast transients of "plucked" stringed instruments and embouchure brass. Its diminutive, durable ribbon element can also withstand extremely high sound pressure levels.

The Beyer M 130's bi-directional pattern enables the engineer to derive maximum ambience along with clean, uncolored noise suppression. Two M 130s correctly positioned in relationship to each other and the source can be used as part of the



The range of Beyer ribbon microphones. From left to right: M 500, M 160, M 260, M 130

Mid-Side miking technique. The outputs from the array can be separated and "phase-combined" via a matrix of transformers to enable the most honest spatial and perceptual stereo imaging — sound the way we hear it with both ears in relationship to the source.



Given the high price of critical hardware used in digital recording, the relative price of microphones is nominal. Realizing that microphones are the critical sound "source point," no professional can allow himself the luxury of superficial judgements in this area. Especially when one considers the value of ongoing experimentation with miking techniques. For this reason, we invite you to acquaint yourselves with the possibilities of employing Beyer ribbon technology to enhance the acknowledged "perfection" of digital recording technology.

Beyer Dynamic, Inc.,
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fit, DAR's first product, is a 16-bit digital audio processing system that automatically synchronizes replacement dialog with actors' lip movements, with the capacity of storing up to 35 track-minutes on a 168-Megabyte hard disk. The system has been used on award-winning films such as *Passage to India* and *The Killing Fields*, and the company has delivered Wordfit units to Universal Studios and The Burbank Studios in the USA, and recently to Video Sweden AB in Stockholm, Sweden.

DAR's next product—SoundStation II—is a complete digital audio recording, storage and processing system that is slated for release in mid-1987.

Direct-to-Disk Acceptance Growing

Ever since delivering the first Synclavier Direct-to-Disk™ tapeless recording studio system last September, acceptance of these multi-track digital units has been on the rise. The system is available in 4-, 8-, and 16-track versions offering either 13 or 26 minutes of recording time per track. Producer Paul Hardcastle received the first 16-track unit, and Pat Metheny, Sting, and Universal Recording in Chicago were among the first customers to receive the initial 8-tracks. More recently, deliveries of 8-track systems were made to Canada's Le Studio, Black Box post-production in Switzerland, and in the U.S. to Ultrascope (Orlando, FL) and Solar Recording Studios in New Jersey.

Some new customers receiving standard Synclavier systems are Sprocket Systems (the Lucasfilm post-production facility), musician George Benson, and Taj Soundworks in Los Angeles. The delivery to Taj included a Synclavier with both SMPTE and Sample-to-Memory™ options. Sample-to-Memory allows the direct storage of sounds in random access memory at a 100kHz sampling rate with 16-bit resolution. If a stereo sample is recorded, both waveforms can be displayed on-screen for modifying and editing. For instance, different timbres or samples can be assigned to each track in the digital memory recorder to create a single sample of 16 orchestral instru-

ments playing simultaneously. Other applications include stereo sampling for the creation of true stereo sound files for post-work and Foley triggering from the keyboard.

Sony: The Innovations Continue

August, 1987, is the expected arrival date for the Sony PCM-3402, a 1/4-inch, digital two-channel deck configured for both DASH-S recording at 7.5 ips and Twin DASH (DASH-M) recording at 15 ips. Like all DASH recorders, the PCM-3402 has two cue tracks, one time code track and one control track. The tape has eight digital audio tracks (not to be confused with channels). At 7.5 ips (DASH-S), each audio channel requires four tracks. At 15 ips (DASH-M), each audio channel requires only two tracks. While the extra four tracks could be used for two additional audio channels, the PCM-3402 uses them to completely duplicate the audio data and its error correction on another part of the tape. This configuration, called "Twin DASH," can completely correct for burst errors and razor blade editing flaws up to 3.8 cm in length.

While the Sony PCM-3402 offers razor blade editing, its electronic editing is assisted by internal RAM storage, enabling the machine to memorize 12-second portions of the music. The producers can audition an edit beforehand, refine the edit point, and digitally set level, balance and cross-fade time to achieve precisely the desired effect.

Now available from Sony is the VSU-3310 Vari-Sync Controller, a rack mounted accessory which brings $\pm 12.5\%$ variable speed pitch control to the PCM-3324 multi-track, with the ability to reference most standard sync signals.

On the semi-pro/consumer front, the last production run of the Sony PCM-601 EIAJ format digital recording processors was in January, and supplies should remain until about June. With the advent of R-DAT digital cassette machines (probably this summer), these 14/16-bit processors may be phased out, so if you need a PCM-F1 compatible unit, these are worth investigating.

Apogee Anti-Aliasing Filters

Demonstrated for the first time at last fall's AES Convention in Los Angeles, the 944-S and 944-G from Apogee Electronics of Santa Monica, CA, are a family of anti-aliasing/anti-imaging low-pass filters designed to achieve accurate band limiting in digital audio systems. The filters were developed by TEC Award winning engineer Bruce Jackson, a principal in the firm, in conjunction with noted Swiss engineer Chris Heidelberger, who designed a complex and highly accurate computer model for examining non-linearities in phase response of the filters commonly used in digital tape recorders.

"Essentially, what we were looking at is the harmonic dispersion in the filters," explains Jackson, "where as a complex harmonic sound goes through existing filters, the higher harmonics are behind in time. The effect after one pass on a digital machine is very subtle, but once you hear the combined effect of [going through] three channels—which is like the multi-track recorder going to the 2-track, and on to the mastering process—then even a relatively low frequency square wave, say 2kHz, no longer resembles a square wave once it's gone through that many channels. A square wave is a function of the harmonics adding up in amplitude and phase, so if the phase is off, they don't sum properly and you get this aberrated, horrible looking thing that looks more like the mountains of Switzerland than a square wave.

"When you plug in our linear phase filters," Jackson continues, "it puts all the harmonics back into line, and the square wave still looks like a square wave, even after three generations. We feel this problem has a lot to do with that 'digital sound' that people talk negatively about. It's not the digital's sound at all: it's just the older technology anti-aliasing filters."

The Apogee filters are plug-in replacement modules, compatible with the specifications and dimensions of filters currently used in digital recorders. Preliminary testing of the filters has been underway at several top Southern California studios for some months now, and the initial production of 1000 of these Swiss-made units was due to arrive by the end of February. Two filters (one for each input/output), priced at approximately \$90 each, are required for each channel. OEM versions, as well as a model for the Sony PCM-F1 are expected to be introduced at a later date. ■

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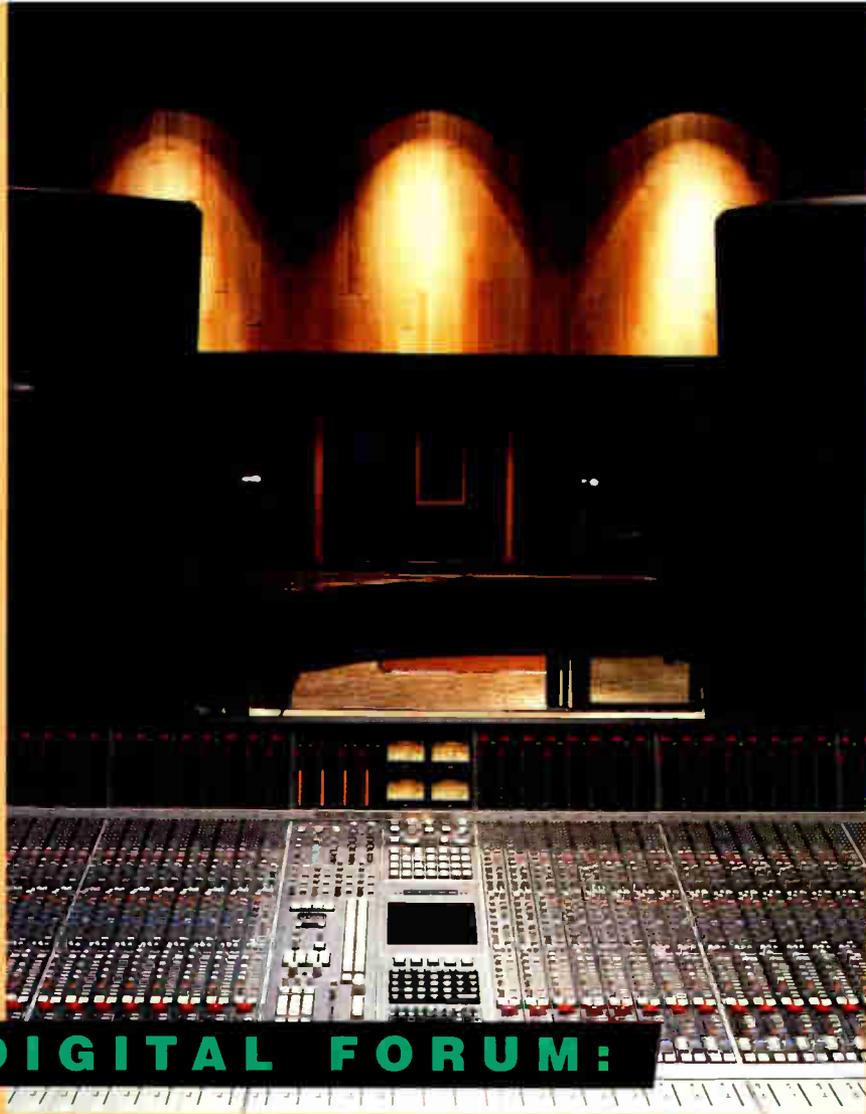
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“In the past, Nashville was a follower, but in the realm of digital recording we’ve become a pioneer.”

DIGITAL FORUM:

SOUTHERN STYLE

by Linda Jacobson

Ladeeeees and gennulmen! Welcome to the 1987 Format Championship of the Southeast! In this cornerr, in white satin, we welcome *Digital*, who is challenging good ol’ boy and current world champeen, in the red, *Analog*! When the tone sounds, come out fightin’, and no hittin’ below the belt!

The digital/analog debate is on. Multi-tracking, mixing, and mastering in the digital domain is hot (especially in Nashville), but in much of the Southeast, the analog format is fine, thank you, and digital recording just isn’t there yet. In some areas, analog and digital formats work hand in hand, often in hybrid setups that provide cost-effective alternatives to the pricey

all-digital route. Recently, *Mix* called upon a few recording studios, mastering facilities, and equipment suppliers throughout the Southeast. We wanted to know who’s buying what, who likes it, who doesn’t, and how it’s affecting business.

Digital Multi-Tracking

We begin in Nashville, which appears to be the national capital of digital recording. With at least 16 32-track digital machines—mostly Mitsubishis—in the neighborhood, we wondered if Nashville could support them all. . . .

First stop, the Castle recording resort, which in 1984 cut the area’s first all-digital album, by RCA artist Deborah Allen. Studio manager Josuf Nuyens tells us that when the Castle went



PHOTO: CHUCK SAGLE

Photo above: Sound Stage Studios in Nashville. Right: Sixteenth Avenue Sound’s Mike Poston at the studio’s SSL 4000E console.



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They even managed to squeeze out more headroom, and incorporate an invert feedback function that gives you maximum phasing control at the push of a button. And just for



fun, they included micro-touch switching for even cleaner, more reliable operation.

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isolation, a machine room, everything. We have tried both analog and digital mixdown formats, and I think you could make a case for that debate—format is program-dependent. There's a trade-off, warmth versus noise, but you could fight that battle all day. It's 100% a customer choice as far as we're concerned. I don't doubt everything's going to go digital, including a lot of the commercial work, but the commercial people aren't ready for it, nor are the television people. My feeling is that we'll be into the 1990s before we see enough demand for it, particularly with our large percentage of commercial clients."

Moving still south, to North Miami, we look into Coconuts Recording and discover that digital doesn't ring many chimes here. Chief engineer and manager John St. John tells us, "This year we'll be getting the Dolby SR, which will give us about the same signal-to-noise as digital. At the moment, I can get 90 dB signal-to-noise out of my MCI 24-track, with dbx. You don't need digital to be clean. Also, not one client has asked for digital recording. We have the Sony F1, and they ask for digital mixdown, but most don't spend the money to go to CD. I've recorded digitally, and I cannot say there is a noticeable difference between our analog system with noise reduction and the digital system. The dbx is frequency-sensitive and you must have very well-aligned machines, so we spend a lot of time aligning. Still, I find that it's a much warmer sound than digital. I've made the same recording on a Mitsubishi X-80 and on a well-aligned analog machine using dbx. When I played it back for people, they went for the analog sound, ten to one."

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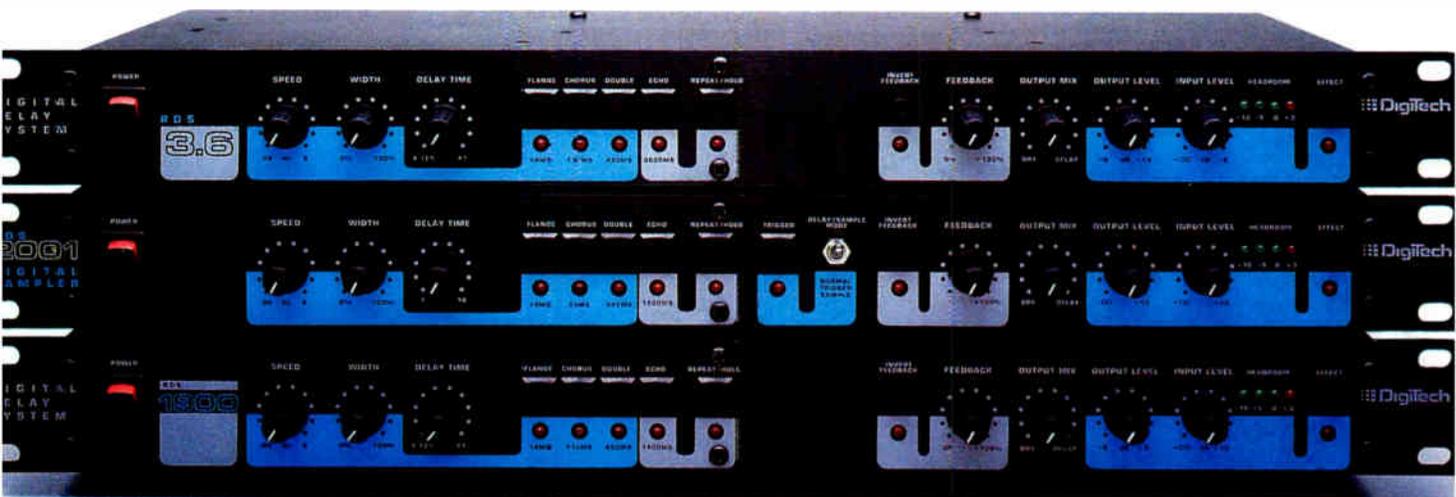
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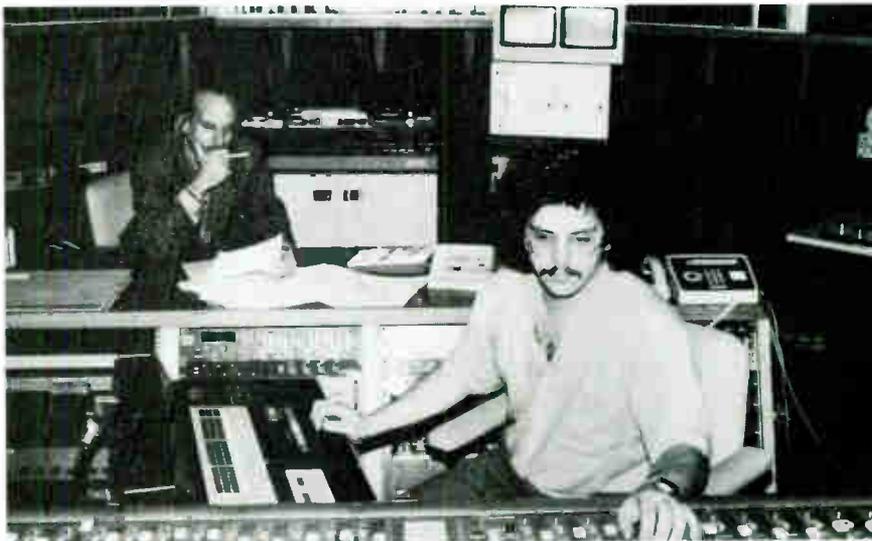
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*New Age Sight & Sound's Mitchell Dorf (L) works with client Herb Koss-
over at the Atlanta studio.*

digital back then, "Nashville was very skeptical. Our clients were saying 'It's too clean, too cold,' so we said 'We'll give you a half-hour for free, and we'll record your stuff on both analog and digital.' After that, not one of our clients stuck with the analog. We were recording digital a lot more than analog within three or four months after we got it."

The album-oriented Castle charges the same rate for recording analog (Studer) or digital (Mitsubishi's 32-track X-850 and new 2-track X-86, and the "old" 3M system). Since they invested in digital over three years ago, they've recouped most of the purchase cost and lowered their rates. That purchase, says Nuyens, "absolutely affected the kind of business coming in. We have as many outside clients, from New York, L.A., and England, as we have from Nashville. But sometimes we have to talk people into going digital. The new Kansas record, *Power*, was done completely here, and



they wanted to start analog. We convinced them to do the whole thing digital. Sometimes clients record analog somewhere else, and then they come to finish here. We encourage a transfer to the digital. They can't lose anything, plus they have more tracks. In the future, maybe two years, we will

go totally digital—but we have to wait until everybody else catches up."

Eleven-Eleven Sound in Nashville, run by John Abbott, went digital (Mitsubishi) in late '85. Abbott explains, "We'd been following the digital technology for some time, convinced it was the way the industry was going to

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Keeping in mind that *most* of the digital multi-track machines are available only from their manufacturers, we surveyed a few Southeastern equipment suppliers to hear what's happening for them in the domain of digital recording.

In North Carolina, Reliable Music's John Saviano says they've sold many Sony F1 processors. "That's the major focus of going digital in North and South Carolina, F1 processors for mixdown. But there's no digital multi-track here. There is a tremendous interest in electronic music and keyboards in recording studios, and I think we'll see more people moving in the direction of digital recording if and when the costs drop a little bit. Most of the studios in this area subsist on post-production work for film and video, so there aren't huge record company projects coming through that support the cost of operating a digitally equipped studio."

In Atlanta, Showcase Audio/Video's Lewis Frisch tells us his 2-track and multi-track line is analog, primarily Studer Revox. "Some clients are looking at digital, but we're not involved in that. Our primary thrust in digital has been with the PCM-based systems such as the

Sony F1 and the Nakamichi DMP-100 processors, which Nakamichi discontinued. There's no way that other forms of technology can be stopped from emerging on the market soon, particularly the R-DAT. Most of the studios I'm dealing with are tremendously interested in Dolby SR and in acquiring the latest generation of analog recorders. They're not economically at the point where they're rushing towards digital. Also, there comes a time when technology has to be recognized as transitional, and I'm beginning to think it may be that way with digital recording on open reel magnetic tape. You still have to rewind, and wait for the tape to move. I think the Winchester or optical disk-based systems look like the future. With that idea of instant access and not having 32 longitudinal tracks, I'd rather try to get studios to put in another generation of analog recorders or Dolby SR, to hold them until the real thing appears."

Valley Audio, which won a TEC Award last fall for studio design and acoustical consulting, is a 15 year-old firm in Nashville. Bob Todrank spoke with us about their digital installations in the past months. "We

sold the world's first four Otari DTR-900s: the first one, in August, to Masterfonics, the next two to Ronnie Milsap, and the fourth to MasterMix. Still, there certainly are a lot more analog machines being purchased than digital. But we've been designing studios with digital in mind for five years, because it was the way of the future. We've been trying to make the rooms quieter, acoustically, make the monitoring systems better. With the broader dynamic range of digital multi-tracking, ambient noise level in the studio is becoming more critical. Mechanically, the digital tape machines tend to be noisier, because they get warm and have a lot of fans in them. Separate machine rooms are becoming more popular. For monitoring, we import the all-dome Boxer system from Europe, because a broader frequency response from the monitor is required once you move to digital.

"I think Nashville is taking the lead in digital recording," Todrank adds. "There's a staggering amount of digital multi-track recorders for a town of this size. They're all busy, all the time, and there's more to come. In the past, Nashville was a follower, waiting to see whatever the coasts did, but in the realm of digital recording we've reversed that process and become a pioneer."

—by Linda Jacobson



Husband and wife production team David and Pam Vaughn use MIDI-LAB's new Version 4 Kurzweil 250 to sweeten rhythm tracks at MIDI-LAB™/JBS Studios in Atlanta. Left to right: David Vaughn, Brad Jones, owner/chief engineer of JBS Studios, Pam Vaughn, and MIDILAB co-owner/engineer, Steve Bell.

things have picked up. Some people say that Nashville and country music can't support all the digital studios, but I think it can. The product is better, and when product is better, people buy it."

Emerald Sound Studio in Nashville re-opened in October after complete remodeling. New owners took over last June, hired Tom Hidley to re-design the control room, and brought Emerald into the world of digital recording. Now, with 24 Studer analog and 32 Mitsubishi digital tracks (both going for the same rate), Emerald's business is growing. Their new clients include the Oak Ridge Boys, Louise Mandrell and Reba McEntire. Manager Ken Criblez says, "There's still quite a bit of analog work in town, mostly demo and lower budget projects, but we've gone about 100% digital. Now, we're hoping to bring in clients from the coasts and London. We're remodeling the house connected to the studio, putting in a recreation room and office space for clients. A lot of Nashville studios will have to pull in non-Nashville acts to support themselves. We have the equipment to pull in that clientele."

At Norbert Putnam's new Digital Recorders in Nashville, you won't find analog tape, unless you rent a machine to transfer to digital. Opened just over a year ago, Digital Recorders posses-

go. Some clients expressed skepticism, but we felt that we wanted to jump in. It's so much better. But we don't do multi-track editing on the X-850. I'd much rather the client try to get the final track instead of cut up the master, or edit when they mix down to 2-track. If someone insists on cutting the multi-track, then we'll make a clone of it and cut that.

"We charge separately for digital," notes Abbott, "so not everyone wants it—but I'd say 80% of our work is on digital. We're up considerably from when we were strictly analog, and we were a major analog studio. Now we're catching more label projects, like MCA/Nashville. They require all their projects to be cut digitally. So we've done their acts, and several non-Nashville—Barbara Mandrell's last album, Ray Charles, George Jones, Kenny Rogers. Digital has allowed us to get business from Nashville and attract artists from outside. It's made people look more seriously at Nashville as a recording capital."

Our next Nashville visit is with Roy Clark's Sound Emporium, where co-manager Susan Sims talks about the popularity of both their analog (Otari) and digital (Mitsubishi) formats. They went digital about two years ago, after opening a new room. Today, Sound Emporium gets higher rates for digital, rates that can change to accommodate client needs. "Digital affected our business somewhat, but we still do a lot of analog. It's about half and half," notes Sims. "We see a lot of transfer from analog to digital. This time last year we were doing more digital, but right now it's more analog. It fluctuates a lot. And I think it will continue to fluctuate." Recording analog at Sound Emporium lately have been Tanya Tucker

and Tommy Cash, while cutting digitally were Tom Petty & the Heartbreakers, and Chet Atkins.

Nashville's Sound Stage Studio, which went digital three years ago, is the home of three Mitsubishi X-800s. Its two digital studios are used exclusively by MCA/Nashville, particularly veteran MCA producer Jimmy Bowen. (MCA artists also record at other digitally-equipped studios around town.) Two other Sound Stage rooms contain 24-track Studer and Otari analog recorders. Bob Lewis, chief technical engineer, tells us, "MCA's projects are completely digital, from tracking to the final mix. Meanwhile, our analog studios are used for lots of gospel and jingle work, and some country albums. People around here consider both formats to be applicable, although it depends a lot on budget. And they turn out a really good product, digital or analog."

Lewis continues, "A few years ago, when the country music business was rocky, sales weren't good. Now, with this infusion of digital recording, and with Mr. Bowen's work in particular,

Pictured at Coconuts Recording in North Miami are (L-R) Carlos Alvarez, John St. John and Holophonics inventor Hugo Zuccarelli.

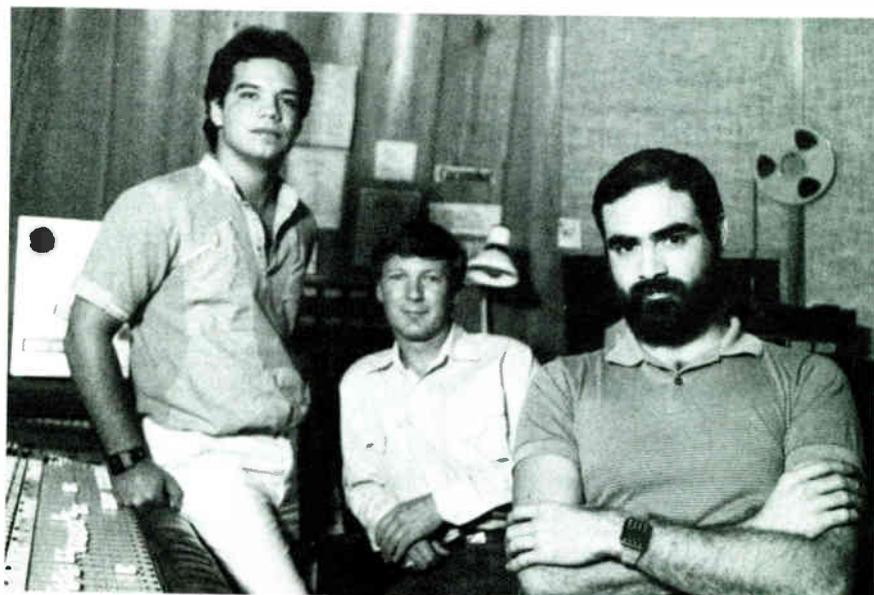


PHOTO: EDUARDO GALLIANI

ses one of Nashville's two Sony PCM-3324 digital multi-tracks, as well as the PCM-3302 digital 2-track. "It's great to edit on the Sony," says engineer Gary Paczosa. "You can do anything with it. Electronic editing is probably the biggest plus." Paczosa (who learned his trade on digital gear, and has never worked in analog) told us that Digital Recorders' clients have been mostly gospel, including the popular Mighty Clouds of Joy, although Neil Young's also been there, as well as Sweethearts of the Rodeo.

Gary describes DR's unusual setup: "The studio was designed mainly for electronic instruments, because Norbert predicted everything would be going that way. So we have a bigger control room to allow for a lot of musicians and instruments. The way it's designed, we have low overhead costs. The room is a 12-sided circle, with pie-section ceiling and floor; the whole thing is moveable. And 180° of it is windows, with a really good view of the studio. The first design priority was acoustics. But the way it was built, if we ever had to move, we could take it with us like a piece of equipment."

Nashville boasts another all-digital recording studio: the brand new 16th Avenue Sound, home of a Mitsubishi X-850, an X-86, and the 32-track Otari DTR-900. Co-owner and manager Mike Poston formerly co-owned Digital Associates, Nashville's first digital machine rental firm. When he and partner Rick Horton set up Digital Associates two-and-a-half years ago, he says, "it was our belief that digital recorders were the way of the future for at least five to seven years, for open reel digital recording." Although there's no analog machine at 16th Avenue Sound, they occasionally do rent one for mixdown from analog to digital. Their first client did that—Steve Winwood, who worked there on a single from the analog-recorded LP *Back In The High Life*. Poston enjoys editing the digital results: "We do razor blade editing on the 850. A lot of people are still hesitant about editing on 32-track, but I haven't found it to be a problem whatsoever." He also feels that his studio can sustain itself within the Nashville community, "but I will try to gain business from other areas. I'd like the rest of the music community to realize that there's more to Nashville than the Grand Ol' Opry."

Down south, in Georgia, we found one studio offering both digital (Sony) and analog (Otari) multi-tracking: Atlanta's New Age Sight & Sound, managed by engineer Mitchell Dorf. Says Dorf, "We're the only digital game in town." New Age, which is two years old and primarily handles commer-

cial and corporate work, can sync up a hybrid 48-channel system, "but there's not much call for that," notes Dorf. "We got into digital and found it's just not happening in Atlanta. Everybody's used to their old tricks, not accustomed to fast changes. We use our digital machine for everything, though. We've found that the video market in Atlanta is better for us than the music market. We record 24-track digital audio, mix it to the Sony 1610, and then make a one-inch or 3/4-inch video. But honestly, it's difficult to justify the cost of the Sony 3324. We thought digital audio would draw music people here, and to some extent it has, but not at the rate we would have liked. Then,

we get higher rates for digital, so people who can't afford it use analog. Also, going analog is a compatibility question if you want to take your tape anywhere else, especially in the Southeast."

The five-year-old JBS of Atlanta is an analog recording studio and home to the new MIDILAB™, a modular facility tied into the JBS control room. Owned and managed by engineer Brad Jones, JBS offers "32-track digital recording on request." We asked Jones if anyone picks up on that. He responded, "Nobody's really requesting it now. I'm pushing it, though. I hate analog, I hate the hiss, the noise factor. We don't use noise reduction,

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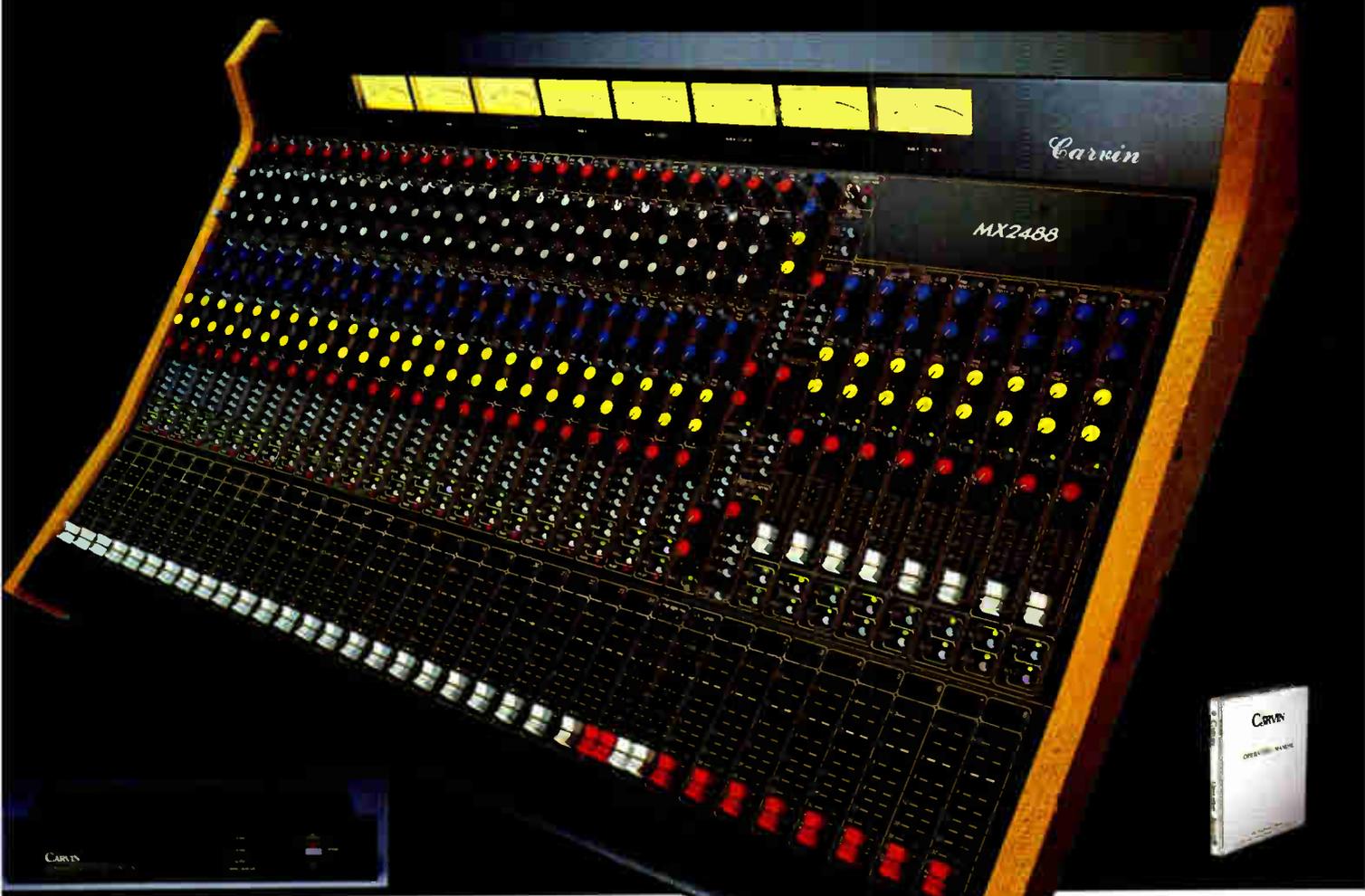
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 Len Feldman—db magazine
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DIGITAL MIXDOWN & MASTERING

Most Southern mastering facilities are enthusiastic about digital technology. They handle major label projects and clients from all over the country, although the labels in Nashville and the local big-budget artists supply their mastering community with plenty of work.

Masterfonics of Nashville owns no analog multi-track machine, but the nation's first digital 32-track Otari, delivered in October to their new remix room. They also own a number of 2-track JVC digital cassette systems, some in use since '81. When a Masterfonics client brings in an analog multi-track master, it's transferred to the digital format, and they mix down from that. Editing is on the digital JVC.

Glenn Meadows, Masterfonics president, tells us that they're well supported by the Nashville community, and adds, "Ricky Scaggs owns a JVC processor which he rents out around town. Music Mill has one, Ronnie Milsap, too. We purchase these because of the sonic performance and, in most cases, because we prefer electronic over razor blade editing. Razor blade is convenient for the engineer in the control room, but not so great if you ever watch the error correction rates. And if you ever have to move the splice, you're really asking for trouble."

MasterMix, another Nashville facility, purchased the nation's first Calrec console. They handle remixes, editing, mastering, and CD prep via Otari's DTR-90 and MTR-90 and Sony's PCM-1630 system. Manager Hank Williams told us, "Since we got the 1630 a year and

a half ago, all our clients dropped the analog format and began mixing down to it. In mastering, there's been a steady increase in digital work, but not a sudden change. Our mastering business came from all over the U.S. when we were analog, and still does now that we're digital. But our remix business is basically from Nashville, so we're not having to reach out to New York and L.A."

Disc Mastering in Nashville, established in 1978 by industry vet Randy Kling, moved to all-digital mastering for CD last month, upon delivery of their new Neve DTC-1 console (one of four in the world). Commenting on the purchase, Kling says, "There are so many different machines and formats in digital multi-tracking, a lot of standards aren't met yet. As a mastering engineer, the best tool I could use would be the digital console, because the digital recording machines out there don't sound the same. Great improvements have happened in digital recording so quickly that the first machines are obsolete.

"In my early days in the major record companies, after we got through in the studio, the tape would go to cutting rooms in New York, Chicago, or Los Angeles," Kling continues. "The producer or artist would only hear the finished product after it's out on the streets. Now, you can send a tape to the CD plant, and regardless of whether its DASH or PD, they have a console for CD prep that makes it sound like it needs to sound. But certain people want their records

to sound pure, some like a lot of punch, some like a lot of highs. When we build a compact disc master in here, the client—the artist, producer—is here with us, 'cause this is the last shot, this is the tape that's going to be sent to Japan or Germany or Holland or Terre Haute or wherever."

We then traveled east by phone line to Miami, and spoke with Michael Fuller, owner and engineer of the new Fuller Sound mastering facility, located in the Criteria recording complex. "Right now in my cutting room," says Fuller, "there's a Mitsubishi X-80 which is owned by Criteria, our F1 format Sony 601, and a Sony 1610 processor rented from the Bee Gees. I'm also doing a lot of CD work now, cutting masters for Manhattan Records on the 1630, which we had to rent. And any minute now I'll receive the Sony 3302 digital 2-track, a demo unit, to compare. We're looking at the Sony DASH because another studio in town is thinking of purchasing one, and everybody in South Florida wants to buy a format that everybody else in town is using. Right now, Criteria's the only studio with digital multi-track recording. I have clients who don't like the digital sound; they still prefer 1/2-inch analog sound. Many of our Southeastern clients use that format. But 70% to 80% of the people I talk to would go digital in a minute. Some just can't afford to. Lately, they've been shifting to cutting disc from the F1, especially for 12-inch singles where they don't do a lot of sequencing. They edit on the analog multi-track and mix it to the F1. It's a pretty inexpensive way to go digital."

by Linda Jacobson

—FROM PAGE 64, DIGITAL FORUM

every respect.

"I don't think you need digital to have a competent, acceptable product, and some people's budgets require analog," adds Fry. "Certainly, major label-type projects are a little more comfortable at the availability of digital, but I would not encourage someone to buy a digital machine to cure booking problems. You've got to see demand for it among your existing clients, then find that you get a few extra people who you wouldn't have gotten otherwise."

Memphis Sound Productions, specializing in demos and jingles for five years, is now expanding to a full-range, 24-track Otari analog audio facility. Tim Goodwin tells us they'll also mix digitally through the Nakamichi DMP-

100 processor. When we ask if they have plans for digital multi-tracking, Goodwin answers, "There have been so many technical problems with the digital up till now. Also, 90% of the studios out there can't afford to go digital, and a lot of the tapes coming through here will be used in other places. So we're going for the best quality we can get—we're going to install the Dolby SR. I'm convinced that's going to breathe a whole new life into analog, and postpone the expected digital revolution."

Next, at Cotton Row Recording, we talked to William Bearden, publishing director of New Memphis Music, which runs Cotton Row. "We're analog," Bearden tells us. "We have the Otari MTR-90. Actually, right now Tony Joe White (*Rain on Georgia*) is

cutting, and his producers wanted digital, so we rented the Mitsubishi 32-track. We rent it on a per project basis; maybe 10% of our work is digital. But digital's becoming a real force in the Memphis market. It's something that will happen for us, but right now buying digital is not in the plans. We get great sound out of our analog machine. And if you got some good tunes, good players, and people who know what they're doing in the studio, that's what's going to make it. This makes me think of Willie Mitchell, a producer here in Memphis, who cut all that great Al Green stuff, like *Let's Stay Together*, on a little mixer that was nothing more than three pan pots nailed on a piece of wood. They cut several #1 hits. Equipment is not the most important thing, it's the feel!" ■

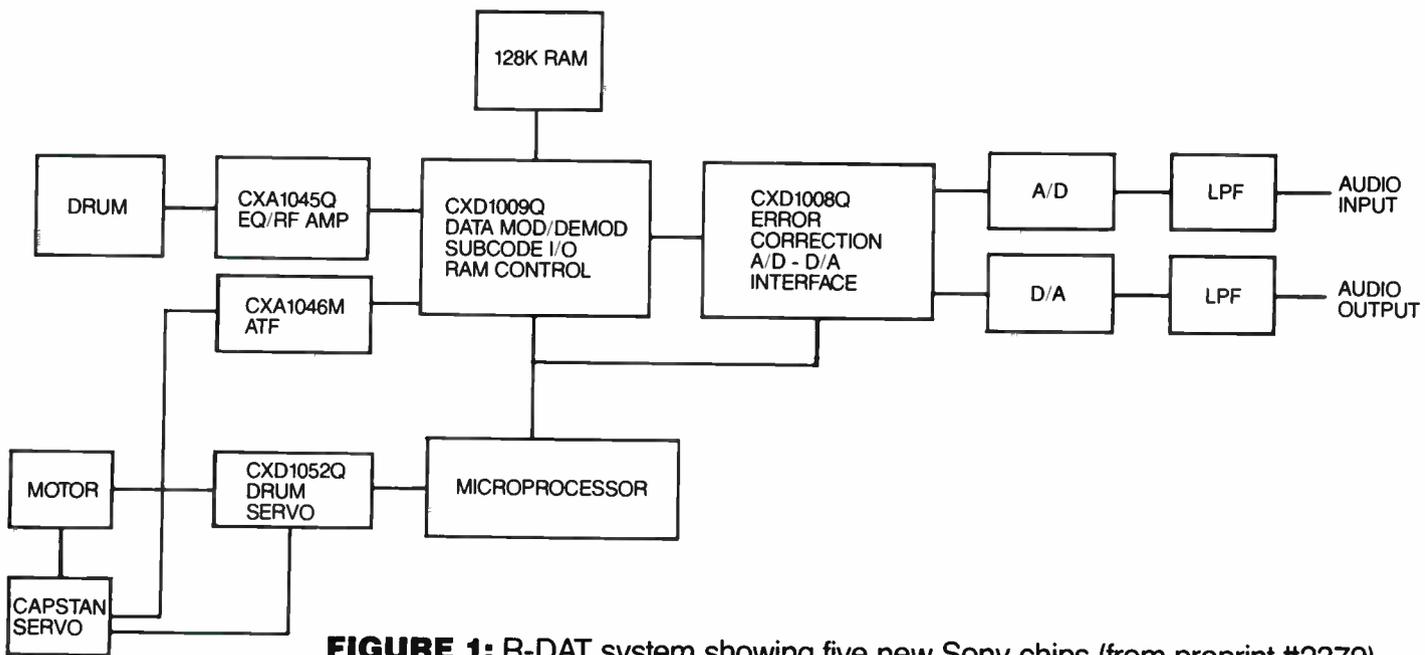


FIGURE 1: R-DAT system showing five new Sony chips (from preprint #2379)

RECENT DIGITAL DEVELOPMENTS

by Ken Pohlmann

The 81st Audio Engineering Society convention, held in Los Angeles last November, presented the newest and latest in audio hardware and software for the examination of tire kickers and cash purchasers alike. Moreover, the technical paper sessions presented the fall crop of the latest literary efforts, a harvest of ideas currently under scrutiny by audio researchers. Although lacking the instant gratification of the knobs and buttons on the exhibit floor, the technical papers are potentially much more earthshaking.

You see, it is the ideas contained in the occasional technical paper that revolutionize the state of technology. For example, Harry Nyquist's paper to the American Institute of Electrical Engineers, in New York, in 1928, presented a topic called discrete time sampling—a little gem of an idea that laid the foundation for digital audio.

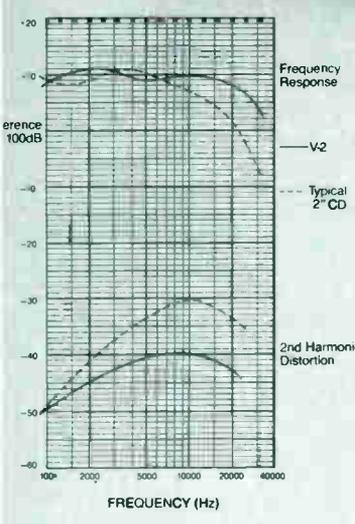
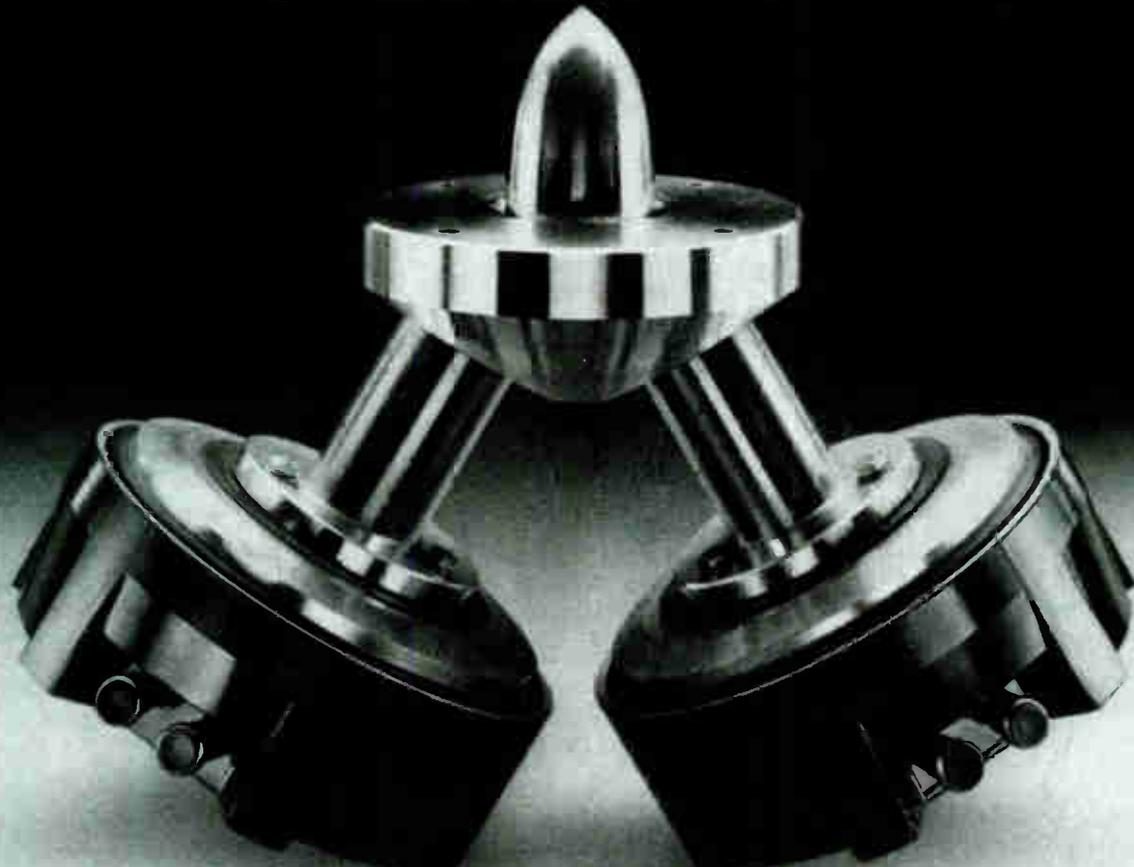
While such papers are few and far between, the sum total of technical papers constitutes the pulse of audio research, and thus points out the future directions of the industry. This AES convention's papers pointed to a wide variety of directions, but research in digital audio topics was especially

well represented. A particularly high concentration of excellent papers were presented in the Audio Recording sessions chaired by John Eargle, with another couple in the Audio Measurements and Instrumentation session chaired by Henning Moller.

Let's check out several of these papers, and the latest ideas regarding R-DAT, the CD, and other theoretical topics in digital audio. Of course, this small sampling isn't meant to disparage the many other fine efforts presented. That's the problem with scientific research: you can never spot the history-making ideas until they're history.

Two teams of Sony Corporation engineers presented two papers on different aspects of R-DAT technology. Tadashi Fukami, Shinya Ozaki, Kazutoshi Shimizume, Takeshi Uematsu, and Kentaro Odaka authored "New LSIs for a Rotary-Head Digital Audio Tape Recorder (R-DAT) and Their Digital Signal Processing" (preprint #2379). The success of most mass-marketed consumer electronic products hinges on the ability of the design team to develop Large Scale Integrated Circuits with the brainpower and ability to handle the various tasks of controlling the system and implementing its features. This Sony team reported on

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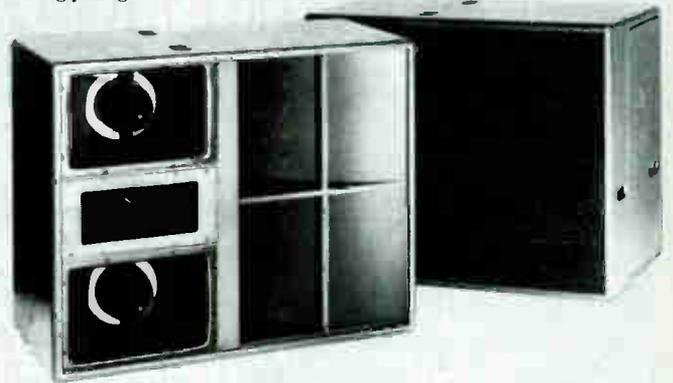
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the development of five new R-DAT chips handling error correction and interpolation, modulation-demodulation and data control, servo for drum motor, ATF (auto-track-finding), and amplification and equalization.

The CXD 1008Q handles error correction and interpolation, the former using the Reed-Solomon code, with two encoding/decoding strategies, C1 and C2. For a burst error, the correction data length is 792 symbols, and the concealment length is 2664 symbols. In addition, the CXD 1008Q has A/D and D/A interfacing, and generates the clock for the three sampling frequencies, 32, 44.1 or 48 kHz.

The CXD 1009Q controls the access timing and addressing of a 128K buffer used for timebase correction and interleaving. The CXD 1009Q also provides for 8/10 modulation, ATF sync detection, subcode I/O, and control of peripheral ICs.

The CXD 1052Q is a servo chip, controlling drum motor speed. It uses loops for both the playback and search modes, outputting a PWM signal to the motor. A phase-comparator signal for the capstan servo can also be generated.

The CXA 1046M contains the analog ATF signal processing functions: RF envelope detection, ATF sync equalizer, and tracking error detector.

The CXA 1045Q handles PCM signal equalization, playback head amplification, limiting, and record head amplification.

Together with a pair of A/D and D/A converters, low-pass filters, microprocessor, and 128K buffer RAM, these five chips constitute a complete R-DAT electronics system, as shown in Figure 1. In addition, these chips could have applications in products other than R-DAT, such as professional digital audio products.

Another Sony team of Toshiharu

Kobayashi, Toshio Shirai, Makoto Ando, and Shinji Amari presented a paper entitled "A Digital Audio Contact Printing Technique" (preprint #2377). This paper describes a high speed duplicator for producing prerecorded R-DAT tapes. Because R-DAT uses a helical scan track format, normal audio tape duplication methods are not suitable; rather, a method is borrowed from video tape duplication. Forseeing the need for high speed duplication, originators of the R-DAT format made provision for a wide track-pitch mode (1.5 times wider than normal mode). A pre-recorded R-DAT tape is thus constrained to 44.1 kHz sampling rate, and 80-minute playing time.

The high-speed duplicator uses magnetic contact printing; the prerecorded mother is placed in contact with the copy tape, magnetic surfaces together, and a magnetic field is applied. Air pressure (as employed in half-inch video tape duplicators) is used to press the bias head against the tape layers. A printing drum moves the tapes past the head.

The coercivity of the mother tape is limited to about 2000 Oersteds, but must be three times that of the copy tape. Thus a barium-ferrite copy tape with low coercivity (620 Oersteds) yet high output characteristics in the high frequency region is used. To reduce demagnetization of the mother tape, the bias field is applied perpendicularly to the surface of the tape. In addition, a soft iron is used for the printing head to increase the perpendicular component of the bias field. Although the short wavelength output (0.67 micrometers) of the copy is 3.5 dB lower than conventional copied tapes, the wide track pitch of the R-DAT prerecorded mode compensates for the loss. Because the ATF signal of the copy is weak, that of the mother must be boosted. Claimed average block error rate

(before correction) of the copy tape is 10^{-3} . These errors in the prerecorded copy are corrected by the R-DAT recorder upon playback.

A complete R-DAT duplicator is comprised of PCM source, signal processor, mother recorder, printer, and cassette loader. The PCM source reproduces the audio signal, the processor places the signal into R-DAT format with subcode and ATF signal, the mother records a reverse-image of the R-DAT format on metal tape, the printer does the copying, and the loader winds the cassettes. The printer prints at more than 150 times regular speed, and a mother tape may be used more than 3000 times.

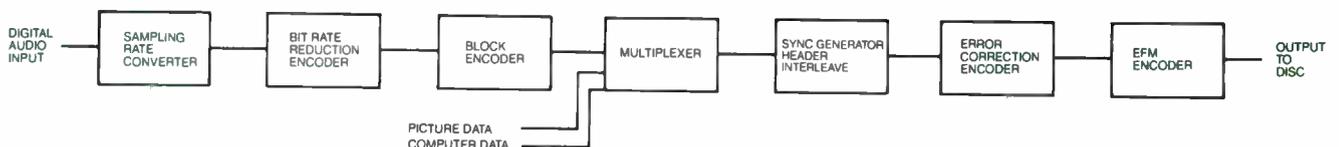
In their paper "Efficient Design of the Oversampling Filter for Digital Audio Applications" (preprint #2378), Ming-Ting Sun and Lance Wu of Bell Communications Research propose a two-stage implementation of a digital filter resulting in decreased computation and hardware requirements. Compared to analog filter designs, oversampling designs avoid need for adjustments, are impervious to degradation due to aging and temperature, only require use of a simple analog filter, and provide for on-board $\sin x/x$ compensation, all with linear phase response. However, conventional two- and four-times oversampling filter designs use high order (such as 96 order) FIR filters; high-speed circuitry is required to perform multiplications and a large memory is needed to store the coefficients.

The authors propose a two-stage design using half-band filters. In a four-times design, the sampling rate is increased by two in each stage; the first stage uses a 59th order design, and the second stage uses an 11th order design. The second stage also provides $\sin x/x$ compensation. Furthermore, a half-band FIR design is

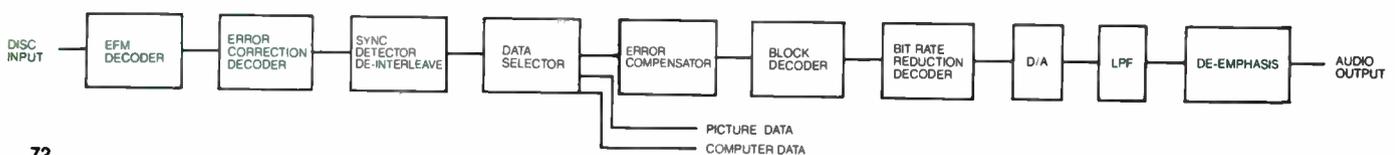
—CONTINUED ON PAGE 77

FIGURE 2: CD-I audio encoder and decoder (from preprint #2375)

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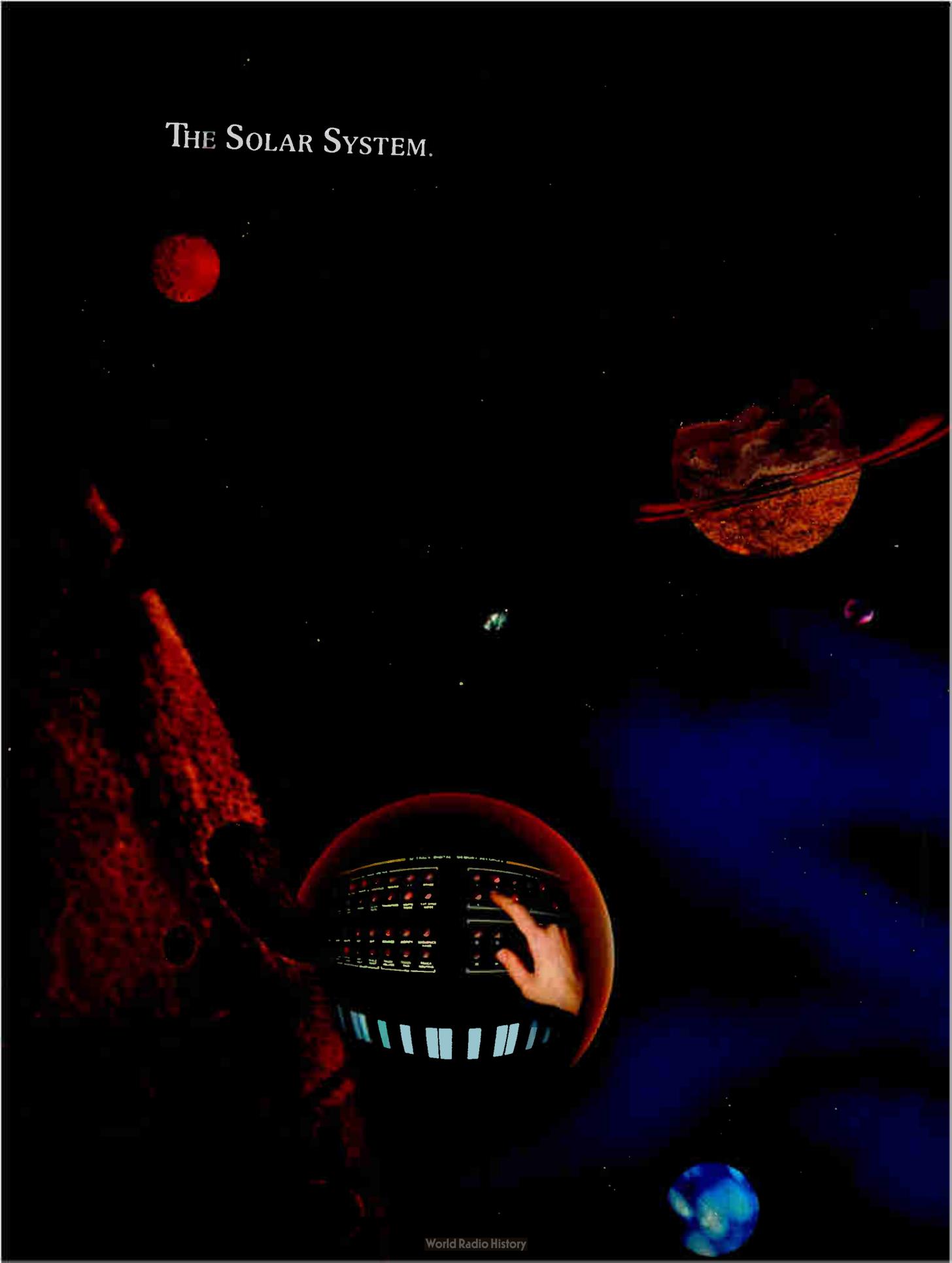
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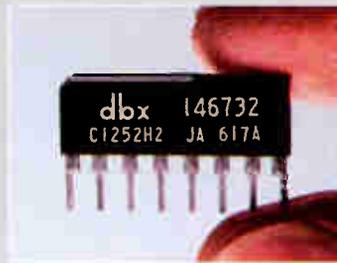
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used; because every other impulse response coefficient is exactly 0, except the center coefficient, a factor of two reduction in computation is achieved. However, because of the need to compensate for $\sin x/x$ the second stage cannot use a half-band design.

The resulting filter provides a pass-band ripple of ± 0.04 dB, with a stop-band of 52 dB. Thus, instead of a conventional design requiring 96 multiplications, 92 additions, and 72 words of memory, the proposed design requires only 28 multiplications, 47 additions, and 58 words of memory, with improved performance. Such a design could be integrated on a DSP chip, or an oversampling chip would have room for other functions.

James Moorer and Jeffrey Borish of the Droid Works presented a paper entitled "An Optical Disk Recording, Archiving, and Editing Device for Digital Audio Signal Processing" (preprint #2376). A single board device is described which randomly accesses data on magnetic or optical discs (such as CDs) with defined punch-in and out points, and conveys it via ethernet or AES/EBU format to digital tape recorders, converters, or other digital audio equipment. The DAB (Digital Audio Board) may be used with a host computer, or in a stand-alone manner, with an ASCII terminal attached.

Audio is processed through a TMS-32010 DSP chip, used primarily for digital cross fades. A 68000 is used to define levels, buffer addresses, cross fade times and other functions. Two megabytes of memory are available for program and data storage, and 15 seconds of sound buffering. Also on board is a SMPTE time code reader, SCSI protocol controller, a DUART for serial interfacing and MIDI interfacing with an external adaptor.

This device forms the basis for a cost-effective digital audio processing station. Applications include editing of digital masters through transfer to magnetic disk, sound effect lay-ins from CDs to magnetic disks and their synchronization with a SMPTE or video source, sound sampling with direct access to random access disk storage, and direct digital recording. As the authors note, surely devices such as this one will soon become standard fixtures in recording studios.

Dither, an unlikely yet highly significant aspect of digital audio technology, merited no less than three technical papers, thus demonstrating the continuing awareness of its importance. Stanley Lipshitz and John Vanderkooy of the University of Waterloo continued their presentation of ongoing research into the nature of dither with their paper, "Digital Dither" (preprint #2412).

The authors have previously documented the advantages of adding analog dither prior to A/D conversion to alleviate quantization distortion and noise modulation. The latest paper explores the effects of rounding or truncating to a fixed wordlength, perhaps following multiplication. Such arithmetic manipulations are germane to finite wordlength digital signal processors such as mixers, editors, or sampling frequency converters. The use of digital dither before final rounding or truncating insures freedom from degradation, with a small penalty in broadband noise level.

