

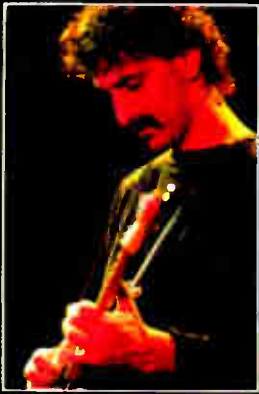
Producer David Kershenbaum • Improving TV Sound • David Lindley

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MIX

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A Primer**
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THE RECORDING INDUSTRY MAGAZINE



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Audio Post Consoles



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APRIL 1989

THE RECORDING INDUSTRY MAGAZINE

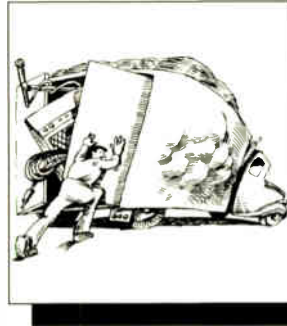
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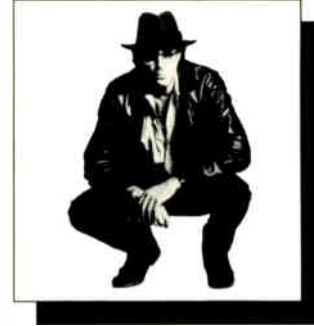
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FROM THE EDITOR

Founded 1977 by
David M. Schwartz and Penny Riker Jacob



Cover: Part of a 72,000-sq-ft. post-production complex located in Manhattan, Sound One's new Studio L recently accepted a 60-input Neve V Series console customized for film work. Owned by noted film mixer Lee Dichter, Sound One is the largest film post-production company on the East Coast, employing more than 100 people in its ten studios and 100 editing rooms. Photo: Ebet Roberts

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A few months ago we insert-

ed a lengthy questionnaire in many of the issues we sent out in order to get a sampling of your response to the editorial content of *Mix*. We wanted to see what sort of articles, columns and general areas of concentration we should work on in our attempt to bring you the best and most relevant reading material. At the moment we are compiling this information and using it to refine our editorial platform. We'd like to thank the thousands of you who took the time to give us your thoughts and observations. Your effort is not only greatly appreciated, but should bring you more of what you'd like to see in the coming issues.

One of these major changes shows up in this issue. The subject of live sound (formerly P.A., then sound reinforcement) has evolved considerably over recent years, and now enjoys a sophistication no less demanding than the world of the recording studio. Recognizing the many common aspects between live and recorded sound, as well as the frequently shared personnel in these two situations, we are increasing our coverage of live sound beginning with this issue. Our sound reinforcement editor, Mark Herman, will guide the way.

In addition to the expanded Sound Reinforcement News, our Live Sound section will look at new products for live sound engineers. Another new column, called Troubleshooting, will survey leading sound engineers and industry professionals for their solutions to common problems and demanding situations. Expect to see more features in this field covering both the technology and the people behind today's live sound applications.

• • •

For those of you wondering what's next for *HyperMedia*, we are happy to announce that beginning next month *HyperMedia* is becoming a monthly newsletter, tracking the hard news and critical information of the developing industry of interactive multimedia production. If the future of media production is of interest to you, we urge you to write for a free sample issue. We think you'll find this approach to the new industry to be a real eye-opener and a concentrated way to stay up on the latest developments.

Keep Reading,

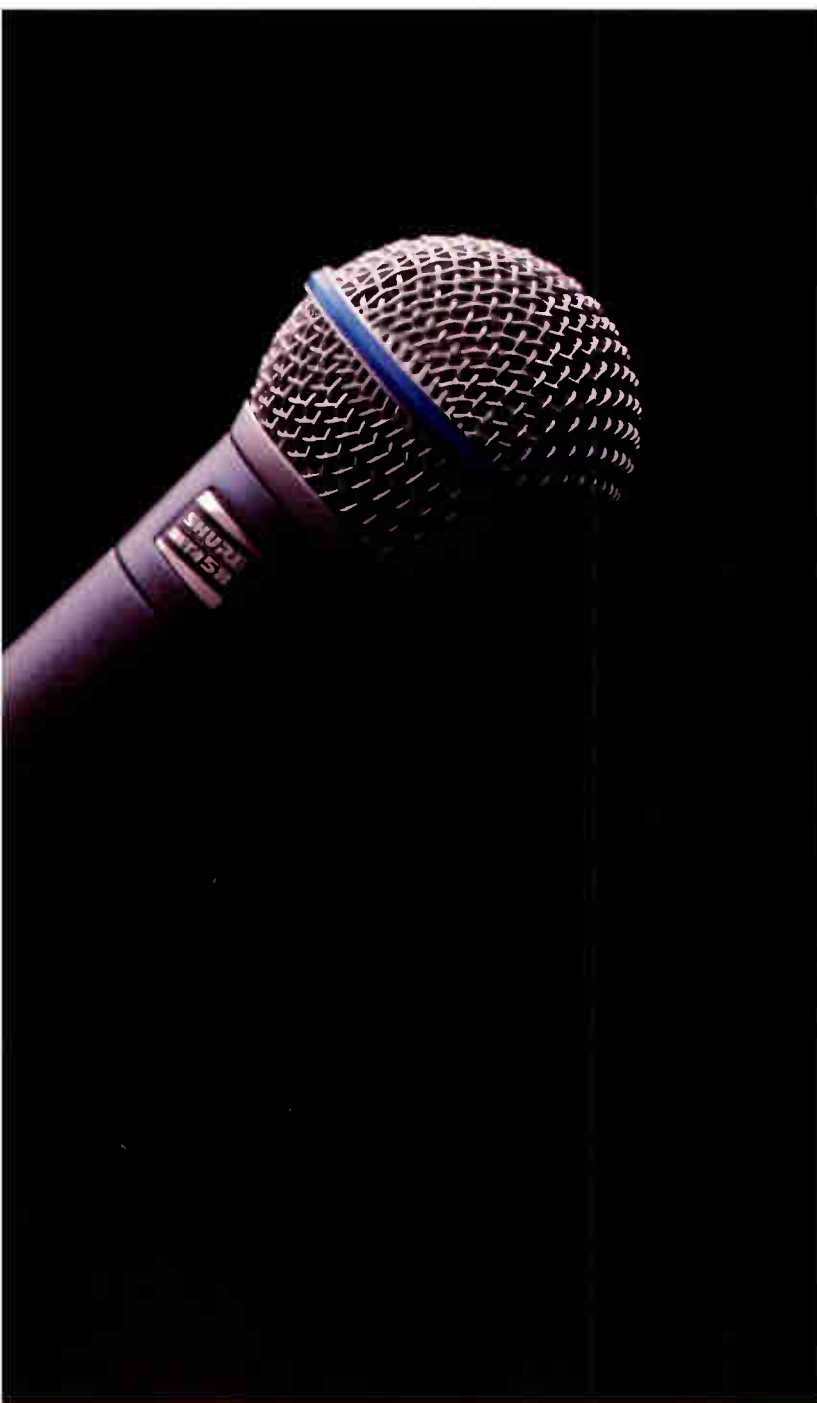
A handwritten signature in black ink, appearing to read 'David M. Schwartz', written over a white background.

David M. Schwartz
Editor-in-Chief

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CURRENT

NAB GATHERS IN LAS VEGAS

The National Association of Broadcasters will gather in Las Vegas April 29 to May 2 for their 67th annual convention, which includes the 43rd Annual Broadcast Engineering Conference. This year's theme, "On the Air: Proud Tradition—Dynamic Future," emphasizes broadcasting's historic breakthroughs while anticipating future technologies.

The conference will offer 21 sessions and workshops, with presentation of more than 100 technical papers. An expanded Government Relations session will include information on taxes, competition, and campaigns and elections. Advanced television broadcast systems have been invited for the second straight year. And, radio broadcasters will have an opportunity to choose from an additional 40 sessions.

As part of the weekend festivities, Sid Caesar and Ernie Kovacs have been named television recipients of NAB's Broadcasting Hall of Fame Award and will be inducted during the television luncheon. Radio recipients Red Barber and Nathan Safir will be inducted separately.

More than 400,000 square feet of floor space has been reserved for exhibitors, making this the largest ever NAB Convention. For more information, contact Susan Kraus or Walt Wurfel at (202) 429-5350.

AES INTERNATIONAL COMING TO TORONTO

The Audio Engineering Society will hold its seventh International Conference in Toronto May 14-17 at the Royal York Hotel. The conference is devoted entirely to digital audio, as reflected by its theme, "Audio in Digital Times." Ken Pohlmann, director of Music Engineering at the University of Miami and a *Mix* columnist, will chair the conference.

The program begins on Sunday afternoon with a digital audio tutorial by AES president Stanley Lipshitz, and it concludes Wednesday with a session on digital audio in film, cable and broadcasting. Special attention will be paid to digital signal processors, including meetings on DSP theory and applications, architecture and music applications.

The advance attendance fee is \$350 (\$450 for nonmembers). An advance student member rate of \$140 (\$190 for nonmembers) is available. For more information, contact AES at (212) 661-2355, or FAX (212) 682-0477.

PRO AUDIO ASIA '89

Manufacturers, buyers, importers, distributors, dealers, broadcasters, engineers and the like will descend on Hong Kong July 6-8 for Pro Audio Asia '89, the first trade show of its kind in the Far East.

Organized by Business & Industrial Trade Fairs Ltd., the show will be held in the Hong Kong Convention and Exhibition Centre. For more information, contact B&I at: 4/F China Underwriters Centre, 88 Gloucester Rd., Wanchai, Hong Kong; tel. 5-756333, FAX 5-8915347.

HDTV 1125/60 GAINS SUPPORT

Thirty-two U.S. companies, all members or advisors to the HDTV 1125/60 Group, sent a policy recommendation to the House Telecommunications Subcommittee in support of the SMPTE 240M 1125/60 production standard. The recommendation urges support of the transmission standard domestically and internationally.

Comments by participating companies included: application of the 1125/60 production technology does not impede U.S. development of HDTV equipment; the standard

is designed to serve a variety of HDTV production needs in a number of industries, including aerospace, medical, defense and printing; and production standards relating to capturing images in the studio or in the field must be considered separately from transmission and display issues.

For more information on the status of the HDTV 1125/60 Group, contact Alec Shapiro at (212) 686-9000.

KEITH WORSLEY REMEMBERED

The professional audio industry lost one of its most beloved figures January 26 when Keith Worsley passed away after a six-month bout with lung cancer. He was 52 years old.

Born in 1937 in Manchester, England, Worsley served in the Royal Navy before becoming involved in medical electronics at Glasgow University. In 1965 Keith, his wife, Wendy, and their three sons moved to Vancouver, BC, where he began work for IBM and Commercial Electronics, designing sound systems for the Vancouver Planetarium and Little Mountain Sound.

In 1976 Worsley moved to San Francisco to continue sound system design work and found his own company, Keith Worsley Audio Design. He became national sales manager for Lexicon in 1978, then moved to Klark-Teknik in 1984, where he helped establish the DN780 and later introduced DDA consoles.

A cornerstone of industry conventions and audio events, Worsley will be greatly missed by his family and many friends. A fund is currently being set up to assist the family with the staggering medical bills associated with the illness. Watch these pages for more information. Fare thee well, Keith. ■

In an age of disk and digital, why buy analog?

We know there are some applications where our 32-channel digital machine, the DTR-900, is the only answer. But if your business is such that you can do anything you want to do in the analog domain, and at the same time do less damage to your budget, then our brand new analog 24-channel MTR-100A may be the perfect machine for you.

When you consider that the MTR-100 will literally *change forever* the way engineers interface with audio machines, and

transport is pinchrollerless to give you the legendary tape handling ballistics of our MTR-90.

What's more, with its optional EC-103 chase synchronizer, the MTR-100 maintains frame-lock in forward and reverse from 0.2X to 2.5X play speed, and will typically park with zero frame error.

Then, there's the sound. New cylindrical-contour heads built by Otari especially for the MTR-100 result in remarkably low crosstalk and outstanding low-frequency performance. Pre-amps are located directly beneath the heads to further improve frequency response, and HX-Pro* is built-in for enhanced high frequency headroom. (An optional internal noise reduction package houses Dolby* SR/A.) Add all these features to gapless, seamless, punch-in, punch-out, which is also built-in, and your

MTR-100's sonic performance will rival, or beat any digital machine in the world.

So there you have it. With these powerful benefits available in analog, does it make sense to go digital? Sure, for some applications. But analyze your needs carefully before you buy. For many applications, a hot

analog tape machine like the MTR-100 is the right choice.

And because we can see both sides of the question, put us to work. We have information that can help you make the right decision. Call (800) 338-6077 x 101 to speak to your Otari representative.



Reel motors that approach one horsepower are driven by pulse width modulation amplifiers to tape speeds up to 474 ips.



The MTR-100's auto-alignment saves you hours of time by eliminating constant tweaking and re-tweaking between sessions.

that this new way will save you hours spent in non-productive time, the analog choice begins to make even more sense. You see, the MTR-100 features full Auto-Alignment that allows total recalibration of the record and reproduce electronics. This means you can compensate for different tapes in a *fraction* of the time that it previously took, and your studio is not bogged down with constant tweaking and re-tweaking between sessions.

And if you think digital machines have a corner on high performance transports, think again! The MTR-100's new transport incorporates reel motors that approach one horsepower—you'll get fast wind speeds of up to 474 inches per second! Of course, the

OTARI®



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INDUSTRY NOTES

Osamu Tamura has been named vice president of **Sony Professional Audio Division** in Teaneck, NJ. . . **DOD Electronics** president and CEO, **John Johnson**, and investors **Charles Chewing**, **Tom Henderson** and **Robert Henderson** have bought out former partner **David O. DiFrancesco**, assuming full ownership of the company. . . **CompuSonics Corporation** of Palo Alto, CA, has moved away from manufacturing desktop digital audio disk recorder editors into the licensing and contract engineering R&D business. . . **Kevin Dauphinee** has joined **Ampeg Corporation** as senior product manager of betacam products. . . **Agfa Corporation** has a new organizational structure consisting of three divisions: Agfa Compugraphic, Agfa Matrix and Agfa Photo. . . **Agfa-Gevaert AG** of West Germany has legally blocked the manufacture and sale of certain stackable winding cores in the U.S. and West Germany by **Sunkyong International**. . . **Finial Technology** announced it will not market the laser Turntable™ planned for introduction in January 1989, due to high production costs. Finial is considering other companies interested in licensing the technology. . . **Orban Associates** announced the appointment of **David Roubush** to the position of marketing and sales manager for Orban's Professional Products. . . Due to a 40% increase in sales last year, **QSC Audio Products** has expanded and renovated portions of its manufacturing facility in Costa Mesa, CA. The company has also named North Carolina-based **Applied Audio Marketing** as its Representative of the Year for 1988. . . **Sam Ash Music** announced the formation of a new division, **Sam Ash Professional**, dedicated to serving studio, production, religious and educational clientele. . . The application deadline for **Master Class in Music Recording** with **Bruce Swedien** has been extended. Call UCLA Extension at (213)

825-9064. . . The **Northwest Area Music Association** will hold the **NAMA Music Business Conference '89** April 21-23 at the Washington State Convention and Trade Center. For info, call NAMA at (206) 329-8875. . . **Barbara A. Koalkin** has been appointed director of marketing at **Digital F/X** in Mountain View, CA. Formerly product marketing manager at Apple Computer, Koalkin was responsible for introduction of the Macintosh and LaserWriter product lines. . . **Lou Dollenger** was appointed director of marketing at the audiophile CD label **Digital Music Products Inc.**, Stamford, CT. . . **Orion Research, Inc.**, Cleveland-based manufacturer of software-based audio consoles for television, has appointed **George Stage** director of engineering. . . Upstate New York's **Camp Impala** announced the formation of its new "MIDI Camp." Kids, ages 10 through 17, will get hands-on experience with Korg M1 music workstations and other MIDI equipment, as well as softball, horseback riding, swimming and more. Call (212) 966-1439 (days) or (718) 967-0826 (evenings) for details. . . **Jack Hollis** has been named district sales manager for **Altec Lansing's** Southeast region. . . **Martin America**, the U.S. distributor for **Martin Audio Products** of London, announced the appointment of **Linda Frank** as general manager. Also, the company has relocated to larger facilities at: 21000 Devonshire St., Ste. 206, Chatsworth, CA 91311; (818) 718-1031, FAX: (818) 718-2886. . . **Video Expo Los Angeles** will be held June 13-15 at the Los Angeles Convention Center. For more information, call (800) 248-KIPI (in NY [914] 328-9157). . . **Amek/TAC U.S.** announced the appointment of **Westlake Audio Inc.** as its Southern California dealer for the range of Amek equipment. . . **Electro-Voice Inc.'s** professional audio division in Canada has changed its name from Gulton Industries to **Mark IV Audio Canada Inc.** ■

S T A F F

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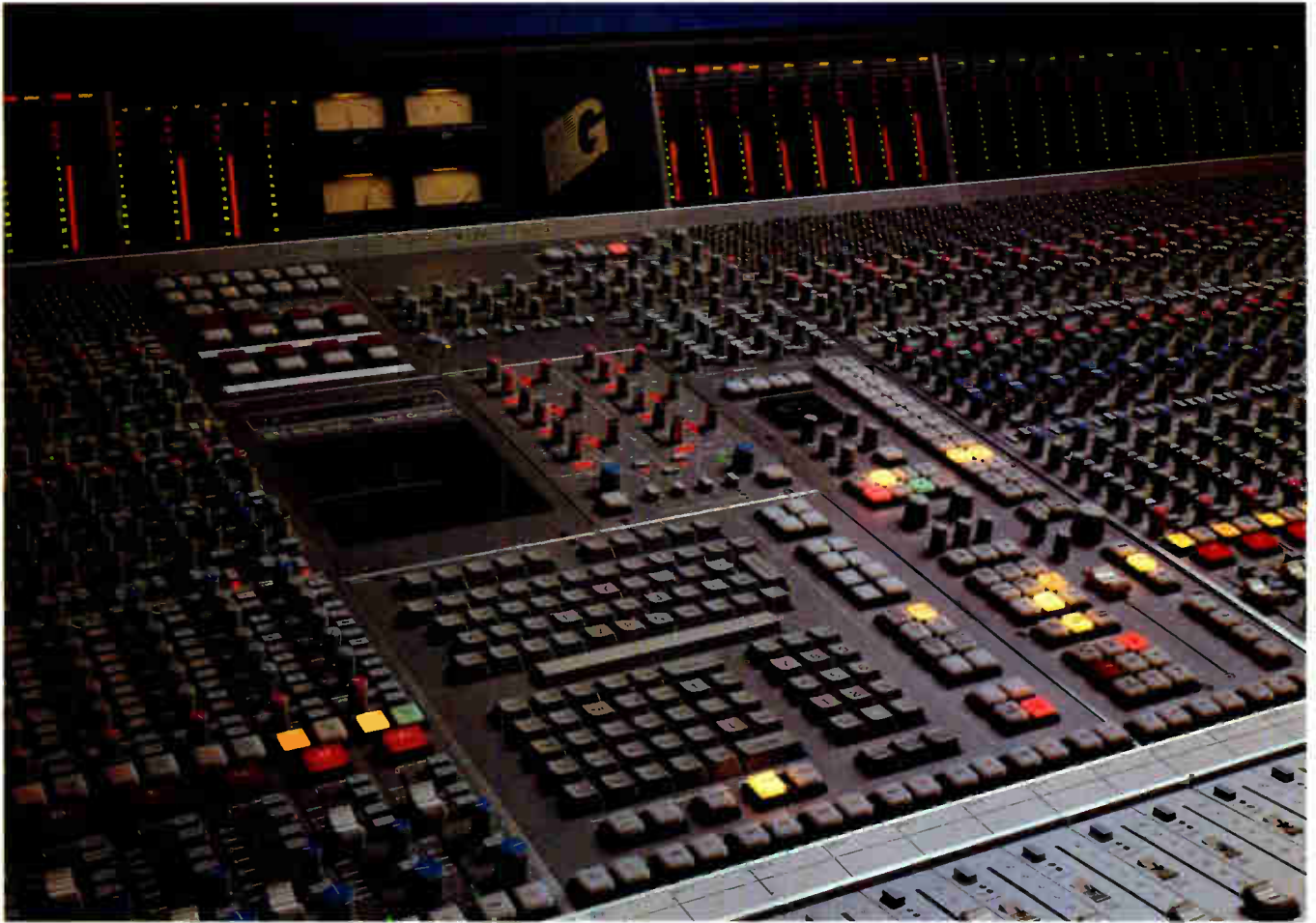
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SESSIONS AND STUDIO NEWS

NORTHEAST

Producer/engineer **Rick Rowe** mixed *Super Bowl XXIII's* halftime extravaganza at **Baby Monster Studios** in Manhattan. On hand were conductor/arranger **Don Pippin** and vocal arranger **Brian Louisella**. (Were they sporting 3-D glasses?)... **Walter Salas-Humara** was working on his second solo album with the help of **Bair Tracks** of NY. Tracks were recorded live at the Rodeo Bar in Manhattan, and the LP is scheduled for release this spring... **Eddie Murphy** took a break from the film and comedy circuit to record his second "musical" album at **Right Track Recording** in NY. **David Jones** produced the month-long project, with **Eddie Garcia** engineering and **Jeff Abikzer** assisting... **Media-sound** in NYC announced that **Tesla** has completed mixing their latest release for Geffen Records, with **Michael Barbiero** and **Steve Thompson** producing and **Victor Deyglio** assisting... **Bob Franke** completed his new album for Flying Fish Records at **Selcer Sound** in Brighton, MA. **Darlene Wilson** engineered and produced the project... **Acme Recording Studios** of Mamoroneck, NY, reports that engineer **Peter Denenberg** has been busy working on projects with **Eastern Bloc**, **Kati Mac** and Atlantic artists **Dirty Looks**... **Benny Golson** was transporting three of Mozart's *Brandenburg Concertos* into the jazz world in a project at **The Edison** studio in Manhattan. The Edison's **Gary Chester** engineered the sessions, which involved a 25-piece orchestra and vocal quartet... Producer **Lucy Simon** was at **Sound on Sound Recording** in NYC overdubbing and mixing live tracks from the *Judy Collins Homecoming* show, taped in Aspen. The upcoming album features two duets with Collins and **Kris Kristofferson**. **Bryce Goggin** assisted engineer **Al Silverman** on the project... **Sountec Studios** in East Norwalk, CT, reports that vocalist **James Mee** completed a seven-day recording marathon

there, with **Terry Cashman** and **Michael Mugrage** producing and **Ron Bach** at the controls. The five-song demo, recorded for Metrostar Productions, has already sparked label interest... The West Chester, PA, band **Life After Elvis** completed a six-song CD project at **Iris Sound**. Titled *Beyond Education*, the project was engineered by **Kenny Homer** and produced by **David Ivory** and the band... Singer/songwriter **Roberta Lawrence** was at **Newfound Sound** in Fairlawn, NJ, recording and producing her current album project, with **Bob Montero** engineering. Atlantic Records artist **Hiram Bullock** lent his guitar and singing talents to one of the cuts, a duet co-written by Lawrence... **I.N.S. Recording** in NYC saw Urban Rock Records artists **The Dismasters** finishing up the title track for their album *Black & Proud*. The cut was produced by **Chuck Chillout** and **Raven T.**, with **Gary Clugston** engineering... Philly's **The Hooters** were at **Studio 4 Recording** putting together their third album for CBS, with producer **Rick Chertoff** and engineers **Phil Nicolo** and **John Agnello**... **Roy Ayers** was hard at work at **Evergreen Recording** in Manhattan recording material for his next LP, with **Hahn Rowe** and **Lamont Moreno** engineering... **Omega Recording Studios** in Rockville, MD, supplied prerecorded services for the 1989 Inaugural Gala aired nationally on CBS. Engineer **Doug Rider** and musical director **Peter Mats** recorded the two-hour show using a 40-piece orchestra and many stars, including **Nell Carter**... Engineer/producer **Tom Lazarus** and assistant **Sue Gibbons** recorded works for piano and three toy pianos for client **John Cage** at **Sunset Productions** in NYC... Producer/artist **Mtume** was at **EARS** in East Orange, NJ, tracking and overdubbing his forthcoming LP for CBS, with **Phil Fields** programming, **Craig White** engineering and **Dani Salt** assisting... **Crystal Sound Recording** in NYC reports that producer **Reggie Segers** was in working

on a charity project called "Homeless, Not Helpless," with **Larry Buksbaum** engineering... CBS heavy metal band **Riot** was at **Greene Street Recording** in New York City working on their new LP with **Steve Loeb** and **Rod Hui** producing. **Nick Sansano** was at the board with assistance from **Dave Swanson** and **Chris Shaw**... **Presence Studios** in East Haven, CT, reports that **Eric Dixon** was in recording for EMI Manhattan Records, with **Rahni Song** producing and **Joe Carrano** at the console... Tommy Boy Records artist **De La Soul** returned to **Island Media Services** in West Babylon, NY, with producer **Prince** to remix three singles for their upcoming album. **Al Watts** engineered the sessions... NYC rapper **LL Cool J** was at **Chung King House of Metal** finishing up his double album for Def Jam Records, which he is co-producing with **Dwayne Simon** and **Steve Ett**. Ett also engineered with help from **Kevin Reynolds**...

SOUTHEAST

Dee Dee Wilde recently completed her debut album for Island Records at **MIDI Land Recording Studio** in Miami. **Eugene Wilde** produced, and **Wayne "Hollywood" Ricker** and **Al Albertini** engineered... Producer/engineer **David Norman** was at **Mr. O Audio Studio** in Columbus, GA, helping **Madamoiselle Chose** on a demo project... **Soundtrax Recording** in Johnson City, TN, reports that **Brockwell Farr** was in recording, with **Rick Monday** at the console... **The AlterNatives** were at **Flood Zone Studios**, Richmond, VA, completing work on their latest self-produced LP for SST Records, with **Adam Green** at the faders... **Sound Emporium** in Nashville has been keeping busy with Warner Bros. artists the **Forester Sisters** recording tracks for a new album, with **Wendy Waldman** producing and **Dennis Ritchie** engineering.

Also at Sound Emporium was country singer **Kathy Mattea** recording overdubs for PolyGram, with **Allen Reynolds** producing and **Mark Miller** engineering. . . Arista recording artist **Geoffrey McBride** was at Atlanta's **Master Sound Studios** completing his first solo album. **Sam Knox** produced, with assistance from **Dave Pensado** and engineer **Ron Cristopher** . . . **Joan Morrison** brought her band, **Motion**, into **Reflection Sound Studios** in Charlotte, NC, to record and mix an EP for Elite Records, with **Steve Bass** producing and **Mark Williams** engineering. . . **Yvette** and **Rene Barge** of Music a la Carte wrote and produced the music for Florida Power & Light's Hispanic publicity campaign entitled "Energia Con Sabiduria." The spot was recorded at **New River Studios** in Ft. Lauderdale, with **Dave Barton** engineering and **Jim Thomas** assisting. . .

NORTH CENTRAL

Adrian Belew was at **Royal Recorders**, Lake Geneva, WI, putting the finishing touches on his latest solo album for Atlantic Records, with **Rich Denhart** engineering and **Dan Harjung** assisting. . . SST Records artists **Tar Babies** will be in Chicago's **DKP Studios** working on their

third album, tentatively titled *Honey Bubble*. **DKP's Steve Gassen** will produce the project. . . **Vonda Shepard** was at **Metro Studios** in Minneapolis to cut "What Do the Other Girls Do?" for her Warner Bros. debut album, with **Ricky Peterson** producing and Metro co-owner **Tom Tucker, Sr.** engineering. . . **Ken Wilson's** gospel group was at the **Disc Ltd.** in East Detroit cutting tracks for their upcoming album, with **Greg Reilly** engineering. . . **Lisa Michael**, assisted by **Paul Pollard**, was at **The Recording Workshop** in Chillicothe, OH, engineering **Southpoint's** new single, "Runaway" . . .

SOUTHWEST

Eliza Gilkyson was in Austin, TX, at **Congress House Studios** working with producer **Mark Hallman** on her new album for Goldcastle/Capitol Records. Also in on the project were **Mark Andes** (Heart), **Tommy Taylor** and **Robert McEntee**, with **James Tuttle** engineering. **McEntee** was also working on his first solo LP at Congress House. . . Oklahoma City's **Studio Seven** recently completed album projects by Grammy Award winners **Sherman Andrus** and **Jody Miller**, both for Amethyst Records. . . **Fire Station Studios** in

San Marcos, TX, recorded several albums scheduled for this year, including projects by **Lou Ann Barton** and **Doug Sahm** (both on Antones Records), **Bang Tango** (MCA/Mechanic), the **Slammin' Watusis** (Epic) and **Syd Straw** (Virgin). **Fire Station** has also formed a production company, **Silverstar Music**, to cut and shop local artists. Country artist **John Legg** and hard rockers **Prezence** were the first two signings. . . Austin's **Reelsound Recording** recently played host to several artists including **Amy Grant**, **Jimmie Rogers** and **Jerry Jeff Walker**. . . **Jimmie Fadden** of the **Nitty Gritty Dirt Band** was at **Nomountain Recording** in Midland, TX, laying down drum tracks for the new **Shake Russell** album. **Nick Carlton** produced and engineered. . . In other Austin action, **Asleep at the Wheel** and **Tex Thomas and the Danglin' Wranglers** were in at **Arlyn Studios**. . . **Chastity** was in at **Planet Dallas** working with engineer **Rick Rooney**. **Rooney** was keeping busy there with other projects by Dallas bands **Shock Tu** and **Intimate Acts** . . .

NORTHWEST

Recent dates at **Alameda Digital Recording**, Alameda, CA, included jazz fusion artist **Muziki Roberson** cutting tracks for his *Poetic Justice* CD, with **J.J. Jenkins** and **George Petersen** producing and engineering. . . **Holiday of Hands** has been mixing at **Different Fur Recording** in San Francisco, with **Corrado Rustici** producing, **Gordon Lyon** engineering and **Mary Ann Zahorsky** assisting. . . Also in San Francisco, producer/engineer **Steve Brown** (The Cult, Wham!, ABC) has started his latest project, the third **Balaam and the Angel** LP for Virgin Records, at **Alpha & Omega Studios**. . . **Prairie Sun Recording**, Cotati, CA, completed a joint project with **Mobile Fidelity Sound Labs** and **The Igor Brill Quartet**. **Krieg Wunderlich** and **Tori Swenson** of **Mobile Fidelity** produced and engineered **Prairie Sun's** first multitrack digital mix-down, which will be released on CD and tape this spring. . . San Francisco band the **Movie Stars** finished up their debut album at **Mesa Recording** in Sebastopol. **Norman Kerner** doubled as producer and engineer, with **Lynn Levy** assisting. . . **Ruff 'n Tumble** were rockin' **Studio D** in Sausalito, CA. **Rick Sanchez** engineered and **Scott Tatter** assisted. . . **Windham Hill** recording artist **Art Lande** was at **Avalanche Recording** in Denver cutting tracks for a **Rabbit Ears Production** children's album and video. **Cookie Ma-**

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renco produced, **George Counnas** engineered and **Chuck Edwards** assisted... **Wayne Jackson** of the **Memphis Horns** and **Robert Cray** were at **Spectrum's Studio A** in Portland, OR, to record overdubs for the next Horns album. Spectrum's **Jim Rogers** engineered with **Rob Perkins** assisting... Vancouver, BC, band **54.40** was back at **Mushroom Studios** working on their third album for Warner Bros., with co-producers **Dave "The Rave" Ogilvie** and **Neil Osborne**, engineer **Greg Reely** and assistant **Anthony Valcic**... **Ironwood Studio** in Seattle reports that engineer **Jay Follette** was busy working on a reunion project with San Francisco rock group **Moby Grape**... At **Music Annex** in Menlo Park, CA, **Gary Lamb** was recording his next album for the Petrale Soul label. **Russel Bond** engineered and co-produced... *Swass*, the latest LP by Seattle rap artist **Sir Mix Alot**, has gone gold. The album was mixed at **Steve Lawson Productions** by engineers **Terry Date**, **Brett Eliason** and **Randy Yount**... **Poolside Studios**, an audio-for-video post-production house in San Francisco, completed preparations on the soundtrack for *Kamillions*. Supervising sound editor was **Mitchell Stein**, with engineer **David E. Nelson**, sound designer **Donny Blank** (of Blank Software) and assistant **Kim Cascone**... **Starlight Sound** in Richmond, CA, was busy with producers **Denzil Foster** and **Thomas McElroy** tracking their album *F.M.* for Atlantic Records. Guest artists scheduled to appear included **Grover Washington Jr.** and **Michael Cooper**. **Ken Kessie** and **Steve Counter** were engineering, with **Ron Rigler** assisting...

SOUTHERN CALIFORNIA

Slash recording artists **The BoDeans** were overdubbing at **Aire L.A. Studios** in Glendale, with **Jim Scott** doing double duty as engineer and producer. **Gregg Barrett** assisted... Engineers **James Mansfield** and **Rich Andrews** were at **3rd Wave Recording** in Torrance working on the second album for Cruz recording artists **Chemical People**... **Madonna** was at **Smoketree Studios** in Chatsworth, with producer **Pat Leonard** mixing her new LP for Warner Bros. **Bill Bottrell** engineered and **Robert Salcedo** assisted... Engineer **Mike Schlesinger** cut some hot rap tracks at Hollywood's **Paramount Studios** for Arista artist **Bobcat's** debut album... German act **Pan Dance**

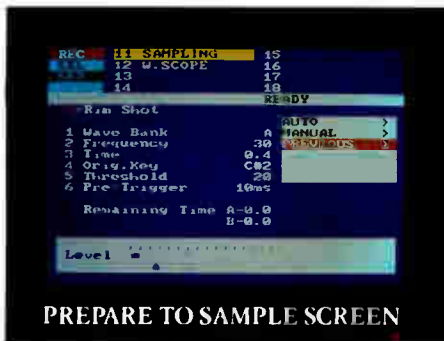
was at **The Enterprise** in Burbank mixing their upcoming BMG release. **Richard James Burgess** produced and engineered, with **Martin Horenberg** assisting... **Sound Image Studio** in North Hollywood reports that artist/songwriter **Randy Cantor** was in working on new material for Geffen Music with engineer **John Henning**... At **Chameleon Recording Studio** in San Fernando, **Silent Rage** was recording a debut album for Simmons Records, with vet rocker **Gene Simmons** producing and **Mikey Davis** engineering. **Jane McCord** assisted... **Dave Stewart** (Eurythmics) and **Jeffrey Osborne** were at **Secret Sound L.A.** mixing and overdubbing a track for an upcoming New Visions film, *Rooftops*. A film crew was on hand to shoot the sessions for *Entertainment Tonight*. **John Hegedes** engineered with assistance from **Daren Chadwick**... Geffen's new band **Blue Murder** was at **Soundcastle** in L.A. mixing their debut album, with **Mike Fraser** engineering, **Bob Rock** producing and **Jim Champagne** assisting... **Madame X** and producer **Bernadette Cooper** were mixing a new LP for Atlantic Records at **Westlake Audio** in L.A. **Jared Held**, **Peter Arata** and **Gerry Brown** were at the board, with assistance from **Darryl Dobson**... **Le Mobile's Guy Charbonneau** was back in North Hollywood mixing live tracks of **Pat Benatar's** recent tour for **Westwood One**... **Stevie Nicks** was in at **Lion Share Recording Studios** in L.A. mixing a new album, with **Steve Taylor** and **Ray Pyle** engineering and **Rupert Hine** producing... **Gerry Brown** was in at L.A.'s **Skip Saylor Recording** handling post-production on **Sharon Bryant's** debut single for Wing/PolyGram. **Pat MacDougall** assisted... **Larrabee Studios**, also in L.A., reports that the first single from **Jody Watley's** new album, *Real Love*, produced by **Andre Cymone**, was being mixed by **Louil Silas Jr.** and engineered by **David Bianco**, with **Andy Batwinas** assisting... Composer **Rick Baitz** was in at **Genetic Music** in North Hollywood recording his score for the world premiere of Dutch landscape, by award-winning playwright **Jon Robin Baitz**. **Richard Rosing** engineered and mixed the project...

STUDIO NEWS

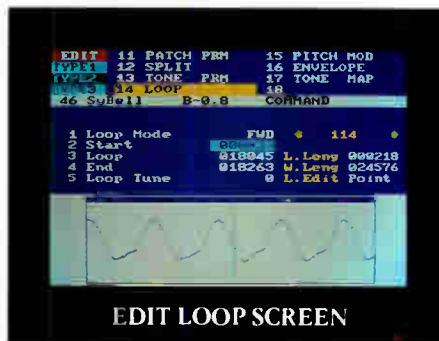
Color Zone Productions in Novato, CA, recently purchased a 44-channel Soundcraft 6000 console with full Twister Automation from Audio Images in San Francisco. The console will be used for mixdown

and mastering... In other Soundcraft purchases, **Good News Broadcasting** in Lincoln, NE, picked up a 16-channel Soundcraft 200 SEQ to be used for broadcast production purposes, and **Moorehead State University** in Moorehead, MN, added a 24-channel Soundcraft 600 console for mastering and mixdown... **Salty Dog Recording** in Van Nuys, CA, has completed construction of **Realtime Studios**, a Fairlight-based pre-production and scoring room... Owners of **Aire L.A. Studios** announced that they have closed escrow with Yamaha International, and now have three working rooms. They've added an SSL 4064G board to Studio A, an SSL 4048E to the pre-production room and Studio B utilizes a custom Neve 8038... **Mix-o-lydian Studios** in Boonton, NJ, recently added a Studer D820X DASH digital mastering recorder. The purchase coincides with a major CD mastering project for a major publisher that will entail assembling and remixing over 2,000 songs onto 60 CDs, and should take two months to complete... London's **Swanyard Recording Studios Ltd.** completed plans for a 40,000-sq.ft. studio complex in the Tribeca area of Manhattan. **Harris Grant Associates** designed the eight-story structure, with acoustic design by **Neil Grant**. The building will house studio, health and leisure, residential and office facilities, including U.S. offices for Swanyard's Publishing and Management companies... Atlanta's **Soundscape Studios** recently added a Studer A820 24-track and Nakamichi MR-1 cassette deck, as well as an old standby Hammond B-3 and Leslie... Also in Atlanta, **New Age Sight & Sound** will be installing a 64-input Neve V Series console with Flying Faders automation... **Mangum/Alford Recording Studio** in Jacksonville, FL, has upgraded its facilities to include a D&R 8000 Series 32 x 24 console... **Unitel-Hollywood** recently received delivery of a Quantel Harry and Harry Encore HUD system. The company will use the system along with its Paint Box to perform high-quality, real-time effects for entertainment, commercial and corporate projects, including graphics for the ABC TV show *thirtysomething* and Nintendo and Mazda commercials... **Producers Color Service** in Southfield, MI, also added the Quantel Harry, to be used in conjunction with two new digital tape machines... In Los Angeles, the folks at **Larrabee Sound** are celebrating delivery of a new 72-input SSL G Series console for Studio A... **Spectrum Sound Studios** in Portland, OR, acquired its first digital audio workstation, the ADAP-One ■

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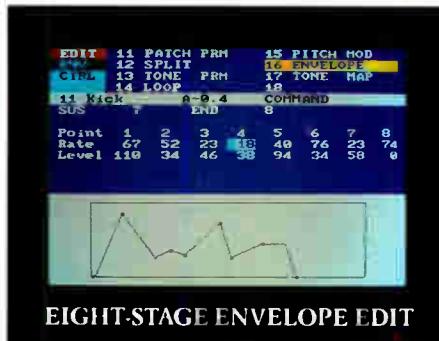
EDIT LOOP SCREEN



MULTI-TIMBRAL PLAY SCREEN



VELOCITY CURVE FOR ENVELOPE



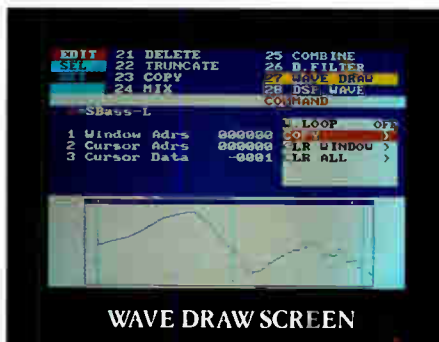
EIGHT-STAGE ENVELOPE EDIT



TONE MAP GROUP EDIT



WAVE BANK DISPLAY



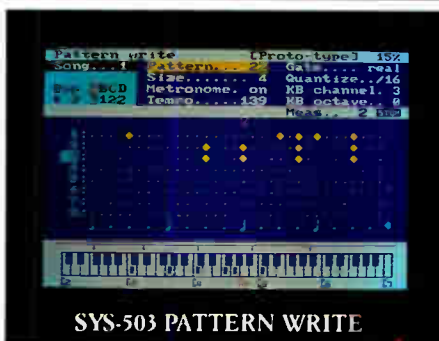
WAVE DRAW SCREEN



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The S-550 provides all of the S-50's performance with the addition of a 1.5M Byte memory (for up to 64 tone memories and 16 patch memory banks), and expands upon the S-50 by providing eight polyphonic voice outputs.

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When it comes to user interface, Roland Samplers are simply unrivalled. Both the S-50 and S-550 allow the connection of a video monitor to greatly facilitate sampling process and use such new features as Wave Draw. The S-550 even allows the flexibility of mouse-style input by connecting the new DT-100 Digitizing Tablet. This kind of interface makes the experience of sampling sounds as fun as it is productive.

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The new 2.0 Software Update (available to all owners for a small handling charge) can now add in loads of new features — including twice as many tones, Automatic Loop Search, combined Wave Data, Polyphonic Multi-timbral performance, and much more. Not just new sounds, entirely new performance. Another new software program — the SYS-503 Director-S — can turn the S-50 or S-550 into a sixteen-channel MIDI sequencer, playing its own sounds as well as those of other MIDI instruments.

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by Ken C. Pohlmann

DAT MACHINES

PART 4

In last month's DAT installment we examined the tape track and data format recorded to tape. As we observed, some of this high technology's highest technology is aligned along those diagonal tracks; the ATF system, for example, is a nifty bit of engineering designed to keep the head and the tape working together. This month, let's examine two more esoteric aspects of DAT, crucial to its successful operation: modulation and—fasten your seatbelts—error correction. Fortunately, DAT borrows considerably from the CD's design in both these areas.

The modulation scheme must meet a variety of criteria. It must eliminate

word is converted to a 10-bit word, as shown in Fig. 1. Azimuth recording relies on cancellation of crosstalk, but this effect is minimal at low frequencies. Thus, the 8/10 modulation must eliminate DC components and seek to minimize its own low-frequency content. The ideal 8/10 code word would have the same number of zeros and ones; for example, the word 1101010010 has no net DC component. A digital sum value (DSV) can be used to keep track of DC components. Simply put, the DSV tallies the number of ones by adding a +1 to its count, and the number of zeros by adding a -1 to its count. Thus the DSV for the above word is 0. However, there is an insufficient number of such 10-bit words to

8-bit	10-bit	DSV	alternate	DSV
00010000	1101010010	0		
00010001	0100010010	2	1100010010	-2
00010010	0101010010	0		
00010011	0101110010	0		
00010100	1101110001	2	0101110001	-2
00010101	1101110011	2	0101110011	-2
00010110	1101110110	2	0101110110	-2
00010111	1101110010	0		

FIGURE 1: 8-bit to 10-bit word conversion.

direct-current components and provide efficient operation in an azimuth recording system. Since erasure is optimized for short wavelengths, overwriting is facilitated by recording with a small ratio between the shortest and longest wavelengths. Finally, the modulation scheme must maximize linear data density.

For these reasons, an 8/10 channel code is used. In this code, an 8-bit

represent the 256 states needed to encode the 8-bit input. This is aggravated by the need to limit the number of consecutive ones or zeros to minimize peak shift and maximize overwrite. Specifically, no more than three zeros are allowed between ones.