For example, in the case of gain fading, previously dithered data is multiplied by a coefficient less than unity. Each 6 dB gain reduction effectively shifts the word one place to the right relative to the binary point. The least significant bits, and dither, are lost, and quantization effects appear. In another example, a signal properly dithered and processed with professional 18-bit converters (soon-to-be-available) would suffer quantization effects when the signal is truncated or rounded to 16 bits for consumer release. Digital re-dithering would preserve the information of the bits below the binary point prior to truncation.

With digital dither, a random binary number below the binary point is added to each digital sample before truncating or rounding. The effect is analogous (pun intended) to adding random analog noise to a finite precision analog signal as in analog dither. Extended wordlengths are maintained throughout all internal computations, and digital dither is introduced just prior to output truncating or rounding. Total elimination of modulation noise requires use of other than uniform probability density function dither; Lipshitz and Vanderkooy suggest summing the outputs of two independent uniformly distributed bipolar random number generators, each of 1 LSB peak-to-peak, followed by rounding.

Interestingly, this new investigation led the researchers to an insight in analog dither; they state, "The optimal analog dither is triangular-pdf [ed: probability density function] dither of 2 LSB peak-to-peak amplitude... this is better than Gaussian dither." Hopefully equipment manufacturers will accept the added difficulty of generating triangular analog dither, and carefully consider the necessity of digital dither in upcoming generations of digital signal processing gear.

One important application of dither is in the generation of digital test signals. Robert Finger of the CBS Technology Center presented a paper entitled "On the Use of Computer Generated Dithered Test Signals" (preprint

#2396). For levels below -60 dB, dithering of digitally generated test signals is essential for meaningful measurements. This is true for evaluating systems such as CD players, or sub-systems such as D/A converters. To more fully explore the practical nature of test signals and procedures, a set of digitally-generated synthesized test tapes were prepared, as well as a CD test disc. Tests confirmed the expectation that at low levels it is undithered test signals themselves that contribute much of the distortion.

The CD test disc contains calibration signals, a bipolar squarewave D/A monotonicity test signal, undithered and rectangular probability density function dither test signals, and a 500 Hz fade from -60 to -120 dB using triangular probability density function dither. The latter provides a listening experience hitherto unavailable to critical listeners, and points up the importance of dithered test signals—subjectively as well as empirically. I hope that a properly dithered commercially available CD test disc appears soon. I'll be first in line.

Barry Blesser of Barry Blesser Associates and Bart Locanthi of Pioneer North America authored a paper entitled "The Application of Narrow Band Dither Operating at the Nyquist Frequency in Digital Systems to Provide Improved Signal-to-Noise Ratio Over Conventional Systems" (preprint #2416). The authors explored the use of narrow band dither, as opposed to the more common broadband variety. They demonstrated that the use of 4 to 5 LSBs of narrow band dither centered at the Nyquist frequency helps linearize the quantization distortion of A/D converters.

Finally, some of the first technical details of the CD-I format were divulged in a paper authored by a team of Sony engineers. Masayuki Nishiguchi, Kenzo Akagiri, and Tadeo Susuki authored "A New Audio Bit Rate Reduction System for the CD-I Format" (preprint #2375). The engineers described development of a bit reduction algorithm, and design of an encoder using DSPs, as well as a dedicated decoder LSI for CD-I (Compact Disc-Interactive) players. The system permits 3-bit reduction modes, and three audio quality levels: high quality using 309 Kbits/second, middle quality using 159 Kbits/second, and lower quality using 80 Kbits/second.

The bit rate reduction system uses multiple prediction filters to respond to fluctuations in the high frequency distribution of the audio signal. Depending on the quality level, some combination of a first-order and two types of second-order differential PCM modes are used in the low and middle

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frequency ranges, and a linear PCM mode is used for the high frequency range. This helps provide high S/N. Additionally, the system uses near-instantaneous companding to augment the dynamic range.

The encoder accepts a 16-bit, 44.1 kHz signal; a sampling rate converter converts the signal to 37.8 kHz for the first two quality levels, or 18.9 kHz for the lower level. The word length is compressed to 8 bits for the highest level, and 4 bits for the two lower levels. Other information such as range and filter selection is added. The result is a 2336-byte block. Sync and header are added. This is followed by CIRC and EFM encoding, as in mastering regular CDs.

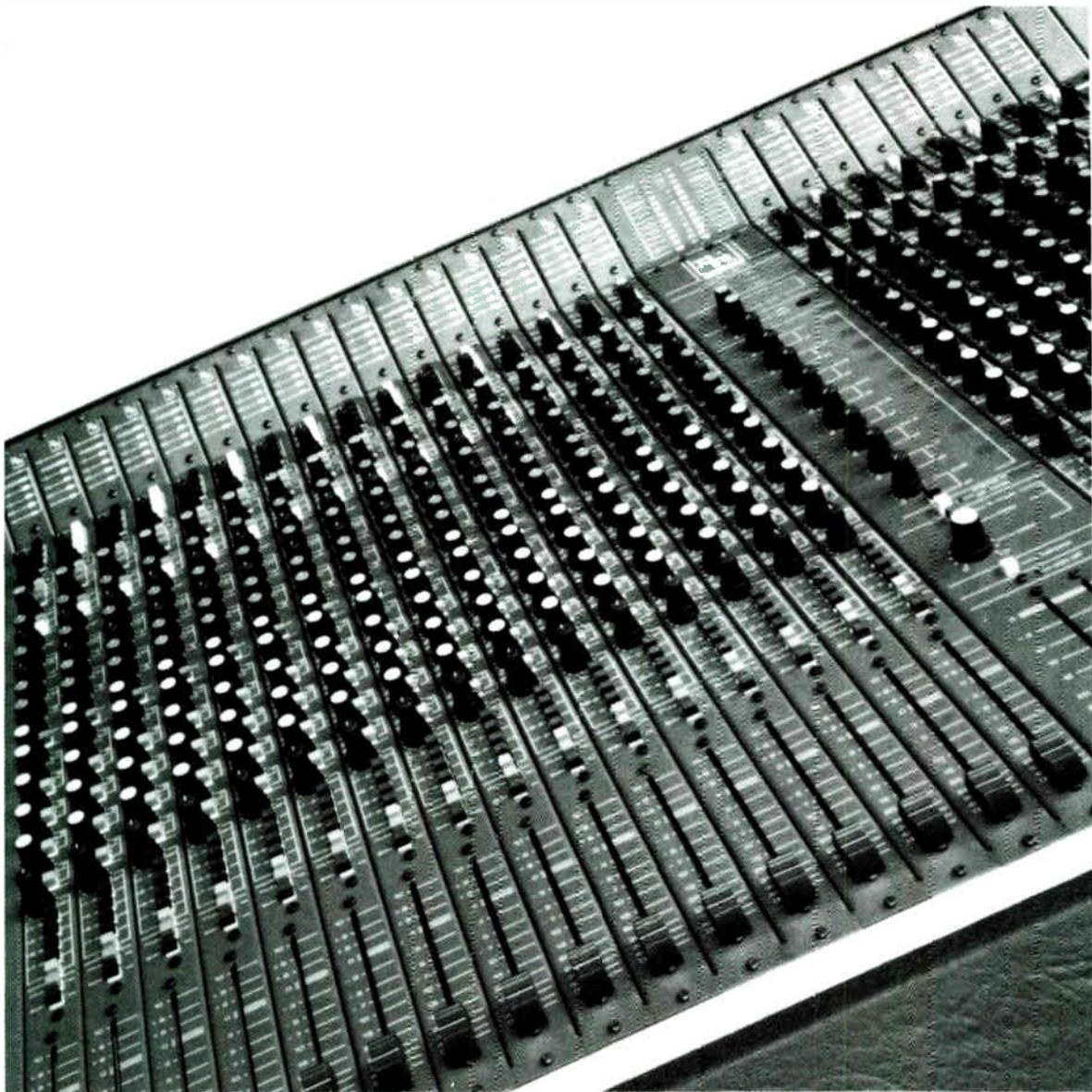
In the decoder LSI, data from the disc is applied to a descrambler and sync detector, as well as CIRC decoding and EFM demodulating. Audio data is then block decoded and expanded to linear 16-bit data. For D/A conversion and low-pass filtering, the sampling rate of the output signal must be considered, or a digital filter may be used. The encoder and decoder are shown in Figure 2.

The system yields audio quality appropriate for the application, with careful rationing of bits leaving CD-I space available for non-audio data such as video, graphics, or text. Hopefully, the development of a CD-I audio decoding chip indicates that introduction of a completed CD-I system is not far away. Next fall's convention?

These and other AES technical papers dealing with digital audio technology illustrate the relative state of infancy and rapid advance of that science. Development of new chip families for applications such as R-DAT and CD-I show that product development is poised for new bursts of energy, while the intricacies of fundamental questions such as dither leave open the possibility of future shake-ups in the quality of the technology, which in turn would engender new product development. Clearly, digital audio is a technology in flux. This is not a maturing technology in which the best has already happened. Rather, it is a young technology with a lot of surprises up its sleeve. The jaw-dropping which has already occurred will be trivialized by that which is yet to come, thanks to the restless efforts of these and other authors.

Preprints of AES Convention technical papers may be ordered from the Audio Engineering Society, 60 East 42nd Street, New York, NY 10165.

Do you have information for Insider Audio? Send it in to Ken Pohlmann, University of Miami, PO Box 248165, Coral Gables, FL 33124. ■



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BITS INTO PITS: CD Engineers Shed Light On The Job

by Philip DeLancie

As the compact disc has laid claim to an ever greater share of an otherwise stagnant prerecorded music market, CD mastering and manufacturing have become an enormously important part of the music industry. But public acceptance of the format has outpaced the technical awareness of many industry professionals. Undoubtedly, the newness of the technology explains much of this unfamili-

arity with CD production details. But another contributing factor is the degree to which CD work is centralized in a few locations (four in the U.S. as of this writing), isolated from the mainstream of recording activity.

The individuals responsible for ensuring the proper mastering of every CD manufactured in the U.S. can probably be counted on two hands. And the towns they work in don't exactly spring to mind when one thinks of the nation's leading recording cen-

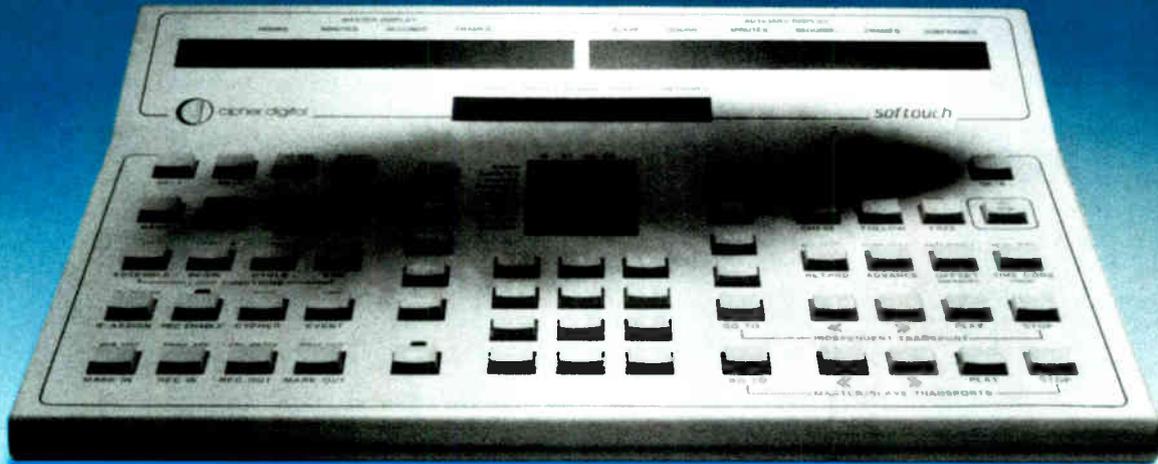
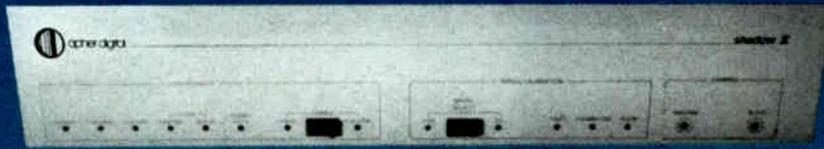
ters. Little wonder, then, that we're not running into these folks all the time at record release parties. We have to go a little out of the way to explore their views on their work and on the industry in which they have come to play such an important role. With the CD looking like the medium of choice for the foreseeable future, however, it seems wise to make the effort to keep in touch.

Some of the topics discussed below have already been touched on in past *Mix* issues (see, for example, Ken Pohlmann's "Insider Audio" columns of July and December 1986). But this "After Mix" Forum gives engineers from three U.S. CD plants the opportunity to describe in their own words what they do, how they do it, and how their goal of making the best possible product can be facilitated by others in the production chain. Participating are engineers from Digital Audio Disc Corporation (DADC) in Terre Haute, Indiana, Discovery Systems of Dublin, Ohio and LaserVideo of Anaheim, California:

Mix: Just for background, give a brief overview of the steps through which a project goes, from the time it is received by your plant through completion of a glass master.

John Macdonald, editing engineer, DADC: When I have a tape that is already in Sony 1610 format, I do my PQ encoding to the specs sent along as mastering information with the tape. They note in SMPTE time code where the exact beginnings and ends of the songs are. Sometimes the client will specify a particular offset time, which is the number of frames before the beginning of a track where the actual statement will go down, allowing a player to cue without clipping off the beginning of the track. There has been quite a bit of debate about what is a good offset time. Some feel 15 frames, others feel five frames. Sometimes, say on a live recording, it is very questionable as to where the beginning actually should be. For the most part, the client specifies that on the timing sheet, but sometimes we question things to be sure that we get it the way they want it. We give them a call with any questions we might have, and they seem to appreciate that very much.

After PQ encoding, we sit through and review the tape, noting for our own internal QC reasons noises that



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sound like they could be defect noises. When our QC people listen to test stampers, they are looking at one of our sheets to be sure that any noises they are hearing are noises from the tape. It helps us a great deal if the client, on their mastering info, includes noises that they've already deemed acceptable. That way the process isn't slowed down for us. We have editing facilities here, two Sony DAE 1100s, and we have done quite a bit of editing as far as removing noises.

When I'm finished in my edit suite with a tape, after I've done my sound-check and I have no questions with it, then I send it off to our production control department, where it will be scheduled for laser cutting. Once the tape leaves my area with PQ encoding and any editing, there are no other changes made by the laser technician/operator that would change the sound quality. They find out how long the tape is, adjust the line speed accordingly, and let it run directly to glass.

Jim Neuhausel, *mastering engineer*, and **Ed Thompson**, *senior audio engineer*, *Discovery Systems*: We do a quality check, which consists first of sitting down and listening to the entire tape. At the same time we are viewing a video monitor, making sure all the bit words are in proper formation, that the record mutes are at the beginning and end of the tape, that the time code track is continuous, and just looking and listening for any problems the tape might have. Also at that time we use the Sony DTA 2000 analyzer. We also compare their track sheet with the actual time code times down to the frame using the Sony DAE 1100 editor. If we find any problems, we contact the client and get them solved before the project goes anywhere else.

After that we go ahead and enter the PQ code. At present, we are using a ten-frame offset. If the client wishes anything less than ten, we ask them to sign off on it. And after that point it goes off to the mastering rooms.

We put the tape into the Sony deck and load the PQ codes. We put on a glass master, and we start cutting at 22.5 millimeters for lead-in. At 25mm our program starts, and we are actually listening to playback from the master. We are cutting the pits, and we have another laser following right behind picking the information up, to make sure there are no defects in the master. After the program, we start our lead-out, cutting all the way out to 59mm. At that point we inspect it and send it over to where they metalize it, and then it goes over to electroplating. **Alan Hamersley**, *director of technology*, and **Robert Harley**, *mastering*

associate, Laser Video: The tape comes with a log that has all the start and stop times of all the tracks. We verify the times, analyze the tape with the Sony DTA 2000, and listen to the tape. Then we program the subcode, which means entering all the time, display and control data for the disc, the PQ code. A small minority of tapes come in with the PQ code already recorded on audio track one, but the majority of the time we do that. Also, the film for the printing that is supposed to go on the disc is double-checked to be sure that it matches what is on the tape.

From there it goes into mastering. There is a glass plate prepared, polished, cleaned, coated with an adhe-

sive promoter, coated with photo resist, checked for defects and sent into mastering. The glass is placed on the master recorder. The tape is put into the rack that has all the digital decoding circuitry, the EFM encoder and the subcode encoder. We also have a DTA 2000 in that rack for monitoring the quality of playback during mastering to be sure there are no defects or uncorrectable errors from the tape. The glass is exposed by laser beam. After recording, the part is developed, inspected and coated with a layer of silver. It is then played on a master player, and checked for defects, track numbering, phase depth, tracking signal and RF signal, to be sure that the

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quality of the disc is as high as possible. From there it goes to galvanics (for electroforming of metal parts).

Mix: Do you accept analog tapes for transfer to 1630, or only projects that are already in the 1630 format?

Macdonald: The majority of tapes we receive are already in the 1610 format. About 10% of our business is Mitsubishi transfers, where we take an X-80 tape and convert it in the digital domain through a Studer sampling frequency converter to the Sony format. From there, we process it just as we would a 1610 master. We have done maybe 3% of our business with analog masters, and we have the facilities here, with our Sony digital console, to do any EQ in the digital domain.

Neuhausel/Thompson: We are a full fledged premastering house. We accept analog, JVC, dbx 700 and F1. As we speak, there is a Sony 3324 that just rolled through the door and a Neve mixing console, so we'll even do mixing to 2-track, do the edits on it, add the PQ code and walk it through.

Right now we are not doing Mitsubishi because of economic concerns. But if that turns out to be a true worldwide standard, then it might be just around the corner.

Hamersley/Harley: At this point we work only with tapes that are already in the 1630 format, although in the future we may do analog-to-1630 transfers here ourselves.

Mix: What are the standard procedures that you like to see followed by those people who send in projects on 1630 tapes?

Macdonald: We need non-drop frame time code on analog track 2. We prefer not to have the overload lights come on. If there is an emphasis change in program, we have to have at least a two-second pause between a track with emphasis and one without. Lately, we're seeing pretty much all the tapes come in with about two minutes of digital mute before program and two minutes after, so that hasn't really been a problem.

I think our largest problem seems to be with the mastering information we receive with the tapes not being very accurate. I understand that not everybody has a digital editor so they can't really find exact beginnings and such. But quite often I'll have tapes where they give me a beginning time code number which is actually four seconds into the song. As far as noise information, if a noise is noted and we encounter it, we don't have to call the client, which slows the process down.

Neuhausel/Thompson: We like at least two minutes at the front of the tape. At the end of the tape we ask for



PHOTO: WILL SHIVELY

at least a minute. Two or three minutes is better, but not necessary.

As far as time code, actual spec says continuous time code. That means no interruptions, but we all know that most folks assemble edit. They don't take the extra hour to run the continuous time code. So there are glitches in the code. As long as it is continuously upcounting, we don't have any problems with that.

Right now we are accepting total program length of up to 68 minutes. We are in the process of doing tests on different pitches and different speeds so we can go ahead and do recordings on out to 72 minutes.

Hamersley/Harley: It has to have non-drop frame time code on analog track 2, starting at 00:00:00:00, continuous, unique and upcounting. It needs to have a written log with all the starts and stops, accurate to within a couple frames. We prefer to have two minutes of recorded PCM silence lead in at the beginning of the tape, and 30 seconds of lead out. We also like the premastering house to indicate on the log the desired offset. We like the highest digital signal possible, in other words, a small amount of digital headroom. We also like the log to show all acceptable noises that they know are on the tape. And we like a printout along with the tape from a DTA 2000, so it is known that the tape was in good shape when it went out to us.

Mix: What comments do you have on the quality of the tapes you have been getting from clients?

Macdonald: This last year for us has been much, much better than our first year. We used to have to reject maybe 30 to 40% of the tapes. Now the reject rate is actually very low. I've seen a vast improvement in the quality of the tapes we receive.

Ed Thompson of Discovery Systems.

Neuhausel/Thompson: We try to work with our clients and if they have problems, we guide them to the proper people or in the proper direction to help them out. One company we work with has made a 100% improvement in their tapes since they first started sending in material.

Hamersley/Harley: Actually, a lot of the tapes are getting worse, because more and more people are trying to get into premastering. Some of these places have an old 3/4-inch video deck around, and they'll go rent a 1610 for a day, with no time code reader, and they try to be in the business of CD premastering. We've had people try to give us SMPTE times from a stopwatch because they don't have a time code reader. There are a lot of hacks producing CD master tapes, and it all ends up on the disc. The producers aren't taking an active enough role in CD premastering. The premastering houses are kind of independent; they get the tape and they do whatever they want to it, and then they send it to us, and that's a problem.

In general, though, the people who have been in the business for a while are getting better. In the beginning we had problems with almost everybody in preparing tapes. But the people who have been in the business are definitely getting better. There is more professionalism and people are coming up to speed with what is really required to prepare a tape properly.

Mix: There has been some question as to how the spaces between bands are handled during mastering and by the playback machines. Is there any muting actually going on between bands?

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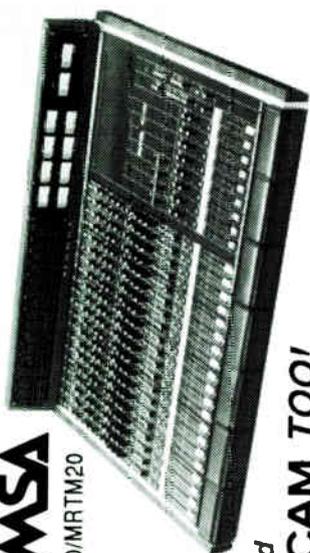
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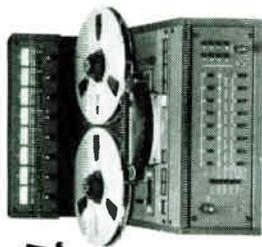
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Macdonald: No. That's an interesting question, though, because when I first started at DADC I was sent over to Japan for training. And one of the things they told us was that CD players will mute when they see an end statement, and will de-mute when they see a begin statement. So we were under the impression for the first few months that that was what was going on. But we started listening to discs that we had PQ'd, and we noticed that we were still hearing tape hiss between the end statements and the begin statements. At that point we realized that the players were not muting.

Neuhausel/Thompson: We do not edit a client's tape by putting mutes in.

Hammersley/Harley: We don't mute. Whatever is between tracks will be audible. And the players don't mute either.

Mix: Does the level on the I630 master become the level of the CD, or do you run down the tape to achieve maximum level before transfer?

Macdonald: Part of our policy here is that we will not go in and change anything without first contacting the client. If we felt that the level was low, we would call them up and find out if they wanted us to boost it at all. One reason we don't really like to do that is that all we would be doing is boosting the hiss as much as the program. We would prefer that the client remasters the tape at a higher level to get more signal to noise ratio.

Neuhausel/Thompson: We are not doing any level control right now. If the level is real low, we give the client a call and let them know.

Hammersley/Harley: We run the exact level that's on the tape. We assume that the producer and the premastering house have set the levels the way they want them on the disc.

Mix: To what extent are you prepared to go beyond strict transfer into the area of sound enhancement, and what facilities do you have available for this purpose?

Macdonald: We end up doing that for some of our clients who send us analog masters, some of the smaller labels. They seem to trust us to go ahead and do whatever we feel. Other labels send specific EQ instructions along with the tape. We have on occasion had several producers come here and do their projects here. We have quite good facilities but, unfortunately, because of where we are located, we don't get used in that way as much as we should.

We have two Tom Hidley-designed rooms. We're putting in a third room which should be on line in April. We

have the Sony digital console, with 4-band parametric EQ. It has the ability to strip a tape of emphasis, and to make gain changes. And it has some shelving EQ as well. We don't have any compressors or limiters.

Neuhausel/Thompson: When we get a I630 tape, our role is mostly quality control for the manufacturing facility. When we have an analog tape or other non-I630 format tape, we have the capability of doing the type of enhancement that is commonly done in disc mastering houses. What we have right now is the Neve 8232. We don't have a digital transfer console.

Hammersley/Harley: At this point we do direct transfer, though in the future we may get involved in enhancement. We don't have a console for changing level and EQ or doing the types of things normally associated with a console. We transfer the data on tape directly into pits on the disc.

Mix: What are your thoughts on the present state and future direction of digital mastering console design?

Macdonald: I saw quite a few newer consoles at the Los Angeles AES. I was very impressed with the Neve console. The cost on all the digital consoles is still very high, but it's nice what Neve has done with some of the programming features. I believe it has the capacity to take something like 150 snapshots per disc side, or per song if you are building your master one song at a time. It seems like a lot of flexibility. At the same time, if you were really going to go ahead and use all those parameters, it could make something take quite a long time.

I also saw some smaller consoles. And also Harmonia Mundi has a digital EQ they are adding to their box. I welcome any such improvements in the field. I'd like to see the price come down.

Neuhausel/Thompson: The Neve console and the JVC transfer console are both very fine products. We are now building two rooms for full digital editing, and there may be one of those in there at some time. It is also interesting to see what they are doing with hard disk. We may see, like the Lexicon system that was shown at the AES show, an actual hard disk-based system, with a mixing console with full digital EQ and an edit decision list built right in. That is the way it is going to go.

Hammersley/Harley: We haven't had enough hands-on experience with the currently available consoles to know how well they do what we would want them to do. The Harmonia Mundi unit looks good because it will accept different digital formats. The ideal con-



Alan Hamersley (L) and Robert Harley of LaserVideo.

sole would accept all formats, and have output in selectable formats like Sony 1630 and JVC 900, for example. It would also remove DC offset, have flexible EQ, and would not degrade the sound quality when you use the fader.

This equipment is just beginning to evolve. We'll see a lot of change as the technology evolves. The next generation should contain all the features. A year from now they'll be a lot different and a lot better.

Mix: What are your impressions so far regarding the Teldec DMM CD mastering lathe?

Macdonald: We here at DADC are really anxious to get a hold of one of those and put it through some of our tests to see whether the specs do indeed match up to what is claimed.

Neuhausel/Thompson: We would be interested in seeing some of the product they have done, and being able to look at it with some of our QC people under the electron microscope. Except for not having to have a clean room, it's not going to lend us any more capability. We believe that our mastering room is one of the best in the country, if not the world.

Hamersley/Harley: It looks as if there may be a lot of potential in that system. However, we have a lot of questions technically. We know how the pit formation works optically, and we are very skeptical that DMM could ever meet the quality of optical exposure and development. They claim it doesn't need a clean room. We question that highly. The geometrics of this information that we're recording are so small that any piece of dust getting under the stylus could cause problems. Also, it was claimed that it can play

back the recording while mastering. We don't see how that is feasible in a non-clean room, because any dust that falls in the embossed pits will cause it not to play properly.

Mix: If the system does perform up to specifications, does it seem likely to encourage a move in CD mastering away from the manufacturing plants and towards the traditional disc mastering houses?

Macdonald: If the system does what they say, it would bring CD mastering back into the hands of the mastering houses. I think that eventually the factories would just have to accept the parts from the mastering houses. It would probably be the most cost effective way. The cost of mastering would come down as compared with laser mastering, which is about \$1000 per disc.

Neuhausel/Thompson: It's too early to tell if that's a danger to us or not. It's obviously a little cheaper for a [disc] mastering room to buy a Teldec machine and not have to work with clean room conditions. It might keep a few of them in business.

Hamersley/Harley: We don't think it will be feasible for a premastering house or a post-production house to do the mastering themselves. Every replication plant's process is a little bit different; it requires a little different pit geometry. It's not as if you can make a universal master that every plant can use.

Another inherent problem is that the CD manufacturing plant loses control over the process. If they can only stamp what comes in on the master, they'll have less opportunity to go back and refine the process to get all the signals perfect. They will be at the mercy of the quality of the incoming master. It is very critical, and difficult, to fine tune the process all the way through. And it is an entire process,

from preparation of the glass to the finished disc. They all have to meet the proper parameters.

CD mastering is a lot trickier than analog mastering. It's a completely different process. People who are involved in analog mastering who want to make the switch over to CD mastering are going to have to rethink everything.

Mix: How do you feel about R-DAT, and its potential effect on the CD?

Macdonald: R-DAT is still a tape-based medium. Tape can still be damaged, and crinkled and get drop-outs. I think it will be great for the "prosumer." I like the F1 for home and in the field recordings, and R-DAT will be easier to lug around. I don't know that the system will really surpass the CD as far as flexibility and being able to stand up over time.

Neuhausel/Thompson: The smaller record companies are happy to see it introduced. It's another avenue for the high quality product. The larger record companies are not so happy because it is another product line that they are going to have to support. As far as we're concerned, it's still a tape medium. It still has a head contacting a tape, and at some point you are going to see a lot more deterioration of tape than you see with optical disc. It's not a threat at this point.

Hamersley/Harley: In a lot of ways it may complement the compact disc. It gives people something to record from, even though they may not be able to do a direct digital copy. They can go analog back to digital, which will be perfectly acceptable. It will help move the digital audio technology itself.

Its impact on the CD may be minimal because of the expense of the hardware. Also, compact disc has such a strong foothold already, it's going to be tough to take a chunk out of that market. CDs will last a lot longer than DAT tapes, so there will still be reasons to have CDs over tapes. DAT is still prone to all the problems of tape: the access time, the wear factor. We don't see it replacing CDs.

• • •

The International Tape/Disc Association will hold its 17th annual seminar for the audio, video and data industries March 11 through 14. The seminar, entitled "Technology and Marketing: Partnership for the '80s," will take place on Hilton Head Island, South Carolina. This year's keynote speaker will be Jack K. Sauter, retiring group vice president of RCA Corp. ITA may be reached at (212) 956-7110 for further information. ■

DMP's Tom Jung: The Search For Digital Excellence

by George Petersen

In 1979, Tom Jung resigned as the president of Minneapolis-based Sound 80 (a highly regarded multi-studio complex cum record label) and moved to the East Coast. "It was about the time the record business fell apart," Jung recalls, "and moving to New York and starting a jazz label wasn't great timing on my part." He turned to freelance engineering (and operated Remote 80, a recording truck that did Billy Joel's *Songs in the Attic*, one of the first digital remote albums) and began laying down the groundwork for Digital Music Products, his label specializing in digitally recorded jazz CDs. DMP was a natural for Jung, who some years earlier began experimenting with a 3M digital recorder prototype, running simultaneous direct-to-disc and digital tape versions of Sound 80 recordings. One of these sessions, with the St. Paul Chamber Orchestra, garnered a 1979 Grammy Award for Best Chamber Music Performance.

Today, DMP has 17 titles in its catalog, which has received widespread acclaim from both critics and public alike. In fact, *Tricycle*, the first Flim & the BB's release on DMP, has become somewhat of a standard item in stereo store showrooms, as it aptly exhibits the sonic clarity and exceptional dynamic range of the compact disc medium, combined with a stunning performance by this versatile jazz quartet. More recently, Sony chose a selection of DMP projects to demonstrate their R-DAT digital cassette system at the Winter 1987 Consumer Electronics Show held in January.

"I've been an 'equipment junkie' for some time," Jung confesses. "From



PHOTO: RON CROFOOT

Tom Jung adjusts the discrete Class-A recording electronics (designed by Mark Levinson of Cello Ltd.). Also in the rack: Rane SP-15 parametric, Yamaha SPX90 digital effects processor, Studio Technologies AN-2 stereo simulator, Quantec QRS, DeltaLab CompuEffectron, and (in foreground) three Cello Audio Palettes.

"I'm going outside of what's 'normal' on the pro side to find components that are meeting my needs."

the beginning, our goal was to improve upon the recording end of the whole process. With digital recording technology, we're really pushing consoles, equalizers, microphones and everything we're using in the studio beyond its limits. In the past year, I started spending a lot of time researching and analyzing every step in the audio path." This scrutiny of the recording process led Jung to the noted audiophile equipment manufacturer Mark Levinson of Cello Ltd. Together they went through various stages of experimentation, with the result being a set of "recording electronics" utilizing a discrete, pure Class-A design.

"I call it 'recording electronics' [rather than a console] because it is pieces of rack mounted gear that live in a rollaround rack configuration, with rotary knobs. It's not very fashionable as far as recording consoles go," Jung explains. "It doesn't look very impressive when you put it next to an SSL, but the signal path has a greater degree of care taken to it than any other electronics that make recordings. It's really opened my eyes and ears to yet

—CONTINUED ON PAGE 92

0-120 in 3.6 seconds



If you're interested in a high-performance synth, it's time to test drive an Ensoniq ESQ-1 Digital Wave Synthesizer. It puts 120 sounds at your fingertips as fast as you can switch it on and plug in a cartridge. But that's only the beginning.

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Although you should always fasten your seat belt when playing the ESQ-1, you don't have to wear a helmet or obey the 55mph speed limit. ESQ-1 and Mirage are trademarks of ENSONIQ Corp.

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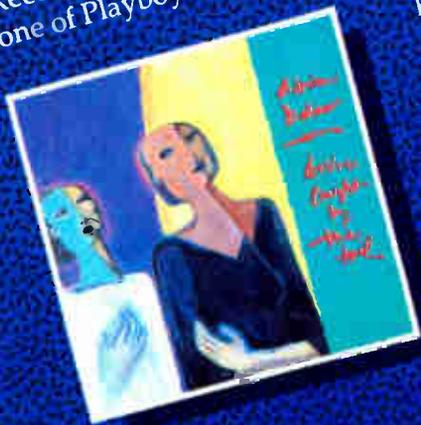
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After logging many solo musical miles, and a multitude more with the likes of Frank Zappa, David Bowie, Paul Simon, Laurie Anderson, King Crimson, and the Talking Heads, guitarist/producer Adrian Belew decided to check in for a sample of Royal Recorders' fabled royal treatment. His experiences with the studio began in earnest with work on his album "Desire Caught by the Tail", and went on to include group efforts with a new band, The Bears. Today, Adrian admits it was love at first sight, and to consummate the relationship, he has joined the Royal court by becoming their artist/producer in residence.

Besides their formidable array of equipment capable of recording 80 independent tracks, Adrian enjoys the natural beauty surrounding Royal Recorders at Southern Wisconsin's Americana Lake Geneva Resort. Formerly one of Playboy's premier Midwestern clubs, recreational accommodations ranging from golf to skiing, plus a complete physical fitness center are available at the Americana, and are at the complete disposal of Royal Recorders' clients.

"Creatively, the atmosphere here is perfect, especially if you work best away from the trappings of normal hectic life," Adrian says. "Add to that the copious amounts of the best equipment around, a studio staff with unparalleled more cooperative, and a managing staff that couldn't be that there is no finer studio."



Adrian Belew...



PHOTO DESIGN SANDY CUCO © 1987

gets the Royal treatment.



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PHOTO: RICHARD LAIRD

A single Speiden stereo bi-directional ribbon mic, placed in the center of the horn section, was used on the *Camouflage* sessions.

—FROM PAGE 88, TOM JUNG

another dimension of recording. I've been engineering for 23 years and this is really a breakthrough for me."

Jung first used the Cello recording electronics on the Bob Mintzer *Camouflage* CD with excellent results. The drums and horns are punchier and the overall mix has greater depth than *Incredible Journey*, the earlier Mintzer release. Since both were recorded in the same studio (Clinton Recording, New York City), with the same players, the use of discrete Class-A recording electronics becomes an audible and quite obvious difference.

The area of microphone selection and application is another topic of intense concern to Jung, and he used ribbon mics for all the instruments on *Camouflage* except for a pair of Bruel & Kjaer 4003 omnis on piano and a Sennheiser 421 on Peter Erskine's kick drum. "I've been a fan of ribbon mics for as long as I can remember," notes Jung. "When I started DMP, I went back to using ribbons—even on percussion, drums and things other than horns. I've found that ribbon mics work very well together with fast, sophisticated Class-A electronics, and with digital recording the high-end is so flat that the high frequency subtleties from the microphone are really preserved. At least one-half to two-thirds of the microphones I'm using are ribbons—mostly Beyers—but I'm also using the Speiden SF-12 stereo ribbon mic. They're made by Bob Speiden, a guy in New Jersey—he doesn't make a lot of them, but it's a really nice microphone; I'm really happy with it. I used it [for reeds and horns] on the *Camouflage* project, whereas last year [on *Incredible Journey*] I used the Calrec Soundfield, which is also a nice microphone, but

it has a lot of opamps and electronics in it. The Speiden ribbon and the Levinson electronics made that band sound much more like you're in the room with them, which is what I was after."

Another bit of Levinson technology that came into play on the project was the Cello Audio Palette, which according to Jung is "basically a giant equalizer—all active, with 50 Class-A amplifiers in it and a hefty remote power supply. I look at it as a 'spectrum shaper' rather than an equalizer, because it has very broad curves to it. It's almost like a graphic equalizer, in that it has six bands that can be used simultaneously, but they're very wide overlapping bands, starting at 15 Hertz at the low end and 25kHz at the high end. The nice thing about it is the phase shift is really minimal because the curves are so broad; and the Q is so low that the musical coloration is just a fraction of that of a normal program equalizer. While the Audio Palette is incredibly quiet and incredibly clean, with super-wide bandwidth, it does not replace all equalizers—it's not the EQ to use on a kick drum—but it makes cymbals sound sweet and it's a great piano and program equalizer. I've always felt that this would be a great tool for a mastering engineer.

"I've spent my whole life on the pro audio end of things and now I'm going outside of what's 'normal' on the pro side to find components that are meeting my needs. It's all part of the process of going back through every tiny bit of the system. Cabling is also important—a lot of things like that are little differences on their own, but when you add them up, make a substantial difference. Different kinds of cable have different characteristics and I'm starting to choose cables—

like I'd choose microphones—for various applications. It's this degree of fine tuning of the whole system that I'm doing now. It's been fun and very enlightening."

DMP currently owns two Mitsubishi digital 2-track recorders, which Jung has been quite pleased with so far. "When I got to New York, I used the Mitsubishi 2-track for mixdown on a project and was so happy with it, because I always liked the sound of the 3M system, and the Mitsubishi sounded just as good, but was much more reliable. The idea of a reliable system that sounded good and you could razor blade edit on seemed like a logical choice. I bought my first Mitsubishi machine in 1983, and bought another one last year. I can send my X-80 tapes off to the CD manufacturing plant and they can do a digital transfer to the 1610 format. I can get a compact disc without having to go through the analog world."

Like many of the smaller, CD-oriented labels, DMP has had its share of problems dealing with pressing plants. With *Camouflage*, Jung turned to the Digital Audio Disc Corp., in Terre Haute, Indiana, which turned out to be a good move. "We've worked with a number of CD plants and the quality varies widely—dropout errors, surface consistency, reliability, and types of plastics used: some are more durable, while others crack more easily. I could show you some discs that would make your hair curl—a good player will still play them, but they'll mistrack on a first generation player. You would think that zeros are zeros and ones are ones, but there are differences: if the surface isn't uniform, then those zeros and ones aren't picked up by the laser as they were meant to be. The nice thing about digital is that either it plays or it doesn't. I don't buy the idea that some discs sound different than others in terms of who's manufactured them. We found the quality at DADC to be the highest of all—they make a beautiful disc and they're real sticklers about quality control. Also, we're not at the mercy of the yen [exchange rate] anymore—we're doing everything at Terre Haute and we're real happy about it."

For Jung, the search for digital excellence is an unending process. "There's still a lot of room for improvement," he adds. "I'm really into the cable thing right now, which is interesting because it's so subjective—it's not something you can sit down and measure. We're about to go into the studio to do another Flim & the BB's project in a couple of weeks and one of the things I'll be focusing on will be cable selection, and how it relates to mic selection. It'll be fun." ■

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World Radio History

AMS

TIME ON THEIR SIDE

by Richard Dean

When Stewart Nevison and Mark Crabtree started playing guitar together at school, they couldn't have known their association would lead to the founding of a multi-million dollar audio effects company.

"We'd already begun to concentrate more on the recording side than playing," says sales and marketing director Nevison, who like Crabtree, was born and bred in Burnley near Manchester, England, "but it wasn't until we met again at Lucas Aerospace that we started to think seriously about turning our ideas into products."

So, just a decade ago, Cambridge computing graduate Crabtree designed the first of what was to become a specialized but profitable range of time processing audio devices—a flanging and double-track effect called

the DM2-20, which he built in the proverbial attic.

"It was all analog and fairly crude by today's standards," says Nevison, "but our experience at Lucas Aerospace had taught us to make things that would 'fly'—robust, rack-mounting equipment with high performance and reliability."

Indeed, both men were still working at Lucas at the time, and Nevison had to take a couple of days off to test the market. He went to top companies like AIR Studios, Abbey Road, Trident, and even to Paul McCartney, and they all placed orders. "We formed a company because it was cheaper than product liability insurance," Nevison adds casually.

A £100 off-the-shelf firm called Edendeck, subsequently registered for trading as Advanced Music Systems, did the trick, and in 1978 Crabtree took the first steps along the digital trail

with a DMX15-80 delay line, which was to lead to the world's first full-bandwidth digital reverb in 1981, the RMX-16. Having long since separated delay from sample storage, and with Crabtree's technical ingenuity, it was once again only a matter of time before the launch of the multi-sampling Audiofile sound production project—in this case a mere 12 months, a fairly short delay by industrial standards.

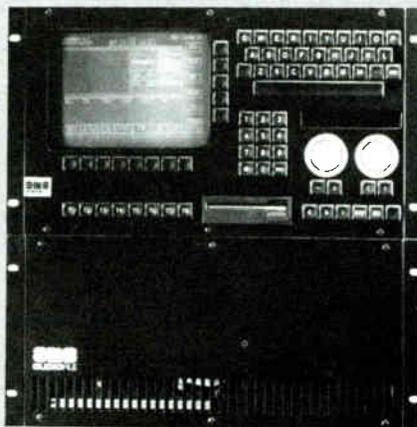
Nevison, who modestly dismisses his degree in metallurgy as "the one people who aren't very good at the major technical disciplines take," identifies flair for technological enterprise and high standards as hallmarks of AMS. For one thing, all devices reproduce a full bandwidth, unlike the low-cost Yamaha REV7 digital reverb, for instance, and the Lexicon 224 before it became the 224X. "After the digital delay was launched, we were constantly asked to produce a harmonizer," he recalls.

"We resisted the request because we weren't happy with the bandwidth of the processor chips on the market. Then Intel brought out the 8086, a new 16-bit 10MHz device aimed at the aerospace industry. We ended up using two of them on an extra module for the DMX15-80," says Nevison, reiterating an earlier remark about his firm's determination against rendering customers' equipment obsolete. "At the time when there were only ten of the new chips in this country, six were here at AMS," he grins.

Since then the firm, renamed AMS Industries plc (public limited company) last year, has become known to many as the brains behind Paul Hardcas-

Audiofile— how it works

Instead of a predetermined number of recording tracks moving along in real time as with tape, disks offer random access and read/write at very high speed. A buffer memory acts as a kind of gearbox to allow sounds to be played out at their proper speed, during which time the disk can search and read the next part to be played. While that's playing out, the next part is found, and so it goes on. As a result, any data can be edited together irrespective of their physical loca-



tions on disk.

As well as acting the tortoise in a two-speed baton race, the on-board RAM can also assign outputs—in other words, having been given the right bundle of sounds for the next few moments of playback, it decides to which of up to eight separate outputs each sound will arrive.

All of these commands—which sounds are to be played out and when (i.e. sequencing), the assigning of outputs or "tracks," and also editing decisions relating to individual sounds or an entire "mix"—are stored on floppy disk. The multi-

—CONTINUED ON PAGE 96

tle's re-triggered sample effect on "N-n-nineteen" (an expanded DMX15-80 which led almost directly to Audiofile), and to a lesser corpus for the triggered snare sounds used for convenience amid the microphonic chaos of the U.S. contribution to the Live Aid concert.

From live and studio music, AMS has made considerable inroads to broadcasting, with delay lines to restore audio landline synchrony where pictures are sent across satellite links and convoluted networks, and the Timeflex system to match running time variations between video and film, among other things.

More recently the firm acquired Calrec, the neighboring broadcast mixing console and microphone manufacturer that holds rights to the Soundfield microphone in the UHJ surround sound format, whose patronage from the British Technology Group has guaranteed virtual obscurity for a project once heralded as the acceptable and indeed broadcastable alternative to the ill-fated "Quadrophonic" craze of the '70s. So far Limehouse is the only UK TV studio with a Soundfield mic, which they use occasionally on music, exploiting the "position after recording" flexibility afforded by its 4-channel output signal.

"Calrec delivered a digitally assigned analog console to Thames TV, and a £444,000 BBC Master Stereo Control Vehicle (MSCV) desk, at IBC, in October. But we haven't had a chance to look closely at the position of the UHJ project yet," says Nevison, who sees console manufacture as a core industry in audio and a natural acquisition for AMS. "We're still sitting on a £3.5 million cash mountain," he adds.

With gleaming mirror-glass company headquarters recently completed in their home town, and the unique security of multi-millionaire status behind them, what's next? Certainly not North England's answer to a Dallas lifestyle, or the standard limo of the city exec. "Since our success I think I've bought one pair of new jeans," quips Nevison. "I'm very excited by work."

"We want to develop Audiofile," says Crabtree, "and this is an exciting time for us now that the product is out in the market and we're getting feedback. Low-cost data back-up is one area of technology which is still evolving—the new R-DAT format will enable us to save and load stereo files four times faster than real time." Crabtree also suggests that the recordable optical disc (and ultimately re-recordable or so-called "erasable" disc) currently being perfected in R&D labs around

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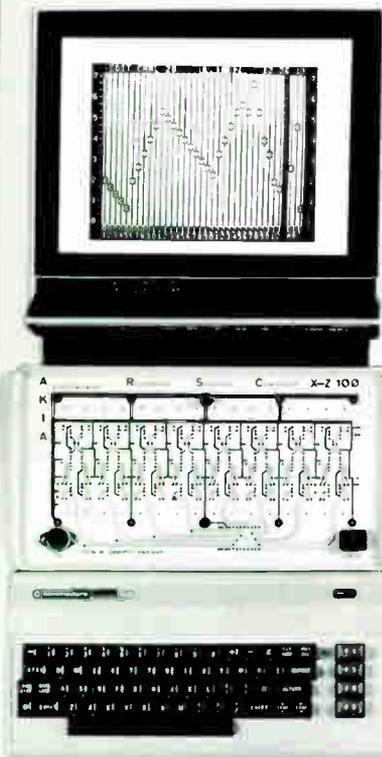
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the world, such as TDK's prototyped Soliton optical erasable disc, may prove to be the long-term answer.

"Audiofile is a powerful system with several different areas of application," says Nevison cogily. "We've got plans for film post-production, with auto dialog replacement as well as sound effects dubbing, and will probably develop a family of equipment to serve different requirements." Meanwhile, is today's Audiofile a challenge to digital tape as some would suggest? "Not

really," says Crabtree. "Tape is a cheap, long-term storage medium, and may be better suited to big recording sessions, where 24 or 32 separate tracks are recorded simultaneously." Without chaining Audiofiles together, the maximum number of discrete inputs is eight. "In practice, I think the two media will work well together, with Audiofile performing editing and other administrative duties. It's not a special effect or a musical instrument, it's a workhorse."

—FROM PAGE 94, AUDIOFILE

platter Winchester hard disks sited remotely only store the sounds themselves, and most important of all, are not removable.

So sooner or later, the system's maximum mono capacity of nearly two hours (with twin 380 drives) would become cluttered up with an assortment of samples from various productions in-the-making. Clearly, to avoid the equivalent situation of buying a new Rolls Royce because the ashtrays are full, some way of saving and subsequently loading hard disk data must be available to allow an unlimited number of productions to be crafted, exchanged with other machines, or recalled for remixing if need be.

Ideally, this routine utility would take a couple of seconds—and preferably less. But here's where the technology is waiting for advances in low-cost data storage. While a high performance computer tape streamer could save and load data quickly, it can cost up to £10,000, or nearly a third of the £37,000 Audiofile itself. Then there's the removable Winchester disk, but again this is expensive and not nearly so fast at reading and writing data as its fixed counterpart.

But for now, the Sony PCM F1 is a favorite for storing Audiofile data. This is capable of storing data in half the time taken to play the corresponding sound—or in other words, at half real time—for a simple mono output. Similarly, 2-track stereo is transferred in real time. After that, in theory, the procedure takes progressively longer as the number of separate outputs is increased, to a maximum save time of some 60 minutes or so.

In practice the operation is unlikely to take that long. One of disk's prime attributes is that it doesn't have to store gaps of silence, as these are administered by the sequencer; which means that the

save/load time for a string of incidental effects, for instance, would be far shorter than for continuous sound, even if they were perhaps allocated to a separate "track," pending the final mix.

Another point is that virtually any number of sounds can be combined on the system without generation or any other losses. So the figure of eight as the maximum number of simultaneous outputs—which is related to the highest practical writing speed of the disks—doesn't put any constraints on the ultimate complexity of the finished result. Cues for particular sounds also can be revised at any time, and the same will be true of stereo pan positions in the future, according to manufacturer AMS, which is based in Burnley near Manchester.

As with drum machines and other electronic instruments, the Audiofile's disks can only be loaded in entirety, but AMS is currently finishing software which will allow selective loading to complement an existing capability to save certain named files held on hard disk rather than the whole memory. This would allow a resident library of favorite effects to be added or retained during the course of Audiofile operation, and the firm is currently assembling just such a file with film dubbers and broadcasters in mind.

Perhaps one of the biggest problems for this widely-applicable technology is piracy. With the first unit going to the rental company Audio FX next month, customers will be encouraged to clear the memory after use. If they don't, Audio FX will. A small library of effects shipped out with each rental will completely clear any residual material—which could after all be the entire sound anatomy of a new album by any one of a host of top recording artists.

—Richard Dean

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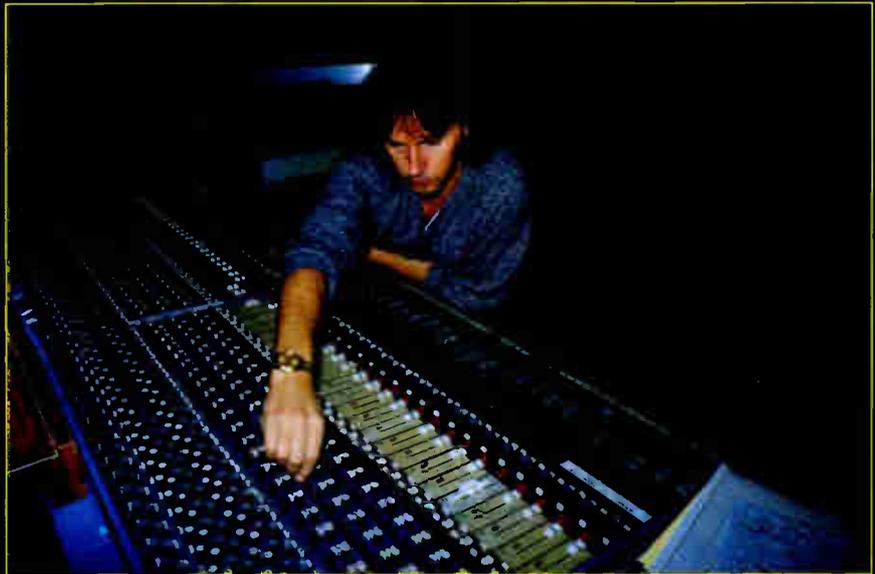


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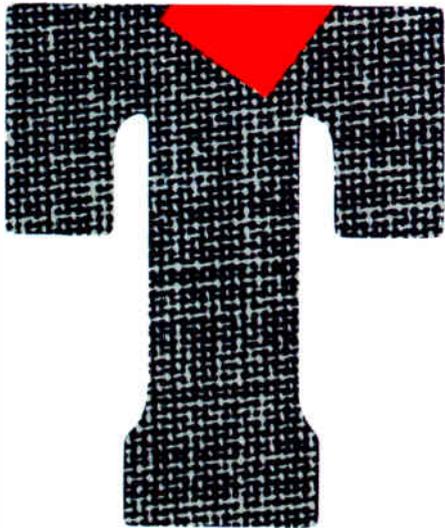
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...YOU'RE IN THE MIX



THE SELDOM SCENE AT THE KENNEDY CENTER

by Tom Turner



PHOTO: AL SEVILLA

The Seldom Scene's Lou Reid and John Starling.

The legendary country-folk group gets by with a little help from its friends.

The Concert Hall at the Kennedy Center in Washington was empty. Sort of. It was four o'clock, and the 15th Anniversary Concert by the Seldom Scene wouldn't begin until eight. Fifteen or 20 seats were filled by performers or idle crew, while technicians from Big Mo mobile recorders and Southard Audio finished balancing levels and checking the splits for the P.A. and 24-track recording truck.

That's why the big hall was only "sort of" empty. Not because it had 28 people instead of 2800, but because a soundcheck was going on, and the room was actually filled to the top of its chandeliered ceiling with bluegrass music.

Onstage, Linda Ronstadt, Ricky Skaggs and John Starling were singing some traditional songs. As their voices blended in the reaches of the big room, idle chatter slowed to a stop, and jaded stagehands drifted in to list-

en, caught by the sound of the old-time harmonies floating sweet as bee balm in the air.

When the trio finished "Drifting Too Far From The Shore," and the last notes evaporated into the ether, there was a moment of silence. Then someone said "Real fine!" Ricky Skaggs asked, "Could I have a little more brightness to the monitor?" and it was back to business.

Business that November night was the presentation and recording of a three-hour anniversary show featuring the famed and influential bluegrass quintet the Seldom Scene: dobro player Mike Auldridge, banjo player Ben Eldridge, bassist Tom Gray, John Duffey on mandolin, and guitar player Lou Reid. (They were augmented by piano and drums.)

Appearing with them would be some of the musical friends they'd made on their way from a once-a-

week club act in D.C., to a group with an international following.

Recording facilities were provided by the Big Mo truck of Wheaton, Maryland. The sound in the hall was handled by Southard Audio from Mount Crawford, Virginia.

And the friends of the Seldom Scene came from all over, the most notable being the aforementioned Ronstadt and Skaggs, and the very popular Emmylou Harris. In all, there would be nearly 20 musicians there.

This gaggle of talented folks would be performing about 35 songs with a variety of guitars, mandolins, dobros, fiddles, banjos and basses, in solos, trios, quartets, quintets and just plain bunches.

It promised to be a dandy night of music.

With 27 mics on stage, enough so that just about everybody could play and sing at one time, noise gremlins were definitely *persona non grata*. Ed Casey of Entertainment Sound Production, a principal designer of the Big Mo truck, talked about grounding problems and solutions:

"We're using a 37-input splitter box equipped with Jensen transformers. But phantom power is coming from the truck, so the mics are actually direct to the truck, and split to the P.A. Grounds aren't lifted; they carry through.

"The truck is parked at the loading dock, and that's a 300-foot run to the stage. So there's the potential for ground loop trouble.

"Now, the truck is getting 240 volts at its end, and stepping it down to 120. But we're not connected to the AC ground at that end. Instead, we've referenced all the grounds up to the hall. We actually have no physical connection to the AC power down there at all, because we've got the transformer isolation.

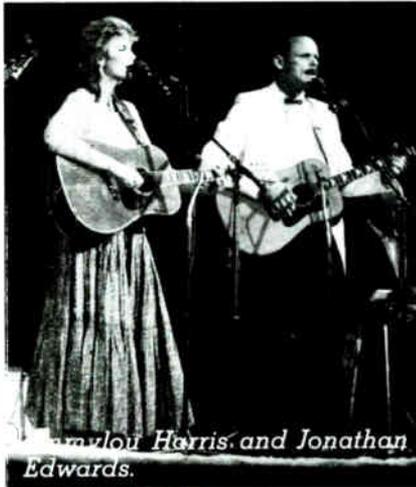
"What that does is make the recording equipment an electrical extension of the P.A. We don't have any ground loop problems, and everything is very quiet."

Mike Southard of Southard Audio offered the sound reinforcement perspective.

"The split and grounding works well," he said, adding that except for the large number of condensers, the stage setup was pretty much what he was used to for the Seldom Scene and other bluegrass groups. "We've done a lot of stage work with the Seldom Scene, and this is our standard stage monitor set-up.

"Our vocal wedges use five piezo tweeters with a 15-inch woofer. I believe they give better performance than a horn-equipped monitor for this

PHOTO: AL SEVILLA



Emmylou Harris and Jonathan Edwards.

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kind of music." He added that having five tweeters in each box smoothes the stridency sometimes heard from piezos.

And what about the Bose 800s standing far left and right about seven feet in the air for stage fill?

"I kind of stumbled by accident on using those," he said. "We were mixing at a club once that used the Bose for front audience fill. Well, the stage monitors went out in the middle of a set, so I grabbed one of the Bose and swung it around towards the band, and it worked so well I went out and bought a pair."

On this night, Southard Audio would be using a Yamaha 2408, manned by

Mike Cacciapaglia, for its stage monitor mix. Mike Southard would be in the house at his Soundcraft 400B, doing the main mix, which would go through a pair of dbx limiters, Sundholm notch filters and UREI third-octave equalizers. And then, one assumed, to a set of Southard speakers.

"No, all the speakers in the house belong to the Kennedy Center," explained Cacciapaglia. "I understand that most acts that work here use this system."

The in-house system, as detailed by Concert Hall manager Paul Simerman, consists of a permanently flown cluster and several front fill boxes, rolled out to the apron as needed. "This is an

acoustic venue," Simerman explained, "and the acts that work here usually find our equipment adequate." The speakers are all JBL. In the overhead cluster, there is a pair of 4508 bass cabinets with 2225 drivers and five horns: three 2380s and two 2385s, each with a 2441 driver.

The Concert Hall itself is a big box, 90 feet wide, 55 feet high, and 160 feet from the last row to the back wall of the stage, where the gracefully ranked pipes of a Skinner organ are mounted. Outposts of high technology from a different age, they stand mute most nights.

Since this is the Concert Hall, and not a theater, there's no proscenium, and no lighting grids. Any theatrical lighting must cling to pipes mounted to the front of the three skinny balconies which ring the auditorium's steep walls.

For the Seldom Scene show, two Kennedy Center cabinets sat far left and right on the apron for audience fill. They were also 4508s, with 2380 horns. A permanent rack of BGW amps equalized by White-Boner filters fed all the house equipment.

Meanwhile, down in the recording truck, Billy Wolf was listening to a different set of speakers: UREI 811Bs in the Big Mo truck. He was using the lengthy soundcheck/rehearsal to set up the 40-input custom ESP console, preparing to "record everything that moves," as Ricky Skaggs put it.

Wolf has done studio work with the Seldom Scene, and spends most of his time mixing for Tony Rice and other acoustic talent in the studio and on the road. "I couldn't do both if Tony wasn't a delicate kind of act," he said. "I'd lose my hearing on the live work, and wouldn't be able to do the job in the studio."

What about the set-up for tonight? Live recordings are a little bit of both worlds.

"This should be nice. We're going with AKG 535s on vocals. Normally you might use dynamics all around, but with the recording, we want to get that extra high end, and the transient response. Also, we'll have 451s and 460s on the instruments. With all the switching back and forth of fiddlers and singers and so forth, we want to have a consistency, so we've got that whole family of condensers.

"Back on the drums, the toms will be close miked by Sennheiser 421s, with 451s overhead, and one of the piano mics will be a 421."

Though the Big Mo racks had a lot of outboard gear, Wolf explained that his processing was going to be kept to an absolute minimum.

"I'll do a little bit of equalization at

the 'mix' consoles

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Inside the *Big Mo* mobile recording truck.

the board, maybe push the top end a little bit, and clean up a few bottoms. There's a bass amp on stage with a mic and a direct input, and I'll limit the direct. No other limiting, though, not even on the vocals."