Given these constraints, there are 153 allowable 10-bit code words. Patterns with a non-zero DSV are used for the other 103 code words. Two

patterns are defined for each of these words, one with a +2 DSV and one with a -2 DSV; to achieve this easily, the first bit is inverted. Either of these code words can be selected based on the cumulative DSV; for example, if it ranges negatively, a +2 word is selected to maintain a zero-DC condition.

To facilitate conversion, the 8/10 relationship was prepared via computer optimization. A programmed logic array can be used to generate the 8/10 code in real time. Decoding is even simpler because of the direct 10/8 demodulating relationship. CD experts will note that this technique eliminates the merging bits required in the CD format.

Eight-to-ten modulation also reduces the range of recorded wavelengths, making the longest one only four times that of the shortest. Because wavelength components are limited, short wavelengths can erase previously written long wavelengths, thus eliminating the need for a separate erase head.

Since the tape is always in contact with the rotating heads during record,

playback and search modes, tape wear necessitates sophisticated error correction. In addition, tape is prone to manufacturing defects and environmental factors. With this in mind, DAT is designed to correct random and burst errors; the former caused by crosstalk from an adjacent track, traces of an imperfectly erased signal or mechanical instability, while the latter come from dropouts caused by dust, scratches on the tape or by heads clogging with dirt. Still, DAT error correction must permit editing. Data cannot be spread over many tracks; it must be limited to pairs of tracks. In this way, new material can be recorded over old.

To facilitate error correction, each data track is split into halves, between left and right channels. In addition, data for each channel is interleaved into even and odd data blocks, one for each head. The interleave process completes every two tracks, and a C2 error-correction code is inserted between the first and second half of a track. (The data interleaving format is shown in Fig. 2a.) Interleaving protects against burst errors such as those caused by a dirty head: half of each

channel's samples are recorded by each head. For example, one head records the right channel's even samples and the left channel's odd samples, and the other head records the left channel's even samples and right channel's odd samples. In the case of a dirty head, only half of each channel's samples would be lost; this can be concealed by interpolation, as shown in Fig. 2b. Similarly, a tape defect could cause losses in both channels, but only even or odd samples would be lost simultaneously.

All data is encoded with a doubly encoded, Reed-Solomon error-correction code over a Galois field GF (256). The inner code, C1, is a (32,28) Reed-Solomon code over GF (256), with a minimum distance of five. Four redundancy bytes are added to the 28 data bytes. The outer code, C2, is a (32,26) Reed-Solomon code over GF (256), with a minimum distance of seven. Six redundancy bytes are added to the data bytes. Both C1 and C2 codes are composed of 32 symbols and are orthogonal with each other.

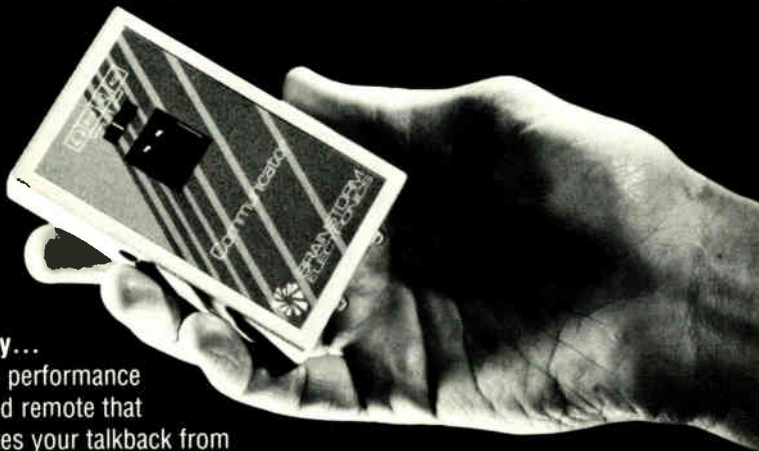
As with the compact disc, DAT's error-correction code endeavors to detect and correct random errors and eliminate them prior to de-interleaving. Burst errors are detected and flagged; following de-interleaving they are scattered and more easily corrected. With this method, the power of the error-correction code is doubled.

The code configuration of a data frame is shown in Fig. 3. Two blocks of data are assembled, one from each head, and placed in memory arranged as 128 columns by 32 bytes; samples are split into two bytes to form 8-bit symbols. Symbols are placed in memory, reserving a 24-byte-wide area in the middle columns.

Rows of data are applied to the first (outer code, C2) Reed-Solomon encoder, selecting every fourth column, finishing at column 124, yielding 26 bytes. The Reed-Solomon encoder generates six parity bytes, yielding a 32-byte word; these are placed in the middle (empty) columns at every fourth location (52, 56, 60, etc.). The encoder repeats its operation with the second column, taking every fourth byte, finishing at column 125. Similarly, the memory is filled with 112 outer code words. (The final eight rows require only two passes, because odd-numbered columns have bytes only to row 23.)

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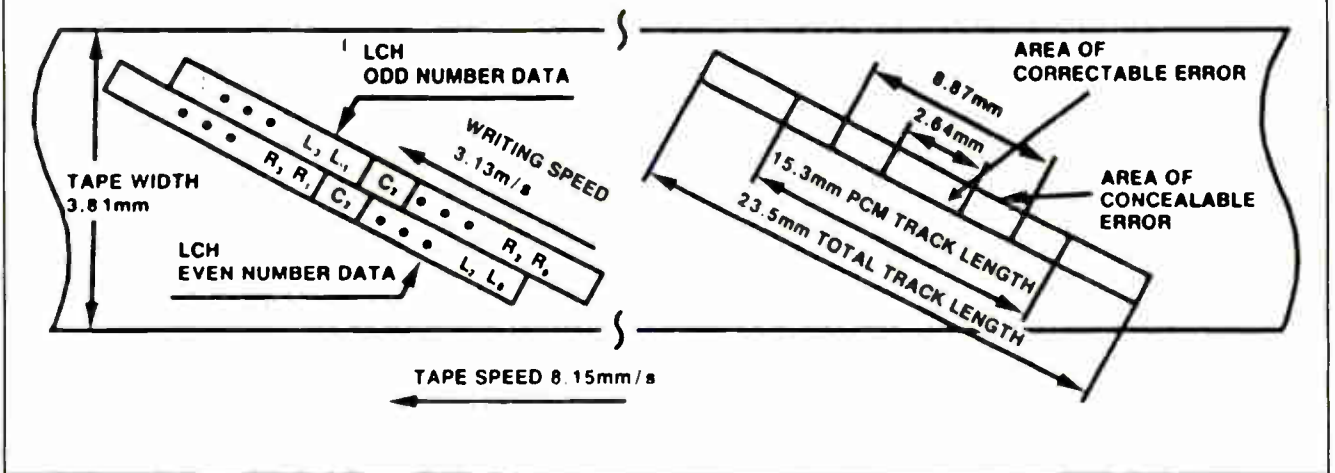
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FIGURE 2a: Data interleaving format.

FIGURE 2b: Burst error correction and concealment capability.



Sixteen even-numbered bytes from the first column and the first 12 even-numbered bytes from the second column are applied to the second (inner C1 code) encoder, yielding four parity bytes, for a total code word of 32 bytes. This forms one recorded sync block. A second pass reads the odd-

numbered row samples from the first two columns of memory, again yielding four parity bytes and another sync block. The process repeats until 128 blocks have been recorded on tape.

The decoding procedure first utilizes the C1 code, then the C2 code. In C1 decoding, a syndrome is calculated

to identify data errors as erroneous symbols. The number of errors in the C1 code is determined using the syndrome, which also determines the position of the errors. Depending on the number of errors, C1 either corrects the errors or flags the erroneous symbols. In C2 decoding a syndrome

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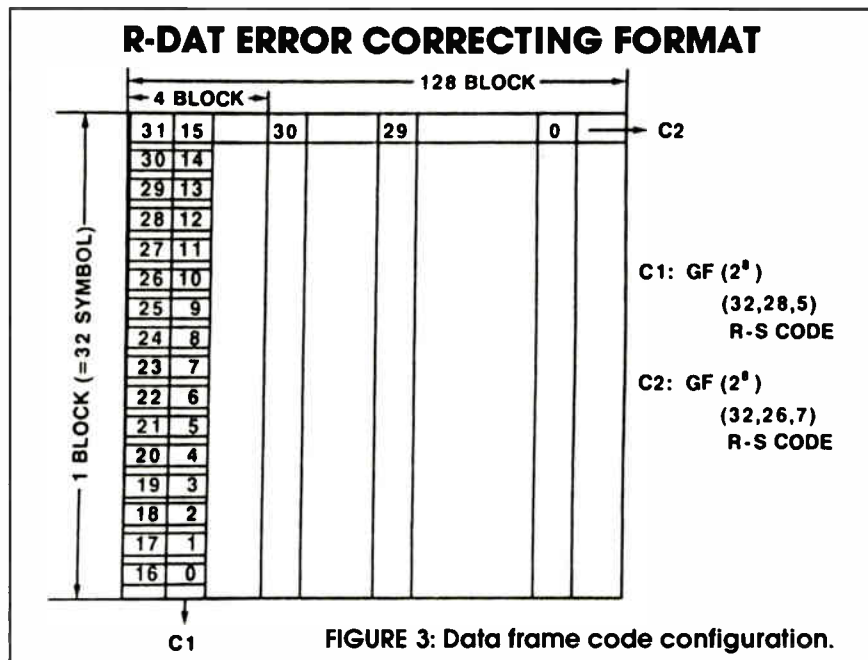
is calculated again, determining the number and position of errors, then correcting them.

During C1 decoding, error correction is performed on one or two erroneous bytes due to random errors. For more than two errors, erasure correction is performed using C1 flags attached to all bytes in the block prior to de-interleaving. After de-interleaving, these errors will be distributed and appear as single-byte errors with flags. The probability of uncorrectable or undetected errors increases along with the number of errors in C1 de-

ous byte in an outer code word. Because C2 can correct up to six erroneous bytes, burst errors of up to 24 sync blocks can be corrected.

The error-correction system can correct any dropout error up to 2.6 mm in diameter, or a stripe 0.3 mm high. Dropouts up to 8.8 mm long and 1.0 mm high can be concealed with interpolation. In all, random errors are correctable if the symbol error rate is less than 0.1 symbol error/second.

In short, although the DAT error-correction system uses mathematics few of us would wish to tackle, it does an excellent job in protecting data on



coding. It is negligible for a single error, because all four syndromes will agree on the error. A double error increases the probability.

The C2 decoding procedure is selected to reduce the probability of undetection. For example, the optimal combination of error correction and erasure correction can be selected based on error conditions. In addition, C2 carries out syndrome computation even when no error flags are received from C1. Because C1 has corrected random errors, C2's burst-error correction is not compromised. C2 independently corrects one or two byte errors in the outer code word. For two to six erroneous bytes in the outer code word, C2 uses flags supplied by C1 for erasure correcting.

Since the outer code undergoes four-way interleaving, four erroneous sync blocks result in only one errone-

DAT tape. In practice, DAT has proven to be very resistant to dirt and dust and tape wear. Next month, we'll conclude our review of DAT technology with a look at the prerecorded DAT format, and a discussion of the technology still needed to make DAT a fully functional professional format. Incidentally, by way of a reminder, these DAT topics are on the agenda for the AES Conference on Digital Audio, in Toronto, May 14-17.

[This material is adapted from the second edition of Ken Pohlmann's Principles of Digital Audio, available from Mix Bookshelf.] ■

Ken C. Pohlmann has recently kicked the sleeping habit. Using his newly available four hours per day, he has agreed to chair the AES International Conference on Digital Audio, to be held in Toronto, May 14-17.

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PROFESSIONAL AUDIO

by Stephen St. Croix

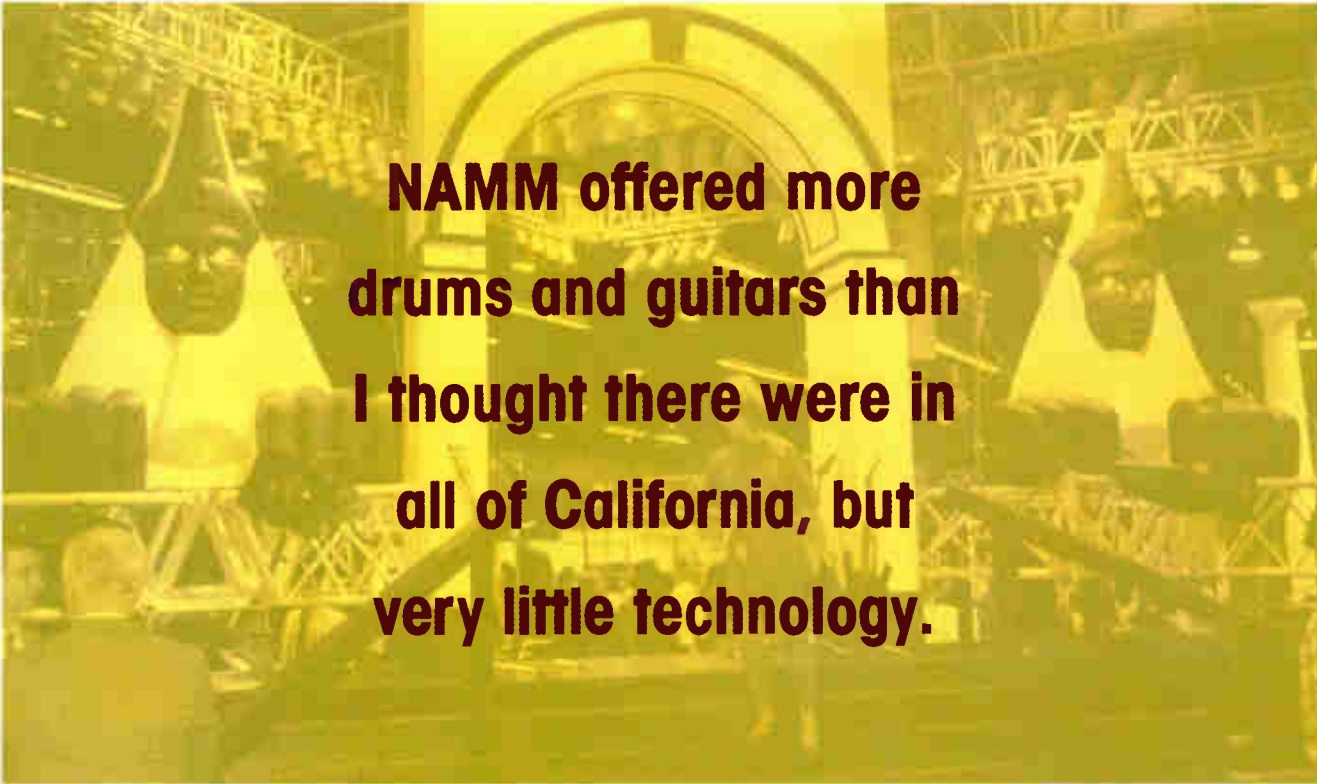
WHAT I DID WITH MY WINTER VACATION

I went to NAMM in Anaheim this year. The representatives of the official children-of-metal faction were all there. In fact, there seemed to be more non-pro people there than I have ever seen at a NAMM show before. There were more drums and guitars than I thought there were in all of California, but very little technology.

I actually ran into the people from Laguna Tattoo (where I had a picture of my first—now deceased—cat permanently engraved onto my person last year). Tattoo artists go to NAMM. What a country.

Sunday's Super Bowl halftime show was in 3-D, and I figure that was the cause for a bit more space in the traffic pattern at NAMM, though I am told that they let the public in on that day, so maybe the two conditions canceled themselves out. I don't know, I stayed down in Laguna and watched the halftime show in 3-D. It was terrible, but it was the right choice. That pretty much reveals what I thought of this year's Winter NAMM.

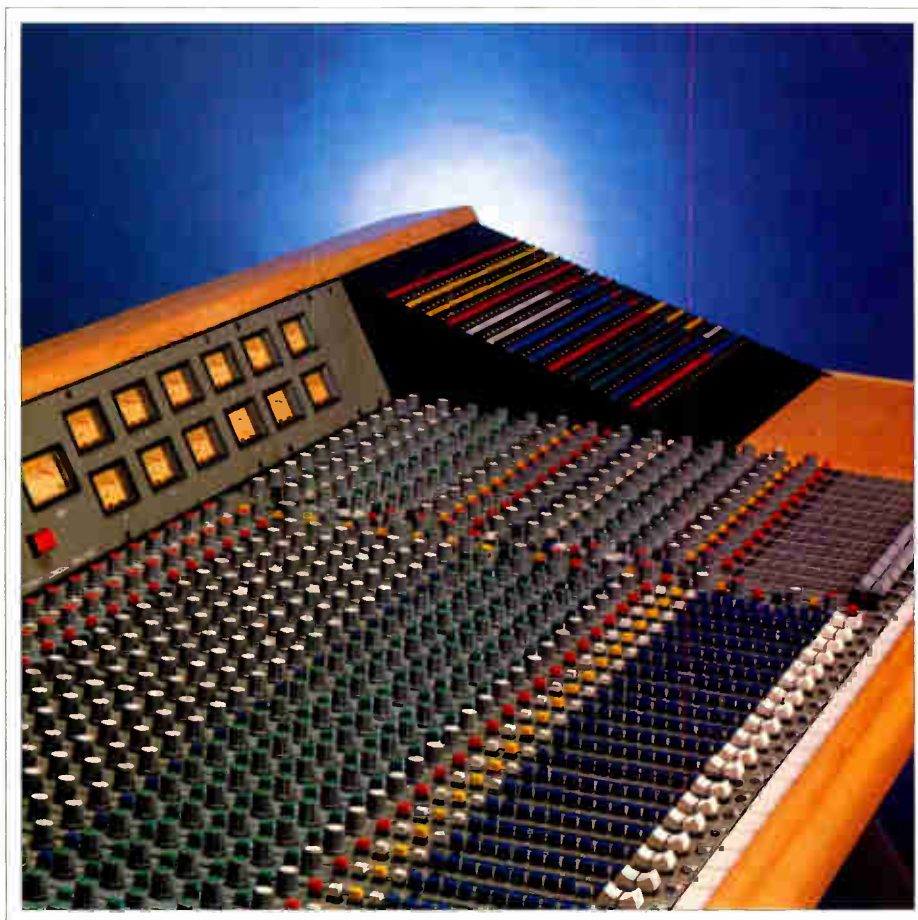
I keep going to NAMM shows because they represent the *other* end of the process—the actual musical instru-



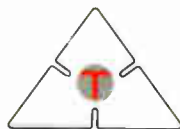
**NAMM offered more
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very little technology.**

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—CONTINUED FROM PREVIOUS PAGE

ments and paraphernalia used to create the noises the recording industry is built on. We capture, massage, arrange, re-record, edit, press and release these noises.

While I have been pleasantly surprised at the quality of the technology that has appeared at the last few AES shows, I must say that this NAMM was quite a disappointment.

Just what, you might ask, did I like? Not much. But what I did like, I liked a lot.

Yamaha is making serious efforts in the area of digital mixers. The DMP7D is very interesting and shows real promise. Tom Jung of DMP Records (no relation) has done some work with this machine, and based on his positive reaction (I trust his ears totally) and what I saw at the show, I am acquiring one next week.

Blank Software showed the next incarnation of *Alchemy*. I'm talking serious stuff here—time compression, pitch shifting and automatic correction of samples to the right pitch of the nearest note on the target keyboard—I got my order instantly. It was great fun just to hang out in the booth. All the Blank reps were wearing little brass Alchemy logos with mysterious red lights inside. Powerful, humorous and strange; my kind of stuff.

With the sample manipulation packages from Digidesign and Blank, I feel secure when I sit down in the synth room to start a session these days. Of course, they all still blow up from time to time, but then so do I.

It is definitely the weird stuff that appealed to me at this show. There were no great monster-breakthrough synthesizers or other machines being shown on the floor, though some interesting next steps were being tried on a select few in hotel rooms.

Sound Ideas, a Canadian sound effects company, once again showed its collection of noises and bumps in the night. Previously I haven't been too interested in what they do, since my film work usually involves scoring and recording music or special effects designed from scratch. The idea of spending one's entire life searching through vinyl or tape libraries for sounds to plug into pictures seems too strange for me. I wouldn't want to see a movie without it, but I sure wouldn't want to

be the one who spent all that time doing it.

Well, this company has changed my attitude. With carefully indexed CDs and well-executed, cross-filed listing books, the process becomes much more efficient. With well-chosen and properly recorded sounds, their time has come. Library/Foley work, in combination with CDs and indexing players, begins to make sense to me.

One CD player manufacturer proudly showed me his new studio CD unit, complete with enough RAM to capture and buffer a segment of material long enough to play while the machine returns to the start of the selection, providing *continuous looping!* This means that if you have only one minute of precious West Hollywood Mall background sound, but you need three, you can program the machine to go back repeatedly to the top of the sound, while masking the jump with RAM-stored playback. Looping!

If I *ever* catch anybody doing that on any movie I paid more than \$2.50 to see, I will walk out, and I will tell you.

Anyway, what really got my interest was the Sound Ideas Sampler Library.

This set of six CDs contains all sorts of stuff to feed your sampler. A simple, nice idea. I liked it. I ordered it, and I will let you know if I *still* like it after I have tried it. I primarily use original samples recorded direct-to-disk in my studio, but I also use commercial samples. I have no objection to building others from these CDs if the recordings are top-notch, and if I can loop them properly.

I do have one word of advice to those currently making or thinking of producing such libraries: we need instruments and various versions of them so we can do velocity layering. We don't need crowd noises, machine guns and screams. We all have friends in New York who can be talked into hanging a mic over a window on Saturday night to get those.

There was a strange guy at NAMM showing what he called the "Bunker Guitar." It is sort of a short Stick with an electric bass attached. It (or he) plays real cool country music. I went there three times to listen, and I don't particularly care for country music.

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like Emmet Chapman's Stick. It differs in that some of the strings are single and others are doubled up. It has elaborate split-voicing control and very clever threshold muting circuitry, which does a fine job of controlling those hammered notes. Think about it. What do you do with those notes when you are through with them? You hammered them on, but how do you turn them off? Well, he figured that out. The notes come on beautifully and expressively when you play them, and then magically go away when you are through with them. I played it myself, and the feel and sound are natural and inspiring. I never heard the enveloping or muting circuits work; they just took care of business. If any of you hear of this instrument appearing on an album, please let me know.

Okay, if you thought *that* was a strange thing to write about in my column, try *this*: those of you who know me know that I am a heli-arc welder. This means that I can weld aluminum. This also means that I am not limited to the hardware normally available from any of the keyboard-stand people.

Four years ago I got a great deal of hardware from the Ultimate Support people and built a giant keyboard/signal processing cage, a sort of full-wraparound, overhead monster cockpit of terror. A lot of welding and machining went into it, and it looks sort of like a cross between a 747 cockpit and the Terminator after his skin came off. It is serious fun, very powerful and it *works*. Everything can be reached from one chair without moving.

I thought I would never get rid of it. I saw it growing endlessly until it ruled the room. Now it looks like all that may change.

I was stopped in the hall at the NAMM show by a friend and given a silly little flyer. On the front was a rushed pencil sketch of some sort of huge, weird-looking furniture-thing with speakers and a TV in it, and a keyboard stuck on the front. Stuck over this artist's rendering was the word "finally." Yeah. Right. I politely thanked him and put it in my bag and walked on to the next see-through drum display.

The next day I happened to wander over to the hotel where this "PlayStation" was residing. I looked, I ordered.

This thing is great! Yes, I am talking *furniture!* I don't usually feel much when talking about something as mundane as furniture, but this is different.

It is essentially the same concept as my synth cage, but executed in very nice, satin-painted 1½-inch pressboard. It is a fully modular system that actually allows you to design a cockpit with your keyboard, video monitor, computers, amps, processing gear, lighting, phone and just about everything else—all within reach. It looks great; much cleaner than my current metal monster.

The sides come in around you, the lower panels slope away from you, the top ones come back at you to hang over your head. Sliding panels provide surfaces for computer keyboards and mice, or maybe drum machines.

The configuration I saw had room for about 200 rack units, and oddly enough, only one music keyboard. Perhaps my Terminator cage would make a nice sculpture out by the pool...

WHY I WROTE THIS

I selected the things that I wrote about in this column very carefully. Obviously they are obscure, strange or just different. The way I see it, you can go elsewhere for a normal overview of a trade show, so you don't need one (I trust you weren't expecting one) from me.

Almost 15 years ago I was a struggling young manufacturer with some unusual ideas. Luckily, those ideas paid off, and I am now a struggling *old* manufacturer.

The press at that time was kind and amused (or perhaps kind of amused) at my idea that you could build a pro device, much less a company, on electronic *analog* delay? Reviews and exposure helped me launch Marshall. In that light, it should not be surprising that I feel it is important to bring a little attention to today's fringe innovators—the ones who have put it on the line to bring us weird stuff that helps us now, or maybe even expands our future.

If you like this kind of information once or twice a year, please let me know. If you do not, please pretend you do, so I can keep writing for *Mix*. ■

Stephen St. Croix spent his last winter vacation in Kauai, Hawaii. This year he spent it at NAMM. He hopes this is not a trend.

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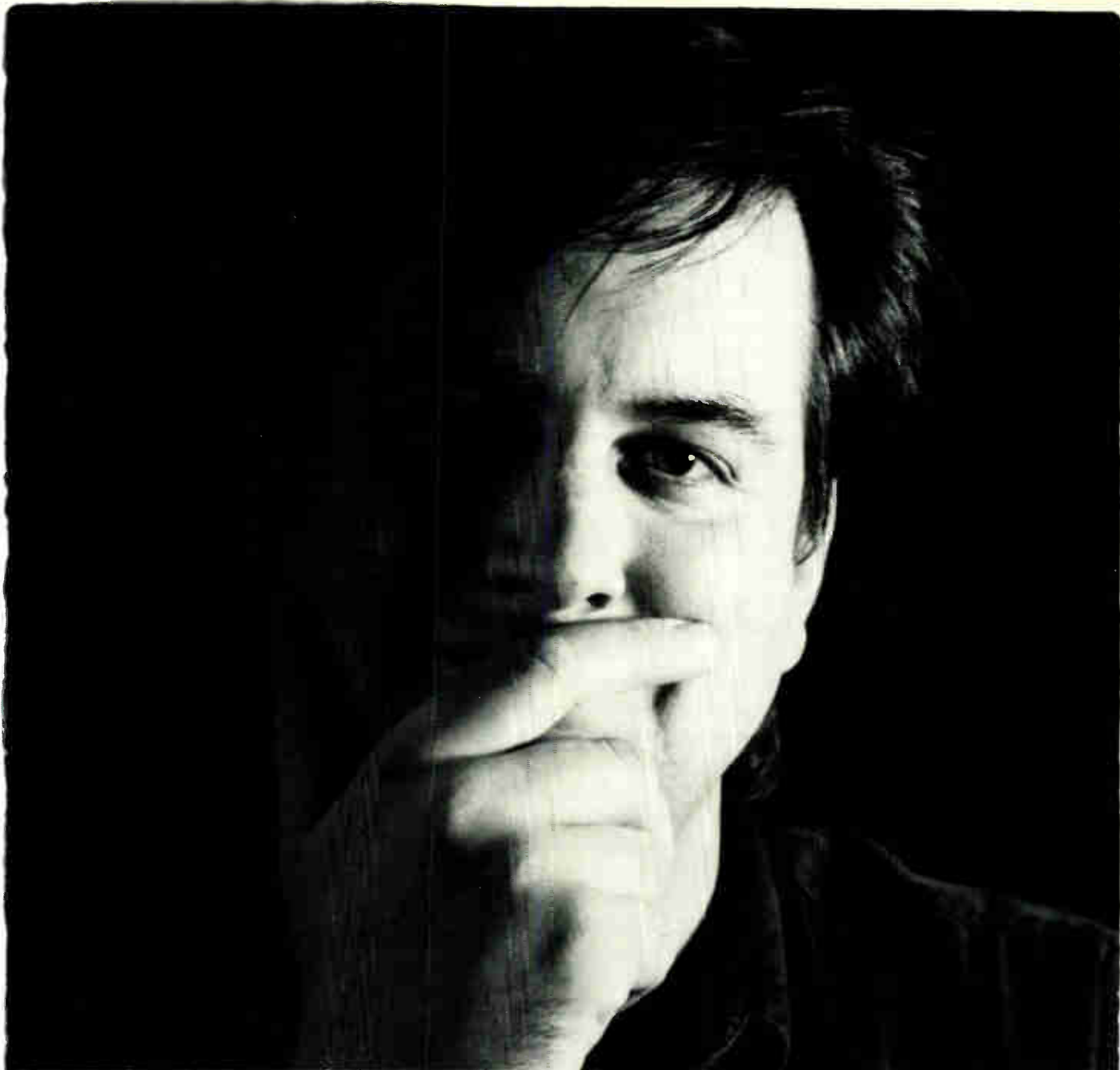
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World Radio History

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by Mel Lambert

AUDIO POST CONSOLES

A

udio post-production for film and video is one area that has seen particularly strong growth recently. As with every task we routinely undertake in the studio, audio post/sweetening requires a special set of hardware and an able-bodied engineer to run the session. And it puts more demand on a console's features and functions than just about any production assignment. It is heartening to observe that an increasing number of console manufacturers are rising to the challenge of providing exceedingly elegant tools to make us more creative in the studio.

Knowing the development of the audio post market over the past two decades helps us understand the front panel layout and operational philosophy of consoles designed for such applications, and why conventional recording and broadcast boards often fall short in critical, functional areas.

Following the introduction of 2-inch quad, 1-inch C format and 3/4-inch U-Matic videotape recorders, directors and producers were quick to explore the creative possibilities offered by electronic editing, special effects and the myriad embellishments available during post-production. They were equally quick to notice, however, that these video formats pose problems for audio. While we might accept the sonic degradation resulting from one or two generations of audio transfer on and off videotape, we



At left: Detail of stereo and mono input modules from a Neve 66 Series console.

Amek APC1000 at Sunset Sound



Paul Camarata – President, Sunset Sound

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Bobby Brooks – Engineer

(Stevie Wonder, Jody Watley, Teena Marie, Rick James, Temptations, Pebbles)
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run into serious limitations if the audio has to follow the same tortuous path as the images. The brain accepts a great deal more visual distortion—in the form of noise and misty color—than audio distortion; distorted, noisy soundtracks do little to enhance an otherwise visually stunning set of pictures.

An obvious solution was to keep the audio away from videotape until that final layback to the release or air master, and use conventional analog and digital multitracks to assemble the composite audio elements, prior to a mix-to-picture session. In this way, the video director could experiment with various audio balances and processing, without the multiple generation losses incurred with videotape.

Unfortunately, the first specialist post studios that sprung up around the country over a decade ago were faced with an immediate dilemma: What kind of mixing console would handle post sessions and provide the

engineer with control of all the various stages? At the time, consoles were usually aimed at one of four markets: on-air broadcast, where ease of operation and push-button assignment of multiple mono/stereo input sources and destinations are of paramount importance; film dubbing, where the control of separate music, dialog and effects elements is needed, plus the ability to cross-assign virtually any input, output or subgroup; music recording, where it's necessary to assign mono mic/line sources to a multitrack during tracking sessions, monitor and provide headphone balances during overdubs, and monitor final stereo balances during remix; and live performance, where dozens of onstage mic/line sources need to be blended, equalized and compressed prior to delivery in less-than-optimum conditions via multiple-array loud-speaker systems.

During a "typical" post session, the production dialog, effects and music elements pre-laid against time code to a multitrack are remixed to picture in

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AUDIO CONSOLES FOR VIDEO POST-PRODUCTION: NEW PRODUCTS, NEW TRENDS

Consoles designed for audio post applications are a specialized breed, constantly evolving to keep up with the needs of an ever-changing industry. Here are a few of the latest entries, many of which will grace the exhibit floor at this month's NAB International in Las Vegas.

AMS Industries' Edit 1 is a stand-alone digital audio console designed specifically for video editing applications. (It is based on technology developed for the Logic 1 mixer, used with its AudioFile workstation.) Edit 1 features: eight input and two output or group faders (all can be stereo or mono); 16 bands of digital equalization, with up to four bands assignable to any channel; two assignable compressor/limiters, mono or stereo; electronic, alphanumeric labeling of inputs, outputs, dynamics and EQ; and RAM-based storage of up to 99 console settings.

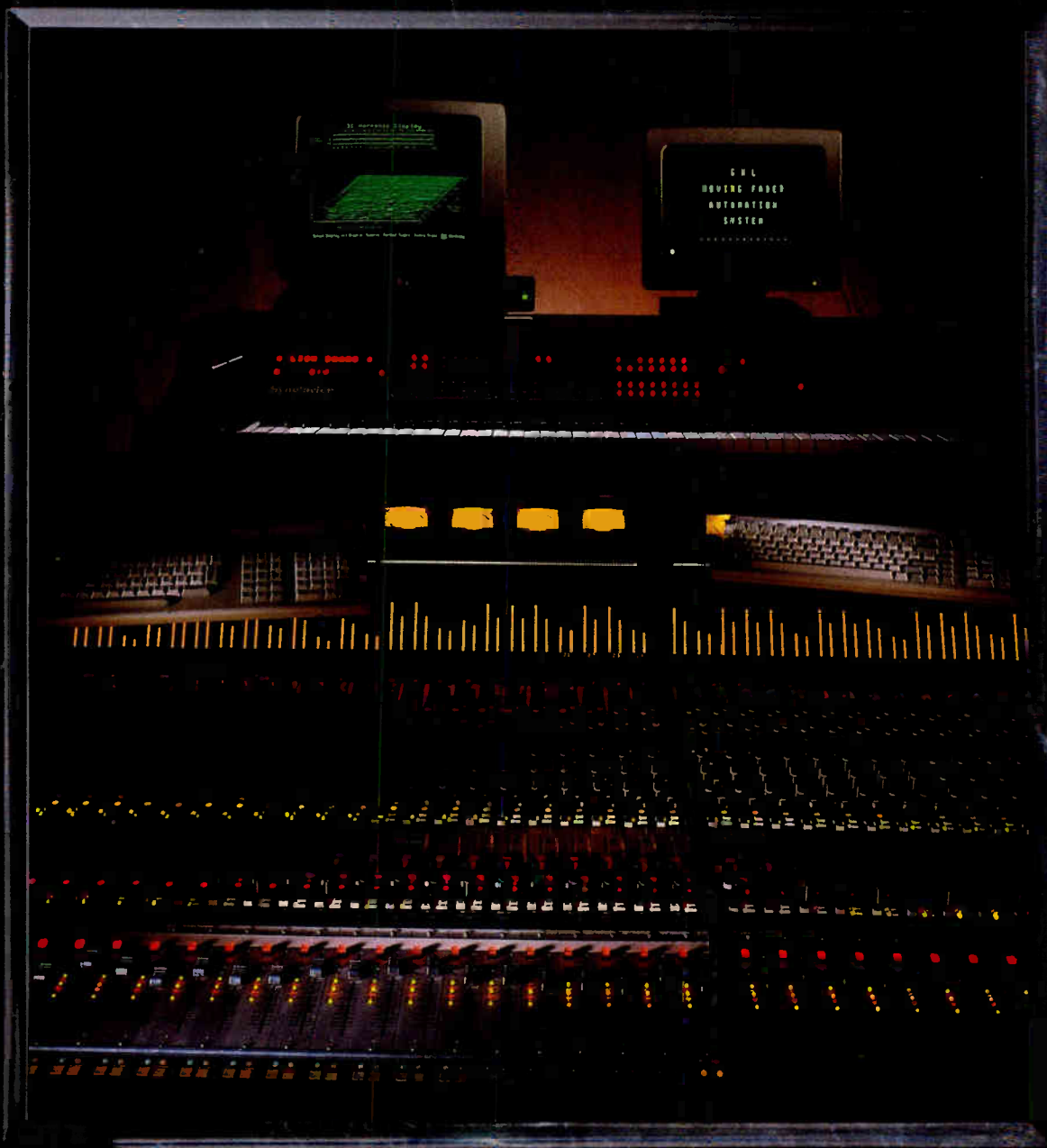
One of the console's most striking features is its use of Logicator™ rotary controls, which incorporate light guides within the knob and

act as a movable cursor, showing control settings at a glance. Also standard on the compact, rack-mount Edit 1 are two stereo AES/EBU digital inputs/outputs, two analog aux outputs, analog monitor outputs, 32-bit floating point internal processing, 16-bit linear oversampling converters and 255-step resolution of all variable controls. Options include automatic cross-fading, with a wide range of available fade times; 2-way A/D analog input cards; snapshot memory system; and a variety of serial digital interfaces. Target pricing is approximately \$40,000, with initial deliveries beginning in May or June.

The VSI from Harrison Systems is an intelligent, microprocessor-based system that provides a sophisticated interface between video editors and Harrison Series 4 or Series 7 consoles. The system can also interface with switchers that generate appropriate control information. VSI mounts internally inside the console and communicates to the video controller in

—CONTINUED ON PAGE 38

LION SHARE AND N.E.D. MOVING FORWARD IN AUDIO POST



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mono, stereo and surround-sound formats. At the same time, mono/stereo music, dialog and effects submixes are recorded in sync to the multitrack, to enable production of foreign soundtracks or to make it easier to substitute alternate music tracks for syndication.

The engineer "enhances" the basic production dialog and other sound elements to produce a balanced soundtrack containing all the audio textures and ambiences required by the video director/producer. Compare the case of a sitcom (where the actual dialog and applause from the set might be complemented in post with simple music, effects and laugh tracks) with a dramatic miniseries, which might involve numerous dubbed effects, Foley and ADR tracks, plus music scored to the action. In the latter case, the only natural sound elements from the shoot might be one or two lines of production dialog and some natural sound, with up to 40 tracks of additional mono and stereo material blended together to form the soundtrack.

Even a relatively simple post session might involve four to six separate production or dubbed voice tracks, four effects tracks, audience applause and a stereo music bed, for a total of 12 to 14 mixing elements. During the post sessions these tracks are balanced to stereo against picture, possibly combined with a laugh track—performed "live" in the control room, allowing it to be played off the visuals—and the final 2-track mix, plus submixes recorded in sync to the multitrack. (On more complex productions, there might be three 24-tracks running in sync with the U-Matic workprint, plus one or two stereo transports with center-track time code to facilitate track slipping.)

The process of prelay, mixdown and re-recording of a post or sweetening mix and submixes has various similarities to broadcast, music, film and live mix sessions. Therefore, consoles intended to handle the day-to-day production chores in a post studio draw on basic design features from these four areas, although the way these complementary functions are integrated within the console topography is unique to the post-production and video sweetening application.

With dozens of well-engineered consoles now being offered to the post and sweetening markets, we no longer have to deal with the inadequate design inherent in mixers designed primarily for music recording, or work with a board that is more of a hindrance than a help during post sessions.

LET'S CONSIDER EACH REQUIREMENT

- Flexible output assignments: in addition to mixing duties, a post console occasionally takes on prelay duties. Therefore, each input channel should offer respectable EQ functions (to allow individual elements to be equalized during the prelay process, or for cleaning up dialog and effects tracks), as well as comprehensive routing to at least eight group buses.

A reassignment matrix *can* be set up prior to the multitrack inputs, or parallel bus taps can be used for connection to a 24-track, for example. However, access to at least eight simultaneous output buses, each equipped with a master level control, greatly simplifies the amount of reassigning necessary, and can help reduce the inevitable confusion that results from expecting too few buses to provide double service.

Because we need to record mono/stereo dialog, music, effects and/or applause elements onto the multitrack at the same time as the master mono/stereo mix, we also need to submix the corresponding elements to unassigned multitrack/group buses or dedicated submix buses. If we use the group buses to set up the necessary dialog/music/etc. outputs, they must be capable of being reassigned post-fader to the mono or stereo master mix. (Why post-fader? To ensure compatibility from room to room and console to console, the three or four mono/stereo dialog/music/etc. subgroups should combine exactly at zero level to form the same final mono/stereo mix.)

- Stereo line inputs with EQ: although the console need not be configured with stereo input modules, access to at least six or eight such units greatly simplifies a complex post session. An increasing number of effects, music and Foley elements are now being tracked in stereo. If we need to add a touch of EQ during a mix or ride level, a single control ensures that left and right channels accurately track

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one another, without asking us to perform gymnastics across two mono channel strips.

By the same token, stereo EQ sections that can be assigned to various output bus pairs are extremely useful in post, primarily because they reduce the number of faders and settings to adjust.

- Centralized audio and tape-machine control: while the majority of post rooms are equipped with separate time code synchronizers and controllers for their video and audio transports, contemporary designs offer more centralized control of sync and remote functions. This development is accelerated in mixers that offer full VCA or servo-fader automation, but is also available on boards that integrate the record safe/ready switching into channel modules, so punch-ins can be performed from the mix position rather than from a remote control located beside the engineer.

In addition, bidirectional EBus control of tape machines and peripheral hardware from the post console is only a short way from becoming a practical reality.

It is equally important that the engineer be able to compare bus outputs with tape-machine return levels. Rather than rehearse a complete mix, it is common practice to build the mix piecemeal. This lets the production engineer concentrate on a music balance against the effects prior to adding, for example, dialog elements. By developing the mix as he or she goes, the relative balances can be progressively adjusted as the mix comes together under the engineer's hands.

If you plan to rebalance a small section—perhaps bringing up a music crescendo to cover an actor exiting a scene—it's absolutely essential that drop-ins be performed seamlessly. Aside from a finely tweaked multitrack, particularly the bias and record-amplifier ramp up/down times, we need to ensure that the relative levels before and after the drop-in point are identical. A simple switch array is often provided to allow the engineer to toggle quickly between the live mix and the off-tape balance, adjusting levels by ear.

- Flexible, comprehensive monitoring: the ability to accurately monitor the nuances of a mix-to-picture is of equal importance. The final viewer

may be listening to a mix on systems ranging from an internal 3-inch speaker in a cheap TV set to an audiophile system capable of outstanding playback quality. So it makes sense to have access to multiple monitoring systems, ranging from a spaced pair of the ubiquitous sound cubes to far-field, wall-mounted units.

A production console should offer sufficiently flexible monitor assignments to allow the mono/stereo master mix and submixes to be routed to the various loudspeaker systems assembled in front of the engineer. And, since a growing number of productions are mixed in some type of surround sound, suitable assignment and panning facilities must be provided. Once four dedicated outputs have been selected—usually designated as left/center/right/surround—panning between left, center and right requires a different audio taper than conventional stereo pan pots. Also, effects assignments to outboard reverbs and DDLs

Console manufacturers are adding remote control ports for their automation systems.

for a surround-sound mix require additional aux outputs, so stereo sends and returns from the front and rear soundstages can be run independently.

Several digital reverbs and room simulators do offer stereo-in/4-channel out, in which case the routing of inputs and returns to the appropriate bus groups must be carefully designated to avoid unnecessary confusion.

Also, since the operator monitors through the matrix-encoding system, the monitoring section should be sufficiently flexible to let the four group sends *to* the matrix be compared with the four outputs *from* the matrix, in addition to the 2-channel L/R matrix-encoded mix. A logic-enhanced, matrix-encoding system will take a liking to certain panned sounds, which increases the importance of accurately monitoring the overall encoding process.

- Flexible, comprehensive metering: besides listening to the individual channels, tracks and groups via the

primary monitoring systems and stereo-in-place or PFL solo buses, it is essential that the operator be able to simultaneously monitor the subgroup levels and master mono/stereo mixes recorded to tape. Therefore, centralized arrays of peak-reading bar graphs or similar devices should allow several meters to be seen clearly from the mix position.

- Flexible subgrouping and/or automation: because a mix may come together in several hours and be recorded to multitrack in a cumulative fashion, it is useful to subgroup channels together under a single VCA-controlled or servo-driven fader. This way, a group of effects tracks, for example, whose internal balance has already been set, can be ridden in level against a dialog track using one or two faders. And because more video mixes are in stereo and surround, it makes sense to be able to control a stereo balance on a single subgroup fader, to prevent image wander as levels are fine-tuned.

While few operators need all the bells and whistles provided by a full-scale automation system, subgrouping and fader-level automation do free up the engineer's attention while he or she fine-tunes a dialog passage (having already established the relative levels for all other sound elements). The ability to return to a previously recorded set of fader moves lets the engineer concentrate on perfecting a complex ambience change on a remote-controllable digital reverb, for example, while listening to a mix balance, without having to make careful notes of every previous fader move.