Big Mo engineer Jim Crenca had finished the set-up of the pair of MCI 24-tracks. Head alignments were checked ("A necessity on every remote job. All the movement...") and Dolby tones were laid down at 30 ips, the speed being used tonight. A Sony Betamax stood ready, not for video (sorry, no pictures this time), but for the reference mix, fed by a Nakamichi DMP 100 processor.

The soundcheck was over. Everyone took a dinner break and hunkered down for the show.

As the hall filled, they listened in the truck to the ambience PZMs mounted on the apron and first balcony, and watched the video monitor for signs of life on the stage.

Finally the house lights went down, tape started rolling on the 24-track, and the show was on. For more than three hours, some of the best pickers and singers in the country regaled the capacity audience with brand-new songs and traditional favorites.

It was hard to say who loved it more, audience or performers. When not on stage, the musicians bunched together in the cramped wing off left, with some of them up the steps of a narrow gangway to get a better view.

There were Linda and Emmylou and

Ricky and the others, fans all of them, applauding and shouting approval to their friends.

All good things must end, however, and after a rousing finale with everyone onstage, the night was over. Was it as successful for the technicians as it seemed to be for the musicians and audience?

"Smooth as silk," said Mike Southard with a smile. "I'll take it."

And the recording?

"No problems here. Everything went great and we got it all," said the Big Mo people, happily listening to a playback after the show.

But the last word belonged to John Starling, an original member of the Seldom Scene who left the group to give more time to his medical practice. Starling stays deeply involved with music, however, and he seemed to be the chief artistic honcho tonight: playing, singing, and coordinating things with the guest stars.

He helped plan this show while working as the producer for an album of traditional songs with Linda, Emmylou and Dolly Parton. And when the night had ended, and everybody was slapping backs and shaking hands, he was in a nearly deserted hallway, catching his breath and wiping his brow.

"Nice show," someone told him. "Thank you," he said. "It was fun, you know, but fun can wear you out. This is one of those times when I'm glad to get to the end of the fun." ■



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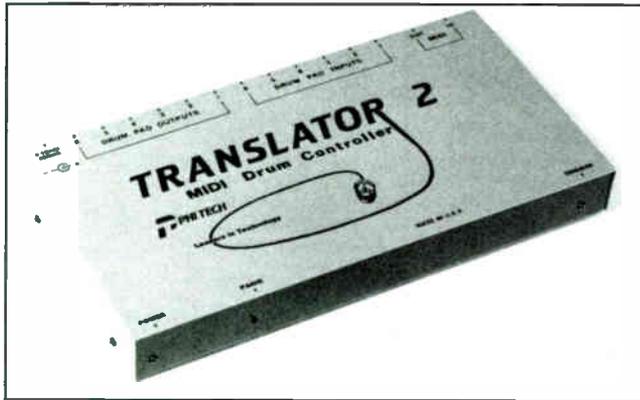
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Phi Tech MIDI Drum Controller

The Translator 2 MIDI drum controller from Phi Technologies (Oklahoma City, OK) allows pre-MIDI and non-MIDI electronic drumsets and machines (Pearl Drum-X, Simmons SDS5/7/8, Tama Techstar, Dynacord Percuter, etc.) to send and receive MIDI-triggering information. With the addition of commercially available acoustic drum sensors, the low-priced Translator 2 also interfaces acoustic drums with MIDI/non-MIDI instruments, as well as translating MIDI-in data into analog voltage outputs for triggering non-MIDI electronic drums and sound generators. Features include internal "set and forget" parameter controls over individual pad sensitivity, separate MIDI in/MIDI out channel assignment, velocity tracking, and eight pre-programmed MIDI note assignment options. The Translator 2 also has assignment programs for C Major and C# pentatonic scales. Suggested list price is \$249.50.

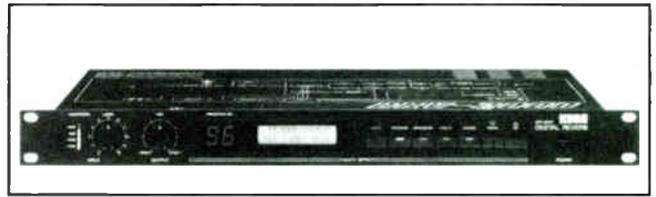
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ElectroSpace Strate Gate

The Strate Gate, from ElectroSpace Developments Ltd. of Cambridgeshire, England, is an advanced noise-gate system consisting of two VCA-based gates. The Strate Gate provides a set of controls for each channel, including: key source switch to select internal or external sourcing; individual LF/HF response filters; variable threshold control providing +20 dBm to -50 dBm adjustment. The user can switch each gate into duck or gate mode, while attack, hold, and release controls provide a wide variety of gating effects. Attack time is adjustable from two microseconds to four seconds; hold time is variable between five milliseconds and five seconds. LEDs display VCA status and the control voltage envelope. A link switch lets the second channel VCA track the first channel. The user can listen to the key filters, the input, or the VCA output, varying the depth attenuation between 0 and -80 dB. Enclosed in a single space, rack mount chassis, the Strate Gate is distributed in the U.S. by Peninsula Marketing (Torrance, CA).

Circle #104 on Reader Service Card



Korg Digital Effects Processor

The DRV-2000 is Korg USA's new multi-function digital effects processor with 16 basic effects, including eight reverbs, three stereo echoes, flanging, chorusing, and "space pan," plus two dual-effects programs using reverb and echo or reverb and chorus. Each effect has user-programmable parameters. Along with the 16 factory presets, the unit provides for 80 user programs. An LED/LCD display shows programs, parameters, and values. Programs may be selected via MIDI, with independent mapping of DRV-2000 program numbers to incoming MIDI programs. The MIDI implementation includes a "multi-modulation" function, which lets you access and control parameters in real time with footswitches, input level, volume pedals, MIDI controllers, and currently unused MIDI messages. Effects output frequency response is 30 to 12k Hz. The unit occupies one standard rack space.

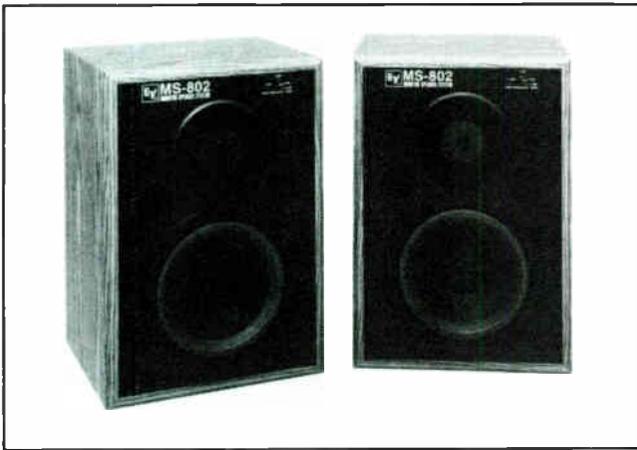
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Yamaha NS-10M Studio Version

Yamaha International introduced the studio version of the 2-way NS-10M speaker system at the NAMM Winter Market. Designed for near-field monitoring, the studio model has been refined for optimum balance in the control room. Along with the original NS-10M's 18 cm, white cone woofer, the update has a new 3.5 cm dome tweeter for high-end response more suitable for studio use. The original vertical design has been replaced with a horizontal one for easy console placement, and overall construction is more rugged. Featuring flat frequency response from 60 to 20k Hz and superior transient response, the NS-10M Studio System will be available during the second quarter of 1987.

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E-V MS-802 Monitors

The MS-802 by Electro-Voice (Buchanan, MI) is a compact, 2-way monitor designed specifically as a reference standard. The speaker features an eight-inch woofer for accurate bass response to 45 Hz, and a Super-Dome™ tweeter for transparent response to 18 kHz. Sound pressure at 1M/1W is 91 dB; power handling is 80 watts. The crossover is a two section 12dB/octave type (second order), with crossover frequency at 2 kHz. A front panel high-frequency control allows continuous adjustment of frequencies from -4 dB to +2 dB from a nominally flat response. The enclosure, covered with oak-look vinyl, can be mounted with the optional SRB-7 rack mount/wall mount kit.

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Sony Updates TC-D5PRO

Sony has improved and renamed the TC-D5PRO portable cassette recorder. Now the TC-D5PROII, it accommodates a wide range of mics—without needing input adapters. Operating time is now 5½ hours on two "D" batteries, and an optional AC power adapter is available. Other new TC-D5PROII features include Dolby NR, dual VU meters with peak level indicator, Sony's ferrite-and-ferrite record/play head, and a "disc-drive" style capstan servo transport. Suggested list price is \$790.

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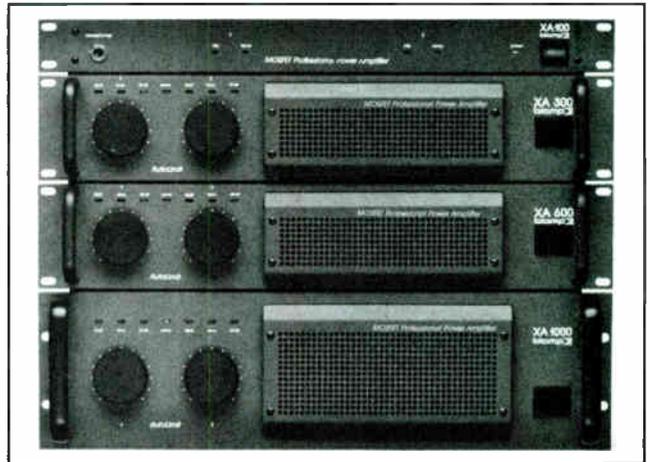
Ramsa Mini-Cardioid Mics

Panasonic debuted the Ramsa "S" series of four miniature, back-electret condenser microphones at the NAMM Winter Market. Designed to streamline on-stage microphone set-ups, these compact mics combine the smooth frequency response and superior transient characteristics of condenser mics with the input level handling of dynamic

mics. According to the manufacturer, these mini-cardioid mics require little or no EQ in most applications, and their range of characteristics suits them to a wide variety of applications.

The WM-S1 features 50 to 18k Hz frequency response and handles a maximum 148 dB SPL; the WM-S2 features 120 to 15k Hz response and handles up to 138 dB SPL; the WM-S5 features 70 to 16k Hz, and maximum 158 dB SPL; and the WMS10, a headset mic, features 120 to 15k Hz response and maximum 138 dB SPL. All four mics operate on phantom power, while the WM-S2 and WM-S10 can also run on batteries. The Ramsa S series is supported by a variety of vibration isolating hardware such as instrument mounting clips, mini-booms, and headsets.

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Biamp Power Amps

Biamp Systems (Portland, OR) has announced two new lines of stereo MOSFET power amplifiers: the XA Series (available in 50, 150, 300, and 500 watt configurations) and the T Series (240 and 510 watt configurations). Continuously variable-speed fans cool the XA Series through enclosed heat sink tunnels, eliminating the need for air filters. The passively cooled T Series is designed for uninhibited 2-ohm operation. Both series are equipped with Biamp's Auto-Limit, for eliminating clipping distortion.

Circle #110 on Reader Service Card

Hybrid Arts SmpteTrack/SmpteMate

Hybrid Arts of Los Angeles has unveiled new MIDI software for the Atari ST computer. SmpteTrack Professional is a 60-track MIDI recorder with: SMPTE synchronizer, reader, and generator; MIDI remote controller; selectable quantization; and selectable "Intelligent Punch." SmpteTrack locks to all SMPTE timing configurations, MIDI, and non-MIDI sync pulses, and can provide a 24/48/96 pulses-per-quarter-note clock. The program contains a song building feature, a looping chart, and instant locate, and controls any and all MIDI boxes in your chain. While reading and locking up to SMPTE, SmpteTrack can output song pointer or a MIDI Start Command. It retails for \$575.

SmpteMate is Hybrid Arts' SMPTE interface for the ST; it reads and writes all standard time code versions, including user bits, through the RS232 port. It chases, locates, and locks to any SMPTE point, and also reshapes SMPTE. SmpteMate's price is \$499.95.

Circle #111 on Reader Service Card



ART ProVerb

by Neil McKamey

In a few short years, digital reverb has gone from being a privilege of the most high-tech facilities to a virtual fact of everyday studio life. Now we're moving into a new stage, in which good quality reverberators are so inexpensive that almost anyone can afford one and studios can easily afford to have several. Naturally, these units won't have as many blinking lights or moving parts as their top-end cousins, but the designers are getting very good at deciding what to put in and what to leave out to pack the most punch for the money. One such unit is a nifty new "Instamatic" digital effects processor from ART called the ProVerb. Like those Instamatic cameras, by eliminating user adjustments ART has accomplished several things: they've made it a snap to use, right out of the box; they've made it foolproof—no user adjustments means no possibility of user mis-adjustments; and they've brought the price of this stereo in/out unit waaaaay down (\$395 list).

The front panel controls of the ProVerb are few and easy to operate. There's a button for selecting the MIDI channel, two for preset select up/down, an effects bypass button, a two digit LED display, and a slider for adjusting the dry/processed mix. The latter is the closest thing to a user adjustment to be found on the ProVerb!

The unit has 99 presets (and one mute preset for cancelling all processing through MIDI, a nice touch).

"We're moving into a new stage, in which good quality reverberators are so inexpensive that almost anyone can afford one."

The first 50 simulate natural reverberation, arranged in order of increasing decay time. The presets also vary in brightness, depth, stereo separation, etc. Reverb sounds with decay times from 0.2 seconds to 1.0 seconds are labeled as "plate" sounds, those with decay times from 1.1 seconds to 5.0 seconds as "rooms" and those with longer decay times are labeled "hall" sounds. I'm not sure why ART hasn't given the unit some hall times shorter than the longest room times or room times shorter than the longest plate times. However, a unit this easy to use and inexpensive should be approached in terms of what it *does* do, rather than dwelling on all the features that might be available on a \$10,000 unit that have been designed out of this one.

The 49 effects presets have been chosen to give several variations on each of a wide range of effects: echo, chorus/flange, reverse and gated reverb, multitap delay effects, synthesized stereo, and others. Presets can be selected via MIDI and incoming MIDI program commands can select any preset, according to a user-defined MIDI program table.

I tried the ProVerb out in two applications where it seems likely to end up being used—demo studio or home studio mixdown, and as part of a MIDI synthesizer setup.

Setting it up for mixdown, I discovered that the ProVerb is genuinely plug-in-and-play. Until now I had been convinced that this much-claimed prop-

erty of audio devices was purely mythical. The unit powers up when you plug it in, set by default to the preset that, of the 50 reverbs available, is closest to a "generic" or all-purpose reverb sound. There's no input or output level adjustment to make. This can be done at the console effects sends and return. The machine is extremely easy and fast to use in mixdown, once you get over the habit of reaching for knobs that aren't there to tweak parameters that aren't accessible. All you have to do is choose the most appropriate preset from the list. There are enough variations among the 50 that there's something to cover most needs that might come up.

The quality of the reverberation is smooth and natural, especially on the short- and medium-decay times. A few of the acoustic simulations are excellent. The ProVerb's limited 10kHz bandwidth becomes a problem only with very short plate sounds and with program material that contains large amounts of very high frequency sound (cymbals, for example). The gated reverbs work well for achieving "those" drum sounds, and ART gives us a healthy range of variations to work with. Some of the other effects—such as slapback and choir—had interesting and useful results, but for many, such as flanging and long discrete

echos, the missing top octave of bandwidth was distressingly noticeable for mixdown applications.

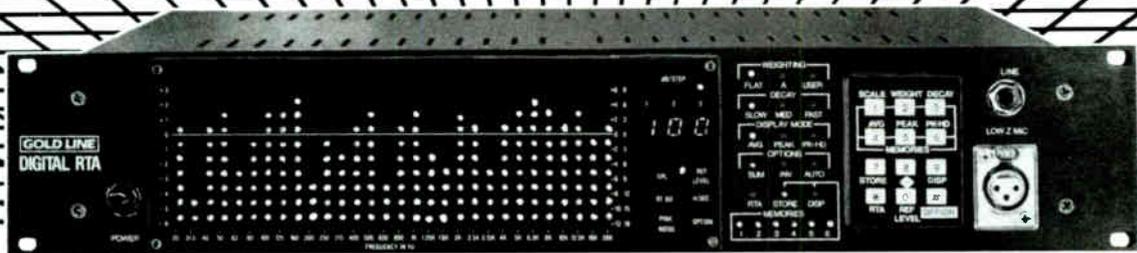
When used with a live synthesizer setup, the whole range of effects became useful. I used them all, and had fun with them. The stereo echoes (one delay time out of the right channel, another out of the left channel) are a blast, and could be very effective on stage. The flanging, slapback, synthesized stereo, etc. all helped to bring synthesizers to life.

Anyone who's heard what digital reverb can do for a digital synthesizer or sampler is sure to be hooked; the "real" or "lifelike" aspect of the sound is enhanced so much that it's hard to go back listening to a DX7 dry. The ProVerb's range of natural reverb presets is broad enough that I was able to find at least one preset that went well with each synth patch I tried. Through its MIDI capabilities I was even able to take my favorite ProVerb preset for each synth patch and have it automatically selected each time I selected the corresponding program on my synth's front panel. This feature is time- and sanity- saving; there's always too much to remember on stage in the middle of a set to keep track of which effects program happens when. As a result of the minimalist front panel design, though, the entry of the MIDI

program table requires pressing buttons simultaneously and keeping mental track of what the numbers showing in the display refer to at any particular moment. This can be tedious and confusing, although it does become easier when the entry is done in conjunction with a MIDI controller, such as a synthesizer. In addition, this table is stored in volatile memory, so every time you power the unit up you have to take the time to re-enter the table. This could be inconvenient or even impossible in many live situations—after the unit is plugged in up on stage someone has to sit on the stage with it patiently entering a data table. This is the only drawback to an otherwise time-saving and effective MIDI implementation, and ART should possibly consider adding a battery for memory backup into future versions.

ART has packed a lot into the ProVerb, and packed it in for a low price. In a small-studio mixdown situation, it covers many needs with good results, and I can't imagine any effects unit being easier to use. For MIDI synthesizer applications, the ProVerb opens up a wide range of useful processing possibilities. At this price, anyone who's invested in one or more MIDI keyboards or drum machines has no excuse for not having a digital reverb in his or her setup. ■

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Roland DEP-5 Digital Effects Processor

by Mark Smith

Since its debut at the Chicago NAMM in mid-1986, the Roland DEP-5 has received relatively little exposure as compared to its apparent competition the Yamaha SPX90 and REV7, and its own big brother the SRV-2000, among others. But the DEP-5 is a different animal than any of these and as such deserves its own place in the studio rack.

The DEP (Digital Effects Processor) features four different signal processing components—reverb, delay, equalizer and chorus—with the reverb component selectable in linear and non-linear formats. Up to three of these components can be chained together into a single patch.

At the root of the 99 programmable memory slots (patches) are 11 algorithms which serve to intertwine the various combinations of effects. In any given patch the selection of a new algorithm will apply all of the other characteristics (parameters) of that patch to the new algorithm resulting in a new effect. In this way, one can create new patches seemingly indefinitely.

Each of the algorithms begins with a signal path run through the three-band digital, partially parametric EQ. The EQ section has no effect on the direct sound portion of the balanced (direct/effect) output mix. It only massages that portion of signal being run through the processor chain.

In normal operation the display of patch (memory) number is virtual on the left side of the lit display with the right side display varying depending

upon the chosen algorithm. Other non-numerical indicators in the display area acknowledge the selection of value mode, EQ mode, the activation of chorus, reverb and non-linear reverb effects in the audio chain, reverb type (R,H,P,S) and size designations when applicable, Q and frequency adjust, MIDI adjust mode, MIDI program and channel, and output level.

By selecting the parametric EQ button, one can manipulate Q and the center frequency values via the memory and reverb buttons respectively. This onboard filtration system is extremely flexible and well thought out, though somewhat biased toward the low/mid ranges. It is somewhat noisy at maximum boost, especially with longer gate settings in the non-linear algorithms. However, once effects are set, readjustment of the EQ results in great enhancements to effects.

Once tailored, signal is thus distributed according to the selected algorithm. Algorithm number one bypasses the reverb section and feeds signal to the chorus only. Upon selection of chorus, with the chorus/EQ button, knobs 1, 2 and 3 serve to allow manipulation of feedback percentage, modulation rate, and modulation depth respectively. Feedback is adjustable from 0 to 100%, rate from 0.3 to 10Hz, and depth from 0 to 50 cents. Unfortunately, the digital chorus appears to be the unit's weakest link. At feedback settings of 75% or higher under high dB conditions, some chorusing noise is evident. The sound, however, is quite superior to analog chorus units.

Certainly if chorusing is the DEP's weakest feature then reverb is its

strongest. The shorter room simulations are uncanny and as sweet as can be. If not bypassed, reverb is the next element in the signal chain for all of the remaining algorithms, and it is found in the form of standard reverb, non-linear reverb, and delay. Additionally, some of the algorithms feature modulation introduction into the reverb via a tapping of the chorus' modulation section.

In addition to the 11 room simulations ranging from 0.3 to 76 meters (measured as the side of a cube), the DEP offers seven hall simulations (14 to 76 meters), two plates and two special reverb settings. This fact alone puts it out of the reach of its own big brother the SRV-2000, which offers only eight, five, two and no special settings, respectively.

Predelay time is selectable over a range of 0 to 500 ms. In conjunction with the room/hall size select, this range provides for quite an array of depth in room sizes through the control of early reflections. A high frequency damping control provides adjustment over the ratio of high frequency drop-off centered at 8kHz. Damping is selectable at ratios from 1.0 to 0.05. Padding and wall material simulations are surprisingly effective over these ratios. Reverb time (wall reflection ratio of the room/hall etc. indicating the time taken to achieve a 60dB drop), is variable between 0.1 and 99 seconds.

Reverb is selectable in linear and non-linear formats as a function of the algorithm selected. Non-linear reverb is reverb whose signal is cut through gating technique. In the DEP, the gating effect is a function of time. Although non-linear reverb has no early reflections, those algorithms that are non-linear offer predelay times variable between 0 and 500 ms. The predelay setting serves to time the length of silence before the developing re-

verberation kicks in.

Reverb times are selectable from -0.9 to 99s, reflecting the time spent for reverberation to complete if un-gated. In non-linear mode, reverb times define the slope and development of the reverb between the pre-delay kick in and the subsequent gate. Negative settings provide for upward slope or swelling reverb (reverse gating) and positive settings for decaying downward sloping reverb. On the DEP the sucking sound of the negative reverb effect is more subtle than that of its competitors.

In a non-linear algorithm, gating control offers time selects from 10 to 999ms. Timed gate is extremely useful when one wishes to track gated reverb effects to BPM or tempo in percussive applications (60,000/BPM = time in ms). Using the reverb select button non-linear output can be delivered in mono or in pan from left to right or right to left.

Algorithm two offers standard reverb only while algorithm seven produces non-linear reverb only. Algorithm's three, eight and 11 produce modulated standard or non-linear reverb with no chorus in the circuit, with 11 serving as a low density version of eight. Algorithm four runs reverb through the chorus in parallel. In parallel, signals merge at the outputs. Algorithm six acts

as a more chorused version of five in that signal is additionally routed from the reverb through the chorus as well as to the chorus directly resulting in a hybrid series/parallel effect. Algorithm nine is a non-linear version of six.

Algorithm ten serves up delay in parallel with chorus. Delay times are set in one of two ranges, from 0 to 999ms and 1.0 to 2.0s. As in non-linear modes, the reverb select button offers the choice of three different output options: normal output, inverted delay phase, and panning delay alternating between output A and B (right/left). Interestingly, over seven minutes (timed drop of meter panel reading from 0dB to -20dB) of clearly audible delay is possible.

The remaining front panel controls include an on/off switch that doubles as a bypass switch, a button to define output level, balance of wet and dry signals, and input attenuation (with a plasma indicator of +6/-20dB). Two other buttons, write and MIDI, offer easy access to memory storage and MIDI mode and channel selection. Write allows you to write over all 99 memory slots, however, factory presets 1-29 can be recalled at any time, even if written over, by way of a simple recall process.

MIDI on the DEP allows you to select between omni on and omni off as well

as channel in omni off. A MIDI program number may be assigned to each patch. Cleverly the unit forces you to choose a MIDI program number before you assign it to a patch in order to eliminate duplicate assignments. The manual features an extensive MIDI implementation section complete with byte and description tables for system exclusive, write and dump formats. The inclusion of the capacity for external storage is a refreshing exercise in forethought. The tables are an invitation to programmers to create after-market programming and librarian software. One could even conjecture that, given the proper software update from Roland and/or the use of a MIDI translation device, keyboard or guitar controllers could effect parameter changes in the DEP-5 live *a la* the Lexicon PCM70.

The back panel contains MIDI in and thru, remote switch jacks for effect on/off and preset shift and stereo (A/B) outs and stereo ins. Input and output jacks are matched "unigain" to either +4dBm or -20dBm. Presumably the lack of a MIDI out jack reflects the fact that software based editors are expected to allow for the programming and dumping of patches but not for the saving of patches already in the system.

The internal specs are very com-

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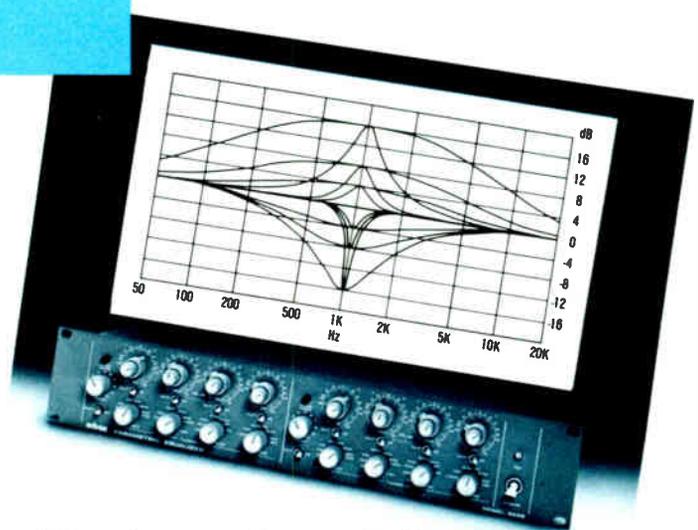
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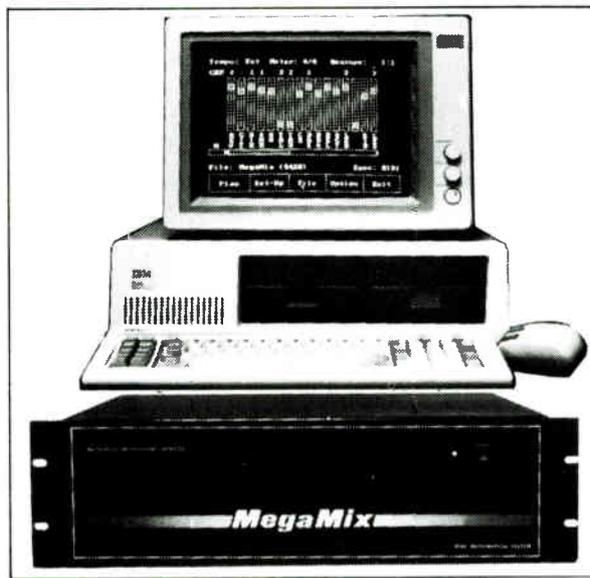
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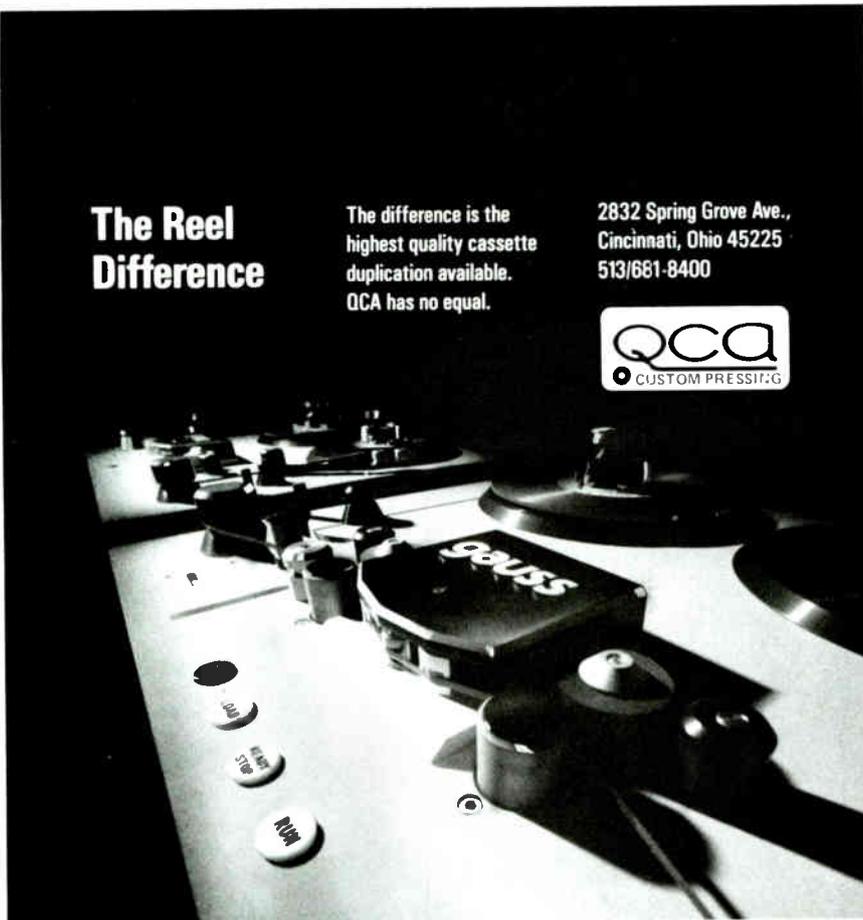
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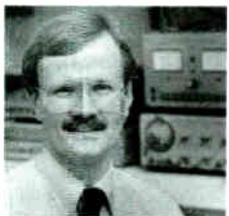
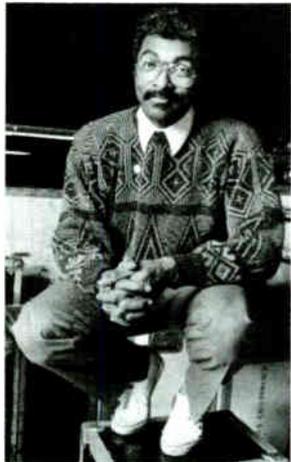
petitive, with 16-bit linear AD/DA at 32kHz and 28-bit arithmetic processing. These numbers allow it to hang tough with not only the SPX90, but also with the REV7, SRV-2000 and higher cost units such as the Lexicon PCM70. Bandwidth of 30Hz to 12kHz is wider than the SRV and insignificantly off of SPX and REV specs. Reverb dynamic range of 90dB and THD of 0.03% duplicates the SRV-2000s and surpasses all other competitors.

Controls serving double duty keep the front panel relatively clean and easy to understand. The lit center display is clean and easy to understand with plenty of visual references. The lack of a remote is somewhat disconcerting, however, this is probably where MIDI software development will come into play.

With the parameters available on the DEP-5, reasonably complex reverbs can be defined. When using non-linear reverb the selection of longer pre-delay times and longer gate times creates a scratch-like effect. Strange delays and slap-backs can also be created using these parameters. The reverb section of the DEP-5 is one of the least complex to use, yet one of the most flexible on the market at this price (\$895 list). Indeed, with no thanks to the typical Roland manual, a novice in the course of one session could learn to operate the DEP and to create useful reverbs and effects.

The DEP borrows many features from the SRV yet implements them more efficiently. Its EQ is not as flexible as the SRV's or the REV7's though it is programmable unlike the REV. The selection of reverb parameters is competitive with all except perhaps the multi-faceted PCM70. It also falls short of the depth available in the REV yet it offers features unavailable on the REV. Comparing the DEP to the SPX90 is in many ways apples to oranges, yet in areas where overlaps do occur my preference is for the flexibility and ease of programming of the DEP. Finally the potential for complete MIDI control over all parameters slips it into the PCM70 class when it comes to digital interface capability.

Comparisons aside, just about any studio would do well to offer a DEP-5 as part of its arsenal. Quick, easy programming makes for little wasted time trying to get that "right" sound. The price-to-feature ratio is excellent. The lack of sampling is not too discouraging as the sampling capabilities of processors in this range are token. More important, and certainly more functional, is the offering of true multi-effects. And while everyone needs a REV7 or SPX90 in their rack, you'll find a DEP-5 in mine. ■



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NEWS From NAMM

by Craig Anderton

The Winter '87 NAMM was the best-attended yet, and this show-goer was not disappointed. Although there were few "revolutionary" developments like sampling or FM synthesis, products continue to evolve towards more power, lower cost, and greater user convenience. This time around, covering the show was even more frustrating than usual—I saw enough items of interest to fill a couple of *magazines*, let alone a couple of columns! This month we'll concentrate on electronic guitar and some other items; next month we'll move into synthesizers, software, and related territories. I must apologize to all the manufacturers who came up with great inventions that I didn't have space to cover—there was just too much at the show.

Since my primary instrument is guitar, I (like thousands of others) have been looking forward to a reliable and fast guitar-to-MIDI converter. At the summer show, I found the K-Muse Photon guitar to be the best of the bunch. But now Roland, who has been in the guitar synth biz longer than anyone, has really cracked things open with their GM-70. This rack-mount "brain" (\$850 list) works with Roland GR-series hex pickup guitars, but an extra \$225 gets you the GK-1 hex pickup/controller box to retrofit existing guitars. I had a chance to actually sit down and give my standard guitar synth torture tests. The tracking is the best I've seen on any device that analyzes a standard guitar; guitarists who are tired of having to think before playing each note on a guitar synth can rejoice. I'd still give an edge to the Photon for speed on the lower strings, but the GM-70 does what I want a guitar-to-MIDI converter to do. The MIDI implementation is pretty hot too—mono mode works well, and you

can have each string drive up to four MIDI channels.

Roland had some other toys for guitarists: the GP-8 guitar processor with eight programmable effects (delay, chorus, EQ, distortion, overdrive, phaser, compressor, and envelope filter); DEP-3 effects processor (reverb, EQ, and delay); and FC-100 MIDI program change foot controller. Speaking of program change foot controllers, there were several at the show including new entries from Yamaha and DOD.

The Vortex guitar-to-MIDI interface (by Beetle) took an entirely new approach to guitar synthesis. The prototype at the show was installed in a Strat and projected to sell for around

\$700. There were also some SynthAxe-style chord trigger switches that mount on the guitar. Although the device is not yet finished, the engineering approach looks extremely promising. You can bet the Beetle booth will be one of the first ones I'll check at the next show.

AudioOptics had a prototype optical hex *audio* pickup for guitar. This is something that has real potential for the hex audio processing system I've been fooling around on for the last six years or so; as with the Vortex, this is one development I'll be following carefully.

The Stepp guitar, for just under \$7,000, is a controller with associated external synthesizer/electronics package that looks great and makes some nifty sounds. The tracking (of both notes and pitch-bending) is flawless since pitch-to-voltage technology is not used, and the synth sounds are as good as any typical analog audio/digital control synth. However, there is also MIDI Out if you want to drive other sound generators. The packaging is beautiful, and the unit has a good feel considering the design constraints involved with a unit like this.

I've always had a soft spot in my heart for guitar effects that come out of left field and do something cool, and the Sustainiac sustain system is certainly my kinda device. It provides polyphonic infinite sustain at whatever volume you want with a remarkable degree of control. A special transducer mounts on the guitar's headstock; the guitar plugs into an amp that drives the headstock. This creates positive feedback where the guitar vibrates its strings electro-acoustically, and *voilà*—instant controlled feedback. The model I played with cost under \$300 and let you select the harmonic on which you wanted to feed back (!), but there are less expensive models available. This is one of those "why-didn't-someone-think-of-this-before" type of boxes, and it's a gas. Now feedback can be much more than a vestige of acid-rock from the 60s; it can be a controlled, expressive tool for whatever type of music you play. You can even sustain clean sounds.

Peavey, one of the first companies to recognize the importance of MIDI in signal processing systems for guitarists, had two new standout products at the show. The RMC 4512 footswitch controller sends out program change

The Stepp DG1 electronic guitar



commands for all 128 MIDI-defined programs on any of 16 channels. Eight footswitches and large LED displays help simplify programming and on-stage use; commands can also be chained for simple one-step program increment and decrement. If you want something more dedicated, the MFC 2128 is a complete MIDI-controlled system for five "stomp box" effects. It responds to MIDI program change commands that select any of 128 different signal routings. A mono/stereo output configuration allows stereo effects to be intelligently used. And to go with the MFC 2128, Peavey introduced a series of five stomp boxes based on custom VLSI chips. They claim that thanks to the custom circuitry, performance will rival that of rack mount units. I saw some of the circuit boards for these units and was impressed by the overall quality, from circuit board to the high-tech surface mount techniques needed to keep quality up and size down.

While we're on the subject of American-made signal processors, the Alexis Microverb, already shown at AES, provides 16-bit reverb for \$249. The Midiverb II, introduced at NAMM, is a rack mount enhancement of the original Midiverb that costs \$399. There are 99 preset programs with a wide variety of different effects, the sound quality is very good, and some limitations of the original Midiverb (e.g. program number mapping) have been removed.

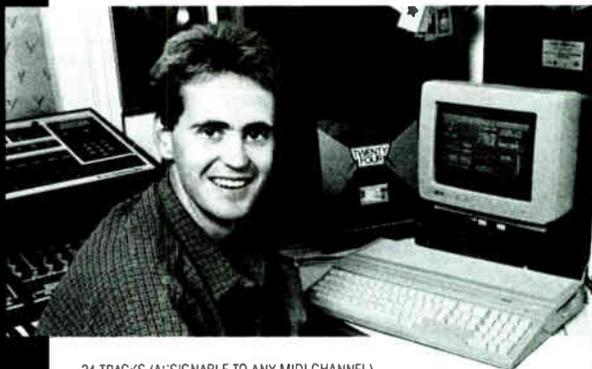
ART, another company I tend to count on for Cool Stuff, had their Intelligent EQ up and running. For under \$600, you have a 2/3 octave graphic EQ under complete computer control. This control means a lot more than program change, however; it is possible to specify particular curves, and have the equalizer set itself to come as close as possible to that ideal curve. "Satellite" units can be controlled from the main "brain," which gets us one step closer to the "virtual studio" concept where lots of outboard units are controlled from a single master to save console space and long, complicated wirings.

Hmmmm... out of space and we've only covered a fraction of the show. See you next month with more.

(Postscript: Since readers of this column tend to appreciate the finer things in life, here's a tip: if you're ever in Anaheim, check out the "Star Tours" ride at Disneyland. All I can say is that if you ever wished you were inside a George Lucas movie instead of merely being a spectator, this is your chance. It's even worth the typical hour-plus wait, which is quite a statement coming from someone who absolutely despises standing in line.) ■

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Richard Thompson Finds a Fresh Perspective

by Josef Woodard

Richard Thompson could paper the walls of his home with media accolades from the past few years of his resilient career. When Thompson released *Shoot Out the Lights* with his then-wife, Linda, in 1982, the critical feedback reached a fever pitch—and rightly so: it contained songs of penetrating power, brutal honesty and a raw vocal intensity, punctuated by his stark, wrenching way with a Stratocaster. This was literate pop music, without compromise or heady pretension—witty missives from a mildly tortured soul.

Of course, sterling press does not a great credit rating make. Despite all the critical ballyhoo and a fanatical core following, the public at large

remained... well, at large. You'd think the heralded Englishman would be frustrated by the naked disparity between attention and sales, but the tall, wry fellow remains stoic about the situation.

Thompson's new album, *Daring Adventures*, his second for Polygram, is a sporting and solid effort. He extends and clarifies his favorite themes and textures but has departed from old habits by using a new producer, Mitchell Froom, and cutting in Los Angeles (at Sunset Sound and Town House) with a cadre of Yank musicians new to his sessions.

Although Thompson's palette is a broad meld of rock and roll, folk music from the UK, and other ethnic flavors, his approach in the studio is four-square and to the point: acoustic and electric guitars dominate the mix, spiced with Froom's swirling organ chords, female background vocals and the occasional accordion lilt. And aside from very sparing use of an Emulator, there's nothing computerized about Thompson's artistic temperament.

Thompson's first claim to recording

fame came in the late '60s and early '70s with the inventive folk hybrid, Fairport Convention—a cult favorite to this day. After Richard and Linda joined musical and connubial forces, the pair produced a string of albums culminating with *Shoot Out the Lights*. But the spell broke just as a major U.S. tour was starting: Richard had fallen in love with Nancy Covey, the American who booked the popular Los Angeles post-folk guitar shop/night club, McCabe's (the two later married, and Covey left McCabe's to live with Thompson in England).

This element of latent melodrama was resurrected last year when Linda Thompson's first solo record came out within weeks of *Crowded Room* and the media speculated as to the confessional content of the two albums. Thompson cringes at the gossip-mongering, denying that his songs are windows on his private life.

At a point when technology runs hand-wringingly amok and pop music has some hard motivational questions to account for, Richard Thompson's music stands apart with a raw, unsullied charm and individualism. The question now: is the public all ears? Or will Thompson remain a specialty item?

Mix: Was *Daring Adventures* a difficult record to bring to life, or do you feel as though you have a handle on the process by now?

Thompson: It was an extremely easy record to make. This was done really

THE FAR SIDE By GARY LARSON



quickly, basically live. It was a breeze. Broadly speaking, making records has gotten easier over time. The way I choose to make records is to do them as live as possible in the studio. If I was going to take a different approach, it would slow me down a lot and I could start having problems.

I find it boring to spend too long in the studio. I find it unmusical to labor for a certain kind of perfection that, for me, is a little sterile. Some people can do it very well; they create excitement out of the studio situation. I flounder under those conditions. I run aground.

Mix: You changed the circumstances of the recording this time—different producer, different band, Los Angeles studios. Were you looking for a fresh perspective on things?

Thompson: Yeah. Every few records, you have to change things just for the sake of change, to provide a new challenge, to stimulate yourself.

Mix: Was it easy to adapt to Mitchell Froom's style after working with Joe Boyd?

Thompson: He's great, a really fine musician and producer. I suppose Mitchell comes from a musician's perspective in the first place. He contributes keyboards to the record. Coming from that side, he'll have a more participatory musical contribution. He'll have ideas for arrangements.

It's a matter of what you need on your team for a record. Do you need an engineer/producer? Do you need an engineer and a producer and an arranger? Who have you got and who do you need to fill the holes up, to get the right team to make the record? It's interesting to just have someone with a different slant.

Mix: It would seem that he encouraged you to dabble with new sounds. For instance, how did that odd bagpipe solo on "Bone Through Her Nose" come into play? The dense, whining timbre sounds like something one would call up on a Fairlight.

Thompson: It's a couple of medieval instruments [Chinese shawms] that are actually blown. The musician who played that—Phil Pickett—I've used on records before, and I kind of envisioned the part for him on that song. There are no Fairlights on the record. It's 100% natural. It does sound like a synthesizer; it's a medieval synthesizer.

Mix: Is that a theremin on "Baby Talk?" That's a very low tech touch on your part.

Thompson: Yeah, it's a theremin, which is, again, a medieval synthesizer. It's a wild instrument; it's hard to control, an untrained stallion that you

have to wrestle with. We did, with great difficulty.

Mix: Your basic sound is consistent with your earlier work but there are subtle changes; the drums sound bigger and, if I could be ethnocentric, more *American* than before. Is that a conscious effort on your part?

Thompson: Not really. I think it's the way Mickey Curry sounds as a drummer. He gets what I think is a great

—CONTINUED ON PAGE 119

Four, one of Britain's most topical bands with a danceable punk-meets-funk attack. Vocalist and keyboard player Barry Andrews appeared on the first two records by popsters XTC; was recruited by the eminent Robert Fripp for his League of Gentlemen, and recorded with his own ensemble, Restaurant for Dogs. Shriekback's core trio is fleshed out by drummer Martyn Barker, whose skipping rimshots, percussive showers and rhythmic ripples create the structure on which the



Shriekback Go Bump in The Night

by Rachel McBeth

Zen bass, pervo vox, insect cymbals, Star Trek vocals, intra-uterine bass drum: are these liner notes for real? It just so happens that, in fact, they describe sonic ingredients suspended in the mix of a London-based trio named Shriekback. Their latest record, *Big Night Music*, is Shriekback's fifth and most versatile release, ranging from songs reminiscent of the hushed elegance of a Chanel commercial to torrential waves of melodic percussion like the soundtrack to some primitive rite of passage. *Big Night Music* is for people who aren't afraid of the dark.

Formed in 1981 by renegades from the period's most auspicious bands, Shriekback are a distinguished pop hybrid. Dave Allen, the word FACT tellingly emblazoned across his bass, was an original member of Gang of

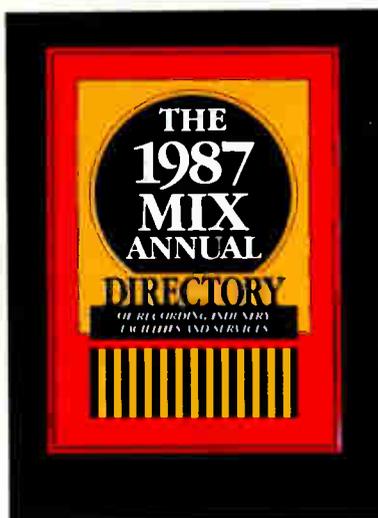
band's sonic blanket rides.

The responsibility of committing the Shriekback experience to vinyl has often fallen to Barry Andrews, who has assumed the mantle of producer. Self-produced from the beginning, Shriekback have learned over the years how to tame the studio. Ironically, bands did not pay much attention to the recording process back in '78 when Andrews, with XTC, was landing gigs aplenty in the heart of London's teeming scene. Using the studio as anything other than a faithful recorder of live music was considered cheating. He noted the inevitable trauma, however, that bands endured when their forays into the studio resulted in flat, boring (albeit accurate) recordings. With XTC, faithful recording was taken to such an extreme that variations were not allowed during studio takes, since compositions were deliberated like mad and decided in advance. Andrews saw that XTC's studio censorship and their disdain of overdubs disrupted the creative process and probably denied them the thrill of discovery. He now encourages even young bands to invest some time

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playing around with the recording process.

Beyond studio experience, there were notables along the way who also contributed recording strategies to Shriekback's evolution as producers. Robert Fripp, a master at layering guitar over tape loops, taught respect for the value of "not flogging a dead horse," as Andrews describes it. "One, two, three, four, five takes at the most. The spontaneity tends to emphasize strengths, especially with the rhythm tracks." When Fripp and Andrews met up with Brian Eno while he was producing *Remain in Light* with Talking Heads, they learned why Eno referred to himself as "the wipist." Andrews remembers, "He was listening to various tracks, and if he found something like dreadful Arabic synthesizers, he had the engineer simply punch erase."

When Andrews was recording his first solo EP with the talented Hugh Padgham and Martin Rushent engineering, "a fatherly hand was not forthcoming" and Andrews found the resultant record dreadful. He has come to the conclusion that the role of the producer (or co-producer) is to take complete responsibility for a project and to support whatever is happening. He claims to despise any producer who is "irresponsible, takes the money, and does the minimum."

Andrews learned to manipulate electronic tricks on his own when he went into the studio with Restaurant for Dogs. "Research and development on Shriekback," he calls it. "The stupid stuff you have to go through: recording drums in the toilet, various percussion on one mic, backward pianos and tape loops... a great laugh with a huge tapestry of racket."

On to Shriekback and their first EP, *Tench*, which was released in Britain in 1981. The first album, *Care*, appeared in 1983, was briefly available domestically on Warner Bros., and contained a popular dance cut, "All Lined Up." *Jam Science* was released in 1984, scoring a chart single with "Hand on My Heart." These early works were surprisingly sophisticated, moody, polyrhythmic and turbulent, with strange sounds like electricity, buzzing clarinets, and bamboo wind chimes coexisting comfortably in the mix. It's as if each sound has its own story, personality, and location. For their next album, *Oil and Gold*, released by Island in '85, Shriekback spent six months in the studio. The music from this extended sojourn was likened by Andrews to "sand when it's washed by the sea a lot, where it's difficult to tell the different parts because everything has been ground up and homogenized." He credits engineer Gavin Mackillop for a redeem-

ing mix which, on one track, transformed a synthesized sound like sawing wood into a lovely and soft cabasa.

With Shriekback's current Island release, *Big Night Music*, the band presents a more "traditional" record. For starters, most of the songs were written in the rehearsal room rather than in the studio as before. The current songwriting approach creates an instrumental cohesiveness of great poise and delivers cuts ranging from the melodically lush to the physically tight. Furthermore, production on some tracks only required simple overdubbing, as Andrews explains, "like dotting the i's and crossing the t's to make it sound richer and denser."

Once possessed to toy endlessly with tape loops, drum machines and walls of MIDI, Shriekback diverged from previous habits on *Big Night Music*: the album was recorded entirely without sequencers, drum machines, nor "digital heartbeats of every kind." Having emerged from the punk milieu, Andrews contends, "where good craftsmen were considered undignified, Shriekback have rediscovered the wonders of playing instruments. We also didn't want to become boring, old non-musicians talking about equipment."

Don't get them wrong: "Shriekback are not and never will be anti-machine," Andrews adds. "We're just less infatuated with the hardware." Sampling devices, on the other hand, quite excite Andrews, allowing for the manipulation of found sounds. Sampling on *Big Night Music* recycled unique tracks from *Oil and Gold*, and allowed the drummer to finally capture the "terrifying quica of hell" (a South American percussion device that had been tormenting poor Barker). Andrews relishes the possibility of using the Synclavier and Fairlight III in the future but, as yet, he hasn't had the money or time to develop a relationship with these elite instruments.

Out on the road, when Shriekback hit the stage they often perform an act of alchemy: turning mere spectators into a putted mob. Although their songs aren't recorded with a tour in mind, successful live translations appear, Andrews has learned, if one appreciates "the different disciplines of studio and stage." Parts are modified on occasion, as in the case of one technological breakthrough where a studio horn section was replaced by kazoos live. As this innovation illustrates, the seven-piece touring band is pared down to essentials—without detriment, Andrews notes, "since a small amount of stagecraft goes a long way."

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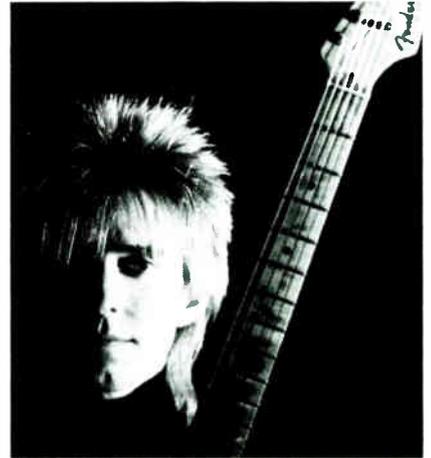
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Dan and The Soft Machine as bands that have looked to William Burroughs for a name. Shriekback employed the author's cut-up technique of clipping words out of newspapers and randomly reassembling them to create new visions. With the release of *Big Night Music*, Shriekback have indeed created a musical vision worth exploring. ■



Eric Johnson

Austin's Secret Goes Public

by Bill Milkowski

When Texas guitar heroes like Billy Gibbons, Johnny Winter and Stevie Ray Vaughan are asked to list their favorite guitarists, invariably the name Eric Johnson appears in the top five.

When I put that question to guitar great Steve Morse a few years ago, he said, "There's a guy in Austin named Eric Johnson. Nobody's gonna believe it when they hear him live. I had to pick up my jaw the first time I heard him. This kid is too much."

Well, the secret is out. Austin's resident guitar hero has gone public with *Tones*, his auspicious debut on Reprise/Warner Bros.

Already he's being called one of the best electric guitarists anywhere, by critics and fellow guitarists. And it's no mere coincidence that Eric's album appears on Reprise, the label of Jimi Hendrix. In terms of technical virtuosity and sheer spirit, Eric is in many ways continuing the Hendrix legacy. One need only drop the needle on "Victory" to hear that.

Says the unassuming Texan, "That tune is kind of my homage to Hendrix." And rather than aping the wild, frenzied feedback side of Jimi's playing, Eric focuses more on the man's lyrical side with this tune. "Of course, the whole spectrum of Hendrix is great," he adds, "but those tunes like 'The Wind Cries Mary' and 'One Rainy

Wish' are really where he defined his subtlety. He had so much feeling and emotion in his playing on those songs. On all his songs. He always played with so much heart that he transcended technique."

It's no surprise, then, that Eric includes both "The Wind Cries Mary" and "One Rainy Wish" in his live sets, along with many sizzling originals like the blistering "Zap," the haunting "Desert Song" and the rocking "Soulful Terrain." And the kid can sing too, as he proves on "Emerald Eyes" and "Bristol Shore."

Which presents a sort of dilemma. Yes, Eric Johnson is an amazing guitarist, a tremendous talent, an exciting progressive instrumentalist. But because he can also sing, has a certain fondness for pop structures and has pop star cutes in the looks department, he could go in two directions. Eric Johnson could easily become either the John McLaughlin or the Peter Frampton of the late '80s.

The 31-year-old puts it in perspective: "I have mixed feelings about it. On the one hand I kind of like that balance of instrumental and vocal tunes on an album, but I think the vocal thing has a ways to go. I really don't feel all that comfortable right now with my voice. I think it's coming along and I'm encouraged by the progress. I mean, when I first started singing it was really a joke. I couldn't sing at all. So I don't want to throw a lot of weight on the vocals. I don't think my voice is good enough yet to bear that responsibility."

I guess that means we won't be seeing Eric pulling a George Benson in concert—strolling the stage with a hand mic during the first five songs in a set while his guitar sits idly by.

Yet, in spite of his instrumental flash, his connection to the Mahavishnu Orchestra and Jeff Beck and Chick Corea, he still loves a good pop song. "I grew up on The Beatles—'Hello Goodbye,' 'Penny Lane.' A well-produced pop song turns me on as much as listening to a very 'outside,' obscure instrumentalist. And I haven't arrived at it yet but I've tried to figure out an alchemy of those two, where you can have these Beatles songs and these wild guitar things too."

The missing link, of course, is Jimi Hendrix, who often blended the two worlds brilliantly ("Crosstown Traffic," "Purple Haze," et al).

But Eric is careful to let this alchemy evolve naturally. "If you're going to write a pop tune, it's got to come from the heart. If it comes from the head, if you're just looking around and checking out what's trendy or marketable and then follow that, I don't think that will get over. Whatever pop music you

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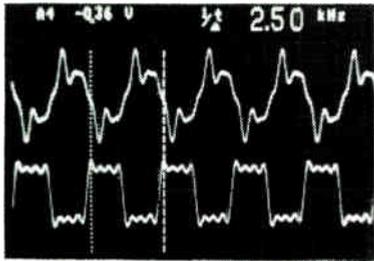
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do, let it be an inspired thing, in the same stream that the 'outside' instrumental stuff would be coming from. If there's some way to accomplish that marriage but still have it be as pure as possible... it's a goal to shoot for.

He adds that he'd like to do an all-instrumental album in which he further explores violin-type sounds on the guitar. And he'd also like to do an acoustic guitar album, possibly with his good friend Steve Morse. But, he wisely adds, "I don't know when it would be *smart* to do that."

Until then, Eric Johnson will continue searching for this elusive formula, this blend of pop and astounding instrumentals, and amazing legions of guitar enthusiasts in the process.

With his first band, The Electromagnets, Eric recorded a regionally-released album in 1975 that attracted a cult of guitar fiends but failed to attract a major label deal. But those Mahavishnu-oriented days are behind him. Now Eric's got a major label and he's singing for his supper. The guitar crazies will always turn out to see this guy because he *is* one of the most amazing players in the world today. But who knows? With those MTV looks and that gentle, appealing voice, he may begin drawing Duran Duran fans as well.

More power to him. It's gotta be a drag being an underground legend. ■



Marching On With New Model Army

by Dan Daley

The name "New Model Army" dates back to the 17th century, when Oliver Cromwell defeated Charles I and gave British democracy its first tentative toehold. "We like that part of English history," says drummer Robb Heaton, a.k.a. Rokk Arthrobb.

Recent history, however, poses a

problem for the trio, which includes Justin Sullivan (a.k.a. Slade the Leveler) on guitar and Jason Harris (Moose) on bass. (Don't lose any sleep looking for significance in the pseudonyms; Heaton says they're "just a bit of fun.") Their Capitol/EMI release, *The Ghost of Cain*, is rife with images of a world that no longer cares, a world where revenge is a justice all its own.

The band's agenda is perhaps best characterized by the single and title track from their previous album, "Vengeance," which was banned from British commercial airwaves last year, ostensibly because it contained the word "bastard," and which may or may not have had something to do with the U.S. government's refusal to allow NMA to tour here (citing a lack of "artistic merit")—a decision which was reversed by the State Department last December as mysteriously as it was imposed. "So three band members from England have 'no artistic merit,'" muses Heaton. "Why should that worry the United States government? What is artistic merit anyway? In England, we have a lot of American bands that I'm not particularly fond of, and I'm also not particularly fond of American cruise missiles. But they're there."

About "Vengeance" Heaton says, "Something we sing a lot about is having our own sense of law and order. When justice fails to be done... it embitters people. Aside from the fact that this sort of thing leads to vigilantism, it also plays right into the hands of fringe organizations like the National Front here in England, or the Klan in the United States."

"The Hunt," from *The Ghost of Cain*, echoes those sentiments. An ominous tale of personal revenge against an anonymous corrupter of youthful innocence, the song bears witness to all the frustrations an urban society heaps upon people—what Jules Feiffer dubbed "the little murders:" the small injustices that individually seem bearable but which when weighed collectively rob us of our humanity.

"The law is supposedly set up to protect people," says Heaton. "People shouldn't have to take it into their own hands. But when all else fails, people will take it over. They have to."

A recent and well-publicized brawl in Edinburgh, Scotland, threw New Model Army into the maw of the legal system they write about. Club security beat up a fan, according to Heaton, and the band asked that the bouncer be dismissed. The bouncer later returned, and when the band confronted him a fracas started that left Heaton and Sullivan with concussions and the erstwhile security man with two missing teeth.

The irony of having to deal with the police and with lawyers from both sides is not lost on Heaton: "We were bitter about the fact that the police believed the club owners over us simply because we're musicians and musicians have, you know, reputations. But it really points up the fact that the little guy is insignificant in the eyes of the law and he suffers for it. It's not a perfect system."

The band's politics are crystal clear, as evidenced by their description of England as "the 51st state." "We're under America's thumb from all angles—culturally, militarily and politically," says Heaton. "And it's not only England, but all of Europe. We don't like American policies, Reagan's policies, we don't like [British prime minister Margaret] Thatcher's policies. We don't feel as if Europe should be part of all this. Wherever we play on the continent I get that reaction. But I want to stress that it's not against Americans themselves. And," he adds, "I'm not particularly against Ronnie Reagan personally. He seems like a nice old granddad."

He's hedging a bit, but Heaton sees it as being pragmatic. "We're not here to ram things down people's throats or get on a soapbox," he argues. "When we were younger we were more naive and thought we had all the answers. All young people do. Right now, we mean a lot to a very small number of people in the world, and we'd like to mean that much to a lot more people."

"If we were articulate enough to be politicians then we would be so in order to make people's lives better. But we aren't. What we are is musicians and what we can do is play our music and live it and show people what we believe in. We think there are lots of things wrong with society, with societies in general, and plenty wrong with the music business, too. But we've chosen a path and we intend to stay on it."

Ah, the music business, long a favorite target for artists who enjoy biting the hand that feeds them. But in New Model Army's case, their rancor is applied to both record companies and to artists who willingly participate in style-over-substance abuse. "In the pop business, at least in England," Heaton remarks, "it seems that if you know the right people and if you dress properly and go to the right parties and don't sing about anything in particular in your lyrics, you have a very good chance of being successful. We try to keep what we're doing separate from that sort of thing."

While New Model Army aren't terribly fond of all the stuff pop stars must endure—record promotions and appearing on the telly are two of Hea-

ton's personal gripes—they were more than pleased to have worked with a pop institution on *The Ghost of Cain*: producer Glyn Johns.