The ability to automate EQ and dynamics changes that can be recalled as needed, in addition to ensuring continuity of sound ambiances in a production, saves creative time during a high-pressure session. At the very least, the ability to scan and store all or selected knob and switch settings on a post console—even track assignments—greatly simplifies the resetting of a production console prior to a regular sweetening session.

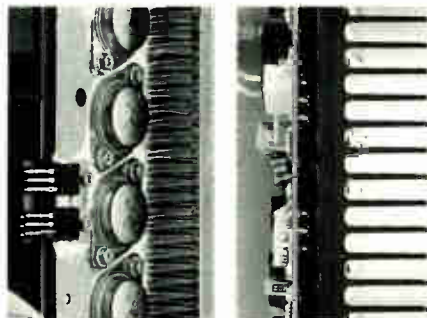
- Integration of audio-follows-video: this function comes under close scrutiny as an increasing number of console manufacturers add remote control ports for their VCA-based or servo-controlled fader automation systems, implementing industry-chosen protocols. Such interfaces allow video switchers and editing systems to issue

Warning: To Avoid Risk Of Shock,

Ignore This Amp-To-Amp Confrontation.

Let's be frank. We're out to change your idea of what — and who — makes a professional power amplifier. So if you just bought a Crown MacroTech, turn the page — this comparison won't be a polite one. But it will stick to the facts.

A look inside these two amps will give you a better idea of why BGW amps like the GTB Grand Touring Amplifier are built like no others in the world. And raise some questions about Crown MacroTechs.



Left: The MacroTech uses mostly air to dissipate heat, not metal. The closely spaced fins are vulnerable to airborne dust and dirt.

Right: BGW uses ten pounds of aluminum to absorb thermal transients, extending power transistor life.

TAKING THE HEAT

If the MacroTech heat exchanger reminds you of an air conditioner, you've grasped its design. This approach works, at least until dust and dirt clog the fins. But as soon as the air flow slows or stops, temperature rises. Soon after that, the Crown shuts off — it could even fail.

The GTB uses massive extruded aluminum heat sinks with widely spaced fins. The

mass of metal absorbs thermal transients without straining the fan. And without quick changes in transistor temperature. That's important. Transient musical loads put the worst kind of stress on power transistors. The effects of thermal cycling fatigue may not show up until after the warranty, but they can destroy lesser amps. Meanwhile, BGWs keep right on delivering clean, reliable power.

REAL SPEAKER PROTECTION

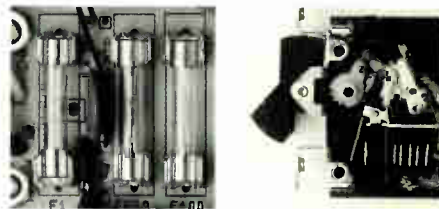
Most amps today are direct coupled, so a blown output transistor (the most common failure) connects the power supply directly to the speakers. Earlier MacroTechs had no protection against DC. Now Crown has learned their lesson — or have they? The sensing circuit and relay they now use shuts off the power transformer, but allows the filter capacitors to discharge stored DC energy directly into your drivers — risking real damage.



Left: Crown uses a slow-acting, less reliable relay. It can allow the filter capacitors to discharge stored energy directly into your drivers.

Right: BGW's modular power output section protects your speakers against DC damage with an instantaneous Thyristor Crow Bar. And the module is easily replaced in the unlikely event of failure.

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Left: Time is money, and with Crown's MacroTech you can lose plenty of both: You have to pull it out of the rack every time a fuse blows.

Right: The GTB's power switch is also a rock-actuated magnetic circuit breaker. You can reset it in a second if power lines hiccup.

MAKE YOUR OWN COMPARISON

Before you buy or spec your next power amp, call us at **800-468-AMPS** (213-973-8090 in CA). We'll send you tech info on BGW amps and the name of your nearest dealer. He can arrange a demo of any BGW model against any amp you choose. Then you'll be able to appreciate the advantages of BGW engineering with your ears, as well as your eyes.



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level-control commands, so scene transitions made in the video domain automatically activate crossfades between audio balances. Once again, because most of a production's dramatic action is visual, it makes sense if the primary audio moves can be synchronized to the video edits or scene transitions, freeing up the post engineer's time for making subtle, creative ambience changes.

To implement audio edits for off-line editing sessions, the ability to import edit decision lists (EDL) is an operational advantage. Time code-

striped production dialog reels, for example, can be quickly assembly edited and transferred in sync to the multitrack, using time code locations from the EDL. In addition to making hard-butt edits during such assemblies, if the EDL data is linked to the console automation system, it is possible to crossfade in real time between time code-referenced sound elements.

• Toward the future: as conventional analog consoles give way to digitally controlled analog approaches, and eventually to all-digital designs, audio-for-video sessions will be greatly simplified. This is primarily due to all the static and dynamic console-surface

settings that can be scanned and stored by these systems. Also, the work now being undertaken into integrating audio with video functions—using ESBUS, serial/parallel audio-for-video interfaces and even MIDI—will further enhance the technical and creative tools available in the post-production studio of a few years into the future. ■

Mel Lambert has been involved with professional audio on both sides of the Atlantic for the past decade, and is currently president of Media&Marketing, a consulting service for the pro audio industry.

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three ways: ESAM II (Edit Suite Audio Mixer II, a subset of the SMPTE serial protocol used by Ampex and CMX); another subset of the SMPTE serial protocol used by Grass Valley's 300 Series switchers (in which the VSI emulates the 300's audio commands when connected to an editor capable of supplying those commands); and a universal, direct-parallel interconnection to a controller capable of supplying both crosspoint selection and crossfade ramp voltages to the VSI.

NEOTEK has expanded the number of fader options for its Esprit, Elan and Elite console lines. Standard fader panels can be replaced with: A/B crossfade groups that can be controlled by a General Purpose Interface (GPI) master; a CMX-style serial interface for master control; or retrofittable GML, Diskmix or Flying Fader automation. NEOTEK has also upgraded its new console frames to an all-aluminum body using bonded construction rather than fasteners.

First announced at last fall's IBC show in Britain, Neve's 66 Series is a new console line designed specifically for on-air broadcast, production and post-production. The 66 provides an integral computer-controlled reset system for switch status and input gain, and an optional recall system for all other rotary controls and faders. All switching is via CMOS elements, allowing EQ, inserts, etc. to be taken in or out of the circuit with no detectable effect on program material. Other features include Format Spectrum Equalization, four or eight

stereo subgroups, a multiple clean-feed (mix-minus) system, and a choice of stereo or mono input channels in a variety of frame sizes and configurations.

A result of the cooperative efforts of both Quantel and Solid State Logic, ScreenSound™ provides digital audio editing, mixing and recording for offline video and film post-production and audio-for-video editing applications. This new system interfaces with VTRs, film reproducers and the Harry digital video editing system, offering all the functions necessary for editing, splicing, mixing, time offset, crossfading and other tasks of the audio editor. Options include a WORM optical disk system for creating and storing library sound clips and effects, and an Exabyte 8mm digital tape streamer for archiving audio, mixing and editing data.

Sony is introducing an outboard ESAM serial unit for interfacing its MXP-2000 consoles with devices using serial protocol. Previously, the MXP-2000 was able to communicate only with Sony-style editors via an optional, internal parallel interface. In keeping with the introduction of the ESAM units, Sony is also offering serial interfaces for its analog and digital 2-track recorders.

A field retrofit kit for converting Soundcraft 200B consoles to 200B/VE status for parallel communication with the Sony 900 editor in audio sweetening applications is now available. Soundcraft offers a similar kit for its larger (24 to 40 inputs) 600 Series consoles, as well

as the VSA-24, a rack-mount interface that brings serial protocol capability to the 200B/VE. The 200B/VE can be ordered with either standard or sweep EQ in a variety of frame sizes, with prices beginning at \$4,900.

Soundtracs has introduced the FM AFV, an audio-follows-video controller for its FMX range of consoles. Available factory-installed or as a retrofit, the unit interfaces up to eight channels of audio with video editors equipped with BVE or GPI outputs.

Studer is now marketing a parallel editor interface in the form of an external, rack-mount unit that easily connects to its Series 961, 962 and 963 consoles. The interface is priced under \$3,000, depending on console inputs and configuration. At the request of many video facilities, Studer's 961 (up to 14 modules) and 962 (up to 20 modules) consoles are now being offered in subgroup versions.

Total Audio Concepts (TAC) offers the Bullet, a compact 10 × 4 × 2 mixer designed for free-standing or rack-mount applications. The board offers balanced mic and line inputs, six aux send buses, 4-band EQ and seven 15-segment LED meters. An audio-follows-video interface will be offered this year. The BCII multipurpose broadcast console from sister company Amek is now available with an optional ESM32 serial interface, allowing use with ESAM I- and II-compatible editors, such as controllers from Ampex, CMX, Grass Valley and Paltex.

—George Petersen



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PICTURE THINGS

How Post Engineers Improve TV Sound

The sound associated with TV broadcasts—particularly stereo—can impress the most jaded studio ears. According to post pros in video facilities across America, this is largely the result of digital technology. *That* refers to anything from video technology (the new D2 systems), to the equipment typically found in music studios, to the brave new generation of digital workstations. For others, however, improving TV sound means posting it with sophisticated, ultra-tweaked analog technology.

While the latest music and recording technologies have helped to broadcast better sound with today's TV signals, audio post engineers also attribute the improved quality to a combination of talent, attitude and technique, which includes: treating the job as if it were film, not video; treating all mixes as stereo even if the end-product is mono; having the capability to handle all formats of audio source material; and informing TV production folks how great it is to bring in source material in digital format—DAT, CD, F1, 1630, DASH, ProDigi—anything, as long as it's zeros 'n ones.


DOING IT DIGITALLY

"You want to degrade the audio as little as possible in terms of generation loss, so digital is your best bet,"

asserts David Smith of Editel/NY. As for editing, "Digital, random-access is where it's at," says Jim Harmon, head of Soundwave, a post house in the nation's capital. In NYC, MasterSound/Astoria—the first East Coast post house to sign a sitcom deal—is sweetening the *Kate & Allie* show with Wave-Frame's AudioFrame. "It's very rare that I do a show today that doesn't use the AudioFrame in some aspect," says post director David Browning. Its primary use is to sweeten the show with audience sounds and effects. "We sample audio into the AudioFrame and manipulate it there, even for as simple [an application] as replacing a cart machine. Or to make a loop with an undetectable splice, or an edit that was virtually impossible a few years ago."

In Phoenix, Maryland, the Wave-Frame AudioFrame helps out with musical composition and editing commercials at Sheffield A/V. Owner John Ariosa notes, "We also have a Kurzweil and other synthesizers, but it's rare that you have to leave the AudioFrame for another keyboard."

This random-access audio action has eased the workload of post engineers so they can pay full attention to



One of the many post suites at Magno Sound & Video (NYC) features this customized Neve V Series console. Magno also recently built a new Synclavier sweetening room.

the assembly job at hand, rather than spend time looking for the right sound effect. Foley-type tasks occur in seconds, and also allow the operator to manipulate audio so it *really* matches onscreen action. Speaking of action, sports fans will remember the gleaming "Bud Bowl" commercials that ran on the Super Bowl telecast. The voice-overs were recorded and edited, and the effects and character voices created and dropped in, all on an AMS AudioFile at Sync Sound in New York City. Engineer Regina Mullen created 32 tracks for a single spot, then mixed them onto two Sony 3324s with an SSL 6000G console.

The AMS AudioFile was beta-tested at Multivision, a video post house in the Boston suburb of Needham Heights. Owner Don O'Sullivan points out that improved sound comes from saving time: "We can do the entire soundtrack for a spot—music, narration, sound effects—in half a day. Budgets translate into time. Under the past technology of multitrack and cutting tape and moving elements around, that same stuff would take a full day more. We're giving them a more so-

BY LINDA JACOBSON

Bud, 27; Bud Light, 24: final score in the "Bud Bowl I" Super Bowl commercials sweetened on an AMS AudioFile by engineer Regina Mullen of NYC's Sync Sound. For the final audio product, she mixed the disk-based tracks onto two digital 24-track ATRs, using an SSL 6000G.

phisticated track for the dollars spent." When the AMS AudioFile was installed at Editel/Chicago, "We ran parallel for a while with our 24-track just in case the AudioFile's eight tracks weren't enough, but it turned out to be fine," reports John Binder. "So we sold our 24-track, bought some more outboard gear and now we sample everything to the AudioFile. We mix directly from it to our video master safety and submaster—with no generation loss whatsoever."

The people at Soundwave of Washington, DC, say they turn out better sound with NED's PostPro Direct-to-Disk system. According to company president Jim Harmon, "It offers the absolute finest sound quality currently



available. After the project is assembled in the digital domain, we do the final mix in one of our computer-assisted mix rooms. That also provides for a cleaner, more creative end-product. The PostPro also excites everyone creatively and allows us to think in

new ways." Soundwave uses the Pro to post and sweeten the *America's Most Wanted* series for the Fox network; the workstation lets Harmon's team easily handle "the last-minute revisions that happen all the time in a

MUSIC, MAESTRO!

Creating effective music for television is no longer the duty of the video post facility. And making sure the music sounds right is no longer a simple matter of checking the final cut on 3-inch speakers. TV music reaps the benefits of multitrack technology and the ability of com-

posers to match music to picture.

Today, the people who compose music for TV still play it back on speakers of all sizes, but they also: judiciously use EQ and reverb; orchestrate for a combination of sampled, synthesized and natural sounds; integrate (or plan for) sound effects; and work on the zip-

—CONTINUED ON PAGE 46

To compose music for TV, Scott Singer uses an extensive Macintosh-based sequencing system, high-end synths and samplers, and guitar or piano. (Not shown here: large Sony Trinitron.) To cut the music, he brings "real" players into his San Francisco studio and records on analog 16-track.



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news-oriented show."

NED's Synclavier is the star at other audio-conscious video facilities, such as Crawford Post-Production in Atlanta and Target Productions in Boston. Target, which posts documentaries for PBS, built its first dedicated audio post room last year. The LEDE®-style room, created by Target's audio director, Steve Blake, houses a 32-voice, 4-track Synclavier/Direct-to-Disk system, a PCM-F1 system and an extensive MIDI setup that's run by a Macintosh computer connected to the Synclavier for music file transfer. Analog source material rolls on a Studer 24-track, synched to video via an Adams-Smith Zeta-3 synchronizer; the setup is controlled with custom *HyperCard* software on the Macintosh. The room design, says Blake, allows for "real accurate mixing, and it's tuned for the client position in the center of a large listening area. That way the client has absolute reference. And the clients are getting hip to the importance of quality audio."

A new Synclavier-based film room was recently built at the venerable Magno Sound complex in Manhattan. Magno purchased Transcom Media Services in January and now offers a grand total of 14 audio studios in four locations. Chief engineer Brian Bailey reports that the room contains "large-screen projection, with left/center/right monitoring and surround sound for Dolby stereo effects. With the help of a Macintosh II, the Synclavier stores and catalogs our 35-hour digital sound effects library in its optical disk system. The room also has a live booth for recording Foley, ADR or narration, as well as a 24-track Sony digital and an Amek Matchless console, which acts as an monitoring system."

DIGITAL VIDEO

The new D2 digital video format provides four editable channels of PCM digital audio, with specs said to top CD audio. "D2 is replacing 1-inch like 1-inch replaced 2-inch a couple of years ago," says Dave Angress, VP of One Pass, a San Francisco-based film and video production company that recently installed Ampex and Sony D2 systems (as has its sister company, Editel/Chicago).

Post engineers at Realtime Video, a production/post/computer graphics facility also in San Francisco, control their new Ampex D2 video machines via a CMX 3600 video editing system. "Now we're talking instantaneous and

revolutionary breakthrough in audio-for-video quality!" says Will Hoover, company president. "We can take any size audio [tape] and edit directly on-to D2, with zero signal-quality loss. And we can take any audio already on video, and using the dynamic noise reduction, improve its apparent quality enormously, then send that to the D2."

DIGITAL MULTITRACK AND OTHER STUDIO GEAR

Record Plant in Los Angeles is a good example of how music and recording technology can better the lot of TV sound. Music for *MacGyver* and *Dynasty* is cut at Record Plant's Stage M

facility, where the staff encourages people to save audio generations by using digital multitrack, and has installed a 48-track Sony digital recorder to entice them. "They mix two tracks to the 48-track, so they have plenty of tracks to try different mixes. Then they run it back to the final format—mag or multitrack analog," says audio engineering director Bill Booley. "And although TV shows like *MacGyver* and *Dynasty* have traditional orchestral scores, a lot of others use contemporary-sounding music. So we have and use contemporary music equipment like SSL consoles and the hip outboard gear for that contemporary sound,

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which is in vogue right now."

Massachusetts' Multivision also relies on souped-up "traditional" studio tools (a custom audio console with extremely powerful EQ; a small sound booth with adjustable oak wall baffles) to beautify their TV sound signals. But they still sample everything into their AudioFile.

Digital multitrack is also the way things are done at Editel/NY. Says audio post project engineer David Smith, "For the classy stuff we almost always composite on the Sony digital 24-track. And we try to transfer [audio] in and out of it digitally as much as possible so we don't have to go through any conversions." The same Sony systems store audio for TV programs posted at Sheffield A/V (Phoenix, Maryland). When they receive an analog 24-track master, they conform it for the 3324. Adds John Ariosa, "If it's within budget, we mix two 3324s down to the Sony digital 2-track, then layover to the 3324 conforming master, add effects, etc., mix down to two tracks of the 3324, then layover back to 1-inch."

SUPER ANALOG

Not every job "needs" digital, because not every budget can afford it, particularly in markets outside Los Angeles and New York. Just as importantly, many post facilities have highly developed analog capabilities. Finally, and ultimately, the broadcast medium is still analog. Some engineers feel that the gains provided by digital are not justified by the cost.

Others start out digitally but concern themselves with that analog end-product. "When material leaves our hands in analog form," notes Smith, "we try to make sure that the analog device at the end of the chain is tweaked and modified to its best. Our 1-inch layback [video] machine, an Ampex VPR-2, has nonstandard, very good-sounding electronics that were reworked in-house."

Then there's the matter of compatibility. "Happily, this town has pretty much standardized using 1/4-inch, center-track time code as the format for interchange of materials between facilities," says Dave Angress of San Francisco's One Pass. "We also support 1/2-inch 4-tracks because that's the format the L.A. market basically supports. All of our tracks, including the mag dubbers, have Dolby SR." Along with a full range of Otari ATRs in their all-new audio facility, One Pass has

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Crawford Post in Atlanta works on TV specials using classic, high-end Neve and MCI consoles. Senior audio engineer Steve Davis notes, "We usually build things on Otari and Studer multitracks and often use dbx Type I noise reduction, unless we're cutting music." Crawford also owns three of Alpha Audio's newly upgraded BOSS II systems, which were originally designed to help control and edit analog tape. The BOSS now boasts advanced digital sampling capabilities and scrub-editing functions. Crawford's BOSSes, running the analog audio machines, also directly and serially control any of the facility's video machines, even the ones in the dubbing room upstairs from the BOSS edit suite.

INTERFACING WITH CLIENTS TO GET A BETTER PRODUCT

"Clients are more aware that good audio helps pull together a good show," says David Browning at MasterSound on the Kaufman-Astoria film lot. "That's why, during the audio mixing process, there's more attention paid to being closer to first-generation audio and using the best possible source for original audio."

Before clients even enter the mix room, "We try to get the source material to come in better shape," says David Smith. "This means asking people—particularly the ones working with music—to come in with digital elements. And we tell them what formats to use—sampling frequency, time code, track splits."

Other facilities pride themselves upon the digital, film-style way they treat video. In the two AudioFile edit rooms at New York's Sync Sound, "We assign different editors to do different things—some cut music, some cut effects, some cut dialog, and it all comes together in a mix. [Treating video] film-style, you do almost no audio in

the video edit [whereas videotape mixes typically involve some audio manipulation]," says Ken Hahn. Sync Sound services high-end clients "who, as little as two years ago, would have shot, edited and mixed [material for TV] on film, then eventually delivered it on videotape. If they wanted a film 'sound,' they had to work on the film, because it was expensive and cumber-

some to work on multitrack tapes."

Now you don't need multitrack tapes to enjoy bouncing or layering or otherwise tossing around track after track after track. ■

Mix assistant editor Linda Jacobson is CEO of Wordswork, a technical and creative writing/editing/desktop-publishing service based in San Francisco.

—FROM PAGE 41, MAESTRO

piest technology, thus offering a competitive edge *and* maintaining creative control. Some things never change: the client still comes first. Yet TV producers budget more for audio now, so compositions are more sophisticated than ever, and their creators are able to incorporate classic film-score compositional techniques and full stereo imagery.

Once upon a time, composing music for television—on a good day—meant watching a poor-quality dub replete with gritty location dialog, pausing the picture to isolate the specific action to be cued, scribbling details about that action and, finally, laying out frame sheets and tempo sheets that form the foundation for the composition.

Enter the world of MIDI, affordable multitrack gear and inexpensive videotape players. Today's TV music composers have become engineers, executing flawless edits of their original music while guaranteeing overall quality and integrity. Composers such as Chicago's Gary Fry can "lock up a Synclavier to picture, following SMPTE time code, at the tempo we desire. Or we can just sit at the Synclavier and play into it, improvising what feels right for the picture in a visceral way. Once we've put it in the Synclavier, we begin the orchestration process, short-circuiting all the busy work you used to have to do."

Fry co-owns ComTrack, a music production company, and composes and produces music for major TV campaigns. Clients have included McDonald's and United Airlines. He keeps one Synclavier at home and another at ComTrack's downtown Chicago facility. He remembers, "You used to have no way of evaluating your music against the picture, except at the final [layback]

session, under the pressure of the clock. Now, with a [videotape] copy of the picture at hand, you can play your music over and over, and decide things like, 'Gee, maybe if I move that cue a little later, it would feel better.' This definitely improves the scoring process."

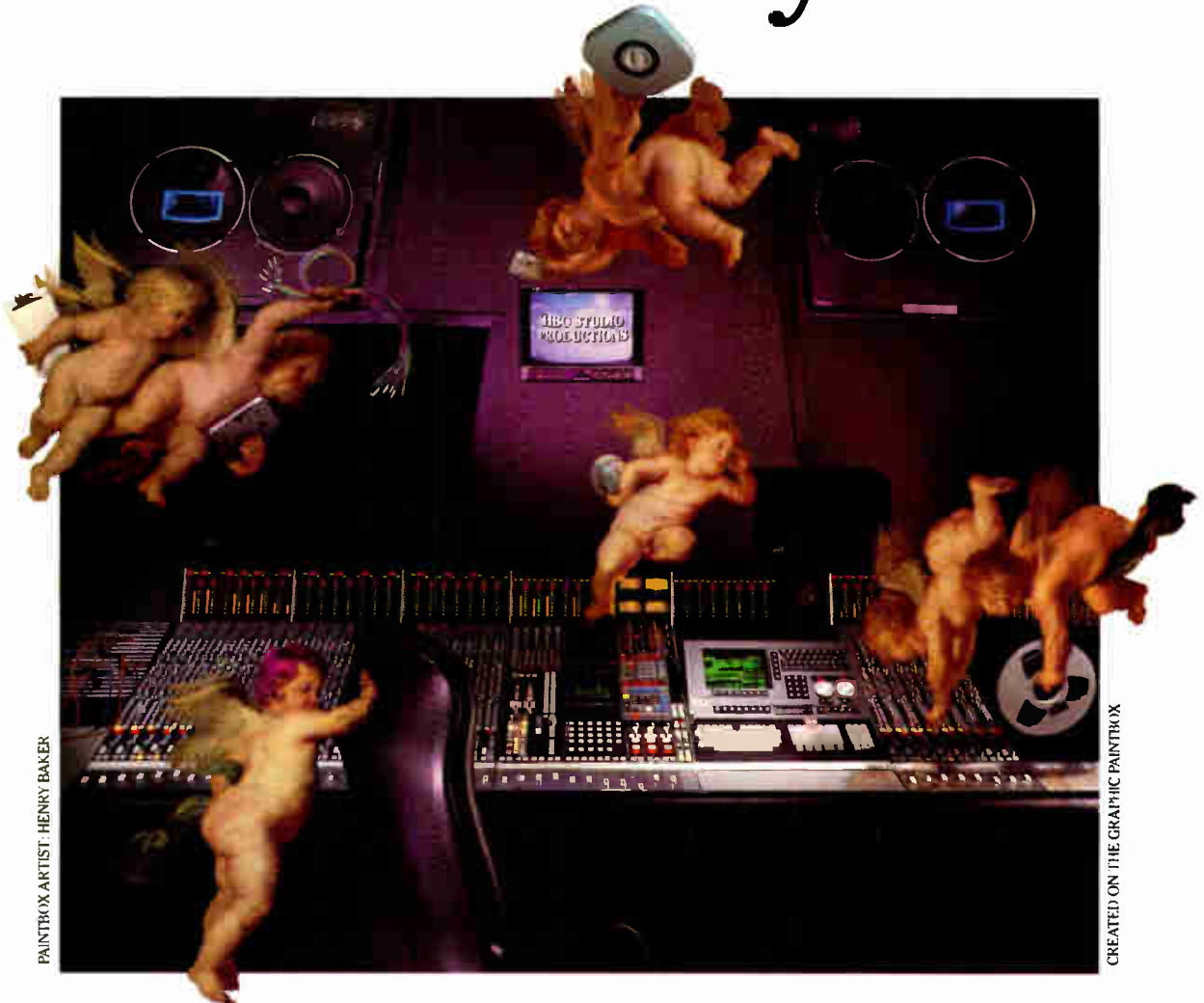
The opportunity to use the Synclavier and systems like it may be seductive, but these composers strive to give clients the best music for the dollar. That means knowing their own limitations, and knowing when *not* to use the electronic keyboard. Fry, for example, would "no sooner use the Synclavier to do a bluegrass thing than I would try to fly to the moon. You get the players who are used to [playing] that style, who can come up with something better in ten minutes than you could in two days of programming." Likewise, composer Scott Singer of San Francisco claims, "I would *never* use a sampled tenor sax!" Also, the chosen genre determines the instrumentation and whether live or sampled players will actualize it. A zydeco music score, for example, doesn't amount to a hill of beans if the accordion and washboard aren't the real thing.

In L.A., the team of Rob Walsh and Mike Linn has composed perhaps more Saturday-morning cartoon music than anyone else in the country. Composing cues for scenes starring Pink Panther, Bugs Bunny and Daffy Duck is no picnic; to whip up a gourmet recipe, Walsh and Linn use teamwork and technology.

Often working at their homes, Linn and Walsh first sketch an orchestral score using *Performer* software on Macintosh II computers, which are networked to the Macs located at Screen Music International, their L.A. production facility. "We

—CONTINUED ON PAGE 160

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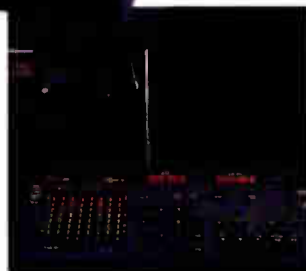
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World Radio History

strict, well-defined standards for background noise level, reverberation times, screen luminance, contrast and glare.

Architect Reischmann previously worked with George Lucas on the design of Lucas' main house and some other buildings at Skywalker Ranch. Reischmann, Allen and Ray Dolby worked together to create a space that would satisfy the rigorous technical requirements demanded of a state-of-the-art testing facility for Dolby products, without sacrificing artistic considerations.

For example, they all worked out an idea for the shape of the seats. Ray Dolby was the guiding force as to what was most comfortable, and Allen modified the design to satisfy the room's technical requirements. The shape was modified after reflectivity tests with pink noise were performed in an anechoic room. Another example is the design of the beams. What appear as solid beams in the theater are actually hollow housings built around structural beams, which are acoustically isolated with neoprene.

Less expensive theaters tend to use high-gain screens, with the result that anyone sitting off to either side experiences a tapering off of image intensity on the far side of the screen. A flat, matte-white screen is used in the Dolby theater. It takes more light from the projector to accomplish a satisfactory image, but the image is consistent from any seat in the room. In his zealous attention to detail, Allen designed a computer program to calculate the ideal angles for mounting the double-glazed windows in the projection room to minimize reflection.

Allen determined that the screening room had to be NC20 or better, equivalent to a first-class recording studio. To meet those specifications in a location 150 feet from a freeway and in the same building as the Dolby offices, the theater floats on two 3½-inch concrete slabs that are separated by neoprene isolators. The room was constructed from the top slab with 42 tons of triple- or quadruple-sheetrock walls and air gaps in between, making it a totally separate room within the building. An air conditioning system separate from the rest of the building is located under the projection room, and is also acoustically isolated from the screening room.

Five Boston Acoustics A40 surround speakers are located in each sidewall (seven across the backwall), mounted

behind the acoustically transparent fabric. Removable side-panel blankets hang behind these speakers in front of hardwood walls. "We can change the reverberation times from 300 to 450 ms by raising and lowering the side-panel blankets," explains Tom Bruchs, Dolby's manager of studio facilities, who supervised the installation of the electronic equipment. The difference in "liveness" is even more pronounced due to the room's random diffraction characteristics. Maximum liveness is achievable by removing the carpets on the floor.

In the spirit of experimentation, an artificial reverb system was designed

using four Schoeps PZM mics combined via a Yamaha mixer and Klark-Teknik digital reverb unit, routed to 15 surround and nine ceiling speakers to enlarge the virtual room size. This system has been used in live concert situations to electronically simulate a cathedral or hall environment. (A Steinway B grand is stored in an offstage alcove.) "We can also use it to create less-than-ideal acoustical situations, to demonstrate our signal processors to theater owners," adds Bruchs.

A speaker system behind the screen receives information from left, center and right for film playback, and con-



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"An Editron synchronizing system allows us to control the audio and projectors, activate lights and curtains, and program fades and gain changes."

sists of Meyer subwoofers and Electro-Voice horns with JBL drivers. The seat tiers of the theater are coupled to the stage, so any subwoofer activity tends to be mechanically transmitted to the viewer's seat.

Bruchs recently completed wiring on the screening room control console, designed to control transport communication, lighting, projection and noise simulation. "A rack of switcher cards in the projection room allows us to reconfigure the equip-

ment in the room," he explains. "For example, by flipping a switch we can inject pink noise into the theater, simulating an NC30 [average noise level in first-run cinemas] or NC45 [more typical theater noise environment]. The room itself is at about NC14. The whole console can be removed and replaced with a chair. Right now I'm using ribbon cables mass-terminating to an ADC punch block. All cables run through more than 4½ miles of conduit."

In the projection booth next to the control room reside two Kinoton DP75 projectors equipped with Schneider lenses selected for the room's length and throw. The projectors are easily convertible between 35mm and 70mm magnetic or optical film. Just as the theater is on a concrete slab, the projectors are also on separate concrete slabs.

Dolby's CP200 cinema processor is the main control unit where the sound formats are selected. The CP200 can also control non-sync inputs for tape recorders. It receives the optical information from the solar cell on the projector, decodes it through the left, center and right channels, and sends it through room equalizers for the surround channels.

The screen room EQ is accomplished by a combination of a THX crossover and the room-EQ contained in the Dolby CP200 unit. "This is to compensate for the room's acoustics and the positions of the speakers in the theater," Bruchs explains. "They're typically customized for each location."

The ADC punch blocks were manufactured to Dolby specs by Audio Accessories. There are tielines to listening rooms downstairs that the engineers use for critical listening in the development of new products. Tielines also connect to a mechanical room downstairs, containing eight Hafler 500-watt amplifiers providing power to the theater.

Other equipment includes a twin-transport Westrex film follower, with each transport configurable as a recorder or playback device. Bruchs says, "We have one not because we're doing any kind of production work, but because we need to be able to simulate any environment where magnetic film is used."

The audio control room includes an Otari MTR-90 24-track machine, Studer A820 2-track and Harrison MR-4 mixing console customized to provide panning to left, center, right and surround for film mixing as well as for stereo music. The console has been prewired for automation in anticipation of that future possibility.

Bruchs continues, "An Editron synchronizing system allows us to synchronize the film chain with the audio chain, selecting either room or any machine in either room as the master. A 16-key remote keyboard is wired to the screen-room console. I can program any of the keys to perform any string of operations—like execute a



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“By flipping a switch we can inject pink noise into the theater, simulating NC30 or NC45. The room itself is at NC14.”

decision list that fires the projector to start; stop the projector; start the 2-track; stop the 2-track; start the 24-track—any number of things. The synchronizer has comparators that act as relay closers. So I can also use it to

open and close the [projector] dowers and to activate the lights and the curtains. From here we can automate a show, whereas when it's offline anyone else can still operate it in a conventional manner. Also, the Edi-

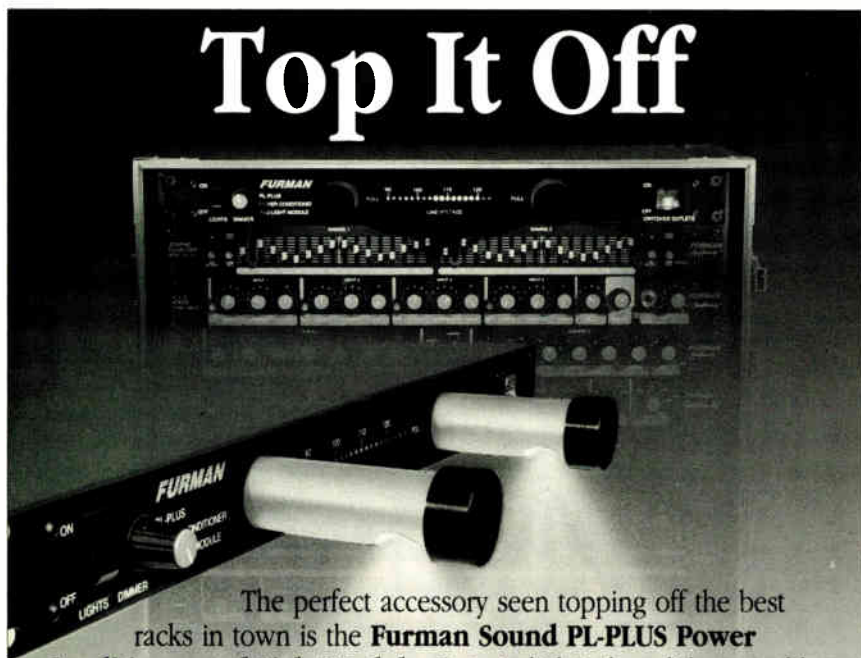
tron allows us to program fades and gain changes. It's quite a powerful tool. We don't even use the remote head for the 24-track anymore, because we have the Editron.”

Naturally, the room is well-equipped for noise reduction. In addition to numerous single-channel units, the 24-track machine is equipped with a Dolby ST frame, which allows Dolby A-type and Dolby SR modules to be interchanged as required. Bruchs says, “The value of that frame is that it allows one to mix, encode that mix to tape, and immediately decode and monitor back. While you're doing the mix you're listening to the overall decoded signal.”

The most recent equipment addition to the facility came as an indirect result of the San Francisco 49ers' appearance at the Super Bowl in January. According to Allen, “While a satellite dish and video projection system had always been on the equipment manifest, we're all 49ers fans, and I had this deal with Bill Jasper where if we got into the Super Bowl we'd order it now rather than later.” The new equipment was christened in a hastily thrown-together Super Bowl party featuring a direct satellite feed in Dolby SR on a 20-foot screen. The event attracted about 75 guests, including the chief engineer and the senior mixer from Lucasfilm, the senior mixer from Fantasy, Francis Coppola's personal mixer, the chief engineers from two local TV stations and yours truly, among others. As the former director of the 49ers' Band, I can report that of the three 49er Super Bowls, this was my best seat.

It's a fitting testimonial to the low-key style of Dolby Labs that the casual passerby is unaware that the offices of this remarkable company are right on this busy San Francisco street, and of the even more remarkable jewel of a studio nestled within its confines. ■

Paul Potyen wears many hats. One of them is that of associate editor of Mix.



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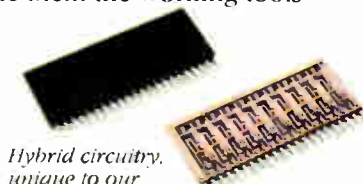
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VIDEO SWEETENING BASICS

FOR AUDIO ENGINEERS



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Your recording studio clients are getting involved with video productions, and there is a need for high-quality audio to accompany their projects. So, the studio has invested in some pricey video sweetening equipment, and now the first project is in the can. Or so it seems. There is an unsettling call from your client's video facility informing you that the on-camera sound is drifting out of sync with the picture during layback. The client is on deadline, and there doesn't seem to be an easy answer as to the source of the trouble.

THE SWEETENING PROCESS

The main purpose of video sweetening (also called "audio sweetening" or "audio post-production") is to augment the audio content of a video production. This augmentation might include sound effects, music, sync

sound or narration. Since most commonly used videotape recorders have only two audio tracks, it is often not feasible, or too time-consuming, to do complex audio recording on the videotape alone (particularly at video editing rates). It is then necessary for the audio to be handled on a multitrack audio recorder (ATR).

A typical video sweetening job takes place after the video of a program has been edited into its final, or nearly final, form. This is done at a video editing facility, and the end product is an edit master—usually on 1-inch or ¾-inch videotape. The two audio channels on the edit master may contain nothing, but they usually contain some reference audio, such as narration, or sync sound that was laid in during editing. This is generally live sound from the shoot, particularly of people speaking on camera. In the sweetening process, the preservation of the sound-to-picture sync relationship is of continual concern.

From the edit master, two dubs are made. One is a ¾-inch videotape with time code on an audio channel (or address track, discussed later) and burn-in time code numbers in the picture. This tape serves as the video reference during the sweetening process. If one channel of the ¾-inch tape has time code, the other should contain a mix of the two audio tracks on the edit master.

The other tape is a 2- or 4-track audio dub of the edit master, with time code on one channel (center-track). For this tape, the two audio tracks from the edit master must be dubbed one-to-one, as they become the base tracks on the multitrack tape. Noise reduction is advisable if it is available at both facilities.

Most importantly, the time code on these dubs should be the same code as the edit master. This greatly simplifies sweetening, because the time code for a given audio event will be identical to that for the correspond-

ing video event on the 3/4-inch reference, thus eliminating the need for slave offsets.

Once these tapes are in the studio, the audio from the 2-track tape is dubbed, or "laid-up," onto the multitrack. The multitrack now contains the base tracks for additional audio. It also has the same time code as the video master, which has been dubbed from one of the other tapes, usually the 2-track.

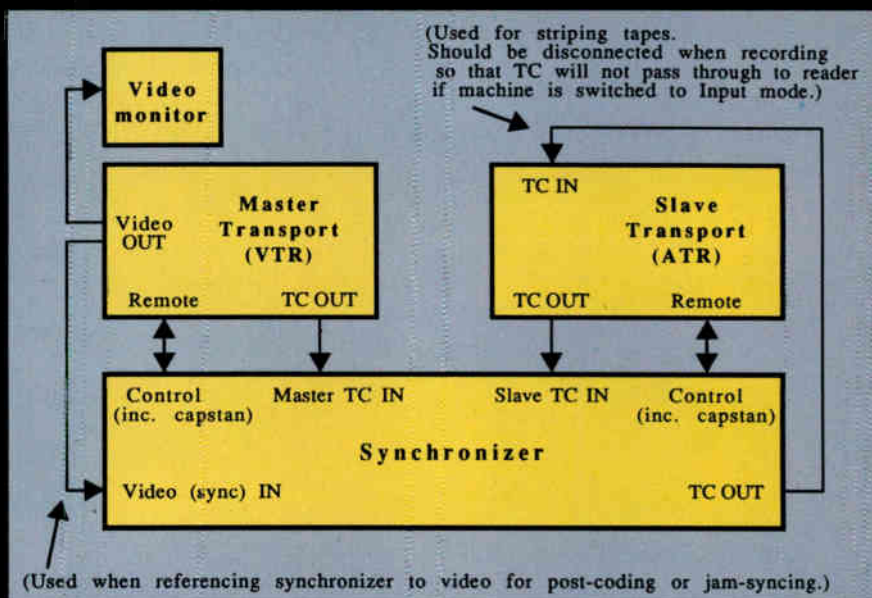
At this stage, the 3/4-inch reference tape is used as the "master," and the multitrack as a "slave." The synchronizer runs the multitrack in exact sync with the videotape, and additional sounds are laid-up onto the multitrack in the exact location to fit with the picture. This usually amounts to a number of effects and/or music tracks. If a three-machine synchronizer (or audio editor) is used, the source tapes may also be run in sync as the audio is laid-up, simplifying precise placement of the new sounds.

When all the sounds have been laid-up, the multitrack tape is mixed back down to 2-track while you watch the video for reference ("mix-to-picture"). Again, this 2-track tape has the same time code as the other tapes, usually copied from the multitrack during mixing.

Finally, the 2-track mix is brought back to the video house where it is laid-back onto the edit master in place of the original tracks. As long as the audio and time code transfers have been made correctly, the audio tracks will be in sync with the edited video.

A common variation of this process is used when the video edit master is 3/4-inch tape. The multitrack mixdown can be made directly onto this tape, eliminating the layback step. Of course, this requires extra care since the recording is made onto the edit master. It is also limited by the location of the time code on the master and whether the mix is stereo (becoming more common in video projects). A 3/4-inch, burn-in dub of the master is still used for reference during the lay-up sessions to avoid running the master.

Of course there are many other ways audio-for-video is used. For example, a soundtrack can be constructed before the video is edited, with the soundtrack acting as the base for the entire show. In most cases, though, the same elements of audio, video and time code are involved and must be



Simple Video Sweetening Equipment Layout

handled correctly.

VIDEO BASICS

Although the television picture appears as a continuous image, it is actually a continual series of individual "snapshots." Unlike analog audio, which is a continuous unbroken signal, these individual snapshots are

electronically generated and recorded as discrete "packets" of information, or fields. Two consecutive fields contain all 525 lines of signal information needed to fill the television screen one time, thus producing a complete frame of video.

Between each field there is a vertical blanking period, or vertical inter-

General Rules for A/V Sync Work

1. The relationship between sync audio and its time code must *never* be altered once it is established. Audio transfers can only be made by methods that do not alter this relationship.

Acceptable methods include dubbing both audio and time code simultaneously to a "wild" (internally locked) recorder, or dubbing audio to a time coded tape, with the machines locked (resolved) together. The pre-striped time code should match the original.

Dubbing audio first, then time code (or vice versa) when copying a tape with an established audio/time code relationship is an unacceptable method. Also, never dub audio to a pre-striped tape unless the two machines are locked together, or locked to a common sync generator.

2. The time code generator must be locked to its internal crystal (non-resolved mode) when gener-

ating new code for audio tapes. It must be locked to the source when dubbing time code. It must be locked to the video when post-coding videotapes.

3. Audio transports must be in "internal" capstan reference mode when recording time code.

4. The time code on a tape being sent for layback should be the same rate as the code on the original-source audio tape (this happens automatically if the time code and audio are always dubbed together).

5. Time code should always be restored or regenerated when it is dubbed.

6. Never attempt a hard record or assemble edit unless video is being fed to the VTR.

7. Audio insert edits can only be made on videotapes with a control track present.

8. At least ten seconds of time code must be present before the start of audio material to allow for synchronizer preroll.