"Our manager, Nigel Morton, wanted us to record with him because he thought Glyn could recreate what we do onstage," recalls Heaton. "We couldn't afford him at first and he also turned us down at first. We had used other producers on our other records and none of those records ever came up to our expectations. So when Nigel convinced Glyn to do the record, we found out very quickly that his approach to recording is exactly what we're about. We're a live band rather than a studio band. Glyn put us all in the same room, miked the drums very sparingly, listened for where the room sounded best and placed the rest of the mics accordingly. Then we'd play. It was almost a live album in a sense. Many of the tracks have no overdubs other than vocals."

The record was recorded at Townhouse 3 in London, formerly Rampart where The Who had recorded a number of their records.

"At first Johns thought we were a very loud punk band and he wasn't particularly impressed with what we had done on other records," remembers Heaton with a laugh. "But Nigel kept hounding him and gave him a rough tape we had done onto one mic in the middle of a room and the material impressed him. Then he heard us play live and thought we were good musicians, something which he hadn't given us any credit for before."

New Model Army can play; *The Ghost of Cain* proves that. But do chops and a heavyweight producer provide enough of an edge to get across NMA's socially-charged anti-pop? For that matter, is rock and roll a viable medium for messages anymore? Justin Sullivan had remarked, "Rock and roll is... ivory tower, irrelevant, gutless and separated from most people's lives." His partner's reaction to that statement is measured. "I've been in the business four or five years and I don't think I'm qualified to say whether rock and roll is getting fat in its middle age," says Heaton. "But I do think it's gotten very stale and boring and controlled by the wrong people at the moment. And that bothers me." ■

—CONTINUED FROM PAGE 113, THOMPSON drum sound. But I've chosen his playing rather than his sound. That's what it is, really, not that we're trying to sound like Bruce Springsteen or anything.

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rade? You're pretty much have-Strat-will-travel.

Thompson: I'm not immune to it. I like it. We recorded analog and mastered digitally. I don't think at this point that I'd record digital, because I don't think it's good enough yet. Actually, I don't think digital anything is as good as the best analog. There are too many funny things about it.

Mix: Because of your straightforward approach, avoiding the latest gadgetry or excessive experimentation, your albums probably have a longer shelf life as opposed to Human League or even Talking Heads, whose records of only a few years back sound dated.

Thompson: I don't know. I wouldn't be trying to *not* sound contemporary. We really try to get the sound as good, as hi-fi as possible, but that's not the basic idea of the record. The idea of the record is to record a musical performance. Sometimes in that performance, there are quirks. If you do a live recording, for instance, you get people coughing in the audience.

I accept, as a part of the music, things like mistakes and the occasional crackle or buzz or bad sound or room sound or whatever. That's just an integral part of the music, and if you remove it, then you're removing something musical.

Mix: Has your status changed now that you're on a major label?

Thompson: Not really, the house with the swimming pool and the tennis court makes a difference, but basically I'm just the same humble guy. There are dangers inherent in large record companies in that they want to run things and tell you what music to record, or to be profoundly commercial. I have as much freedom as I've ever had, with the added advantages of better distribution and better facilities. No complaints.

Mix: Did you go into the project with a clear concept of what the finished shape of the album would be?

Thompson: It's just a bunch of tunes, the best available at the time. There may be some consideration given to suitability of tunes against each other, so I might actually leave a track off a record because it's too different. But mostly it's the best tunes fit together in a way that's most cohesive.

Mix: Are you compulsively creative? Do you feel incomplete if you haven't written a song in a given amount of time?

Thompson: There probably is a compulsion there. It's also something that's enjoyable most of the time. Sometimes it's very tedious, but in order to feel

satisfied with myself, I have to do a certain amount of work. Sometimes I have to be driven. I have to drive myself. Sometimes I have to do office hours.

Mix: Do you hit the wall of writer's block often?

Thompson: All the time. It's frustrating. It's like a job, an unusual job that allows me to do what I enjoy best. You have to go through barriers in order to do it. And that's part of it. You have to be frustrated to get the good stuff. Having routines and rituals helps.

Mix: Do you have any particular discipline that you follow?

Thompson: If I'm touring, I can't really apply discipline. When I have the time to write, I'll sit down at a certain time and work for a few hours, and then work again for a few hours later in the day, trying to keep it the same time every day, always use the same pen and notebook, same typewriter.

I read an interesting article in the London *Times* about writers. I think it was Jeffrey Archer who said it drives him crazy when people come in the house and see him staring out the window, and they'll say "can you do the washing up or do something instead of just sitting there?" And he'd say "you don't understand—I'm working when I'm staring out the window."

Mix: Do you consider yourself a writer foremost, or a guitarist?

Thompson: Writing is probably the thing I find the most interesting, but I really like to do both. Just doing one of them drives me crazy.

Mix: When did you arrive at your signature guitar sound?

Thompson: People tell me I sound Knopfleresque. [Smiles] I've been playing Strats with that kind of sound since about 1969. It's become a fairly standard thing now, where you jam the pickup selector between the second and third pickup and you get the out-of-phase position. I think that's what Hendrix did. You get a nice hollow sound. I think I was trying to get the Strat to sound like a Telecaster; I really wanted a Tele but I couldn't find a good one.

Mix: I notice you have a well-defined fondness for the key of D. It seems tailor made for English folk music, with all those ringing open strings and abundance of fifths. Do you like to take advantage of the low D?

Thompson: It's also a good key for me to sing in. I've always preferred D to open E, a real boring key. D's a great acoustic guitar key. It's a good drum key. It's one of the main keys if

you play with fiddle players and accordion players—D, A and G mostly. Everything is right there—G and C, conveniently located, which is just fine. Yeah, I like D. A big D fan. I'll go for D anytime.

Mix: What are the specifics of your guitar: when did you get it?

Thompson: I've had it since about '71. It's the only one I've got. I'd like another one.

Mix: It's not that you're monogamous to it.

Thompson: No, I'm just broke. I bought it in a shop in the days when you could buy them. It must be a stock Fender, '57 I think. Pickups are standard. I've got a slightly modified tone; I think the effect is just that it's warmed up.

Mix: You always like to use a large amp, many speakers?

Thompson: Not really. For recording, I use a small amp, a Deluxe with one speaker—it's a piercingly loud 50 watts. On the road, I like to use a Musicman 4x10. I use a Roland stereo chorus.

Mix: Who had a big influence on your guitar playing? You don't bear the typical stamp of an Eric Clapton fanatic.

Thompson: James Burton, I think, the first real Fender guitar player. I never really heard Roy Buchanan until this year. He's a great player, a wonderful player, but I never saw any records in England at all. Django Reinhardt—I used to listen to him, great stuff. Les Paul. Johnny Smith.

A guitar player I was always impressed with was Ida Prestey, a classical guitar player. She was killed quite young in a car crash. She had the best vibrato; a heavy metal guitar player would weep for her vibrato. I used to love her playing.

Mix: You have an unusual, quick vibrato yourself.

Thompson: That's probably where it came from.

Mix: Were you ever into a heavy ethnomusicological bag?

Thompson: Oh, I always have been, yeah. In Fairport, we used to go straight to the weird section of the record shop. Funny stuff, internationally speaking. I'm sure I was the first person in London to listen to Cajun records, back in '65.

Mix: Is that where the accordion came in?

Thompson: That's more from Scottish music. My cousin used to play in a band with an accordion, two guitars, bass and drums, doing guitar instru-

mentals and Scottish dances, swing tunes.

Mix: You're perceived as being an eclectic kind of guy?

Thompson: Me? I'm Mister Roots.

Mix: Do you have any identification with willful eclecticism, snatching ideas from here and there or anywhere you can?

Thompson: No, I'm not one of those at all. I'm not an art school type; "what's happening this month? Oh, Africa. Yeah, let's get some African music in here." Basically, my scene is rock and roll and traditional music—the two things that I really like the most. I like to stick those together in various combinations. Those are the most interesting things to me. Then I can spice it up with a little jazz or a little Peruvian music.

Mix: How do you view the current pop scene in general?

Thompson: The current pop scene is truly abysmal. I actually listen to a lot of stuff, but the good stuff doesn't really get on the radio or even into record companies. It exists on the demo level or small labels. Radio's disgusting—junk. Anywhere—Britain, in the States—it's the same. It's been downhill since punk, as far as I'm concerned.

Mix: In Fairport Convention, you were actually doing some fairly rebellious things in your own way.

Thompson: Oh yeah, we were extremely nonconformist for the time.

Mix: Are you happy with the way things are going for you now?

Thompson: Oh yeah, it's fine, as long as I can make the odd record, do the odd tour, it suits me fine. I'm easily pleased.

Mix: People assume that you're the most autobiographical of songwriters, which is not necessarily true.

Thompson: It's a drag. I'm definitely not autobiographical, very much. And I wouldn't write literally about myself, because that's not very interesting. It's always more fun to take an idea or experience and change the story, to change the picture.

Mix: Are you as prolific as it would appear from your output?

Thompson: Oh, medium prolific. I write about 30 songs a year, about half of which get promptly ditched. There are endless ditching processes involved, various stages of refinement—like a sugar factory, I am, get rid of the little bits. I don't know if sugar is that good an analogy. I hope what I do is not that refined. ■

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Movie Music Memories

by Lou CasaBianca

Music has always been one of the most important elements in the creation of film. Music provides the emotional pulse, the aural background against which the visual and narrative action unfolds. In the last few years movie soundtracks have gained importance in the record business as well. From musical scores to "greatest hits" compilations, movie soundtracks have not only sold briskly in their own right, but have contributed directly to the artistic and commercial success of many films. Music in the movies and on television also has helped create an expanded market for higher quality audio for film and video post-production.

Last December the Film Institute of Northern California and the Mill Valley Film Festival paid tribute to some of the world's greatest film composers. The event, held at the Warfield Theater in San Francisco and co-produced by Bill Graham Presents, was a gathering of some of film's finest composers.

Over the course of several hours, the program featured brief speeches from various film music notables, innumerable clips demonstrating the range and scope of the artform, and special performances by Tangerine Dream (*Thief, Risky Business*), Ry Cooder (*Paris Texas, Crossroads, The Long Riders*), Stewart Copeland (*Rumblefish, Out of Bounds*), and others. Other guests included producer/composer Giorgio Moroder (*American Gigolo, Top Gun*), Howard Shore (*The Fly, After Hours*), Narada Michael Wal-

den, two members of film's most famous heavy metal band, Spinal Tap, Thomas Newman (*Desperately Seeking Susan, Reckless*), Michael Mann (producer of *Miami Vice* and *Crime Story*), rock impresario Bill Graham, and Jack Nitzsche (*One Flew Over the Cuckoo's Nest, An Officer & a Gentleman, Starman*). All in all, it was quite a star-studded affair.

What follows are anecdotes from a few of the speeches made that evening. Hopefully, they serve to underline the uniqueness of the film scoring business. And certainly we come away from these tales amazed that anyone could forge a career and keep their sanity working with film directors.

David Raskin

David Raskin arranged Chaplin's music from *Modern Times*, as well as the scores for *The Bad and the Beautiful* and *The Secret Life of Walter Mitty*. Since then, he has scored more than a hundred features and become active in promoting film music as art. The 1944 film, *Laura*, features Raskin's most famous score. He teaches film music at USC and UCLA and recently premiered a commissioned composition for the Library of Congress.

"It has been suggested that I might say a word or two about *Laura*. It was one of those things where the director, Otto Preminger, was a mighty tough cat, and had the bright idea of getting my boss, Alfred Newman, to do the music. He had heard that the film was in a little bit of trouble, so he declined and offered it to my friend, Bernard Hermann, who on hearing him out, decided it wasn't good enough for him

and decided to give it up for me. Well, I was considered a composer of detective story music for the studio and not really being considered for pictures with less stress. So they assigned me to the picture, and I immediately realized that it was a love story with a detective story background. That was how I treated it, and that was how the tune came to be born."

Julian Temple

Julian Temple left film school to direct rock and roll movies. In 1980, Temple made the Sex Pistols documentary *The Great Rock and Roll Swindle*. He has produced hundreds of rock videos for such artists as David Bowie, The Rolling Stones, and The Kinks. In the film *Absolute Beginners*, Temple got to live out a fantasy of directing a big MGM-style musical.

"For me the most total combination of music and film has to be the movie

"The challenge now is how to get out of the clichés and three-minute heavy metal videos. The feature-length musical is a fertile area that hasn't been sown in 30 years..."

musical. And by that I don't mean the kind of music film which we've seen a lot of lately, where the producer goes out after the film has been shot and checks the *Billboard* chart and picks a number of songs and hopes he's going to have a regular play list hit. It's sad about the lost tradition of movies built around the music from the beginning where the song and dance numbers actually tell the story, and the music propels the narrative, and gives the audience an idea of what the character is about through its own energy. To me, musicals would have to be the ultimate form in cinema. But only if they have all the ingredients of a normal film. They can effortlessly transform the viewers from external reality

to what's going on in someone's head. They can tell more about a character with a gesture or a phrase of a song than often many pages of badly written dialog will do. They can free them to take risks in terms of camera movement, in terms of color, in terms of the use of costumes and sets. It also allows them to explore the emotional impact of a moving painting. And I think that in the '40s and '50s, movie musicals directed by people like Vincent Minelli and Stanley Donen were the most popular films around. They were in sync with what the audiences wanted to see and hear.

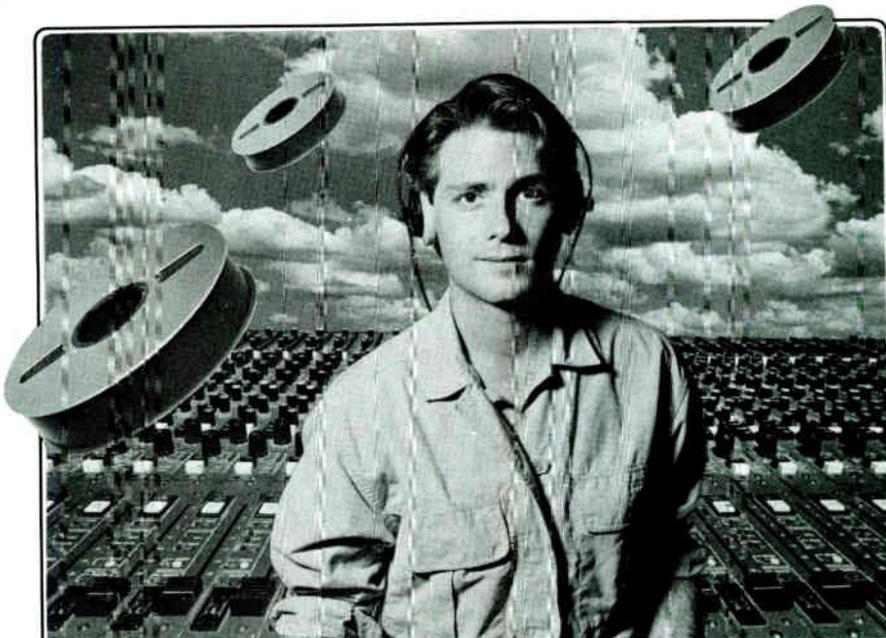
"By mid-'60s and through the '70s, despite the success of a film like *West Side Story*, audiences would run miles if they heard someone open their mouth and sing on a movie screen. The problem wasn't the musical form. The problem was the fact that those musicals had lost touch with the world and the music that was around. They were dinosaurs. Today, there's MTV, and I'm sure you agree that 90% of it is absolute trash. But I would defend the best music videos, in the sense that they've created the young audience that again is willing and able to understand and enjoy ideas and stories told through music and dance.

"It's kind of fashionable now to knock music videos and the people who make them, but I'd ask you to remember that in a way they really are the descendants of the spectacular music numbers of the '40s. After all, when you think of *Singing in the Rain* or *Bandwagon*, you don't remember the storyline, you remember the numbers. The challenge now, both to the music industry and the film industry, is how to get out of the cliches, heavy rotation and three-minute heavy metal videos. The feature-length musical is a fertile area that hasn't been sown for 30 years and it's time we did it. It doesn't have to confine itself to the sentimental love stories of the '40s; it can take the lead from *West Side Story* and explore some darker social themes.

"Hollywood is very happy, it has no qualms about accepting or using music to sell and even make sense of moronic, totally moronic films like *Top Gun* or *Rocky IV*. They use music, but they're not treating it properly. And what we should do is push them right over the edge and say 'Let's make musicals again' in the 1980s. There's no reason why David Bowie or Janet Jackson or Iggy Pop shouldn't be the equivalent of Fred Astaire and Ginger Rogers of the 1980s."

Elmer Bernstein

Almost every moviegoer has heard a score written by Elmer Bernstein



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(not to be confused with Leonard Bernstein). Elmer Bernstein, one of the busiest composers in Hollywood, is active in preserving vintage film scores and promoting film music as art. His credits include *The Man With the Golden Arm*, *Birdman of Alcatraz*, *Magnificent Seven*, *To Kill a Mockingbird*, and *Ghostbusters*.

"I'm going to just tell you this story about some of the things that happen in the life of a film composer, and the kinds of problems we have in communication with directors. This story involves the great director Cecil B. DeMille. I was writing the music for *The Ten Commandments* at the time, and Cecil B. DeMille was one of the directors who was very precise about what he wanted in the music. The music I'm referring to is from the scene of the Exodus—a huge scene where it seems to involve 8000 people leaving bondage in Egypt. We talked about an anthem-like thing, and the original piece that I wrote for that sequence was a very slow-moving sort of quasi-Hebraic sounding anthem. When DeMille heard it, he hated it. He thought it was terrible, it was wrong, it wasn't right, and I asked why. Interestingly enough this is a lesson in film music scoring, and I learned from it. He said it was too slow.

"Those of you who remember the film, when you see the scene, the people do move off in a very slow, dignified way. I said, 'Well I'm just reflecting what I see on the screen.' DeMille said, 'What you see on the screen I don't like.' He was very critical of the scene. He said, 'I don't like it, it's too slow, I would like the music to be a little faster.' I said, 'Well, won't that seem strange?' He said, 'No, trust me, it works.' That's one of the things you can do, you make a scene appear to move faster with music. Now comes the funny part. The 8000 Hebrews in this scene were being played at the time by members of the Egyptian army as extras. Mr. DeMille, trying to infuse me with the kind of fervor that he wanted in the music said, 'I want something that sounds like "Onward Christian Soldiers."' That's just a little look into the life of a film composer. I think it's wonderful that people out here in San Francisco are interested in the art of film music. Thank you for that."

Alan and Marilyn Bergman

Alan and Marilyn Bergman are lyricists whose achievements include three Academy Awards for their songs, "The Windmills of Your Mind" from *The Thomas Crown Affair*, "The Way We Were" and "Yentl."

"I suppose, to an actor, *A Streetcar Named Desire* was Marlon Brando's movie. To a writer it's a Tennessee Wil-

liams' movie. To a director it's Elia Kazan's movie. To us, it's Alex North's movie. Just as *Out of Africa* is John Barry's movie, and *Tootsie* is Dave Grusin's movie. The writing of songs has been an occupation of ours for about 20 years. A project begins usually with a phone call and we find ourselves, usually 9:00 or 10:00 in the morning, in a very dark, cold screening room. It's usually the first time the director has shown the picture to anybody. We've been very fortunate in working with directors who have the courage to shoot a scene and know when shooting the scene, that there's going to be a song, not must music, because the combination of music and lyrics and the image makes another entity entirely. We always remind people about what our friend Richard Brooks, the wonderful writer/director once told us. When he's writing a script, for example he's writing a scene that takes place on the beach. He said that as he's writing, he hears the sound of the water, the seagulls cry and he may hear some cars from the highway. But he said, 'there's some other sound, I don't quite know what that is but that's where the music goes.'

"In *The Way We Were*, we were given a wonderful title [to work with], the title of Arthur Lawrence's book, before he wrote the screenplay. The director said, 'I would like a song that would take us back to the year that they went to school together—so you'll remember.' Right before the song starts she sees him with the red-haired character. It all starts coming back to her and that song and the melody takes you back. One of the problems that challenges the lyric writer and the songwriter is exemplified in that particular picture. The most important function of that song was to take you back again at the end, to relive their old romance when she touches him in front of the hotel and remembers all the emotions of their romance. So it's not just a simple thing of putting a song to images. We knew the song should have a function in the picture other than just to be a good song. And for it to also be a hit record is an added pleasure.

"But the first master to serve is the picture, and we have had some wonderful pictures to work with, and some wonderful composers to work with and some terrific directors. We just heard from one of them. We were thrilled working with Barbra Streisand on her first film as a director [*Yentl*], and calling her and saying 'we have something we'd like you to hear,' and in would come your director ten minutes later and sing it for you. If you ask most composers, they'll tell you that typically directors are tone deaf. She was the exception to the rule."

Alan Silvestri

Alan Silvestri went from being an out of work musician to the top of the motion picture soundtrack business by landing just one job, the score to *Romancing the Stone*. Since then he's done at least ten movies ranging from *Clan of the Cave Bear* to *Deltaforce* and *Back To The Future*.

"What I have to offer is a little bit about luck and fear in the life of a young film composer. Luck that I was home on a Friday evening when I got a call from a music editor with whom I

"I'm a firm believer that there's a quality in film that has to do with getting energy on the media."

had done a television show. The show was called *Chips* and every week these two guys brushed their teeth and went out on choppers, taking to the highways of Southern California, to a maddening disco beat. And it was great—it bought houses, it bought a place in New Mexico, it was fantastic. So this Friday night after not working for a year, literally, a call comes from this music editor [who was working on *Romancing the Stone*] and he says, 'What are you doing?' I say 'nothing.' He says, 'There's this picture and they're stuck. They don't have anybody to do the score. They've listened to everybody's tapes and here's a guy, his name is Bob Zemeckis.' Bob gets on the phone and says 'Well Al?' 'Well Bob?' He says, 'Al, there's this guy and this girl, and they're running and they're in the jungle and these machettes are cutting all this stuff, there's shooting, it's raining and it's crazy and I need about three minutes by lunch tomorrow.' So I'd gone out and bought a few electronic keyboards and a Linn-Drum, and a few things and I figure well, why not try it? So I stay up all night and I do this three-minute rhythm track picturing this guy and this girl running through the jungle, machettes cutting and crazy, and go to lunch the next day.

"I walk in with this cassette, put it in the thing. They listen to it. They hire

me. They really can't substantiate this momentous decision. I mean these guys have been in the jungle, in the rain for two years of their lives, and now they hire some guy they don't even know. Anyway it was a happy ending.

"Then comes *Back To The Future*. This is a little bit of a problem because Bob [Zemeckis] is up to his eyeballs in getting this picture made. It's a Steve Speilberg film. They're spending a lot of money, and it's what we call 'an important career move' for all of us. So the problem is I'd only done one orchestra score in my whole life before this, a picture called *Fandango*, also a Speilberg film. (I remember the night my wife and I went to opening night—we loved the picture and the other two people in the audience loved it also.) So now I have this chance to do this incredible film and I go into the set as Bob is shooting the dance sequence for *Back To The Future*. So, as it turns out I say, 'Bob, we have to talk about music, we have to talk concept.' Bob's doing his director thing and he says 'Al, wait Al, I don't have any big pictures in my movie, when we were doing *Romancing The Stone*, we had jungle, we had guys running around with guns, it's raining, it's great, it's big, I don't have anything, you know what I need really in this picture is. . . .'

"Basically, what he was saying is he needed scope, he needed size, he needed muscle. Because he didn't have the images in the picture, he didn't have a chance to do spectacular photography so what we was looking for in the score was a way to bring size and scope to the picture. So I went out and hired everybody in town. I go up to Bob and I start to talk about the score, I say 'we're going to start on Monday and we have 98 musicians.' He goes, 'Whoa, wait a second, what are you talking about?' I say 'Bob, I booked 98 musicians to do your movie.' He said 'Who'd you talk to?' I said 'I didn't talk to anybody Bob, I just went and booked 98 musicians.' Well, I went through about nine tapes on my answering machine from Universal asking me what the hell was going on. It turns out it's the largest orchestra in the history of Universal pictures! It was thrilling to me and it was thrilling to Bob. I'm a firm believer that there's a quality in film that has to do with getting energy on the media. Somehow it's not only about the right notes. It's not about perfectly correct performance. It's about really capturing an excitement and an energy. There's nothing wrong with 98 musicians and there's nothing wrong with one. It was one of those things that seemed to be the right thing at the moment and it turned out fantastically for all of us."

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RECONSTRUCTION PERIOD

by Rose Clayton



There is no music industry in Memphis anymore. There hasn't been one for more than a decade. But there is still a small number of studios and a great deal of talent committed to creating some of the best music in the world.

Sometimes an awareness of what is *not* is an important step to changing what is. "For a time it seemed all the energy was in lamenting about its old

musical value," reports ZZ Top's Billy Gibbons. "Now I think you're seeing a lot more action geared at 'We're tired of talking about it. Let's go ahead and start making great music again.'"

Semi-Memphians since 1974 when ZZ Top brought its second album project to town, the band and producer Bill Ham divide their time several months a year between Ardent Recording and the Peabody Hotel, where

some of their songwriting has taken place.

It's not unusual to catch Gibbons pickin' at the Rum Boogie Cafe on Beale Street. The blues bar is a celebrity jamming spot, a favorite for out-of-towners, where you might catch members of Journey's band or Jerry Lee Lewis and Ron Wood sitting in with Don McMinn's Band.

What intrigues Gibbons about Mem-

Photo above: William Lee Golden, center, of the Oak Ridge Boys, receives a certificate as Honorary Memphian for recording his solo album American Vagabond at Sounds Unreel. L to R: producer Eli Ball, studio owner Jon Hornyak, Golden, his wife Luetta, Memphis mayor Dick Hackett.

phus is that mystical "something in the air," the respect Memphians have for musicians, and the free exchange of ideas that constitutes its musical climate.

Whether Gibbons realizes it or not, his presence in the music community and the success of ZZ Top's Memphis-based product have been a catalyst for a second generation of songwriters, musicians, producers and engineers who have observed that you don't need an active hometown music industry to be among the world's best. You do it by doing your best.

ZZ Top's *Afterburner* achieved double platinum certification in a shorter period of time than any previous release in music industry history. The "little band from Texas" was named *Billboard's* 1986 top rock group and was cited by *Amusement Business* as the top box office band. At press time, *Afterburner* had received a Grammy nomination for the best rock group vocal.

Other Grammy-nominated records showed a new willingness by veterans to take chances. *Class of '55*, the album that reunited Carl Perkins, Jerry Lee Lewis, Roy Orbison and Johnny Cash in the re-opened Sun and American Studios, was Chips Moman's gamble

*What intrigues
ZZ Top about
Memphis is that
mystical "some-
thing in the air,"
the respect
Memphians have
for musicians,
and the free
exchange of ideas
that constitutes its
musical climate.*

that focused world-wide attention on the famed Sun artists pickin' in contemporary style. A companion LP documenting the event through interviews was also recognized.

The soulful '70s oft-awarded duo, pop star Al Green and his gifted producer Willie Mitchell, joined together again and won a nomination for the male soul gospel performance of the year for *Going Away*, recorded at Mitchell's legendary Royal studio.

DeGarmo and Key, the rock band that practically invented contemporary Christian rock, was knocked for being too secular in its approach to *Street Light*, an album that has become a contender for the best gospel vocal performance. Once known as the rebels of Christian music, DeGarmo and Key also record at Ardent.

Other activity at Ardent included the current LPs of Joe Cocker, Phil Driscoll and Mylon Lefevre. Single records and overdubbing were done there by Journey's Steve Perry, the Beach Boys, Lou Rawls, Davy Jones, Jimmy Buffett's Coral Reefer Band, Stevie Wonder and Stevie Nicks.

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Womack, Willie Nelson, and Kris Kristofferson. On the schedule are new projects by B.B. King, Ringo Starr, Merle Haggard, Willie, and Willie & Merle.

But, no matter how impressive all this may sound to those outside major music centers, it is evidence only of healthy activity and not a sign of a resurgence of the music industry in Memphis.

Memphis has been concentrating on aggressively marketing the talent it has and hoping new artists will provide the impetus for a renaissance of the Memphis Sound and a return to prominence as a major recording center.

Leading the way in innovative rock recording is Sounds Unreel. A homey hangout in a nondescript building that served as a drugstore in the '50s, it provides the same kind of environment for channeling creative energy that gave birth to the old spirit of Memphis music.

"Everybody seems to drift in here that does rock and roll," says Jon Hornyak, who co-owns Sounds Unreel with Don Smith. "Word's got around that if you want a deal and cut here, we can get it heard."

That word is not rumor. It was Sounds Unreel that launched the career of Rob Jungklas. "With Rob we cut three sides and played them for Almo Irving," explains Hornyak. "They were interested, so we cut four more songs and they signed him to a publishing deal. This made the labels take a closer look at him as an artist."

It took a little more than a month for Jungklas to ink a deal with the Manhattan label where he was teamed with producer William Wittman to add four new tracks for the debut album, *Closer to the Flame*. Two hit songs and videos that gained wide exposure on MTV were evidence of Manhattan's commitment to the Memphis artist.

Sounds Unreel used a similar approach for songwriter/artist Richard Orange. Orange landed a publishing deal with Dick James Music. "He now not only has money to live on, but he's in a better position to go for an artist deal," Hornyak says. "Publishers generally work with A&R people anyway, so they can serve a two-fold purpose by pitching the artist."

"Before Jungklas got his deal it was tough to get A&R people to Memphis," Hornyak continues. "We got five label reps here for Rob and Richard, and we've got ten in to see Jimmy Davis."

One album that was instrumental in establishing credibility for Sounds Unreel was *American Vagabond*, a solo album on MCA by William Lee Golden of the Oak Ridge Boys. Pro-



PHOTO: KELLY K. CRAIG

The Replacements (shown here with engineer Joe Hardy) were recent clients at Ardent's Studio B in Memphis.

duced by Eli Ball and Booker T. Jones, the album has been a favorite with critics and industry professionals.

"For the past couple of years we have been building a foundation so labels will know what we can do," Hornyak says. "We know what a hit is. The question is whether it's right for the label. There's a different set of doors at different companies."

Until an act can gain an invitation onto a major's roster, Hornyak figures that simply gaining acceptance in the marketplace is a worthwhile pursuit. Sounds Unreel has been developing two bands, Good Question and The Crime, on its independent SUR label. Eventually Hornyak hopes to expand to in-house marketing and promotion, not only to increase the effectiveness of SUR Records, but to supplement the work major labels are doing on the albums of his rental clients.

Cotton Row Recording, owned by Ward Archer, Jr. and Nikos Lyras,

hopes to break an artist in '87 as a result of the seeds it has been planting for the past eight years.

"I feel we've got control of the best black talent around," says Lyras, who is currently negotiating a label deal with an L.A. company for singer Ella Brooks.

"I was in love with R&B in Greece," says Lyras. "I came to Memphis at the end of '76; it was the worst time. There was all this talent playing in the clubs, but nobody was working with them in the studio. Our philosophy has always been to develop local talent, but we had to have rental to cover overhead."

Cotton Row Recording gained its first measure of industry credibility when the demos they recorded on swamp rocker Tony Joe White landed him a contract with CBS and approval to cut there. White currently is in Cotton Row working on his latest project with two Nashville producers.

"It's difficult to spec projects when

Producer-engineer Nikos Lyras at Cotton Row Recording.



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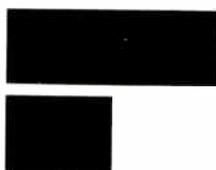
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you're working with rentals," Lyras points out. "It can take from four to six months to cut four sides and shop them to a major label. We can only do a few at a time and we're very selective. We have several artists that came close to getting major deals and we've learned from that."

"The biggest problem we've had is that we've always been developing artists, but we actually haven't been doing anything but getting them on tape," adds Archer. "It's quite expensive to do that. Also, we were constantly relying on lawyers to make deals for us. We thought that was the way business was done. But we've grown up a lot now. We know that what we do is good and that we are welcome in people's offices. They want to hear what we have. They can always say they don't like it, but they want to hear it."

"We've never had a problem getting in to see people on the few shopping trips we've been on," Archer continues. "They have been very kind. We have been at fault from a marketing standpoint."

Cotton Row's determination to more aggressively market the product it believes in has led to the decision to open New Memphis Music Inc. The publishing company is headed by William Bearden, assisted by Melonie Hunolt, and concentrates on complete organization and follow-through of song promotion. Ideally, the association with A&R personnel and producers will increase the opportunities for songwriters and artists.

"People in Memphis have been out of grace with labels for a long time," Archer says. "There are so many people after A&R guys it's up to us to make a noise. Fortunately for us, Memphis has a real strong history of hit songs. Hopefully we'll be a driving force in the creative atmosphere of the city."

Ardent Recordings' approach to developing new talent is like Cotton Row's—a limited and selective process contingent on studio availability. "Our main business is providing studio rental and production services to other acts," explains John Fry, Ardent's owner. "We have had a limited amount of time to spend on developing new talent in the last three or four years mainly because the possibility of getting acts signed looked bleak."

Fry points to figures that show a steady decline from 5000 to 2000 records released annually by RIAA record companies from 1976 to 1986.

"What the record companies were trying to do, obviously, was trim their rosters of marginal acts," he says. "There has been a steady regression.

You have more people competing for half the space. Up to a year and a half ago, there was small stimulus for getting acts signed. Now there seems to be a more active expression of interest from major companies to acquire acts, so we have begun some in-house productions on a very selective basis. I wouldn't be in it at all if I didn't have studio producers with potential. When they find something they believe in, we try to work it out." Fry stresses Arden's posture is definitely not one of soliciting or auditioning new acts.

Fry says he is skeptical about taking the route of releasing product on an independent label to increase the possibility of having an act signed to a major. "It's always been difficult for me to define all the factors A&R people put into decisions," he says. "From a business point of view, if someone came to me with product that generated airplay and sales, I would think they had proved its marketability. In the old days, it was in vogue when you had regional labels, but lately it hasn't been so.

"It's hard to test market a product now because of several factors," Fry continues. "You have to get enough population to get measurable results—not too small, but not too large to supply. You need a willingness on the part of radio to experiment on the basis that they hear a record and like it, and cooperation on the part of the retail market to supply records if people hear it and want to buy it."

Memphians have great hopes for a reconstructed music industry, in part because they have faith that Chips Moman can attract major label interest for acts that he is developing with co-producer J.R. Cobb, former guitarist with the Atlanta Rhythm Section. They have been working with such acts as Reba & The Portables, Cool Breeze and Stephanie Smith. Chips Moman Music has signed exclusive contracts with a dozen of the city's songwriters, who are now hoping to land cuts on records by the major acts Moman is recording.

At Royal, Mitchell and cotton magnate Julian Hohenberg have formed Waylo Records in hopes they can develop a following for Michael P. Allen and Lynn White. According to Mitchell, he has been successful through the locally-owned Select-O-Hits in obtaining favorable distribution for Waylo.

The general attitude here is that music would be better if everyone involved were more willing to take chances. Naturally Memphis would think that way. Taking chances has always been what Memphis music does best.

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MEDIA GENERAL:

Staying on Top of the JINGLE JUNGLE

"You must sell the products with well thought out lyrics, great music and masterful engineering."

by Deborah Camp

Recording engineer Joe Dixon remembers an 8-track studio in Memphis called Pepper/Tanner. "It was in the early '70s. Back then, they'd bring in a full ensemble to record—musicians, brass, everything," says Dixon. "It was, even then, well-known as a jingle facility."

It was also during that time that Pepper Records, a subsidiary of Pepper/Tanner, recorded such artists as Rita Coolidge and Eddie Harrison. Eventually, Tanner and Pepper reorganized the business and it was renamed the William B. Tanner Company.

In July of 1982, Media General, a diversified communications conglomerate, purchased the capital stock of the William B. Tanner Company for approximately \$36 million. The marriage of the two companies made Media General's broadcasting arm one of the largest media placement companies of its kind. Broadcast time was acquired by the exchange of products and services and supplied a hungry broadcast industry with thousands of contracts to radio and television stations nationally and internationally.

In the studios, hundreds of jingles were produced weekly, providing engineers like Dixon with a steady flow of work.

The following year, the bottom fell out. Dark days loomed as agen-

cies of the federal government embarked upon an investigation based on allegations that the company's president, William B. Tanner, and some of his associates, had committed tax fraud and other unlawful acts. Shortly thereafter, the company began its own investigation and it wasn't long before Tanner was removed as president and management was purged of other high ranking personnel. In addition, the company changed its name to Media General Broadcast Services in an attempt to further disassociate itself from the Tanner scandal.

In March of 1984, Media General instituted a suit against Tanner, later filing a \$75 million civil suit against the accounting firm of Touche Ross for its failure to provide a truthful audit to Media General prior to the acquisition. In January of 1985, William B. Tanner pleaded guilty to three counts of felonious tax fraud and one count of federal mail fraud.

Still reeling from the unwelcome spotlight and adverse publicity, Media General, in the summer of 1984, yanked a portion of its sales force and buying operations out of Memphis and transported them to New York. The music, travel and corporate services remain in Memphis with some 250 employees working at three locations.

Throughout the ordeal, which left many employees uncertain and nervous about their future, Dixon and the other engineers just kept on doing what Media General

Broadcast Services is known for throughout the world—producing syndicated music libraries for radio and TV. Luckily, the reputation of the creative and technical services was strong enough to survive the heat. According to Dixon, "Production was never much affected."

Today, MGBS enjoys a reputation for being one of the world's largest suppliers of original source music such as jingles, radio and TV station IDs and commercials. Approximately 100 to 125 pieces of original music are produced weekly. A typical day involves 20 to 30 productions.

Dixon has little patience for prima donnas and those who would have you believe engineering is more than a craft honed by years of experience. And he is particularly turned off by the myth that jingle engineers don't know anything about the production and engineering of album projects.

"The product libraries we produce incorporate the same considerations that go into the engineering of a phonographic studio," says Dixon. "We are dealing with a more condensed form of music, but when you're mastering to disc, you have the same problems. It doesn't matter if the music is 30 seconds or five minutes long."

The creation of product libraries is an activity that takes up about 80% of Dixon's time at Media General. The libraries are comprised of discs, each containing six 60-sec-

ond (or ten 30-second) songs that are generically applied but address brand names. For example, a local Ford dealership may want a commercial that identifies the Ford name but with a local twist.

For this client, "We would produce a 60-second spot with a full-song version," Dixon explains. "It would start with a slug at the beginning, that is, a line which is sung that describes Ford. You would *not* use 'Have you driven a Ford lately?' with the music that usually identifies Ford on a national level. We *could* use that line with new music, though.

"So, we'd slug it in the front, the middle and the back of the commercial. Then we'd rewind the tape and go back and put that slug in the beginning and in the end and delete the one in the middle. Then we'd do a 60-second instrumental and then a 30-second version of that. So, for one 60-second cut, you'd get six versions, and for a disc that contains six 60-second instrumentals, you'd get 36 versions. That way, the radio stations can use whatever they want."

If jingle production sounds tedious and complicated, it's worth it because jingle business is *big* business. In addition, a lot more effort goes into commercials these days because the public demands a lot more from radio, including commercials.

"In what we do, the lyric is the most important thing," says Dixon. "The music is the vehicle which carries the lyrical message. Some of the 'old school' used to think you should put the lyrics right on top and whatever happens to the music was secondary. But today the public is more sophisticated. You must sell the products with well thought out lyrics, great music and masterful engineering. People are just more educated about sound."

Media General will soon release some of their music libraries on compact discs.

Dixon, who has been with the company since 1971, is basically pleased with the facilities at Media General. "I think our studios pretty much represent state-of-the-art technology in recording with computers."

The studio uses a Harrison MR4 console, with automation equipment, Mastermix, made by Audio Kinetics. They master exclusively with 3M 250 on 2-inch machines and Ampex 456 on 1/4-inch or Scotch 250 on 1/4-inch.

Dixon estimates he's recorded/produced over 6000 jingles. "It may not be your #1 hit record, but it *is* your #1 hit record in terms of how effective it works for your client," he says.

Apparently, clients such as Sears, Westinghouse, Holiday Inn and Bayer Aspirin agree. Currently Media General has around 200 large advertisers servicing over 6000 TV and radio stations nationwide. The company boasts a history of over \$600 million in media placements.

For a company that's had more than its share of adversity, Media General has remained a tenacious, hard-edged competitor in the jungle of jingle production. Says Dixon, "We've continued to move forward because we have sustained our reputation for delivering quality work. After all, we've got the equipment. And we've got the ears." ■

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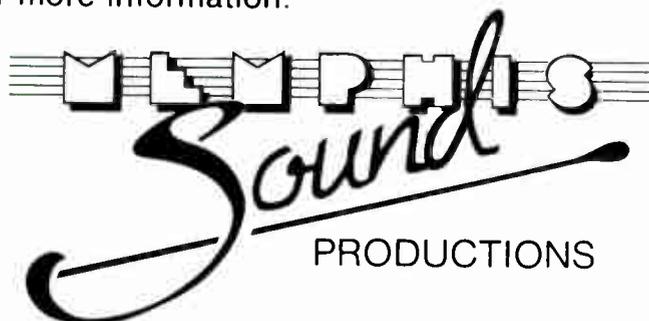
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STUDIO • DIRECTORY

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- 138** 2, 4, & 8 Track Studios
- 142** 12 & 16 Track Studios
- 154** 24+ Track Studios

The information in the following directory 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. **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.

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- Remote Recording/Sound Reinforcement: **March 13, 1987**
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The well-equipped remix room at Masterfonics in Nashville features an SSL console, Otari DTR-900 digital multitracks, and a 20Hz-capable Hidley/Kinoshita monitoring system set into concrete enclosures. *Photo: Don Putnam*

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How to make a living as a recording engineer.

It's no wonder that being a successful recording engineer is so appealing. In the magic environment of the studio, today's top engineers make a very good living by knowing how to bring music to life.

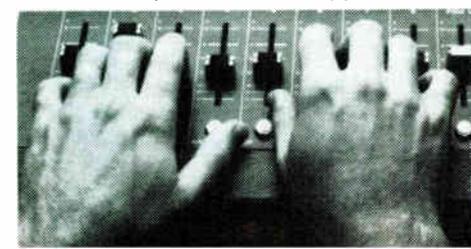
If you're serious about becoming an engineer whose services are constantly in demand by the music industry, there's something you should know. More than ever before, the hottest engineers will be those with the skills of both a technician *and* a musician. And now there's one place where you can develop 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.

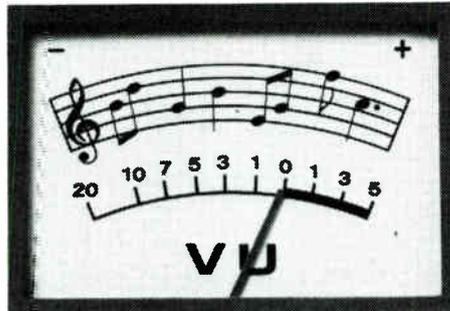
You'll work with a full spectrum of acoustic to electronic music, from Top 40 to film and television scores. And you'll learn sound reinforcement techniques for a wide variety of live music applications.



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.

So if you want to make a living as an engineer, we'll send you more information. Just send us the coupon below to see how you can get a competitive edge, or call us at (818) 985-0905.

Grove School of Music.

Mail coupon to: **Grove School of Music**
12754 Ventura Boulevard
Studio City, California 91604

Please Print:

Name _____

Street _____

City _____

State _____ Zip _____

Phone(_____) _____

MIX 3/87

I'd like to know more about the Recording Engineering Program.

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

Songwriting Program

Synthesizer Program

General Musicianship Program

Vocal Program

Keyboard Program

Guitar Program

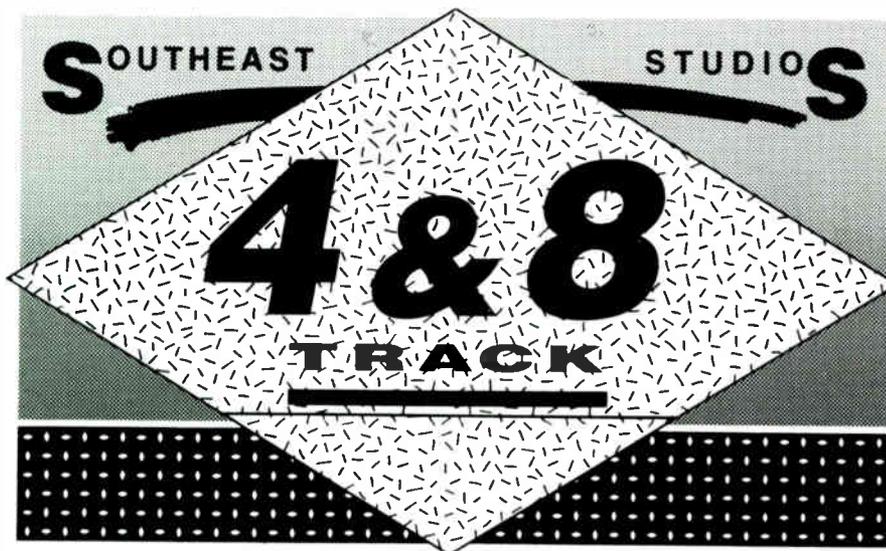
Bass Program

Percussion Program

Composing and Arranging Program

Film/Video Composition Program

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(804) 644-7700
 Owner: John Valentine
 Studio Manager: Roger Price

[8] AUDIO RECORDING & DUPLICATION
 323 Santa Villa Dr.
 Milton, FL 32570
 (904) 994-9297
 Owner: Ty Bracken
 Studio Manager: Ty and Glenda Bracken

[4] AVP, INC.
 12155-1 Metro Parkway SE
 Fort Myers, FL 33912
 (813) 768-0500
 Owner: Don W. Abbott
 Studio Manager: David Nixon

[4] THE BACK DOOR SRS
also REMOTE RECORDING
 PO Box 45
 Atlantic Beach (Jacksonville), FL 32233
 (904) 249-4602
 Owner: Robert K. Lynch
 Studio Manager: Robert K. Lynch

[4] BARNHARDT, CAMPBELL & WALKER, INC.
also REMOTE RECORDING
 PO Box 163, 56 Cabarrus Ave.
 Concord, NC 28025
 (704) 786-7193
 Owner: John Barnhardt, Fred Campbell, Gary Walker
 Studio Manager: J. Michael Brown

[4] BARR-NOTE STUDIO
also REMOTE RECORDING
 316 Thomas St.
 Staunton, VA 24401
 (703) 885-2454
 Owner: Denny Barr
 Studio Manager: Eric John

[4] BASE TRACKS RECORDING STUDIO
 825 W. Florida St.
 Greensboro, NC 27406
 (919) 379-8289
 Owner: Rick Bowling
 Studio Manager: Rick Bowling

[2] BGA PRODUCTION SERVICES
also REMOTE RECORDING
 4420 Dunnoudy Pl.
 Orlando, FL 32808
 (305) 290-5747
 Owner: Bruce Gorstein
 Studio Manager: Kealc McCall

[8] TERRY BICKLE SERVICES
also REMOTE RECORDING
 226 30th St.
 New Orleans, LA 70124
 (504) 486-0327
 Owner: Terry Bickle
 Studio Manager: Terry Bickle

[8] MIKE BILLS PRODUCTIONS
 Rt. #1, Box 310
 Heiskell, TN 37754
 (615) 457-4990
 Owner: Mike D. Bills
 Studio Manager: Mike D. Bills

[8] BLACK DOG RECORDING STUDIO
 212 Davis Ave.
 Elkins, WV 26241
 (304) 636-1758
 Owner: Brad Gum
 Studio Manager: Melody Meadows

[8] BLACK & SILVER STUDIO
 3608 Hidden Acres Dr.
 Atlanta, GA 30340
 (404) 934-3048
 Owner: James Lanier
 Studio Manager: James Lanier, Charles Nelson

[2] BILL BLAIR VIDEO PRODUCTIONS
also REMOTE RECORDING
 811 1st St. NE

[8] ACCURATE RECORDING
 952 Poplar Dr.
 St. Albans, WV 25177
 (304) 727-4008
 Owner: Bill Stevens
 Studio Manager: Bill Stevens

[8] ACOUSTIC CREATIONS RECORDING STUDIO
 4813 W. Wendover Ave.
 Greensboro, NC 27410
 (919) 299-6307
 Owner: Kip Williams
 Studio Manager: Kip Williams

[8] A C PRODUCTIONS
 3750 N. Lyons St.
 Macon, GA 31206
 (912) 784-1891
 Owner: Al Cotton
 Studio Manager: Darlene Cotton

[2] AIRSHOW, INC.
only REMOTE RECORDING
 5727 N. 25th Rd.
 Arlington, VA 22207
 (703) 237-8312
 Owner: David Glasser
 Studio Manager: Ann Blonston

[8] ALANWOOD STUDIO
also REMOTE RECORDING
 925 Alanwood Ln.
 Corydon, IN 47112
 (812) 738-8855
 Owner: Dennis R. Hill
 Studio Manager: Dennis R. Hill

[8] ALPHA RECORDING, INC.
also REMOTE RECORDING
 207 S. Mulberry St.
 Elizabethtown, KY 42701
 (502) 765-7899
 Owner: James Cottrell
 Studio Manager: Keith Pacey

[8] AMBERWOOD RECORDING STUDIO
 12538 Cavalier Dr.
 Woodbridge, VA 22192
 (703) 494-0234
 Owner: Jim and Paula Williams
 Studio Manager: Jim Williams

[8] ARCADIA PRODUCTIONS &
 RECORDING STUDIO
 425 Windsor Pkwy., NE
 Atlanta, GA 30342
 (404) 255-3284
 Owner: Samuel Knox
 Studio Manager: Samuel Knox

[4] ARCHER PRODUCTIONS, INC.
 24 Music Square W.
 Nashville, TN 37203
 (615) 254-1149
 Owner: Nick Archer
 Studio Manager: Tern Jones

[2] PHIL ARNOLD SOUND SERVICES
only REMOTE RECORDING
 206 Acklen Park Dr.
 Nashville, TN 37203
 (615) 292-0876
 Owner: Phil Arnold
 Studio Manager: Phil Arnold

[8] ARTIFEX RECORDING STUDIOS
 906 Lee Ave.
 Harrisonburg, VA 22801
 (703) 434-5651
 Owner: Peter Miller
 Studio Manager: Peter Miller

[4] ASCENSION SOUND PRODUCTIONS
also REMOTE RECORDING
 Rt. 5, Box 542
 Travelers Rest, SC 29690
 (803) 834-9881
 Owner: Larry D. Blanton
 Studio Manager: Larry D. Blanton

[8] ATLANTIS AUDIO INNOVATIONS
 3905 Quail Hollow Dr.
 Raleigh, NC 27609
 (919) 872-3181
 Owner: Vincent Luciani
 Studio Manager: Vincent Luciani, John Shinal

[8] AUDIO CRAFT
 Suite 100, 288 Fourteenth St.
 Atlanta, GA 30318
 (404) 876-1600
 Owner: Henry Howard
 Studio Manager: Henry Howard

[4] AUDIOIMAGE RECORDING
also REMOTE RECORDING
 110 N. Jefferson St.
 Richmond, VA 23220

St. Petersburg, FL 33701
(813) 896-6300
Owner: Bill Blair
Studio Manager: Bill Blair

[8] BRANTLEY SOUND ASSOC., INC.
REMOTE ONLY
724 Vanoke Dr.
Madison, TN 37115
(615) 859-9568
Owner: Leland P. Brantley
Studio Manager: Leland P. Brantley

[8] BRIGHT STAR MUSIC
3117 Bright Star Rd.
Douglasville, GA 30135
(404) 949-6335
Owner: Theresa & Michael Butorac
Studio Manager: Mick Butorac

[2] LOU CASINI RECORDING
only REMOTE RECORDING
1001 Neville St.
Follansbee, WV 26037
(304) 527-1758
Owner: Lou Casini
Studio Manager: Lou Casini

[8] CELEBRITY STUDIOS
also REMOTE RECORDING
1910 Karl St.
Arabi, LA 70032
(504) 277-5687
Owner: Steve Esponge, George Artigues, III
Studio Manager: George Artigues, III

[8] CHASOUND
5317 Curry Ford Rd., N103
Orlando, FL 32806
(305) 282-0010
Owner: Chas Whitley
Studio Manager: Chas Whitley

[4] CHEAPSKATEBOARD PRODUCTIONS
also REMOTE RECORDING
115 Garrett Way
Milledgeville, GA 31061
(912) 453-8934
Owner: Tim Vacula
Studio Manager: Tim Vacula

[8] CHRISTIAN AUDIO TAPES
3005 W. Glendale Ave., Phoenix, AZ 85051
Owner: Rita Hauke

[8] CHRISTIAN RECORDING
4733 Beverly Cir.
Jacksonville, FL 32210
(904) 388-4635
Owner: Bill Sorrells
Studio Manager: Bill Sorrells

[8] COLEMAN PRODUCTIONS
also REMOTE RECORDING
114 Circle Dr.
Rocky Mount, NC 27804
(919) 443-7870
Owner: Bill Coleman, Jr.
Studio Manager: Don Lee

[4] COMEDY NOW/MOUNTAIN
BEAR PRODUCTIONS
136 Union Chapel Rd.
Weaverville (Asheville), NC 28787
(704) 645-4269
Owner: Ken Mays
Studio Manager: Ken Mays

[8] COMMERCIAL AUDIO
PO Box 1958, Ft. Walton Beach, FL 32549
Studio Manager: J.B. Maccladden
Mixing Consoles: MCI JH-636 24x24.
Audio Recorders: MCI JH-24 24-track, Otari 5050 Mark
III 8-track, MCI JH-110B 2-track.
Noise Reduction: dbx.
Echo, Reverb, Delay: Lexicon 224XL, Lexicon M97 Super
Prime Time.
Other Outboard: Aphex Type B Aural Exciter, Eventide
H949 Harmonizer, dbx 160x, Valley People Dyna-Mite,
AudioDesign Recording Scamp, UREI Filters, B & K Spec-

trum analyzer, MCI console automation.
Monitor Amplifiers: BGW, AB Systems.
Monitor Speakers: UREI 813A, Yamaha NS-10, JBL 4401,
Auratone.
Video Equipment: Complete production service avail-
able; funding requested to enable interfacing with record-
ing studio.

[4] COMMERCIAL TALENTS, INC.
also REMOTE RECORDING
213 Banner Ave.
Winston-Salem, NC 27107
(919) 723-4397
Owner: Gene Johnson
Studio Manager: Gene Johnson

[8] CRUTCH RECORDERS
also REMOTE RECORDING
PO Box 33301, 2809 Avent Ferry Rd.
Raleigh, NC 27606
(919) 851-0767
Owner: Doug Llewellyn
Studio Manager: Doug Llewellyn

[8] CUSTOM RECORDING & SOUND, INC.
also REMOTE RECORDING
1225 Pendleton St., PO Box 7647
Greenville, SC 29610
(803) 269-5018
Owner: Bob Edwards
Studio Manager: Jere Davis

[8] D.A. PRODUCTIONS
1752 S. Glades Dr.
No. Miami Beach, FL 33162
(305) 940-6177
Owner: Dennis Allen
Studio Manager: Dennis Allen

[8] DAVROY RECORDING
also REMOTE RECORDING
2427 Kingsley Dr. NE
Marietta, GA 30062
(404) 973-9536

Owner: Roy Franco, David Hobbs
Studio Manager: Roy Franco, David Hobbs

[8] DEADCAT PRODUCTIONS, INC.
6200 SW 63rd Ave.
Miami, FL 33143
(305) 662-4170
Owner: Pat Wethington
Studio Manager: Pat Wethington

[8] DEERFIELD STUDIO CLUB
306 Deerfield Dr.
Clayton, NC 27520
(919) 553-3871
Owner: Steven Hall
Studio Manager: Steven Hall

[4] DIGITAL GRAPHICS & AUDIOVISUALS
710 Thimble Shoals Blvd.
Newport News, VA 23606
(804) 873-3303
Owner: Richard Joyce
Studio Manager: Richard Joyce

[8] DISCOVERY RECORDING STUDIO
also REMOTE RECORDING
PO Box 4625
Jackson, MS 39216
(601) 353-3205
Owner: Trest Audio/Video Prod.
Studio Manager: Perry Trest

[4] DISTANT THUNDER RECORDING
also REMOTE RECORDING
PO Box 290096
Davie, FL 33329
(305) 474-3073
Owner: Distant Thunder Music
Studio Manager: Yarrow Ann Kearney

[8] DRAGON PATH MUSIC
also REMOTE RECORDING
1451 Piedmont Ave. NE
--LISTING CONTINUED ON NEXT PAGE

When it comes to service most music stores are way off track. Their expertise extends as far as the price tag; Their interest in you as far as their commissions.