—Eric Wenocur

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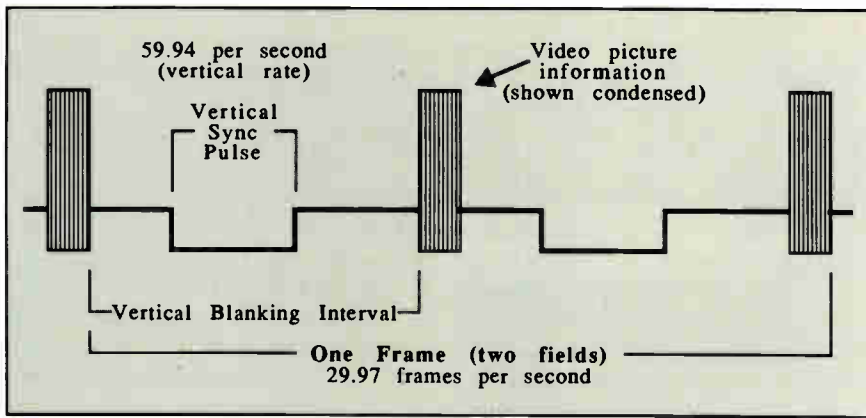
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Vertical Blanking Between Fields

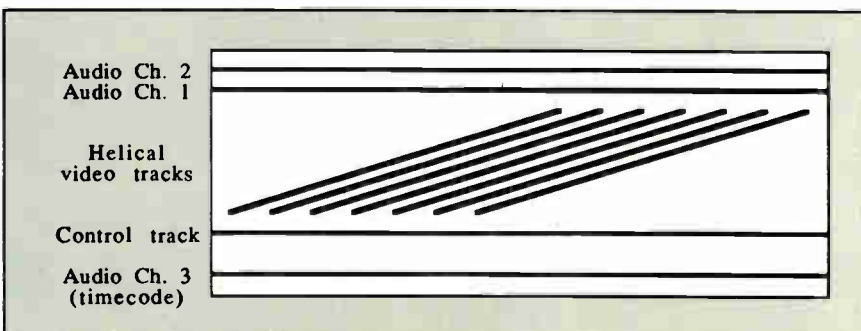
val, containing a vertical sync pulse. The vertical blanking period can be seen as the "black bar" that rolls through the picture when the vertical hold is adjusted. Because of their construction, video signals can only be edited electronically, so video edits are made during the vertical interval where they remain unseen.

In American color television (which uses the National Television Systems Committee [NTSC] standard), there are 29.97 frames of video per second, or 59.94 fields. This does not mean that 29 "and a fraction" actual video frames occur each second, which would be impossible. It simply means that the video frame rate is slightly slower than 30 fps, so that at the end of one real-time (clock-on-the-wall) second, only enough time has elapsed for 29.97 frames to have occurred. The reasons for this odd number have to do with the frequencies used in the color television signal; in the days of black and white, the frame rate was an even 30 fps. Fortunately, it is quite acceptable to think in terms of 30 fps for most applications, particularly video sweetening. The actual frame rate is only important under certain circumstances, which will be mentioned later.

On a VTR of any current format, the

video is recorded by rotating heads attached to a round-head drum—a system known as helical scan. The tape is threaded around the drum at an angle so that the tracks of the signal end up as slanted lines along the tape. The audio, time code and control-track signals are recorded longitudinally beside the video tracks by conventional audio heads. In addition there is a "full bar" erase head, which wipes all signals on the tape, and "flying" erase heads on the video-head drum, which erase video only.

On 1-inch videotape, time code is usually recorded on audio track 3, which is dedicated for that purpose. On 3/4-inch tape, time code can be on an audio track or on a special address track. The address track is standard on professional 3/4-inch decks, but is usually an option on industrial (U-matic) models. Address track is tricky, because it is a longitudinal track recorded in the same physical location as the vertical interval on the tape. This means that address track code cannot be post-striped; it can only be recorded simultaneously with video. Since it may be optional, studios must know if their VTR has address track capability before accepting these tapes. If not, matching time code can be post-striped onto an audio track at a video



Track Layout on 1" (Type C) Videotape (3/4" is similar)

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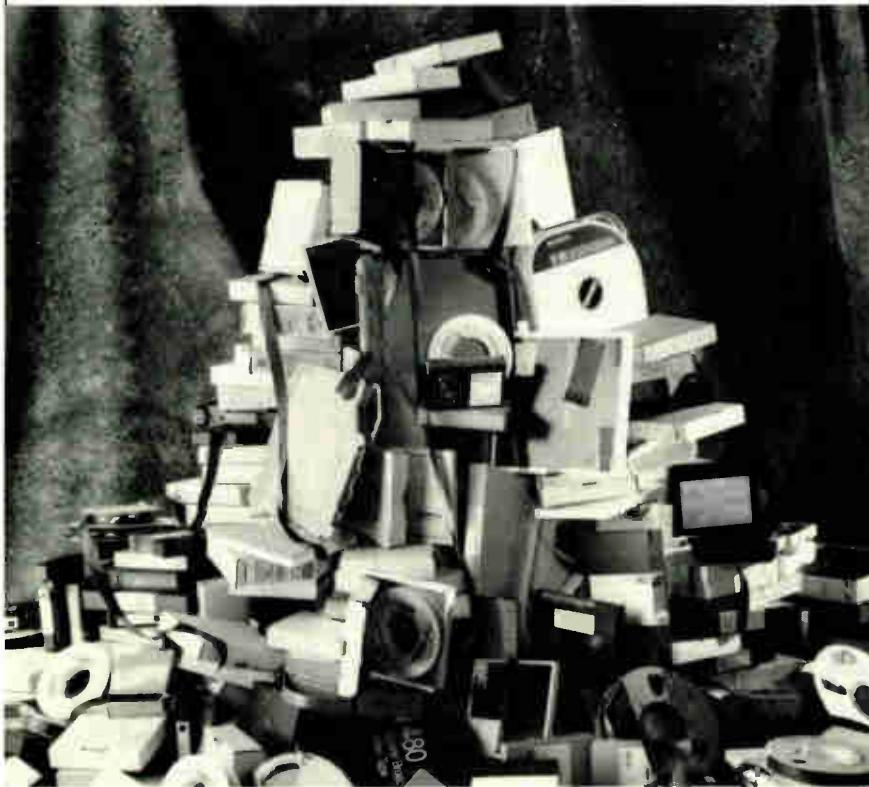
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facility, but, of course, that track is no longer usable for audio. Any other method of recording time code on a 3/4-inch VTR is not "industry standard" and should be examined for compatibility before accepting tapes.

There are three types of video recording: hard record, assemble editing and insert editing. When a VTR is put into hard record, it erases and records all tracks simultaneously. In addition to the video and audio, the VTR records a control-track signal (NOT to be confused with address track). The control track is a series of pulses used to govern the tape speed on playback. This is necessary because off-speed playback on most VTRs causes visible frame lines in the picture. In addition, lack of a control track is likely to cause erratic tape speed and make any audio or time code unusable as well.

The hitch here is that a VTR only records a control track if it is recording a video signal. If hard record or assemble edits are attempted with no video input to the VTR, control-track signals will *not* be recorded. Any audio house that cannot provide a correct video (or composite sync) signal cannot make these types of recordings. This does not mean that no video sweetening can be done. It simply means that these functions of the VTR should be disabled, or the buttons taped over. This is the first step in avoiding potentially disastrous trouble. Remember, a facility that cannot record video also cannot "stripe" time code on a fresh videotape.

On VTRs with electronic counters, if the tape has no control track the counter will not advance. As long as the counter advances, the control track is present and audio can be accurately recorded, even if the video has been erased. Since it is recorded automatically, the control track is often taken for granted, but a videotape without the control track is virtually useless.

Assemble editing is just like hard record, except that the VTR rolls into the edit and starts recording a new control track in a perfect continuation of that already on the tape. Assemble editing is used when recording new material on a partially blank tape, and it is desired to "pick-up" at the end of each segment and continue on. To make assemble edits, the first video on the tape must have been created by hard recording. In addition, once

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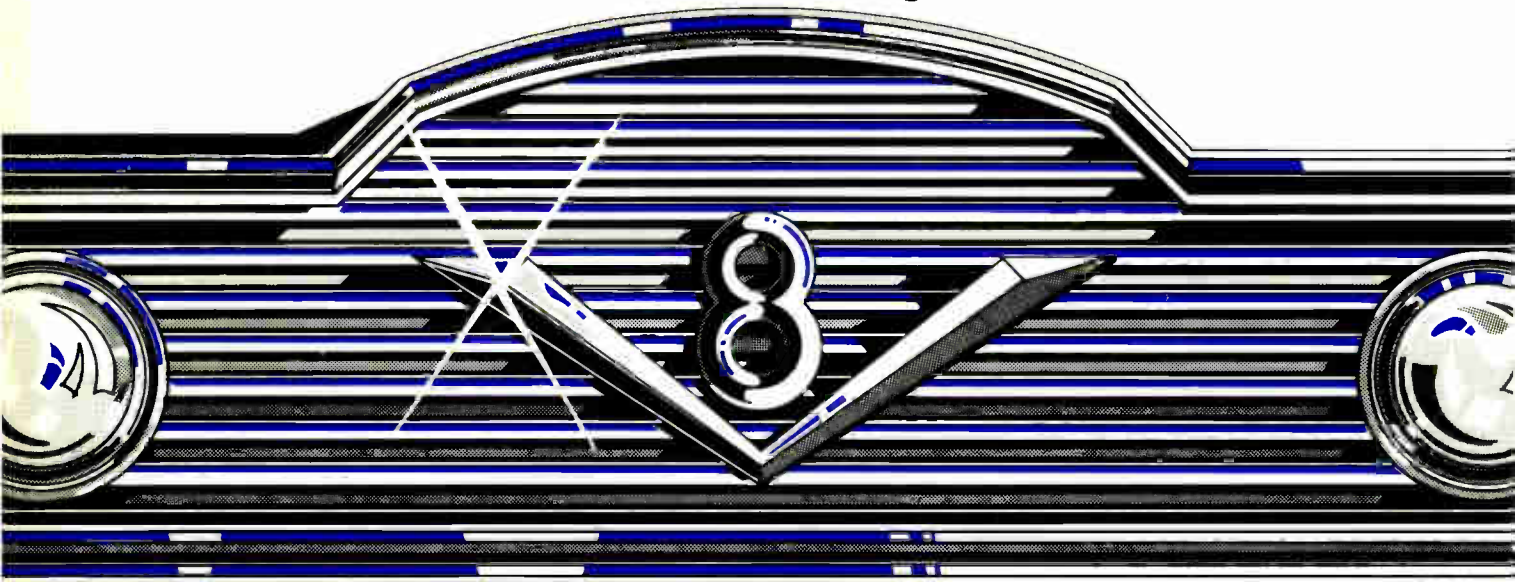
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an assemble edit is made, a "hole" is left at the end, so assemble edits must be made from then on. Again, the VTR must receive video to make assemble edits.

In insert editing, only video or audio tracks are recorded. On VTRs with this capability, there are buttons to select which track will be put into record, similar to record safeties on an audio deck. There is also a separate "record" button for editing (vs. hard record). No control track is recorded during an insert edit, even if video is being recorded. For this reason, insert edits are made only on tapes that already contain a control track. Keep in mind that only fresh videotapes are actually blank. Tapes that have been "blacked" for editing contain at least a control track and video, so insert editing can be done. Audio insert editing is the only type likely to be used at an audio facility doing sweetening.

TIME CODE BASICS

Time code is a system designed to allow accurate identification of every video frame on a tape by assigning each frame a unique number. There is only one valid time code number for each video frame. Each frame of time code is made up of an 80-bit stream of digital data, containing bits for hours, minutes, seconds and frames, as well as other information. There is a sync word at the beginning of each 80-bit group that identifies the start of a new frame. The time code signal is recorded longitudinally on a videotape (except for Vertical Interval Time Code, mentioned later) and is a continuous, frequency-modulated signal that can be heard as a dirty sounding "warble tone," much like drum machine sync tone.

Time code comes in a variety of different formats: 30 fps, 30 fps drop-frame, 29.97 fps, 29.97 fps drop-frame (SMPTE, for the American standard), 24 fps and 25 fps (EBU, the European standard). Each type has its purpose, and they are not interchangeable. The 30 fps code is always used in conjunction with 24 fps film shoots and is generally acceptable for audio post-production work, as long as audio leaving the studio for layback is locked to the same code it came in with. In most cases, this is 29.97 fps code, which is used in video houses because the time code rate must match the video frame rate. (Bear in mind that video houses rarely need to

consider what rate code they are using because the VTRs and time code generators are all locked to a common sync generator. Don't be surprised if your contact at a video house acts confused when the subject of time code rates comes up.)

Then again, while standard 29.97 fps code is most common, in some cases it causes a problem with determining program length. The reason for this is that the slower frame rate results in a loss of 1.8 frame counts per actual minute of time, since the time code counts to 30. If standard 29.97 fps code is used to determine program length, after one real-time

hour the time code reads only 00:59:56:12 (59 minutes, 56 seconds, 12 frames). When the time code finally reaches the 01:00:00:00 count, the program is 3 seconds and 18 frames too long. In broadcast this is thoroughly unacceptable. Since the video frame rate really is 29.97 fps, it is necessary for the time code numbers to reflect the actual number of frames that have gone by in order to time programs accurately.

This is done with the aid of drop-frame time code. Drop-frame is a variation whereby certain frames are "dropped" from the count, so that the

—CONTINUED ON PAGE 67

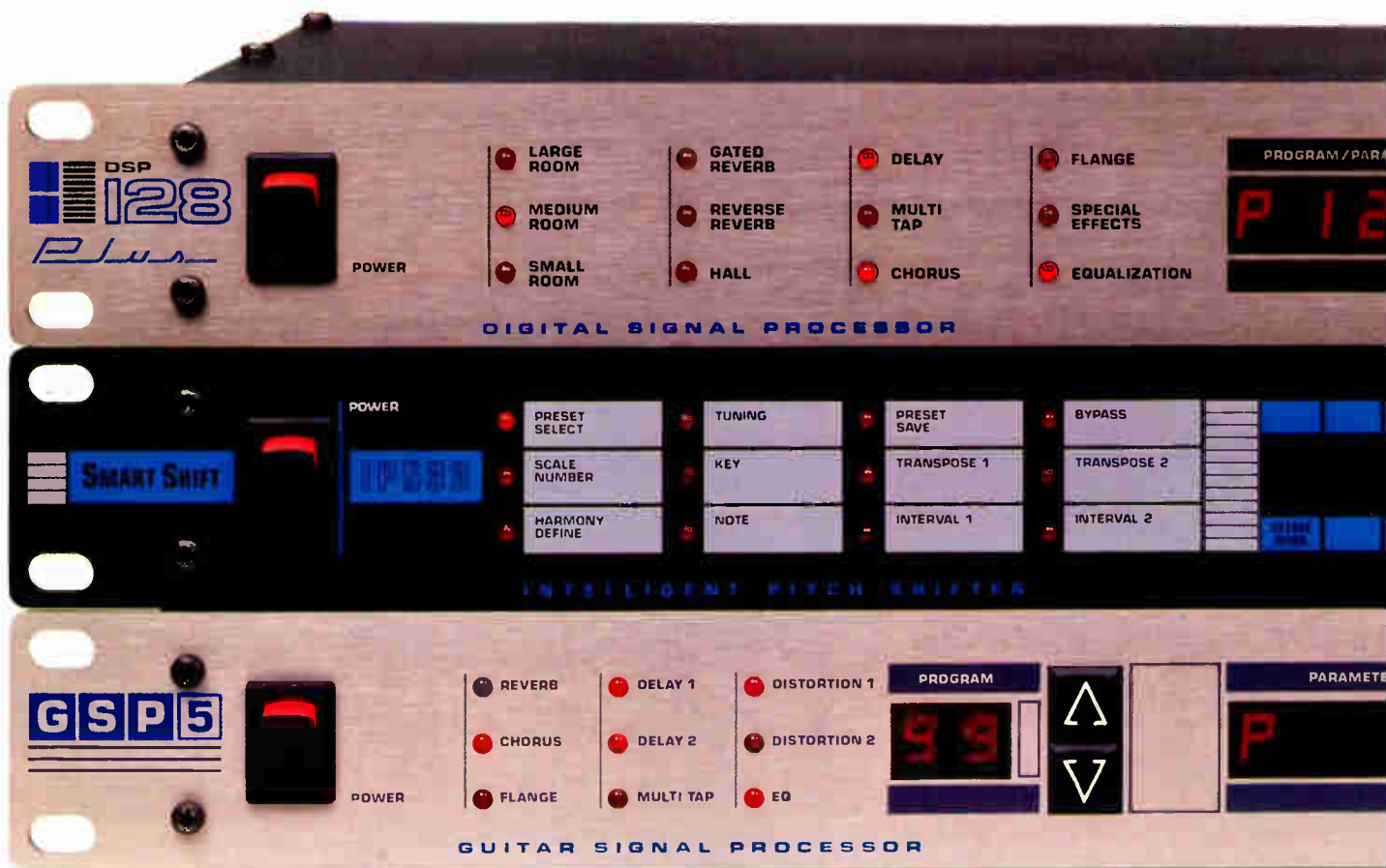
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—FROM PAGE 63, VIDEO SWEETENING

final count is 01:00:00:00 at the end of each real-time hour. The drop-frame system eliminates the first two frames in every minute, except the "tens" minutes (10, 20, etc.), thus "fudging" the count by the necessary 108 frames. Remember, drop-frame runs at the same rate as non-drop-frame code, either 30 or 29.97 fps, only the counting system is different (and the names have been changed. . .).

From a video sweetening perspective, the use of drop-frame or non-drop-frame code is relatively unimportant, and is usually determined during the video editing. However, any tapes that are synchronized with a drop-frame master should also contain drop-frame code. This eliminates a lot of confusion. Another complication to remember is that with drop-frame, certain frames *do not exist*. Thus, if we ask a synchronizer to park the tape at 1:01:00:00, it won't be able to because this frame number is not on the tape! The count actually changes from 01:00:59:29 to 01:01:00:02. The lack of certain frames also complicates offset calculations and such. Most time code generators and synchronizers can handle drop-frame code without problems, but, given a choice, it may be preferable to use non-drop to simplify manual time code calculations.

The other two time code formats, 24 fps and 25 fps, are used for film work and European television (PAL), respectively. My own recommendation for audio studios is to stick with 29.97 fps code for all in-house work. This avoids any possible problems that arise from mixing frame rates with the video houses. One such problem is that the tempo and absolute pitch of audio material locked to one rate of code changes if played back synchronized to the other rate. The difference is only .1% (1/10 of 1%), but it might cause trouble in certain situations.

HANDLING TIME CODE

Time code is a relatively volatile signal in two ways. It has a lot of high-frequency information and seems to "leak" into everything (like drum sync). And it is easily degraded due to dubbing. Time code should never be dubbed from any tape source without first being regenerated or restored. If this is not done, each generation of code becomes less and less readable.

Regenerating is a process whereby the code leaving a tape is used to feed a time code reader, which simultaneously drives a generator that makes new code. This new code is fresh and can be recorded again. Since regenerating utilizes a generator, the code that comes out is subject to the sync frame rate that the generator is locked to. In the case of most smaller studio synchronizers, the generator simply locks to the incoming code, and the regenerated code is exactly the same rate as the original.

At least that is one option. Many units also allow the generator (or entire synchronizer) to lock to other sources of sync. Here the utmost care must be taken! If the generator is inadvertently locked to the wrong source of sync, the new code will no longer be locked to the video or audio it was originally associated with. (It will emerge at the rate the generator is locked to.) For this reason, the generator must always be locked to the reader when dubbing code, unless all equipment is locked to a common sync generator.

The converse of this scenario occurs when post-stripping code on a videotape. In this case, the generator *must* be locked to the video output of the VTR. Otherwise the time code does not have an exact one-to-one relationship to the video frame. Instead, it floats in relation to the video, a condition known as "unlocked" code, which causes all sorts of nasty problems in video editing.

Regenerating is often referred to as jam-synching the time code, because the reader is "jamming" new numbers into the generator. It is important to know whether or not the code is being duplicated frame-for-frame. In a "momentary" jam-sync the generator looks at the reader at the start of the transfer, but then continues to count upward on its own, regardless of what comes out of the reader. This is used to replace time code that has been partially erased or has unwanted breaks. A "continuous" jam-sync (called "Transfer" by at least one synchronizer manufacturer) causes the generator to duplicate the reader exactly, even if the incoming code jumps or stops. This second method is generally used for dubbing code during video sweetening.

A simple alternative to regenerating is restoring the code. This is electronic reshaping of the time code signal so

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that the bits are clearly defined. It does not involve a generator and does not have the same inherent dangers. Some time code devices provide a Restored Code output, which can be used for dubbing code with little worry.

Time code should not be recorded at 0 VU on audio tracks of an ATR or VTR, as it tends to crosstalk. Recommended levels are between -10 and -5 VU. Also be sure that any noise reduction is bypassed on the track being used for time code.

Keep in mind that "time code present" indicators on many VTRs and ATRs actually detect the presence of any audio signal. If the light is on, but still no time code reading, patch the code output into a speaker and see if there is really time code there.

Finally, a word about Vertical Interval Time Code (VITC), a signal recorded in the vertical interval on a videotape by the video heads; it is not a longitudinal signal. The usefulness of this method, besides saving an audio track, is that the time code can be read at very slow speeds—even when the tape is not moving at all—because the video heads are always moving

I do not recommend making razor blade edits anywhere on a time-coded tape during program material.

(longitudinal code is inaccurate at very slow speeds). Hence it is excellent for locating and cueing up to exact points on the videotape (such as a sound effect "hit"). VITC can be recorded on any videotape, but requires a special generator and reader, offered as an option by some synchronizer manufacturers.

USING TIME CODE

There are a few commonly accepted practices in the video industry that should be adopted by audio studios dealing with time code. All synchro-

nizing devices require a few seconds to bring their transports up to speed and lock before the actual audio can be used. For this reason there must be sufficient time code before the audio material to allow for this preroll time. The upshot is that the standard audio practice of tight leading between cuts is a no-no! There must be at least ten seconds of magnetic tape, with time code, before each selection for adequate preroll. As much as 30 seconds might sometimes prove useful. And please, do your video colleagues a favor by applying this practice to *any* audio tapes going to video houses.

Another standard practice is that of starting actual program at the 01:00:00:00 (one hour) count. Besides being neat and tidy, this avoids the possibility of crossing the 24-hour count during preroll, which sends the transports screaming backward to find a number less than 00. Also, it is wise to start the time code at about 00:58:00:00 (58 minutes), to allow two minutes for tone, slates and silence before the show.

In a related rule, time code on a given tape should always be ascend-



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ing. If there is a point where the time code jumps backward (say, at an edit), there will be some duplicate numbers on the tape, which will confuse the synchronizer to no end.

And speaking of edits, I do not recommend making razor blade edits anywhere on a time coded tape during program material. While it is possible to make a frame-accurate splice, if any numbers are spliced out of the code, it may cause a speed glitch when synchronized or, worse yet, loss of lip-sync after the edit.

While people in video refer to SMPTE time code as "time code" or "code," people in audio seem to refer to SMPTE time code as "SMPTE." For those who don't know, SMPTE is a professional organization (it's not a gang, it's a club, the Society of Motion Picture and Television Engineers) that would probably like to collect dues from everyone who uses its name instead of the more accurate term, "time code." For that matter, SMPTE time code should not be confused with MIDI time code, MIDI Song Position Pointer, FSK or similar-sounding signals.

RESOLVING AND SYNCHRONIZING

Now that we have discussed time code and its relation to video, the final issue is relating time code to audio. Before sweetening, the audio from the video edit master is dubbed and transferred to audio tapes. The premise here is that the finished audio will ultimately be laid-back onto the videotape, so there must be a means of ensuring that the audio will remain in sync with the picture.

The link keeping the audio/video relationship intact is a time reference. Recording audio with a known time reference is like marking it with the ticking of a clock to guide it to the correct speed whenever played. Different time references have particular rates of "ticks" per second. These include video control track (59.94 per second), time code frames (29.97 or 30), pilot-tone cycles (60 Hz) or film perforations (24 per second). The key to successfully using a time reference to retain audio sync is that once established, the relationship between the audio and the time reference must never be altered from one generation to the next. How this is accomplished requires some further background...

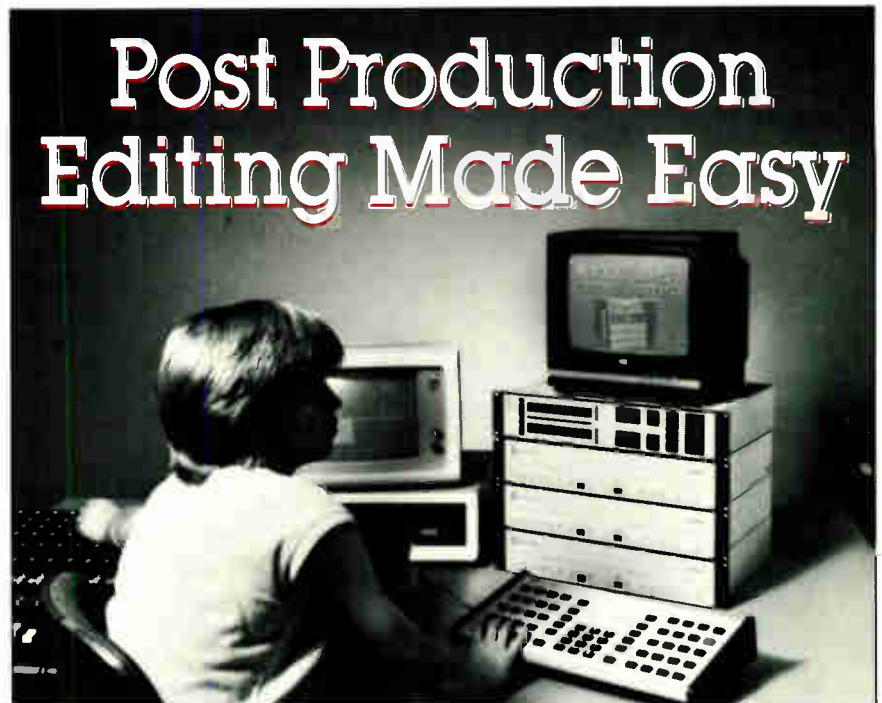
The method used to make tapes play at a speed determined by the time reference is known as resolving

the tape speed. Resolving is the process of regulating a tape's playback speed so that the time reference from the tape matches the rate of an external time reference. The resolving device continually compares the time reference signal off the tape with the desired external reference, and controls the tape playback speed (via the capstan) so that the two rates match exactly. This comparing/compensating feedback loop happens continuously, so the resolver always keeps the references locked together.

Resolving playback speed inherently compensates for speed deviations that may have occurred during record-

ing. However, the main purpose of resolving is not to keep the absolute pitch of some audio correct, but to ensure that the audio remains in sync with the video, or with the audio on another machine.

Unlike VTRs (with a control track), audio machines traditionally have no means of resolving their own speed; the ATR runs at a speed determined by an internal crystal (or the AC line frequency), regardless of the exact recorded speed of the tape. When set for "15 ips," the crystal provides a speed close enough to 15 ips for most audio work. However, when picture sync is involved, the long-term speed



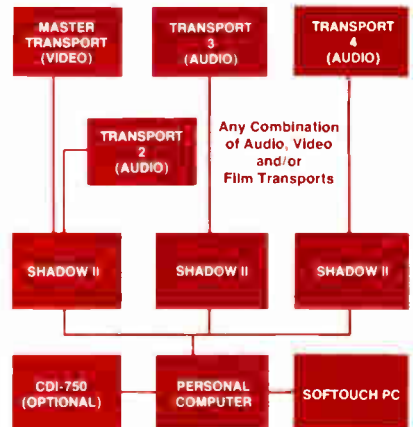
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drift of two non-synchronized machines is not acceptable. Consequently, audio tapes must use time code as a time reference. For this reason time code must be present on an audio tape for it to be run in sync with other tapes. The time code allows the ATR's playback speed to be resolved so that the audio remains in sync with the picture. It also allows the tape to be synchronized with other transports and cued to an exact location repeatedly.

For resolving to take place, the capstan speed must be controlled by an external device (the synchronizer), rather than the internal crystal. ATRs with this capability generally have

some type of interal/external selector for capstan control. A simple synchronizer runs a slave transport in sync with a master transport by using the time code present on both tapes. The synchronizer compares the time code from both machines and controls the slave transport's speed so that the slave time code is playing at the same rate as the master time code. Thus, the slave tape is resolved to the master time code. The actual speed of the master is not an issue since the slave locks to it precisely. Likewise, any variations in the master tape's speed will be followed by the slave.

During sweetening, tachometer

(tach) pulses from the transports may be used by the synchronizer to keep rough track of tape position when time code cannot be read (such as fast-winding). This is known as tach-pulse updating. But only the time code can be used to resolve the ATR's speed, because the time code has the precise relationship to the audio necessary to retain sync with the picture.

PROCEDURES FOR AUDIO AND TIME CODE

Because the sweetening process involves a number of audio and time code transfers between tapes, care must be taken so that the audio and time code never become "unlocked" from one another. These types of mistakes are the easiest to make and, naturally, are the hardest to repair.

Basically there are two methods for recording a tape that preserve the original relationship between the time code and audio.

The first method is to record the audio and time code simultaneously, with the recorder's capstan speed internally locked. This applies when the audio and time code already have a fixed relationship (for example, from the edit master). Since they are recorded onto the tape at the same time, they are subject to the same speed variations, and their relationship remains constant. Even if the recorder is running off-speed, when the tape is later resolved to the master time code, the playback speed adjusts so that the audio is correct.

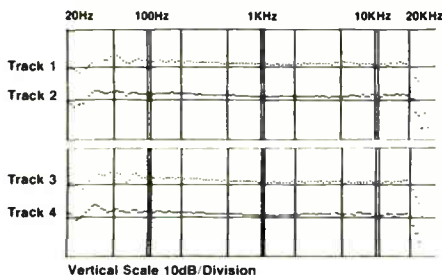
The second method is to record the time code first and resolve the ATR while the audio is recorded. In this case, the tape always runs at the correct speed while recording the audio, because it is already resolved to its time code. If this method is used when transferring audio and time code tracks, there must be an external reference for the recorder to resolve to while the audio is transferred, and this reference must already be related to the audio. The external reference usually comes from the source tape providing the transferred audio (or from a sync generator).

Either method results in a tape that can be resolved so the audio plays at the correct speed at all times—that is, the speed that keeps it in sync with the related video. The chosen method depends on the circumstances at the particular time. Most disasters result

—CONTINUED ON PAGE 142

EXCEPTIONAL FREQUENCY RESPONSE

AT 1 7/8 IPS (REAL TIME)



TEST METHOD A 40KHz to 20Hz sweep at -20dB from a Sound Technology 1510-A was recorded at 1 7/8 ips in a KABA slave deck on TDK SA tape. The tape was played back at 1 7/8 ips in the KABA master control deck and the output displayed on the Sound Technology. The curves represent the SUM of the record and playback response of the KABA system at 1 7/8 ips.

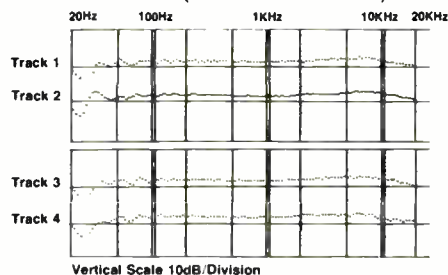
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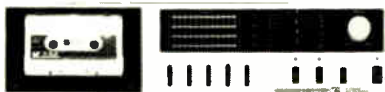
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EXCEPTIONAL FREQUENCY RESPONSE

AT 3 3/4 IPS (DOUBLE TIME)



TEST METHOD Same as above except the sweep was recorded at 3 3/4 ips on the KABA slave deck and played back at 1 7/8 ips on the master control deck. Highest frequency on playback was 20KHz so there is no response beyond 20KHz.



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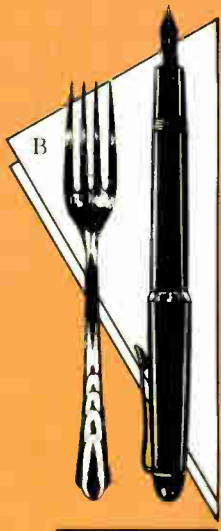
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World Radio History

by Mr. Bonzai

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After nearly two decades of making records, the soft-spoken David Kershbaum has a sterling reputation for producing platinum results from real artists. His thrust is subtle, never flashy. He's a nice guy with a gifted musical touch. Is it possible for a nice guy to finish first?

Nineteen eighty-eight was a big year for Kershbaum and his Powertrax studio in Hollywood: Tracy Chapman, Shadowfax and a number of record and film projects riding the crest of success in this spring of '89. Go way back to find his first hit: B.W. Stevenson's "My Maria," followed by consistently tasteful, good fortune with Cat Stevens, Joan Baez, Joe Jackson, Richie Havens, Duran Duran, etc.

Kershbaum's studio is a classic

Wally Heider room, with tubes in the mics and outboard gear, and a new digital "engine" with computerized flying faders. Let's climb in and cruise with the driver. . .

Bonzai: How did you get together with Tracy Chapman?

Kershbaum: Tracy was the end of a search that started for me two years before we actually met. I had been traveling between here and England, as I do when I find myself getting bored with Stateside music—trying to find any clues as to its new directions. My roots are in acoustic instruments and real sounds, and I felt that music was going to turn around again and go in that direction.

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years or so, music swings in a completely opposite direction and stylistically starts over again. The new artists grow up, become sophisticated and get bigger budgets to make records and change their lifestyles. While that process is taking place, a new wave of artists develops who will carry the ball through the next period. Ultimately, the cream of the crop rises to the top and keeps on going. Another layer sounds like the trend setters, goes for a bit of time, then dies. Then there are the followers who make a few records and you never hear from them again.

I felt like we were approaching one of those times of change, and I was getting bored with what was going on. I wanted to produce something that would go against the grain again. Politically, socially and economically it was a time of transition, where I thought people might want to really start listening again, and music would be of deeper interest. But I didn't know who it was going to be and how it was going to be done.

I got a call from Don Ruben at SBK. He told me he had a singer. They were looking for someone to do a record with Tracy—a simple, direct, acoustic, in-your-face thing. He described her as an urban folk artist who was found on a street in Boston singing for 30 people. "She's wonderful, she'll move you. Is this of interest to you?" A light went off, and I said send her tape immediately.

On the cassette were 15 songs with just Tracy and her acoustic guitar, basically the way she did them live. I immediately arranged to meet her in New York. Then she came out to Los Angeles where we discussed concepts and spent one afternoon looking for the correct vocal mic. I lined up every mic I could find and discovered she sounded good on all of them. We ended up choosing a U47 tube that had just a little more richness.

I wanted to avoid changing Tracy's basic sound. I felt we could make a statement, but that I had to beware of falling into the pitfall of too many overdubs and too much layering. As long as I had her miked correctly and completely out in front, we would fulfill the task of preserving who she was. I decided to make the record backwards, the way I made records in the early days. Start with the vocal, add

the acoustic guitar. Get that right, then fill in the blanks. Rather than make a track, make it hot and then drop the artist on.

I got Tracy's vocal sound, and we spent some time getting the guitar sound. Then we invited a large number of musicians to come in, and for two days we listened to combinations of top studio bass players and drummers. I knew that if we were going to basically cut this live, as a three-piece, each element was going to be a third of the track and had to be played well, supportively enhancing what Tracy was doing. We compared and found the right players for the right combination: Denny Fongheiser on drums and Larry Klein on bass. We also brought in Jack Holder for some guitar and keyboards. He's got a real stamp, with emotion and a great feel. I felt the record had to be sparse, and the sparseness was the key to the shock value of this project. However, it had to be sparse in the right way, or it wouldn't hold your attention. The colors and the people had to be exact.

Bonzai: In Japanese painting, the space surrounding the subject is essential. The positive elements and the negative space exist because of each

other. Did this album have a similar concept?

Kershenaum: Yes, it really did, and it was an exercise in discipline. We had to forget all the rules and take a new perspective, not unlike what happened in '79 when I made the first Joe Jackson record. It was another case of going against the grain and doing something simple with a new perspective.

Bonzai: Even with your enthusiasm, did you imagine the Chapman record would become such a major success?

Kershenaum: I couldn't be completely objective about it. I was so overwhelmingly happy to be making the record because of what she was saying and who she was. However, after making 75 albums, you get to the point where you know deep inside whether something is special. You can't say how well it will sell, because nobody knows that. If we could predict sales, we'd be multibillionaires.

I felt that what Tracy was doing would touch people. What I didn't know was how the system would react. I didn't know the opportunities. I knew SBK would do a great job; Elektra seemed to be into it. All of us were pleasantly surprised that it happened

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as fast as it did, but none of us thought we would be looking at 7-plus million records worldwide.

When the record was released and marketed, it went against the grain. There was no single in the beginning, although "Fast Car" became a hit. The album had a life of its own. Everything about it broke all the rules. But a lot of industry people were rooting for it. Many wanted to see this type of music become successful. There was truth and heartfelt communication in the record that stopped people in their tracks. The time was right for her statement. It was unusual for someone to be as vulnerable and exposed as she was. It got to people.

Bonzai: Does a record like this downplay the role of the producer, as opposed to a record where the producer takes the raw material and completely shapes it?

Kershbaum: I've always produced records this way. It's always been enhancement. When I have attempted to manufacture records, they have turned out stiff. A producer is only as good as the artist. What we are supposed to do is recognize raw talent and understand how to pull all the elements together to achieve in the final product what was precious to begin with. Most of production is taste, and you try not to get too much of yourself into it. Enhance and support, and you end up with the best of the artist.

Bonzai: Who was the first artist you produced?

Kershbaum: B.W. Stevenson. I found him in Texas while I was with RCA. The first album was country-folk and got a lot of critical acclaim in 1974. We recorded "Shambala," but Three Dog Night had the hit. We came back with "My Maria," a major hit for him.


Bonzai: Let's go back further. Can you remember your first experiences in music?

Kershbaum: I grew up in a small Midwestern town and wanted to play music by age 5. I started out with a little toy piano. Around age 6, I started teaching myself guitar and later took lessons. I was fascinated with sound and recording. I had a disc-cutting adapter for the record player and was in heaven making records when I was 10 years old. I had amplifiers and P.A. systems in my room and put the speakers in the back yard and would do my


own little shows from the bedroom for the neighborhood kids. Finally I got hold of a 2-track recorder and began mixing my voice on one track with records on the other.

Later on I got into the local radio station and hung out in their little 2-track studio. Then I formed a band called David & the Boys Next Door. We played resorts and socials. After a lot of pushing and shoving and begging and scratching, I got some introductions.

After school, I moved to Illinois and worked at an advertising agency. The owner and I went into partnership with a recording studio to do jingles and commercials. Then I had my own setup and started working with groups at night. I brought those tapes out here to Los Angeles during the days when there were staff producers. It was 1971, and I had been out here a week and was out of money, out of



Most of production is taste, and you try not to get too much of yourself into it.



time. CBS and RCA were interested and then the earthquake hit. CBS's office caved in, so I met with RCA and went with them. They moved me back to Chicago, because I knew that area and they wanted me to head the office. I was given the opportunity to build up the operation in Chicago. At age 23, and starry-eyed.

Bonzai: You must have cut quite an impressive figure to land that job. . .

Kershbaum: I just said the right thing to the right guy at the right time. Mort Hoffman, a vice president, liked my tape. He became my mentor and gave me that first break. Eventually, they closed the studio in Chicago and moved me back out here.

I stayed a year-and-a-half, then decided to go independent. It was tough for the first year, but I was introduced to Jerry Moss and produced the *Diamonds and Rust* album for Joan Baez at A&M. That led to an eight-year relationship, which included going to Eng-

land to produce some acts for the label.

At A&M I produced a number of new artists. One day Jerry asked me to take an office as an A&R man and producer—still not exclusive with A&M. I had some success but felt the music here was getting stale, and I asked to go over to England. I went for a summer with Derek Green and, near the end of my stay, I got Joe Jackson's cassette from his publisher, John Telfer. On the tape was "Is She Really Going Out With Him?" and other key cuts. I realized I had found what I was looking for. We signed Joe that weekend and made the first record in about two weeks. It became a hit.

Bonzai: Does the pressure to work that quickly refine your chops?

Kershbaum: Oh, yeah, plus the fact that we were going for something semi-live with a certain rawness. The record became high-profile in England and then shifted over here about the same time The Police broke. The vice president of A&R resigned, and I was offered the job, a three-and-a-half-year commitment, but I felt it would be my "graduate school." You can become isolated working as a producer, and this was an opportunity to learn about business affairs, marketing and promotion. And a chance to be involved with interesting artists.

Bonzai: In studying up on your career, I listened to Joe Jackson's *Big World* album. At first, I wasn't aware that it was recorded live. I had to go back and listen again—an amazing piece of work.

Kershbaum: Thanks. To me, Joe's like a young Gershwin. He's always been able to come up with arrangements and styles that are never the same. He never really liked recording in the studio; he's a real performer. Around the time of *Body and Soul*, he had the idea to start recording semi-live. We searched all over New York for a big room and ended up in a 19th-century Masonic Temple. We built a control room, and the idea was to record live-to-2-track. But because of the magnificent acoustics of the room, there were problems. You had to raise the piano lid and put the mics high enough to get the benefits of the room. When we did that, the horns obliterated the piano. We would have had to use special techniques to get everything. We ended up recording live-to-32-track, then adding a few overdubs and mixing.

A black AKG C568EB short shotgun microphone is shown diagonally from the top right towards the bottom left. The microphone has a distinctive ribbed texture on its upper section and a small switch on the lower section. The background is a light, textured surface.

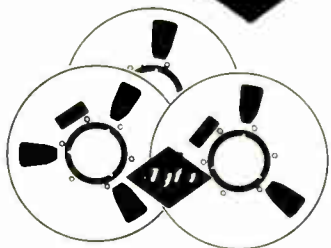
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LUNCHING · WITH · BONZAI

We planned ahead for the next project and found a room to use with a remote truck. We ended up in Tammany Hall, an old union hall. Joe wanted to perform live with an audience. Every song had a different mix level, with lots of different instruments and levels. Michael Fondelli did that record with us and created templates for the Neve console, which were different for each song. I mixed one side of the board, he mixed the other. We practiced for about ten days in clubs to get the moves down. Then we set up at the hall—the ambience was totally different. We had a film crew and an audience, and we were scared. We ran back and forth to Bill Ludwig's Masterdisk to try and figure out the EQ curve during the last hours. We finally got rid of a standing wave by putting a big piece of fabric over the stage to stop the sound from going up into this dome and resonating.

It was a risky undertaking. Joe hired his own film crew at his own expense to film this thing. He was about three-quarters through a soft piano song and a cameraman was standing near him, talking to the crew. Joe just stopped and told them to quiet down or he was canceling the show. The audience went silent. He took it again and pulled it off great. It was like a sporting event, with the audience rooting for us. We put it together with digital editing, no mixing. All live-to-2-track digital. When we were doing it the sweat was running down my face, because if you missed a cue, the cut was marred permanently. [For more on the recording of *Big World*, see *Mix*, June '86.]

Bonzai: Do these hair-raising challenges help you with the more leisurely recording in the studio?

Kershenabaum: It keeps you on your toes and fine-tunes your abilities. And I suppose the live recording with Joe was the predecessor for the types of recordings I'm doing now. You have to get all the elements together and record them live. That got me into the practice of recording tracks live, versus the tedious hours of layering. A spontaneity comes from live recording that you can't get any other way.

Bonzai: What about your early aspirations as an artist?

Kershenabaum: I went through a short period of wanting to be an artist, and I found out as my ears got better

that my talents [laughs] were really on the production side.

Bonzai: Give me some quick impressions of some of the artists you've worked with, starting with The Everly Brothers.

Kershenabaum: That was right after B.W.'s record. I co-produced that record with Chet Atkins—a major experience because I've always admired him so much. We did it in Nashville. Their harmonies were absolutely phenomenal, and although there was tension between the two of them, you would never guess it from the way they sang together. It was strictly professional, and it was like a homecoming because they hadn't worked in Nashville for many years. It was a great learning experience for me.

Bonzai: How about Joan Baez?

Kershenabaum: Joan was at a point in her career where she wanted to take a step toward something more commercial and accessible. She always had a captivating voice. Very intelligent artist—knew who she was and what she wanted to say. But it was a bit of a sidestep for her because she had decided to do a commercial set of songs. Maybe because it was an early break for me, my first album at A&M, maybe because it was my first overall success in that period—but for me, *Diamonds and Rust* was a special treat. There is a warm feeling about that record. I really felt we were making an important album.

Bonzai: Supertramp?