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704-375-8662

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Atlanta, GA 30309
(404) 874-0903
Owner: Frank French

[8] DREAM MAKER STUDIOS
613 Powell Rd. NE
Lenoir, NC 28645
(704) 758-0270
Owner: Henry and Lisa Starnes
Studio Manager: Henry Starnes

[8] DRUID CITY SOUND
3511 18th St E
Tuscaloosa, AL 35404
(205) 556-3968
Owner: Jim Ingram
Studio Manager: Jim Ingram

[8] THE DUNGEON OF LADY SABRE
also REMOTE RECORDING
PO Box 1323
Delray Beach, FL 33447
(305) 734-4657
Owner: Chris W. Warren, Sandra Thomas
Studio Manager: Chris W. Warren

[8] EAR WORKS, INC.
PO Box 1303
Virginia Beach, VA 23451
(804) 425-0745
Owner: Robert C. Smith
Studio Manager: Robert C. Smith

[4] EBONY STAR PRODUCTIONS/BRIEFCASE
OF TALENT
also REMOTE RECORDING
1612 Marlbrook Dr.
Atlanta, GA 30307
(404) 371-8583
Owner: Robert Howell
Studio Manager: Robert Howell

[8] EG STUDIO
also REMOTE RECORDING
Rt. Box 349-A
Denver, NC 28037
(704) 483-3798
Owner: Michael Eagen
Studio Manager: Dan Graves

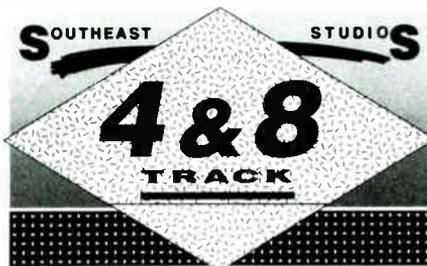
[8] EGO PRODUCTIONS
1040 Dorothy St.
Lakeland, FL 33801
(813) 686-2873
Owner: Ken Srodek, Paul Gillaspay
Studio Manager: Ken Srodek, Paul Gillaspay

[8] ELECTRIC MOUNTAIN SOUND, INC.
also REMOTE RECORDING
2021 12th St.
Sarasota, FL 33577
(813) 366-2622
Owner: Terry F. Donato, Duane Stilwell
Studio Manager: Terry F. Donato

[8] ELECTRONIC MUSIC & RECORDING
also REMOTE RECORDING
2741 East 10th St.
Greenville, NC 27858
(919) 758-5316
Owner: Ronnie Daw, Scott Taylor

[8] ELITE STUDIOS
also REMOTE RECORDING
1701 Coconut Dr.
Ft. Lauderdale, FL 33315
(305) 523-1431
Owner: Sam Hamory
Studio Manager: Nancy Frey

[8] EXPRESS RECORDS
also REMOTE RECORDING
781 Eugene Rd., Box 9186
Memphis, TN 38109
(901) 744-6863, 744-6868
Owner: United Promotion
Studio Manager: Bobby Cole



[8] EZ RECORDING
119 Williamsburg Ln.
Woodstock, GA 30188
(404) 924-0433
Owner: Ricky Payne
Studio Manager: David Harden

[4] FARM BOY STUDIOS
also REMOTE RECORDING
Rt. 2, Box 688C
Flintstone, GA 30725
(404) 931-2913
Owner: Gary R. Farmer
Studio Manager: Gary R. Farmer

[8] FISHER STUDIOS
also REMOTE RECORDING
113 Mallette St.
Chapel Hill, NC 27514
(919) 968-4931
Owner: Steve Fisher
Studio Manager: Steve Fisher

[8] FLORIDA MUSIC RESOURCES FMR
120 S. Court Ave. Ste. 223, Orlando, FL 32801
(305) 648-8666
Owner: Mike Redman, Alain Leroux
Studio Manager: Mike Redman, Alain Leroux

[8] FLORIDA MUSIC SALES, INC.
also REMOTE RECORDING
8370 W. Flager St. Ste. 230
Miami, FL 33144
(305) 223-1205
Owner: Art Weissman

[8] FLORIDA PRODUCTION CENTER
also REMOTE RECORDING
150 Riverside Ave.
Jacksonville, FL 32202
(904) 354-7000
Owner: Ted Johnson
Studio Manager: Michael Minnock

[8] FOUR STAR RECORDING
also REMOTE RECORDING
PO Box 4205
Huntsville, AL 35802
(205) 551-0832
Owner: Tom Linscott, Jack Robbins, Stan Taylor, Charles Snoddy
Studio Manager: Charles Snoddy

[8] FREE-LANCE PRODUCTIONS
6464-93rd Terr. N.#505
Pinellas Park, FL 33565
(813) 545-8040
Owner: Lance Abair
Studio Manager: Lance Abair

[8] FRIPPED OUT PRODUCTIONS
11 Fairway Ct.
Fripp Island, SC 29920
(803) 838-2775
Owner: Tom Armeni
Studio Manager: Tom Armeni

[8] FULL SKY RECORDING &
PRODUCTION STUDIO
PO Box 261072

Tampa, FL 33685
(813) 855-5901
Owner: Michael A. Normandeu

[8] FY PRODUCTIONS
also REMOTE RECORDING
1407 Allen Ave.
Murfreesboro, TN 37130
(615) 890-1521
Owner: Forrest York, Colin York
Studio Manager: Forrest York

[4] GARDEN SOUND STUDIO
also REMOTE RECORDING
PO Box 4870
University, MS 38677
(601) 236-1246
Owner: Britt A. Fitts
Studio Manager: Britt A. Fitts

[8] G.I.D. STUDIO
25 Music Square East
Nashville, TN 37203
(615) 244-8950
Owner: Charley Pride
Studio Manager: Jim Scherer

[8] GLOBAL VILLAGE RECORDING STUDIO
also REMOTE RECORDING
101 E. Water St.
Charlottesville, VA 22901
(804) 293-7574
Owner: Mac Dent
Studio Manager: Mac Dent

[8] GOLDREEL STUDIO
3611 Centreville Rd.
Chantilly, VA 22021
(703) 471-7079
Owner: Golder W. O'Neill
Studio Manager: Golder W. O'Neill

[8] GOOD REVIEW INC.
3836 Appling Rd.
Bartlett, TN 38134
(901) 386-7681
Owner: Terry S. Ratcliffe
Studio Manager: Steven Cox

[8] GOSPEL WORLD STUDIOS
Box 366, Stoney Hill Church Rd.
Middlesex, NC 27557
(919) 235-4691
Owner: Jerald Boykin
Studio Manager: Jerald Boykin

[8] GRAPHIC MEDIA, INC.
also REMOTE RECORDING
530 E. Main St., Ste. 320
Richmond, VA 23219
(804) 780-0772
Owner: Public
Studio Manager: Storm Freeman

[4] GREFF PRODUCTIONS
also REMOTE RECORDING
2622 Moorman
Cincinnati, OH 45206
(513) 221-8805
Owner: Kraig Greff
Studio Manager: Kraig Greff

[4] GRIFFIN MUSIC DESIGN
Ste. 425, Carr Mill Mall
Carrboro, NC 27510
(919) 942-8075
Owner: Robert Griffin
Studio Manager: Robert Griffin

[8] GROUND LEVEL SOUNDE
2717-A Clayton Dr.
Huntsville, AL 35810
(205) 852-7454
Owner: John Heilman, William Roof, Lyn Bullard, Steve Weber Associate
Studio Manager: John Heilman

[4] HAMPTON UNIVERSITY DEPT. OF MUSIC
PO Box 6583 Hampton Univ.
Hampton, VA 23668

(804) 727-5404, 727-5514
Owner: Hampton Univ.
Studio Manager: Bob Ransom

[8] H & G RECORDED PRODUCTIONS
REMOTE ONLY
PO Box 161
Chalmette, LA 70044
(504) 469-7963
Owner: N.B. Hardy
Studio Manager: Marcelle B. Hardy

[8] HIGH ST. STUDIO
also REMOTE RECORDING
1504 High St.
Bowling Green, KY 42101
(502) 842-7316
Owner: Marc Owens
Studio Manager: Marc Owens

[8] HORIZON PRODUCTIONS
1010 W. Platt St., Tampa, FL 33606
(813) 254-3399
Owner: Robert Stephenson
Studio Manager: Philip Schwarz

[8] HORIZON RECORDING STUDIO
2607 Eastland Ave., Nashville, TN 37206
(615) 226-2227
Owner: Richard Owens
Studio Manager: Richard Owens

[2] HORTON SYSTEMS COMPANY
only REMOTE RECORDING
1268 Chesapeake Dr.
Lilburn, GA 30247
(404) 923-5825
Owner: Frederick W. Horton III
Studio Manager: Frederick W. Horton III

[8] IZZIT REEL STUDIO
10952 Hawaii Dr. S.
Jacksonville, FL 32216
(904) 721-2420, 641-9690
Owner: Howie Lucero
Studio Manager: Howie Lucero

[8] JACK O' DIAMONDS RECORDING STUDIO
4201 Central Pk.
Hermitage (Nashville), TN 37076
(615) 883-9600
Owner: Alex Zanetis
Studio Manager: Jon "Mr. Big" D'Amelio

[2] JALEX RECORDINGS
REMOTE ONLY
PO Box 024453
West Palm Beach, FL 33402
(305) 391-3793
Owner: Jon A. Lind

[8] JASIR PRODUCTIONS
also REMOTE RECORDING
PO Box 22332
Memphis, TN 38122
(901) 728-6271
Owner: Jeffrey Rust, Keith Tomes
Studio Manager: Jeffrey Rust

[8] JINGLE WORKS STUDIO
PO Box 717
Pass Christian, MS 39571
(601) 452-2331
Owner: Rick Sierra
Studio Manager: Marsha E. Daniel

[8] JOBE SOUND
also REMOTE RECORDING
1610 John St., PO Box 664
Corinth, MI 38834
(601) 287-9538, 287-3101
Owner: Joseph A. Jobe, Joe T. Jobe
Studio Manager: Joseph A. Jobe

[8] KING DAVID PRODUCTIONS
1580 Agape Wy.
Decatur, GA 30050
(404) 284-5683

Owner: David Hargis
Studio Manager: David Lawrence

[8] KOS PRODUCTIONS & RECORDING STUDIO
also REMOTE RECORDING
709-25th Ave. E.
Tuscaloosa, AL 35404
(205) 553-7680
Owner: Ken Smitherman
Studio Manager: Ken Smitherman

[8] KYTCHEN SYNC
also REMOTE RECORDING
103 Broadway
Birmingham, AL 35209
(205) 879-0728
Owner: Persuasive Media, Inc.
Studio Manager: Frank Pigott

[8] LAKESIDE PRODUCTIONS
PO Box 1914
Forest Park, GA 30051
(404) 366-4553
Owner: Steve Thomas
Studio Manager: Steve Thomas

[4] LASAGNA STUDIO RECORDING
also REMOTE RECORDING
514 Gas Light Tower
235 Peachtree St. NE
Atlanta, GA 30303
(404) 688-6217
Owner: John P. Blackwell
Studio Manager: Bruce Lasagna

[8] LEATHERWOOD SOUND
also REMOTE RECORDING
4107 Bynum-Leatherwood Rd.
Anniston, AL 36206
(205) 238-1038
Owner: Kevin Freeman
Studio Manager: Kevin Freeman

[8] LEAVELL STUDIO
2045 Anderson Snow Rd.
Spring Hill, FL 33526
(904) 799-6102
Owner: John & Becky Leavell
Studio Manager: John Leavell

[8] LEGGETT RECORDING STUDIO
223 Broadmoor Ave.
Baton Rouge, LA 70815
(504) 923-0729
Owner: Chuck & Therese Leggett
Studio Manager: Chuck Leggett

[8] LENTZ & ASSOCIATES
501 Washington St.
Raleigh, NC 27605
(919) 828-6761
Owner: L.A. Lentz
Studio Manager: L.A. Lentz

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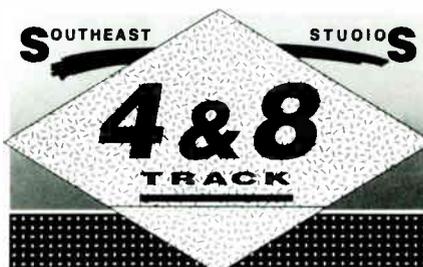
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Stone Mountain, GA 30086
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[8] GERALD LEWIS RECORDING
only REMOTE RECORDING
 216 S. Pershing Dr.
 Arlington, VA 22204
 (703) 521-1871
 Owner: Gerald Lewis
 Studio Manager: Gerald Lewis
 Engineers: Gerald Lewis, George Duman, Mark Walters
 Dimensions: Location recording only from fully equipped Dodge van.
 Mixing Consoles: Audiotronics 110 24 x 8
 Audio Recorders: Otari MX 5050 8 track, Studer B 67 2-track, Sony 2000 2 track PCM w/Nakamichi DMP-100 processor.
 Echo, Reverb, Delay: Lexicon PCM70, Lexicon PCM60, AKG BX-10-II.
 Other Outboard: (2) UREI 1176, UREI 1178, UREI LX-4, (2) UREI 530 graphics, Bercus-Berry BBE-802 processor, dbx type I all channels.
 Microphones: Schoeps omni, (2) Neumann KM-84, (4) Neumann U-87, (3) AKG 414-EB, (2) AKG P-48, (5) AKG 224E, (5) AKG 320, (9) Shure 57.
 Monitor Amplifiers: Bryston 3B, Nakamichi A7.
 Monitor Speakers: JBL 4311B, ADS 1590.
 Extras & Direction: Real time cassette duplication with 50 Nakamichi LX-5 decks; record pressing; all related printing and fabricating services including color key, color separations, full-color insert cards, cassette labels, 2- and 8-tracks and 2-track digital location recording. 25 years experience.
 Rates: Recording \$50.60 per hr, mileage, expenses when applicable; mixing and editing \$40 per hr plus tape.

[4] LIGHTHOUSE PRODUCTIONS, INC.
also REMOTE RECORDING
 2979 Inverness Pkwy.
 Memphis, TN 38115
 (901) 365-9933
 Owner: Bill Thorne
 Studio Manager: Bill Thorne

[4] LIMITED PRODUCTIONS
 3188 Holiday Pl.
 Doraville, GA 30340
 (404) 457-6248
 Owner: King Enterprises/Big Ideas, Ltd.
 Studio Manager: Allen Swain



[4] LINDEN INC.
also REMOTE RECORDING
 229 N. Henry St.
 Alexandria, VA 22314
 (703) 549-4424
 Owner: Katherine Monteith
 Studio Manager: Gregg Powers

[8] LOCONTO PRODUCTIONS & STUDIOS
(FXL SOUND STUDIOS)
also REMOTE RECORDING
 7766 NW 44 St.
 Sunrise, FL 33321
 (305) 741-7766
 Owner: Frank X. Loconto
 Studio Manager: Phyllis Finney Loconto

[8] LOOKING UP STUDIO
 Rt. 3, Box 170U6, Kearneysville, WV 25430
 (304) 725-3047
 Owner: Preston L. Barger
 Studio Manager: Preston L. Barger

[4] LOST RIVER RECORDING STUDIO
 631 N. 9th St
 Paducah, KY 42001

(502) 444-7594
 Owner: Clyde F. Wood
 Studio Manager: Clyde F. Wood

[8] LOWERY SOUND STUDIO
 1509 14th Ave. SW
 Decatur, AL 35601
 (205) 353-2403
 Owner: Steve Lowery

[8] L.P. PRODUCTIONS
also REMOTE RECORDING
 Rt. 2, Box 131-C
 Independence, VA 24348
 (703) 773-2766
 Owner: Larry Patton
 Studio Manager: Larry Patton

[8] L-7 STUDIOS
 273 NW 1 St., #30
 Deerfield Beach, FL 33441
 (305) 427-1836
 Owner: Robert & Jill Wlos
 Studio Manager: Robert Wlos

[8] LUNDY RECORDING & CASSETTE DUP. CO.
also REMOTE RECORDING
 PO Box 408
 Heidrick, KY 40949
 (606) 546-6650
 Owner: David D. & Duran A. Lundy
 Studio Manager: Walter Lundy

[8] MAKIN' TRAX PRODUCTIONS
 415 Manship St., PO Box 22951
 Jackson, MS 39225
 (601) 355-7306
 Owner: William Evans
 Studio Manager: William Evans

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[8] **MARIAH RECORDING**
also REMOTE RECORDING
337 N. 25th Ave
Hattiesburg, MS 39401
(601) 545-1886
Owner: Vaughn Wilson
Studio Manager: Valene Wilson

[8] **MASTER MEDIA, INC.**
also REMOTE RECORDING
5097 Chamblee-Tucker Rd.
Tucker, GA 30084
(404) 491-0330
Owner: Dave Causey
Studio Manager: Steve Causey

[4] **MASTERSOUND, INC. ANALOG
& DIGITAL RECORDING**
only REMOTE RECORDING
7425 Buckland Rd.
Charlotte, NC 28208
(704) 588-2491
Owner: Jim Deal

[8] **MAYS COUNTRY DEMOS**
340 N. Broadway
Georgetown, KY 40324
(502) 863-1533
Owner: Elmer Jones
Studio Manager: Norman L. Mays

[8] **M B L RECORDING STUDIO**
667-669 Hawthorne
Memphis, TN 38107
(901) 278-5003
Owner: Bobby Davis
Studio Manager: Bobby Davis

[4] **MCDONALD SOUND STUDIO**
also REMOTE RECORDING
2808 Napier Ave., PO Box 2186
Macon, GA 31203
(912) 746-2586
Owner: Ray McDonald
Studio Manager: Ray McDonald

[8] **MEDIA PRODUCTIONS/RESISTOR RECORDS**
also REMOTE RECORDING
125 Miller Ave.
Oak Hill, WV 25901
(304) 465-5786
Owner: W. Doug Gent
Studio Manager: W. Doug Gent

[8] **MEMPHIS COMMUNICATIONS CORPORATION**
also REMOTE RECORDING
1381 Madison Ave., PO Box 41735
Memphis, TN 38174
(901) 725-9271
Owner: Dean W. Berry Jr.
Studio Manager: Scot A. Berry

[4] **THE MIDI SHOP**
3450 E. Mendenhall
Baton Rouge, LA 70814
(504) 272-8187
Owner: John Dobyans
Studio Manager: John Dobyans

[8] **MILLER RECORDING**
also REMOTE RECORDING
Rt. 5, Box 447, Hwy. 25 S.
Starkville, MS 39759
(601) 323-0728
Owner: Bill & Virginia Miller
Studio Manager: Bill Miller

[8] **MILLER RECORDING STUDIO**
also REMOTE RECORDING
2513 S. Scales St.
Reidsville, NC 27320
(919) 349-8911, 342-1892
Owner: Robbin D. Miller
Studio Manager: Robbin D. Miller

[2] **MOBILE SOUND SERVICE**
only REMOTE RECORDING
1010A Dorothea Dr.
Raleigh, NC 27603
(919) 834-3158

Owner: Ted Bissette
Studio Manager: Ted Bissette

[4] **MOUNTAIN BEAR PRODUCTIONS
AND RECORDING**
136 Union Chapel Road
Weaverville (Asheville), NC 28787
(704) 645-4269
Owner: Ken Mays
Studio Manager: Ken Mays

[8] **MOUNTAIN EAR PRODUCTIONS**
also REMOTE RECORDING
PO Box 77
Mountain City, TN 37683
(615) 727-5070
Owner: Ralph Nielsen
Studio Manager: Marci Nielsen

[8] **MOUNTAIN VIEW MUSIC INC.**
401 Ocoee Pl.
Cleveland, TN 37311
(615) 478-2750
Owner: John Cook, Ron Moore, Tony Cissom
Studio Manager: John Cook

[8] **MR. O AUDIO**
also REMOTE RECORDING
2035 S. Lumpkin Rd.
Columbus, GA 31903
(404) 687-6221
Owner: Maurice Owens
Studio Manager: Maurice Owens
Engineers: Maurice Owens, Dave Norman, Mike Osborn,
Shawn Jemison
Dimensions: Studio: 30 x 50, (12 x 8 booth). Control
rooms: 20 x 12
Mixing Consoles: Soundcraft 500 32 x 8, Canary 32 x 8,
Studiomaster 20 x 8.
Audio Recorders: Tascam 38 8-track, Tascam 32 2-track,
(4) Nikko ND-350 cassette (stereo).
Echo, Reverb, Delay: Lexicon 95 Prime Time II, Yamaha
REV7, Eventide H-910 Harmonizer, Yamaha SPX-90, Effec-
tron III, Roland Space Echo.
Other Outboard: Valley People Dyna-Mites, UREI 1/3
octave EQs, Yamaha 1/3 octave EQs, Crown crossovers,
Furman crossovers, Rane headphone amp, dbx Type I
noise reduction.
Microphones: Shure, AKG, Sennheiser.
Monitor Amplifiers: Crown, BGW, Yamaha.
Monitor Speakers: JBL 4312, JBL L-36, Auratone 5C.
Musical Instruments: Oberheim DX drum machine, Korg
Poly 61, Wurliizer electric piano, Akai assorted keyboards
and sampler, Rickenbacker bass, Fender bass, assorted
guitars, MiniMoog, other instruments on request, P.A. and
lighting rentals.

[8] **MULTIMEDIA LABORATORIES FSU STUDIO**
also REMOTE RECORDING
011 Diefenbaugh Bldg.
Tallahassee, FL 32306
(904) 644-6848
Owner: Multimedia Labs (FSU)
Studio Manager: Michael Dorian

[8] **MURDOCK PRODUCTIONS, INC.**
also REMOTE RECORDING
Rt. 1, Box 95
Dry Prong, LA 71423
(318) 640-4992
Owner: Dennis Murdock
Studio Manager: Dennis Murdock

[8] **MUSIC AND FX**
2807 Bob Bettis Rd.
Marietta, GA 30066
(404) 973-9704
Owner: Rick Shaw

[8] **MUSICAL REFUGE STUDIOS**
Also REMOTE RECORDING
6403 Elliot Dr.
Tampa, FL 33615
Owner: Gary Griffith, Carl Esselmeyer, Dan Myers
Studio Manager: Carl Esselmeyer

[8] **MUSIC & SOUND PRODUCTION SERVICES**
1908 S. Randolph St.
Arlington, VA 22204
(703) 892-6615
Owner: Gregg Krech
Studio Manager: Gregg Krech

[4] **NAN & ASSOCIATES, INC. STUDIO**
PO Box 37, Hwy 80 W.
Tuskegee Institute, AL 36088
(205) 727-3921
Owner: Nan Poole Spicer
Studio Manager: Nan Poole Spicer

[8] **NIGHTSHIFT PRODUCTIONS**
11073 Duncan St.
Seminole, FL 33542
(813) 398-1403
Owner: Brent Woody, James McAuliffe
Studio Manager: Brent Woody

[8] **NITESHAD**
927 1/2 N. Hagan
New Orleans, LA 70119
(504) 488-7408
Owner: Donald Hull
Studio Manager: Donald Hull

[2] **NOMAD PRODUCTIONS, INC.**
REMOTE ONLY
PO Box 6868
Mobile, AL 36660
(205) 479-2769
Owner: Nomad Productions, Inc.
Studio Manager: Barry L. Little

[4] **NOMADD IV**
also REMOTE RECORDING
15228 Pond Woods Dr. E.
Tampa, FL 33618
(813) 961-7434
Owner: Andrew Dobson
Studio Manager: Andrew Dobson

[8] **OFFBEAT STUDIO**
965 Old U.S.#1 So.
Southern Pines, NC 28387
(919) 692-6594
Owner: Bob Hensley
Studio Manager: Bob Hensley

[4] **ORANGE STREET RECORDERS**
305 Orange St.
Tuscaloosa, AL 35401
(205) 752-3191
Owner: Brook Clement
Studio Manager: Brook Clement

[8] **RICK PAINTER SOUND STUDIO**
also REMOTE RECORDING
2826 Iroquois Ave.
Jacksonville, FL 32210
(904) 388-7649
Owner: Rick Painter
Studio Manager: Donna Painter

[8] **PARTY TOWN**
also REMOTE RECORDING
2624 Chestnut St.
New Orleans, LA 70130
(504) 837-5652
Owner: Jay Weigel, Mark Bingham
Studio Manager: Mark Bingham

[8] **PEARLMAN AUDIO & VIDEO**
also REMOTE RECORDING
PO Box 18375
Asheville, NC 28814
(704) 253-4127
Owner: Jonathan Pearlman
Studio Manager: Aileen Pearlman

[8] **PENGUIN STUDIO**
also REMOTE RECORDING
1305 Cedar Keys Ct.
Stone Mountain, GA 30083
(404) 299-2614
Owner: Alex Ayers
Studio Manager: Alex Ayers

[8] **PHASE ONE RECORDING**
(Formerly FLAMINGO RECORDING)
1910 Honour Rd. #3
Orlando, FL 32809
(305) 859-8493
Owner: Jerry Albanese
Studio Manager: Loretta Albanese

[8] PINK PELICAN MUSIC CO.
2908 Edenwood St.
Clearwater, FL 33519
(813) 799-0661
Owner: Tom Klepacki
Studio Manager: Tom Klepacki

[8] PRODUCTION WORKS
also *REMOTE RECORDING*
PO Box 2625
Birmingham, AL 35202
(205) 870-6780
Owner: Southern Company Services, Inc.
Studio Manager: George Pirkle

[4] PROJECT 70 AUDIO SERVICES, INC.
also *REMOTE RECORDING*
777 Lambert Dr. NE
Atlanta, GA 30324
(404) 875-7000
Owner: Jerry L. Connell, John G. Harnill
Studio Manager: Jerry L. Connell

[8] PROSOUND LABS, INC.
5625 SW 108 Pl., Miami, FL 33173
(305) 595-7071
Owner: M.A. Salas Jr.
Studio Manager: M.A. Salas Jr.

[8] PROTECH PRODUCTIONS
also *REMOTE RECORDING*
Rt-1, Box 339-D #4
Marrero, LA 70072
(504) 689-4556
Owner: Rick Neiser
Studio Manager: John Sauer

[8] PROTOLOG
also *REMOTE RECORDING*
4470 57 Ave. N.
St. Petersburg, FL 33714
(813) 526-1452
Owner: ProtoLog Inc.
Studio Manager: Michael Petrucci, Jim Thompson
Engineers: Michael Petrucci, Jim Thompson
Dimensions: Studios: 15 x 17, Control Rooms: 10 X 8
Mixing Consoles: Trident series 65 24 x 8 x 16, Yamaha
PM-700 12 x 6 headphones customized for mix.
Audio Recorders: Tascam 58B 8-track, Fostex A20 2-
track 1 center, Tascam 3340S 4-track, Nakamichi MR-2
2-track
Echo, Reverb, Delay: Lexicon PCM41, Lexicon PCM70,
Yamaha D1500, Yamaha SPX90, Yamaha REV7.
Other Outboard: (4) dbx 180A noise reduction w/bal
in-out, Aphex Exciter, (3) dbx 160X, Klark-Teknik DN300,
Carver holophonic pre-amp, IQS FFT analyzers, Eventide
spectrum + RT60
Microphones: Sennheiser 421, 431, 441, Shure 57, 58,
60, AKG 414, AKG 460 pre-amp w/ ck 1 and ULS-62 cap,
E-V D35, E-V RE20
Monitor Amplifiers: Crown, Carver
Monitor Speakers: Electro-Voice 100A, Yamaha NS 10M,
Auratone 5C
Musical Instruments: Fender 1965 Jazz Bass, Yamaha
DX7, Yamaha RX-11, Ensoniq drum computer, Emulator
II+ w/full Mb of disk, Macintosh 512 w/ 10 meg hard
drive, Musicworks software (MIDI, seq., voices, printer,
Digidesign software, Apple IIE, IBM PC Jr., Commodore
64, SMP/L lock system, Rane HC-6, Fender Champ amp.
Video Equipment: Half inch and 3/4 inch recorders
w/SMPT-E-TBC, video sweetening, post productions
Rates: \$20/hr. audio and any extras (video sync, produc-
tion, etc.)

[8] PROTRACKS
75 Steele Rd.
Covington, GA 30209
(404) 786-1397
Owner: Steve Jeffnes
Studio Manager: Steve Jeffnes
Engineers: Steve Jeffnes
Dimensions: Studio: 24 x 30 (including drum booth)
Control room 8 x 10
Mixing Consoles: Tascam M-50 12 x 8
Audio Recorders: Tascam 38 8-track, Tascam 22 2
track, Technics RS-B11W cassette, Akai CS-M02 cassette
Echo, Reverb, Delay: Lexicon PCM60 digital reverb
room simulator, Furman spring reverb, ADA 1280 digital
delay, Digitech 1000 digital delay.
Other Outboard: dbx noise reduction, Ross 31 band EQ,
Yamaha GC2020 limiter/compressor w/noise gate, Fur
man limiter/compressor, Furman parametric EQ, Aphex
aural exciter, Ibanez, DOD, Morley, Electro-Harmonix,
electronic metronome, Korg tuner, Conn Strobetuner
Microphones: AKG 414, Shure SM57, SM58, SM80, Elec-
tro-Voice, PZM.



Monitor Amplifiers: Pioneer.
Monitor Speakers: E-V Sentry 100, Auratone cubes, KLH,
custom built 3-way main studio playback system.
Musical Instruments: Casio CZ-1000 synth, upright pi-
ano, Slingerland drums w/rototoms, Syndrum, other per-
cussion, Marshall amps, Fender amps, Mesa studio 22
amp, Telecasters, P. Bass, Gibson Firebird, Yamaha acous-
tic mandolin, Sho-Bud LDG steel guitar, many others!
Rates: \$25/hr. Block rates available.

[8] P.R. PRODUCTIONS
PO Box 5361
Richmond, VA 23220
(804) 358-0703
Owner: Barry J. Hayes
Studio Manager: Barry J. Hayes

[2] QL MOBILE RECORDING
only *REMOTE RECORDING*
314 Romano Ave
Coral Gables, FL 33134
(305) 446-2477
Owner: Rob Burr
Studio Manager: Robin Burr

[4] R & R STUDIOS
also *REMOTE RECORDING*
5054 Rock Glen Turn
Mulberry, FL 33860
(813) 425-3769
Owner: C.M. Raymond
Studio Manager: C.M. Raymond

[8] RCM SOUND STUDIO
300 Flanagan Sta. Rd.
Winchester, KY 40391
(606) 744-5345
Owner: Bill Martin
Studio Manager: Bill Martin, Texas Martin
Engineers: Paul Martin, Bill Martin
Dimensions: Studio: 24 x 36, Control room: 12 x 20
Mixing Consoles: Sound Workshop 1600 16 x 16.
Audio Recorders: Scully 284-B 8-track, Ampex 440-C
2 track, Sony 4 track
Echo, Reverb, Delay: Lexicon, Tapco, Roland SDE-1000,
Alesis MIDiflex, MXR delay, Yamaha SPX90.
Other Outboard: Getex 4 channel, Aphex, Eventide 910,
Harns limiter, MXR pitch transposer, Biamp, EQ (graphic),
PS 1 power supply, Ashly compressor.
Microphones: Neumann U87, Neumann U47, Electro-
Voice RE20s, Sony ECM-22, Shure Brothers SM57s, AKG.
Monitor Amplifiers: (2) McIntosh, Hitachi, Yamaha
Monitor Speakers: JBL, Advent, ARS, Yamaha.
Musical Instruments: Mirage multi-sampler, E-mu SP-
12 drums, Gibson EBO bass, Yamaha cabinet grand, Mar-
tin D 28, Pearl drums, Kramer electric guitar, Washburn
electric guitar, TX7 OB-Matrix-6, Akai AX-80, Mesa Boogie,
Peavey amp, Marshall 4 x 12 cabinet, Yamaha QX7 se-
quencer, Rockman, Sho-Bud pedal steel.

[4] REAL TO REEL
only *REMOTE RECORDING*
PO Box 4164
Hollywood, FL 33083
(305) 583-5093
Owner: Angelo Enriquez, Gary Willhoite
Studio Manager: Angelo Enriquez

[4] REASON'S EDGE
also *REMOTE RECORDING*
3530 Seagrave Ave.
Naples, FL 33942
(813) 643-0927
Owner: Gary J. Edgington
Studio Manager: Gary J. Edgington

[8] RECORDING ASSOCIATES STUDIOS
1045 Savannah Hwy., Charleston, SC 29407
(803) 556-5770
Owner: Ronald E. Clifton
Studio Manager: Edd Salen

[8] RED BARN STUDIOS
5151 Abbots Br. Rd.
Alpharetta, GA 30201
(404) 475-5170
Owner: Richard R. Hudgins
Studio Manager: Richard R. Hudgins

[8] REEL SOUNDS
75 Parris Ave.
Nashville, TN 37210
(615) 255-6347
Owner: Mr. Dana L. Clark
Studio Manager: Cindy B. Clark

[8] REELS ON WHEELS
also *REMOTE RECORDING*
PO Box 1141
Scottsboro, AL 35768
(205) 582-3161
Owner: Dennis W. Thorne
Studio Manager: Dennis W. Thorne

[8] RIDGE RECORDING STUDIOS
also *REMOTE RECORDING*
407 South St.
Greenville, AL 36037
(205) 382-7800
Owner: Cleveland Poole
Studio Manager: Cleveland Poole

[8] RIVER CITY SOUND PRODUCTIONS
2146 Old Lake Ct., Memphis, TN 38119
(901) 683-2514
Owner: Steve Wenger, Bob Pierce
Studio Manager: Bob Pierce

[8] ROADHOUSE STUDIO
3179 Clarendon Rd.
Memphis, TN 38118
(901) 365-4234
Owner: Mark Patnck, Ronnie Vanddver
Studio Manager: Ronnie Vandiver

[8] ROCKING HORSE STUDIO
254 Cedarview Dr.
Antioch (Nashville), TN 37013
(615) 834-9944
Owner: Michael G. Smith, Gatlin Brothers Music Resourc-
es, Inc.
Studio Manager: M. Smith

[4] RON SOUND CO.
333 Butterfly Forest Rd.
Orlando, FL 32765
(305) 349-5832
Owner: Ron Schrader
Studio Manager: Ron Schrader

[4] ROOT PIZZA STUDIOS (EAST)
also *REMOTE RECORDING*
280 Northern Ave. #201
Avondale Estates, GA 30002
(404) 294-6910
Owner: Berndt H. Gnner
Studio Manager: Berndt H. Gnner

[8] RON ROSE PRODUCTIONS, INC.
also *REMOTE RECORDING*
3409 W. Lemon St.
Tampa, FL 33609
(813) 873-7700
Owner: Ron Rose
Studio Manager: Mike Stram

[4] R&R STUDIOS
also *REMOTE RECORDING*
5054 Rock Glen Turn, Mulberry, FL 33860
(813) 425-3769
Owner: C.M. Raymond
Studio Manager: C.M. Raymond

[8] RUM PRODUCTIONS
also *REMOTE RECORDING*
824 Baronne St.

New Orleans, LA 70113
(504) 522-5979
Owner: Jim Rumsfeld
Studio Manager: Jeffrey Talbot

[8] STEVE RUSSELL AUDIO
1789 Banbury Rd.
Charleston, SC 29407
(803) 763-1816
Owner: Steve A. Russell
Studio Manager: Steve A. Russell

[8] RW STUDIO
also REMOTE RECORDING
1684 Avon Ave.
Atlanta, GA 30084
(404) 939-2099
Owner: Rick Ware
Studio Manager: Rick Ware

[4] SAC-AU-LAIT RECORDING
also REMOTE RECORDING
PO Box 3766
618 Gouaux Ave.
Houma, LA 70364
(504) 868-5493, 873-7431
Owner: Mark Mayer, Johnny Pontiff
Studio Manager: Mark Mayer

[8] SILHOUETTE STUDIOS
14269 Palmwood Rd.
Lake Park, FL 33410
(305) 842-2497
Owner: Mark Brown
Studio Manager: Cecilia Erazo

[8] SING-A-SONG RECORDING STUDIOS
also REMOTE RECORDING
10227 Hanover Woods Pl.
Charlotte, NC 28210
(704) 542-7616
Owner: Slep-Tone Entertainment Corp.
Studio Manager: Derek J. Slep

[8] SLEEPY CREEK MUSIC
Rt. 2 Box 116-H
Berkeley Springs, WV 25411
(304) 258-2175
Owner: Jim McCoy
Studio Manager: Bertha McCoy

[4] THE SOUND CATEGORY
REMOTE ONLY
PO Box 1297
Manassas, VA 22110
(703) 361-3352
Owner: Ralph & Mary Haller
Studio Manager: Mary A. Haller

[8] SOUND CENTER RECORDERS
also REMOTE RECORDING
329 N. Main St., PO Box 233
Church Point, LA 70525
(318) 684-2176
Owner: Lee Lavergne
Studio Manager: Lee Lavergne

[8] SOUND DESIGN STUDIO
1943 NE 148 St.
N. Miami, FL 33181
(305) 945-1728
Owner: George Lopez
Studio Manager: Rudy Sanchez

[8] SOUND PICTURE RECORDING
also REMOTE RECORDING
2730 NW 105th Ln.
Ft. Lauderdale, FL 33322
(305) 742-0019
Owner: Charles Reichel
Studio Manager: Robin Reichel

[8] SOUND SERVICES
also REMOTE RECORDING
5138 Lakeview Ct.
New Orleans, LA 70126
(504) 241-2389
Owner: Marc T. Hewitt
Studio Manager: Marc T. Hewitt

[8] SOUND SHOPPE
424 E. Tombigbee
Florence, AL 35630
(205) 767-2185
Owner: Joey Holder
Studio Manager: Joey Holder

[8] THE SOUND SHOPPE
2110 Oak Ln.
Corinth, MS 38834
(601) 287-9530
Owner: Bill Stottlemeyer
Studio Manager: Bill Stottlemeyer

[8] SOUNDS, REASONABLE! REC. DUP.
& MUSIC SERVICES
also REMOTE RECORDING
10209 Bent Tree Ln.
Manassas (Wash. DC area), VA 22111
(703) 369-4250
Owner: Fred Wygal
Studio Manager: Fred Wygal

[4] SOUND STAGE
also REMOTE RECORDING
2042 N. Rio Grande Ave. Ste.F
Orlando, FL 32804
(305) 849-9767
Owner: Fletcher/Franklin Assoc., Inc.
Studio Manager: Dan Franklin

[4] SOUNDWORKS, INC.
also REMOTE RECORDING
1509 Government, #104
Mobile, AL 36604
(205) 479-3331
Owner: Barry Silverman
Studio Manager: Gary Mitchell

[4] SOUTHERN OAK MUSIC
also REMOTE RECORDING
PO Box 1681
Meridian, MS 39301
(601) 655-8447
Owner: Brad Lee
Studio Manager: Brad Lee

[8] SPIRE AUDIO VISUAL CO., INC.
also REMOTE RECORDING
1509 S. Andrews Ave.
Ft. Lauderdale, FL 33316
(305) 527-4042
Owner: Jack Spire
Studio Manager: Erik N. Hartmann

[8] STARSOUNDS MUSIC PRODUCTIONS
556 S. Gladstone Dr.
Virginia Beach, VA 23452
(804) 340-7836
Owner: Alan Sharps
Studio Manager: Kathy Sharps

[8] STARTRACK RECORDING INC.
also REMOTE RECORDING
1550 W. 84 St., Hialeah, FL 33010
Owner: Jeff Caldwell, Ron Fattorusso
Studio Manager: John Bauer

[8] STONEBRIDGE RECORDING
Rt. 15, Box 54
Maryville, TN 37801
(615) 983-7448
Owner: Michael Ishibashi
Studio Manager: Michael Ishibashi

[8] STONEE'S STUDIO
Metairie, LA
(504) 467-3655
Owner: Winston Doussan (Stonee)
Studio Manager: Winston Doussan (Stonee)

[8] SUNRISE SOUND
3252 Hwy. 15 So.
Sumter, SC 29150
(803) 481-2128
Owner: Charles M. Ardis II
Studio Manager: Charles M. Ardis II

[8] SUNSHINE SOUND RECORDING STUDIO
also REMOTE RECORDING
2826 Whitlock St.
Louisville, KY 40213
(502) 968-8757
Owner: Carl Sandler
Studio Manager: Carl Sandler

[8] THE SYNC PRODUCTIONS
1094 Ponce De Leon Ave. NE
Atlanta, GA 30306
(404) 874-1564
Owner: Paul B. MacDonald
Studio Manager: Paul MacDonald

[8] SYNC RECORDS
also REMOTE RECORDING
9111 Parliament Dr.
Burke, VA 22015
(703) 978-4999
Owner: George Bowley
Studio Manager: Laurie Bowley

[8] T & S STUDIO
2898 Susan Ave.
Lake Park, FL 33410
(303) 622-5981
Owner: Tom Green
Studio Manager: Tom Green

[8] TELE TAPES, INC.
515 N. Highland
Memphis, TN 38122
(800) 222-4040
Owner: Tele Tapes, Inc.
Studio Manager: Rick Tarrant

[4] 10:29 PRODUCTIONS
2454 Gwinn Dr.
Norcross, GA 30071
(404) 446-7726
Owner: William McClaw Jr.
Studio Manager: William McClaw Jr.

[8] THE TIME MACHINE RECORDING
& DUPLICATING
also REMOTE RECORDING
2852 20th Ave. N. #2
St. Petersburg, FL 33713
(813) 321-7900
Owner: Steve Repetti
Studio Manager: Steve Repetti

[4] TLB CHRISTIAN MUSIC, INC.
8824 Field Dr.
Baton Rouge, LA 70809
(504) 292-9200
Owner: Terry Lee Bozeman
Studio Manager: Terry Lee Bozeman

[8] TOWNSEND SOUND
also REMOTE RECORDING
4913 Kentucky Ave.
Nashville, TN 37209
(615) 385-1314
Owner: Tim Townsend
Studio Manager: Tim Townsend

[8] THE TRACKING CO.
1240 18th Ave. S.
Birmingham, AL 35205
(205) 939-1493
Owner: Keith Muron
Studio Manager: Hugh Brothers

[4] TREE LEE PRODUCTION CO.
46 Woodcraft Pl., #3
Stone Mountain, GA 30083
(404) 296-0460
Owner: Tree Lee Banks
Studio Manager: Ray Middlebrooks

[8] TRIANGLE MEDIA PRODUCTIONS
also REMOTE RECORDING
Rt. 1, Box 291
Cleveland, AL 35049
(205) 681-0602
Owner: Hawk & Phoenix Sims
Studio Manager: Hawk & Phoenix Sims

THIS MONTH IN ELECTRONIC MUSICIAN...



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RECORDING

Trackology: The Art and Science of the 4-Track Cassette Studio by Craig O'Donnell **27**
Tips on choosing, using, and occasionally abusing the 4-track cassette studio.



INTERVIEW & OPINION

Jan Hammer's Electronic Cottage by Craig Anderton **50**
For this electronic musician, home is more than where the heart is.

Electronic Music Behind the Iron Curtain
by Archie Patterson **60**
When they say "state-of-the-art," the emphasis is on "state."



DO-IT-YOURSELF

Two Buck Pickup by James Chandler Jr. **68**
Champagne sound on a beer budget—whether for recording or live performance.

Build Your Own Synth Stands by Jim Kerkhoff **76**
All it takes is a little plastic tubing and a few hours of your time.

Mini-Controller, Part 2 by Thomas Henry **79**
Add an LFO to Part 1's Noise Source and Lag Processor.



COMPUTERS AND SOFTWARE

CoCo and the Sequencer: Radio Shack/Syntrax
by Chuck McQuillan Jr. **82**
Radio Shack's deceptively powerful computer now speaks MIDI.



MIDI

Fun With System Exclusives by Jim Johnson **87**
Esoteric, perhaps...but very useful.

MIDI Mergers: Theory, Practice, Applications
by Doug Kraul **90**
We take you through the ins, ins, ins, and outs of MIDI merging.



APPLICATIONS AND BASICS

The Performing DX7 by Lowell Levinger **98**
Tame your DX for efficient live use.



REVIEWS

Sonus Super Sequencer by Steven Smith **100**

Siel DK70 MIDI Synthesizer by Alan Gary Campbell **104**

[8] TRUSTY TUNESHOP RECORDING STUDIO
also REMOTE RECORDING
Rt. 1, Box 100
Nebo, KY 42441
(502) 249-3194
Owner: Elsie Trusty Childers
Studio Manager: Elsie Trusty Childers

[8] TSON RECORDING STUDIO
733 Granby St.
Norfolk, VA 23510
(804) 625-1545
Owner: Martin Culpepper, Jr.
Studio Manager: Oscar Jai-Tee

[8] TWIN OAKS STUDIO
also REMOTE RECORDING
Hwy. 117, PO Box 187
Rocky Point, NC 28457
(919) 675-9226
Owner: Tempo I. Inc.
Studio Manager: L. Joseph Teachont

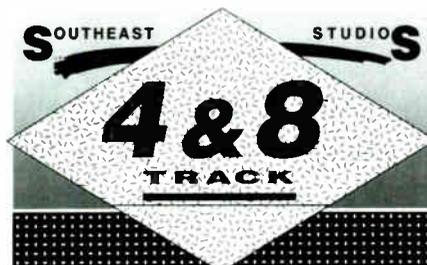
[4] UNCLE RIKKI'S MUSIC PROJECT
also REMOTE RECORDING
1107-A Louise Ave.
Muscle Shoals, AL 35661
(205) 381-9846
Owner: Richard Butler
Studio Manager: Ashley Graham

[8] UNDERGROUND RECORDING
808 Houston Dr.
Seymour, TN 37865
(615) 573-5269
Owner: Matt Lincoln
Studio Manager: Jeff Stansberry
Engineers: Matt Lincoln, Jeff Stansberry, Mike Lincoln
Dimensions: Studios: 12 x 14 main room, 9 x 6 drum room, 5 x 4 vocal booth. Control Room: 11 x 9.
Mixing Consoles: Studiomaster Series I 16 x 8, 2088 x 4, TEAC Model II 6 x 4.
Audio Recorders: Tascam 388-track, TEAC 2340 4-track, Sony 630 2-track, Mitsubishi 156 cassette, Tascam 30 2-track.
Echo, Reverb, Delay: Yamaha REV7, DeltaLab, Fostex, Ibanez.
Other Outboard: dbx 166, dbx 150, Symetrix 522, UREI EQs, TEAC EQs.
Microphones: Shure, AKG, A-T, Sennheiser.
Monitor Amplifiers: Sony, Kustom, Yamaha.
Monitor Speakers: JBL, Sony.
Musical Instruments: Gulbransen baby grand, Akai AX-80, Roland JX-3P, Ludwig drums, Simmons electric drums, Roland 505, Gibson Les Paul, Fender jazz basses, Fender Stratocaster, and B. C. Rich, Guild, Alvarez 6 & 12 string guitars, among others. Fender, TOM, Scholz, Roland, Ampex, Traynor, Peavey amps.
Video Equipment: Available upon request: Fujicon; Philips.

[2] UNDERWOOD AUDIO
also REMOTE RECORDING
34 Aviation Wy.
Chamblee, GA 30341
(404) 457-1268
Owner: Hamilton Underwood
Studio Manager: Angela Henderson

[8] UNICORN FIDELITY STUDIO'S
Rt. 1, Box 3, Hwy. 1
Galliano, LA 70354
(504) 632-7117
Owner: Kim Dufrene
Studio Manager: Nicky Maucele

[8] USC SOUND ENTERPRISES
REMOTE ONLY
4829 Barfield Rd.
Memphis, TN 38117
(901) 682-7002
Owner: Rodney Peppenhorst



[4] THE VIDEO PRODUCTION CO. OF AMERICA
also REMOTE RECORDING
1201 Central Ave.
Charlotte, NC 28204
(704) 376-1191
Owner: Mary J. & Walter Knox
Studio Manager: H. Walter Knox

[8] VMR STUDIOS
173 W. Putnam Ferry Rd.
Woodstock, GA 30188
(404) 926-3268
Owner: Deryl Voutla
Studio Manager: Deryl Voutla

[8] WADI PRODUCTION STUDIO
also REMOTE RECORDING
1608 John St., PO Box 664
Corinth, MS 38834
(601) 287-3101
Owner: Joe T. Jobe
Studio Manager: Joseph A. Jobe

[4] WHITE MOUNTAIN CHRISTIAN STUDIO
Rt. 1, Box 122
Alexandria, AL 36250
(205) 831-7465
Owner: Michael A. Jinks
Studio Manager: Regina Jinks

[4] WHITEWATER RECORDING
also REMOTE RECORDING
181 Moffitt Rd.
Asheville, NC 28805
(704) 298-1731
Owner: Adam Greenberg
Studio Manager: Adam Greenberg

[8] WILKERSON SOUND STUDIOS
3794 Park Ave.
Memphis, TN 38111
(901) 458-1624
Owner: Skip Wilkerson
Studio Manager: Skip Wilkerson

[8] WISTARIA RECORDING STUDIO
also REMOTE RECORDING
607 Piney Point Rd.
Yorktown, VA 23692
(804) 898-8155
Owner: Kim Person
Studio Manager: Lana Puckett

[8] WKRL RADIO
Feather Sound Corporate Center
2 Corporate Dr., Ste. 550
Clearwater, FL 33520
(813) 579-9790
Owner: Sandusky Radio
Studio Manager: Steve Schneider

[4] WLM RECORDING
also REMOTE RECORDING
2808 Cammie St.
Durham, NC 27705
(919) 471-3086
Owner: Watts Lee Mangum
Studio Manager: Watts Lee Mangum

[8] WOODHOUSE RECORDING
also REMOTE RECORDING
2900 Brittany Wy.
Chesapeake, VA 23321
(804) 483-6212
Owner: Larry K. Carr
Studio Manager: Larry K. Carr

[8] WOODRICH RECORDING STUDIO
also REMOTE RECORDING
PO Box 38
Lexington, AL 35648
(205) 247-3983
Owner: Woody Richardson
Studio Manager: Woody Richardson

[4] WTPE-RADIO/TAPE PRODUCTIONS
also REMOTE RECORDING
4312 Hunters Landing Dr.
Chesterfield, VA 23832
(804) 744-7564
Owner: Keith Brodie
Studio Manager: Keith Brodie

[4] WUNC RADIO
also REMOTE RECORDING
Swain Hall 044A
Chapel Hill, NC 27514
(919) 966-5454
Owner: University of North Carolina
Studio Manager: Don Mercz

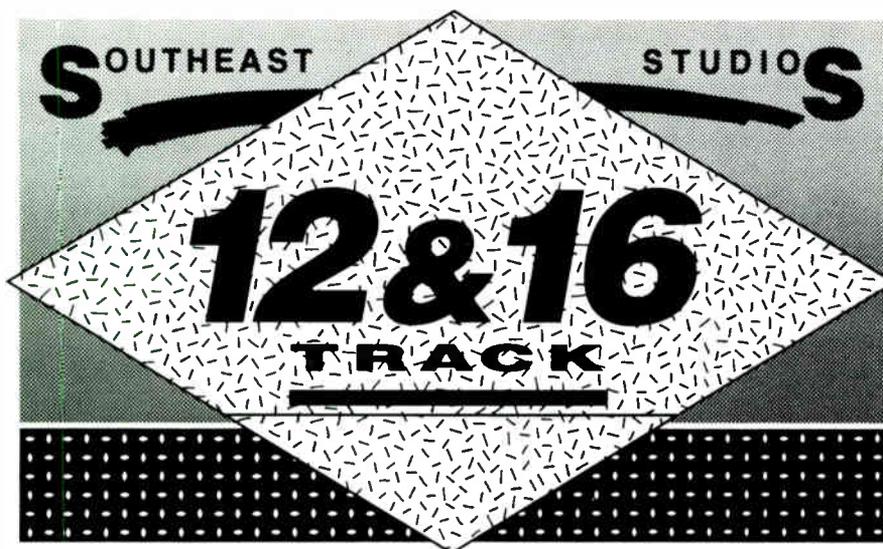
[2] WWNO-FM
also REMOTE RECORDING
University of New Orleans
New Orleans, LA 70148
(504) 286-7000
Owner: University of New Orleans
Studio Manager: Kathy Laack

[8] X COMMUNICATIONS STUDIO ONE
600 S. Nova Rd.
Ormond Beach, FL 32074
(904) 672-5289
Owner: Jay Fradet, Mark Carter
Studio Manager: Chip Fradet

[4] YELLOWEYES MUSIC
(Formerly PEACEPIPE PROD.)
2015 12th St. West
Bradenton, FL 33505
(813) 748-4022
Owner: Mark E. Pettey
Studio Manager: Mark E. Pettey

[8] JOHN YOUNG PRODUCTIONS, INC.
2461 Spring Lake Dr.
Marietta, GA 30062
(404) 977-7177
Owner: John Young
Studio Manager: John Young

[4] ZAO MUSIC
also REMOTE RECORDING
Box 1489
Andrews, NC 28901
(704) 321-4175
Owner: Scott Duncan
Studio Manager: Scott Duncan



[12] A-J-S
also REMOTE RECORDING
2458 N. Tonti
New Orleans, LA 70117
(504) 949-8457
Owner: T. Quest
Studio Manager: L. Bourgoyne

[16] A-LIVE RECORDINGS
1251 Virginia Ave.
Harrisonburg, VA 22801
(203) 434-6703
Owner: Mennonite Board of Missions
Studio Manager: Abe Rittenhouse

[16] AMAZING MUSIC
also REMOTE RECORDING
Macon Mall
Macon, GA 31206
(912) 474-4700
Owner: Edward Vance
Studio Manager: Edward Vance

[16] ARTISTS' RECORDING SERVICE
also REMOTE RECORDING
980 Barret Ave.
Louisville, KY 40204
(502) 581-9294
Owner: Artists' Recording Service, Inc.
Studio Manager: Mike Franklin

[16] ASSOCIATED SOUND PRODUCTS
also REMOTE RECORDING
215 Bickett Blvd.
Raleigh, NC 27608
(919) 829-1143
Owner: Steve Foley, David Emory
Studio Manager: David Emory

[16] AUDIO ARTS, INC.
also REMOTE RECORDING
Rt. 1, Box 59, Hwy 43 N.
Greenville, NC 27834
(919) 758-2240
Owner: Lewis Gidley, Sonny Johnson, Dennis Michaels
Studio Manager: Sonny Johnson

[12] AUDIO CONCEPTS RECORDING COMPANY
also REMOTE RECORDING
5 Cedar St.
Milton, FL 32570
(904) 626-0139
Owner: Gregory D. Pendleton
Studio Manager: Gregory D. Pendleton

[16] AUDIOCRAFT - SOUND HUT STUDIOS
1604 W. New Bern Rd.
Kinston, NC 28501
(919) 527-8845
Owner: Clark Tutt
Studio Manager: Steve Thigpen

[16] AUDIO, INCORPORATED
820 East Blvd.
Charlotte, NC 28203
(704) 376-3818
Owner: Frank & Sandi Rogers
Studio Manager: Sandi Rogers

[12] BATES BROTHERS RECORDING
also REMOTE RECORDING
25 Joy Ave., Ste. 101
Hueytown, AL 35023
(205) 491-4066
Owner: Eric Bates, Eugene Bates
Studio Manager: Eugene Bates
Engineers: Eric Bates, MIDI engineer: Eugene Bates
Dimensions: Studios: 30 x 17 x 10, iso booth 9 x 10 x 10.
Control Rooms: 22 x 18 x 10
Mixing Consoles: Akai MG-1212 12 x 12 x 2, Ramsa WR-8210 10 x 4.
Audio Recorders: Akai MG-1212 12-track, (2) Technics RS-1500 2-track, (2) Sharp cassettes.
Echo, Reverb, Delay: Yamaha REV7, Ibanez SDR-1000, (2) Ibanez DM-2000, Yamaha E-1010.
Other Outboard: (4) Gate noise gates & expanders, (2) Yamaha GC-2020 Dual C/L, Ashly SE-50 C/L, (2) dbx 150 N/R, Roland SBX-80 sync box, Roland MC-500 MIDI sequencer
Microphones: AKG tube 451, (3) Shure SM81, (3) Shure SM57, Shure SM58, (2) Audio-Tech AT857AM Unipoint, E-V RE-20, PL-6, PL-5, (2) Sennheiser MD-421, (3) Sony condensers
Monitor Amplifiers: Yamaha P-2200, Crown International D-60, Yamaha CA-610 II.
Monitor Speakers: JBL 4430 custom built, Aurstone cubes.
Musical Instruments: Yamaha G-3 6-ft. grand, Ensoniq ESQ-1, Ensoniq Mirage, Korg EX-8000, Yamaha FB-01, Yamaha MJC-8 MIDI Patcher, Tama 5 pc. drums and hardware, Simmons SDS-8, Korg DDD-1 drum machine, Roland Octapad, (2) timpani, assorted percussion, Ibanez bass, Yamaha acoustic guitar, Ana electric guitar w/EMG's, Rockman sustainer and stereo chorus/delay.

[16] BEECHTREE RECORDING STUDIO
also REMOTE RECORDING
2804 Beechtree Dr.
Sanford, NC 27330
(919) 774-8926
Owner: Bill Tripp
Studio Manager: Bill Tripp

[16] BIRDLAND RECORDING STUDIOS, INC.
3116 Sandlin Rd.
Decatur, AL 35603
(205) 353-8324
Owner: Owen Brown, Dewayne Murphee
Studio Manager: Owen Brown

[16] BOONE SOUND
also REMOTE RECORDING
313 Highland Ave.
Albany, GA 31701
(912) 436-6508
Owner: Jesse Boone

[16] BTM STUDIOS
PO Box 928
Burnsville, NC 28714
(704) 675-5685
Owner: Frank Wyatt
Studio Manager: Frank Wyatt

[16] CARNEGIE HALL RECORDING
1508 16th Ave. South
Nashville, TN 37212
(615) 292-1567
Owner: Vaughn R. Skow
Studio Manager: Vaughn R. Skow

[16] CHANNEL ONE, INC.
also REMOTE RECORDING
1727 Clifton Rd.
Atlanta, GA 30329
(404) 634-3324
Studio Manager: George Watts, James Klotz

[16] WALLY CLEAVER'S RECORDING
also REMOTE RECORDING
1518 Princess Anne St.
Fredericksburg, VA 22401
(703) 373-6511
Owner: Peter L. Bonta
Studio Manager: Lorie Stannard
Engineers: Peter Bonta, Pete Fields, Lin Arroyo
Dimensions: Studios: Main room 20 x 22, dead room 9 x 13 1/2, isolation booth 6 x 7 Control Rooms: Main room 12 x 14, post production room 10 x 10
Mixing Consoles: Sound Workshop Series 30 w/ ARMS VCAs, 24 x 24 x 2.
Audio Recorders: Tascam 85-16B 16-track, Revox A77 2-track, 3M M-79 4/2-track 1/2-inch, Otari 5050 2-track, Scully 280 2-track, (3) TEAC cassettes.
Echo, Reverb, Delay: Yamaha REV7 digital reverb, AKG BX-1011, Lexicon PCM60, Lexicon PCM41, DeltaLab DL-2, DeltaLab Effectron 1024.
Other Outboard: (2) UREI 1176 LN, Eventide 910 Harmonizer, (2) UREI LA-4s, Symetrix 522, (2) Dyna-Mite, (3) dbx 160, (2) dbx 163, Aphex Aural Exciter, dbx n/r on all channels, SMPTE sync on 16-track, DOD 15 x 2 EQ, Accessit noise gate, Roland digital delay, comp., MXR flanger, Ibanez stereo chorus, Rat box, Audioarts stereo parametric EQ, Commodore C64 computer w/MIDI sequencer and editing programs.
Microphones: AKG D12E, Neumann U87, Neumann U47FET, (4) Neumann KM84s, (2) AKG C414, (4) AKG C451EBs, (2) E-V RE20, (3) Shure SM57, SM54, SM55, (3) Sennheiser MD441, MD421, MD409, RCA 44a, 77DX, BK-5B, 74, (2) PZM, Audio-Technica ATM-11, (2) Adams transducers, misc. DIs.
Monitor Amplifiers: Crown DC 300A power amp, Crown D-150a, (2) Dyna mono 60s, Dyna ST-70, Uher CV-140.
Monitor Speakers: JBL 4311s, Altec 9842-8As, Minimus 7s, JBL custom monitors.
Musical Instruments: Ensoniq Mirage, Oberheim DX drum machine, Yamaha 6 ft. grand piano, Yamaha DX7 synthesizer, Roland TR707 drum computer, 6-piece Rogers drums, Vox AC-30 amp, Vox AC-15 amp, Marshall 50 watt amp, Roland Playbus amp, Fender Telecaster, Fender Stratocaster, Fender Precision 1957 bass, Gibson 1952 acoustic guitar, misc. percussion instruments, Fender 1966 12-string guitar.

Video Equipment: Call for rates and info.
Extras and Direction: We offer the most affordable remote 16-track rates combined with exceptional audio quality. Our remote truck has been to Pittsburg to tape a 42 member choir, Windgap, PA to record the three-day Windgap Bluegrass Festival and to the Birchmere in Alexandria, VA to record "The Johnson Mt. Boys Live," which received two Grammy nominations and is considered one of the best live bluegrass records ever recorded. Clients: Rounder Records, Rebel Records, Song-Bird Records, Del McCoury, Jimmy Arnold, Mark Wenner, The Prevaricators, Johnny Sportcoat & The Casuals, Gene Ryder, First Hall Records, The Suspects, Artful Dodger, Gary Herrewig, Kenny Wilson, Special Blend, Joyful Noise, Mountain Laurel and many more. We offer a comfortable, creative environment in historic Fredericksburg, and offer a reasonable alternative to Washington, DC and Richmond rates.
Rates: \$38.50/hr. Call for block rates.

[16] **COLEY RECORDING STUDIO**
 PO Box 1529
 Carrollton, GA 30117
 (404) 832-0616
 Owner: Phil Coley
 Studio Manager: Phil Coley

[16] **COMPOSERS' RECORDING STUDIO**
 2919 Lafitte St.
 New Orleans, LA 70122
 (504) 486-4691
 Owner: Patrice Fisher, Steve Masakowski, Jimmy Robinson, Denise Villere
 Studio Manager: Mike Murphy

[16] **CONTI STUDIO**
 also *REMOTE RECORDING*
 509 N. Ridgewood Ave.
 Edgewater, FL 32032
 (904) 427-2480
 Owner: Conti Inc.
 Studio Manager: Dick Conti

[16] **CRS RECORDING STUDIO**
 113 N. Chestnut St., PO Box 85
 Marion, VA 24354
 (703) 783-6828
 Owner: James K. Cornick
 Studio Manager: James K. Cornick



DAN-SING RECORDING STUDIO
 Danville, VA

[16] **DAN-SING RECORDING STUDIO**
 also *REMOTE RECORDING*
 120 Ridgcrest Dr.
 Danville, VA 24540
 (804) 836-1209
 Owner: Dan-Sing Enterprises, Inc.
 Studio Manager: Roy Frazier
 Engineer: Scott Frazier
 Dimensions: Studios: 16 x 11. Control Rooms: 10 X 7.
 Mixing Consoles: Yamaha RM-1608 16 x 8 x 16, Tascam MI 8 x 2 x 8, Tascam MX-80 8 x 2.
 Audio Recorders: Fostex B-16 16-track, Tascam 38 8-track, Tascam 22-2 2-track, Sanyo Hi-Fi Beta 2-track, Marantz, Pioneer cassette decks.
 Echo, Reverb, Delay: Yamaha SPX90, ART DR-2, Delta-Lab Effectron 2.
 Other Outboard: Aphex Aural Exciter C, dbx noise reduction (8-channel), Rockman X-100, DOD R875, MXR delay, Roland Phase V, headphones (Fostex, Sennheiser, BP).
 Microphones: Sennheiser, AKG, E-V, Shure, Toa, Peavey.
 Monitor Amplifiers: Kenwood, Rane (headphones).
 Monitor Speakers: Eastern Acoustic Works, Auretones, Realistic T 120 Towers.
 Musical Instruments: Ensoniq Mirage, Yamaha TX7, Korg CS-1, Oberheim DMX, Roland 727, Yamaha acoustic piano, various guitars, percussion instruments, and kazoo's!
 Rates: Low as \$35/hour. Special package rates available.