Kershenabaum: Another highlight. Supertramp was a group of musicians I admired for their creative excellence and the unique touches they had in their records. It was another pressure situation, the first record without Roger Hodgson, Roger and Rick [Davies] were a team, and it was a long project, but an interesting one. Great players.

Bonzai: Ozark Mountain Daredevils?

Kershenabaum: Their big record was "Jackie Blue." They were all from the same town I came from in Missouri, so we were old school friends. We got together at Caribou Ranch for the record. It was like going home for me.

Bonzai: Duran Duran?

Kershenabaum: They came along when I had just left A&M. I recorded *Night & Day* with Joe Jackson, then left A&M to produce independently. About that time, Duran Duran released "Rio." It was strong everywhere in the world but hadn't broken in the States. Rupert Perry, who was then the head

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of A&R at Capitol, asked me to listen to them and think about making some changes. I met with the group and remixed "Hungry Like the Wolf," then additional tracks for an EP. Most of the remixes were part of the album that was re-released here and became very successful.

Bonzai: What did you change?

Kershenbaum: Some vocal things, some arrangements, some instrumentation and a lot of mixing.

Bonzai: Any tips for aspiring artists?

Kershenbaum: Keep showing up. Talent is something you sometimes don't get agreement on. It's all so subjective, and opinions change, so you have to go down into the depths and be truthful with yourself and understand who you are. Get a fix on what you want to express and hold onto that belief for dear life. Along the way there will be barriers, disappointments. It may sometimes look like you're going in the wrong direction, but stick to your vision and don't be influenced by negative opinion. And keep showing up. If destiny is there and the time is right, with all factors considered, with persistence, and if

your talent was accurately judged by yourself, then you have a shot. But you will face a lot of obstacles. There is such a lack of agreement and a "machine" setup that discourages rather than encourages what you are trying to do artistically. It takes an incredible amount of commitment and belief in yourself. You can't let yourself be pulled down.

Bonzai: Let's talk about your studio, Powertrax. You've got one of the only two existing sets of George Massenburg monitors, two Mitsubishi 32-track digital machines, some nice, old tube limiters, a 56-input API custom board and this new Neve/Martinsound Flying Faders system. I've read about your use of computer assistance in mixing, in conjunction with the manual touch.

Kershenbaum: Some people don't mind going from room to room, but I'm very sensitive to the differences. I want to know exactly what I'm getting so that I can concentrate on the creative aspects. I don't know why I took so long in developing my own studio. I didn't want to build something and be disappointed, so I chose the established "Wally Heider" Studio 4 because it was a proven room, and there

are very few of those left. The monitors were already in place, which is a major factor—monitoring is everything. It was important to have an environment that could augment what I wanted to do production-wise. It was important to have a place where you could record drums and acoustic instruments.

Everybody has their own opinions about consoles; at a certain level it becomes a matter of personal taste. I wanted a pure sound, something simple, and the shortest chain between the musician and the tape machine. The API components suited me.

As for the computer, I used one of the very first Neve computers with Cat Stevens at AIR Studios in London. I was fascinated, but I felt there was a tendency to lose some of the passion in the mixing. Mixing is really somewhat of a performance. However, as systems reached new plateaus, there were some key advantages to having a computer. One of the major advantages [with our system] is that it really isn't obtrusive. You don't know it's there unless you want to know. You never have to tell it to go from one location to another. Basically, you don't have to address it at all, but it

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remembers everything you are doing. When you finally get the performance/mix you like, you can look back in the computer and say that's the one. Then you can continue and make the enhancements. You can run a number of different versions and keep the original.

Also, the Martinsound is three times more accurate than any other system out there. It's got three times more null points, so when you do make the moves they are remembered with incredible resolution. It also has some new bells and whistles, grouping possibilities, etc. But it was the fact that you don't have to be aware of it that was most important to me.

Another factor: when you first cut a track, sometimes it's magical, perfectly balanced, and there is enthusiasm. A rough mix can be wonderful, then when you really start to mix, you try to capture that rough beauty. I am going to have the computer on all the time, so I can have all the balances and actually overdub in balance. So when I am ready to do the final mix, the record is almost made. I'm doing it as I go, rather than deciding at some point it's time to finish and mix.

Another reason for the computer is

that you may feel everything is perfect, but the record company says they need another version. Easy to recall and adjust. It's a supportive tool, which is where technology should be.

Bonzai: This was a co-development with Neve?

Kershenbaum: Martin developed the system, and Neve bought it to market it. We are beta-testing the system at the moment and have the first installation.

Bonzai: What can we look forward to in 1989?

Kershenbaum: I have a lot of records coming out. Powertrax is the beginning *and* the long-range concept. I set up this company to be multifaceted. It's a full studio, and I am building a second digital room with a Neve 8048: classic 4-band EQ, my other favorite. It will allow me to handle more projects. We've started a publishing company with BMG to develop writers. We're also moving into film music with another new company called The Music Department, a partnership with Jackie Krost, former vice president of music at Lorimar. My first job was supervising the music for the new Patrick Swayze movie, *Next of Kin*, for Warner Bros. My first soundtrack for

A&M is a new Orion picture, *Bill and Ted's Excellent Adventure*, a trek through time with rock and roll.

As for new artists, Show of Hands comes out shortly, an album of intelligent songs made in the fashion of Tracy's, although it doesn't sound like hers at all. An interesting British singer, on PolyGram, Labi Siffre—early '70s feeling with some R&B. The Pilgrims, an MCA act from New York—interesting '70s parallels, early Grace Slick, lots of character and charm. Peter Himmelman on Island. Another Tracy album finished up in March. Latin Quarter—a stylized, moody thing. Marshall Crenshaw. And The Burns Sisters on CBS.

Bonzai: If you had your chance to work with anyone at all...?

Kershenbaum: Bryan Ferry and Mark Knopfler have always interested me. Van Morrison, too. I go for artists who have definite character—a voice, a message, a simplicity—so you can hear the heart. Style or format doesn't matter. ■

Mr. Bonzai is Mix's editor-at-large, interviewing interesting personalities and getting a few lunches out of the deal.

so an entire effects rack can be selectively routed to the console.

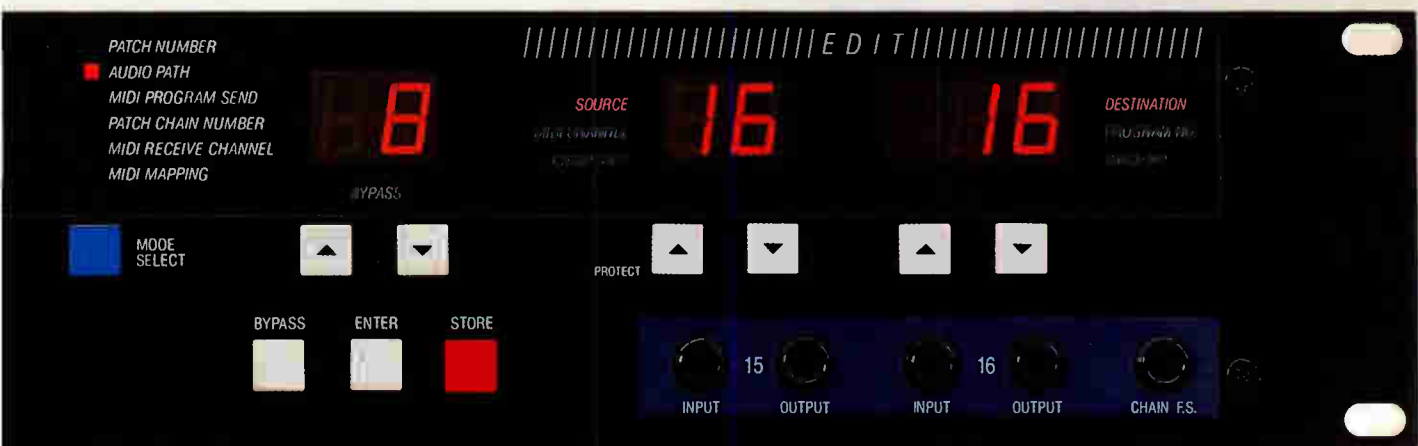
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CHRISTOPHER CROSS

FINDS INSPIRATION AT HOME

Appropriately, "Hotel California" was blaring on the car radio as I approached the condominium complex where Christopher Cross lives, for the building resembles the Eagles' album cover. Amid a residential area of West L.A., the Spanish-style, 4-level unit houses Cross' domestic and professional lives. (At the beginning of the year, Cross moved his studio intact to a new home in Santa Barbara.) The 7 x 20 x 10 basement studio connects to the garage, which is convenient for the load-in of equipment, live rehearsal and even some recording.

At first glance, the stained-glass flamingo (Cross' logo throughout the years) makes Pop 'N' Roll look like an authentic pro recording studio. It only takes a minute to notice that the equipment is far more than the average "home" studio situation. It's obvious that a great amount of time and money went into this studio.

For Cross, no price was too high for the much-needed creative kick provided by his own studio.

"In the last two years, I've rediscovered my passion for music, and that's worth it all," Cross says, "because if I



can come down here and write one hit song, then it's paid for itself. Between '85 and now I didn't want to get up and go to school," Cross admits. "I didn't want to work, I didn't want to write, I had lost the passion. If this is what it takes to get me back into it, then great."

In fact, Cross sounds extremely positive about the future, considering that Warner Bros. axed him from the label just the day before this meeting. In a way, it seems like a relief to the man who brought them a debut LP that spawned four hit singles and won five Grammys, for he's tired of being expected to write "Sailing II."

Before his termination, however, Cross completed *Back of My Mind*, his fourth effort for the label, which was recorded almost entirely at Cross' own 24-track studio. Cross is very proud of that. For a guy who used to only know how to string his acoustic guitar, he marvels at his progress.

"I couldn't even plug in a microphone unless someone was there to help me," he laughs. "I once had an old MCI board strewn about my living room, but being an in-line console, it was very difficult for me to learn. Then I sold the MCI, got a DDA board and started getting new toys, putting everything in racks (made by K.K. Audio). Everything is on multipin connectors, so I can take the racks to use live or to mix someplace else. I can disconnect this whole room and plug it in in an afternoon, because nothing is on the floor.

"The problem was learning everything, because once I started buying the gear, I realized I wouldn't be able to afford having an engineer here full time. While all this was happening, I was at Pat Leonard's place working on a record, and I looked at his Mac like a caveman would fire. I left there thinking that not only did I not understand what he showed me, but it terrified me. A friend of mine brought a Mac over, though, and once I got over the initial fear, I became an addict.

"This is a home studio, but it's a pro studio," Cross says of the studio designed by Chet Himes and James Wofford, with wiring by MVB Services. "I don't have automation, although I am looking into that now. I don't have an SSL or a Neve or a 32-track Mitsu-

—CONTINUED ON PAGE 150



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NEW PRODUCTS



Tascam CD-701/RC-701 CD Player and Controller

Compact discs can be handled Tascam-style now that the Montebello, California-based company has come out with the CD-701 CD player and accompanying RC-701 control unit. The combined two-box system features an auto cue function, event play, link play and an optional RAM buffer that allows immediate play and continuous looping between two points—great for expanding FX, ambience, etc. The player itself boasts oversampling digital filters, 16-bit D/A converters and an internally switchable, monitor-mode line output. The control unit runs up to four CD players, can be

programmed for up to four events and provides $\pm 6\%$ pitch control and frame-accurate search using its dial or numeric keys. The CD-701 lists for \$1,999; the RC-701, \$1,249.

Circle #144 on Reader Service Card

Soundcraftsmen 300X4 Power Amp

This new amplifier from Soundcraftsmen (Santa Ana, CA) works in 2-, 3- or 4-channel configurations. It delivers 600 watts per channel (2-channel use) at 8 ohms. Supplied in a 3U rack-mount chassis, the 300X4 contains two independent power supplies and two power transformers, which share a power cord, and provide clipping, mode and over-temp indicators. Retail price is \$1,299.

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Dorrough Signal Set

The 1200 Stereo Signal Test Set from Dorrough Electronics (Woodland Hills, CA) allows measure-ment down to -75 dB and can measure the stereo program signal in the Left and Right or Sum and Differ-

ence formats. It includes two loudness meters to indicate peak amplitude and the average on one simultaneous display. Stereo broadcast facilities will find it handy for level set and checking crosstalk and balance.

Circle #146 on Reader Service Card

Acoustic Systems Announce Booths

Acoustic Systems (Austin, TX) announced the debut of its prefab, acoustically engineered, voice-over booths. The BB line of booths, available in ten sizes from 3-foot, 8-inch-square to 8-foot, 8-inch-square with standard 7-foot inside height, are constructed with 4-inch panels providing a 45 STC rating. Standard features include: carpeted floor, mounted on vibration-isolation rails; prewired duplex outputs; quiet ventilation system; prewired lighting; recessed conduit run; durable, enamel paint finish; and two double-glazed windows. Many options are available. Call the company's toll-free number ([800] 531-5412, outside Texas) for more info.

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Monster Fiber Optic Audio Snake

Said to be the world's first high-resolution, multi-channel digital audio fiber-optic cabling system, the OptoDigital LightSpeed Model 12 from Monster Cable (San Francisco) allows sending up to 12 mic/line signals up to 3,000 feet through a lightweight optofiber about the diameter of a toothpick. The 12 channels are digitized at 16 bits/48 kHz (a 200kHz recording version will be offered at a later date), multiplexed and optically transmitted to a rack-mount unit at the console, with complete



freedom from ground links, EMI and RFI. This system also provides a substantial savings in bulk and weight: a standard 500-foot snake weighs hundreds of pounds, while the Monster system could easily be carried by one person.

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Sennheiser MKH 70 Shotgun

Whether you need a fish-pole or handgrip mic, the MKH 70 P48 supercardioid, condenser shotgun mic from Sennheiser (Old Lyme, CT) fits the bill. This mic weighs in at a mere 180 grams and features a smooth off-axis frequency response (70-20k, $\pm 2\text{dB}$), and according to the manufacturer, a "virtually unperceivable" noise floor. Its push-pull capsule prevents intermod distortion at SPLs up to 124 dB (131 dB when the switchable pad is in). The MKH 70 incorporates the same RF principle that earned Sennheiser a technical Academy Award for shotgun mic development.

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**Milab D-37
Microphone**

Designed to withstand the abuses of the road, the new D-37 dynamic cardioid microphone from Milab (distributed by Klark Teknik, Farmingdale, NY) is constructed of solid brass. It features a heavily shock-mounted, moving-coil element, pop protection and a 50 20k Hz frequency response with a boost in the vocal/presence range.

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**Spectral Synthesis
SynthEngine**

The latest digital audio workstation to enter the market is the modular, expandable, user-configurable SynthEngine by Spectral Synthesis (Redmond, WA), complete with *AudioCAD* software. Hardware consists of a rack-mount PC AT-compatible running at 12 MHz (or optional 16 MHz), plug-in "SynthCARDS" for

digital signal processing (which share data over a proprietary, high-speed FlyBy bus) and an optional tabletop control console, the "DashBoard." For the cleanest possible analog output signals, D/A conversion is accomplished in shielded, 16-bit modules external to the SynthEngine that run at sample rates up to 96 kHz. System capabilities include: process real-time audio input or previously recorded digital audio; use of sampling methods, modular algorithmic construction or a combination of both methods to develop sounds; process and synthesize simultaneously; provide tactile analog input controls; process MIDI data streams in real time; respond immediately to MIDI software; provide digital output directly to DAT, CD player or AES/EBU-standard devices; perform digital mixing of multiple channels; and much more. A basic, complete SynthEngine system retails for \$14,950, while a "Starter Kit" for IBM-compatible PCs (includes FlyBy bus controller, one SynthCARD and *AudioCAD* software) lists at \$1,995.

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**TimeLine Lynx
Keyboard
Control Unit**

The compact, stand-alone Lynx Keyboard Control Unit from TimeLine (New York City) provides comprehensive, programmable machine control for up to six tape machines or film chains, via Lynx time code modules. Time codes can be captured, calculated or manually entered. Controls are grouped by function and programmed for operator ease. Other features include: 2-line x 40-character, alphanumeric display; large transport control buttons; jog/shuttle/trim wheel for precise positioning and trimming; automatic transport offset calculation via "sync-points"; user-programmable macro function keys; individual transport status LEDs; and two GPI closures.

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multiple tasks, and also provides: four channels of digital I/O in AES/EBU or Sony DIF format; four RS-422 serial ports; and ability to support 44.1 and 48kHz sample rates. On the software side, the company offers the Sonic Operating System, and its first applications package, *CD Pre-Mastering Desktop*. This provides digital editing, mixing, EQ, dynamics and project management functions. Other features include record playback of four channels in/out, a "mixing desktop" with up to four EQ sections per input channel, one dynamic section per output channel and 4-channel-to-2-channel mixing, session automation and much more. Other applications packages are forthcoming.

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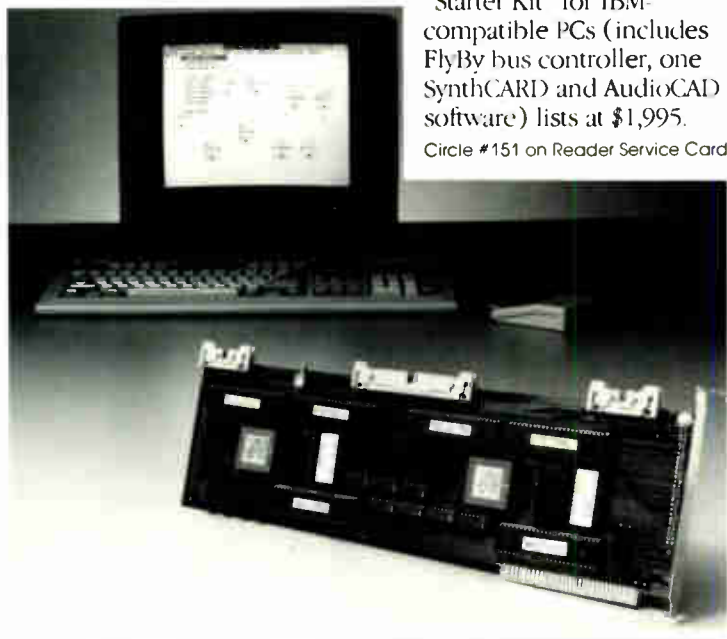
**Sonic Solutions
Sonic System**

Sonic Solutions of San Francisco has unveiled its Sonic System, an Apple Macintosh-based system that helps in the preparation of master recordings. Hardware includes a Macintosh II, SCSI Winchester hard disk drive and a Sonic Signal Processor (SSP) circuit card for the Mac. The SSP can split its four signal processors to simultaneously handle

**Ampex 472
Cassettes**

From Ampex (Redwood City, CA) comes the new 472 studio audio cassette, the first tape made specifically for studio use. The cassettes are available in Type I normal bias and Type II high bias configurations and a wide variety of lengths (from five to 90 minutes).

Circle #154 on Reader Service Card



Sine Systems News Director

Radio news directors have been addressed directly by Sine Systems' News Director (distributed by Broadcasters General Store, Ocala, FL), a microprocessor-controlled, 16x2, program audio and monitor routing switcher. Analog CMOS switches handle all audio routing duties, while automatic level control can be selected to any of four control speeds. The unit contains speaker and headphone amps, a clock, manual event timer, various audible alarm/timers, recorder-start function, automatic dub function and other features. Installation is facilitated by three input/output connectors and a changeable operating legend on the front

panel to identify source assignments.

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Interface Location Mixer Modules

The 200C input module has been developed by Interface Electronics (Houston, TX) for its Series 200 location mixers. Interchangeable with the 200B module, the 200C provides similar features and specs, except it draws less current and adds mid-frequency EQ that is continuously tunable over the 400-6k Hz range. It lists for \$375. Another new mixer add-on is the I2 intercom module (\$500). The basic 8x2 mixer is \$3,900, including eight 200C modules, master section and road case.

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Audio + Design ProDAT 1 & 2

The ProDAT from Britain's Audio + Design (U.S. headquarters are in Arlington, VA) integrates Sony's DTC-1000 R-DAT unit into a 3U, rack-mount configuration. It can be supplied complete or as a retrofit to existing Sony decks. In addition to the player's standard functions, the ProDAT 1 provides: electronically balanced, analog

inputs/outputs; EBU digital ins/outs; 44.1 and 48kHz sampling rate; and copy-defeat. On top of these, the ProDAT 2 includes a 1630/1610 interface, preemphasis on/off, word-clock out and video sync; selectable digital source input with signal available in parallel on all three digital outputs; and optional Apogee filters.

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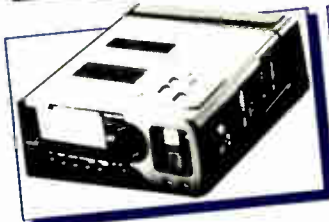
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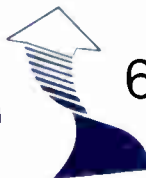
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by George Petersen

PRODUCT CRITIQUES AND COMMENTS

O

OTARI MX-50 2-TRACK

With all the headlines about digital, DAT, DASH and ProDigi, one might assume that the analog 2-track format has gone the way of horse-driven buggies, 78 rpm and spring reverbs. This notion bears little resemblance to reality in light of analog 2-track's unparalleled, international status as the most widely used professional stereo tape format, particularly among broadcasters. Since it combines a respectable amount of audio-punch-per-dollar with simple, yet highly accurate, editing capabilities and a worldwide user base, it's a safe bet this format will be around for years to come.

At last fall's AES Convention, Otari introduced the MX-50, a low-cost (\$2,495 list), fully professional machine. The MX-50 does not replace the popular MX-5050B, but it offers surprisingly good audio performance at a lower cost thanks to advances in electronics and engineering, and through the elimination of some non-essential features such as mic pre-amps, tone oscillator and cue speakers.

Physically, the MX-50 is compact (18 × 17.25 × 8.5) and weighs only 55 pounds. The deck can be used in a vertical or horizontal position (a slanted connection panel allows it to be used on its back without interfering with the AC, input/output, synchronizer or remote connections). Mounting options include a rack kit.

The standard configuration is 1/4-inch, accepting from 5-inch to 10.5-inch reels; removable NAB hub adapters are standard, and the machine comes factory-aligned for Ampex 456 tape, with a free 10.5-inch reel included. A rear panel switch selects IEC or NAB equalization. Inputs and outputs are XLR-type set at +4 dBm, and internal jumpers allow operation at -10 dBm levels, if desired. Both 7.5/15 ips

and 3.75/7.5 ips versions are available, and although an internal jumper selects the desired pair, field conversion is required for equalization.

The MX-50's speed-control capability is extremely versatile, with switchable modes for fixed speed, ±7% varispeed and ±50% via external controllers—such as synchronizers or the Eventide Broadcast Ultra-Harmonizer (reviewed later in this article)—or the optional Voice Editing Module. VEM is a \$250 option that doubles the playback speed of 7.5 ips material and routes the audio to headphones through a simple but effective one-octave pitch change circuit that uses a Yamaha chip. It would be nice if the pitch-shifted audio could also be routed through the main outputs when



AUDITIONS

using the VEM; perhaps Otari could offer this as a switchable option on future models.

I highly recommend the VEM to anyone who edits a lot of voice tracks, especially for news and documentary work. In the most literal sense, it really speeds up the editing process, without requiring the operator to spend hours listening to tracks that sound like Alvin, Simon and Theodore's outtakes. The pitch shifting won't win any awards, but it is serviceable and gets the job done. VEM is also an option on Otari's MX-55 2-track, the MX-50's bigger sibling.

One of my current projects is engineering monthly, one-hour news magazines for release in Japan, and I had a chance to check out the MX-50's edit capabilities first-hand. The deck handles editing chores like a champ, and its return-to-zero, single cue-point memory, real-time hours/minutes/seconds counter (with large, bright, numeric display) and tape-dump functions performed flawlessly. The deck has no cue speaker, but its headphone amp is quite loud; I rarely needed to listen with the control turned past half volume.

The manual that originally came with the MX-50 was marked "Preliminary," and can only be described as truly bad. In fact, it didn't even include a threading diagram, which is a prerequisite to passing Tape Recorder Documentation 1A. Fortunately, I have since received a copy of the "Edition No. 1" manual, which is clear, concise and complete, including schematics, parts lists, diagrams and well-written operation and maintenance sections. Better give Otari a call if you own an MX-50 and don't have this improved text.

Overall, I was impressed with the MX-50's edit features and smooth transport characteristics, but what sur-

prised me even more was the machine's audio performance, which was remarkably clean for a 1/4-inch, 7.5/15 ips deck in this price range. Whether you need a primary or additional 2-track for a radio production room, video suite, broadcast facility or small recording studio, Otari's MX-50 is worthy of your consideration.

Otari Corporation, 378 Vintage Park Dr., Foster City, CA 94404, tel. (415) 341-5900.

EVENTIDE H3000-B BROADCAST ULTRA-HARMONIZER®

About a year ago, Eventide began shipping its H3000-S (studio version) Ultra-Harmonizer to an anxious audio community, which had heard its audio prowess demonstrated at AES and NAMM shows and was stunned by its versatile bag of tricks. Offering more than 60 stereo reverb, effects and pitch-shifting programs (at full 20kHz bandwidth), with an extremely easy-to-use, front panel design, and priced at \$2,495, the H3000-S was an instant success for Eventide. It's a tough act to follow, but now the software wunderkind from Little Ferry, New Jersey, has unveiled the H3000-B, a version of the Ultra-Harmonizer tailored specifically for the needs of broadcasters.

The bad news first. The H3000-B will cost you a little more, listing at \$2,995. Now the good news: you'll get a lot more bang for the buck. . . literally. And if you don't believe me, just power up the unit, hit the program switch, spin the large black knob until Program 411 shows up on the screen, and press the leftmost yellow button. You've just loaded "tank attack," one of the unit's 15 onboard sound effects. Others include air raid alert, boingy buzz, doorbell, jet plane, rocket jettison, laser echo, string pluck, siren, submarine sonar ping, helicopter, thunder, UFO spaceship, ocean wave and windstorm—just about everything your DJ needs for that "Morning Zoo"

drive shift.

The beauty of using the H3000-B lies in its simplicity. The programmability of any effects processor is worthless if it's not used. With the H3000-B's softkey approach, tweaking to find the exact sound you need is easy, fast, even fun—a far cry from the usual drudgery of programming signal processors.

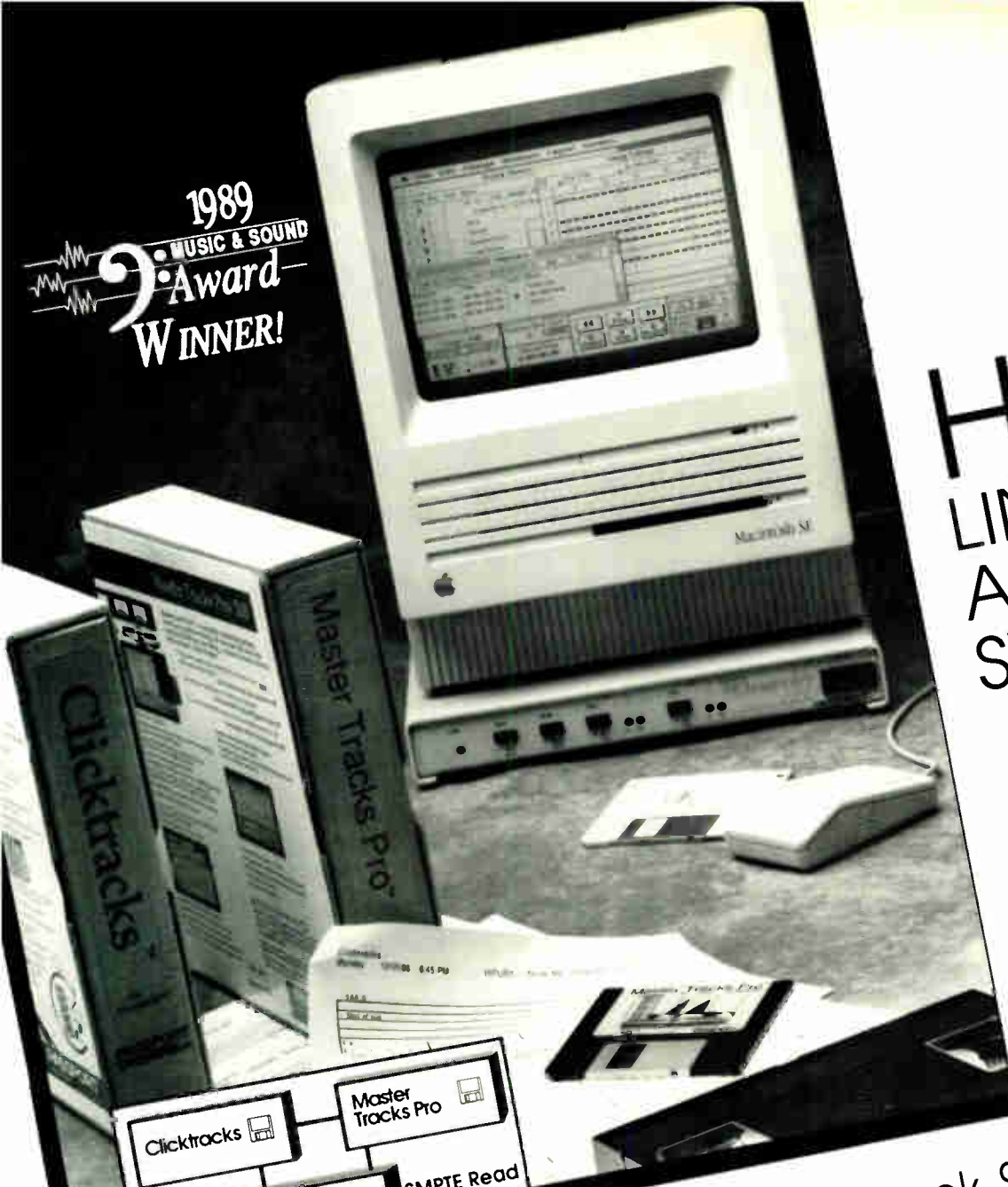
For example, I needed 15 seconds of a jet plane landing for the intro to a program I was working on. We listened to a couple of choices from CD sound effects discs, which sounded good but were too short. I contemplated programming a synth patch, but that would have required too much time. Then I decided to check out the H3000-B's "jet" effect, which also was too short. I pushed the softkey under the onscreen word "speed," cut the speed to a value of "1" and hit the softkey labeled "fly-by" to retrigger the effect. This time, the effect was too long, so I increased the speed to "2" and we had the effect we wanted—all in under a minute. Sure, it was a wonderful coincidence that the Ultra-Harmonizer just happened to have the sound I needed, but the point is that the unit's ease of operation is reality, not fantasy. In fact, you won't need the manual much, which is too bad, since it's very well-written.

Now for the fun part. The H3000-B includes 80 factory presets of diverse effects—as well as 14 algorithm programs—ranging from reverbs and room simulations (canyon, cave echo, locker room, St. Peter's Cathedral, warm room, bright room, new house, etc.) to other useful patches such as autopanning, flanging, chorusing, delays, lowpass filters and backwards playback. The quality of these patches is superb, perhaps borrowing from the reverb algorithms in Eventide's outstanding SP-2016 processor.

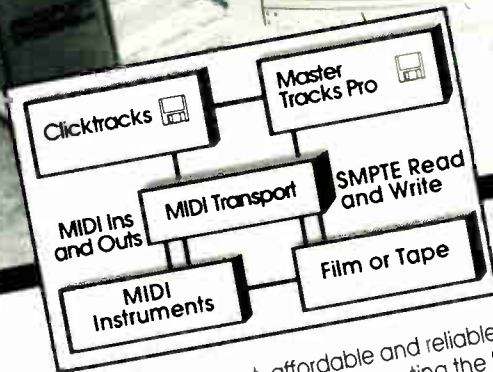
Some presets combine environmental effects with vocal processing, such



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—CONTINUED FROM PREVIOUS PAGE

as steam bath, airport page, stadium, telephone, CB radio, underwater and traffic report. The latter provides a background helicopter sound with CB-style vocal processing—just the right touch for any news department on a tight budget. Besides, you can probably buy another Ultra-Harmonizer or a couple of cart machines on what you'll save on fuel, chopper rental and pilot fees.

Want more? The unit also includes a selection of funny voice settings: Alvin, Cousin It, Cylons, gremlins, Martians, planet Zorgon, sissy and stutter, to name a few. They're all a cinch to use: just route your voice into the unit and pick the strange creature of your choice.

In the back-to-basics department, the H3000-B really shines with its solid, basic algorithm presets, including a variety of pitch shifters (this is a Harmonizer, after all). Choices here include diatonic, dual, layered, reverse and stereo shifting; digiplexes (recirculating delay lines); patch factory (to easily construct custom effects); reverb factory (for designing detailed, custom reverb sounds); swept combs; swept reverb; stutter; ultra-tap; and TimeSqueeze.[™]

One item that impressed me about the Ultra-Harmonizer was how its various presets and programs can inspire creativity in the user. After a late-night recording session, we decided to create some station IDs, repeatedly reading copy while jumping from one "funny voice" or pitch-shifting effect to another. Some silliness ensued (as expected when you hear Darth Vader or Alvin do a station logo), but after a few minutes we had what we needed.

The TimeSqueeze algorithm is amazing. It's simple to use and sounds great. The H3000-B can automatically control the playback of any frequency-controllable, variable-speed tape machine. Connecting the unit to the Otari MX-50 (also tested for this article) merely required assembling a cable with a ¼-inch plug on one end, terminating with two solder connections (to pins 19 and 36) on a standard 37-pin "D" connector. This would feed a 9.6kHz control tone from the H3000-B to the MX-50.

TimeSqueezing a tape involves nothing more than calling up preset 113 and following the instructions. The

screen display asks you to enter the length of the program and how long (or short) you'd like it to be, and the H3000-B automatically calculates the required pitch change and speed variations. There are some limitations: compressing the program length usually sounds better than expanding it; music can be squeezed about 25% to 30%, while vocal parts start sounding funky at 10% to 12%, although with the right tweaking, 15% vocal TimeSqueezing is acceptable. On one project, I compressed a 31-minute program into a 30-minute slot (3% shortening) with excellent results.

The H3000-B is rugged and thoroughly built to pro specs: inputs and outputs are balanced XLR-type at +4 dBm (internal jumpers convert the unit to -10dBm operation); signal processing is CD-quality, 16-bit PCM at a sampling rate of 44.1 kHz; dual 10-segment LED meters monitor input levels; input/output levels can be programmed and stored to suit each preset or effect; space for up to 99 user presets are provided and can be named with the alphanumeric keys; and external control of the unit is available via MIDI.

Perhaps best of all, hidden inside the H3000-B are two unused EPROM sockets, allowing for future updates. Besides offering the just-announced custom guitar presets and some secret new sounds to be unveiled at this month's NAB show, owners of H3000-S units can upgrade to the broadcast version via a \$600 conversion kit. H3000-B owners can add the 58 studio presets with a \$100 plug-in ROM.

Eventide Inc., One Alsan Way, Little Ferry, NJ 07643, tel. (201) 641-1200.

JBL/UREI 7110 LIMITER/COMPRESSOR

Not exactly a newcomer to the field of dynamics control processors, UREI has been making compressor/limiters for about as long as I can remember. And they've done a remarkably good job. Mention UREI limiters, and the words "legacy" and "industry standard" often crop up. The latest heir to the throne is JBL/UREI's 7110, a versatile, single rack-space performer priced at an affordable \$475.

The 7110 is a single-channel unit (with link switch for multichannel operation) that offers adjustable soft-knee compression ratios from 1.5:1 to infinity:1. Other controls include the usual threshold, attack, release and output levels, but one of its neatest features is a threshold knob that permits selecting peak or average limiting, or any blend of the two. Dual meters for gain reduction and signal level (the latter switchable to monitor input or output) are large, 16-segment, multicolored LED ladders, which are slightly inset, making them easy to read under almost any lighting condition.

Another nice feature is an "Auto" button on the front panel. This activates a program-dependent, variable attack and release circuit and presets the 7110's ratio and peak/average controls to settings that provide good results with most material. The auto control probably won't be engaged very often in a relaxed recording studio environment, but it's a terrific feature in sound reinforcement and broadcast applications, where every second counts and you may not have time to leisurely tweak the 7110 during a hectic setup.

Rear panel connectors include barrier strip, XLR and ¼-inch inputs and outputs, as well as a detector input. This ¼-inch jack enables the 7110's limiting action to be controlled by an external signal. This not only allows standard ducking and de-essing operations, but also opens avenues for creative experimentation. Connect a kick-drum signal to the detector while processing a lead vocal track, and you could be onto some hip, new age tremolo effects. The fun possibilities are nearly endless.

I had the opportunity to test the 7110 in a variety of situations—bass guitar compression on album sessions, mild limiting in recording vocal narrations and a rock session (severe limiting) with your typical no-mic-technique, out-of-control singer. In each case, the unit performed flawlessly; "pumping" and "breathing"



World Radio History

were virtually nonexistent, and the dynamics processing was best described as smo-o-o-th.

The JBL/UREI 7110 limiter/compressor has it all—flexibility, versatility, great sound and a great price. Add in its well-written, comprehensive manual, and the 7110 starts looking like a suitable heir to the UREI throne.

JBL/UREI Electronic Products, 8500 Balboa Blvd., Northridge, CA 91329, tel. (818) 893-8411.

PROSONUS STUDIO REFERENCE DISC

Having already taken the audio industry by storm with its critically acclaimed sampling library CDs and innovative CodeDisc (one hour of SMPTE time code on a compact disc), Prosonus now debuts the Studio Reference Disc, a \$49.95 CD containing



just about every test tone you will ever need.

An invaluable aid to the studio, sound reinforcement or contracting professional, SRD is a complete audio toolkit on a compact disc. With a running time of nearly 70 minutes, SRD is packed with useful tones including white noise, pink noise, pink noise and sine wave bursts in third-octaves, 30- to 60-second sine waves in 17 bands from 15.525 Hz to 16.0 kHz, the standard 50-second Caveat Header (with channel, level, EQ, azimuth and polarity checks), Tecron TEF® and ETC test sweeps, tones from Acoustic Sciences Corp.'s Music Articulation Test Tape,™ a 28-millisecond impulse click followed by 20 seconds of silence (for making RT60 measurements), Northwestern University's LEDR™ psychoacoustical perception test bands (great fun on headphones), speaker phasing checks, and a variety of musical pitch references, including A-440, A-442, A-444 and octaves of A3

(220 Hz) to A4 (440 Hz), presented both as sawtooth waves and piano notes.

SRD also provides some nifty little touches, such as band 53, a left/right channel test. This is presented as a 30-second digital recording of an Amtrak passenger train approaching and passing from left to right. And while we're on the subject of digital recording, SRD was completely produced in the digital domain directly into a Sony PCM-1630 processor.

SRD also makes clever use of the compact disc medium. Getting right to the sound you need is simple: punch in the track number you need, and your CD player is instantly transformed into a multifunction test generator. Tracks can be accessed quickly (I loved using the SRD with a wireless remote) and can play back in any desired order—or set for endless repeat—using the programmed play features found on most CD players.

The best thing about SRD is its comprehensiveness. Even if you don't know what to do with TEF sweeps, you just might need them someday. I have a feeling that mastering engineers around the world may applaud the fact that SRD includes one-minute 100, 1,000 and 10,000Hz tones; in fact, these appear twice on the disc. With an inexpensive tool like SRD available, you no longer have any excuses for sending out tapes without these important signals emblazoned on the head.

Another point worth emphasizing is the great deal of care Prosonus has taken in producing the Studio Reference Disc. The company did its homework on this, having consulted a lengthy panel of experts in researching what test signals to include. The accompanying booklet (written by audio pro and *Mix* columnist Mel Lambert) is excellent, offering plenty of applications notes for the test signals and even a bibliography of recommended reading. At \$49.95, SRD may be one of your best audio investments in 1989.

Prosonus, 1616 Vista Del Mar, Los Angeles, CA 90028, tel. (213) 463-6191. Also available through Mix Bookshelf: (800) 233-9604. ■

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

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by George Petersen

FIRST BASE

THE BEDINI AUDIO SPACIAL ENVIRONMENT

The evolution of signal processing has changed considerably over time. Twenty-five years ago, engineers had only live reverb chambers, rudimentary equalization and perhaps a bit of tape slap echo to work with. Today just about every conceivable effect can be applied to audio, either in live performance or studio applications. Flang-

put signal into both mono and stereo components. Stereo elements in the mix—instruments, vocals, stereo reverb, etc.—can be adjusted to appear at the outermost edge of the left/right soundstage, resulting in a psychoacoustical enhancement that can be perceived as though the monitor speakers were moved to either side of the



ing, phasing, panning, exciting, equalizing, pitch shifting, harmonizing, gating, ducking, compressing, limiting, expanding and room simulating are but a few of the rabbits that can be pulled out of a hat by the creative audio engineer. But until now, spatial manipulation of the 2-channel stereo image is the one area of signal processing that remained largely unexplored.

In a November 1987 *Mix* interview on the future of signal processing, RolandCorp U.S. president Thomas Beckmen predicted the advent of spatial manipulation devices, and we are now starting to see the beginning of that revolution. Perhaps you have noticed a small, inconspicuous "BASE" logo showing up on recent releases ranging from the the film *Halloween 4: The Return of Michael Myers* to George Strait's album *Beyond the Blue Neon*. BASE is an acronym for Bedini Audio Spacial Environment, a spatial enhancement system developed by John Bedini—better known as a manufacturer of high-end amplifiers for the consumer market—and First BASE is his initial entry into the pro audio market.

Working entirely in the analog domain, First BASE separates a stereo in-

listener. The degree of increase or decrease in the stereo space can be controlled by a front panel potentiometer.

Mono, center-panned elements that are common to both left and right channels in the mix can also be adjusted to compensate for the enlarged stereo spread. These can be increased or reduced in overall volume, and even panned to right or left, if desired. A sidechain loop in the mono section is provided (via rear panel, ¼-inch input and output jacks) for external processing such as equalization, de-essing or limiting.

The front panel also includes controls for output level, headphone gain, and in/out bypass switches for making A/B comparisons between "dry" and BASE-processed signals. The headphone output monitors only the processed signal and is unaffected by the bypass switches.

In addition to the mono sidechain jacks, the rear panel provides unbalanced XLR and ¼-inch inputs and outputs; besides the usual left/right connections, First BASE includes center-channel inputs and outputs. Designed to facilitate connecting the unit in stereo (left/right/center) film mixing ap-

plications, these center ports are merely hard-wired across from input to output and are not affected by the processor.

BASE is a single-ended processing system—since the BASE information is recorded along with the program material, no hardware boxes or decoders are required by the end user. With this in mind, I connected the unit to two of my console's pre-fader monitor sends and returned the BASE-processed signal into two console inputs. After a quick input trim adjustment, I could access both dry and processed signals without any apparent level changes, a perfect environment for A/B comparisons.

Sources for the listening tests included digital masters from two albums I completed mixing the month before—and was therefore quite familiar with—and Donald Fagen's *Nightfly*, which should be required listening for any student of finely crafted American pop. Since all the Bedini's controls are calibrated in an arbitrary 0-40 scale (except the mono balance, which is ± 20), I began with all the

controls set at a 12-o'clock position. Only a slight difference between the two signals was perceptible at this setting, but as I turned up the "Stereo Space" control the effect became rather dramatic, with the imaging from the studio's near-field monitors actually beginning to change from point-source to a much wider stereo imaging. The effect was quite amazing, but upon closer listening I detected a slight loss of some center-panned information, which was promptly restored by increasing the "Mono Gain" control.

Speaking of mono, I switched the control room monitors to mono playback, and while the widely spread image diminished (no surprise), the overall balance of the mixes remained constant. Conversely, the First BASE's ability to manipulate mono information within a stereo mix—such as rebalancing a too-loud vocal when mastering for disc or CD—can be a powerful tool for mastering applications (see sidebar). My next test involved using the First BASE to enhance the stereo spread of drum overhead mics during

basic tracking on a jazz fusion album session. I liked the BASE's effect on a conventional X-Y pair of condensers in this application. The result was a widely spread image, with a controllable (via the mono controls) amount of crosstalk between the two, a sort of MS (mid-side) miking effect in a box.