[16] **MIKE DAVIS PRODUCTIONS**
 106 Hermit's Tr.
 Altamonte Springs, FL 32701
 (305) 331-7211
 Owner: Mike Davis
 Studio Manager: Mike Davis

[16] **DEERFIELD SOUND and SYNTHESIS**
 342 SW 32nd Ave.
 Deerfield Beach, FL 33442

(305) 428-3413
 Owner: John E. Simsic
 Studio Manager: John E. Simsic
 Extras & Direction: Emulator II, Oberheim Xpander, Prophet VS, DX7, TX7, Minimoog, JX-3P, GR-700, GR-300, EX-800, Fender Rhodes, Hammond A-100, Macintosh w/20 meg, performer and composer, soltsynth and sound designer, Opcode, Fostex 4050. Specializing in computer pre-production, 16-track recording w/digital mixdown, as well as synthesis and special EFX. All at very competitive rates

[16] **DERBYTOWN SOUND STUDIOS**
 5900 Outer Loop
 Louisville, KY 40219
 (502) 968-2320
 Owner: John Wesley
 Studio Manager: John Wesley

[16] **JIM DEVITO'S RECORDING STUDIO**
 also *REMOTE RECORDING*
 Rt. 9, Box 68T3
 St. Augustine, FL 32084
 (904) 471-0506
 Owner: Jim DeVito
 Studio Manager: Bill Parker

[16] **DIGITRAX, INC.**
 5226 North Ave., PO Box 572
 Buford, GA 30518
 (404) 932-2842
 Owner: A. Dickerson, R. Atha, L. Day
 Studio Manager: Alva Dickerson

[16] **EASLEY RECORDING**
 also *REMOTE RECORDING*
 3744 Marion
 Memphis, TN 38111
 (901) 323-5407
 Owner: Doug Easley
 Studio Manager: Doug Easley

[16] **ESP STUDIO**
 2213 S. Adams
 Tallahassee, FL 32301

(904) 222-1495
 Owner: Elmer Sheffield Jr.
 Studio Manager: Elmer Sheffield Jr.

[16] **EUREKA MUSIC MILL/HIGH TECH SOUND AND COMMUNICATIONS**
 also *REMOTE RECORDING*
 1159 W. Tucker Rd.
 Zephyrhills, FL 34249
 (904) 588-2475
 Owner: Lon Swonger, Patrick Swonger
 Studio Manager: Micah L. Swonger

[12] **FAIR WARNING RECORDING**
 also *REMOTE RECORDING*
 830 Glastonbury Rd., Ste. 612
 Nashville, TN 37217
 (615) 367-1737
 Owner: Fair Warning Ministries Inc.
 Studio Manager: W. Lord Lyell IV

[16] **FALK RECORDING SERVICE**
 also *REMOTE RECORDING*
 7914 Fegenbush Lane
 Louisville, KY 40228
 (502) 239-1010
 Owner: Gary Falk
 Studio Manager: Tim Hoertel

[16] **56 STATION**
 also *REMOTE RECORDING*
 PO Box 1439
 Hilliard, FL 32046
 (904) 845-4866
 Owner: Oases Productions
 Studio Manager: David Henderson

[16] **FIVE SQUARE RECORDING**
 PO Box 420
 Bells, TN 38006
 (901) 663-2229
 Owner: Paul Jackson
 Studio Manager: Paul Jackson

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Stewart Electronics
 P.O. Box 60317, Sacramento, CA 95860
 (916) 635-3011

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[16] FLORIDA VIDCOM
3685 N. Federal Hwy.
Pompano Beach, FL 33064
(305) 943-5590
Owner: Joseph M. Carey
Studio Manager: Thomas F. Bailey Jr.

[12] FORD RECORDING
also REMOTE RECORDING
4395 Maple Leaf Dr.
New Orleans, LA 70114
(504) 392-2795
Owner: Jim Ford
Studio Manager: Jim Ford

[16] GATOR TRACKS
also REMOTE RECORDING
104 E. Main St.
Houma, LA 70360
(504) 851-4602
Owner: Charlie Positerry, Louis Eschete
Studio Manager: Louis Eschete
Engineers: Charlie Positerry
Dimensions: Studios 26 x 17, 8 x 8, Control Rooms 18 x 13
Mixing Consoles: Studiomaster 16 16-2 16 x 16
Audio Recorders: Tascam 85-16B 16-track, Otari MX5050 2 track, TEAC 3340 S 4-track, Tascam 122 cassette
Echo, Reverb, Delay: Orban 111 B reverb, (2) Roland SDE 2000 digital delays, Yamaha SPX90 effects processor
Other Outboard: Furman sound parametrics, limiter/compressors, noise gates, UREI LA-4 compressor, EXR SP2 exciter, Tapco 27 band EQs, NEI 27 band EQs, Rane RE 27 analyzer/EQ
Microphones: Sennheiser, AKG, Shure, Electro Voice
Audio Technica, Crown PZM, Beyer
Monitor Amplifiers: HandH, Tapco (control room monitors), HandH (monitor)
Monitor Speakers: JBL 4312, Infinity RS 10, Auratone
Musical Instruments: Samick 5-ft 9 in grand piano, Ludwig drums, Paiste and Zildjian cymbals, LP percussion, Korg Poly 61, Crumar orchestrator, Crumar TI C, Hammond B 3, G&L L 2000 bass, acoustic guitars (6 string, 12 string, classical), Conn Strobotuner



[16] GIZMO PRODUCTIONS
PO Box 1398
Ozark, AL 36361
(205) 774-4931, 774-0225
Owner: J.H. Brown
Studio Manager: J.H. Brown

[16] GROUP EFFORT SOUND STUDIO
2656 Crescent Springs Rd.
Erlanger, KY 41017
(606) 331-TAPE
Owner: Dan Murphy, Wayne Hartman, Jeff Seeman, Bill Gwynne
Studio Manager: Dan Murphy, Wayne Hartman, Jeff Seeman, Bill Gwynne

[16] HERITAGE RECORDS & RECORDING STUDIO
also REMOTE RECORDING
Rt. 3, Box 280
Galax, VA 24333
(703) 236-9249, 236-9079
Owner: Bobby Patterson
Studio Manager: Bobby Patterson

[16] HOMESTEAD RECORDING STUDIO
Rt. 1, Box 1097
Norton, VA 24273

(703) 679-4182
Owner: Ron Swindall
Studio Manager: Ron Swindall



HUMMINGBIRD RECORDINGS
Melbourne, FL

[16] HUMMINGBIRD RECORDINGS
113-A Nelson Ave., Melbourne, FL 32935
(305) 259-6576
Owner: John O. Foley
Studio Manager: John O. Foley
Engineers: John Foley, Scott Peters, Greg Roberts
Dimensions: Main room is 1400 sq ft with 16 ft ceiling—9 x 13 drum booth Control room 12 x 15
Mixing Consoles: Tascam M 320 20 in x 20 x 4 x 2, Fostex 350, 8 x 4 x 2, Peavey MD 12, 12 x 2 x 1, Tapco 6000, 6 x 1
Audio Recorders: Fostex B16-D, 16 track, Fostex A 8 LR, 8 track, Fostex A 2, 2 track, Sony 701ES PCM 2 track digital, JVC cassette deck
Echo, Reverb, Delay: ART DR 2 digital reverb, (3) digital delays, Fostex stereo reverb
Other Outboard: Compressors, graphic EQs, parametric 4 channels, dox Type I on 2-track, guitar effects, etc. Furman quad noise gates, DOD comp/limiter/de esser, vocoder
Microphones: Fostex printed ribbon, Shure 58s and 57s, Beyer, Audio Technica, AKG, FCA 77X ribbon
Monitor Amplifiers: Kenwood
Monitor Speakers: Fostex RM780, JBL L15, Minimus 3 5
Musical Instruments: Upright piano, Korg Poly 61 synthesizer, Drummulator, percussion, acoustic and electric guitars, bass guitars, flute, Marshall 50 watt amp Peavey Studio pro, Bass Rockman, Guitar Rockman, Sunn 4 x 12 speaker cabinet, trumpet, trombone, alto and tenor saxophones, Yamaha CP 70 electric grand piano, Yamaha DX7 synthesizer, Slingerland 7 piece drums w/roto toms, Korg EX800, Kramer Pichrider 7000 guitar synthesizer
Rates: \$40/hr —block rates as low as \$30/hr

[16] IMPORTANT RECORDING STUDIO
Box 352
Esterio, FL 33928
(813) 947-0103
Owner: John McLane, Dianken Bernet
Studio Manager: Dianken Bernet

[16] INNER EAR STUDIO
712 S. Ivy St.
Arlington, VA 22204
(703) 892-2123
Owner: Don Zientara

[12] ISLAND RECORDING
also REMOTE RECORDING
St. Simon's Island, GA 31522
(912) 638-6144
Owner: Bill Zorn
Studio Manager: Bill Zorn

[16] IVS MEDIA PRODUCTIONS
also REMOTE RECORDING
517 Meeting St.
Charleston, SC 29403
(803) 577-9185
Owner: Corporation
Studio Manager: Steve Green

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[16] JAG STUDIO, LTD.
also *REMOTE RECORDING*
3801-C Western Blvd.
Raleigh, NC 27606
(919) 821-2059
Owner: Joy Cook
Studio Manager: Byron T. McCoy

[16] GREG JOHNSON STUDIO
Rt. 2, Box 104
Ridgeley, WV 26753
(304) 738-8870
Owner: Greg Johnson
Studio Manager: Greg Johnson

[16] AL JOLSON ENTERPRISES, INC.
31 Music Sq. West
Nashville, TN 37203
(615) 242-1580
Owner: Albert Jolson
Studio Manager: Albert Jolson

[16] J.Y. RECORDING
PO Box 2602
West Monroe, LA 71291
(318) 325-4413
Owner: James E. Young
Studio Manager: Greg Hough

[16] JOHN KEANE STUDIO
165 Hillcrest Ave.
Athens, GA 30606
(404) 548-4137
Owner: John Keane
Studio Manager: John Keane

[16] KEY RECORDING STUDIO
also *REMOTE RECORDING*
2969 Edison Ave.
Jacksonville, FL 32205
(904) 388-TAPE
Owner: John L. Key II
Studio Manager: John L. Key II

[16] LAMON SOUND STUDIOS INC.
6870 A Newell Hickory Grove Rd.
Charlotte, NC 28212
(704) 537-0133, 537-9310
Owner: Dwight L. Moody Jr.
Studio Manager: David B. Moody

[16] LAST TRUMPET RECORDING STUDIO
228 Buckskin Dr.
Milton, FL 32570
(904) 623-5600
Owner: Last Trumpet Ministries Inc.
Studio Manager: Keith Wilkinson

[16] LOYOLA UNIVERSITY RECORDING STUDIO
6363 St. Charles Ave.
College of Music
New Orleans, LA 70118
(504) 865-2773, 865-3750
Owner: Loyola University
Studio Manager: Sanford Hinderlie

[16] MANGUM/ALFORD RECORDING STUDIO
also *REMOTE RECORDING*
3524 Morton St.
Jacksonville, FL 32217
(904) 737-9242
Owner: Larry Mangum, Jeff Allford
Studio Manager: Larry Mangum

[16] MASTERCRAFT RECORDING
only *REMOTE RECORDING*
7075 Rosemary Ln., Port St. Lucie, FL 33452
(305) 878-2041
Owner: Marc and Kenny Rabins
Studio Manager: Marc and Kenny Rabins

[12] MIDISOUND RECORDING CENTER
903 Neptune Rd.
Kissimmee, FL 32743
(305) 847-9757
Owner: Angelo Ballestero
Studio Manager: Sam Whittemore

[16] MILEEDGE RECORDING STUDIO
5281 Lochinvar, Memphis, TN 38116
(901) 346-8818
Owner: Michael Elledge
Studio Manager: Michael Elledge
Engineers: Michael Elledge, Dean Bryant, Wayne Loden
Dimensions: Studio 21 x 11. Control room: 8 x 14.
Mixing Consoles: Tascam M-520, 20 inputs.
Audio Recorders: Fostex B16D, 16-track; TEAC A3300
SX 2-track.
Noise Reduction: dbx stereo noise reduction.
Echo, Reverb, Delay: Yamaha REV7, Yamaha SPX-90,
Yamaha R1000 reverb, DeltaLab ADM 1024, digital delay.
Other Outboard: (2) Yamaha stereo comp/limiters
GC2020, DOD stereo graphic EQ, Rockman, Aphex Aural
Exciter type C.
Microphones: Shure, Audio-Technica, Beyer, Electro-
Monitor Amplifiers: Crown D-150A Series II, Tascam
MH-40.
Monitor Speakers: JBL 4311Bs and Yamaha NS-10Ms.
Musical Instruments: Korg DSS-1 sampling synthesizer,
(2) Seymour Duncan Convertible guitar amps, (2) Latin
Percussion congas, various percussion instruments. Story
& Clark console piano, 9-piece Ludwig drum set.
Rates: \$30/hr. Block discounts available.

[16] MIRROR IMAGE RECORDING
also *REMOTE RECORDING*
619 S. Main St., Gainesville, FL 32601
(904) 376-1688
Owner: Bob McPeck, Paul Parelka
Studio Manager: Bob McPeck, Mark Pinsky

[16] THE MISSISSIPPI RECORDING COMPANY
107 N. State St.
Jackson, MS 39202
(601) 354-0857
Owner: Jerry Puckett
Studio Manager: Jerry Puckett

[16] MLS STUDIO
also *REMOTE RECORDING*
614 S. Panama St.
Montgomery, AL 36107
(205) 262-7732
Owner: Terry and Jerry Morgan
Studio Manager: Terry and Jerry Morgan

[16] MMR STUDIOS
also *REMOTE RECORDING*
Virginia Beach, VA 23452
(804) 340-4053
Owner: Ira White
Studio Manager: Ira White

[16] NEIGHBOR RECORDS RECORDING STUDIO
110E Selig Da. SW
Atlanta, GA 30336
(404) 691-5619
Owner: Nate and Bernard Bronner
Studio Manager: Nate Bronner

[16] OAK BOWERY RECORDING
also *REMOTE RECORDING*
Rt. 3, Box 185
Lafayette, AL 36862
(205) 749-5879
Owner: E. Logan Patton Jr.
Studio Manager: Lloyd Townsend

[16] OLIVERIO MUSIC STUDIOS
750 Ralph McGill Blvd. NE
Atlanta, GA 30312
(404) 525-4440
Owner: James Oliverio
Studio Manager: Richard B. Burgess

[16] O.M.A. MUSIC PUBLISHING and PRODUCTION
PO Box 9411
Birmingham, AL 35220
(205) 681-5856
Owner: Mark LeBerte
Studio Manager: Mark LeBerte

[16] ON LINE AUDIO
also *REMOTE RECORDING*
124 St. Phillips St.
Charleston, SC 29203
(803) 577-4629
Owner: Robert Graves
Studio Manager: Brian Gilbert

[16] OVERDUB LANE
also *REMOTE RECORDING*
300 E. Main St.
Carrboro/Chapel Hill, NC 27510

(919) 942-9434
Owner: Wes Lachot
Studio Manager: Holden Richards

[16] PACO PRODUCTIONS
also *REMOTE RECORDING*
211 E. Madison Ave.
Athens, TN 37303
(615) 745-3199
Owner: Don Thompson, David Passmore
Studio Manager: David Passmore, Don Thompson

[16] PLAN 'B' RECORDING STUDIO
Rt. 5, E. Lake Cir.
Canton, GA 30114
(404) 442-3300
Owner: Don Bryant
Studio Manager: Don Bryant

[16] PLATINUM PRODUCTIONS
OF CENTRAL FLORIDA
REMOTE ONLY
6427 Undine Wy
Orlando, FL 32818
(305) 298-3917
Owner: Corporate
Studio Manager: Michael Creamer

[16] PORT CITY SOUND
1715 Spring St.
Shreveport, LA 71101
(318) 424-6675
Owner: Newton Hunsicker
Studio Manager: Newton Hunsicker
Engineers: Mike Semon, John Walker, Howard Hart, Jerry
Bensen
Dimensions: Studios: over 1,000 square feet. Control
Room: 10 x 14
Mixing Consoles: Soundcraft 600 16 x 8 x 16, Yamaha
RM804 8 x 4.
Audio Recorders: Otari MX70 16-track, Otari MX5050BII
2-track master, Yamaha MT44 4-track.
Echo, Reverb, Delay: Lexicon PCM70, Yamaha SPX90,
Yamaha analog delay.
Other Outboard: dbx compressor limiters, dbx de-essers,
dbx noise gates, Rocktron dual exciter, and more.
Microphones: Assortment of Shure, AKG and others.
Monitor Amplifiers: Yamaha 2050, Crown DI50.
Monitor Speakers: JBL 4408, Auratone 5-in. reference
monitors.
Musical Instruments: Yamaha keyboards including DX7
and CLP50; Heritage, Ovation, Kramer and other model
guitars; Simmons electronic drums, KORG DDD1 with
octapad and drum buggers and much more.
Rates: We service from the smallest demos or commercial
spots, to complete album projects. Each project custom
and competitively priced starting at \$25/hr. Package pricing
available. Musicians, assistance in arrangement and
production also available. Free demonstration and quote
available by appointment.

[16] THE POWER HOUSE
3505 Macon Rd.
Memphis, TN 38122
(901) 452-8063
Owner: Steve Hauth
Studio Manager: Phil Black

[12] PRINCE PRODUCTIONS
also *REMOTE RECORDING*
Lake Hartwell
Hartwell, GA 30643
(404) 376-6477
Owner: Dave & Fran Prince
Studio Manager: Dave Prince

[16] PRODUCTION ARTS
also *REMOTE RECORDING*
Rt. 5, Box 30
Jacksonville, AL 36265
(205) 435-9609, 435-2312
Owner: Ben H. Haskell
Studio Manager: Mike Marbut

[16] PROGRESSIVE MUSIC STUDIOS
also *REMOTE RECORDING*
2116 Southview Ave.
Tampa, FL 33606
(813) 251-8093
Owner: Ken Veenstra
Studio Manager: Marcie Veenstra

[16] RAIN MOON STUDIO
85 NW 67th Ave.
Miami, FL 33126
(305) 261-5947
Owner: Rafael M. Irizarry
Studio Manager: Rafael M. Irizarry

[16] REAL TO REEL RECORDING STUDIO
970 E. Lake Dr.
Bartow, FL 33830
(813) 533-4650
Owner: Stanley T. Warren
Studio Manager: Stanley T. Warren

[16] REAL TO REEL RECORDING STUDIO
4911 N. Henry Blvd.
Stockbridge, GA 30281
(404) 474-4776
Owner: Bill Turpin
Studio Manager: Ed Roland, Joe Randolph

[16] RED D PRODUCTIONS
16064 SW 4th Ave., #A-13
Delray Beach, FL 33444
(305) 265-1825
Owner: Dennis Tooker
Studio Manager: George Cavenas

[16] REEL WORLD RECORDING STUDIO
PO Box 1396
Whiteville, NC 28472
(919) 642-2843
Owner: Ron Johnson
Studio Manager: Ron Johnson

[16] R.I.M. SOUND STUDIO
Box 55, M.T.S.U.
Murfreesboro, TN 37132
(615) 898-2518
Owner: Middle Tenn. State Univ.
Studio Manager: Chris Haseleu

[16] RITZ STUDIOS
1817 Park Lake St.
Orlando, FL 32803
(305) 896-9369
Owner: Paul Rizzo
Studio Manager: Carol Becker Rizzo

[16] THE ROCK
also REMOTE RECORDING
2216 White Ave.
Nashville, TN 37204
(615) 383-9602
Owner: Robert Krusen

[16] ROCKIT STUDIOS
2515 3rd St.
Kenner, LA 70062
(504) 837-8383, 464-6335
Owner: Frank Jenkins, Steve Matthews, Tom Conrad, Jim Lockwood
Studio Manager: Steve Matthews, Frank Jenkins
Engineers: Steve Matthews, Tom Conrad
Mixing Consoles: Canary 2442 16 x 8
Audio Recorders: Tascam MS-16, TEAC 80 8, Nakamichi ZX9 cassette, Nakamichi BX300 cassette
Echo, Reverb, Delay: Yamaha REV7, ART 01A reverb, DeltaLab Elfection II
Other Outboard: Ashly parametric equalization, Rane parametric equalization, Altec equalizers, Biamp equalizers, DOD equalizers, dbx noise reduction, Dyna-Mite compressor/limiters, dbx compressor/limiter
Microphones: Sennheiser, AKG, Shure, Realistic, PCM, Audio Technica
Monitor Amplifiers: BGW 500, Crown.
Monitor Speakers: JBL 4411
Musical Instruments: Weber 6-ft 6-in. grand, Yamaha DX7, JX8P, Polyfusion 800, Yamaha PF15, Yamaha RX11, Rogers acoustic drums, Simmons SDS7s, Rickenbacker bass, Fender Precision, various guitars, Amiga w/ Sound-scape, Mesa Boogie amplifiers, Fender amplifiers, Peavey amplifiers, and a full range of MIDI keyboards & sequencers
Rates: \$30/hr. Block rates available

[16] ROLANDO RECORDING SERVICE
1760 Osborn Dr.
Memphis, TN 38127
(901) 357-4431
Owner: Roland Janes
Studio Manager: Roland Janes

[16] ROSEMONT RECORDING STUDIO
also REMOTE RECORDING
222 N. Tonti St.
New Orleans, LA 70119
(504) 821-8611
Owner: Al Taylor, Ryan Watson
Studio Manager: Al Taylor



[16] SANDCASTLE RECORDING STUDIO
also REMOTE RECORDING
Wade Hampton Mall, Ste. 109
Greenville, SC 29609
(803) 235-1111
Owner: Christopher Cassels, Rick Sandridge, Rob Cassels
Studio Manager: Patrick Blackwell

[16] MIKE SCHRIMPF MUSIC SERVICES
143 Forest Retreat Rd.
Hendersonville, TN 37075
(615) 822-1856
Owner: Mike Schrimpf

[16] SHOOK SHACK
802 18th Ave. South
Nashville, TN 37203
(615) 242-1421
Owner: Don Cox, Hoyt Henry
Studio Manager: Hoyt Henry

[16] SILVER STAR RECORDING STUDIO
PO Box 428, 3rd St.
McBee, SC 29101
(803) 335-7703, 335-8988
Owner: Don Tiller
Studio Manager: Don Tiller

[16] SINGING WOODS
133 N. Hermitage Rd.
Beaufort, SC 29902
(803) 524-1381
Owner: Rick Bowen
Studio Manager: Rick Bowen

[16] SOUND ON SOUND STUDIO
7109 Apple Orchard Ln.
Crestwood, KY 40014
(502) 241-5115
Owner: Howell H. Gano
Studio Manager: Howell H. Gano

[16] SOUND VORTEX RECORDING
2806 Oakland Ave., Nashville, TN 37212
(615) 297-8602
Studio Manager: Robb Earls

[16] THE SOUND ROOM
325 Patterson Ave.
Fort Oglethorpe, GA 30742
(404) 866-2432
Owner: Steve Mullinix
Studio Manager: Steve Mullinix

[16] SOUND STAGE MUSIC CO.
PO Box 1082
Calera, AL 35040
(205) 668-1981
Owner: Charles Sampson
Studio Manager: Greg Brown

[16] STAR TRACK
also REMOTE RECORDING
1820 Beechwood Ave.
Nashville, TN 37212
(615) 297-1010
Owner: Ida May Music Inc
Studio Manager: Dana C. Belser

[16] STAR TRACKS RECORDING STUDIO
also REMOTE RECORDING
207 S. Macon St.
Jesup, GA 31545
(912) 368-3228

Owner: Walter and Kathy Pinder
Studio Manager: Walter F. Pinder Jr.

[16] THE STUDIO
also REMOTE RECORDING
Route 8, Box 484-B
Chapel Hill, NC 27514
(919) 967-8470
Owner: John Santa
Studio Manager: Mac Monroe

[16] STUDIO B
also REMOTE RECORDING
1119 Bell St.
Montgomery, AL 36104
(205) 834-6881
Owner: Jayonn Bearden
Studio Manager: Jayonn Bearden



SUN-RAY RECORDS / SKY-VUE
Lexington, KY

[16] SUN-RAY RECORDS / SKY-VUE
also REMOTE RECORDING
1662 Wyatt Pky
Lexington, KY 40505
(606) 254-7474
Owner: James T. Price
Studio Manager: Kathy Parvin, Darrell Burton

[16] SWEETSONG PRODUCTIONS/
MUSIC FACTORY
Rt. 9, Box 332-A
Parkersburg, WV 26101
(304) 428-7773
Owner: Roger Hoover
Studio Manager: Roger Hoover

[16] THOROUGHbred STUDIOS
498 Millwood Dr.
Nashville, TN 37217
(615) 361-1575
Owner: Raymond Rider
Studio Manager: Raymond Rider

[16] THRESHOLD RECORDING
also REMOTE RECORDING
410 Elm Ave. SW
Roanoke, VA 24016
(703) 345-2539
Owner: F. Howard Beasley, J. Harold Thompson
Studio Manager: F. Howard Beasley

[12] TOP TRACKS RECORDING STUDIO
1019 17th Ave. S., Ste. D
Nashville, TN 37212
(615) 321-4876
Owner: Tom Pallardy
Studio Manager: Clark Williams

[16] TOTAL TRACS, INC.
4194 Meadow Ct.
Marietta, GA 30066
(404) 924-2141
Owner: Dwight Waggener
Studio Manager: Dwight Waggener

[16] TRACKS RECORDING STUDIO
 Rt. 6, Box 304A
 Waycross, GA 31501
 (912) 283-5369
 Owner: Billy Ray Herrin
 Studio Manager: Marion Shadron



TROPICAL RECORDING STUDIO
 Miami, FL

[16] TRAXION RECORDING STUDIO
 701 Lexington Ave., Greensboro, NC 27403
 (919) 275-6773

Owner: William Babcock
 Studio Manager: Barry Webb
 Staff Engineers: Barry Webb, Bil Jenko
 Dimensions: Studios 20 x 40, 8 x 12; Control rooms 20 x 10, 10 x 12.

Mixing Consoles: Sound Workshop Logex 8, 20 x 8 x 2; Sound Workshop Logex 8, 12 x 8 x 2.

Audio Recorders: Otari MX-70, 16-track; Otari MX-5050 MK-III, 8-track; Otari MX-5050 BQ-II, 4-track; Otari MX5050B, 2-track.

Noise Reduction: dbx 180.

Echo, Reverb, Delay: Yamaha REV7, Ursa Major 8 x 32 digital reverb, Effectron II, Sound Workshop 242A reverb. Microphones: Neumann, AKG, E-V RE20, PL20, Sennheiser 421, Crown PZM.

Monitor Amplifiers: Crown DC300 A, Crown D-75. Monitor Speakers: JBL 4430, JBL 4411, Fostex 6301.

Musical Instruments: Yamaha DX7, Tama 7-piece drum set w/Zildjian cymbals, LinnDrum, Oberheim OB-8, Kimball grand piano, Deagan marimba, Fender Stratocaster, Fender Precision Bass, assorted percussion instruments. Video: Do corporate videos for training/sales as well as music video.

Rates: 16-track: \$60/hr.; 8-track: \$50/hr.

Extras & Direction: All Traxion engineers can produce as well as engineer and we all have served time on the road. We are all singers, musicians, writers as well as producers. Bring us your next album project and let us show you what our "Musicians" can do. We also offer in-house graphics and PR services (album cover design, logo design, t-shirts, hats, etc.) Why settle for an engineer when you can have a "Musician?" Traxion specializes in high quality song demos, national quality jingles, music videos, and corporate training cassettes/videos. Compare sound, rates, and engineers... "Nobody can follow in our tracks."

[16] TROPICAL RECORDING STUDIO
 7393 SW 42 St.
 Miami, FL 33155
 (305) 264-4511

Owner: Daniel Diaz, Gary W. Flea.

Studio Manager: Rick Reed

Engineers: Rick Reed, Danie. Diaz

Dimensions: Studios: 24 x 23. Control Rooms: 12 X 16.

Mixing Consoles: Tascam M-520 20 x 16

Audio Recorders: Tascam MS-6 16-track, Otari MX 5050 MK III 2-track, Otari MX 5050 B II 2-track, Nakamichi Z/X 9 cassette, Nakamichi MR 1 cassette.

Echo, Reverb, Delay: Yamaha REV7, Yamaha SPX90, Roland SDE-3000 MXM 01 reverb, Boss DE200, Elctra EP 550.

Other Outboard: Drawmer gates, dbx 116, Aural Exciter, dbx 3BX expander, Akai XZ-100 automation system.

Microphones: Neumann U87, 460R, D12E, D112, D321, Sennheiser NI421, 441, Shure 57, 58, Audio-Technica ATM-41, E-V PL 6

Monitor Amplifiers: Yamaha P-2200, Rane MA-6, Kuston, PA. 10.

Monitor Speakers: JBL 4430, Klipsch Cornwall, E-V FM502, Yamaha NS-10M, Auratone 5C.

Musical Instruments: E-mu SP-12, Simmons SDS EPB, Simmons SDS 1, Simmons MTM, Yamaha QX21, Simmons SDS 5 drum kit, sampling keyboard, Korg DW6000, Oberheim DX w/Stretch, Korg EX 800.

[16] TWENTY-TWENTY INTERNATIONAL RECORDING STUDIO
 also REMOTE RECORDING

2020 Capitol St.
 Savannah, GA 31404

(912) 236-0000

Owner: Ferman Tyler, James Barefoot
 Studio Manager: James Barefoot

[16] UNDERGROUND SOUND
 3010-Skyland Blvd. E.

Tuscaloosa, AL 35405

(205) 556-0030

Owner: Andy Chappell
 Studio Manager: Joey Laycock

[16] WAVELENGTH RECORDING STUDIOS

913 S. Chapman St.

Greensboro, NC 27403

(919) 378-0650

Owner: Hugh Savis
 Studio Manager: Hugh Savis

[16] WISE ENTERPRISES

also REMOTE RECORDING

184 Mariners Row

Columbia, SC 29210

(803) 781-8388

Owner: Doug Baker
 Studio Manager: Doug Baker

[16] ZBOP/WV

also REMOTE RECORDING

1301 Briar Creek Rd. "Walnut Hollow

Charlotte, NC 28205

(704) 376-2864, 889-4508

Owner: Cal Walker
 Studio Manager: Cal Walker

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| Amek | Bose | Easoniq | Nady | Shure | Technics |
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| Aphex Broadcast | BBE | Fairlight | Orban | Sony Digital | TOA |
| ATI | Capitol | Fostex | Otari | Sony/MCI | UREI |
| Audioarts | Cipher Digital | Goldline | Peavey | Soundcraft | Ursa Major |
| Audio Design | Countryman | HME | PPG | Soundcraft | U.S. Audio |
| Audio Developments | Crest | Hill Audio | QSC | Magnetics | Valley People |
| Audio Technica | Crown | Ibanez | Ramko | Studer Revox | Wheatstone |
| Audio Kinetics | dbx | JBL | Ramsa | Symetrix | |
| Q-Lock | DOD | JVC | Rane | Symetrix | |
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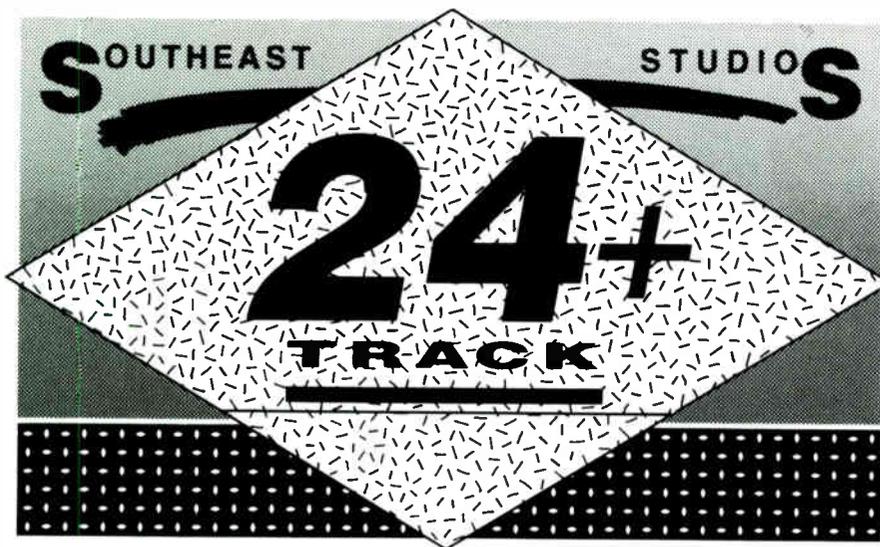
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ARDENT RECORDINGS, INC.
Memphis, TN

[24+] ALLEN-MARTIN PRODUCTIONS
also **REMOTE RECORDING**
9701 Taylorsville Rd., Louisville, KY 40299
(502) 267-9658

Studio Manager: David Blythe, Vince Emmett
Extras & Direction: Synclavier studio; full Synclavier system with single instrument booth linked to main 24-track studio with 30 x 40 x 20 room. We also offer: full array of reverbs, plates, digital-to-live echo chambers; extensive mic collection with several vintage mics; and audio-to-video sync (multi-cam remote capabilities and 30 x 30 cyclorama with two editing suites). Our production team is experienced in all phases of product management, from pre-pro through finished product. Staff specialist can assist in album: production (musicians on staff), pressing and duplication, music video productions, film scoring, post-scoring and mixing, film and video sweetening. Staff script and song writers. Jingle division clients include: Coca-Cola Inc., AMC, Nationwide Insurance, Chevron, Valvoline, Hyatt International, GE, and Budget Rent-a-Car. This comprehensive facility, located on a private Kentucky estate, offers a warm, creative atmosphere. Our award-winning staff of 14 is here to complete any facet of your project with a professional attitude and all the extras you need: complete kitchen, large conference room, 15 minutes from major airport, limo service available.

Audio Recorders: Studer A800, 24-track; Otari MTR-90, 24-track; Otari MTR-20, 2-track; Otari MTR-10, 2-track; Ampex 350, 1-track; Ampex 300, 2-track.

Noise Reduction: Dolby.
Synchronization: (2) The Boss automated audio editors, (2) Adams-Smith synchronizers.
Echo, Reverb, Delay: (2) EMT140, Yamaha REV-1, (6) REV7, AKG BX20, Lexicon.
Other Outboard: Compressors by UREI, dbx, Orban. Equalizers by Pultec, Lang, Orban, UREI. Compact disc players by Sluder, Technics, Carver. Custom 8-channel headphone mixers for Studio 1.

Microphones: 100 microphones including: Neumann, AKG, Shure, RCA, Sony Electro-Voice. Mint condition tube mics: Neumann U47 and 67 Sony.

Monitor Amplifiers: UREI, Crown, JBL, BGW
Monitor Speakers: UREI, Yamaha, JBL, Auratone.
Musical Instruments: Yamaha C7 concert grand piano, Fender Rhodes piano, Hammond B3 organ w/Leslie tone cabinet, Hohner clavinet, congas, Coral electric sitar, Rogers-Ludwig-Gretsch drums, Music Man and Fender amps, Kurzweil 250 w/all current software options, Yamaha DX7, KX88, TX816, Ensoniq Mirage, Sequential Circuits Prophet-5 and Prophet-2002 digital sampler.
Video: IVC 3/4-inch VCR.

Rates: Rate card available upon request.
Extras & Direction: Dolby noise reduction, extensive sound effects and music production libraries on CDs, custom music libraries stored on digital format (MIDI). Audio-for-video production, comprehensive music production serving international recording companies, advertising agencies and film/video production companies, corporate accounts. Further development of Boss automated audio editor and acoustical products for the audio industry.

[24+] AMERICAN RECORDING CENTER
also **REMOTE RECORDING**
515 W. 18th St., Orlando, FL 32805
(305) 425-1342
Owner: Jeff Pratt
Studio Manager: Jeff Pratt

[24+] PAT APPLESON STUDIOS, INC.
also **REMOTE RECORDING**
1000 NW 159 Dr., Miami, FL 33169
(305) 625-4435
Owner: Pat G. Appleson
Studio Manager: Fran Fiman Pickens

[24+] ARCHER ENTERTAINMENT
also **REMOTE RECORDING**
PO Box 1118
3220 NE 14th St. CSWY #2
Pompano Beach, FL 33061
(305) 781-9901
Owner: Peter Archer
Studio Manager: Ray Monzon

[24+] ARDENT RECORDINGS, INC.
2000 Madison, Memphis, TN 38104
(901) 725-0855
Owner: John Fry
Studio Manager: Carol Tabor
Engineers: Joe Hardy, John Hampton, Robert "T.D." Jack-

son, Pat Taylor, Mark Culp.
Dimensions: Room 1: studio 25 x 40; control 16 x 25; Room 2: studio 24 x 17; control 25 x 20; Room 3: studio 25 x 35; control 18 x 25.

Mixing Consoles: Solid State Logic 6000E, 40 x 32; Mitsubishi Wsstar, 44 x 24; MCI 542, 42 x 32.
Audio Recorders: Mitsubishi X-850 digital, 32-track; Mitsubishi X-800 digital, 32-track; Otari MTR-90, 24-track; (2) MCI JH-24, 24-track; (4) Mitsubishi X-86 digital, 2-track; (2) MCI JH-110, 2-track.

Echo, Reverb, Delay: Lexicon, 224XL, Quantec, (6) Yamaha REV7, (2) Publison Internal Machines, Lexicon Prime Time, (2) Eventide Harmonizer, (3) Roland SDE-3000, DeltaLab Effectron, ADR Scamp ADT, Marshall Time Modulator, (3) EMT, AMS RMX-16, AMS DMX-16, Bel BD-8, (3) live chambers.

Other Outboard Equipment: (2) Fairchild limiters, (2) UA 176 limiters, UA 1176, (4) dbx 16C, (6) dbx 165, Kexex, (3) Scamp Racks w/gates, compressors, de-essers, Dynamic noise filter, Auto Panner, (2) Valley Intelligent de-esser, Dr. Chick.

Microphones: Neumann M-249, U67, U87, KM 84, KM 86; B&K; Sanken; AKG; C-422 Stereo, C-414, C-451, D-12; Crown PZM; Electro-Voice RE-20, RE 15; Sennheiser: MD-421, MD-441; Shure SM81, SM57; Bever 201; also Sony and RCA.

Monitor Amplifiers: Crown, BGW
Monitor Speakers: Audicon, JEL 435C, KEF, Yamaha NS-10M, Auratone.

Instruments Available: (2) Fairlight Series III, Yamaha DX7, Yamaha TX-track, (2) Roland Super Jupiters, Roland piano synthesizer, Minimoog w/MIDI, Moog Memorymoog, Steinway grand piano, Yamaha grand piano, Chickering grand piano, Fender Rhodes, Hammond M-3 organ, Hohner clavinet, (2) Gretsch drums.

Video: Complete 1-inch video tape 16 and 35 mm film production and editing.

Rates: Available on request.
Extras & Direction: ZZ Top, Joe Cocker, Emerson Lake & Palmer, Leon Russell, Issac Hayes, Bar-Kays, Memphis Horns, Staple Singers, Bobby Blue Bland, Roy Orbison, Johnny Cash, Roy Clark, DeGarmo & Key, Mylon LeFevre, Phil Dnsccil, Glad, Blackwood Brothers, Jessie Dixon, Farrell & Farrell, Green on Red, Alex Chilton, The Ramblers, The Beach Boys, J. Blackfoot, Coral Reefer Band, Joe Walsh, Al Green.

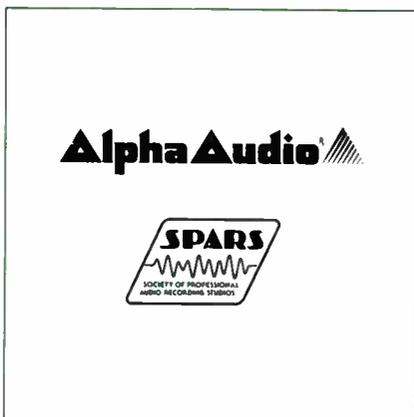
[24+] AUDIO CREATIONS RECORDING STUDIO
also **REMOTE RECORDING**
4815 Clarks River Rd., Paducah, KY 42003
(502) 898-6746
Owner: Ralph Rowton Jr., George Cumbee Jr.
Studio Manager: George Cumbee Jr.

[24+] AUDIO MEDIA RECORDERS
808 19th Avenue South, Nashville, TN 37203
(615) 320-5985
Owner: C.E. Jackson
Studio Manager: Bob Wright
Engineers: Hollis Halford, Bob Wright.
Dimensions: Room 1: studio 28 x 25, control 16 x 22; Room 2: studio 14 x 13, control 16 x 13.
Mixing Consoles: Trident 80B (56 in. ar. remix) 30 x 24; Harrison MR2, 28 x 24.

Audio Recorders: Studer A800 MKIII, 24-track; Studer A80, 24-track; Sony 3202, 2-track; (2) Studer B67, 2-track; Studer A67, 2-track; Ampex 440B, 2-track; IVC digital 2-track.

Echo, Reverb, Delay: (3) EMT stereo tube plates, Lexicon 224X, EMT 250, Yamaha REV1, Lexicon Super Prime Time, DeltaLab 102.

Other Outboard: LA-2As, LA-3As, dbx 160s, dbx 165s,



ALPHA AUDIO
Richmond, VA

[24+] ALPHA AUDIO
also **REMOTE RECORDING**
2049 West Broad St., Richmond, VA 23220
(804) 358-3852

Owner: Nick Collieran
Studio Manager: Carlos Chafin
Staff Engineers: Joe Sheets, Joe Horner, Bevin Armistead, John Thusty, David Brooks.
Dimensions: Room 1: studio 65 x 35 x 20, control 12 x 14 x 8; Room 2: studio: 8 x 12 x 8; control 12 x 9 x 9; Room 3: studio 8 x 12 x 8; control: 8 x 12 x 8; Room 4: studio 18 x 20 x 9; control 12 x 14 x 8.
Mixing Consoles: Sphere Eclipse C, 44 x 34; Quad Eight Ventura, 28 x 14; Quad Eight 2, 4, 8, 12 x 12.

1176LNs, Pultec EQs, Sontec, API, Kepex II.
Microphones: Neumann: U47 (tube), U47 FET, U87, U67, KM64, KM84, U249, M49; AKG: 414EB, 451, 452; Shure 57; Sennheiser 421; E-V RE20; Sanken CU-41; Telefunken 250.

Monitor Amplifiers: McIntosh, Phase Linear, BGW, Crown, UREI.

Monitor Speakers: (2) Westlake TM-1, Yamaha NS-10, JBL 4310, Fostex 780, Westlake BBSM-6.

Musical Instruments: New England Digital Synclavier 32-voice polyphonic, PPG wave 2.3, Oscar, Yamaha 9-ft. grand piano, Wuritzer electric piano, ARP Axhe, ARP String Ensemble, ARP Omni, clavinet, various percussion. Video: Post-scoring available w/Synclavier music system. Rates: Available upon request.

[24+] AUDIO VISIONS

also REMOTE RECORDING

710 Distillery Commons, Louisville, KY 40206

(502) 587-6863

Owner: J.R.E. Inc.

[24+] AUGUST RECORDING STUDIO

1428 Marcheck St., Jacksonville, FL 32211

(904) 743-7131

Owner: Wayne Fanning

[24+] THE BENNETT HOUSE STUDIOS, INC.

134 4th Ave. N., Franklin, TN 37064

(615) 790-8696

Owner: Bob Montgomery

Studio Manager: Steve Schaffer, Jack W. Ross
Engineers: Gene Eichelberger, Mike Clute, Brian Hardin, Wade Jaynes, Clarke Schleicher, J.T. Cantwell.

Dimensions: Room 1: studio 44 x 18, control 20 x 26;

Room 2: studio 9 x 12, control 20 x 26.

Mixing Consoles: Trident A-Range 28 x 24; Trident Bud Wyatt Series 80.

Audio Recorders: (2) MCI transformerless, 24-track; (2) Studer B67, 2-track; Ampex ATR-100 ½-inch, 2-track; (2) Studer 800s, 2-track; Sony PCM-F1 digital 2-track.

Cassette Recorders & Duplicators: (4) Technics, Studer cassette.

Synchronization: Lynx SMPTE lock-up available.

Echo, Reverb, Delay: EMT 250, (2) Lawson plates, Lexicon 200, Yamaha REV7, AMSDDL, Eventide 949, Lexicon 224X with LARC.

Other Outboard: Various gates, EQs, delay lines, CD players.

Microphones: Neumann Tube M-249, 87s, 414, 421s, 224s, etc. AKG Tube, Sankens.

Monitor Amplifiers: Yamaha.

Monitor Speakers: JBL 4411s, John Meyer monitors, Yamaha NS10, E-V Sentry 100, Braun 3-way, Auratones.

Musical Instruments: New England polyphonic Synclavier, Baldwin 7-ft. grand piano, Eddie Reynolds Rhodes. Video: Sony 5850 ¾-inch VTR with sync. Rates: Call for rates.

[24+] BIAS RECORDING COMPANY, INC.

also REMOTE RECORDING

5400 Carolina Pl., Springdale, VA 22151

(703) 941-3333

Owner: Bill McElroy, Bob Dawson

Studio Manager: Glona Dawson

Engineers: Bob Dawson, Bill McElroy, Jim Robeson, Rob Schnapf, Don Lundbergh

Dimensions: Room 1: studio 16 x 25, 20 x 30, control 12 x 16; Room 2: studio 16 x 25, control 12 x 16.

Mixing Consoles: API (Studio A) modified 2488 w/Allison Fadex 24 x 8; API (Studio B) modified 1604 16 x 4.

Audio Recorders: Ampex (Studio A) MM-1200, 24-track; Ampex (Studio B) MM 1200, 24-track; Ampex; Studer (7) B-67, 2-track, A-67, 2-track; Ampex 440-B, 4-track; Technics (2) M-280 cassette.

Echo, Reverb, Delay: (2) Lexicon Model 200, Lexicon 224, (2) EMT 162, Lexicon PCM70, Lexicon PCM60, Lexicon Prime Time, (2) Eventide Harmonizer, AKG BX20E.

Other Outboard: UREI 1176 LN, UREI LA-4, UREI 964 digital metronome, UREI 1178 stereo, dbx 160, Teletronix LA-2A, Kepex, Dyna-Mite, MXR studio phaser, MXR studio flanger.

Microphones: Neumann, Sony, AKG, Shure.
Monitor Amplifiers: Studio A: Bryston; Studio B: Crown.
Monitor Speakers: Studio A and B: Sierra/Hidley and Auratone.

Instruments Available: Yamaha C-5 grand piano, Hammond C3 w/Leslie, Fender Rhodes, Hohner clavinet, Slingerland drums, Fibes drums, Fender Precision Bass, Fender Twin Reverb, blond Fender Pro, (2) tweed Fender Deluxe, tweed Fender Vibrolux, Oberheim DX drum machine, DX7, Marshall 50W head, Marshall 4 x 10 cabinet. Rates: Studio A: \$100/hr.; Studio B: \$70/hr.; bulk rates available.

[24+] BOUTWELL RECORDING STUDIOS, INC.

also REMOTE RECORDING

720 S. 23rd St., Birmingham, AL 35233

(205) 251-8889

Owner: Various

Studio Manager: Nancy Boutwell Cotton

Staff Engineers: Greg Bass, Courtney Haden, Mark Harrelson, Jeff McKee, Wayne Thompson, Tony Wachter.

Mixing Consoles: MCI 428, 28 x 16; Soundcraft 800, 18 x 8; (2) Soundcraft 200, 16 x 4.

Audio Recorders: MCI JH-16, 24-track; Otari MX-70, 16-track; (2) Otari MX-5050, 8-track; Otari MTR-10TC, 2-track; (3) MCI JH-110, 2-track; (3) Ampex ATR-700, 2-track; Ampex ATR-800, 2-track.

Synchronization: Cipher Digital Softouch system with Otari MX-70 and MTR-10 locked-to-video for scoring and sweetening.

Echo, Reverb, Delay: Yamaha SPX-90, Lexicon PCM60, PCM70, ART 1500, AKG BX-20, Lawson Plate, ADA 1500, Ross DDL.

Other Outboard: Limiters/compressors by UREI, dbx, Ashley, ADR; Orban 526 A, Pais 6710 Vocoder.

Microphones: U-87s, 414 EB, MD421s, RE-20s, C-452s, PZMs.

Monitor Amplifiers: Crown, Yamaha.

Monitor Speakers: JBL, Auratone.

Musical Instruments: Akai AX-60 synthesizer with sampler interface, Oberheim DX drum machine, Yamaha grand piano, Fender bass, various guitar amps, drums, percussion, etc.

Other MIDI Equipment: Akai S612 sampler.

Rates: Call.

Extras & Direction: We have extensive sound effects and production music libraries on compact disc with CD players in all four studios; open reel and cassette duplication; on-staff announcers; comprehensive script writing and production services; commercial music composition, and production for regional and national clients. Since incorporating in 1962, the Boutwell Studios has become the largest audio production facility in the market and one of the most prestigious in the Southeast. Winning the Clio, as well as numerous national and international awards for commercial production, we have also garnered dozens of local and regional advertising honors for our exceptional work on all kinds of audio applications. We have recently upgraded our sweetening facilities to position ourselves competitively for stereo TV production and general post-production. However, our most important asset is not equipment, but experience—the years of production skills our six production engineers focus on every project they undertake.

Other MIDI Equipment: Akai S612 sampler.

Rates: Call.

Extras & Direction: We have extensive sound effects and production music libraries on compact disc with CD players in all four studios; open reel and cassette duplication; on-staff announcers; comprehensive script writing and production services; commercial music composition, and production for regional and national clients. Since incorporating in 1962, the Boutwell Studios has become the largest audio production facility in the market and one of the most prestigious in the Southeast. Winning the Clio, as well as numerous national and international awards for commercial production, we have also garnered dozens of local and regional advertising honors for our exceptional work on all kinds of audio applications. We have recently upgraded our sweetening facilities to position ourselves competitively for stereo TV production and general post-production. However, our most important asset is not equipment, but experience—the years of production skills our six production engineers focus on every project they undertake.

Other Outboard: Dynamites, UREI 1176 limiters, Ashley comp/limiters, Gatex noise gates, dbx 160, Aphex compeller, Aphex B, Orban de-esser, Barcus Berry BBE, White EQs, Neptune parametric EQ, API 550As, Altec tube limiter.

Microphones: AKG The Tube, 414s, Neumann U-87s, KM-84s, Sennheiser 421, 441, Shure SM7, 54, 57, 58, 81, 330, E-V RE20, Crown PZMs, Beyer M300.

Monitor Amplifiers: Crown.

Monitor Speakers: UREI 813B, JBL 4311, Yamaha NS-10, Auratones.

Musical Instruments: Yamaha C-5 grand, Hammond M-3 w/Leslie, Yamaha DX7, TX7, GS-2, Oberheim OB-8 w/MIDI, 360 Systems, Roland JX-8P, MKS-20, MKS-30, SVC-350 Vocoder, Arp 2600, string ensemble, Linn 9000, Oberheim DMX w/MIDI, Roland 727, Simmons SDS-7 w/EPROM blower, Rodgers drum kit, Musser vibes and orchestra bells, Ovation 6- and 12-string guitars, Music Man electric bass.

Video: ¾-inch U-Matic facilities available in-house and remote.

Rates: \$90 per hour 24-track, \$25 per hour 8-track. Call for package rates.

[24+] BROKEN DOOR STUDIO

5405 Stanford Dr., Nashville, TN 37215

(615) 269-0727

Owner: Keeble Media Group

Studio Manager: Peter Keeble

[24+] C-NOTE STUDIO

233 Ponce De Leon Ave., Atlanta, GA 30308

(404) 872-6683

Owner: C-Note Studio Inc. (Curtis A. Walker)

Studio Manager: C-Note Studio Inc. (Curtis A. Walker)

[24+] THE CASTLE RECORDING STUDIO, INC.

Old Hillsboro Rd., Rt. 11, Franklin, TN 37064

(615) 791-0810

Owner: Joseph Nuyens

Studio Manager: Joseph Nuyens Jr.

Engineers: Jeff Coopage, Mark Richardson, Mark Nevers.

Dimensions: Size of castle.

Mixing Consoles: Solid State Logic 4000E with Total Recall Computer 48 x 32, Yamaha 16-track.

Audio Recorders: Mitsubishi X-850, Mitsubishi X-86 digital, 3M digital, Studer analog machine.

Synchronization: Masterbeat synchronizer.

Echo, Reverb, Delay: Lexicon 224x w/LARC, Lexicon 224, AMS DMX 15-80 w/1.6 sec. delay on A side and 3.2 sec. delay on B side, Lexicon Super Prime Time 97, Lexicon Prime Time 93, (2) Large Ecoplate II, AMS RMX-16, Lexicon PCM42, (3) Lexicon PCM70, EMT-250, and Yamaha D-1500 delay.

Other Outboard: AMS DMX 15-80s w/delgitch card in both channels; Eventide H1910; (2) ADR vocal stressers, ADR 504; (4) Valley People Kepex II, (2) 504 Scamp parametric EQ; S25 Scamp de-esser, Trident stereo limiter/compressor, (2) UREI 1176; SSL has built-in compressor/limiter, expander/gates on all 48 channels.

Microphones: Complete assortment of Neumann, Neumann old tubes, Sennheiser, AKG, AKG tubes, Shure, PML, Sony.

Monitor Amplifiers: (3) 4B Bryston on main; Yamaha 2201 on alternates; BGW 250s on cue.

Monitor Speakers: JBL 4430 Bireadials, Yamaha NS-10s, JBL 4411, Auratones, Fostex RM 780.

Musical Instruments: Fairlight CMI system and printer, Yamaha DX1, Yamaha DX7, Bosendorfer 7'3" grand, TX Rack, Oberheim MATRIX 6, Oberheim DMX, Simmons 7-piece set, Simmons SDS6, Roland TR 808, Hammond B3 w/Leslie, Rhodes, tack piano, Martin guitars from private collection.

Other MIDI Equipment: Akai S900 sampler, QX1 sequencer, JL Cooper MIDI selector.

Rates: Available upon request.

[24+] CENTURY THREE TELEPRODUCTIONS

5000 Eggleston Ave., Orlando, FL 32804

(305) 297-1000

Owner: Ross Cibella

Studio Manager: Oliver Peters

[24+] CHANDLER AUDIO

also REMOTE RECORDING

1617 W. Midland Trail Rd.

PO Box 5629, Ashland, KY 41105

(606) 928-9507

Owner: Chandler Audio, Inc.

Studio Manager: Denny Chandler

Staff Engineers: Dick Hawkins, Ed Lambert, Otis Dillon,

Denny Chandler. Independents: Paul Callicot, Steve Hoffman, Dave Staton.

Dimensions: Studio 22 x 24, drum booth 11 x 12, control 19 x 16.

Mixing Consoles: Harrison 3624, 36 x 24 x 4 x 2, Sound Workshop 1280B-BEQ, 12 x 8 x 2.

Audio Recorders: Studer A-80II, 24-track; Tascam 80-8, 8-track; Ampex ATR-800, 2-track (2) Nakamichi BX-300, cassette.

Echo, Reverb, Delay: Klark-Teknik DN-780, (2) Yamaha REV7, stereo plate Ibanez SDR-1000, Yamaha SPX-90, Eventide Harmonizer, Eventide Flanger, ADA 2.56 delay, ADA STD-1, Korg SDD-3000, Ursa Major Space Station, Roland chorus/echo, Lexicon Prime Time.

Other Outboard: Dynamites, UREI 1176 limiters, Ashley comp/limiters, Gatex noise gates, dbx 160, Aphex compeller, Aphex B, Orban de-esser, Barcus Berry BBE, White EQs, Neptune parametric EQ, API 550As, Altec tube limiter.

Microphones: AKG The Tube, 414s, Neumann U-87s, KM-84s, Sennheiser 421, 441, Shure SM7, 54, 57, 58, 81, 330, E-V RE20, Crown PZMs, Beyer M300.

Monitor Amplifiers: Crown.

Monitor Speakers: UREI 813B, JBL 4311, Yamaha NS-10, Auratones.

Musical Instruments: Yamaha C-5 grand, Hammond M-3 w/Leslie, Yamaha DX7, TX7, GS-2, Oberheim OB-8 w/MIDI, 360 Systems, Roland JX-8P, MKS-20, MKS-30, SVC-350 Vocoder, Arp 2600, string ensemble, Linn 9000, Oberheim DMX w/MIDI, Roland 727, Simmons SDS-7 w/EPROM blower, Rodgers drum kit, Musser vibes and orchestra bells, Ovation 6- and 12-string guitars, Music Man electric bass.

Video: ¾-inch U-Matic facilities available in-house and remote.

Rates: \$90 per hour 24-track, \$25 per hour 8-track. Call for package rates.

[24+] CHESHIRE SOUND STUDIOS

also REMOTE RECORDING

2093 Faulkner Rd., N.E., Atlanta, GA 30324

(404) 321-3886

Owner: Tom Wright

Studio Manager: Karen A. Smith

[24+] CINDERELLA SOUND STUDIO

1108 Cinderella St., Madison, TN 37115

(615) 865-0891

Owner: Wayne Moss

Studio Manager: Wayne Moss

[24+] COCONUTS RECORDING CO.

1830 NE 153 St., No. Miami Beach, FL 33162

(305) 940-4656

Owner: Shirley P. Kaye

Studio Manager: Shirley P. Kaye

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COMMERCIAL MUSIC RECORDING COMPLEX
Memphis, TN

[24+] COMMERCIAL MUSIC RECORDING COMPLEX
Memphis State University
Dept. of Music, MSU, Memphis, TN 38152
(901) 454-2559

Owner: Memphis State University
Studio Manager: Larry Lipman
Engineers: Larry Lipman, advanced students in audio degree program.
Dimensions: Studio A 60 x 60 x 20, studio B 23 x 16 x 20; control 20 x 16 x 12.
Mixing Consoles: MCI JH-636 24 x 24.
Audio Recorders: MCI JH-24, 24-track, Otari 5050 Mark III-8, 8-track; MCI JH-110B 2-track, others.
Echo, Reverb, Delay: Lexicon 224XL; Lexicon M97 Super Prime Time.

Other Outboard: Aphex Aural Exciter Type B, Harmonizer H949, dbx 160x, Dyna-Mite, Scamp, other. Monitors tuned with UREI filters and B&K Spectrum analyzer. Console equipped with MCI automation.

Microphones: Neumann U47, U87, KM84, AKG C414, C452, Sennheiser MD421, Shure SM81, SM57, E-V RE20, RE10, Crown P2M.

Monitor Amplifiers: BGW, AB Systems.
Monitor Speakers: UREI 813A, Yamaha NS10, JBL 4401, Auratones.

Musical Instruments: Steinway grand, Baldwin grand, Yamaha DX7, full complement of studio, orchestral and percussion instrumentation available.

Video Equipment: Complete video production services available; funding requested to enable video production suite to be interfaced with recording studios.

Rates: The CMUS Complex is operated primarily as an instructional facility and was developed to handle the needs of the University's Commercial Music degree programs and Highwater record company. Although normally unavailable for commercial use, studio rental is authorized under special circumstances. Availability and rates upon request.