The First BASE processor seems ideally suited to a variety of applications, especially in the realm of stereo television. That medium greatly suffers from a lack of separation—have you ever tried to experience any kind of spatial imaging or decent soundstage perception from a stand-alone stereo TV receiver? Of course, the situation can dramatically improve by listening to stereo TV broadcasts through external speakers, but it's a safe bet that fewer than 10% of stereo televisions in this country are so equipped. A bit of mono-compatible spatial enhancement could be a welcome touch toward improving stereo broadcasts and hi-fi videotape playbacks for those equipped with less-than-ideal monitoring systems.

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The ADx-02 is being used around the world in a variety of environments and applications. But the diagnostics function is not the end of the story, the -02 is a very versatile timecode reader-generator-insert, with multiple screen displays, selectable fonts, three jam-sync modes, stable code generation, full speed range read and much more. So why buy just a timecode reader-generator ?

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—CONTINUED FROM PREVIOUS PAGE

sessions, using 4-channel Dolby optical stereo matrix encoding, the apparent stereo spread of the left/right behind-the-screen channels could be widened with BASE processing on music and sound effects, while the center mono channel, which usually carries the majority of the dialog information, would remain unchanged. Six-track, 70mm mixes could be encoded with BASE processing on both the outermost left/right channels, as well as the stereo-surround channels, to create a

seamless, 360-degree, spatial environment.

With its ability to enhance spatial perspectives and alter mono balances within stereo mixes in various media, the Bedini First BASE represents one of the first entries of a new breed—an upcoming revolution in signal processing. While its \$6,000 list price will certainly dissuade the more casual user, the First BASE is a versatile unit with a great deal of potential for the production professional.

For more information, contact: B.A.S.E., 600 West Broadway, Suite 100, Glendale, CA 91204, (818) 500-4171. ■

THE MASTER'S VIEWPOINT

Probably the most obvious use for the First BASE processor is in mastering applications, so I made a quick call to Glenn Meadows of Masterfonics in Nashville. Three BASE units have been in use for the past few months at Masterfonics' two mastering suites and mix room, and Meadows—having cut more than 50 gold and platinum albums over the years—is widely respected for both his "golden ears" and his extensive knowledge of the mastering art.

"It's another tool in your toolkit," Meadows comments on the BASE processor. "You can't use just one tool to build a house. You've got to be able to use a lot of different tools to make the finished product come out the way it needs to be."

Meadows did offer some caveats about BASE processing in certain instances: "If the producer has used a lot of short delays to create space around instruments, the box tends to tear those things apart, making the mix very un-conjugated—sounding very weird."

Another thing to be aware of is the unit's possible effect on the disc mastering procedure. "A lot of the processing that the BASE does deals with 90-degree phase shifts," Meadows continues, "and when you try to cut things with 90-degree phase shifts on a lacquer disc with a moving stylus, you have serious problems. Now in a mastering environment where you're adding the effect, you can keep yourself out of trouble, but with a lot of mixing engineers who go crazy with ef-

fects, you could end up with a product that is almost impossible to get on a disc."

Of course, the issue of tailoring mixes to suit the needs of the vinyl medium has become less important as sales of the LP format continue to plummet. "It used to be that the bass and the kick would have to be in the middle, just to deal with what's going to happen on the record," Meadows explains. "Once we move farther toward non-mechanically reproduced mediums—CD, DAT, audio cassette—then the record itself becomes less of a determining factor in terms of what kinds of wild effects you can create."

According to Meadows, client reaction to the BASE processor has been mixed. "Some people like it, some don't like it, some like it on certain songs and not on others. It's not a cure-all box that you can park somewhere and use on everything. It has its applications, and it needs to be adjusted from song to song because each mix is different. You have to play it by ear.

"It's an interesting effect," Meadows adds. "On some product it works very nicely, giving a nicely spread spatial image. It also allows you to pull the center image back up again, whereas a lot of the black boxes that do the magic of spreading out the stereo sometimes tend to lose things that have been panned center: kick drums, bass and vocals. The BASE has a mono gain control so you can reinforce that center image, and you can put an equalizer into that mono gain channel and EQ certain portions that are popping up in the middle. It's really quite a flexible tool."

—George Petersen

The method now commonly used to connect and distribute the input and output signals of audio and video equipment is to insert patch cables into a jack board. This patch cable type patch bay is a well established connector and distributor of signal lines, but it poses various inconveniences. Changing the connections is time-consuming, and to remember a certain patching system it is necessary to record everything on tables. Furthermore, such problems as dirt or rust of the jacks and plugs resulting in poor contacts and damaged patch cables disconnecting the lines occur frequently. The Akai Digital Matrix Patch Bay System has been developed to eliminate all these problems. For the exchange of input and output signals of professional audio equipment, this system uses balanced type/line level inputs and outputs for the audio signals and 75Ω BNC/composite line inputs and outputs for the video signals. To find out more, send for a brochure or see your AKAI dealer.

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by Mark Herman

SOUND REINFORCEMENT NEWS

Large American national touring sound reinforcement companies continue to report strong winter and early spring concert tour schedules. Leading audio hire enterprises such as Clair Brothers, Showco, Maryland Sound Industries, Electrotec Productions, Schubert Systems Group, Sound On Stage and others claim to have experienced a tremendous first quarter, while smaller national and regional sound companies paint a traditional picture of sporadic business. Some have enough work to get through the slow times, while others not so fortunate are desperately waiting for the high-revenue summer season to begin.

Electrotec Productions (Canoga Park, CA) is looking at



Showco's Prism system in place for George Michael's appearance at Texas Stadium in Dallas.

ENGINEER SPOTLIGHT

Name: James "Trip" Khalaf

Age: 39

Home: Lancaster, Pa.

Now employed by: Clair Brothers

Years of experience: 16

Favorite console: Clair custom 32-channel

Favorite signal processing devices: Lexicon 480, all the AMS devices

Favorite venues: "I like going to fresh places where people haven't heard anything on such a large scale before and are really amazed by professional sound. Out-of-the-way places—like the soccer stadium in Budapest, Hungary, the 'Rock in Rio' festival in Brazil, or maybe shows in Argentina and Mexico—come to mind. I like working these

—CONTINUED ON PAGE 105

empty warehouses. **Pierre D'As-tugues** is happy to say that Electrotec has been enjoying a busy touring agenda. . . A large 180-cabinet Lab Q outdoor sound system was sent by seafreight to South America for gravelly voiced **Rod Stewart's** latest tour. Seven 40-foot containers loaded with audio, lights, a portable roof, special portable power transformers and band gear took three weeks via ship to arrive. The tour started February 20 and worked its way up through Argentina, Uruguay, Brazil, Colombia and Venezuela, before finally arriving in Mexico. The equipment was flown by special air charter freight between the different countries. Stewart's U.S. tour leg began soon after the final Mexican show. . . **Randy Travis** continued his tour and played several February dates in Canada before heading back to the States

. . . **Cheap Trick** (see "On the Road")—with the revitalized **Eddie Money** opening for many dates—carried a 72-cabinet Lab Q main P.A. system for a mid-sized arena tour that began in late December and finished in March. . . **Barry Manilow** remained on the road. . . **Air Supply** had rehearsals and a brief three-week theater tour in February on the East Coast. . . **Ozzy Osbourne's** North American tour ended two weeks early due to a family illness. Ozzy began touring Europe in March.

Showco Shorts. . . Deep in the heart of Texas, Showco's **Wil Sharpe** reports tours and dates with **Diana Ross** (see "On the Road"), the **New Bohemians**, **Little Feat**, **Kansas/ Night Ranger** and **Eric Clapton** in England, **Mike & the Mechanics** in Europe, the **Jonathan Butler/**

LIVE · SOUND

Najee jazz tour, **Bee Gees** rehearsals, the **Beach Boys**, **Moody Blues** and **Barbara Mandrell**.

Look out everyone! . . .

Schubert Systems Group

(North Hollywood, CA) is gaining a reputation for having some of the best-sounding P.A.s in the country. Many people I've spoken with lately have commented very favorably about SSG's audio quality. SSG specializes in concert touring. . . **George Thorogood & the Destroyers** went out from the end of February to the beginning of April. After a short break,

Thorogood is scheduled to resume touring through the summer. . . In mid-March **Charlie Sexton** started a tour of large clubs and small venues ending April 19, before heading over to Europe. . . **Ex-Prince** bandmembers **Wendy and Lisa** are doing a three-week, small-venue tour (3,000 seats and under) of Europe beginning April 11. . . **Al Jarreau** (see "On the Road," March '89) left for his European tour in mid-January carrying a complete sound system that featured an impressive 72-cabinet SSG main P.A., along with a Gamble Series EX-56 house

console, newly designed monitors and brand new Crest amplifiers. . . SSG is scheduled for the newly reunited **Doobie Brothers** tour that should begin soon. . . **Bruce Hornsby & the Range** ended their long world tour in Japan on March 18th. . . **Ziggy Marley & the Melody Makers** (see "On the Road") went out for a brief three-week tour in early February.

Crest has put out a special new 700 amplifier just for Schubert Systems Group, who purchased 56 of them. The amp has the same cosmetics as the recently released

ON THE ROAD

SOUND COMPANIES, EQUIPMENT, ARTISTS & PERSONNEL ON TOUR

Artist Sound Company Tour Dates & Region	House Console #1 House Console #2 Monitor Console #1 Monitor Console #2 House Crossover	Main Speakers Other Speakers Subwoofers Monitor Speakers (a) Monitor Speakers (b)	Main Amplifiers Other Amplifiers Sub Amplifiers Monitor Amplifiers (a) Monitor Amplifiers (b)	Engineers: (B) = band (H) = house (M) = monitor (T) = technician (a) = assistant
Bangles Ultra Sound East March-April U.S. May-June Europe July U.S.	Gamble HC 40x16x2 ----- TAC Scorpion 40x12 ----- Meyer	(16) Meyer MSL-3 (U.S. leg) ----- (8) Meyer 650R2 Meyer UM-1	Crest 4001 ----- Crest 8001 Crest 3001, 4001	Steve Botting (B, H) Matt Haasch (M) Keith Dirks (aH) Dave Taylor
Cheap Trick Electrotec December-March North America	Yamaha PM3000 40x8x2 ----- Lab Q Soundcraft 32x16x12 ----- BSS MCS 200	(60) Lab Q ----- Lab Q Subs Electrotec Floor Wedge Lab Q side fill	Crown MA1200, UREI 6400 ----- Crown MA1200 Crown MA1200 Crown MA1200	Glenn Preston (B, H) Stephan Phillips (B, M) Russel Fischer (aH) Jon Ducrest (T)
Ziggy Marley Schubert Systems Group February U.S.	Gamble HC 40x16x2 ----- Gamble SC 32x16 ----- SSG	(16) SSG Steradian ----- (8) SSG Steradian Sub SSG 1x12, 2x15, 2x12	Crest 8001, 7001, 700 ----- Crest 8001 Crest 8001, 7001	Errol Brown (B, H) N/A (B, M) Gary Sanguinet Jason Berk
Petra MP Productions Ongoing North America	Yamaha PM3000 40x8x2 ----- Soundcraft 500 40x12 ----- BSS 360	(12) MP Custom High (12) MP Custom Low ----- MP Custom	Carver 1.5 Carver 1.5 ----- Crown PSA-2	Michael T. Moore (B, H) Jeff Gallup (B, M) Jim Ragus (aH) J.D. Hatfield (aM)
Diana Ross Showco February U.S. March-April Europe Summer U.S.	Harrison HM-5 32x16x2 (with 16-ch. extender) Harrison SM-5 32x16 ----- Showco	(16) Prism (U.S. leg) ----- (8) Prism Subwoofer Showco BFM 500, 600	Crown PSA-2, MT1200 ----- Crown MA2400 Crown MT1200	Jeff McGinnis (H) Randy Piotroski (M) Leon Hopkins
Neil Young Maryland Sound Ind. February Northwest	Yamaha PM3000 40x8x2 ----- Ramsa WR-S840 40x18 ----- MSI HS 301	(16) MS-10 (16) MS-10B ----- MSI 2x12, 2x15 MSI NW2 Sidefill	Crest 7001, Ramsa 9220 Crest 8001 ----- Crest 3501, 4001 Crest 8001	Tim Mulligan (B, H) George Parker (M) Steve Guest (T, aH)

LIVE · SOUND

7001. **Dirk Schubert** says, "It has the drive board and the sonic characteristics of the 8001 and the 7001, but with an FA800 heat sink and power supply, so it provides 250 watts per side into eight ohms, or 400 watts per side into four ohms for horns and tweeters. SSG also recently purchased 50 new Crest 7001 amps. "Now we are using Crest power amps exclusively—8001s, 7001s and the special 700s," adds Schubert.

Heavy-duty Meyer speaker user

Ultra Sound (San Rafael, CA) and its East Coast affiliate **Ultra Sound East** report a good start on the spring season with a six-week tour that began in early March with **The Bangles** (see "On the Road"). After finishing the first leg of their U.S. tour, the group travels to Europe for six more weeks before returning to the States to finish in late August . . . **Elvis Costello** began touring in late March . . . The incredibly popular **Grateful Dead** played scattered dates in February and March, and plan a full sche-

dule for the first half of April.

Starfire Systems Inc. is the biggest sound reinforcement company in Tulsa, and one of the largest P.A. companies in Oklahoma. The company also handles pro audio sales and installations, and owns a full lighting system. Audio sound reinforcement work is primarily local, with some regional jobs in Oklahoma, Arkansas, Kansas and Texas. **Kevin Hulett** states, "Primarily we do one-nighters, although occasionally we pick up a band and work all their dates in our region. We also provide complete audio equipment support to other local sound companies, as well as miscellaneous equipment for larger touring companies that pass through our area." Hulett says that Starfire usually experiences the winter slow period that affects almost all small- and mid-sized sound companies. "For us, summer is a lot hotter for business. It always starts up around March. The off time in the winter is good for repair work, pro audio sales and installation work. We also do our share of club and church installations in the Tulsa area." Starfire has one main sound system, and another smaller system composed of a Soundcraft 500 40x8x2 house console, Yamaha 2408 monitor console, 24 JBL 4699 main P.A. cabinets and JBL 4604 monitor enclosures, as well as three JBL 4699s for sidefills and drum monitor. Power amplifiers are Crown, with Micro-Tech 2400s and Micro-Tech 1200s for mains and monitors.

Not So Super . . . I had the good fortune to attend **Super Bowl XXIII** in Miami and root for my home team, the 49ers. The new **Joe Robbie Stadium** is a fantastic place for football, but I found the sound in the upper deck to be rather bleak. Why is it that developers spend millions of dollars on a stadium, but still can't make the P.A. clearly audible for the fans?

Maryland Sound Industries (Baltimore, MD) spokesperson **Ronnie Smith** reports that a combination of tours, installations, industrials and the recent Presidential Inauguration have

STATE OF THE ROAD.

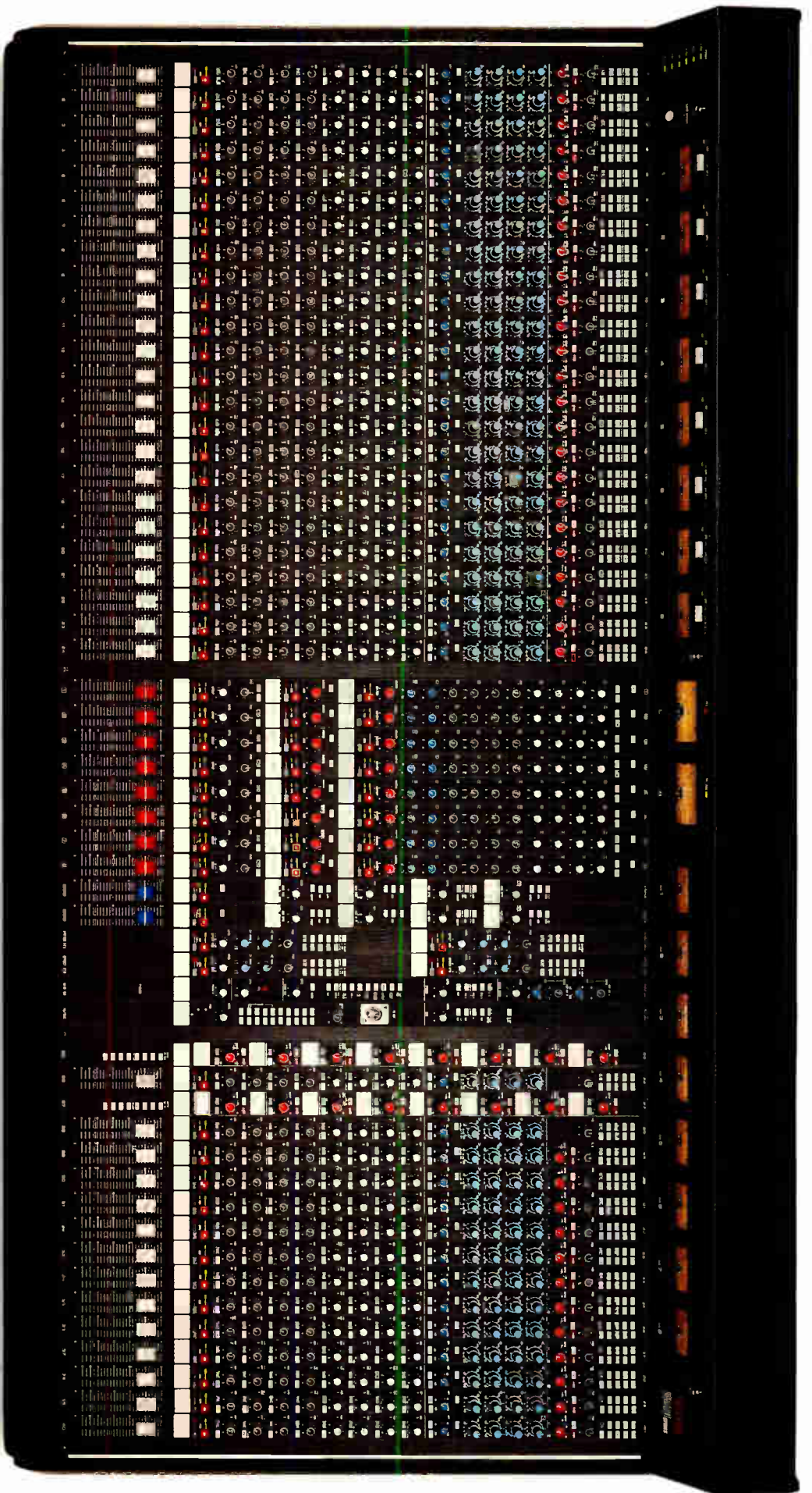
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LIVE · SOUND

kept MSI tremendously busy. Smith notes tours with artists **Patti LaBelle, Neil Young** (see "On the Road"), **The Pointer Sisters, Neil Diamond, Melissa Manchester, Stevie Wonder, Anne Murray, Frankie Valli, Kenny G.** and **Roberta Flack** . . . Also, there were sporadic shows with **Crosby & Nash**, various dates with **Daryl Hall & John Oates** and personnel-only in Europe with **The Manhattan Transfer** . . . Almost all MSI's corporate industrial work is funneled through **Audio Facility Industries** in New York. "We do a lot of industrial work with businesses like IBM, McDonald's, car companies, tennis shoe companies and insurance companies," Smith declares. Recent corporate events include IBM in Florida and Ford Motor Co. in Chicago.

Big Bush Bash . . . "A large portion of our sound equipment

COMPANY PROFILE:

QSC Audio Products Inc.
1926 Placentia Ave.
Costa Mesa, CA 92627

Founded in 1968 by electrical engineer Pat Quilter, QSC Audio Products is now one of several companies that specializes in producing amplifiers for the professional audio market. In the beginning, QSC produced guitar amps, mixers, speakers and power amplifiers for its retail store operating out of Costa Mesa (Southern California). In the late '70s the company focused its efforts on designing and producing high-quality amplifiers for the pro audio industry. QSC has seen its market share increase over the years, and according to director of marketing Greg McVeigh, worldwide sales have increased by 40% in the last year. Factory and office complexes are still located in Costa Mesa; all amplifier design and manufacturing is handled there, making QSC products 100% American-made.



QSC Series 3, Model 3800

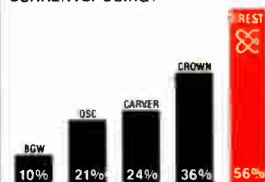
In the quest for cost-effective and efficient production, new gravity-feed conveyors were recently installed in the chassis manufacturing department. Automatic computer testing procedures are used to test and verify each amplifier's performance to insure that all required specifications are obtained before the unit is shipped. All data pertinent to each amplifier is kept both on disk and paper for review if necessary. QSC is active in the installation, commercial paging, cine-

—CONTINUED ON PAGE 105

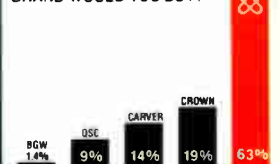
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Robert Palmer Band

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ma, nightclub and sound reinforcement markets. Sales are mainly concentrated in the U.S. and Canada, but a fairly large market exists in France, West Germany and, surprisingly, Japan. QSC's warranty program is three years parts and labor, and the service department offers 24-hour turnaround time on any amplifier module. Products are available for purchase via a strong retail network of music stores and pro audio dealers throughout the U.S. and Canada.

Currently, 14 different models are offered for professional use:

Series One products are designed primarily for fixed installations. Models 1400 and 1200 are popular in the cinema industry.

Series Two products are strictly for commercial music and paging systems and are popular with hotels, restaurants and ballrooms.

Series Three is QSC's most advanced line. These models are rugged pro touring amplifiers designed for demanding situations. Models 3800, 3500, 3350 and 3200 make up the series. They are low-profile and convection-cooled, with front modules that easily slide out for quick field replacement. McVeigh says, "The Series Three amps have front-removable, individual channel modules. Touring personnel find it useful if, for some reason, a channel is lost during a show; they don't have to take the amp out of the rack to fix it. They can just take the front panel off and replace the module in about five minutes." McVeigh stresses the importance of the Series Three line in regard to developing products and sales: "The input from touring professionals about what they like, and don't like, is invaluable to our R&D. Because we have such a broad line of products, what the touring pros are using trickles down to the retail music stores and affects sales. The touring market is very important to us."

The **MX Series** is a cost-effective version of the Series Three with a stripped-down chassis. The MX still maintains the high-power, low-profile characteristics of the Series Three and is represented by the 2000 and 1500 models. Nightclubs are big users of the MX line. ■

LIVE · SOUND

was tied up with Inauguration Day at the end of January. We flew in close to 20 engineers from around the country," says Smith. MSI provided audio for the Washington, DC, Convention Center and inaugural gala dance held January 21. They began setting up on the 16th and used five men to work three stages, with music featuring traditional big bands. MSI also handled the Daughters of the American Revolution events held at Constitution Hall that featured a variety of shows, including the Presidential Children's show with Big Bird, the Mormon Tabernacle Choir and some military pageants. They ran four stages for two presidential VIP parties at the newly refurbished Union Train Station. For Washington insiders, this was the place to be seen.

Console News . . . Yamaha

—FROM PAGE 98, ENGINEER

venues because the crowd appreciates it."

Hobbies: Fly-fishing. Favorite trout stream is Kettle Creek in north central Pennsylvania. "Traveling all over the world lets me get in some great fishing. After the last 'Rock in Rio' show, I flew down to Tierra del Fuego and went fishing."

Memorable tours: All the Queen tours and some Fleetwood Mac. "My favorite was probably Fleetwood Mac's *Tusk* tour. That would be right up there with any Queen tour. Elton John is also a great one anytime."

Background: After finishing college and a brief stint playing bass in a band, Khalaf ended up in Columbia, S.C., where he got his first taste of pro audio by helping put together a road P.A. while working at a music store. Later, Khalaf took the advice of a former Clair Brothers employee who suggested that he apply to the Lititz, Pa., sound reinforcement company for a position. He landed the job and has been working there ever since, mostly on the road. Nearly three years ago he took a break from touring and moved to London to oversee Clair's new European operation, spending two years in the

gave us a peek at its 2800 prototype pro monitor console at the '88 AES convention. Now the company has announced that the 2800 will be available from Yamaha pro audio dealers this spring. The monitor console will be available in 40- and 32-input configurations, and features eight mix buses and a stereo master bus, as well as eight master mute groups and four auxiliary sends. . . **JBL Professional** will now sell **Seck** mixing boards through its Soundcraft distributors. Aimed toward the beginning and intermediate user, this unit is designed for recording and live applications and is available in various frame sizes up to 24 inputs. ■

Address all correspondence and photos to: Mix Publications, Sound Reinforcement Editor, 6400 Hollis St. # 12, Emeryville, CA 94608.

UK before returning home. Lately, Khalaf has been alternately touring with Elton John and working in the expanded Clair Brothers engineering department.

Mix: How would you describe the best and worst aspects of mixing?

Khalaf: The high point is finding a band to work with that really plays well, sounds great and everything seems to fall into place. Then it goes beyond an audio experience and becomes a physical experience. It becomes rarer as the P.A.s become bigger and the bands get louder, but every once in a while it still happens.

The part I dislike has to be when bands play dry, sterile music, with Synclaviers, programmed synthesizers, etc. The excitement is marginal. It becomes much too clinical when the show is exactly the same every night, and I don't have to change the faders.

Mix: Your advice for aspiring engineers?

Khalaf: Make it your religion. If you can get yourself into a good-paying position through hard work and knowing what you are doing, it can become your religion as well as your job. For me it is not really a job; it is part of what I am and what I do. ■

TROUBLESHOOTING

TRUCK PACKING

TIPS FROM THE PROS ON A NEGLECTED ART

by Mark Herman

AL CHILDRESS, SHOWCO

Background: Al Childress is responsible for figuring out the allotment and placement of equipment in concert-tour truck packs for Showco, a Dallas-based sound reinforcement company.

How has the art of truck-packing changed over the years?

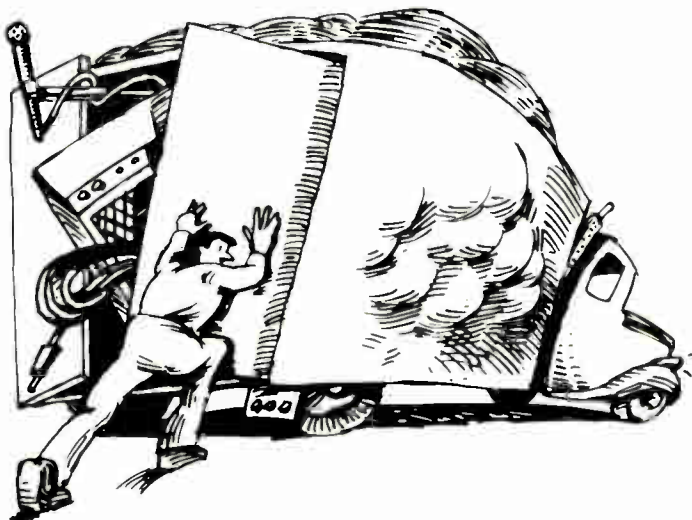
You used to solve your truck-packing problem by how much space you would take up, but unfortunately, it is not that way anymore because all the gear is much denser than it was in the past. Now you are often limited by weight. I could easily put 55,000 pounds in one truck now, but it would be impossible to drive because it would be illegal, weight-wise. It's hard to predict exactly how much it's going to weigh.

At Showco, how do you handle weight distribution?

We keep a close watch on what our pieces weigh. I developed a spreadsheet [computer program] that lets me manipulate where we put the weight in the truck so I can get it to balance out correctly on the axles. When you try to get within 500 pounds of the 34,000-pound axle limit, it becomes sensitive where each item goes in the truck. You try to balance it out where the drive axle and the trailer axle weigh exactly the same, and as close as possible to 34,000 pounds each. To get it really right, you have to know how much the truck weighs empty.

How important is the balance between the two axles?

If you're not close to overweight, it's not very important, but when you're running at the legal load



limits, it makes a big difference. With one axle at 1,000 pounds over the limit—even if the truck is within the total legal limit—they can shut you down. They will fine you or make you stop until you've taken some of the weight off.

How do you actually pack the equipment?

It depends, but we have some general approaches. We try to have amplifiers and speakers in front, because they're usually ready to be loaded out first. And they're not needed quite as quickly in the morning for load-in, as much as the rigging, AC, motor cable, etc.

Where do you place the mixing console?

There are no hard-and-fast rules, just common sense. Do not load it as the very last piece in the truck. Often they seem to end up about two-thirds back in the pack.

JEFF FORBES, ELECTROTEC PRODUCTIONS

Background: Jeff Forbes is an experienced sound engineer at

sound reinforcement company Electrotec Productions, Canoga Park, Calif., and he has a pragmatic viewpoint on packing the truck.

How do you start the load-in?

In a 48- or 45-foot trailer, the area that's slightly raised over the tongue is nicknamed the "dance floor." We load our main P.A. speakers first, four-wide across the trailer with the heavier mid-high cabinets on the bottom and the lighter bass cabinets stacked on top. The P.A. gear is not very heavy, so we aren't putting much weight over the center pin that attaches to the tractor. We make a point to put the grills of the first row of mid-high cabinets facing forward and the first row of bass cabinets facing the rear, and then we go grill-to-grill and wheel-to-wheel on the following boxes to keep from putting any wheels through the grills. Another thing to remember: heavy ones on the bottom and light ones on top.

Does some equipment require special placement?



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LIVE · SOUND

Sometimes, yes. Keep in mind that there are parts of the truck that ride better than others. The softest ride will be over the rear wheels of the tractor and the rear wheels of the trailer, where the air-ride is. If you have certain items that are susceptible to heavy vibration—like the band's keyboard or keyboard racks—you tend to place them over areas with the best ride.

How difficult is it to plan the pack?

After a while you get to know it in your head and can plan it fairly quickly. Sometimes only the number of P.A. boxes is different from tour to tour. Most of our cases are standardized, so I already know how they fit for every tour.

Is your pack the same every night?

Yes, almost always. But sometimes you need to think ahead. For instance, if you are going to use some in-house equipment at the next show, you might pack differently at the load-out so you don't

have to pull unneeded equipment out of the truck to get to gear you need.

For a standard arena tour, how many trucks are used for the audio equipment and in what order do you load-in?

We can pack a 48-box arena system, except for rigging and motors, in one 48-foot trailer. It is to your advantage to put all your rigging, motors, steel cable and most of the lighting truss in the first truck that unloads in the morning, so the rigger can complete the points for lights and can start on the sound rigging without having to wait for it.

For load-in on a typical four-truck tour, the first truck has the rigging and truss lighting, the second has all the lighting and maybe staging, the third usually carries sound and the fourth has the band gear, wardrobe and miscellany. Generally, the load-out is the reverse of the load-in.

How do you begin and finish the load-out?

With a four-person crew you usually send the first free person to the truck with the responsibility of starting the pack. Try to be fair and rotate this responsibility, because it isn't a very fun job. Usually we swap halfway through the pack. It's good this way because everyone on the crew knows the pack. Also, nobody needs to ask unnecessary questions. If you do the pack the same way every night you will know if some piece has been left out immediately.

Believe me, it happens sometimes. As things come out of the air, get packed and go into their cases, have the stuff sent to the truck as it is being completed. This allows you to get the equipment to the truck in the proper order, helps clean up the area where you're working, allows for access and eliminates a backlog of cases. On a good load-out we'll have our P.A. coming out of the air in the first ten minutes and ready to wheel to the truck in 30 to 45 minutes. The next section to be packed usually consists of monitor cases with some cable and mic cases in the center. Then come the mixing consoles which are left standing on their wheels.



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After that, things such as the effects and amp racks start going on top. Some of the last pieces of gear on the back equipment wall are the cases with straps and flying hardware. This is so that on the load-in you can be ready right away, or if production is running behind you can get a few cases out and be working on some preliminary flying. At the end of the pack we try to leave a smooth wall. Avoid the stair effect, so that if it is necessary, there will be a separate section for other types of gear, like wardrobe and catering.

Any tips on handling stagehands and loaders?

Don't make them mad. Be patient. Try to make it a team effort. Remember that you'll probably end up returning to the same spots, and people remember bad days more than good ones. Near the end of our load-outs we try to bring in some sodas or water for them. Avoid alcohol, because it slows them down.

**DAVID OWEN,
ROADSHOW SERVICES**

Background: Roadshow Services in San Francisco is one of the premier trucking companies in America specializing in concert touring equipment transportation. Roadshow driver David Owen, who also has valuable sound engineer experience, offers advice from the driver's point of view.

Any general concepts that you follow when packing?

One of the most important things is to keep everything—sound, lights and band gear—compartmentalized, and try to avoid what we call an integrated pack. Keeping the different gear separate cuts down on the confusion while loading and unloading. On big tours with multiple trucks this is relatively easy, but smaller, one-truck tours are a different story.

How do you pack a tour that would take only one truck for everything?

It would be band gear in the nose, sound company equipment next and then lights. Compartmentalize on big and small tours. Try to integrate the truck as little as possible and still make it all fit.

Any bad-weather tips?

In bad weather you may want to put more weight up front over the drive axles. It is easier, and common practice in good conditions, to load the chain motors and rigging in the tail, where it gets unloaded first. But if you do that you will be heavy on the back end, and that can be dangerous in the snow and ice. Try to balance it out for those special occasions so the driver has more control over the tractor and trailer.

Is left and right trailer balancing important?

Most times with audio gear it is usually not a problem. Just don't severely overload one side. Lighting equipment is more difficult. With the air-ride trailers we use, the suspension will compensate for a lot of imbalance side to side—the trailer and tractor will self-level.

What tip can you give that saves time and hassles?

Draw the pack to scale and post it somewhere in the truck so that the driver, crew and local help can see exactly where pieces go.

—CONTINUED ON PAGE 116



Sum of the Parts . . .

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SOUND REINFORCEMENT PRODUCT NEWS



Martin F2 System ▲

The F2 from Martin America (Chatsworth, Calif.) is a fully horn-loaded, two-box system using a modular, rack-mount shell design in its "top" box. This approach allows the unit to accept different horn and driver combinations to suit different venues: a rack can be made up of only mid or high horns, for long-throw arena use, or configured as a mid/high pack for other applications. The F2's rigging system enables array designs with extended, coherent columns of bass, mid and high horns for clean, high-level music reproduction.

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Gold Line 30M8 RTA ▲

Offering $\frac{1}{3}$ -octave, real-time analysis in a compact AC or rechargeable DC-powered package, the 30M8 from Gold Line (West Redding, Conn.) is priced at an affordable \$649.95, including instrument mic. The 30M8 features 30 bands on ISO centers, calibrated "A" or "C" weighted SPL readings,

XLR mic input, $\frac{1}{4}$ -inch line input and a memory mode for user storage of up to eight room curves.

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JBL Control 12SR™ ▼

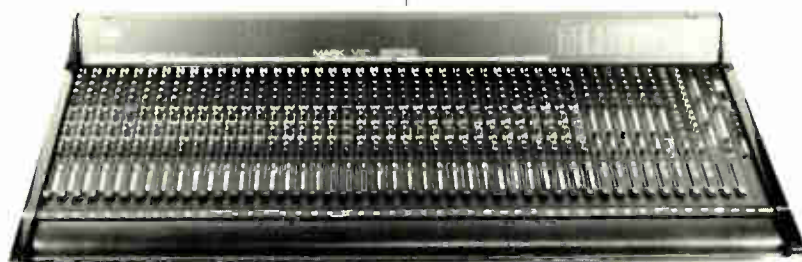
JBL (Northridge, Calif.) has expanded its Control Series to include the 12SR, a high-fidelity, high-power system for fixed or portable P.A. and foreground music playback applications. The speaker combines a 12-inch woofer and 1-inch exit compression driver on a flat-front Bi-Radial™ horn in an injection-molded cabinet fitted with handles and mounting hardware for wall, ceiling or stand mounting.

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Peavey Modular Console ▼

The Mark VIII™ Series of sound reinforcement consoles from Peavey (Meridian, Miss.) offers a



totally modular design in 24- or 36-channel configurations. Standard features include electronically balanced input circuitry, gold-plated signal contacts, eight submasters, 4-band sweepable input EQ, eight aux sends (switchable pre/post fader or EQ), 100mm long-throw faders, CD/tape inputs, LED indicators on mute and PFL switches, eight aux returns, matrix mixing, comprehensive talkback and intercom sections, two lamp sockets with dimmer, and 11 LED meters for monitoring subgroups, PFL and main L/R outputs.

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Community M4 CoAx ▲

The M4 CoAx from Community Light & Sound (Chester, Pa.) allows any of the company's PC400 Series HF horns to be coaxially mounted in the center of a matching M4 PC1500 Series horn with a PCMX mouth extension. The new system improves directivity and reduces cluster space, and the M4 CoAx is available as a complete system or as a special hardware mounting package. ■

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Once upon a time

This was a movie
soundtrack.



And this was
an amplifier ↑

In their day, they

were the state-of-the-art. The theater organ (or piano) provided most of the sonic textures required to completely involve an audience with the film on screen. The megaphone... well, it was reliable, but its limitations quickly became obvious. Its frequency response was rather limited, and its direct dependence on input level made it usable only by oral athletes.

With man's undying need to to expand his ears' horizons, the film soundtrack came to replace live accompaniment. Sound reinforcement came to span everything from audio in the home, to rock and roll in the arena. As the quality of these mediums grew, the need to surpass the limitations of existing amplification became apparent.

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World Radio History

SOUND ON STAGE

SOUND ACROSS THE WATER

by Robin Tolleson

As chief sound engineer with Michael Brecker, one of the world's most in-demand sax players, Tony Romano has had to maintain his passports and visas, hopping from New York to London to Scandinavia, into Czechoslovakia and Hungary, down to South America and across the Pacific to Japan.

Romano began mixing live sound with drummer Peter Erskine on the road with Maynard Ferguson in 1975. After a few years with Weather Report, Erskine asked Romano to do sound for Steps Ahead in 1980, where the engineer met tenor player Brecker. In addition to working with Brecker's band since 1984, Romano has continued to work with Erskine in Weather Update and the Joe Zawinul Syndicate.

The Brecker band has sound gear requirements written in their U.S. contracts, as well as when they go overseas. "When we're picking up production on the road, we give a minimum spec requirement of 32 channels and certain processing gear," says Romano. "Then I usually take a couple of digital reverbs and a digital delay for the house, some compressor limiters, and maybe four channels of gates, in case something gets particularly noisy during the night."

Of those 32 channels, the Brecker band uses 23, with the rest for Romano's effects returns. "I like to bring up all my effects on faders, so I have a little more control over them, and it makes it a little bit smoother in and out. I

Michael
Brecker



**AN INTERVIEW
WITH TONY ROMANO,
MICHAEL BRECKER'S
LIVE SOUND
ENGINEER**

like to have a little equalization if I need it, although a lot of the new digital effects have built-in programmable equalizers. We go with minimal stereo imaging in the concert situation, because a lot of people are sitting hard left or hard right, and if you're giving them a full stereo spread they're not hearing properly."

Romano takes four sends from Brecker, including one Shure wireless signal dry to the house,

and one wireless signal that's processed through the saxman's rack with a little bit of reverb on stage. "I have two feeds, wet or dry, depending on what I want," says Romano. "The way Mike's rack is designed, everything is brought up on a patch panel in the back. We plug an XLR into outs on the back of the panel, and it all comes up on his mixer. I can either have his mix signal with processing on it, or just the microphone dry. I take another signal from his EWI, which is patched into his huge racks. And we also have a Beyer K88 mic that we use as a backup. Sometimes the batteries go dead or he forgets to turn his mic off, and halfway through the show it craps out."

Occasionally Romano will have the challenge of working in a smaller club situation on a Tapco 16-track with rotary pots, but not often. "The first time I went to Europe, I was expecting it to be a couple years behind the U.S. technology," says the sound engineer. "I was pleasantly surprised. Their professional companies are on an equal with any here in the States."

On a recent trip to Brazil with Brecker, Romano was impressed with the quality of the mixing boards. "They had Soundcrafts in Sao Paulo and Scorpions in Rio," he says. "They're very cost-effective consoles; they're all modular, and they're dependable."

The mics he usually finds on the road are Sennheiser 421s, Shure 57s, AKG 451 condenser mics, Electro-Voice PL20s and AKG B-12s for the kick. "They

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usually give you quite a bit of choice. They're all good quality these days," he says. "If there's a particular mic you love and have to have, carry it with you. We do specify certain mic choices in our rider, but a lot of times they'll give you a substitute."

At an outdoor concert in Ibirapuera Park in Sao Paulo, the sound company had a large system, with 15 boxed speakers on each side of the stage. "I think they had all JBL components on everything and drivers on the horns. It was a very well-designed system," says Romano. "It was a lot of one-box cabinets, and subwoofers down on the bottom. The all-in-one box systems sound a little more coherent than the all-component systems with separate cabinets for everything. I like at least a 3-way system for clarity, but sometimes you'll run into an old 2-way system."

As far as the precision of road crews and sound operators, Romano says that Japan takes the gold. "They assign you a crew and

sound company of six or eight people, and they travel with you pretty much for the entire tour. The first night after you've set up the band, they come out on stage and take Polaroid pictures of the setup, and mark the stage with tape. The next day you walk into soundcheck at a different venue, and the entire stage is set up. It's totally correct, wired up. After the show, by the time I get from the board to backstage to get a glass of water, and walk back out on stage, they have it broken down and in the truck. It's ridiculous."

One of the major problems Romano has to deal with in performing overseas is a power supply that changes from city to city, which can play havoc on electrical equipment. "European power in most places is 220 volts, and they'll regulate it down for you. But a lot of times you can't depend on the power regulator. In Japan it's a different problem. Our power here is 60 cycles. Our equipment is geared to that. You get to Japan and it's 50 cycles,

which doesn't really affect things too greatly, but synthesizers don't tune up properly. You have to regulate your power there, too. In England it's 240 and 60 cycles.

"We always carry a stage power distribution system when we travel overseas, so when we plug into our own connectors we know it's going to be clean," Romano says. "We didn't carry the stage distribution system to Brazil, and kicked ourselves for it. We usually tap into a 220 primary and distribute our own regulated power to our stage. When you have a lot of synths like Mike does, he's dependent on the equipment being totally stable. But our first night in Rio, one of the stage crew gave us 125 volts of power—a little too hot. We ended up frying the EWI brain and the Prophet-VS. We had a spare EWI brain, but not a spare Prophet, so we had to do without a couple sounds that he normally uses."

Power problems are not confined to other countries. "On Long Island [NY] somebody shut

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down the power and our Matrix-12 crashed; the whole thing went down. Matrix doesn't like an abrupt power outage. We just grabbed the tape recorder and loaded back all his patch information and it was fine. Things like that happen every place. You can never tell when they're going to happen. You just float with it. We're lucky in the States where our power is pretty stable.

"Definitely take stage distribution power when you go to communist countries," continues Romano. "That's a must. When we measured their power it was pretty low, and had to be regulated up. And take stage amplifiers and things like that, because their technology is quite a bit behind the West. They can find a professional-quality sound company to bring in from Austria or close by to do festivals, but if you find yourself in the middle of nowhere in Czechoslovakia and need to find a Roland JC-120, good luck. It's just not going to happen.

"If you can afford to, take as much of your stage as possible. Take your drum kit, that way you don't have to deal with *drums du jour* every night. Every night you get a different kit, and it's not reliable, even though you tell people the drum sizes you want. Say you're doing a jazz act and the guy doesn't like to use anything bigger than say a 22-inch kick.

You show up for the gig and there's a 24-inch or 26-inch, something huge. And the drummer freaks out. It sounds like a cannon shot and he's trying to play bebop. If you're going to do a tour without taking your backline, be aware that you could get in trouble."

Finding spare parts is easy in the big countries like Germany and France, but can be quite difficult in smaller countries, especially if you need to find a place you can walk in and buy parts. You can't always just pick up the telephone and make a call. "We'll carry a basic toolkit with a few connectors that we know we're going to need during the course of a tour," says Romano. "It's hard to foresee everything, but you can bring basic stuff to fix something minor. Scope that out with the companies in advance, and try to find a guitar store."

When entering a foreign country with musical equipment, Romano strongly recommends that care is taken with immigration officials so that you may also *leave* the country with the equipment. "We do a very extensive equipment list that has all serial numbers and full description and price," Romano says. "When you enter a country and give immigration the list, they check it and have the prerogative to open up cases. But most of the time, if you've taken care of business, act

—FROM PAGE 109, TRUCK PACKING

This helps with lost or misplaced pieces and speeds up the pack time. And if one of the crew needs to work on a certain piece, he or she will know exactly where it is.

As a driver, what are some of your pet peeves regarding sound companies?

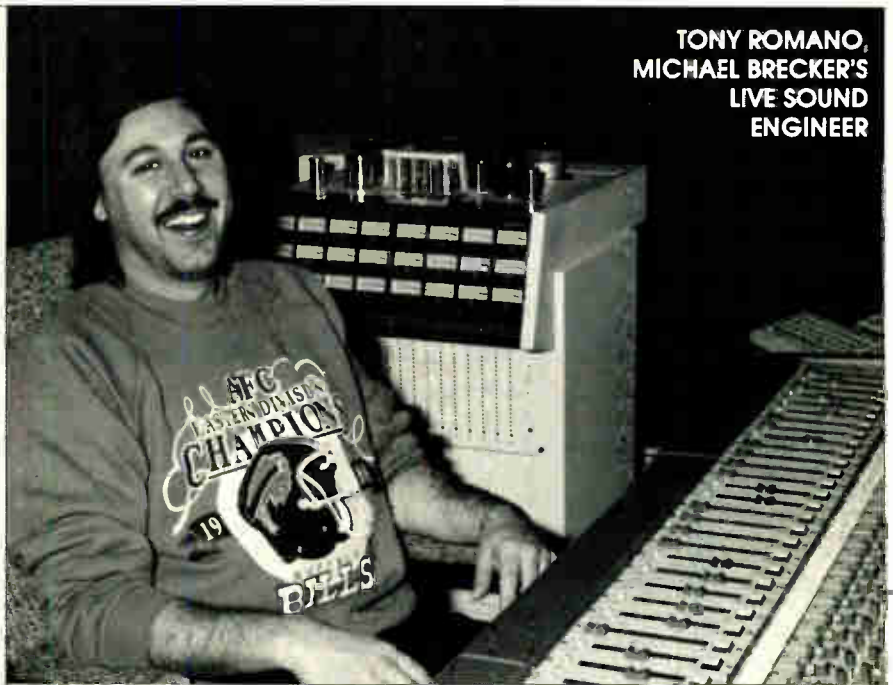
Please don't put markings on cases or boxes that say, "DO NOT TIP" or "MUST STAY ON WHEELS," unless you really mean it. You're going to have to tip some pieces, and it helps to know which ones truly deserve the labels. Amp and effects racks are often labeled too liberally. One suggestion is to label them

"FRONT" and "BACK" instead. It is far safer to keep the equipment suspended from the rack frame, tipping the rack on its back. Also, don't put hard metal edges (aluminum is okay) on the corners of your cases. A lot of companies like to build cases or carts with metal edges to protect the gear, but they dig a hole in the rounded front corner of the trailer after a short time. And those hard metal corners cut straps. If you use a strap to secure the load, and it runs around a box with the metal edge, it can cut the strap and let the load loose. Anticipate the problem, and move those boxes away from the end of the trailer. ■

professional and look reasonably coherent, then you've got a pretty good chance. Usually it's a lot harder getting back into the United States than it is getting out."

The traveling itself takes a toll on Romano's ears. "Flying screws me up for about three or four hours," he says. "Usually you recover by soundcheck. Flying with a cold can be devastating to an engineer. Not only is it painful, but you can rupture an eardrum. I got a bad cold touring in Europe last summer, so I had to stay on the ground and surface around with the truck, because I was afraid of blasting my eardrums out. When I get home from tours I go to an ear, nose and throat doctor. I always get my hearing checked out to make sure I'm not killing myself. I work in the studio when I'm not on the road, and I like to make sure that I'm not damaging myself live."

The engineer recommends taking a little more time with soundchecks in Europe and other overseas countries. "We go a little



**TONY ROMANO,
MICHAEL BRECKER'S
LIVE SOUND
ENGINEER**

earlier and check out the picture," says the engineer. "A lot of times when you're playing a festival you're lucky if you get a chance to hear a microphone before the band starts. That's one thing the crowd doesn't understand. If

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Playing unfamiliar concert halls also lends to the general confusion in mixing, especially in halls

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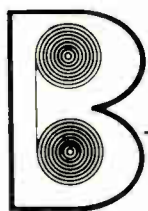
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Fagen. Since then, he's spent much of the last 20 years musically re-creating the feel of the '50s and '60s, writing and producing soundtracks for a string of hit films that includes *American Hot Wax*, *Animal House*, *Streets of Fire*, *Eddie and the Cruisers* and *Hairspray*.

Vance still lives in New York (Rockaway, Queens), in a home facing the Atlantic Ocean just a short subway ride from the streets he grew up on. "Anybody from Brooklyn who had a pompadour wanted to be a singer," Vance recalls, "and [our manager] would put these tours together, and we'd go to every club imaginable on a bus and do shows."

Leiber and Stoller auditioned the group and they were on their way. "In those days you could make records like 'Tonight, Tonight' by the Mellow Kings or 'Little Star' by the Elegants for \$100," Vance says wistfully. "Leiber and Stoller were already producing The Drifters and The Coasters. They were making very different records with them. They were urban story records like 'Charlie Brown' and 'Yakety

"I look at the engineer more like a camera operator and myself as the director."

Yak.' And The Drifters had a new sound—strings and kettle drums and triangles—and early production ideas that separated their record making from the doo-wop record making going on at the time. They took us and stretched us into a sort of white Drifters."

A string of producers, including Art-

ie Ripp, Wes Farrell and Burt Bacharach, worked with the band. The hits began to dry up after 1966, so Jimmy Miller (Traffic, Rolling Stones) and Joe Wizzard (The Turtles) were brought in. "Nothing worked," says Vance, "and without hits we couldn't get booked and we couldn't make money. So we decided to produce ourselves, and we went into a 4-track studio in 1969 and did 'This Magic Moment.' It was our biggest hit ever."

Vance's first shot at production was characterized by a touch that was to remain through the years. "I knew you had to capture a certain feeling in the studio," he says. "I was lucky enough to be around people like Jackie Wilson, Sam Cooke and Bobby Darin, and I was in enough studios with them to understand what had to be going on to make the sound correct. I primarily relied upon my instincts to get the sound right. It's pretty much what I do now on films."

A more recent example of this approach is found in *Heart of Dixie*, a film due out this spring. In one scene, the 1958 Elvis Presley homecoming show that took place in Tupelo, Mississippi, is restaged. The film's producers got permission to go into the vaults at RCA and remove one of Presley's master tracks of "Blue Suede Shoes." "I discovered there were 25 versions of 'Blue Suede Shoes' released, some even RCA didn't know about," remembers Vance. "When I called RCA with the numbers from Holly Springs, Mississippi, where I was researching it, they didn't know what I was talking about."

In preparation for scoring the scene, Vance spent three months criss-crossing Mississippi, searching for talent to play the scene's principal parts. "Traveling between New York and Los Angeles," he says, "you think you're on top of things musically, but down there, in places like Jackson and Yazoo City, are some of best-kept musical secrets this country has. There is an incredible, centuries-old American musical tradition they've kept alive. The feel I got down there renewed why I got into this business in the first place. There was a certain sincerity then that has to exist in the records I do."

After finding the choice take in RCA's Nashville vaults, Vance compared it with an original recording of the Tupelo show, a mono tape made by a fan present at the show, which included the sounds of a near riot dur-

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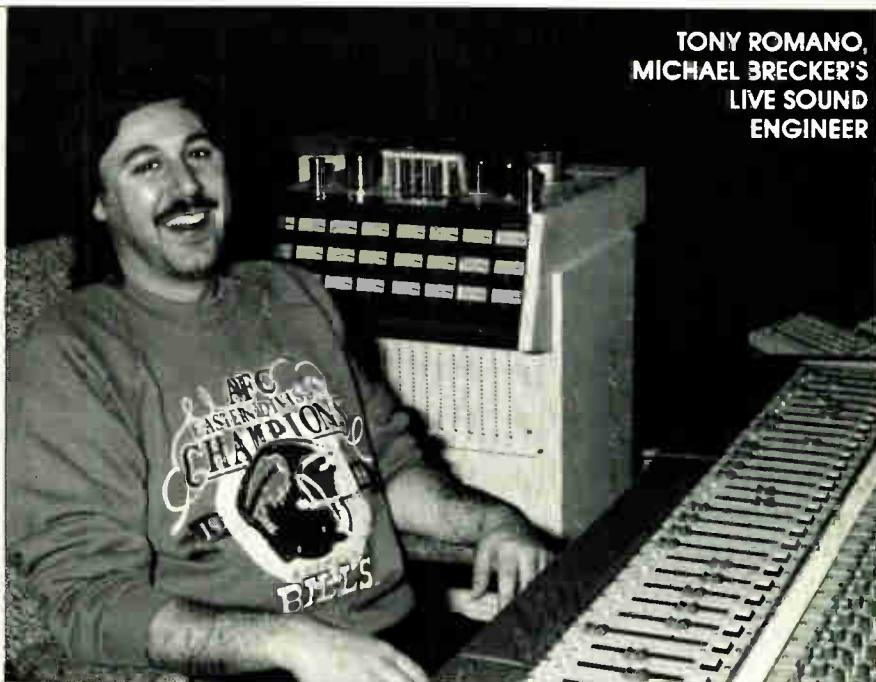
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The traveling itself takes a toll on Romano's ears. "Flying screws me up for about three or four hours," he says. "Usually you recover by soundcheck. Flying with a cold can be devastating to an engineer. Not only is it painful, but you can rupture an eardrum. I got a bad cold touring in Europe last summer, so I had to stay on the ground and surface around with the truck, because I was afraid of blasting my eardrums out. When I get home from tours I go to an ear, nose and throat doctor. I always get my hearing checked out to make sure I'm not killing myself. I work in the studio when I'm not on the road, and I like to make sure that I'm not damaging myself live."

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—CONTINUED ON PAGE 143

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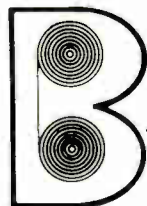
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by Dan Daley

KENNY VANCE

KEEPING YESTERDAY CONTEMPORARY

It was a gray, rainy day in lower Manhattan. Along Canal Street, the artery that feeds Chinatown, you could buy a \$30 Rolex from one of the stands lining the street and find out almost immediately how waterproof it was.

It was a day just like this 20 years ago when Walter Becker and Donald Fagen trudged through the Brill Building, that erstwhile New York music mecca, vainly searching for someone to listen to their songs. They were without a tape, and the doors stayed shut until they reached the fourth floor, where Kenny Vance heard their knock. Vance, then 23 years old and sensing the finale to his successful ride as a member of Jay & the Americans, opened the door and pointed to the piano in his office. Thus began a three-year relationship that was one point among many in a career that took Vance from the Flatbush streets of Brooklyn to the world of movies.

Vance, now 43, is tied to New York in many ways. He grew up pushing clothing racks down the streets of the garment district for his father's company, listening to the *a capella* harmonies that characterized New York's street corners in the late 1950s. He honed his vocal talents under the boardwalks and in subway stations, listening to doo-wop groups on the radio and on opposing street corners. At 15, he was haunting the Brill Building, where he teamed up with three singing buddies to form Jay & the Americans, a vocal group of the sort that only Brooklyn streets could produce. The group's string of hits included "Cara Mia" and "Come a Little Bit Closer." More significantly, during this period Vance began to apply production talents he had ac-

quired over the years in the studio, first under the tutelage of Leiber and Stoller, who produced the early Jay & the Americans records, then as a producer of the group himself in their later years.

A 1970 encounter with a film producer gave him a shot at scoring a film, *You Gotta Walk It Like You Talk It*, with newfound friends Becker and

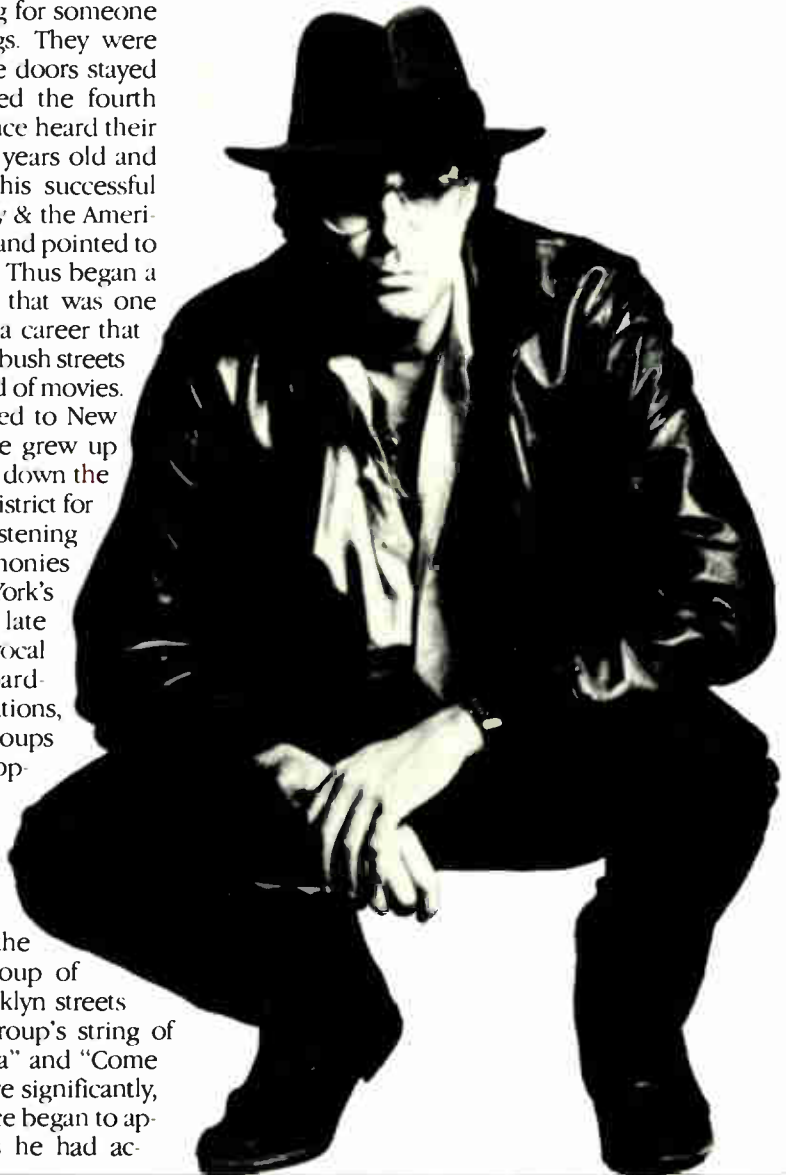


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World Radio History

Fagen. Since then, he's spent much of the last 20 years musically re-creating the feel of the '50s and '60s, writing and producing soundtracks for a string of hit films that includes *American Hot Wax*, *Animal House*, *Streets of Fire*, *Eddie and the Cruisers* and *Hair-spray*.

Vance still lives in New York (Rockaway, Queens), in a home facing the Atlantic Ocean just a short subway ride from the streets he grew up on. "Anybody from Brooklyn who had a pompadour wanted to be a singer," Vance recalls, "and [our manager] would put these tours together, and we'd go to every club imaginable on a bus and do shows."

Leiber and Stoller auditioned the group and they were on their way. "In those days you could make records like 'Tonight, Tonight' by the Mellow Kings or 'Little Star' by the Elegants for \$100," Vance says wistfully. "Leiber and Stoller were already producing The Drifters and The Coasters. They were making very different records with them. They were urban story records like 'Charlie Brown' and 'Yakety

"I look at the engineer more like a camera operator and myself as the director."

Yak.' And The Drifters had a new sound—strings and kettle drums and triangles—and early production ideas that separated their record making from the doo-wop record making going on at the time. They took us and stretched us into a sort of white Drifters."

A string of producers, including Art-

ie Ripp, Wes Farrell and Burt Bacharach, worked with the band. The hits began to dry up after 1966, so Jimmy Miller (Traffic, Rolling Stones) and Joe Wizzard (The Turtles) were brought in. "Nothing worked," says Vance, "and without hits we couldn't get booked and we couldn't make money. So we decided to produce ourselves, and we went into a 4-track studio in 1969 and did 'This Magic Moment.' It was our biggest hit ever."

Vance's first shot at production was characterized by a touch that was to remain through the years. "I knew you had to capture a certain feeling in the studio," he says. "I was lucky enough to be around people like Jackie Wilson, Sam Cooke and Bobby Darin, and I was in enough studios with them to understand what had to be going on to make the sound correct. I primarily relied upon my instincts to get the sound right. It's pretty much what I do now on films."

A more recent example of this approach is found in *Heart of Dixie*, a film due out this spring. In one scene, the 1958 Elvis Presley homecoming show that took place in Tupelo, Mississippi, is restaged. The film's producers got permission to go into the vaults at RCA and remove one of Presley's master tracks of "Blue Suede Shoes." "I discovered there were 25 versions of 'Blue Suede Shoes' released, some even RCA didn't know about," remembers Vance. "When I called RCA with the numbers from Holly Springs, Mississippi, where I was researching it, they didn't know what I was talking about."

In preparation for scoring the scene, Vance spent three months criss-crossing Mississippi, searching for talent to play the scene's principal parts. "Traveling between New York and Los Angeles," he says, "you think you're on top of things musically, but down there, in places like Jackson and Yazoo City, are some of best-kept musical secrets this country has. There is an incredible, centuries-old American musical tradition they've kept alive. The feel I got down there renewed why I got into this business in the first place. There was a certain sincerity then that has to exist in the records I do."

After finding the choice take in RCA's Nashville vaults, Vance compared it with an original recording of the Tupelo show, a mono tape made by a fan present at the show, which included the sounds of a near-riot dur-

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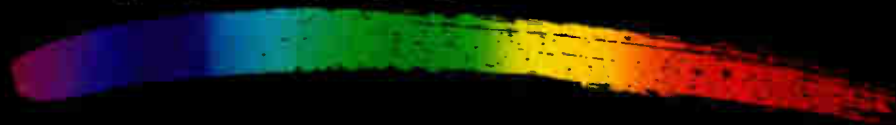
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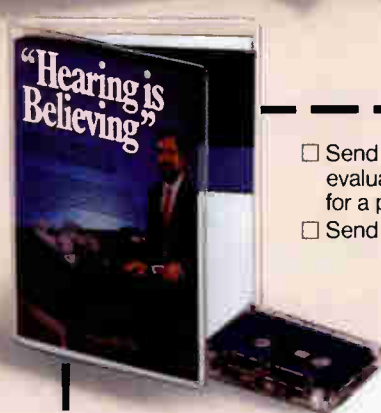


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World Radio History

ing one song as Presley cautioned the racially mixed crowd against violence. Vance says, "You can hear Elvis on the tape saying, 'Those people in back [a reference to blacks in the audience] paid their money, too, and they should see the show.'"

Along with engineer Mike Bradley, Vance slaved the mono 2-track of Presley's "Blue Suede Shoes" onto a 24-track tape at the Sound Shop studio in Nashville, equalizing as they went. A splice was made at the spot in which a drum solo occurred during the 1958 live performance. A local band, The Kingsnakes, doubled the Presley track and drummer James Stroud copped the drum solo hit for hit, which was inserted into the splice breach. Then, newly recorded guitar, drum and bass

"We decided to produce ourselves, and we went into a 4-track studio in 1969 and did "This Magic Moment." It was our biggest hit ever."

parts were mixed together with the original track, along with new background vocals from The Jordanaires, who appeared on many early Presley hits, re-creating the live performance built around the original Presley track. "We mixed in such a way that it didn't change the vibe of the original record, but it sounds much fuller than the original," states Vance.

With actor Michael St. Gerard (*Hairspray*) as Elvis, the restaged Tupelo concert was filmed to the prerecorded track. "The people there forgot it was a movie and went crazy," recalls Vance. "It was like they had waited 30 years for Elvis to come back. It was a special moment and you'll see that in the movie. Because the prerecord has the

sincerity of the original moment, it did exactly the same thing to the crowd. When the drum solo came, they went nuts."

Vance doesn't regard himself as a "technical" producer, preferring to rely on engineers for options. "I look at the engineer more like a camera-operator and myself as the director," he says.

Recalling some of his other sound-track efforts, Vance sang the voice of Sal, the lounge singer in *Eddie and the Cruisers*. Again looking for a more holistic approach to music for that movie, Vance used John Cafferty & the Beaver Brown Band, a band he once saw at the Bitter End in Greenwich Village years before and later tracked down at a Rhode Island club.

Hairspray, with a soundtrack he scored and produced, included the eponymous title song performed by Rachel Sweet. "I tried to get that one to sound like a 1988 Ronettes," says Vance. "I recorded live drums, and Sandy Marandino triggered his samples off that. So the ambience is real live and 1965, but the sounds are very modern."

Of *American Hot Wax* he says, "What was great about it was that all the *a capella* work was live, and we did it with the Record Plant remote truck. It gave me a chance to re-create a lot of what I had done years ago."

Vance has found a happy niche for himself as Hollywood looks back fondly at the '50s and '60s. But rather than simply remake musical museum pieces or do overly contemporary versions of classic tunes, Vance seeks to meld new and old. "You don't try to fudge the sound to make it sound like 1956," he says. "You get it to feel like 1956, then you go for the best sounds you can. You need all the kids in the theater who never heard the song before to say this is great for right now, and you need the people in their 40s to say this is the way it was."

Vance has also produced a few non-cinematic musical projects, including John Cafferty's *Tough All Over* LP, as well as his mellow, second solo album on Gold Mountain Records, *Short Vacation* (1988), with Pete Himmelman co-producing. Vance acknowledges, however, that being a producer is his true calling. "I guess it's always been that way," he muses. ■

Dan Daley is a Mix contributing editor based in New York City.

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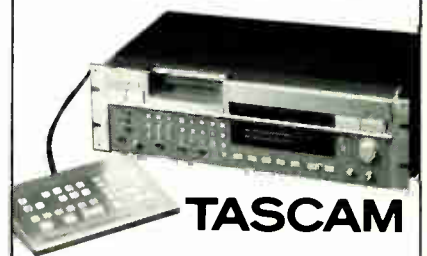
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by Craig Anderton

WINTER NAMM REPORT

SYNTHESIZERS STRIKE BACK

In a welcome contrast to the downer show held last summer in Atlanta (where many key manufacturers didn't even bother to show up), the Winter Expo of the National Association of Music Merchants (NAMM), held in Anaheim January 20-22, was brimming with optimism and nifty products. There were also some pretty significant trends worth noting.

For starters, companies seem to be addressing the upscale, professional market once again. During the past few years, it sometimes seemed that the race was to see who could cut expenses the most; often durability, flexibility or product longevity were compromised in the process. At the show, though, several companies were showing products with elevated price tags—and features to match.

One such product was Yamaha's V80FD, which

was shown privately and not featured on the main floor. Retailing at \$2,995 and expected to hit the stores by early summer, this is a six-operator, 16-bit FM digital synthesizer with an onboard expansion port. Plans are already afoot to make expansion modules that add PCM-sampled sounds to the basic FM repertoire, allowing for combinations of samples and FM (I bet that will produce some great piano sounds), an RGB video interface card and memory expansion for the built-in 32-track sequencer. The sequencer, by the way, includes digital mixing and individual note editing. The V80FD also includes an internal disk drive, a 40 x 8 super-twist LCD that enhances ease of programming, dynamic allocation and, like just about every other synth these days, onboard signal processing.

As noted in this column on the AES, the hottest trend these days seems to be toward improving the user interface. The V80FD, in addition to its informative CD, also includes six continuous sliders for real-time control over several parameters (hurrah) and macros to simplify programming.

The V80FD may be pricey, but it's a pro unit whose expandability is a major

plus. Yamaha also showed the V80FD's little sibling, the V50, which is a dual, four-operator FM synthesizer with a built-in PCM drum machine, 8-track sequencer with 15,000-note storage, 32 digital effects, disk drive,

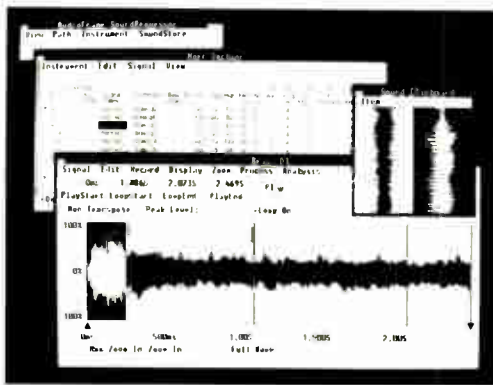
At left is Yamaha's V80FD, a six-operator, 16-bit, expandable FM digital synthesizer introduced at the NAMM show.



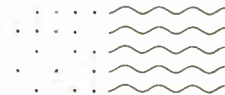
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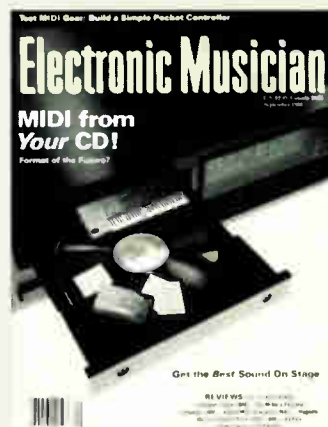
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—CONTINUED FROM PREVIOUS PAGE

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The surprise of the show, though, was Peavey's DPM-3 synthesizer. The price isn't firm yet, but looks like it will be around \$2,000. What you get is a velocity/pressure-sensitive keyboard driven by a 32-oscillator sound generating engine. The sounds are based on PCM samples (wavetable synthesis) but with one significant difference: new samples can be loaded in via memory cards or the MIDI Sample Dump Standard. So, if you have a great trumpet sound stored in another synth or a sample editor such as *Alchemy*, you can send it over to the DPM-3 and use it as a sound source.

The DPM-3 also features 16 voices, internal signal processing with assignable inputs and outputs, digital filtering with resonance controls, 100 on-board patches with an extra 200 accessible via memory cards and a built-in disk drive. In keeping with the current trend of creating "workstations" out of synthesizers, the DPM-3 also includes a ton of drum samples and a 9-track, 20,000-note sequencer whose memory, interestingly enough, is not shared with the PCM samples. A lot of people at the show were not really aware of just how technologically hip Peavey gear is these days (its signal processors in particular are woefully underappreciated), but the DPM-3 made a dramatic statement about just how far this company has come in the past few years.

Can you keep a secret? Ensoniq was giving private demonstrations of the VFX, its latest "super-synthesizer." They will not be shipping by the time you read this, so don't call Ensoniq or distributors until you start seeing the ads. The VFX sounds great and adds something entirely new to synthesis: being able to "get inside" the wavetable sounds and modify them in real time. This is not unlike the way you would do, say, pulse-width modulation with a conventional analog synthesizer; but when it comes to samples, this is an effect you have to hear to believe.

The VFX wasn't the only upscale Ensoniq synth. The company also showed EPS-M, a rack-mount version of the popular Ensoniq Performance Sampler. Retailing for over a thousand dollars *more* than the keyboard ver-

Manufacturers seem to be addressing the upscale, professional market once again; several companies were showing products with elevated price tags—and features to match.

sion, the rack includes more memory, built-in SCSI and eight polyphonic outputs.

Speaking of secrets, Roland gave its dealers a sneak preview of the S770 sampler prior to the NAMM show in a special presentation at Knott's Berry Farm. This is a no-holds-barred, top-of-the-line 16-bit sampler that, in the demo, recorded about a minute-and-a-half of CD-quality sound on hard

disk. It's called a sampler, but frankly, I wouldn't be surprised if the S770 is the first step in creating a "baby Synclavier" digital audio workstation. While its introduction is still a ways off, this is a development that bears watching.

The Roland product that got the biggest buzz, though, was the R-8 drum machine, which not only sounds great but includes a variety of "humanizing"

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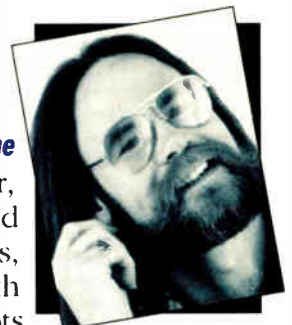
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functions that really do make a difference. I heard the R-8 demoed with a brush snare cartridge and it sounded great—no robot drumming there.

Roland also showed the lower-cost R-5 (like the R-8, but with fewer outputs, no provisions to accept external sound cards and less memory). And since everybody had to have a new "workstation" at the show (I think that's written into the NAMM bylaws), Roland obliged with the W-30 Music Workstation. For \$2,795 you get a 16-track sequencer, keyboard, 16-bit sampling, 16 voices, eight outputs, SCSI interface and downward compatibility with MC-series Micro Composer disks.

Bucking the high-end trend was, surprisingly enough, E-mu, one of the few companies to have continued making high-end products over the past few years. They reduced the Emulator III's list price to under \$10,000 (perhaps now it will get the recognition it deserves), but the big news—and possibly the biggest attention-getter at the show—was Proteus, a 16-bit playback-only device containing sounds ported over from the Emulator III (pianos, guitars, drums, organs, strings and so on).

This 1U rack-mount unit is unusually flexible; sounds can be edited, and the modulation routing scheme follows the same kind of thinking as the Oberheim Xpander and Matrix products. Throw in 32-note polyphony, six polyphonic outputs, integral sends and returns, and alternate tuning capability, and you have quite a machine. Price it at \$995, and you have a monster. Just about everyone I talked to at the show can hardly wait until the thing actually comes out so they can run out and buy one. Hey, sign me up, too!

Which brings up an interesting point: few of the keyboards mentioned in this report (except for the E-III) are available as of this writing, so it's probably worth pointing out that prices and specifications may (and probably will) change before these units hit the streets. Meanwhile, there were plenty of other developments at the show, which we'll get into next month. See you then. ■

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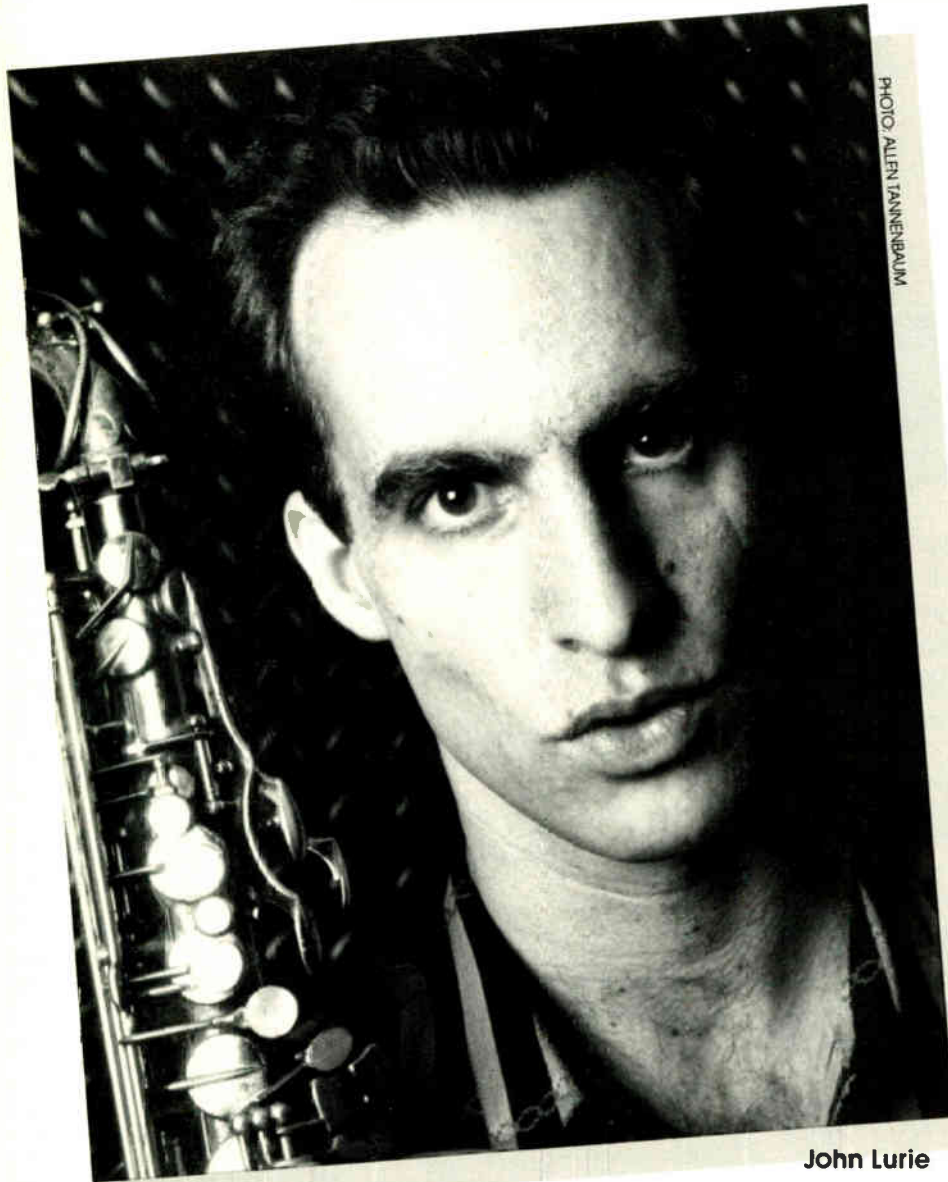


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John Lurie

JOHN LURIE: A Lounge Lizard's New Skin

by Robin Tolleason

The Lounge Lizards have been described as a Holiday Inn band on acid. (A cruise ship like the Queen Elizabeth II would be a good gig for the group, jokes group founder John Lurie.) But the band has evolved into a serious and respected musical outfit, changing gears with a smart-alecky nonchalance, throwing rhythms atop each other and blasting simple melodies over the fray. They headlined last year's Vienna Jazz Festival and were picked to close this year's Free Jazz Festival in Brazil.

"They say it's punk jazz," says Lurie, fighting a bout with food poisoning in a luxurious Sao Paulo hotel room. "Maybe in 1979 or '80 it was like Art Blakey meets the Sex Pistols—sleazy riffs, and a couple Monk tunes turned upside down. But we didn't play that well. It was just ferocious energy with a few melodies hopping out. It was a time when everybody was messing up everything. Painters were starting bands, and everybody was being irreverent about everything.

"For a while we were too eclectic. It was like, 'The tango, the fast blues, the African song, the go-go.' But now I feel like it's synthesizing into something unique."

—CONTINUED ON PAGE 136

MICHELLE SHOCKED

A Strange Wind From East Texas

by Iain Blair

Michelle Shocked is not your run-of-the-mill singer with a guitar. First there's the matter of her name (it's a pseudonym, obviously) and the title of her latest album, *Short Sharp Shocked*. Both were inspired by her real-life experiences as a patient in a Texas mental institution. "You know the principle of the short sharp shock?" she asks. "It's a behavior theory that says you don't have to change someone's thinking, just change their behavior."

Then there's her appearance. It's not exactly shocking, but the singer's shaved head with punky spikes on top, and unflattering, utilitarian black clothing are about as far as you can get from the Tiffanys and Debbie Gibsons of the pop world.

What *is* shocking is the music. She may look like the illegitimate offspring of the Sex Pistols, but when Michelle Shocked strums her guitar or bows her fiddle and starts to sing, she sounds, as one music magazine described her, like 'Woody Guthrie's long-lost daughter.' Her voice is pure and rich, and although she's only 25, she sings convincingly of the hardships of life.

No wonder, when you hear her life story. She grew up in Gilmer, a small town with big prejudices that she skillfully skewers in the dreamy ballad "Memories of East Texas": "Their lives ran in circles so small/They thought they'd seen it all so/They couldn't make a place for a girl who'd seen the ocean."

"It was the kind of place that didn't leave you many choices," she comments. "There were maybe a dozen categories they could put you in. I guess I fell into the 'none of the above' category." Shocked's childhood sense of isolation and alienation wasn't helped by her strict, Mormon upbringing. Her mother refused to let her go

—CONTINUED ON PAGE 139

DAVID LINDLEY: ELECTRIC ECLECTIC

by Josef Woodard

Music has been quite good to David Lindley over the decades, for a sideman versed in folk music who has stayed aloof from the pop mainstream. In the '60s, as the multi-instrumentalist leader of Kaleidoscope, Lindley had one of rock's first freely polystylistic bands. In the '70s, Lindley's searing lap steel guitar style cozied up to Jackson Browne's voice and became part of the signature Browne sound, and Lindley spread his talents as a reluctant studio player. Now, in the late '80s, Lindley's band, El Rayo-X, continues to generate the non-digital eclectic merriment that's an antidote to techno-pop overkill. *Very Greasy*, the band's most recent album, boasts the same happy mix of elements and unpretentious glee that has made the band one of the dark horse favorites of the pop scene.

There is more than meets the ear with El Rayo-X. For one thing, they deftly skirt the issue of musical category: For Lindley, there's nothing at all unusual about a collage of reggae, Tex-Mex, surf music, calypso, swamp rock and juju music in the space of one album—or one song. In fact, it's

—CONTINUED ON PAGE 140



Baryshnikov's ultimate nightmare



David Lindley

PHOTO: RANDEE ST. NICHOLAS

F.Z. DOES IT LIVE ON CD

by Rip Rense

You can't do *what* on stage anymore? "That certain *je ne sais quoi* of Frank Zappa," says Don Rose, president of Rykodisc.

Or, for those who don't speak French, a more Anglicized comment from Zappa himself:

"Just little incidents in concerts that I've always felt were exemplary live events; things that could only have happened one time with one particular band, because that's the way the universe worked that night."

Those little understatements describe what non-Zappa appreciators consider a major overstatement—*You Can't Do That On Stage Anymore*, a six-volume (two CDs in each) package of live Zappa material on Ryko dating back 20-plus years—a project of such outrageous scope that it is probably without precedent in the history of recorded pop music (not counting bootlegs, of course).

But then Zappa himself is of such outrageous scope that he is without precedent in the history of pop music. That sounds like hype, of course, but what other contemporary musician has put together so many distinctively talented conglomerations of monster musicians over so long a period of time? Who else has composed music

—CONTINUED ON PAGE 134

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MUSIC · NOTES

—FROM PAGE 133, ZAPPA

for orchestras, jazz bands, rock bands, chamber groups and computers? Who has had his music realized by everyone from Flo & Eddie to George Duke, Lowell George, Jean-Luc Ponty, Adrian Belew, Captain Beefheart, lexicographer/composer Nicholas Slonimsky, John Lennon and composer/conductor Pierre Boulez?

"Admittedly," says Rose, "with this project he's preaching to the converted, more or less. But that group of fans remains so active and indeed has asked for this for years. Frank has every right and ability to give it to them."

You Can't Do That On Stage Anymore is a slap at the overprogrammed nature of most pop concerts today and a tribute to the notoriously spontaneous Zappa stage shows of the last quarter-century(!). What Zappa is assembling (Volumes One and Two are out; the remaining four will be released throughout '89) is no hastily thrown-together sampling of a few favorite concerts. It is a lovingly executed realization of one of the 47-year-old musician/composer's longest-standing fantasies.

"One of the things I've always wanted to hear," Zappa says, "just for my own amusement, was an impossible concert, where you could take examples of all the different bands throughout the years, as though you were in a concert hall, and could have all these different bands on the same stage segueing from one song to another, from band to band.

"Digital editing technology allows you to do that; you can balance the level from cut to cut; you can do 90-millisecond crossfades from cut to cut so the edits are real smooth; and you can jump from one year to another right in the middle of the song, right on the beat. From a conceptual standpoint, it's something I would have done for my own amusement even if I never had a chance to release it."

The result: a "concert" that might include, as does Volume One, the old Mothers of Invention doing "Let's Make the Water Turn Black" from 1969; the so-called "Vaudeville Band" with Kaylan and Volman doing "The Groupie Routine" from 1971; "The Mammy Anthem" from *Thing-Fish*, as performed by Zappa's 1982 band (featuring Ray White, Tommy Mars, and Steve Vai); and "Big Swifty" from 1973,



PHOTO: SERGIO ALBONICO

Frank Zappa

featuring what was probably the most musically interesting Zappa troupe, consisting of Duke, Napoleon Murphy Brock, Ruth Underwood, Bruce and Tom Fowler, Chester Thompson and Ralph Humphrey—among other things.

There are no overdubs on any of the fantasy concerts, and each volume comes with Zappa-penned liner notes explaining the date (and sometimes the circumstances) of each song's performance. For example, the notes to "Zomby Woof" from a 1982 Milan, Italy, performance read, in part: "There were approximately 50,000 people in attendance. Most of them got in by breaking down the fence. When the show began and the lights came up, the entire band was swarmed by mosquitoes. We spent the rest of the evening swatting them off and trying to dodge the discarded disposable syringes tossed on stage by the unfortunate users in the front row. The cartoon illustration on the cover of the *Man From Utopia* album commemorates this event."

Of course, the concerts also include things you "can't do on stage anymore"—ad-libs of what would customarily be described as off-color and bizarre verbal and musical pranks. The titles are being selected with meticulous care by the musician in all-night sessions that find him weighing the relative merits of performances in terms of humor, group performance and solo excellence.

Volume Two of the project is the only one of the six made entirely of material from a single concert. It is the Helsinki, Finland, performance from September 22, 1974, featuring

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the Duke/Underwood/Brock/Tom Fowler/Thompson band, and it also has been issued on LP (a three-record set). It is a musical *tour de force* of the *Live at the Roxy and Elsewhere* LP ilk, liberally interspersed with touring jokes and audience participation.

Rose and Ryko recognized the bankability of the Zappa market. Of notions that the market is flooded (Zappa usually issues several new LPs a year), Rose says, "Every time we release a batch of new material, we have an opportunity to revive the existing catalog," explaining happily that there are x-number of people who buy everything F.Z. issues.

Obsession? Fanaticism? You bet.

"First of all," says Zappa matter-of-factly, "I don't think there's another artist who has ownership of as many of his master tapes as I do, who also has his own recording studio, any amount of time on his hands, and the obsession to take this material and organize it into such a product. It does seem like an obsessive thing to do, but on the other hand, the fans for this kind of stuff are themselves bordering on obsessive. So we have a good working relationship.

"I think," he adds, a trace of pleasure in his voice, "they like the idea that they're waiting for the next thing to come out, and they know that in some dark, little cubicle in the middle of the night there's an obsessive individual welding it together for their amusement."

For the record, now being welded together by that obsessive individual for future amusement: a sequel to the 1967 avant-garde ballet, *Lumpy Gravy*, entitled *Phase III* (Synclavier compositions, live performances from '88 mixed with "missing parts" of spoken dialog from *Gravy*), and, in what is big news for Zappaphiles, the video release of *Uncle Meat*, the Mothers of Invention movie begun in 1968 but only recently completed. (It features superb rare footage of the old Mothers on stage on London, with orchestra and, if nothing else, is sure to immortalize the phrase, "I'm using a chicken to measure it," in Zappa lore.) Also, coming this spring: *The Real Frank Zappa Book*, a quasi-autobiography/commentary from Poseidon Press.

Anything else, Frank?

"I started a little symphony, and I've got a couple of piano concertos I've been working on. . . ."

—MUSIC NOTES CONTINUED ON NEXT PAGE

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MUSIC · NOTES

—FROM PAGE 132, LURIE

Lurie claims to have been influenced by Monk, Bartok, Varese, John Coltrane, Eric Dolphy, Ornette Coleman and Duke Ellington, and film composers Bernard Hermann and Ennio Morricone. These days he's listening to more primitive sounds: "African sounds, pygmies, Tibetan, Balinese, Javanese. Now my influences really come from non-musical sources. It's simple stuff, but really wacky. Everybody's playing in different time signatures, the melodies are super simple, but the way they lock together is really odd. There are parts where somebody is doing a 5/4 against a 4/4. I really do want it to sound like pygmies from New York."

The current Lounge Lizard lineup is solid in brass and rhythm, with Roy Nathanson on sax, Curtis Fowlkes on trombone, Marc Ribot on guitar, Dougie Bowne on drums, Erik Sanko on bass, percussionist E.J. Rodriguez and Evan Lurie on piano. Sometimes the trick is hiding the chops.