COOK SOUND STUDIOS
Fort Payne, AL

[24+] COOK SOUND STUDIOS
1419 Scenic Rd., Fort Payne, AL 35967
(205) 845-2286

Owner: Jeff Cook
Studio Manager: John Estes
Engineers: John Estes, independents
Dimensions: Studio 28 x 37; Control room 14 x 16
Mixing Consoles: Neve 8058 28 x 24



Audio Recorders: Studer A80 VU MKII, 24-track; A80 VU MKII 1/4-inch, 2-track, A80 VU MKII 1/2-inch, 2-track, Revox PR 99, 2-track.

Cassette Recorders & Duplicators: Studer A710.
Echo, Reverb, Delay: EMT plate, Lexicon Super Prime Time, Ursa Major 8 x 32.

Other Outboard: Eventide Harmonizer; (2) dbx 160X compressors; EXR EXIV Exciter, Orban 622B parametric; UREI 1176LN compressors; Scamp rack w/ gates, compressors, de-essers, sweep EQ; Neve compressor/limiter, telephone distort module, notch and correction filters, and background noise suppresser.

Microphones: Neumann M49, (2) U48, (2) U47, (3) U87; AKG (4) 414, (4) 452; Shure (2) SM7, (3) SM81, (8) SM57; Electro-Voice (2) RE20, Audio-Technica (2) ATM31R; Sennheiser (4) 421; Studer SKM-5.

Monitor Amplifiers: McIntosh 2300, McIntosh 2105, Yamaha 2200, Yamaha 2050.

Monitor Speakers: UREI 813, Yamaha NS-10M, Auratones.

Musical Instruments: Yamaha acoustic piano, Oberheim OB-Xa w/DSX, Yamaha SK-15, Music Man, Fender and Carvin amps, Rhodes 73, Gretsch drums.

Rates: \$75/hr.

[24+] COTTON ROW RECORDING
1503 Madison Ave., Memphis, TN 38104
(901) 276-8518, 276-8520

Owner: Ward Archer, Jr., Nikos Lyras
Studio Manager: Melanie Hunolt
Engineers: Nikos Lyras, Danny Jones, Gerard Harris, Doug Nightwine, John Scott.
Mixing Consoles: Trident Series 80, 32 x 24; Akai MG 1214, 12 x 12.

Audio Recorders: Otari MTR-90, 24-track; Otari MTR-10, 2-track; Akai MG 1214, 12-track; TEAC 2-track.

Cassette Recorders: Nikko, Tascam.
Echo, Reverb, Delay: Lexicon 224, Lexicon PCM60, Roland, Lexicon PCM41, Roland, DeltaLab Echotron, DeltaLab Effelectron Jr., Yamaha SPX-90.

Other Outboard: Dyna-Mite gates/limiters/de-essers, dbx 160X compressors, White EQs, UREI EQs, OmniCraft gates, Roland choruser/flanger, TC electronics choruser/flanger, TC electronics sustain/parametric.

Microphones: Neumann U87, AKG 414, AKG 451, Neumann K84, AKG D12, AKG D200, Sennheiser MD421, E-V RE20, Crown P2M, Shure SM57.

Monitor Amplifiers: Yamaha, Crown, BGW.
Monitor Speakers: E-Vs, Yamaha NS-10M, JBL 4401, JBL 4311, Auratones.

Musical Instruments: Kawai 6-ft grand piano, Hammond B-3 organ and Leslie speaker, Emulator II, Yamaha DX7 and DX1, MemoryMoog, MiniMoog synthesizers, Fender Strat, Gibson 355, Seymour Duncan amp, Fender twin reverb amp, Polytone mini bruce amp, Simmons SDS8 drums.

Other MIDI Equipment: Akai S900 sampler.

[24+] CRAWFORD POST PRODUCTION, INC.
535 Plasamour Dr., NE, Atlanta, GA 30324
(404) 876-7149

Owner: Jesse Crawford
Studio Manager: Mike Greene
Engineers: Steve Davis, Tom Race, Carl Maduri, Kathy Gray
Dimensions: Studio A 32 x 25 x 14, Control room 34 x 27; Studio B: 6 x 8, Control room 12 x 12; Studio C: 9 x 13, Control room 21 x 23

Mixing Consoles: Studio A: Neve 8128, 40 x 32, Necam II automation, will lock to video, Studio B: Trident Series 70, 24 x 24, Studio C: Sony/MCI JH-600, 36 x 24, VCA automation.

Audio Recorders: Studio A: (2) Studer A-80 MKIV, 24-track; Ampex ATR-102, 1/4-inch; Otari MTR-12 center track, 1/4 inch; Ampex ATR-104, 1/2-inch 4-track; Studer A-80, 1/2-inch 2-track; Studio B: Otari MTR 90-II, 24-track; Otari MTR-12 center track, 1/4-inch, Ampex ATR-102, 2-track; ATR-101, full-track; Studio C: Otari MTR 90-II, 24-track; Otari MTR-12 center track, 1/4-inch; Ampex ATR-102, 1/4-inch 2-track; ATR-101, 1/4-inch full-track.

Synchronization: Adams-Smith 2600 Series, 5 synchronizers, code reader, code generator, character inserter,

controlled by Alpha automation Boss computerized audio editor. Same rig all three studios.

Echo, Reverb, Delay: Studio A: (2) Lexicon 224X, AMS RMX 16, Lexicon 200, Lexicon PCM 70 reverbs; (2) Lexicon PCM 42, Lexicon Super Prime Time DDLs; Eventide Harmonizer. Studio B: Lexicon 200 reverb. Studio C: Lexicon PCM 70 reverb; Lexicon PCM 42 DDL.

Other Outboard: dbx, Neve, Aphex, ADR, Audioarts, UREI, Ursa Major, Klark-Teknik, Teletronix, Valley People.

Microphones: Neumann, AKG, Sennheiser, Beyer, Milab, Crown, Shure, Schoeps, Fostex, E-V, Sony.

Monitor Amplifiers: Crest, Crown, Haller, AB System.
Monitor Speakers: Custom Design, Yamaha NS-10M, Auratone, MDM-4.

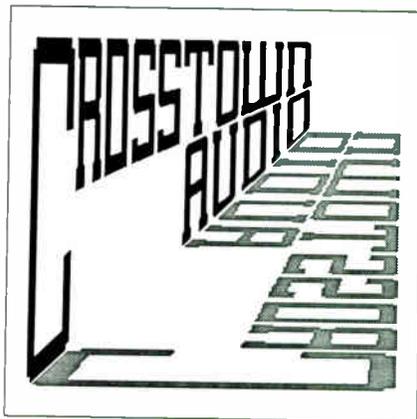
Musical Instruments: Yamaha C7, LinnDrum, Tama drums, Simmons drums, Prophet T-8, Rhodes, Marshall amp.

Video Equipment: Studio A: Sony BVU-800 1/4-inch, Studio B: Sony BVU-800. Full video post services. (4) 1-inch on-line suites with ADO, Harry, Encore, Abekas A-62, Abekas A-52, Zeus, Vidionit, Chyron. Video graphics Bosch, Dubner, AVA I and AVA III Paint Box, Satellite uplink and downlinks, Rank Cintel film transfer. Interactive video disc division with ODC DRAW disc machine.

[24+] CREATIVE SOUND CONCEPTS
also REMOTE RECORDING

495 Armour Circle, Atlanta, GA 30324
(404) 873-6628

Owner: Baxter/Herzog
Studio Manager: Herzog, Connelly



CROSSTOWN AUDIO
Atlanta, GA

[24+] CROSSTOWN AUDIO
2135 DeLoor Hills Rd. NW Ste. 1, Atlanta, GA 30318
(404) 352-4790

Owner: Brandon Wade, Jon Aaron
Studio Manager: Jon Aaron
Staff Engineers: Brandon Wade
Dimensions: Studio 15 x 20 x 12, control room 29 x 20 x 12.
Mixing Consoles: Soundcraft 1624/2400 (custom) 40 x 24.

Audio Recorders: Otari MTR-90, 24-track; Otari MTR12 w/center track timecode, 2-track; Otari 5050B2, 2-track.
Cassette Recorders & Duplicators: Nakamichi MR-1.
Synchronization: Q.Lock 4-machine editor with 4.10 frame.

Echo, Reverb, Delay: Lexicon 200, Lexicon PCM42, Ecoplate I, Yamaha REV7, Yamaha SPX90, MicMix reverb.
Other Outboard: Studer CD player, Goldline RTA-30, Drawmer noise gates, Aphex C, Symetrx 511, Orban 622 parametric, Orban 422 gated limiter, Orban 536 de-esser, White 1/3-octave graphic, LA-2A limiter, UREI 1176 limiters, Eventide Harmonizer, time code generator and reader.

Microphones: Neumann 87, Neumann 47, Neumann 84, Telefunken 251 Elam, AKG 414, AKG 451, Sennheiser 441, Sennheiser 421, Shure 81, Shure 56, PML 73, Electro-Voice RE20, Beyer 500, Sony ECM 50, Countryman 101, Altec/Westrex ribbon.

Monitor Amplifiers: BGW, Haller.
Monitor Speakers: UREI 813C, JBL 4313B, Auratones (3-channel stereo control room).

Musical Instruments: Baldwin SD-109-ft. concert grand, Yamaha DX7, Oberheim drum machine, Fender Telecaster, Fender bass, Gibson Les Paul Special, Gibson Southern Jumbo acoustic, Silver Dobro, Ampeg bass amp, Lab Series bass amp, Fender Twin Guitar amp, Fender super guitar amp, Mesa Boogie guitar amp, Sonor drum set.

Other MIDI Equipment: Macintosh computer with HD20 hard disk drive, Southworth Total Music MIDI software with Jam Box 4.

Video: JVC CR850U 3/4-inch, Ampex VPR-80 1-inch (on day rates), Panasonic AG6810 1/2-inch, Panasonic 72-inch color projection system.

Rates: \$160/hr. 1-inch video and interlock, \$130/hr. 3/4-inch video and interlock, \$90/hr 24- and 8-track, \$70/hr. 2-track.

Extras & Direction: Compact disc music and sound effects library. Croestown Audio's new Atlanta facility has been designed to meet the needs of the mix-to-picture/audio-for-video market. Major services include 3/4-inch and 1-inch audio/video interlock, "repair" of audio tracks from field production, MIDI computer sequencing with SMPTE multi-track lockup and 2-, 8-, 24-, and 40-track recording and mixing. Our 3-channel phase aligned control room is capable of true center channel behind the screen mono, 2-channel stereo and 3-channel stereo production. The design for this control room is the result of eight years of research at our Michigan facility.

[24+] CROSTOWN RECORDERS
435 N. Cleveland, Memphis, TN 38104
(901) 27-MUSIC
Owner: James Craft
Studio Manager: James Craft

[24+] CUE RECORDING, LTD.
2826 Linden Lane, Falls Church, VA 22042
(703) 532-9033
Owner: Willard R. Jeffrey III
Studio Manager: Jim Ebert
Staff Engineers: Jeff Jeffrey, Jim Ebert, Joe Gelchion
Dimensions: Studio 26 x 19, control room 15 x 13
Mixing Consoles: A: API 3224, 32 x 24; B: Quantum Gamma A, 16 x 8.
Audio Recorders: MCI JH-24, 24-track; (2) Otari 5050 MKIII, 2-track; Tascam 35-2B, 2-track.
Cassette Recorders: Nakamichi R-505, Technics M85 MKII, JVC KD-V6.
Noise Reduction: 2 channels dbx.
Echo, Reverb, Delay: Lexicon 200 reverberator, Yamaha REV7, (3) Effectron IIs, Korg SD2000 delay/sampler.
Other Outboard: UREI 1176N, (2) UREI LA-4s, Orban 424A dual gated compressor/de-esser, Aphex Type B Aural Exciter, Systech stereo phase shifter, Boss CE-300 stereo chorus, (4) Kepex IIs, Technics SH-9010 parametric EQ, (2) UREI 537 graphic EQs.
Microphones: Neumann U-87, U-67; AKG 414, 451s, Crown PZMs; E-V RE20s, 635A; Sennheiser 421s, 441;

Shure SM57s; Beyer M-88N (C); Altec ribbons, RCA ribbon; Audio-Technica electret condensers.
Monitor Amplifiers: Crown PS-A2, Crown D-150, Pioneer.
Monitor Speakers: UREI 813s, Yamaha NS-10s, JBL 4401s, Auratones.
Musical Instruments: Yamaha DX7, LinnDrum LM-2, Yamaha CP80 grand piano, Roland JX-3P synth, Roland Juno-6, Roland SH-101, Micromoog, Ovation 12-strng, Fender Jazz bass, Epiphone, Gibson, various amplifiers, Ludwig kit w/(5) different snare drums. Also complete sound effects libraries and music beds.
Rates: Available on request, block time discounts.

[24+] DELSHAY STUDIOS & RESORT COMPLEX
PO Box 7415, North Port, FL 33596
(813) 426-2063
Owner: Delshay, Inc.
Studio Manager: Ricardo "Rick" Mozo

[24+] DIGITRACKS MIDI SEQUENCING
6080 SW 28 St., Miami, FL 33155
(305) 666-7407
Owner: Mark J. Hill
Studio Manager: Kay O'Neil

[24+] DISK PRODUCTIONS
1100 Perkins Rd., Baton Rouge, LA 70802
(504) 343-5438
Owner: Joey Decker
Studio Manager: Joey Decker

[24+] DOPPLER STUDIOS, INC.
1922 Piedmont Circle, Atlanta, GA 30324
(404) 873-6941
Owner: Pete Caldwell
Studio Manager: Pete Caldwell
Engineers: Bill Quinn, Joe Neil, Wayne Murray, Curt Bush, Granger Beem, Mitch Eaton, Steve Schwartzberg.
Dimensions: Studio A: 35 x 50, control room 20 x 25; Studio B: 25 x 35, control room 15 x 17; Studio C: 15 x 20, control room 10 x 15; Studio D: 12 x 15, control room 15 x 13; Studio E: 35 x 50, control room 26 x 28.
Mixing Consoles: SSL 4000E, 32 x 32; Sphere Eclipse C, 40 x 24; Sphere A, 28 x 24; Audiotronics 110-A, 20 x 4; custom 8 x 8
Audio Recorders: Otari MTR-90-II, 24-track; 3M M-79, 24-track; Otari MTR-12, 2-track; Otari MTR-10, 2-track;

Atlanta's Heavyweight.

DOPPLER

DOPPLER STUDIOS, INC.
Atlanta, GA

Ampex ATR-102, 2/1-track; Scully 280, 4/2/1-track, Otari MTR 10, 4-track.

Noise Reduction: dbx.
Synchronization: (2) BTX Softouch Systems Echo, Reverb, Delay; Lexicon 224XL, Eventide 969, Eventide 1745M, Lexicon Prime Time II, Lexicon Pnme Time, EMT 140 Plates, DeltaLab Effectron II, Marshall Time Modulator.

Other Outboard: dbx 160, 163, 165 and UREI 1176LN limiter/compressors, ADR Vocal Stresser, Aphex Compressor, Kepex II, Gain Brain II, Orban parametrics and de-essers.

Microphones: Neumann, AKG, Studer, Sennheiser, Shure, E-V.

Monitor Amplifiers: Crest, UREI, Haller, Yamaha.
Monitor Speakers: UREI 813, EAW MS-30, JBL 4311, Auratone.

Musical Instruments: Steinway and Baldwin grand pianos, Ludwig and Rogers drums, Hammond B-3 w/Leslie, Fender amps.

Video Equipment: Video sync, Sony 5850 3/4-inch VCRs with address track SMPTE, 16/35mm mag, layback to Sony 1-inch type C.

Rates: Upon request.

ELEVEN ELEVEN SOUND STUDIO.

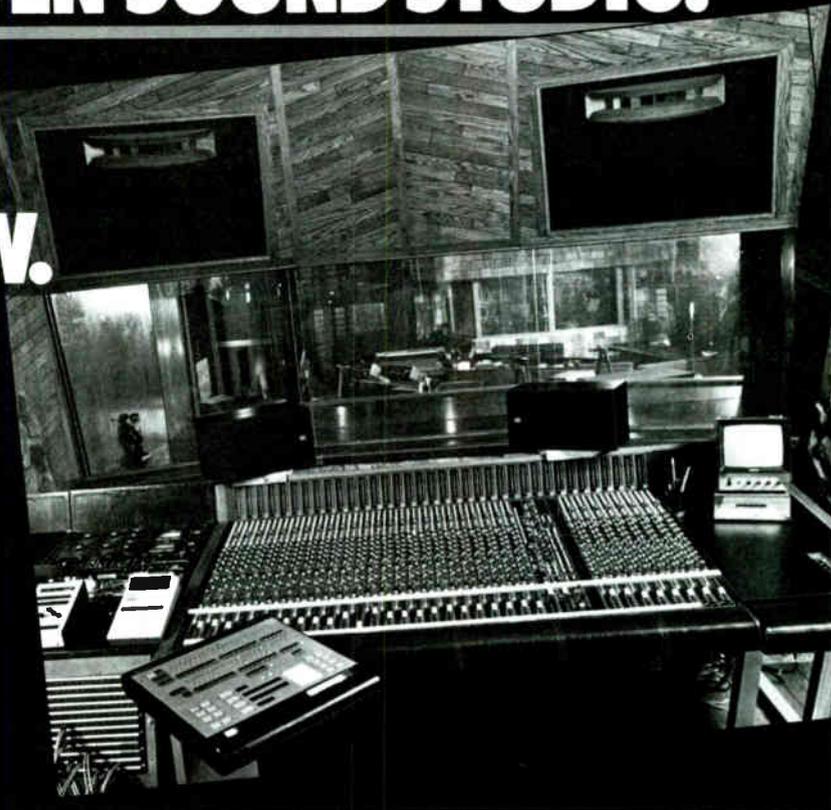
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1111 17th Avenue South
Nashville, TN 37212
615 / 327-3200
CONTACT: JOHN ABBOTT,
STUDIO MANAGER

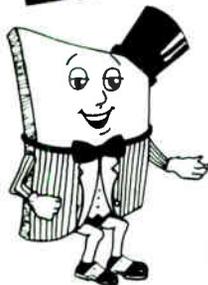


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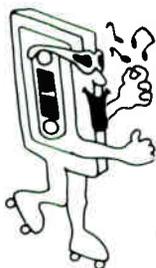


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[24+] EBS, INC. (EVANS BROS. STUDIOS)

1125 Moore Duncan Hwy.
PO Box 66, Moore, SC 29369
(803) 574-6104

Owner: Duane Evans, Joseph Evans
Studio Manager: Lyndon Vestal
Engineers: Duane Evans, Denver Wright, Babe William-
son, David Rochester

Dimensions: Studio 50 x 60, control room: 24 x 20.
Mixing Consoles: MCI JH-600, 28 x 24.
Audio Recorders: MCI JH-24, 24-track; MCI JH-110B,
2 track; Ampex 2-track; TEAC 3340, 4-track; Recordex
CS 4000, GT4-A duplicator 5 bays, 8:1.
Cassette Recorders & Duplicators: Nakamichi MR-1, (2)
TEAC, Recordex CS-4000, GT4-A duplicators bays, 8:1.
Echo, Reverb, Delay: Yamaha REV1, Lexicon PCM60,
plate, Master-Room stereo reverb, Eventide H-949, Electra
EP 500, DDL, MXR digital time delay, Yamaha REV7, Lexi-
con PCM-41, Roland SDE-1000 DDL.

Other Outboard: dbx 165s, dbx 160s, Teletronix LA-3As,
UREI 1176s, Audioarts stereo parametric EQ, Aphex Excit-
er, Furman QN-4, Furman QN-4, Aphex Type C exciter,
Soundcraftsman SP4002.

Microphones: Neumann U47s, AKG 414s, E-V RE20s,
AKG-D202s, Sennheiser MD-421s, Neumann KM-84s,
Shure 57s, 58s, 53s, E-V PL77s.

Monitor Amplifiers: (3) Crown DC-300A, (2) Crown D60,
Monitor Speakers: UREI 839A, JBL 4331, JBL 4301, JBL
4301, Aurotone Cubes, Yamaha NS-10M.

Musical Instruments: Vintage Mason and Hamlin grand,
Hammond B-3000, Leslie 722, PolyMoog, MicroMoog,
Yamaha DX7, Emulator II, Tama Techstar electronic drums,
Fender Strat, Gibson Les Paul, Fender Precision, congas,
assorted rhythm instruments.

Video Equipment Available at extra charge.
Rates: \$80/hr., call for day and block out rates.

[24+] ELEVEN-ELEVEN SOUND STUDIO

1111 17th Ave. S., Nashville, TN 37214
(615) 329-1111

Owner: Larry Butler
Studio Manager: John Abbott
Engineers: Independents
Dimensions: Studio 34 x 36, 1200 sq. ft., control room, 12
x 14.

Mixing Consoles: Harrison MR-2, 32 x 32 x 32 aux
returns.

Audio Recorders: Mitsubishi 850, 32-track (digital); Stud-
er A-80, 24-track; Mitsubishi X-80A, 2-track (digital); Stud-
er A-80, 2-track; Studer B-67, 2-track; Studer A-67, 2-track.
Noise Reduction: Dolby A-type 24 package.

Echo, Reverb, Delay: Lexicon 224XL with Larc, Lexicon
224, EMT 140, EMT 162.

Other Outboard: Lexicon Prime Time, UREI LA2Ab, Har-
monizer, Allison Research 65k automation.

Microphones: Neumann: 249 tube, 67 tube, 47 FET, 87s,
KM84s; AKG: 462, 414; Sennheiser 421; Electro-Voice;
Sonsys.

Monitor Amplifiers: McIntosh 2500, BGW 600, BGW
250s, Crown 150 and 60s, Sony

Monitor Speakers: Sierra Audio with oak dispersion
horns, Yamaha NS-10M.

Musical Instruments: Steinway 9-ft. grand, Yamaha DX7,
Rhodes piano, Wurliizer piano, Hammond B-3, congas.
Rates: \$120/hr., digital extra.

[24+] BERT ELLIOTT SOUND INC.

also REMOTE RECORDING
2080 Peachtree Ind. Ct. Ste. 114, Atlanta, GA 30341
(404) 452-1140

Owner: Bert Elliott
Studio Manager: Amy Rambow

[24+] EMERALD SOUND STUDIO
1033 16th Ave. S., Nashville, TN 37212
(615) 321-0511

Owner: Moore Recording
Studio Personnel: Robert Porter

[24+] EVANS BROTHERS STUDIO

1125 Moore Duncan Hwy.
PO Box 66, Moore, SC 29369
(803) 574-6104

Owner: Duane Evans
Studio Manager: Lyndon Vestal
Engineers: Duane Evans, Babe Williamson, Dave Roches-
ter, Denver Wright

Dimensions: Studios 50 x 60, (10 x 15 booth, 20 x 20 live
floor). Control room: 20 x 15

Mixing Consoles: MCI JH-600, 28 x 24.

Audio Recorders: MCI JH-24, 24-track; MCI JH-110B,
2-track; Ampex A-440, 2-track; TEAC 3340, 4-track; Naka-
michi MR1-B, 4-track; Recordex CS-4000, 16-track.

Echo, Reverb, Delay: Yamaha REV7, Lexicon PCM-60,
Lexicon PCM 41, Eventide H949D, Roland SDE 1000,
Electra DDL, large "Plate," Yamaha SPX-90.

Other Outboard: Aphex Type C Exciter, Furman QN-4
noise gates, dbx 165, (2) dbx 160s, (2) UREI 1176, (2) UREI
LA3As, Sound Craftsman SP-4002.

Microphones: Neumann U-47s, U-87s, AKG 414s, Senn-
heiser 421s, Shure SM 57s, 58s, EV PL77s, RE 20s, AKG
452s.

Monitor Amplifiers: Crown: (3) DC 300A, (2) D-60.
Monitor Speakers: UREI 839, Yamaha NS-10Ms, Aura-
tone Cubes, JBL 4411, 4311, 4301, 4331.

Musical Instruments: Mason & Hamlin grand, Hammond
B-3000 w/Leslie, Ludwig drums w/Zildjian and Paiste
cymbals, Tama Techstar electronic drums, Poly-moog, Korg
Poly 6, Fender, Gibson, and Martin guitars, Emu drum
machine; also available with notice: Emulator II, DX7s, and
virtually any synthesizer in the world.

Rates: \$80/hr. base (includes engineer and all instru-
ments). Block and day rates available on request.

[24+] FAITH PRODUCTIONS

also REMOTE RECORDING
1441 Guthrie Dr., Cleveland, TN 37311
(615) 478-7240

Owner: Church of God
Studio Manager: Mike Baker

[24+] FANTA PROFESSIONAL SERVICES

only REMOTE RECORDING
1213 16th Ave. S., Nashville, TN 37212
(615) 327-1731

Owner: Johnny Rosen
Studio Manager: Robin Victor

[24+] FLACK PRODUCTIONS

Rt. 1 Box 111B, Penrose, NC 28766
Owner: Tommy Flack

[24+] FLAMINGO STUDIOS

2195 Lake Bradford Rd.
PO Box 2434, Tallahassee, FL 32316
(904) 576-4741

Owner: Charles E. Roberts
Studio Manager: Dorene J. Giblin

[24+] FLOOD ZONE STUDIO

11 S. 18th St., Richmond, VA 23221
(804) 644-0935

Owner: Bruce Olsen, Steve Payne, Mason Wyatt
Studio Manager: Bruce Olsen

[24+] FLORIDA SOUND RECORDING STUDIO

3350 Ulmerton Rd. #19, Clearwater, FL 33520
(813) 577-7113

Owner: Florida Sound Inc.
Studio Manager: Vance Borland

[24+] G.E.M. RECORDINGS

2825 Millwood Ave., Columbia, SC 29205

Owner: Gordon R. Goodwin, Richard L. McMahan, John
V. Epps
Studio Manager: John Epps

[24+] GLASER SOUND STUDIOS, INC.

916 19th Ave. S., Nashville, TN 37212
(615) 327-0005

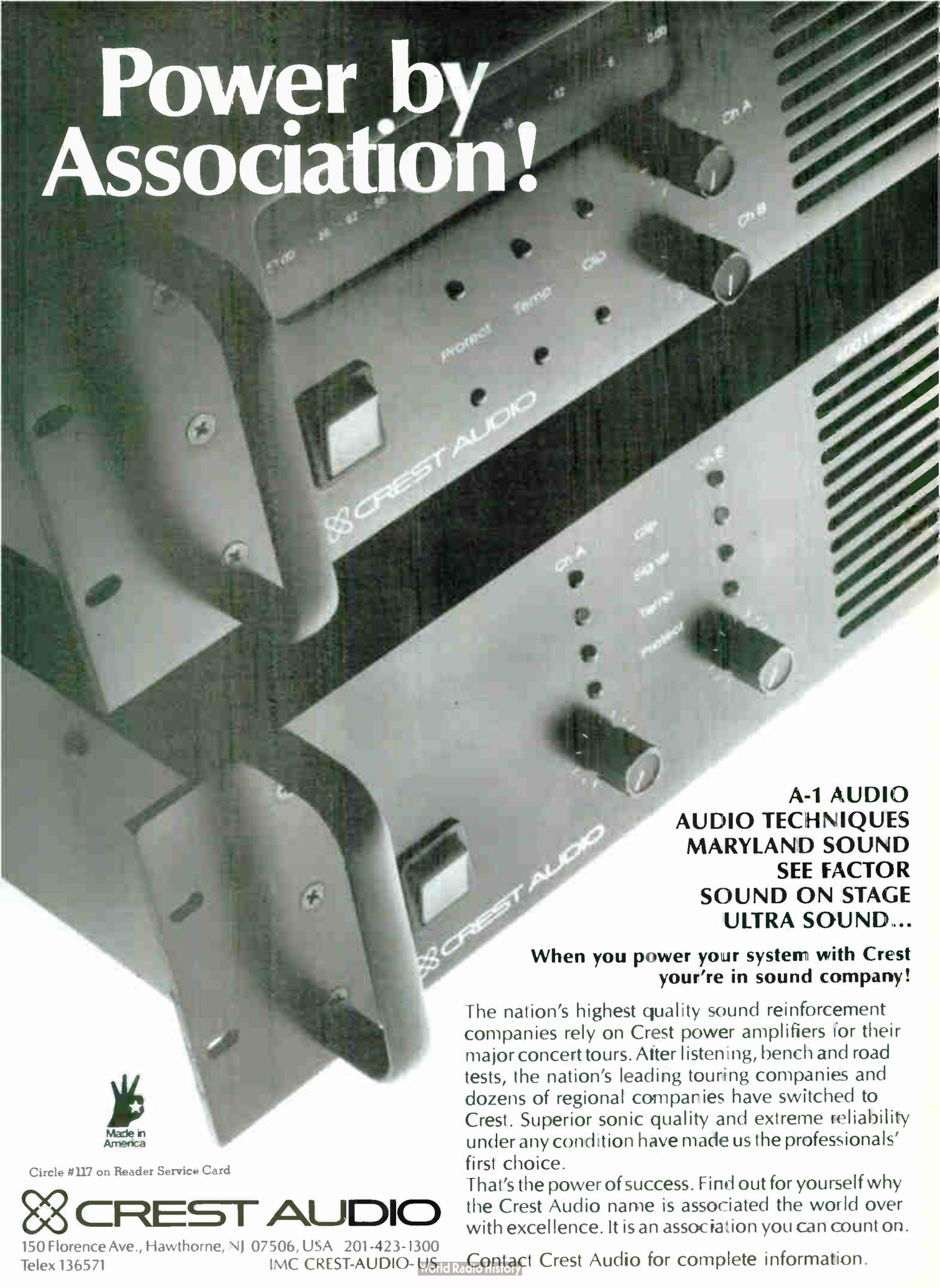
Owner: Thomas P. Charles V., James W. Glaser
Studio Manager: June Glaser

[24+] GOLD MINE STUDIO

2020 Sunnyside Dr., Brentwood, TN 37027
(615) 373-8840

Owner: Chris Christian
Studio Manager: Richard Headen

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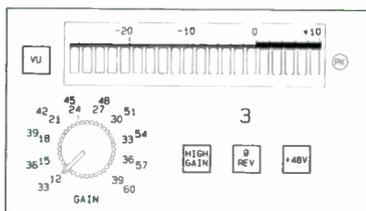
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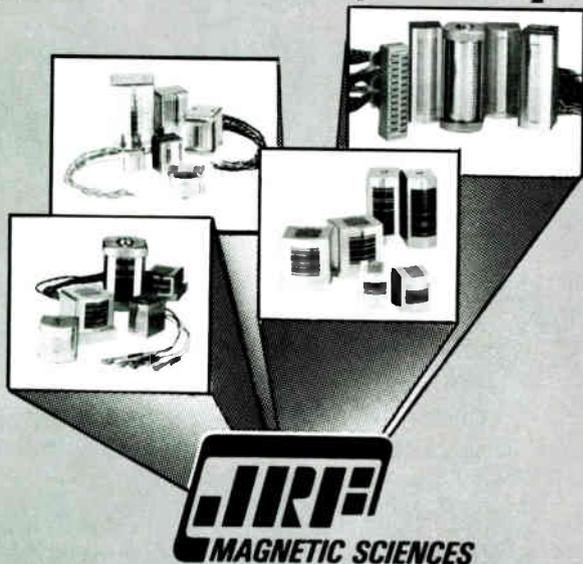
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[24+] GOLDBAND RECORDING STUDIO
313 Church St., Lake Charles, LA 70601
(318) 439-8839
Owner: Eddie Shuler
Studio Manager: Jeff Le Jeune

[24+] GRAND CENTRAL STUDIO
1708 Grand Ave., Nashville, TN 37212
(615) 327-0520
Owner: Pat Patrick
Studio Manager: Kent Madison
Engineers: Kent Madison
Dimensions: Studio 27 x 20, control room 19 x 10.
Mixing Consoles: AMEK M-2500, 36 x 24.
Audio Recorders: MCI JH-2424, 24-track; Studer A-810,
2 track; Studer A-67, 2-track; Studer/Revox PR99, 2-track.
Echo, Reverb, Delay: Lexicon 200, Roland SDE3000,
SDE1000.
Other Outboard: UREI LA-4 limiters.
Microphones: Neumann U87, U67, U47, KM-84s; AKG
414s, 451s, 460s; Sennheiser 421s, 441s; Shure 57s.
Monitor Amplifiers: BGW 750D, 250D, Yamaha PZ100.
Monitor Speakers: JBL 4430 Bi-Radials, Yamaha NS-10s.
Musical Instruments: Yamaha DX7, Roland Jupiter 6,
Samick 7'4" grand piano, Fender and Music Man amps.
Video Equipment: 3/4-inch JVC VCR, color monitor for
monitoring only.
Rates: \$75/hr. or \$60/hr. block book rate.

[24+] GREAT CIRCLE SOUND
365 Great Circle Rd., Nashville, TN 37228
(615) 742-6803
Owner: The Benson Co.
Studio Manager: Bob Clark
Engineers: Bob Clark, David Murphy
Dimensions: Studio 40 x 60, control room 18 x 21.
Mixing Consoles: MCI JH-528, 28 x 28.
Audio Recorders: Studer A-800, 24-track; MCI JH-110,
Studer A-80 VU 1/2-inch 2-track.
Cassette Recorders & Duplicators: Nakamichi RX-505,
Studer A710.
Echo, Reverb, Delay: Lexicon 224XL, EMT 240, Lawson
Plate, Lexicon digital delay 102 Delta; EMT 240 Gold Foil,
AKG BX 20, spring echo.
Other Outboard: Eventide flanger; (4) UREI 1176 limiters;
(2) UREI LA3A limiters; (2) dbx 160 limiters, Orban para-
metric EQ, Orban de-esser; Harmonizer; Kepex, Dolby; (2)
ADR Vocal Stressers, Dimension-D, SDE-3000 DDL; Korg
SDD 3000 DDL, UREI bandpass filter
Microphones: Neumann U87, U47, KM84; Sennheiser
421, 441; AKG 414, 224E, D202; Shure SM56, 57; E-V
RE16, Beyer 160.
Monitor Amplifiers: McIntosh 2300, Crown D 150, Ya-
maha P 2200
Monitor Speakers: UREI Time Aligned 813, Auratone
SC, Fostex RM 780, Yamaha NS 10M.
Musical Instruments: Yamaha 7'4" grand piano, ARP
String Ensemble, Hammond C3 organ and Leslie, Wurlitzer
electric piano, clavinet, Music Man bass and guitar amps.
Rates: Available upon request.

[24+] GYPSY STUDIO
also REMOTE RECORDING
Falls Church, VA 22044
(703) 241-7445
Owner: Mike Rivers
Studio Manager: Mike Rivers

[24+] HAYES RECORDING STUDIOS
2406 So. MacDill Ave., Tampa, FL 33629
(813) 837-6384
Owner: Paul Hayes
Studio Manager: John Uhrig
Engineers: John Uhrig, Bob Bodell (maintenance). Inde-
pendents welcome.
Dimensions: Studio A: 20 x 24 x 12; isolation rooms 8 x 9
and 8 x 10; control room A: 20 x 15 x 9.
Mixing Consoles: Sphere A-Custom 32 x 16.
Audio Recorders: Ampex MM1200, 24-track; Studer
A80RC, 2-track 1/2-inch and 1/4-inch; (2) Ampex 440-B,
2-track; Ampex 440B, full; Scully 280-B, 2-track.



HAYES RECORDING STUDIOS
Tampa, FL

Cassette Recorders & Duplicators: Studer A710.
Noise Reduction: 24 channels dbx.
Synchronization: Audio Kinetics 3.10 controller and 4.10 brain (SMPT).
Echo, Reverb, Delay: Lexicon Model 200, BAE LP 140 Plate, DeltaLab DL-2, Eventide H910, MXR delay system II, DeltaLab Super Time Line ADM2048.
Other Outboard: (2) dbx 160 compressor, (2) Audioarts 4200 parametric, Orban 516EC de-esser, ADR vocal stresser, EXR 3 exciter, UREI 539 room EQs, (8) US Audio GateX, Symetrix SG200 noise gates, UREI 960 digital metronome, Technics SP-25 turntables, Countryman direct boxes, Symetrix TI-101 telephone interface, Spectra Sonics 601 limiters.
Microphones: Neumann U87, U48A (tube); AKG 414/P48, 452EB, 451E, D202; Beyer M160N; E-V RE20, RE16, 666; Shure SM54, SM58; Sennheiser MD421; RCA 77DX, 44DX; Sony C37 (tube); Countryman 85; Wahrenbrock P2M.
Monitor Amplifiers: Crest P3500, 2501S, McIntosh 2105 (phones).
Monitor Speakers: E-V Sentry III, MDM4, Auratone 5C, E-V Sentry 1A.
Musical Instruments: Marshall & Wendall grand piano, Hammond organ w/Leslie, Deagan electric chimes, Ludwig drums w/Zildjian cymbals, Scholz Rockman X-100B, Fender Twin guitar amps, various percussion, Emulator II+, Oberheim O88, RX11 drums.
Other MIDI Equipment: Macintosh Plus 1MB computer w/Mark of the Unicorn, Southworth, Opcode Systems, and Digidesign hardware/software.
Rates: Available upon request. Flexible packages available.

[24+] **HOLBROOK MEDIA PRODUCTIONS**
also **REMOTE RECORDING**
2143 West Main St., Jeannerette, LA 70544
(318) 276-6267
Owner: Bob Holbrook
Studio Manager: Bob Holbrook



JBS STUDIO
Avondale Estates, GA

[24+] **JBS STUDIO**
106 N. Avondale Rd., Avondale Estates, GA 30002
(404) 296-0604
Owner: Jones Broadcasting System, Inc.
Studio Manager: Diane Jones
Engineers: Brad Jones, chief engineer; freelance engi-

neers: Richard Wells, Donal Jones, Scott Hyman.
Dimensions: Studio 40 x 50 soundstage with 22-ft. ceilings. Two isolation booths 5 x 12. Performing stage 16 x 22; control rooms: 21 deep x 25 wide, 12-ft. ceiling; B: 14 x 16, 12-ft. ceiling.

Mixing Consoles: Amek Angelo, 32 x 24.
Audio Recorders: (2) Otari MX-70, 16-/30-track w/sync; Otari MTR-12, 2-track; Otari MX-5050 MKIII-8, 8-track; Otari MX-5050 MKIII-2, 2-track; Otari MX-5050, 2-track.
Synchronization: 32-track sync.
Echo, Reverb, Delay: Lexicon 200, (2) Lexicon PCM60, (2) Yamaha REV7, (2) Yamaha SPX-90; Audio Digital TC-2, Effectron 1024, and 64; Korg SDD-3000.
Other Outboard: Eventide 949H, Valley People Kepex, and Maxi-Q, dbx 165A, 160X, 166 and 163, compressor/limiters; Dyna-Mite, Aphex Aural Exciter Type B.
Microphones: \$25,000 inventory including but not limited to: Neumann, Sennheiser, E-V, Crown, Sony, and Shure.
Monitor Amplifiers: Crest, Haller, Adcom.
Monitor Speakers: A Control: Mains—custom designed 3-way active all cone/dome. No room EQ; Yamaha NS-10M; Auratone. B Control: Fostex RM865; Minimus 7.
Musical Instruments: 1928 5-ft. Conover grand piano, studio drums, Music Man bass guitar, plus access to all the synthesizers and sampling in MIDILAB. (See listing under MIDILAB).

Video Equipment: 32-track sync to 3/4-inch or 1-inch video. Complete production packages. Call for details.
Rates: Call for free color brochure and current rates.
Extras & Direction: 32-track digital available upon request. MIDILAB™ on-line for easy MIDI-dump. SMPT sync to all audio/video recorders. JBS has always strived to set the pace for technical excellence and creativity in the Southeast. As we enter our fifth year, we are proud to house MIDILAB™, and we are proud of MIDILAB's superior sound. Together we offer the musician/songwriter/producer a powerful production/creative facility where quality, service and comfort are guaranteed.

[24+] **KNIGHT RECORDING STUDIO, INC.**
3116 Metairie Rd., Metairie, LA 70001
(504) 834-5711
Owner: Corporation
Studio Manager: Traci Borges

[24+] **LA LOUISIANNE RECORDING STUDIO**
711 Stevenson St., Lafayette, LA 70501
(318) 234-5577
Owner: Carol J. Rachou
Studio Manager: David M. Rachou

[24+] **LAMBTRON INC. RECORDING SERVICE**
2692 N. University Dr. #10A, Sunrise, FL 33322
(305) 748-7010
Owner: Lambtron Inc.
Studio Manager: Gary Lambert

[24+] **LECHE SOUND**
PO Box 121702, Nashville, TN 37212
(615) 321-5479
Owner: Carl Tatz, Larry Lee
Studio Manager: Carl Tatz, Larry Lee

[24+] **LONDON MUSIC, INC.**
5120 N. Florida Ave., Tampa, FL 33603
(813) 238-3900
Owner: Howard Conder
Studio Manager: Doug Johnston
Staff Engineers: Howard Conder, Doug Johnston
Dimensions: Studio 17.5 x 25 / 11.5 ceiling; control room 17.5 x 22.5 / 11.5 ceiling.
Mixing Consoles: Trident Series 75 w/automation 28 x 24 (56 on remix).
Audio Recorders: Studer A80 MKIV, 24-track; Ampex ATR100, 2-track; Sony digital PCM701, 2-track; Studer PR99, 2-track.
Cassette Recorders: Revox/Aiwa.
Echo, Reverb, Delay: Lexicon 224XL, AMS RMX16, Yamaha REV7, AMS 1580s and 1580 DDLs.
Other Outboard: Drawmer dual gates and dual compressor, Valley People DynaMites, Aphex compellor, dbx 166 dual compressor, Panscan auto panner.
Microphones: Neumann, AKG, Sennheiser, Shure.
Monitor Amplifiers: Quad, Adcom.
Monitor Speakers: Tannoy, Yamaha, Visoniks.
Musical Instruments: Linn 9000 and MKII, Emulator II+, Yamaha DX7 w/(2) TX modules, (2) Roland MK530, Mini-moog, Seq. Circ. Pro One, Studio Rack, Rockman, Roland drum pads.
Other MIDI Equipment: Akai 612 sampler.

[24+] **MARK FIVE STUDIOS**
also **REMOTE RECORDING**
10 Michael Dr., Greenville, SC 29610
—LISTING CONTINUED ON NEXT PAGE

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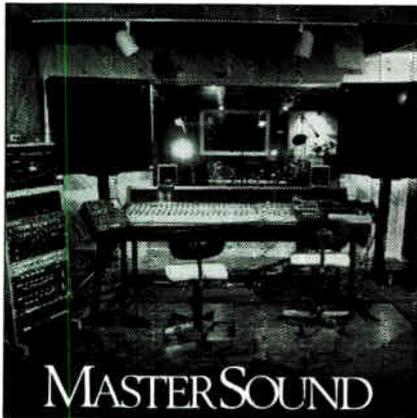
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—LISTING CONTINUED FROM PAGE 161

(803) 269-3961

Owner: Joe Huffman, Bill Huffman, Mike Burnette, Harold Huffman

Studio Manager: Mike Burnette, Bill Huffman



MASTERSOUND

MASTER SOUND RECORDING STUDIO
Virginia Beach, VA

[24+] MASTER SOUND RECORDING STUDIO
5249 Challedon Dr., Virginia Beach, VA 23462
(804) 499-0000

Owner: Robert Ulich

Studio Manager: Robert Ulich

Engineers: Robert Ulich, Bruce Buehler, Brent Havens, Mark Olmstead, Tom Jones

Dimensions: 35 x 45 with two isolation booths (10 x 12 and 10 x 8); control room 20 x 22

Mixing Consoles: Amek Angela, 28 x 24 x 62 returns.

Audio Recorders: Sony/MCI transformerless with Auto Locator III JH-24, 24-track; Otari MTR-12C, 2-track; (2) Tascam 52s, 2-track

Cassette Recorders & Duplicators: (2) Tascam 2-7000. Synchronization: SMPTE time code lock up.

Echo, Reverb, Delay: (2) Lexicon 200 stereo digital reverbs, Yamaha REV7 stereo digital reverb, Lexicon PCM-41 digital delay, Lexicon PCM-42 digital delay, Eventide 969 harm./delay, (2) Yamaha SPX90s.

Other Outboard: Orban 424A stereo compressor/limiter, Universal 175 tube limiter, LT Sound CLX-2 stereo comp/limiter/expander, dual MXR 1/3 octave EQ, Aphex Aural Exciter, Rane 6-channel headphone, Eventide 969 Harmonizer/delay, Valley People 4-channel noise gate (2) dbx 160X comp./limiter, dbx 166 stereo comp./limiter, USAradio GateX 4-channel noise gates, Scundcraftsman AE2420-R EQ, Drawmer noise gate.

Microphones: (3) Neumann TLM-170, (5) AKG 414 P-48, Neumann U-89 (8) AKG C-451 46G, AKG "The Tube," AKG D-12E, (6) Sennheiser 421, Sennheiser 441s, assortment of 17 additional dynamic mics.

Monitor Amplifiers: Acoustat Trans Nova twin 200 watt Kenwood Basic M-2 440 watts.

Monitor Speakers: JEL/UREI 4435s, JBL 4411, Yamaha NS-10s, Auratones, TOAs.

Musical Instruments: Yamaha 74" C-7 concert grand piano, 7-piece Ludwig drum set, Oberheim DMX drum machine, Simmons drums, Emulator II digital sampling keyboard with extensive sound library, Fender Rhodes, DX7s, Prophet-600, Fender Precision Elite Bass, Fender Stratocaster "Elite" guitar, Hamer-prototype guitar/Floyd Rose, Fama & Alvarez Yairi DY-78 acoustic guitars, Ampex B-1EN amp, Yamaha G-100 amp, Laney-tube amp, E-mu SP-12 drum machine, Ensonics ESQ, Oberheim Matrix 6, E-mu E-max.

Video Equipment & Services: Sony BVU-800 3/4-inch with Sony 19-inch monitor.

Rates: 24-track \$85/hr., 16-track \$70/hr., video sweetening \$125/hr.

Extras: Atmosphere, studio arrangers and producers with a large pool of professional studio musicians at reasonable rates. Master Sound is geared up for the MIDI revolution with several computers and interfacing cards to run your programmed software with our Emulator II, drum machines and synthesizers. We also handle 45: and LP albums including layout artwork and album pressing. We do full production of radio and television music commercials with 24-track audio/video sweetening facilities.

Direction: Master Sound Recording Studio has over the past six years gained a reputation for high quality sound engineering and recording. We have engineers who know how to get the "sound" you want and the equipment to achieve it. We have a fully transformerless studio from our Amek Angela console to our Sony/MCI JH-24 recorder. We are offering high-tech recording with quality production at affordable rates and we're only 15 minutes away from the Virginia Beach resort oceanfront.



[24+] MASTER SOUND STUDIOS, INC.

also REMOTE RECORDING

1227 Spring St. NW, Atlanta, GA 30309

(404) 873-6425

Owner: Bob Richardson

Studio Manager: Bob Richardson

Engineers: Bob Richardson, Ron Christopher, Buzz Richardson, and Bret Richardson.

Dimensions: Music studio 23 x 25; production 10 x 10; control rooms music 2 x 45; production 10 x 10

Mixing Consoles: SSL 4000E 40 in x 32 bus out—full automation plus Total Recall; Audiotronics 110B, 20 in x 4 out.

Audio Recorders: (2) MCI JH-114 24-track, MCI JH-110 1/2-inch 2-track; (4) MCI JH-110 1/4-inch 2-tracks; (2) Ampex AG 440B 2-track, (2) Ampex AG 440B monos; MCI JH-110B 1/2-inch 2-track mastering.

Synchronization: BTX Softouch synchronizer.

Echo, Reverb, Delay: EMT 140 mono and stereo, Lexicon 224, Lexicon 102; Marshall, Eventide, ADR.

Other Outboard: dbx 165, 160, UREI LA2, LA3, 1176; ADR limiters; Pultec, Orban EQ; ADR Vocal Stresser; Orban de-esser.

Microphones: Neumann U64, U68, U47, U47 FET, KM86 KM88, U86, U87, M49; AKG 414, C60, C61, 202; Shure (all types); E-V (all types); Schoeps (all types); Sony C37, ECM50; RCA 77DX; Sennheiser (all types); Altec; Telefunken; others.

Monitor Amplifiers: BGW 250, 500; Crown D150, 300.

Monitor Speakers: Audicon-custom; JBL 4313, Auratones.

Musical Instruments: Baldwin 9-ft. concert grand, Steinway 7-ft. grand, Rhodes 7-ft. stage, Hammond B-3 organ, Slingerland drums, Musser vibes, Ork bells, percussion kit, effects kit, Fender, Ampeg and Music Man amps.

Video Equipment & Services: MCI JH45 audio/video sync lock; Sony VP1000 3/4-inch U-Matic; (2) Panasonic 19-inch color monitors. Sony BVU 8500 VCR.

Rates: On request.

[24+] MASTER-TRAK SOUND RECORDERS

also REMOTE RECORDING

413 N. Parkerson, Crowley, LA 70526

(318) 788-0773

Owner: J.D. Miller

Studio Manager: Mark Miller

[24+] MASTERMIX

1808 Division St., Nashville, TN 37203

(615) 321-5970

Owner: Trio Entertainment Co.

Studio Manager: Hank Williams

Staff Engineers: Tom Brown

Dimensions: Overdub/sampling room with RPG diffusion; control room 23 x 19 x 11.

Mixing Consoles: Calrec AMS automated UA-8000, 56/64 x 32.

Audio Recorders: Otari DTR-900 digital, 32-track; Otari MTR-90, 24-track; Otari MTR-10, 2-track (1/2-inch and 1/4-inch); Sony digital PCM-1630.

Echo, Reverb, Delay: AMS RMX 16, AMS 15-80, Publison Internal 90, Lexicon 224 XL, Lexicon Super Prime Time, EMT 250/251, Eventide H-949, Studer DAD-16.

Other Outboard: Valley People, Trident, Sonotek, ITI, dbx, Audio+Design, API, Scamp, UREI, Teletronix, Neve, Fairchild, BBE.

Microphones: Sanken, Calrec, Neumann, AKG, and classic tubes.

Monitor Amplifiers: Bryston, Lenco, Hafler, Yamaha.

Monitor Speakers: State-of-the-Art Elektronik CF 1000, 4-way cone system, Meyer, Fostex, Rogers, Auratone, Yamaha, Mastermix Kneerphilds.

Video Equipment: Sony BVU-800.

Rates: Please call for hourly and block rates.

Extras & Direction: Stereo disc mastering, CD prep, Sony digital editing.

[24+] MEDIA GENERAL BROADCAST SERVICES

1711 Poplar Ave., Memphis, TN 38104

(901) 320-4254

Owner: Media General Inc.

Studio Manager: Glenn Crawford

[24+] MEGA SOUND STUDIOS, INC.

542 E. Main St.

PO Box 189, Bailey, NC 27807

(919) 235-3362

Owner: Richard H. Royall, Daniel R. Dixon III

Studio Manager: Richard H. Royall

Staff Engineers: Dan Dixon, Johnny Falzone, Richard H. Royall

Dimensions: Studio 18 x 30; control room 12 x 18.

Mixing Consoles: Harrison w/864 autoseg computer 3232 A/B, 32 x 32; MCI 416 416-24, 24 x 24; location mixer, custom, 12 x 8.

Audio Recorders: MCI JH-114-24, 24-track w/autolocator III; Scully 280B, 2-track; Revox A-77, 2-track; Revox A-77 1/4-track.

Cassette Recorders & Duplicators: Sony, Nakamichi, Hitachi.

Noise Reduction: 28 channels dbx.

Echo, Reverb, Delay: Lexicon 224 XL w/LARC, Delta-Lab DL-2, Lexicon Prime Time.

Other Outboard: dbx and UREI compressor/limiters, parametric EQ by Ashly and Scamp; Scamp EQ gates and expanders, UREI 1/3-octave EQs; Eventide audio analyzer w/Apple computer, Roland Dimension-D.

Microphones: AKG, E-V, Neumann, RCA, Sennheiser, Shure, Sony.

Monitor Amplifiers: Crown, McIntosh, Phase Linear, Yamaha.

Monitor Speakers: Bi-amplified JBL, Yamaha, Auratone.

Musical Instruments: Yamaha conservatory grand piano, Hammond B-3 organ, Fender precision bass guitar, Pearl drums w/cymbals by Paiste and Zildjian, synthesizers by Roland and Yamaha, drum machines by Linn and Yamaha, Ibanez electric guitars, Yamaha acoustic guitars.

Video: Full video production services in association with Southeast Video Services. JVC, Sony, Panasonic equipment. Datamax computer animation.

Rates: Write or call for rate schedule and brochure.

Extras & Direction: Available AMS 15-805 with loop editing and 2-channel pitch change. AMS-RMX 16 digital reverb. MDB 16-bit window recorder, Lexicon PCM70, dbx 160-X compressor/limiters, Drawmer dual noise gates, Valley People DynaMite noise gates, Roland SDE3000 delay, ART OLA digital reverb, Roland RE-201 Space Echo, USAudio GateXs. "Fast Forward."



MIAMI SOUND STUDIO
Miami, FL

[24+] MIAMI SOUND STUDIO

697 N.W. 28 St., Miami, FL 33127

(305) 635-4890

Owner: Carlos and Angie Diaz-Granados

Studio Manager: Angie Diaz-Granados

Engineers: Carlos Diaz-Granados, Jr., Paul Khoun

Dimensions: Studio 17 1/2 x 13 3/4 x 28; control room 17 x 10 x 15.

Mixing Consoles: Neve 8028 24 x 16-24.

Audio Recorders: Studer A-80 24-track, Ampex 440-B 2-track, Scully 2-80 24-track, Studer/Revox 77 2-track; Studer 810, 2-track.

Echo, Reverb, Delay: Echo delay tape, (2) EMT 140 echo chambers, Lexicon digital reverb 200, Lexicon Prime Time 93.

Other Outboard: Eventide Harmonizer, Scamp Rack, UREI Teletronix LA2A limiters, LA3A limiters, Pultec equalizers/compressors, Neve limiters/vocal doubler, Electra digital delay, Roland phase shifter, Roland stereo flanger, Simmons Clap Trap, Linn Drum, Simmons electronic drums, Roland Dimension D.

Microphones: Neumann U87s, U67s, KM84s; AKG 451, E-V RE20; Sennheiser; Shure 57; Sony C-37P; RCA 77-DX, RCA 44.

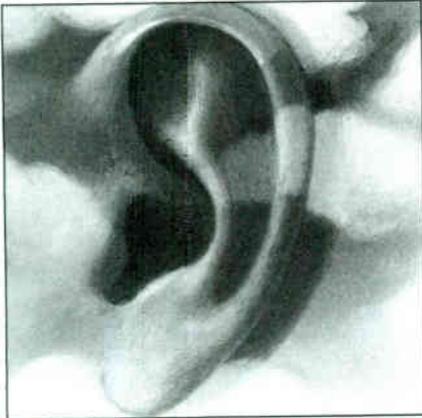
Monitor Amplifiers: McIntosh 2300, 2105, 255.

Monitor Speakers: JBL 4343 (Gauss) JBL 4311, Auratone, SC Tannoy, Fostex.

Musical Instruments: Yamaha grand piano, Fender Rhodes; Roland synthesizer; Rhythm Box harmonizer; Slingerland drums, Synare, Hammond B3.

Rates: Rates upon request.

Extras & Direction: Studio philosophy: simply that our engineers strive to treat every recording as if it were their own aspiration; to be categorized as a hit making quality studio. "We've got the sound you want."



MIDLAB™
Avondale Estates, GA

[24+] MIDILAB™

JBS Studio, 106 N. Avondale Rd.
Avondale Estates, GA 30002
(404) 292-2103, 296-0604

Owner: Bill Anderson

Studio Manager: Steve Bell

Staff Engineers: Steve Bell, Bill Anderson

Dimensions: 40 x 50 soundstage w/22 ceiling. 16 x 22 performing stage. Two 5 x 12 iso booths. Control room A: 21 x 25 w/12 ceiling. B: (MIDLAB) 14 x 16 w/12 ceiling.

Mixing Consoles: A: AMEK Angela 32 x 24; B: (MIDLAB) SPECK EO-1 16 x 8.

Audio Recorders: (2) Otari MX-70 16-track (30 w/synch); Otari MX-5050 MKIII, 8-track (w/dbx); Otari MTR-12, 2-track; Otari MX-5050 MKIII, 2-track; Otari MX-5050, 2-track.

Synchronization: BTX Shadow.

Echo, Reverb, Delay: A: See JBS Studio listing B: (MIDLAB) Yamaha REV7, Lexicon PCM60, (2) Yamaha SPX90s, Korg SDD-3000.

Other Outboard: A: See JBS Studio listing; B: (MIDLAB) Aphex Aural Exciter, Dyna-Mite, dbx 166, 163, Valley People Getex.

Microphones: Neumann, AKG, Sennheiser, E-V, Beyer, Crown, Shure, Sony.

Monitor Amplifiers: A: Crest, Hafler, Adcom; B: (MIDLAB) Yamaha.

Monitor Speakers: A: Mains—custom 3-way active all cone/dome, no room EQ, Yamaha NS-10M, Auratone. B: (MIDLAB) Fostex RM865, Minimus 7.

Musical Instruments: Yamaha KX-88, DX7 and TX modules, Roland MKS-20 digital piano, Roland Super JX, E-mu SP-12 Turbo, Oberheim DMX, Roland Octapad, Simmons, Oberheim OB-8, Korg Poly-61M, 360 Systems MIDIBass.

Others available upon request.

Other MIDI Equipment: Akai S900 w/VX90 voice module.

Video: Complete production packages.

Rates: Call for rates and information.

Extras & Direction: PC/XT w/20 megabyte hard disk, 640K RAM, dual 360 drives, Roland MPU-401 MIDI interface, sequencing and patch library software. MIDILAB™ is a computer-based music production studio designed to provide a creative, cost-effective facility for programming and producing audio and audio-for-video. Once programming has been complete, MIDILAB's direct tie-lines to JBS Control Room A allow easy transfer to multi-track.

[24+] MORRISOUND RECORDING
12111 N. 56th St., Tampa, FL 33617
(813) 989-2108

Owner: Morrisound Recording Inc.
Studio Manager: Tom Morris
Engineers: Tom Morris, Jim Morris, Rick Miller, Assistant engineers: Scott Burns, Dawn Britner, Dave Rauch.

Dimensions: 32 x 40 Studio A; 32 x 15 Studio C; control rooms 25 x 23 both.

Mixing Consoles: Sound Workshop Series 34 with automation, 32 x 24; Amek Scorpion, 24 x 16.

(2) Lexicon PCM-41, Lexicon PCM-42, Prime Time, Loft 450, Ecoplete, Yamaha REV7.

Other Outboard: DeltaLab DL5 and Eventide 910H Harmonizers; dbx 165 and UREI LA-4 compressor/limiters; Valley People Dyna-Mites; EXR EX-3 Exciter; Omni Craft noise gates; Audioarts stereo parametric equalizer; BTX Shadow synchronizer.

Microphones: Neumann; AKG, Sennheiser, Shure, Electro-Voice.

Monitor Amplifiers: (6) Hafler.

Monitor Speakers: UREI 811A; UREI 813B; JBL 4312; Yamaha NS-10M, EAW MS-50; E-V Sentry 100; Auratone 5C.

Musical Instruments: Yamaha grand piano, Hammond C-3 w/Leslie, 5-piece Gretsch drum set with Tama snare, 5-piece Yamaha drum set, full range of rental synthesizers and drum machines, including Synclavier II.

Video Equipment: Audio post-production for film or video.

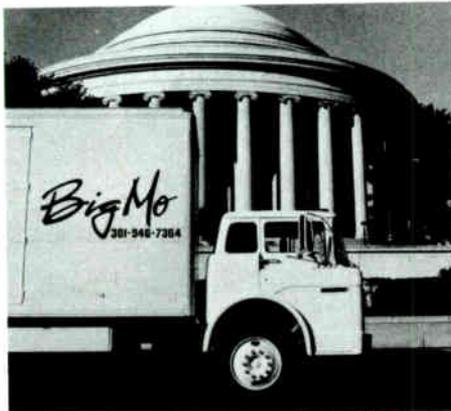
Rates: Please call.

[24+] MUSIC BUSINESS INSTITUTE
3376 Peachtree Rd. NE, Atlanta, GA 30326
(404) 231-3303
Owner: Music Business Institute
Studio Manager: Mert Paul

[24+] MUSIC MILL
1701 Roy Acuff Pl., Nashville, TN 37203
(615) 254-5925
Owner: Harold Shedd, Donny Canada
Studio Manager: Paul Goldberg, Jim Cotton

[24+] NATIONAL SOUND & VIDEO ENGINEERING
1756 Wilwat Dr., Norcross, GA 30093
(404) 447-1717
Owner: Thomas M. Hayward
Studio Manager: Mike McNamara

[24+] NEW AGE SIGHT & SOUND
Ste. 164, 120 Interstate N. Parkway, E.
Atlanta, GA 30339
(404) 956-7956
Owner: Media Associates, Ltd. William Allgood, President
Studio Manager: Mitchell Dorr



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NEW RIVER STUDIOS
 Fort Lauderdale, FL

[24+] NEW RIVER STUDIOS
 408 South Andrews Ave., Fort Lauderdale, FL 33301
 (305) 524-4000

Owner: New River Productions
 Studio Manager: Virginia Cayia
 Engineers: Chief: Ted Stein. Assistants: Teresa Verplanck,
 Dave Barton. Maintenance: Dale Peterson.
 Dimensions: Studio 36 x 35, ceilings from 13-18 feet;
 control rooms: 35 x 25.
 Mixing Consoles: Neve 808 w/Neacm 96, 56 x 48.
 Audio Recorders: (2) Studer A800 MKIII, 24-track; (2)
 Studer A80, 2-track; Revox B77, 2-track.
 Cassette Recorders: (2) Revox B710, (2) Yamaha K1000.
 Echo, Reverb, Delay: AMS RMX16 digital reverb, Lexi-
 con 324XL EMT 25, EMT140S tube plate, Lexicon PCM42
 digital delays, Lexicon 97 Super Prime Time.
 Other Outboard: Valley People Kepex II and Gain Brain,
 dbx 165, dbx 162, Neve stereo comp/limiter, Scamp Rack,
 Telatronix LA2A, API 550As, API 550As, API 550s, Drawmer noise
 gates.

Microphones: Neumann: M49, U87s, U89s, KM85, KM84,
 AKG: 414, D12, Beyer: M88, M101, Countryman Isomax,
 Crown PZM30, Electro-Voice RE20, Schoeps: CMT55C1
 CM05, Sennheiser MD4210, Shure SM57 and SM81.
 Monitor Amplifiers: (5) Acoustat TNT-200s.
 Monitor Speakers: Meyer 833s, UREI 813Bs, JBL 4311i,
 Yamaha NS10s, Auratones.

Musical Instruments: Yamaha C7D grand piano, Ham-
 mond B3 w/Leslie, Dyno-My-Piano Fender Rhodes, drum
 set and various amps available.

Video Equipment & Services: Audio to video 3/4-inch
 post-production. JVC 6000 3/4-inch U-matic VCR and (2)
 JVC 2092 monitors.

Rates: Upon request.

Extras: We have established contacts with hotels, rental
 cars, yacht charters, etc., with special rates for our clients.
 We would be happy to structure a package to suit your
 needs. The studio has a private lounge, producers' office
 and conference room for our clients. It is situated off the
 New River, only three miles to the beaches and airport.
 Direction: Having completed four years in business, New
 River has established itself as Florida's premier full-ser-
 vice facility. We are proud to have worked with Miami
 Sound Machine, Jimmy Buffett, Peter Frampton, Cyndi
 Lauper, Jose Luis Rodriguez, and many other fine artists.
 We thank you for your support.

[24+] CMNISOUND RECORDING STUDIO
 1806 Division St., Nashville, TN 37203
 (615) 321-5526
 Owner: Espri Sound, Inc.
 Studio Manager: Kelly Sharber McBryde

[24+] PACE RECORDING SERVICE
 also REMOTE RECORDING
 2504 Bayou Rd., New Orleans, LA 70119

(504) 943-7542, 949-2414
 Owner: Glen Himmagha and Peter Schulman
 Studio Manager: Jack Berry
 Extras: Top equipment, top engineers, the only remote
 recording truck in the area. Add all this and the best
 attitude in the business, place yourself in the heart of the
 most inspiring city in the country (New Orleans) and you've
 got "Pace Sound Co." the only complete production center
 in the southeast. A first-class 24-track recording studio
 with equipment by MCI, Otari, NEOTEK, Soundcraft, Neu-
 mann, Yamaha and more plus the south's largest and most
 complete sound and lighting system. Credits include the
 Neville Bros., Adam Ant, Alan Landsberg Productions, Bill
 Graham Presents and more. Call us.

[24+] PARALLAX RECORDING
 (formerly Patmos Productions)
 also REMOTE RECORDING
 123 E. State St., Ridgeland, MS 39157
 (601) 856-2525, 1-800-257-5539
 Owner: James A. Griffin
 Studio Manager: James A. Griffin



PARC STUDIOS
 Orlando, FL

[24+] PARC STUDIOS
 also REMOTE RECORDING
 PO Box 7877, Orlando FL 32854-7877
 660 Douglas Ave., Altamonte Springs, FL 32714
 (305) 788-2450

Owner: Pat Armstrong/Parc Records, Inc.
 Studio Manager: Andy deGanahl (for bookings: Pat Arm-
 strong (305) 299-0077, Garry Jones (305) 788-2450)
 Engineers: Andy deGanahl, Greg McNeilly.
 Dimensions: Studio 40 x 30; control room 25 x 25.
 Mixing Consoles: Solid State Logic 6000E 56/44; Sphere
 (mobile) Eclipse Model A 32/24.

Audio Recorders: Studer-Revox A800 24-track; Studer-
 Revox A80 4-track; Studer-Revox A80 2-track; Studer-
 Revox A80 2-track; (2) dbx 700 w/Sony Umatic 8500
 VCR 2-track; Otari (mobile) MTR-90 24-track; Otari (mo-
 bile) MTR-10 2-track; Otari MTR-12 (1/2-inch) 2-track.

Echo, Reverb, Delay: AMS RMX-16 Reverb, Lexicon 224
 XL reverb, (2) Lexicon 200 reverb, Micmix Super Creverb,
 AMS DMX 1580 delay, Eventide 969, Lexicon PCM 42 (2),
 PCM 41 (2) M 93 Pnme Time.

Other Outboard: Drawmer DS 201 dual gate (2), Drawmer
 stereo tube compressor, dbx 900 rack w/2 compressors/2
 de-essers/4 parametric EQ/Aphex compeller, Eventide
 flanger, Eventide phaser.

Microphones: Neumann U47 tube & FET, U89, KM84,
 AKG 460, 414 EB, C-12A, Sennheiser 421, 441 Sanken
 CU41, B+K 4000 Series, Shure SM 57, 58, 81, UREI direct
 boxes.

Monitor Amplifiers: Hafler DH 500 (3); Hafler DH 220 (3).
 Monitor Speakers: Fostex LS-3, Fostex RM 780, Yamaha
 NS-10, UREI 811, Auratone.

Musical Instruments: 9-ft. Yamaha grand piano. Rental
 of any required instrument with 24 hour notice.

**[24+] PERFECT PITCH RECORDING &
 PRODUCTION CO.**

Rt. 8 Box 433-A, Statesville, NC 28677
 (704) 872-2360

Owner: Marcus Kearns

Studio Manager: Marcus Kearns

Engineers: Marcus Kearns, independents.

Dimensions: Studio 12 x 20; isolation booth 8 x 10; control
 room 20 x 24.

Mixing Consoles: MCI JH 636 30 x 24 automated, fully
 loaded.

Audio Recorders: Studer A80 VU MKIII 24-track; Studer
 A80 RC 2-track (1/4-inch), A810 (1/4-inch) 2-track.

—LISTING CONTINUED ON NEXT PAGE

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1031C) MODERN RECORDING TECHNIQUES, Robert Runstein, David Huber The updated 1986 edition of this classic book contains state-of-the-art technical developments and practices in recording. Practicing engineers and students will find comprehensive coverage of equipment, acoustics, controls and techniques, as well as information on proper and creative production and sound measurement. 366 pp.(P) \$18.95

1340B) THE MASTER HANDBOOK OF ACOUSTICS, F. Alton Everest An all-inclusive sourcebook that fully explores the world of acoustics and sound reproduction, transmission, and reception. Includes much detail on hearing, ear anatomy and sensitivity, and audibility, room testing, and loudness vs. frequency, and intensity, and bandwidth. 337 pp.(P) \$12.95

1415B) SUCCESSFUL SOUND SYSTEM OPERATION, F. Alton Everest This excellent new book provides background information on the physical nature of sound, electricity and electronics. It also gives in-depth detail on current equipment with a very useful section on equipment usage including microphone placement and usage, speaker care and placement, the working mechanics of amps, mixers, and signal processors, tips on troubleshooting and repairing audio equipment, detailed information on noise reduction, room acoustics, sound equalization, and more. 336 pp.(P) \$17.95

1440B) THE DIGITAL DELAY HANDBOOK, Craig Anderton An outstanding book to help unlock the hidden potential in virtually any delay line. In addition to long, short, and multiple delay line techniques, it contains 66 different applications including auto flanging, sound effects, tuning percussive sounds, phase shifter simulation, reverb pre-delay, synco-sonic echo effects, and much more. 134 pp.(P) \$9.95

1535B) AUDIO SWEETENING FOR FILM AND TELEVISION, Milton Hubatka, Frederick Hull, Richard Sanders This excellent new guide explains all current post-production techniques and equipment for sweetening audio tracks. The basic techniques of spotting, laydown, track building, mixing, and layback are covered as well as the advanced techniques for treatment of on-camera dialog music, sound effects, Foley, narration, background presence, stereo mixing and more. Includes sections on smaller scale TV productions, the history of sweetening, and state-of-the-art developments. 240 pp.(H) \$29.00

3010B) THIS BUSINESS OF MUSIC (REVISED AND ENLARGED), Shemel & Krasilovsky This highly comprehensive 1985 reference provides detailed explanations of legal, practical, and procedural problems of our industry. Part 1—Recording companies and artists; Part 2—Music publishers and writers; Part 3—General music industry aspects. Includes over 200 pages of contracts, forms, and licenses. 646pp.(H) \$22.95

3250B) SINGING FOR THE STARS, Seth Riggs This complete program for voice training was written by one of the most respected vocal coaches in the world. His students have included Michael Jackson, Al Jarreau, Bette Midler, Stevie Wonder, James Ingram among others. No matter what style of music you sing, from pop to opera, Seth Riggs' techniques will increase your vocal strength, clarity, flexibility, and range. 146 pp. plus two cassettes \$29.95

3570B) MIDI FOR MUSICIANS, Craig Anderton This brand new 1986 release is by far the best book we've seen on the subject. Clearly and thoroughly it discusses the evolution toward Musical Instrument Digital Interface, how MIDI solves musician's problems, the MIDI language and what it means in musical terms, how computers work in musical applications, MIDI applications both live and in studio, typical features of MIDI gear and their musical uses, set up and use of MIDI-based studios, MIDI accessories, musician-oriented software, and much more. 104 pp.(P) \$14.95

3580C) FOUNDATIONS OF COMPUTER MUSIC, Edited by Curtis Roads & John Strawn This superb reference book from MIT is the most complete overview of the field for serious students and practitioners. In four sections it covers Digital Sound-Synthesis Techniques, Synthesizer Hardware and Engineering, Software Systems for Music, and Perception and Digital Signal Processing. It contains many classic articles in revised and updated versions and should be in every contemporary composer's library. 736 pp.(H) \$50.00

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—LISTING CONTINUED FROM PAGE 164

Mixing Consoles: Studer A710
Echo, Reverb & Delay Systems: Lexicon 224 X with LARC digital reverb, Lexicon Super Prime Time, Eventide H949 Harmonizer.
Other Outboard: Scamp rack (dual de-esser, comp/lim., exp/gate, dual gate), White equalizers
Microphones: AKG, Sennheiser 421s, Neumann (87s and 89s), Electro-Voice, Shure.
Monitor Amplifiers: Banner 900 power amp, Banner 300 power amp, NAD 250.
Monitor Speakers: JBL 4430, 4401, 4311.
Musical Instruments: Bosendorfer 7'4" grand piano, Fairlight CMI (with AIC), Yamaha DX7, Oberheim OB-Xa, Oberheim DSX sequencer, ARP 2600, LinnDrum computer, Simmons drums, Sonor acoustic drums, Roland 350 Vocoder, Gibson Les Paul, Roland, Ampeg amps, Yamaha CP-70 electric grand, Fender Rhodes, Garfield Mini-Doc, Roland Juno 106, Roland 707 drum machine.
Rates: Upon request.

[24+] PICKIN' POST
also REMOTE RECORDING
Hwy. 70E, Exit 239B I-40E, Lebanon, TN 37087
(615) 449-1770
Owner: Pickin' Post Enterprises
Studio Manager: Joe W. Nave

[24+] POLYMUSIC STUDIOS, INC.
225 Oxmoor Cir. #812, Birmingham, AL 35209
(205) 942-3222
Owner: Daniel E. Whiteside
Studio Manager: Daniel Whiteside
Engineers: Mike Panepinto, Andy Bray, Daniel Whiteside.
Dimensions: Studio 25 x 23 main; 15 x 20 keyboard room, 12 x 8 isolation; control room 25 x 23 main; 15 x 8 Synclavier room
Mixing Consoles: Trident 80B, 30 x 24; Quantum QM-128 20 x 8
Audio Recorders: Otari MTR-90, 24-track; ATR-800, 2-track; ATR-102, 2-track; ATR-700, 2-track; TEAC 3340, 4-track.
Cassette Recorders/Duplicators: Technics and JVC.
Echo, Reverb, Delay: Lexicon 224; Eventide Harmonizer and Flanger; Lexicon PCM 41 and 42 DDL; (2) Yamaha REV7; SPX-90; Roland SRV 2000; Yamaha REV-1 digital reverb, Roland Vocoder.
Other Outboard: Bercus-Berry 202R, Orban parametrics; UREI, Eventide and dbx compressor/limiters, (4) dbx noise gates
Microphones: Neumann, Shure, E-V, RCA, Sennheiser, AKG.
Monitor Amplifiers: BGW and Yamaha.
Monitor Speakers: JBL 4411, 4311B, 4401; Auratones, Visonik 6000 and 9000.
Musical Instruments: Synclavier II w/16 synth voices, 16 Polyphonic sampling voices, music printing, Yamaha DX7 and TX816 rack, Roland RD-1000 digital piano; LinnDrum; Yamaha G-2 piano; Hammond B-3 w/128 Leslie; Prophet 5; ARP 2600, Odyssey, Omni; Poly and Micro-Moog; full Yamaha and Pearl drum sets; vibes and a complete array of Latin percussion; assorted guitars and amps.
Rates: \$55/hr., block rates, call.
Extras: Polymusic has a highly qualified, friendly staff of musicians, writers, lyricists, and arrangers to assist you. We also have an in-house jingle production company.
Direction: Our productions cover a broad range of musical styles, and our wide range of services is a definite plus. Polymusic has a growing list of loyal clients, and we invite you to become one of them.

[24+] PYRAMID RECORDING
1228 Lula Lake Rd.
Chattanooga (Lookout Mountain), TN 37350
(404) 820-2356
Owner: R.H. MacLellan
Studio Manager: Jim Stabile

[24+] QUADRADIAL CINEMA CORP
14203 NE 18th Ave., North Miami, FL 33181
(305) 940-7971
Owner: Robert Ingna and Mary Shahan

[24+] RADIO-ACTIVE AUDIO
also REMOTE RECORDING
9 West Grace St., Richmond, VA 23220
(804) 643-2022
Owner: Victor Benshoff, Michael Gray
Studio Manager: Victor Benshoff

[24+] RAINBOW RIVER STUDIOS
also REMOTE RECORDING
PO Box 1708, Auburn, AL 36831
(205) 821-4876
Owner: Larry L. Barker, Kattie W. Watson
Studio Manager: Larry L. Barker



[24+] REFLECTION STUDIOS
1018 Central Ave., Charlotte, NC 28204
(704) 377-4596
Owner: Wayne Jernigan
Studio Manager: Mark Williams
Engineers: Steve Haigler, Mark Williams.
Dimensions: Studio A: 44 x 32 w/18-ft. ceiling; Studio B: tape duplicating; Studio C: 28 x 24 w/12-ft. ceiling; control rooms: Studio A: 19 x 24 plus 8 x 10 isolation room;; Studio C: 18 x 14, plus alcove for recorders.
Mixing Consoles: Sony MX-3036, 36 input automated; MCI JH-636, 24 input.
Audio Recorders: (2) Sony APR 5002, 2-track; MCI/Sony JH-110C (1/2-inch), 2-track; Sony PCM-3202, digital (dash format); (2) MCI/Sony JH-24, 24-track; Otari 5050, 1/4-track; MCI JH-C8, 8-track.
Echo, Reverb, Delay: Lexicon 224XL EMT, Lexicon PCM-70, Lexicon 200, DeltaLab delays, Effectron, Super Time Lin.
Other Outboard: UREI comp. (2) dbx 900 series w/de-essers, gates, limiters, (2) Valley People 440, Orban comp, Drawmer turntable gates.
Microphones: Neumann, AKG, Shure, E-V, Sennheiser, RCA, Sony.
Monitor Amplifiers: AB Systems, BGW, Haller
Monitor Speakers: Custom TAD components, double woofer system, JBL 4401, ROR.
Musical Instruments: Yamaha grand, Kawai grand, stereo Fender Rhodes, Wurliizer electric piano, Farfisa, upright tack piano, Sonor drums and percussion, Musser vibes.
Rates: Upon request. Block rates available.

[24+] THE REFLECTIONS
2741 Larmon Dr., Nashville, TN 37204
(615) 269-0828/3405
Owner: Gene Lawson
Studio Manager: Gene Lawson

[24+] STEVE ROGERS PRODUCTIONS
940 Tarpon St., Ft. Myers, FL 33901
(813) 543-1968
Owner: Steve Rogers

[24+] ROXY RECORDING STUDIO
also REMOTE RECORDING
827 Meridian St., Nashville, TN 37207
(615) 226-1122
Owner: RRT, Inc.
Studio Manager: Donna Bridges

[24+] SAM'S TAPE TRUCK
only REMOTE RECORDING
2785 Osborne Rd., Atlanta, GA 30319
(404) 237-9075
Owner: Joe Neil, Larry Goode
Studio Manager: Ruth Neil

[24+] SCENE THREE, INC.
also REMOTE RECORDING
1813 8th Ave. S., Nashville, TN 37203
(615) 385-2820
Owner: Scene Three, Inc.
Studio Manager: Nick Palladino

[24+] SCRUGGS SOUND STUDIO, INC.
2828 Azalea Pl., Nashville, TN 37204
(615) 383-7994
Owner: Randy and Steve Scruggs
Studio Manager: Bernie Ellis

[24+] SEA-SAINT RECORDING STUDIO, INC.
3809 Clematis Ave., New Orleans, LA 70122
(504) 949-8386
Owner: Allen R. Toussaint, Marshall Sehorn
Studio Manager: Mary Ledbetter

[24+] SIXTEENTH AVENUE SOUND
1217 Sixteenth Ave. S., Nashville, TN 37212
(615) 327-8787
Owner: Byron Hill, Mike Poston
Studio Manager: Mike Poston



SIXTEENTH AVENUE SOUND
Nashville, TN

Staff Engineers: Mike Poston, Steve Clark
Dimensions: Studio 24 1 x 40 x 12 (includes two large iso rooms), control room trapezoidal 23 1 x 28 x 11
Mixing Consoles: SSL 4000E w/Total Recall™ 45 input
Audio Recorders: Mitsubishi X 850 digital, 32 track, Studer A-82C analog, 2-track; Mitsubishi X 86 digital, 2 track, JVC VF-101 digital processor, 2 track
Echo, Reverb, Delay: AMS RMX 16 digital reverb, AMX DMX 15 digital delay with stereo harmonizer, Lexicon 480L digital effects processor; Lexicon 224XL digital reverb, (2) Lexicon PCM70 effects processor, (2) Yamaha REV7 effects processor, Yamaha SPX90 effects processor; Lexicon PCM42 digital delay
Other Outboard: ADR vocal Stresser FX 760, (2) Sontec dual limiter/compressor; (2) dbx 165 limiter/compressor; Valley Kepex, Simon Systems direct box
Microphones: AKG C414EB-P48, (2) Sny C 48 (2) Neumann KM84, (4) Sennheiser MD-421, (4) Shure SM 57, E V PL20
Musical Instruments: Perreaux 5150B, Yamaha P2250
Monitor Speakers: B&W 808 main monitors, B&W near field monitors, Yamaha NS-10, Auratone T6, Tannoy SRM 12
Musical Instruments: Kawai 7'5" grand piano
Video: IVC industrial quality VHS hi fi video deck
Rates: Upon request. No extra charge for digital—it's all we have!
Extras & Direction: Extra large control room. Game room with pool table and movie library. Sixteenth Avenue Sound is a brand-new studio, having just opened in December, 1986. We are committed to digital recording. Owner Byron Hill has produced recordings for Mercury, Polydor, MEI (Germany), Warner Bros. (France), Ariola, and Capitol. Owner/general manager Mike Poston, who designed and built the studio, has engineered recordings for Chet Atkins, Perry Como, Woody Herman, David Hungate, Garrison Keillor, Dolly Parton, Kenny Rogers, George Strait, and Roger Whittaker.

[24+] SMART/SOUTHERN MUSIC ART
1231 Singer Dr., Riviera Beach, FL 33404
(305) 842-8944
Owner: John and Terry Joneths
Studio Manager: John Joneths

[24+] SOUND CELL RECORDING
also REMOTE RECORDING
601 Meridian St., Huntsville, AL 35801
(205) 539-1868
Owner: Doug Smith
Studio Manager: Doug Smith

[24+] SOUND INTERNATIONAL CORPORATION
4730 E. 10th Lane, Hialeah, FL 33013
(305) 685-8409

Owner: Enzo Caputo
Studio Manager: Ayal Ieshua
Engineers: Bruce Greenspan, Mark Eoccaccio, Ayal Joshua

Dimensions: Studio 10 10 x 13 7, control rooms 12'4" x 25'6"; (4) dubbing/voice over studios 8 x 10, (4) dubbing/voice over control rooms 8 x 6.
Mixing Consoles: Soundcraft 2400, 52 x 24
Audio Recorders: Otari MTR-90 II, 24 track, Otari MX 5050B II, 8-track, Otari MX5050 II, 2 track
Synchronization: Q Lock 3 10 and BTX Shadow
Echo, Reverb, Delay: Lexicon 200 digital reverb, Yamaha SPX 90, Roland SDE 3000 DDL, Roland Space Echo
Other Outboard: Eventide Harmonizers, Aphex Aural Exciter, Aphex Compeller, dbx compressors, Dyna Mite gates
Microphones: Neumann U87s, Sennheiser 441, Sony ECM 50s, Sony ECM30s, E V 635A
Monitor Amplifiers: BGW, Yamaha

Monitor Speakers: JBL, Auratone, EAW.
Musical Instruments: E-mu I and E-mu II, Yamaha DX1, MemoryMoog, Prophet-5, Yamaha RX11 drum machine, Simmons SDS-7 w/MIDI.
Other MIDI Equipment: Fully MIDI equipped with MIDI central switching.
Video Equipment & Services: We provide video production, post-production and all transfers. Equipment includes three 1-inch type C video machines, 3/4-inch machines with editing, VHS, Beta, and a Videola.
Rates: Please call for rates.

[24+] SOUND OF BIRMINGHAM RECORDINGS STUDIOS, INC.
also REMOTE RECORDING
 3625 5th Ave. S., Birmingham, AL 35222
 (205) 595-8497
 Owner: corporation
 Studio Manager: Don Mosley

[24+] SOUND TRAX, INC.
 1626 Glenwood Ave., Raleigh, NC 27608
 (919) 832-9953
 Owner: Perry R. Cheatham
 Studio Manager: Don Stone

[24+] SOUNDS UNREEL STUDIOS
also REMOTE RECORDING
 1902 Nelson Ave., Memphis, TN 38114
 (901) 278-8346
 Owner: Jon Hornyak and Don Smith
 Studio Manager: Jon Hornyak
 Engineers: Don Smith, Jack Holder, Evan Rush, Andy Black.
Dimensions: Studio 44 x 19 x 12; control room 19 x 15 1/2 x 11 1/4.
Mixing Consoles: Soundcraft TS24, 32 x 24.
Audio Recorders: Otari MTR-90-II, 24-track; Otari MTR-10, 2-track; Otari MX5050B, 2-track.
Echo, Reverb, Delay: Lexicon 224XL, Lexicon 200, AMS RMX 16, Ursa Major 8 x 32 digital reverb, AMS DMX 15-80s digital delay/harmonizer, Korg programmable digital delay, Yamaha SPX90.
Other Outboard: dbx 900 mainframe w/limiter/compressors, noise gates, and de-esser, Symetrix 501 limiter/compressor, LA-2A, Fairchild 660, Roland Dimension-D, EXR

Exciter, MARC MXI and MXE.
Microphones: AKG Tube, 414, 451, D12E, 224; Neumann U87, KM84; Shure SM7, SM57, SM58, SM81; Sennheiser 421; E-V RE20, RE16; Crown PZM; Beyer M500.
Monitor Amplifiers: Yamaha, Crown, BGW, McIntosh.
Monitor Speakers: Steven Durr custom monitors (JBL TAD), Yamaha NS-10M.
Musical Instruments: Steinway grand piano, Hammond B-3, Yamaha DX7, PPG 2.3 w/Waveform, Fairlight CMI, Emulator II, Roland JX-8P, JX-3P, MSQ700, Juno 60, Oberheim DMX, 4 voice, Rhodes, Prophet 5, MiniMoog, Linn-Drum, Marshall amps, strings and things, custom guitars and basses.
Rates: Upon request.



SOUNDSCAPE STUDIOS, INC.
 Atlanta, GA

[24+] SOUNDSCAPE STUDIOS, INC.
 677 Antone St. N.W., Atlanta, GA 30318
 (404) 351-1003
 Owner: Jon Marett
 Studio Manager: Jim Zumpano

Engineers: Larry Turner, Jim Zumpano, Edd Miller, I.B. Smooth, independents welcome.
Dimensions: Studio A: 60 x 50 x 22, isolation A 19 x 14 x 10, isolation B 30 x 20 x 10, isolation C 25 x 19 x 10; control rooms 29 x 28 x 12.
Mixing Consoles: NEOTEK Series IIIc, 28 x 24.
Audio Recorders: Studer A80 MKIV, 24-track; Studer A80, (1/2-inch) 2-track; Studer A810, (1/4-inch) 2-track.
Cassette Recorders: Studer A710, Tascam 122.
Echo, Reverb, Delay: Lexicon 224X with Larc, Super Prime Time, PCM70, PCM41, PCM42, Eventide H910, Marshall Time Modulator.
Other Outboard: LT Sound CLX-2s, Valley People Dyna-Mites, Kepex IIs, Drawmer gates, LT Sound, Pultec, UREI, Audio Arts EQ.
Microphones: Neumann: U47, U67s, U87s, KM84; TLM 170s; AKG: 414s, D12s 460s; Sennheiser: 421, 441; Shure: Crown PZMs, Electro-Voice; RCA Ribbon, Beyer M500.
Monitor Amplifiers: Control room—FM acoustics 800A (low end) FM Acoustics 300A (top end); nearfield; Hafler 500; Studio, Crest 5000, and BGW 250D.
Monitor Speakers: Custom Steven Durr cabinets with TAD drivers and JBL15-inch; nearfield, choice of Tannoy SRM10B, AR18B, Minimus 7, Yamaha NS-10M.
Musical Instruments: Yamaha C-7 grand piano, Gretsch acoustic drums, Gallien-Krueger preamp, Marshall and JBL cabinets all available at no extra charge. Yamaha DX7, Prophet-5, Oberheim OB-8, Emulator II, Simmons SDS7, Prophet 2000, Emu SP-12 available.
Video Equipment: Sony 5850 3/4-inch video recorder; Panasonic 6800 1/2-inch VHS recorder, Sony monitor, SMPTE time code.
Rates: Available upon request.
Extras: Extensive lighting system includes 50 PARs (500-1000 watts); (3) Far-cycs; Strand Century console with programmable dimmer assignment; assortment of 1.5-10 kw Mole-Richardson and McAllister lights; stage for band rehearsals and showcases upon request. Developing MIDI system and room. Large drive-in door and comfortable lounge facilities with kitchen, bedroom and private bathroom with shower.
Direction: Soundscape Studios is a state-of-the-art multimedia complex which combines a qualified, amiable staff to serve a client's full spectrum of needs. The flexible 3,000 sq. ft. Studio A allows for a simple transition from a recording studio to a soundstage for video or movie production. The built-in comfort of the control room and lounge facility provides the perfect complement to a quality industrial, commercial or album production.

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. Eurhythms.
- 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 Burt on ImaX. Nile Rogers.
- 1985 November, North Central & Canadian Studios. George Massenburg. Video Supplement. Alligator Records. Women in Media Production.
- 1985 December, Tape-to-Disc 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 Titelman. CD-ROM & CD-I. Ry Cooder.
- 1986 July, Recording School Directory and Southwest Studios. CD Pre-mastering. Britain's Live Aid. Producer Rick Rubin. Christian Rock. Stevie Wonder. 1986 August — SOLD OUT
- 1986 September, Southern California Studios. Film Sound. Telecommunications. Production Music Libraries. David Byrne's True Stories.
- 1986 October, North Central and Canadian Studios. Television Sound. Fred Catero. John Entwistle's Studio. Backstage at Late Night.
- 1986 November, New Products Directory. CD-I Supplement. Kenny Loggins Tour Sound. Daryl Hall. Grounding Primer. Rupert Neve.
- 1986 December, Tape-to-Disc Issue: Mastering, Pressing & Duplication Facilities. CD Manufacturing. Mastering Engineers' Forum. Lee Ritenour's Studio. Casey Kasem. 1987 January — SOLD OUT
- 1987 February, Independent Engineers & Producers. International Recording Supplement. APRS Studio Directory. Bruce Lundvall. DMM for CD. Kitaro.

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[24+] **SOUNDSHINE PRODUCTIONS, INC.**
723 W. Sunrise Blvd., Ft. Lauderdale, FL 33311
(305) 463-9882
Owner: Thomas M. Graefe
Studio Manager: Paul Avakian

[24+] **SOUNDSHOP RECORDING STUDIOS**
1307 Division St., Nashville, TN 37203
(615) 244-4149
Owner: Wm. D. Killen
Studio Manager: Patrick A. McMekin



SOUND TREK RECORDING STUDIO
Pensacola, FL

[24+] **SOUND TREK RECORDING STUDIO**
PO Box 18566, Pensacola, FL 32523
(904) 434-0052
Owner: Glen Fowler and C.B. Fowler
Studio Manager: Glen Fowler
Engineers: Glen Fowler, Paul Garcia Video engineer: Mike Fowler
Dimensions: Approximately 700 sq. ft.; control rooms: 15 x 16
Mixing Consoles: Sound Workshop 3028 MB w/automation and super group 28 inputs.
Audio Recorders: Studer A-80 MKIII, 24-track; Studer B 67, 2 track; Tascam 32-2B, 2-track; Tascam 122, 2-track; Akai GX-77, 2-track
Echo, Reverb, Delay: Lexicon 224XL, Ecoplate 2, AKG BX 5, Loft 440.
Other Outboard: Orban 424 stereo compressor, (2) dbx 160X compressors Omni Craft noise gates (4-channels), Valley People Dyna-Mites, Aphex Aural Exiter, Countryman direct boxes, Tama percussion computer, Dynacord Percuter.
Microphones: AKG 414-P48s, 451s, D-12E; Neumann-U87, Sennheiser MD-421s; Crown PZMs, Calrec cm1051C, CCS6; Countryman 250 MAXs.
Monitor Amplifiers: Haller P500, Crown PS-200.
Monitor Speakers: JBL 4411, 4311; Auratones
Musical Instruments: Baldwin 6'3" grand piano; 7-piece drum kit Fender and Yamaha amps various types of synthesizers, 7-piece Tama electric drums.
Video Equipment: Panasonic 1/4-inch U-Matic and A500 editor, 8500 1/2-inch editor cameras by Panasonic and Hitachi, complete video service.
Rates: Please call for rates.

[24+] **SOUTHERN TRACKS RECORDING**
3051 Clairmont Rd., Studio Complex
Atlanta, GA 30329
(404) 329-0147
Owner: Bill Lowery
Studio Manager: Russ Fowler
Engineers: Doug Johnson, Greg Archilla
Dimensions: George Augspurger designed—Main room

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25 x 40, isolation booth 1-15 x 18, 2-16 x 20, dead alcove 12 x 12, vocal booth 8 x 10; control room George Augspurger design—22 x 26.
Mixing Consoles: Harrison 2824 with automation.
Audio Recorders: Ampex 1200 24-track, Studer A80 2-track, (2) Ampex 440 2-track.
Noise Reduction: Dolby.
Echo, Reverb, Delay: Lexicon 224, EMT, Super Prime Time, Eventide Harmonizer.
Other Outboard: Orban parametric EQ, Vocal Stresser, KepeX, Auto Flanger, dbx 165 and 160 limiters, UREI EQ, AudioTec Exciter.
Microphones: Neumann 87s, 47s, AKG 414s, Sennheiser 441s, 421s, E-V RE20, Wright mics.
Monitor Amplifiers: Crest, Hafler, BGW, Crown, AB.
Monitor Speakers: Custom George Augspurger system—JBL 4311, 4301, AR and Auratones.
Musical Instruments: Ludwig drums, Yamaha grand, Rhodes.
Rates: \$175/hr., call for block rates.

[24+] S.P. SOUND PRODUCTIONS
 709 Shadowfield Ct., Chesapeake, VA 23320
 (804) 547-0500
 Owner: Steve Peppos

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 (305) 428-0119
 Owner: James Kalamasz
 Studio Manager: James Kalamasz

[24+] STARGEM STUDIO
 43 Music Square East, Nashville, TN 37203
 (615) 244-1025
 Owner: Wayne Hodge
 Studio Manager: Dan Hodge

[24+] STARSTRUCK STUDIOS
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 270 Sunset Park Dr., Herndon, VA 22070
 (703) 471-1380
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 Studio Manager: David Goddard

[24+] STOKES PRODUCTION SERVICES, INC.
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 Studio Manager: Allan J. Stokes



STRAWBERRY SKYS RECORDING STUDIO
 West Columbia, SC

[24+] STRAWBERRY SKYS RECORDING STUDIO
 1706 Platt Springs Rd., West Columbia, SC 29169
 (803) 794-9300
 Owner: Bob Curlee, Gary Bolton
 Studio Manager: Gary Bolton
 Staff Engineers: Bob Curlee, Gary Bolton, Ron Hollins.
 Dimensions: 28 x 36 with large iso room; control room 17 x 22 with video monitor and MIDI interface.
Mixing Consoles: MCI automated w/plasma displays JH-536 AF-LM, 28 x 24.
Audio Recorders: MCI III JH-24-24, 24-track; MCI III H-11CC, 2-track w/ 1/2-inch heads 30 ips; TEAC 80-8 w/DZ-8 8-track w/dbx; TEAC 2300-ZT w/dbx 150, 2-track w/dbx; Pioneer RT-707, 1/4-track.

Cassette Recorders: (2) Aiwa F-770.
Echo, Reverb, Delay: Lexicon 224, Lexicon 93, (2) Delta-Lab Effectron, ART DR2, MXR flanger.
Other Outboard: Aphex Aural Exciter, Getex gates (4-ch), Ronxx gates (2-ch), Thompson Vocal Eliminator, dbx 162 limiter (stereo), (3) UREI 1176 limiters, Symetrix compressor, gates "Level Devil" compressor, Thorens TD160-C turntable, Marantz 2270 stereo receiver, Hitachi compact disc player, Zenith color video monitor, telephone audio feed.
Microphones: Neumann U47, Neumann KM84, AKG C-414EB, AKG C451, AKG C452, Sennheiser 421, Sennheiser 441, Shure SM7, Shure SM57, Shure SM58, Sony EC-9.
Monitor Amplifiers: Hafler 500, Hafler 200 Phase Linear, (3) Crown D-150.
Monitor Speakers: Bi-amped JBL 4435 Biradials, Yamaha NS-10C, Auratone 5-C, Klipsch Heresey.
Musical Instruments: Kurzweil 250, Emulator II, Linn-Drum, DX7 piano, Ludwig drums, Fender bass, Fender guitars, etc. Anything available by rental.
Video Equipment: Color video monitor in control room, building wired with video tielines, video equipment by rental and video services by contract.
Rates: Call for quote, our rates are surprisingly affordable!
Extras & Direction: Large, comfortable accurate control room designed with electronic music production in mind. 64 transformerless instrument inputs in the control with MIDI interface lines. Video monitor for computer data or other video display automated console with plasma displays. SMPTE available. Producer's desk with telephone audio feed. Convenient to food, lodging, airport and downtown. With over 20 years of combined experience, Strawberry Jamm and Higher Skys studios have become Strawberry Skys, the only recording studio of its kind in the state. We're the flagship studio in South Carolina and we offer a high level of recording service for about one-third the average national rate. We're a member of SPARS.

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 1918 Wise Dr., Dothan, AL 36303
 (205) 794-9067
 Owner: Jerry Wise
 Studio Manager: Steve Clayton

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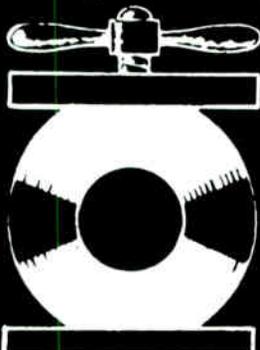
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[24+] STUDIO ONE
3864 Oakcliff Industrial Ct., Doraville, GA 30340
(404) 449-5147
Owner: Georgia State University
Studio Manager: Gregory M. Quesnel

[24+] STUDIO SOUTH
2510 Peach Orchard Rd., Augusta, GA 30906
(404) 793-7800
Owner: Howard Lovett
Studio Manager: Howard Lovett

[24+] STUDIOEAST
5457 Monroe Rd., Charlotte, NC 28212
(704) 536-0424
Owner: Don Lawrence and Tim Eaton
Studio Manager: Tim Eaton and Don Lawrence
Engineers: Doug Hawthorn, Jim Brock.
Dimensions: Studio 45 x 42 x 25(H); control room 20 x 24.
Mixing Consoles: 1986 AMEK Angela 36 x 24 with Audio Kinetics Master Mix MX644 floppy disk drive; AMEK Scorpion, S3-16-, 8-, 2-track.
Audio Recorders: Studer A-80, 24-track; MCI-110 1/2-inch master 2-track; Otari Mark III, 8-track; (3) Scully 280B 1/4-inch 2-track.
Echo, Reverb, Delay: Lexicon 224XL, EMT 140 stereo reverb plate, EMT 140 mono reverb plate, Eventide instant flanger, Eventide Clockworks Harmonizer, (2) Yamaha REV7.
Other Outboard: dbx limiter/compressor equalizer.
Microphones: Neumann U87, Neumann U47s, Neumann KM-84, Neumann KM-86, Sennheiser MKH 405, Sennheiser MD421-U-5, AKG, and E-V.
Monitor Amplifiers: Tannoy B40, Crown DC-300A, (2) Crown DC-150, McIntosh 2300.
Monitor Speakers: Tannoy FSMs. 4411 JBL, Yamaha NS-10, Auratone.
Musical Instruments: Kurzweil 250, Yamaha 7'4" grand, Hammond C-3 w/Leslie tone cabinet, Gretsch drum kit, Ludwig Octaplus Vistalight drum kit, MiniMoog, Hohner D-6 clavinet, Baldwin harpsichord, Fender 88 electric piano, Fender amps, Music Man amp.
Other MIDI Equipment: Macintosh 512K computer.

[24+] SUNDOWN SOUND STUDIOS
120 N. Laurens St., Greenville, SC 29601
(803) 233-3036
Owner: Bruce Freeman, William Williamson

[24+] TECHNO-SOUND
also REMOTE RECORDING
11724 Industriplex Blvd., Baton Rouge, LA 70809
(504) 295-1400, 292-2400
Owner: Nelson Blanchard
Studio Manager: Jim Odum

[24+] TELSTAR
also REMOTE RECORDING
2074 17th St., Sarasota, FL 33580
(813) 365-0337
Owner: Rick Moulton
Studio Manager: Lynn Nieder
Engineers: Rick Moulton, Jerry Jordan
Dimensions: Studio 25 x 30; control room 20 x 16

Mixing Consoles: Sony/MCI JH-636, 30 x 24.
Audio Recorders: Sony/MCI JH-24, 24- and 16-track; Sony/MCI JH-110 (1/4-inch), 2-track; Sony/MCI JH-110 (1/2-inch) 2-track; Sony PCM-F1, 2-track.
Cassette Recorders: Otari-Tascam real time duplication.
Echo, Reverb, Delay: Lexicon 224XL, Lexicon PCM60, Lexicon PCM-42s, Prime Time; Eventide Harmonizer.
Other Outboard: UREI 1176s, LA-3s, dbx 160s; Allison Research Gain Brains, Kepex's; Valley People Dyna-Mites, Dyna-Mic's; 610; Orban 516EC; Audioarts parametrics, AXE direct boxes.
Microphones: U87s, 414s, PZMs, SM-85s, 81s, 57s, 56s, Beyer 160s, etc.
Monitor Amplifiers: BGW, JBL, SAE, Yamaha.
Monitor Speakers: JBL 4430, Yamaha NS-10, Auratone.
Musical Instruments: Kawai 6-ft. grand piano, Hammond B-3 w/Leslie; LinnDrum computer.
Rates: Upon request.

Monitor Amplifiers: BGW, Crown.
Monitor Speakers: JBL 4331-A, Yamaha NS-10, Auratones.
Musical Instruments: Kawai grand; Ludwig drums; Mesa Boogie, Yamaha, Fender guitar amps; keyboards, drum machines etc. Available on request, Fender P-Bass.
Video: Sony 5800 3/4-inch U-matic.
Rates: On request; 48-track recording available on request.

[24+] **VIRGINIA ARTS PRODUCTION STUDIO**
 Box 800, Louisa, VA 23093
 (703) 967-2245
Owner: R. Paul Brier
Studio Manager: R. Paul Brier

[24+] **THE TERMINAL**
 426 Bradford Dr., Jackson, MS 39208
 (601) 932-2627
Owner: Rick Garner
Studio Manager: Randy Everett
Engineers: Randy Everett, Rick Garner
Dimensions: Studio 34 x 24 x 17; 12 x 14 x 8 isolation; 8 x 12 x 18 isolation; control room 22 x 22 x 12 LEDE type design, 12 x 14 MIDI room.
Mixing Consoles: Sphere Eclipse A 28 x 24, Studio Master 16 x 8 (MIDI room).
Audio Recorders: MCI transformerless JH-24 w/autolocator III, 24-track; Scully 280-B, 2-track; Sony digital PCM F1, 2-track.
Cassette Recorders: (4) Nakamichi MR-2.
Noise Reduction: 28 channels dbx.
Echo, Reverb & Delay Systems: EMT 240 Gold Foil Plate; Lexicon PCM70, Lexicon PCM60, Yamaha REV7, Yamaha SPX90, Ursa Major Space Station, (2) Lexicon Prime Time; (2) Eventide 1745MDDL; Eventide Harmonizer, flanger and phaser; Loft flanger.
Other Outboard: (2) UREI 1176, (2) LA3A, (2) dbx 160 comp, (2) dbx 160 comp; (2) dbx 163 comp; UREI digital metronome; (6) Kepex II; (2) Gain Brain II; Valley People DSP; White 1/3-octave EQ; Aphex Aural Exciter; Aphex compellor; moog parametric EQ.
Microphones: (4) Neumann U87, (8) Sennheiser 421, (2) Sennheiser 421, E-V RE20, AKG D12E, 452, 422, 414EB, D1000E, Shure SM57, 58, (2) Crown PZMs.
Monitor Amplifiers: Crown, BGW, Yamaha.
Monitor Speakers: UREI 813 Time Aligned, Yamaha NS-10; JBL 4311, Auratones.
Musical Instruments: Complete MIDI studio with Yamaha DX7, TX-216; Ensoniq Mirage w/over 100 sounds; Roland JX-8P, JP-6, Juno 106 and MKS-30; (2) Korg Poly 800s; Casio CZ 101; CZ-5000; Micromoo; Oberheim DX drums; Pearl deluxe drum set; Kawai 6'8" grand piano, Fender guitars, 50 watt Marshall and Peavey amps.
Other MIDI Equipment: Commodore C-64 computer w/Syntech software.
Video Equipment & Services: Upon request.
Rates: Upon request.



WESTPARK SOUND
 Nashville, TN

[24+] **WESTPARK SOUND**
 3212 West End Ave. 2nd Fl., Nashville, TN 37203
 (615) 292-5838
Owner: Dunkin Nelson
Studio Manager: Dan Wujcik
Staff Engineers: Ted Wilson, Dan Wujcik, Jerry Kimbrough
Mixing Consoles: MCI 636 28 x 24, Soundcraft and Yamaha submixers.
Audio Recorders: MCI JH24, Revox PR99, Sony 701ES digital processor.
Cassette Recorders: Nakamichi.
Echo, Reverb, Delay: Lexicon 224XL w/LARC, Yamaha REV7, SPX90s, Lexicon PCM70, ART 01A, Roland SDE 1000, Lawson plate, PCM 42 w/exp.
Other Outboard: Aphex B Exciter, Gatex, BBE, dbx 160Xs, Kepex's, AudioArts stereoparametric, Altec tube compressors, Roland Dimension V, symetrics limiter, ADA effects.
Microphones: Senken CU41, Neumann TLM-170, U84, (4) AKG 414s, Sennheiser 421, AKG 330s, PZMs.
Monitor Amplifiers: Audio Research D-100, D-76, Crown D-150, Yamaha, NAD.
Monitor Speakers: EAW MS50, Klipsch, Fostex RM 780s, JBLs, Auratones.
Musical Instruments: Kurzweil 250 w/V.3 software and QLS, Emulator II w/Soundesigner and Softsynth, E-mu SP-12 turbo w/hard disk library, drum file software, KX 88 master, (3) DX7s, Oberheim Xpander, (2) Juno 106s, Super Jupiter, 360 Systems MIDIBass, CZs, DMX, RX 11 and 15.
Other MIDI Equipment: Macintosh Plus w/hard disks (3 computers), full software facilities including Performer, Southworth, Digidesign, Opcode, Drum file, and modem.
Video: Available upon request.
Rates: \$50/hr. basic w/out engineer, \$80/hr. for full computer/MIDI pkg., \$15/hr. for engineer.
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[24+] **TWELVE OAKS STUDIO**
 3830 S. Cobb Dr., Atlanta, GA 30080
 (404) 435-2220
Owner: Sonny Lallerstedt and Randy Bugg
Studio Manager: Randy Bugg

[24+] **ULTRASONIC STUDIOS INC.**
 also **REMOTE RECORDING**
 7210 Washington Ave., New Orleans, LA 70125
 (504) 486-4873
Owner: Jay Gallagher
Studio Manager: Scott Goudeau
Staff Engineers: Jay Gallagher, Scott Goudeau
Dimensions: Studio 50 x 50; 2 isolation booths; drum room; control room 25 x 16.
Mixing Consoles: MCI 652 w/automation 52 x 48.
Audio Recorders: MCI JH-24, 24-track; Sony 5003 w/center track timecode, 2-track; MCI JH-110, 2-track; Otari 5050, 2-track; Sony PCM-F1, 2-track.
Synchronization: Audio Kinetics Pacer synchronization.
Echo, Reverb, Delay: (2) Yamaha REV7, live chamber, (2) Yamaha SPX90, Lexicon Prime Time, Lexicon PCM-42.
Other Outboard: (4) UREI 1176, Allison Kepex/Gain Brains, EXR Exciter, Gemini compressor/limiter, UREI 565 filter set, outboard EQ.
Microphones: Neumann, Sennheiser, RCA, AKG, Shure, Beyer.

[24+] **WOODLAND SOUND STUDIOS**
 1011 Woodland St., Nashville, TN 37026
 (615) 227-5027
Owner: First National Entertainment Corp.
Studio Manager: Glenn Snoddy

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F E E D B A C K

Dear Mix:

As most everyone knows, The Plant has been subject to an extraordinary amount of publicity this past year due to the various ownership changes. I suppose it is always a notable occasion for the press when a studio with such a musically rich past makes significant changes, but it is also extremely important to note the correct credits and context of the facts involved with such changes.

In three years The Plant has seen four owners, most notably the Federal Government. In a nutshell I would like to say "So what?" I don't feel that that is really an earth-shattering piece of news. The truly marvelous and newsworthy thing that goes on at this studio is that it works, and works well in spite of these changes. Owners have come and gone, and yet The Plant continues to rank among the top studios of the world. Even as a newcomer to The Plant, it is apparent to me that The Plant has a unique energy that is created by its personnel and its relationship with its clients.

In my edited quotes, (Jan. '87 *Mix*) one might think that The Plant has fallen to the devices of inattentive owners. This is hardly the case. The Plant staff of dedicated engineers, technicians, and office staff have been solely responsible for The Plant not only remaining in the top leagues, but continuing an upward trend in providing clients with the best studio services available.

It is wonderful that after all the years and ownership changes that The Plant still has the greatest staff, and is "home" for so many great artists, producers, and engineers.

As far as changes, I think all studios have some kind of game plan for rebuilds and upgrades. So, of course, we have big plans for this year also. The result of these changes will provide our clients with even better services and offer a contribution to the growing popularity of the recording industry in the San Francisco Bay Area.

I guess what this owner is trying to say, is that being the new owner of a well respected studio may have some news merit, but please don't miss the point; the reason someone buys a working studio is because of its worth as a working entity. In my case, The Plant

represents a major mainstay in the recording studio world that I am proud to be part of. The Plant works because of the staff and clients who support it. If you need something great to write about, write about them. They are The Plant.

Sincerely yours,
Bob Skye, Owner
The Plant Recording Studios
Sausalito, California

Dear Mix:

Thank you for your positive exposure in the November issue of *Mix* magazine. On behalf of *The Search For Signs of Intelligent Life in the Universe*, we'd like to take this opportunity to express our pleasure at the recognition from the industry and also to clarify a few points highlighted in the article.

Although this was very much a collaborative effort and several people did significant work on the extensive sound used in the production, the original sound person was Debby Van Poucke, who technically developed many of the basic elements which were later incorporated into the Broadway design.

Both Jane Wagner and I take our hats off to the professionals who have worked so effectively with us, especially Van Poucke, Bruce Cameron and Otts Munderloh, to bring *The Search...* to life.

Sincerely,
Lily Tomlin
Producer

Dear Mix:

This letter is a request for a new audio product to meet a growing need in the area of sound recording.

I am interested in maximum fidelity, real time sound recording using minimal miking. At long last the forthcoming digital audio tape (R-DAT) recorder promises professional recording quality in an affordable and conveniently portable package. Hurrah for R-DAT! When mated with the best professional condenser mics and accessories, a complete recording system of studio quality will cost less than an unwieldy reel-to-reel machine of lesser sonic potential.

As soon as they are available here, I intend to purchase a portable R-DAT recorder. I have already purchased

three studio condenser mics, a telescoping tripod stand, and have fashioned a three-mic M-S mount. Please note that I am but one of thousands of audio enthusiasts who, for reasons of cost, have not participated in serious sound recording. Now, with the advent of R-DAT we are jumping in with both feet.

However, there is a compatibility problem and therefore a missing link in our recording systems: the connection between the mics and the recorder. Where pros use a recording mixer to combine several mic signals into two channels in real time or separately record them on a multi-track recorder for later mix-down, we "semi-pros" need only a simple but equally high-quality 3-mic preamp/blend interface. Let me describe this interface in some detail. It would:

1. Function as an elementary 3-mic stereo mixer with a *recording quality* signal path. Employ low-power electronics for minimal current drain. Have dual power supplies for 120VAC and 12VDC operation.

2. Accept three balanced low-impedance mic input signals, providing switchable phantom power to each.

3. Route mic-1's amplified signal directly to the left output channel, mic-3's directly to the right and provide a continuous pan control on the center mic's amplified signal, blending it in any ratio between the left and right output channels.

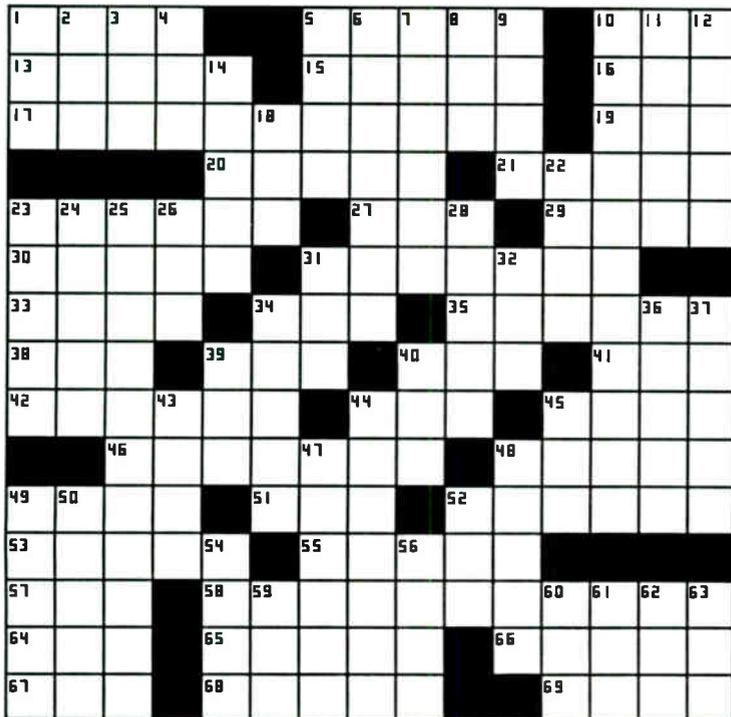
4. Provide two unbalanced RCA phono output connectors. The output circuit characteristics and impedance should be compatible with the line inputs on the best portable R-DAT decks.

This high-quality mic interface would also be welcomed by twin-mic recordists, for it resolves the universal incompatibility between professional mics and consumer tape deck inputs.

Sincerely,
Michael C. Bassell
Mount Airy, NC

CORRECTION: Two errors slipped into our January studio listing for Tarpan Studios. The owner is Narada Michael Walden, not "M. Walden" as printed, and Doc Shaffer is the studio's system engineer. We regret this error.

MIX WORDS



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ACROSS

1. Latin lesson word
5. Jumped connections
10. Old French coin
13. An acid
15. Ponti
16. Chaney
17. New audio standard
19. Yalie
20. Flux
21. Florida attraction
23. Stations
27. Season
29. Other, Sp.
30. Beth's kin
31. Studio

33. Latin catch-all
34. "___ Whiskey"
35. Embark
38. Varangians
39. Links locale
40. Swiss river
41. Pro
42. Whole
44. Another 1D
45. Pacific moslem tribe
46. Berg
48. Vocal harmonies
49. Post-nouveau style
51. ___ House, bluesman
52. Fate
53. ___ of its own
55. Germ
57. ___-Pierce

58. With 17A, a future technology
64. Compass pt.
65. Yaws
66. Duck down
67. QB concern
68. The way to a man's heart
69. Many

DOWN

1. Broadcaster
2. Pasture sound
3. Tone
4. Inside info
5. Rock concert units
6. Propagate waves
7. Shriveled
8. Urban railways
9. Brazilian river
10. Process for making 17A
11. Tint
12. Jonas Savimbe Org.
14. A la
18. Trig function
22. Wordsworth, e.g.
23. Tractor man
24. "Rocket Man" man
25. Does a step to make 17A
26. Power liquid
28. Girl's names
31. Yea
32. Comparative ending
34. Offshore obstructions
36. Piano-___
37. Another 22D
39. Numerical prefix
40. Vigoda
43. Relic
44. Make digital from analog
45. More, Sp.
47. Disaster opportunist
48. Composition
49. "___ Boy"
50. Adjust
52. Los Angeles station
54. Aria operator
56. Sky bear
59. Classical or natal
60. "___ There Was You"
61. Wedding vow
62. Experienced one
63. Hesitations

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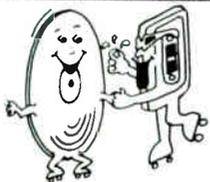
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- Studio Business Operations
- Northeast Studios Directory
- Programmable Signal Processors

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MARCH 7

MATERIALS DUE:

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- Concert Sound/Remote Recording Issue
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TRUTH: A lot of monitors "color" their sound. They don't deliver truly flat response. Their technology is full of compromises. Their components are from a variety of sources, and not designed to precisely integrate with each other.

CONSEQUENCES: Bad mixes. Re-mixes. Having to "trash" an entire session. Or worst of all, no mixes because clients simply don't come back.

TRUTH: JBL eliminates these consequences by achieving a new "truth" in sound: JBL's remarkable new 4400 Series. The design, size, and materials have been specifically tailored to each monitor's function. For example, the 2-way 4406 6" Monitor is ideally designed for console or close-in listening. While the 2-way 8" 4408 is ideal for broadcast applications. The 3-way 10" 4410 Monitor captures maximum spatial detail at greater listening distances. And the 3-way 12" 4412 Monitor is mounted with a tight-cluster arrangement for close-in monitoring.

CONSEQUENCES: "Universal" monitors, those not specifically designed for a precise application or environment, invariably compromise technology, with inferior sound the result.

TRUTH: JBL's 4400 Series Studio Monitors achieve a new "truth" in sound with

an extended high frequency response that remains effortlessly smooth through the critical 3,000 to 20,000 Hz range. And even extends beyond audibility to 27 kHz, reducing phase shift within the audible band for a more open and natural sound. The 4400 Series' incomparable high end clarity is the result of JBL's use of pure titanium for its unique ribbed-dome tweeter and diamond surround, capable of withstanding forces surpassing a phenomenal 1000 G's.

CONSEQUENCES: When pushed hard, most tweeters simply fail. Transient detail blurs, and the material itself deforms and breaks down. Other materials can't take the stress, and crack under pressure.

TRUTH: The Frequency Dividing Network in each 4400 Series monitor allows optimum transitions between drivers in both amplitude and phase. The precisely calibrated reference controls let you adjust for personal preferences, room variations, and specific equalization.

CONSEQUENCES: When the interaction between drivers is not carefully orchestrated, the results can be edgy, indistinctive, or simply "false" sound.

TRUTH: All 4400 Studio Monitors feature JBL's exclusive Symmetrical Field Geometry magnetic structure, which dramatically reduces second harmonic

distortion, and is key in producing the 4400's deep, powerful, clean bass.

CONSEQUENCES: Conventional magnetic structures utilize non-symmetrical magnetic fields, which add significantly to distortion due to a nonlinear pull on the voice coil.

TRUTH: 4400 Series monitors also feature special low diffraction grill frame designs, which reduce time delay distortion. Extra-large voice coils and ultra-rigid cast frames result in both mechanical and thermal stability under heavy professional use.

CONSEQUENCES: For reasons of economics, monitors will often use stamped rather than cast frames, resulting in both mechanical distortion and power compression.

TRUTH: The JBL 4400 Studio Monitor Series captures the full dynamic range, extended high frequency, and precise character of your sound as no other monitors in the business. Experience the 4400 Series Studio Monitors at your JBL dealer's today.

CONSEQUENCES: You'll never know the "truth" until you do.



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