"It's more about the attitude of the guys," says Lurie. "I'm having trouble with the sloppiness, but the key is the emotional level of the music. We're not just getting up and ripping or playing some super technical stuff. That doesn't interest me.

"To be a virtuoso is absolutely nothing. Marc is an incredible guitarist. He can play great classical music and country-western like nobody I've ever heard. But when he plays with us, he plays like he just found the guitar. I like that. That's a hard thing to do."

The Lounge Lizards' first album was released in 1981, and mixed a growling "Harlem Nocturne" with Monk's "Epistrophy" and several of Lurie's feisty originals. After signing with Island Records, the group did a live album from Japan. Their 1987 release was titled *No Pain for Cakes*, and although Lurie liked the sound, he thought it a little stiff. "I like to record live, but somebody always makes a mistake," he says. "I don't know how most people do it. I've got to admit I fixed one thing where I took a solo and played in a booth so I could isolate it and cut into the middle, which I know is supposed to be sacrilegious. It was okay but not that interesting, so I punched in to go over that part to

—CONTINUED ON PAGE 138

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—FROM PAGE 136, LURIE

make the whole thing better.

"I don't like physically to be inside the studio. It's just a closed-in atmosphere with no air," Lurie continues. "I think saxophones always sound better in rooms that are slightly vibrant, that echo a little bit. Studios never have that. The saxophone always sounds bad in the studio, and then it gets treated afterwards with reverb. In Rio I had the engineers run a line, and I went and played in the bathroom. And they were very happy with it."

Lurie also has to fight his own expectations when he goes into the studio. "It seems a little mundane," he says. "It's not always the best performance. I guess some people can afford to just keep going back, but if you play something too many times it doesn't work either. With our music, lots of times we just go for the energy rather than the musical thing."

Lurie's musical career started with the harmonica (he was influenced by Little Walter), but he knew there wasn't much future with the instrument, so "I switched to playing electric guitar and studying classical, but

it wasn't happening," he says. After Lurie's father died his senior year of high school, Lurie colored in his college board exams and planned to go to Vietnam with the Army rather than college.

"I was walking around in Worcester, Massachusetts, at 5:00 in the morning," Lurie recalls, "and I meet this guy with a wheelbarrow full of dirt. He was going to plant a garden on his roof. He started telling me that he had just seen a statue turn into an angel and fly away. At that point in my life I was looking for some kind of mystical revelation. Then he started explaining that amplifiers could be made out of cotton. He took me to his house and gave me a saxophone and a bike. Every day I rode into the woods and blew my brains out—sort of what Pharoah Saunders sounded like to me at that point. I heard Coltrane's *Live at Birdland* and Dolphy's *God Bless the Child*. I was moved by it, but I didn't understand it, and so it just opened up this whole thing."

While writing a script in 1978, Lurie decided to sell the idea through music first. That band began playing an occasional club date around New York, and the Lounge Lizards were born. The

saxman has continued his writing and acting—he played St. James in *The Last Temptation of Christ*. "I had to figure out 50 ways to look amazed while Willem [Dafoe] did the miracles," he says. Lurie has also done the soundtracks for *Down by Law* and *Stranger than Paradise*, and Capitol recently put out an LP of some of his film music.

The saxman/composer doesn't have any one set way of working. "I just walk around with the saxophone playing. I'll hit on something, record it and put it down. Sometimes I'll just go into the studio with a little line, have the drummer play and work out something. I'm not one of those people who gets up at 8:00 in the morning and starts writing music. I'm kind of erratic. Give me six weeks to write a soundtrack, and I'll pace in my room, get sick, and then two days before it's due I'll write everything."

The band's image is a contrast—they all wear suit and tie, in the jazz tradition, then proceed to blow jazz stereotypes right out the front door once the music starts. "When we were really poor, the best thing you could do was buy a \$10 suit in the used clothing store. It started as kind of a

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joke, sort of a throwback to the late-'50s jazz musicians. I want it to look like something, not just a bunch of musicians in plaid shirts. The audience is watching these people for two hours—the band might as well dress nicely. Also, just to make it like it's serious, like we respect what we're doing." ■

—FROM PAGE 132, SHOCKED

to the movies, watch television, listen to popular music or participate in other normal teenage activities. Her stepfather was in the Army, and she grew up "an Army brat, a child of the military welfare system."

It was Shocked's natural father, "a pot-smoking hippie teacher," who first introduced her to the local blues and folk influences that pepper *Short Sharp Shocked*—though the singer is quick to deny that her own music is either. "We'd go to these bluegrass festivals, meet these old geezers and drink their corn liquor and stuff," she recalls. "It was a whole other community."

At 16, Shocked, the eldest of eight, ran away from home to join her father in Dallas, and then began traveling in earnest—first to Austin, where she played the local clubs, and then to San Francisco, where she became involved with a squatter's movement and the politics of homelessness. "That's where it all fell into place for me," she comments. "I found an alternative community that was really committed to its ideals."

But back in Dallas, confronted by a daughter she no longer understood, Shocked's mother promptly had her committed to a psychiatric hospital on the grounds that, "I was—and still am—crazy." Ironically the singer was declared sane and released a month later when the insurance money ran out. Not surprisingly, mother and daughter have not spoken since. "I don't want to sensationalize the matter, but it has caused me a lot of pain," she states simply.

Shocked's personal turmoil coincided with her increasing disillusionment with the American political climate, and in 1985, after several nights in Texas jails for political protests, the singer headed for New York and then Amsterdam and London. She quickly found a sympathetic audience in Europe for her special brand of confrontational, politically motivated songs ("It's *not* protest music, though," she insists), and has since based herself

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MUSIC · NOTES

in London, where she lives on a houseboat.

Shocked might have remained a well-kept secret from her native land but for one of those stranger-than-fiction real-life twists. In 1986, on a rare return to East Texas, she played a batch of her songs at the Kerrville Folk Festival and was "discovered" by English record producer Pete Lawrence. "He asked me if I'd mind him recording some of the tunes on his Sony Walkman," she recalls. "I didn't give a damn one way or the other, so I said, 'Sure.'"

Much to the singer's surprise, the results, *The Texas Campfire Tapes*, which feature Shocked's potent music alongside chirping crickets and passing trucks, immediately shot to the top of the British indie charts, and brought the major labels a-knocking. "That was the real scary part," she confesses. "I'd spent all those years fighting against the system and the 'music business,' and suddenly I saw myself being swallowed up by it."

Shocked needn't worry. Her second album, on PolyGram and made with the help of a big-time producer,

doesn't sacrifice any of her fire or passion, and the singer managed to land on a tour with another politically outspoken performer, Billy Bragg.

Still, she's uncomfortable with suddenly being thrust into the spotlight. "It changes your motivations for writing and performing, and I'm beginning to wonder if that's where corruption starts," Shocked says earnestly. "People tell me, 'It's okay. Change the system from the inside.' I don't know about that. I just hope I change it before it changes me." ■

—FROM PAGE 133, LINDLEY

Lindley's standard operating procedure. *Very Greasy* features R&B cover songs treated in various ethnic grooves, a wacky reggae-rap version of Warren Zevon's "Werewolves of London," and campy ditties such as "Texas Tango" and "Tiki Torches at Twilight" (an audience sing-along number) written by his friend Bob "Frizz" Fuller. The album is an infectious and unassuming fun fair of music that never gets lost in the mire of frivolousness.

It's important for Lindley to mix and match his influences. "There will always be a reggae influence in every-

thing I do," he says. "That is there for good. There's also a bluegrass influence, which is very much the same as reggae. Of course, the Tex-Mex thing is like bluegrass, with the two and the four backbeat stuff. When you think about it, a lot of that stuff is very similar. You can overlay one on top of another and it really works. Okinawan music, Chinese music, Japanese, Korean music—that works too, right on top of there. And then you can get some other things that go over the top of that, like long singing notes on a slide. That's the way I put stuff together. I get a rhythm track; I start with the drums always, and then the bass line and put stuff on top of that.

"It's like painting," says Lindley, who has painted since childhood. "You do the large areas, and then you get smaller and you underpaint it and use textures. Who do I play like? Chagall [the great Russian painter] is pretty much like that. He goes all over the place. His influences were from all over the world. He also raised pigeons, which I did too."

Very Greasy's unified but eclectic approach works partly because of a familiar face in the producer's seat. Linda Ronstadt, Lindley's longtime

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World Radio History

friend and musical comrade, handled the producer role in more than a ceremonial way. "Linda had a lot to do with picking the material and making sure the tempos were right and the key was right for me to sing," he says. "She also has the greatest ears of anybody I know.

"You think that she's just this cute, furry creature—which she is—and it's really nice to look into the control booth and there's Linda Ronstadt instead of some old guy with a spliff," he chuckles. "She's real cute and nice, and also a terror. She'll stand nose to nose with you and tell you you're full of shit. 'Lindley, that was awful. You better go back. Let's try it again.' But she's one of my good friends from a long time back. This whole thing was real natural. There was nothing weird about it at all. She's going to do more of it, too. She enjoys doing it."

Lindley is no stranger to studios, having contributed to records by Warren Zevon, Rod Stewart, Linda Ronstadt, David Crosby and Graham Nash, James Taylor, Joe Walsh, Andreas Vollenweider, The Bangles, etc. He also played on Ry Cooder's soundtracks for *Paris, Texas* and *Alamo Bay*.

But by his own admission, Lindley is an unlikely session player. "When I play other people's stuff in the studio, it's not what I'd call 'studio musician work,' which involves very skilled musicians who can play all different sounds and instruments many different ways. They read like fiends and do everything very fast and very well. I really have a lot of respect for those people, like Tommy Tedesco. A lot of times, people will call me in and they think I can do that. They find out different. I say 'I'm illiterate, mon.'"

The session life, lucrative though it might be, doesn't entirely agree with Lindley. "When I was doing a lot of sessions and a couple of TV things, I was deciding whether I wanted to get into that or not. First of all, it was too much work. I'd have to learn how to sight-read like a machine. I said, 'Forget it, man.' I did work on some semi-slick stuff and I didn't like it. There's lots of money in doing that. You do three sessions a day at double scale—that's more than \$1,000 a day. But you have to look out that you don't die doing it. Working 9 to 5 is not a bad thing, but if you do that playing music, it's very bad."

Though he's often considered a guitar player's guitar player, Lindley is es-

"What kills me is when you can do everything with one note that somebody else may do with 2,200. It gives you time to take a breath."

entially a champion of economy over excess. The chemistry in his interplay with Jackson Browne had to do with

Lindley's ability to play solos that took their own melodic course. With El Rayo-X, his solos and rhythm parts fit into the musical framework rather than screaming for attention. He has always been attracted to players who exercise the power of restraint.

"What kills me is when you can do everything with one note that somebody else may do with 2,200," Lindley says. "It gives you time to take a breath. I think that's what it is; it's more human when things are phrased like taking a breath. When an instrument approaches the human voice, there's something more to it." ■

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—FROM PAGE 70, VIDEO SWEETENING

from careless transfers, where the audio and time code somehow become unlocked (for example, dubbing individually without resolving the recorder).

Finally, the exception to these rules is a circumstance where the audio and time code do not have a fixed relationship to begin with—for example, adding time code to a tape of background music that will be laid-up simply where it sounds appropriate. In this case, the time code is recorded "wild," with the recorder capstan internally locked. From this point on, however, the tape must always be re-

solved on playback, if the newly established relationship is to be of any use.

TRICKS AND MISCELLANEOUS INFO

Bear in mind that by striping time code on an audio tape we are artificially "creating" frames, for the purpose of resolving the tape speed and synchronizing. These time code frames have no inherent relationship to the audio, because audio does not come in discrete packets. For this reason, the time code does not represent every individual audio event, since it occurs only 30 times per second (33 milliseconds, or approximately a half-inch of tape at 15 ips). This is not

generally a problem, but it can lead to occasional questions of accuracy when checking sync between sound and picture. Fortunately, most people cannot visually perceive lip-sync differences less than about two frames, and the most any audio event can be off is one-half frame of time code (if it occurs exactly between two time code numbers). But a build-up of these kind of offsets can become noticeable.

Actually, the tolerances that audio engineers are accustomed to are a good deal tighter than video (audio comb-filtering becomes evident at around 5 ms delay). Synchronizers often provide the ability to offset master and slave time code numbers by fractions of a frame. This capability can be used to correct one-time sync errors (such as a jump in the time code, causing lip-sync to shift suddenly), but cannot be used to correct for unlocked audio and time code, at least not without numerous punches to "pull up" the sync.

When making audio and time code transfers during sweetening, it is a good idea to check the sync at each step to be sure everything is okay. One method is listening to the reference audio on the 3/4-inch videotape, while also listening to the newly transferred audio running in sync with the videotape. If the transfer was successful, the two audio tracks should overlay perfectly. If there is any phasing or echo, something may be wrong. This method is more critical than simply watching the mouth of the person on camera, and discloses sync problems that get worse as the program runs.

Another method of checking sync is viewing the time code from the master and slave on an oscilloscope. Using dual-trace, observe both time code signals while triggering the scope on the sync word of the VTR's time code (or the video output of the VTR). The sweep rate must be very slow. Over a period of several seconds (up to a minute) the two time code signals should not drift in relation to each other. If they do, something has unlocked, or a machine is not resolved (check the capstan reference switch). This method can also be used to make sure that the time code on the videotape is locked to the video.

If it can be determined that the difference in time code rates is around .1%, that may indicate that the synchronizer/time code generator was

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locked to AC mains at some point, since .1% is the difference between 59.94 Hz and 60 Hz. Or it may indicate a problem with mixed time code rates, or inadvertent cross-resolving during some part of the process.

A final point to remember is that a video sweetening project involves interaction with a video facility, where some things are done differently. Make sure all your tapes are adequately labeled with the usual audio information, including location and type of time code. Do not assume that the equipment used by a video house to lay-off or layback audio is similar to a synchronizer used in a studio, or that it behaves the same way. Most importantly, do not hesitate to get further information if something about a project is not understood. There are too many variables involved to allow questions to go unanswered. ■

Eric Wenocur is an engineer at KLM Video, a post-production facility in Bethesda, Maryland, and technician at Roar Productions recording studio. He is also a musician, recording engineer and producer, and would someday like to meet Stephen St. Croix, another local resident.

—FROM PAGE 117, BRECKER

built for something other than music, like the Palacio Das Convencoes in Sao Paulo. "The roof was pretty much cement, and it had a lot of weird shapes. So we were getting early reflections, late reflections, just about everything," Romano remembers. "The acoustical discs up above the stage didn't do a whole lot. But that was the venue, and you have to make it the best show you can."

To Romano, the hardest instruments to get a quick mix on are drums, horns and especially acoustic piano in an electric setting. He hates to close the lid on an acoustic piano, "but the only way I can get isolation on it, to get it in its proper perspective, is to use two C-ducers taped onto the sound board underneath. And inside the piano I use a pair of condenser mics to pick up the hammer sound. I can get the volume out of the C-ducers, but they tend to sound a little unnatural—too much direct sound, not enough timbre. The

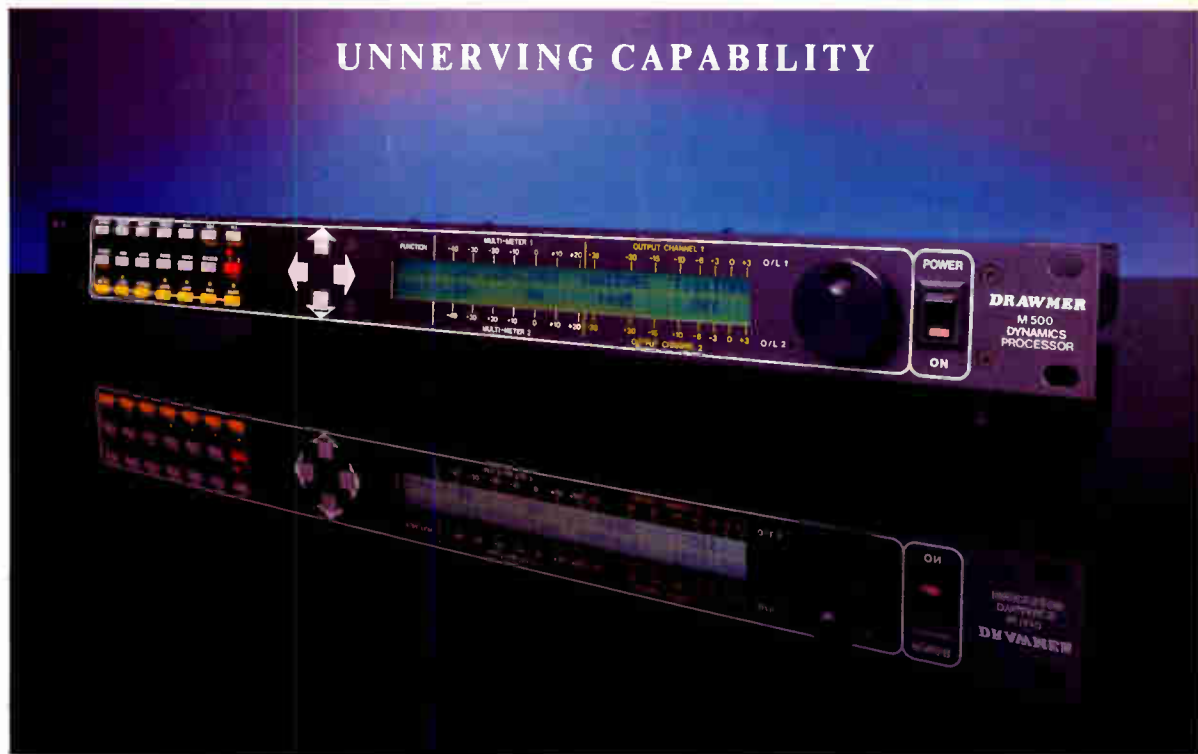
piano has a very complex sound. So I can usually get close by putting a little hammer sound back in with the condensers in the top. What makes the piano so hard in the electric setting is that you get all this stage rumbling happening, and that all goes underneath the piano and is amplified by the C-ducers. But there's nothing prettier than a great-sounding piano."

Romano's job is to satisfy the artist and the crowd. In international sound engineering, it's often a matter of scrambling and making do with what you're given. "It changes from night to night. Rooms are different. Sometimes you're given a gymnasium, sometimes you're in a beautiful concert hall. You've just got to deal with it. If you can get the show on and people enjoy it, you've done your job for the night. That's the excitement of live for me." ■

Robin Tolleson is a San Francisco Bay Area-based writer and musician.

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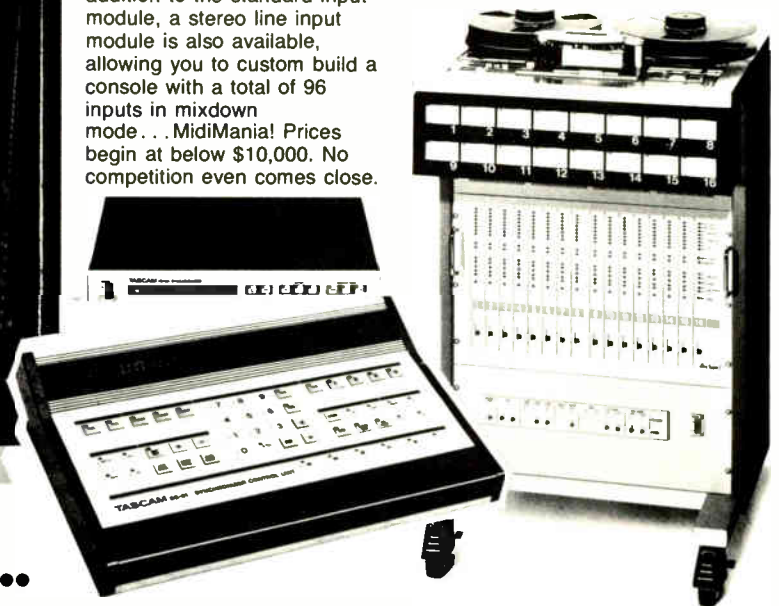
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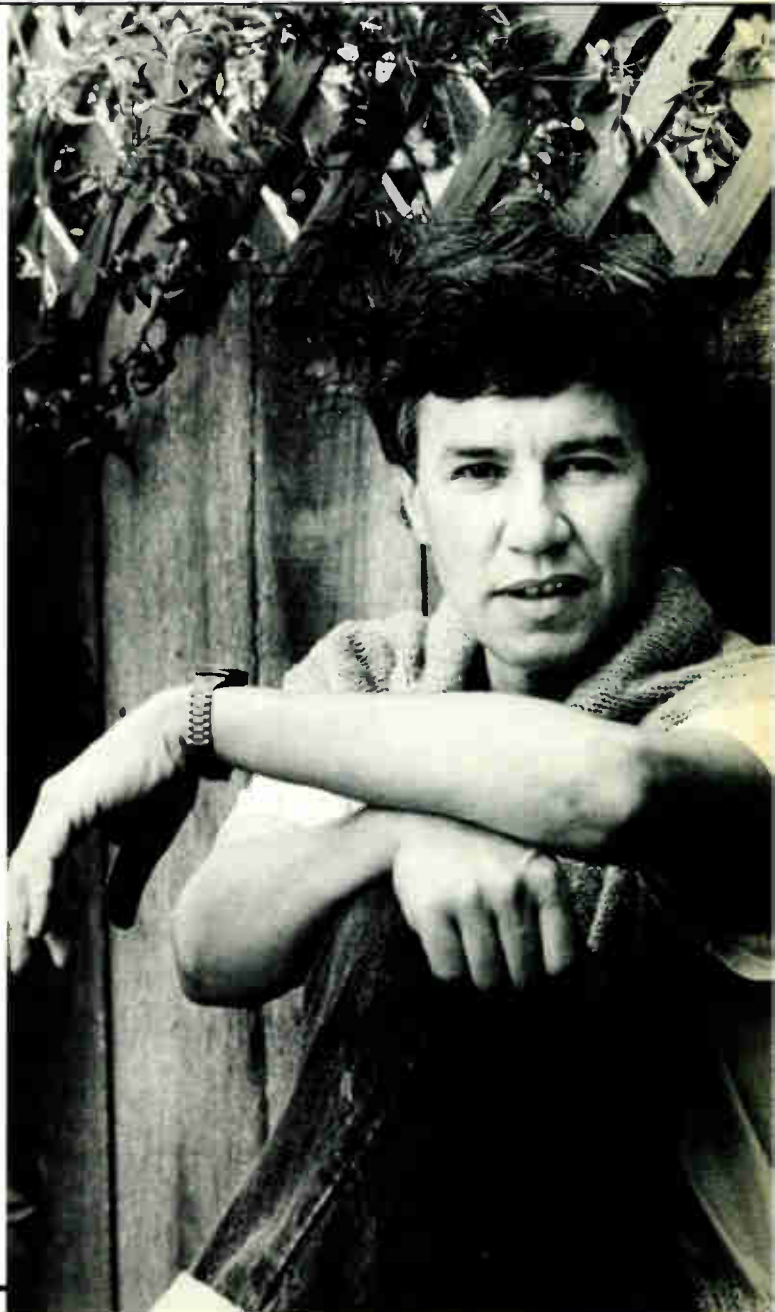
BERNIE KRAUSE

THE CALLS OF THE WILD

Bernie Krause is no stranger to these pages. When *Mix* last interviewed the synthesizer pioneer, bioacoustician and environmentalist (see "Playback," January 1987), he had released *Equator*, combining synthesis and sampled biological sounds such as the vocalizations of frogs, birds, fish and whales, with the ambient sounds of their environments (from the sounds of a mountain stream, progressing to the ocean's waves) to create a musical composition with a classical structure.

In addition to compositions like *Equator*, Krause has created The Nature Company Environmental Sound series, which, using recordings of natural sounds, focuses on particular environmental scenes, such as a thunderstorm (*Distant Thunder*) or birds (*Morning Bird Songs*). These are not simply playbacks of assorted sounds; they are carefully crafted pieces that combine the emanation sound of a selected locale with species-specific sounds appropriate to that place, time of day and year. The objective of these recordings is to give the listener the illusion of being in the aurally depicted scene. The Nature Company Environmental Sound series is continuing with the upcoming release of *Tropical Jungle* and *Gorilla*. The latter is based on Krause's expedition, with photographer Nick Nichols, to record the mountain gorillas of Rwanda, Africa, made famous by primatologists George Schaller and Dian Fossey.

Krause has also used recordings of ambient and species-specific sounds from selected places to create sound pieces for various museum exhibits, some of which are innovative and



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PLAYBACK

unique. But the works getting media attention are two fascinating dance pieces called "Fish Wrap" and "Jungle Shoes."

It is stretching the term to call these "instrumental" pieces; in a sense, they are 14 minutes of a cappella "singing," although no human voices appear. "Fish Wrap" and "Jungle Shoes" are

tention. "If you can get them dancing in the aisles," Krause figures, "it will break the ice, and you can hit them with all the environmental stuff you want."

The solution, combining biological sounds with a dance format, was the result of a piece Krause created a half-dozen years earlier in collaboration with The Tubes' Mike Cotton and Prairie Prince. Desiring to use animal

collaborate on a rap tune using Krause's unrivaled library of biological sounds. They added another partner, Scott Singer, booked time at Spark Studio (Oakland, California) and produced "Fish Wrap" with sounds previously used on "Sea Dance," from *Equator*. *Equator* was classically structured in sonata-allegro form, but the new piece enabled Krause, Ward and Singer to experiment with a dance format.



PHOTO MICHAEL K. NICHOLS

Bernie Krause and mountain gorillas of Rwanda

composed completely with biological sounds, the vocalizations and other forms of sound produced by the creatures of our planet. The "instruments" may sound like real bass and percussion, but they're drumfish, tree frogs, lions and other assorted critters, with a little thunder and ocean waves for good measure.

• • •

Bernie Krause was getting frustrated. The music he composed for The Nature Company was good, but, he says, "It was bordering too close to new age for me. I'm closer to old age." Also, he was speaking in schools about environmental issues and wanted a vehicle to gain the children's at-

sounds for a Greenpeace benefit, Cotton and Prince reviewed Krause's killer whale and humpback whale sounds, and the three musicians decided to loop the sounds—this was before samplers—and create a rhythm track from the resulting "whale loops." Krause produced a ruler, cut short pieces of tape (three to six inches long), spliced them and looped them around the room, hoping they would stay in sync. Finally, Prince added drums to the piece. The results so pleased Krause that he kept the whale loops and wanted to develop the idea further.

When Krause finished *Equator*, his creative associate, keyboardist and "recordist" Matt Ward, suggested they

Not surprisingly, selling this project was extremely difficult. Krause tried agencies and "a couple of hundred" record companies, with the same results: "We don't want fish," they told him. "Put it on a plate at 300 degrees, with salt and pepper." Finally, he approached Don Rose of Rykodisc, who heard possibilities in the Krause team's unique music. The advance was modest, but that was fine; the partners just wanted a chance to show what they could do, and Rykodisc had a reputation for releasing quality CDs.

After Rykodisc accepted "Fish Wrap" Krause and Ward decided a second piece was necessary. Krause had recently returned from Rwanda with a lot of new material, and they started sequencing a few parts at a time, in real time. The musicians assembled a

PLAYBACK

significant amount of interesting material, and Rykodisc was pushing for delivery of a single. These factors combined to prod Krause and his partner to accelerate their efforts.

They went into the studio with a formidable group of people: Krause, Ward, musician/engineer Tony Mills (owner of Spark Studio), and keyboardists Peter Michael Escovedo and Frank Martin. Although the original concept was Krause's, each team member contributed to the writing and realization of "Jungle Shoes." Escovedo had never heard most of the sounds before, so he provided fresh ideas and, Krause adds, "another level of irreverence. His keyboard playing made the thing come together for us. He is a quick, marvelous, exciting musician."

Most of the wildlife sounds Krause uses are recorded in the field using a Nagra IV S stereo deck that still operates despite a 40-foot fall from a helicopter, a leap into the Rwandan brush to evade a charging gorilla and assorted other field hazards.

For underwater recording requiring less sensitivity but a superior high-fre-

quency response, Krause uses a B&K 8103 hydrophone (underwater microphone). The rest of his underwater work is done with a custom-made hydrophone (from the University of California-Santa Cruz), which is more powerful and less noisy but lacks the wide frequency response of the B&K mic. Krause records in mono for underwater work, as the speed of sound is so much faster than in air (at 21 degrees centigrade, approximately 4,987 ft./sec. in seawater, compared to approximately 1,128 ft./sec. in sea-level air at 50% humidity) that stereo recording is pointless for his purposes.

Krause's favorite mic for recording in dry air is the Schoeps 541 hypercardioid condenser (the CMC-5 body and preamp with the MJ-41 capsule). He had his 541s modified by Klaus Heine to improve the low frequency balance and clarity. He is also delighted with his new Neumann RSM 190i-S selectable-pattern condenser mics, used with a Rycote windscreens. Because he sometimes works in places like Rwanda, where the humidity is too high to rely on condenser microphones, Krause also has Beyer M700N-(C) hypercardioid dynamic mics,

which survived steam, driving rain and a charging gorilla.

The primary sonic problems Krause encounters are wind and other noise. He loads his recordings into an E-mu Emulator II (or his recently acquired Emulator III) and runs Digidesign *Sound Designer* on his Macintosh to clean up the garbage. "Sound Designer is brilliant," Krause declares. "I rely on Digidesign software more than any other." He also reduces noise with Dolby SR, assorted EQs and, occasionally, Digital Audio Corporation time-based, digital filters. (*The author presents a detailed account of Krause's equipment, techniques and musical philosophy in an upcoming issue of Electronic Musician magazine.—Ed.*)

The parts for "Jungle Shoes" were played in real time into a Macintosh Plus computer (Krause has since added a Mac II), running Mark of the Unicorn *Performer* sequencing software. The Krause-led team created families of "orchestral" instruments to organize the biological sounds into an accessible form. Most of the sounds are as they really sound: snapping shrimp provide a swing-style hi hat, elephants provide the horn section and solo



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trumpet, the coyote sings a lead, the walrus "plays" cowbell, etc. When they created the bass, Krause and his partners found the original drumfish sound they wanted to use (one of a collection of sounds gleaned from cleaned-up, 1950s-era, U.S. Navy recordings) lacked bottom. Using Sound Designer, they kept the attack portion of the drumfish sample and combined it with a lion roar to provide the sustain. For the main lead voice, they looped together certain dolphin sounds and the voice of Humphrey (the famous California gray whale who had been lost in San Francisco Bay until a Krause-led rescue team guided him to safety using sampled whale sounds).

With product in the can, Krause pushed The Nature Company to pick up the cassette rights and distribute the Rykodisc CD. To overcome their initial rejection—dance music was a major departure from the company's usual fare—Krause gave a talk to the assembled store managers. They responded by ordering 12,000 CD units for Christmas and agreed to a franchise on the cassette. "The Nature Company has taken the risk on this," Krause says. "When they decided they had made an error in judgment, they made up for it. It's a remarkable relationship."

Next on Bernie Krause's busy schedule is the completion of *Tropical Jungle* and *Gorilla* for The Nature Company. Rykodisc has picked up the option for a new, all-biological-sound album, scheduled for a late-summer 1989 release. Then he's off to Costa Rica to begin a three-month recording odyssey from Central America to Alaska, recording on land controlled by the Nature Conservancy. Krause expects the resulting album, *Meridians*, to be distributed by The Nature Company. Finally, Krause will continue to use recordings of biological ambient and species-specific sounds to create sound pieces for museum exhibits, like the African water hole and gorilla exhibits at San Francisco's California Academy of Sciences and his 8-channel, holophonic-type sound sculpture at the St. Louis Zoo's new education center. ■

Steve Oppenheimer, an alumnus of the Berklee College of Music, spent more years as a road and studio musician than he cares to remember, before joining the editorial staff of Mix and Electronic Musician magazines.

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ARTIST'S · STUDIO

—FROM PAGE 83

bishi, but the bottom line is I like analog. I think it's warm. I cut at 30 ips at +5, and I think the tapes are quiet and the gear is affordable. I certainly couldn't afford an SSL or Mitsubishi, but I'm not sure they're necessary. I think the DDA is certainly the best of affordable gear, and the Otari MX-80 24-track is about \$26,000, and it's a wonderful little machine."

Even with all his "affordable gear," Cross estimates the studio set him back about \$250,000. In addition to the DDA and the Otari, Cross has one rack with a quad GML setup—four GML preamps, compressors and EQs—which he primarily uses to record onto tape, bypassing the console electronics. He has two Lexicon PCM70s and two LXP-1 units, the new Lexicon multiprocessors (used mostly for reverb), a Lexicon PCM42 and a Yamaha SPX90, which he uses for chorusing. ("It's noisy, but it has a couple of sounds that are great.") He has a couple Wendel Jrs., which he uses primarily in the mix to help with bass drums and snare drums, and two Valley Dyna-Mite noise gates. Other gear includes Roland and Hill mixers, four Akai samplers used for drum sounds, a dbx 900 rack with four compressors, a de-esser and some gates, and a dbx 160 compressor that he uses a lot, because he still finds the GML equipment to be complicated.

"Then I have a MIDI rack with a Cooper MSB 16/20 MIDI Switch Box, which I use as my control center for all the MIDI," he says. "And I've got two Oberheim Matrix-1000 synthesizers and three Kurzweil modules—the PX, SX and GX—piano, string and guitar expanders, which I think are great. I've got the Roland digital piano module, which I mostly use for a Fender Rhodes sound, especially since I have the Kurzweil grand piano which is so much better, two Yamaha TX802 synths and two Roland D-50s," he says, adding that his guitar rack is out being repaired at the moment.

And all that does not include his video gear: a JVC CR600U recorder, JVC BR6400U ½-inch machine, Adams-Smith Zeta-3 synchronizer and remote, Mitsubishi color monitor, and an audio and video patch bay.

Realizing he has just admitted to machine madness, Cross emphasizes, "I would always choose to play with

live musicians, but in these days and times with production costs being so high, it's not a bad alternative. The danger is people who really aren't musicians learn to manipulate the equipment and then let the equipment write the songs. I think Jimmy Jam and some of those guys are great; that's their thing and they do it well. But you find a lot of imitators and people who are using the machines to compose for them.

"Machines are fine as long as you use them as I do," he continues. "I'll basically put on a little drum pattern and sync up the 24-track and start writing on the guitar. I'll write the tune onto the 24-track using a loop pattern of some kind. After I've got the bass on, I'll fix up a better drum pattern using the Mac SMPTE'd to the 24-track. Then I'll fill in the blanks with the synths. I try not to create tracks using the Mac, because then it starts to dominate you.

"I like recording at home because there's no pressure of the clock and also not the hang. If you record at [the big studios in L.A.] people are wandering in and out. Personally, I feel insecure enough when I'm recording and really self-conscious, so it's irritating to have people walking in and out even if it's somebody I know and like. I really like the casualness of recording at home."

As if on cue, a loud noise suddenly leaks through the studio ceiling and Cross laughs, "Home studios are not without their problems. That's my wife Jan watering the plants upstairs. There's one water pipe that runs in the ceiling, but it's not a problem because she knows not to water the plants or shower in the guest bathroom when we're doing vocals.

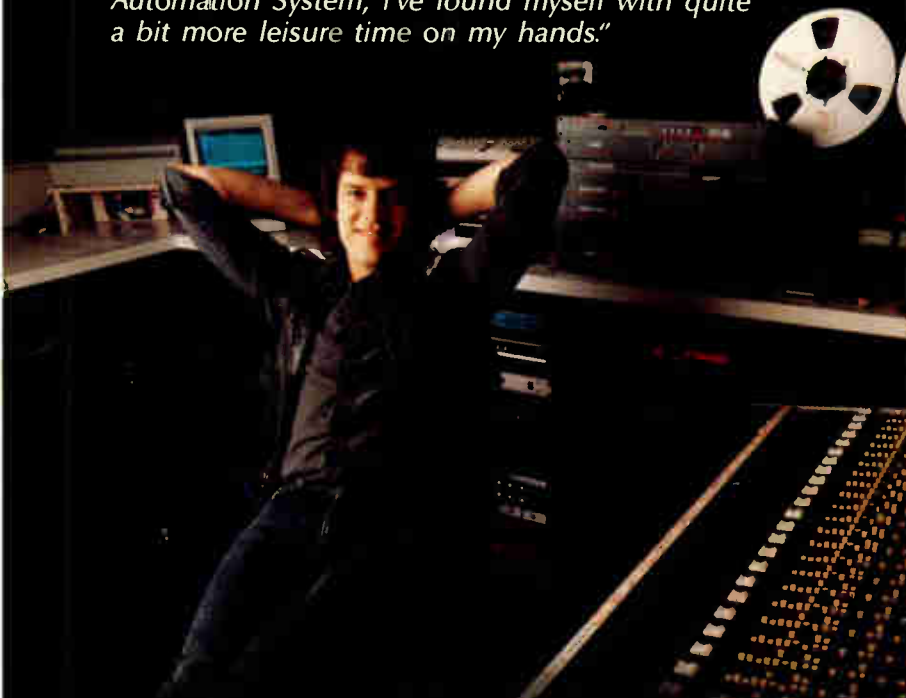
"The studio has given me a sandbox to play in. I'm making music again because I just like to do it, whereas for a period of time after the second album and during that period of trying to follow up on my success, I started to resent music because of the pressure I was feeling. Now I have nothing to prove, because the third album didn't do well at all. I feel this new album is so much fresher and so much like the first album because it has passion again. I'm enjoying myself, and I think it shows." ■

Robyn Flans is a Southern California-based freelance writer who frequently contributes to Mix.

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by Philip De Lancie

RECORDABLE COMPACT DISCS READY IN '89?

Industry experts were surprised and openly doubtful when Tandy Corporation revealed last April that a technological breakthrough in its development of the THOR-CD (for Tandy High-intensity Optical Recording) would allow it to introduce a consumer-level, recordable compact disc system selling at less than \$500 in 1990. Eyebrows might have been raised by such an announcement even from an industry leader like Sony or Philips, who, though known to be working on their own CD recorders, are not expected to market such product before 1992. But Tandy, lacking the relevant experience and vast technological resources of the electronics industry giants, was thought to be an unlikely source for the next important extension of the CD family.

A similarly skeptical reaction might have been expected to a recent report in *Billboard* that a CD recording system should be forthcoming in 1989 from Japanese manufacturer Taiyo Yuden. The company, described by *Billboard* as the maker of "That's" cassettes, is not exactly a household name in sophisticated electronics. But its plans to market a WORM (write once, read many) system under the logo CD-R are being taken very seriously in some quarters. *Billboard* quotes a "senior executive" of the International Federation of Phonogram and Videogram Producers (IFPI) as calling the move "deplorable." The concern at IFPI stems from the delicate state of that organization's efforts to resolve the thorny copyright issues that have held up record company cooperation in the introduction of DAT. A December meeting between IFPI and some hardware manufacturing representatives broke the ice after a

long freeze in relations (see last month's "After-Mix"). IFPI apparently fears that introduction of a new form of digital recording in the absence of agreement on appropriate copyright safeguards would imperil this tentative progress toward hardware/software reconciliation.



Taiyo Yuden, for its part, denies any current intention of entering the consumer market with its new product and has pledged not to sell blank discs to the general public while the copyright controversy remains unresolved. The discs, which are to be playback-compatible with existing CD players, are reportedly aimed toward

PDO's Jack Kiernan feels that lower retail prices are the key to expanding the market of CD consumers.

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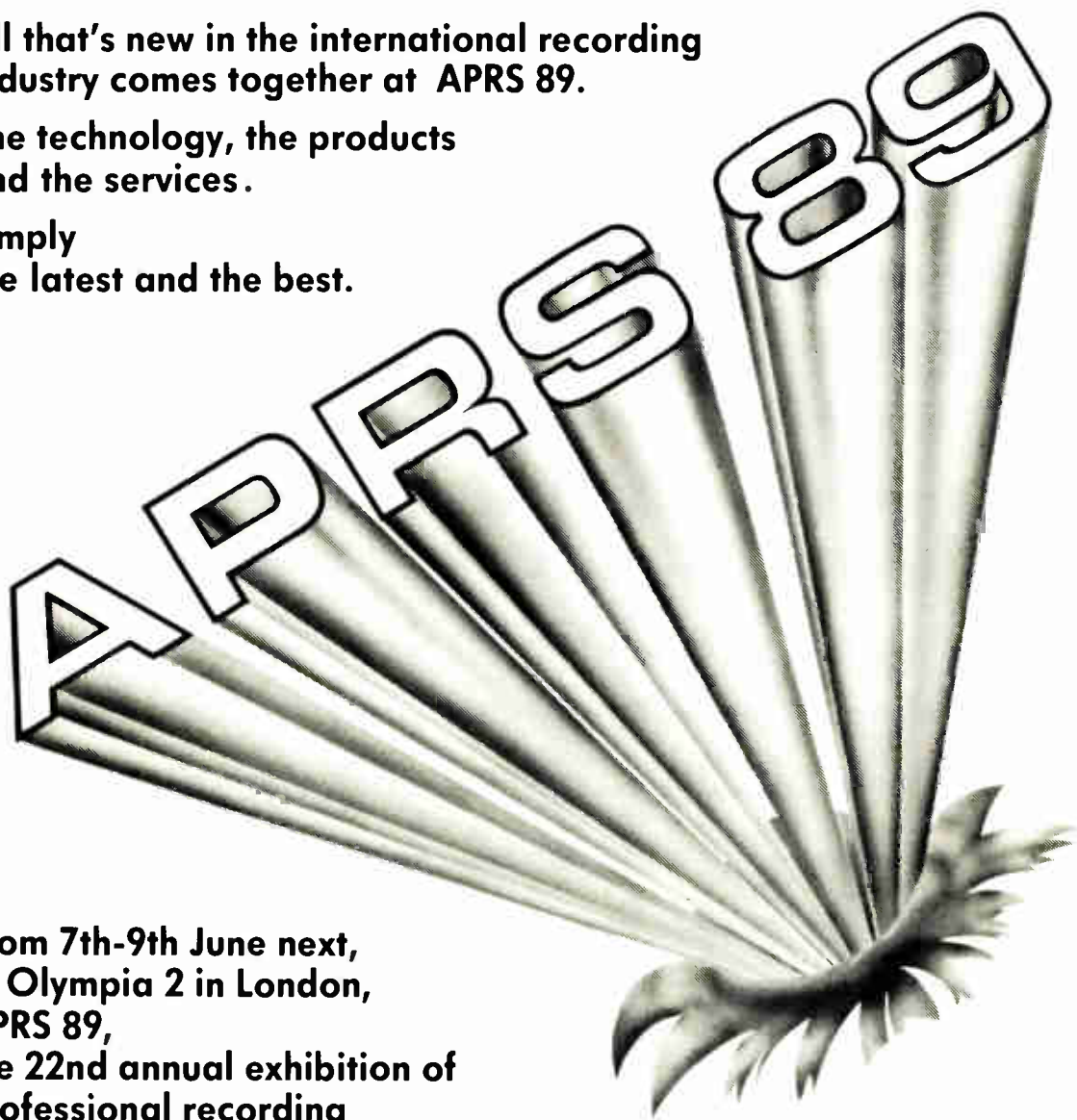


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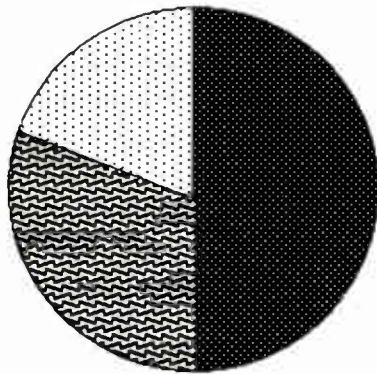


AFTER · MIX

professional users for broadcasting or small-run custom products. With discs to retail in the \$9 range (no price for the recorder was mentioned), the system could find rapid acceptance in mastering rooms as a cost-effective means of providing clients with reference discs of their projects. Three- and 5-inch formats are planned, with

Systems and Shape Optimedia brought the serious problems facing the CD replicators into sharp focus. With an industry shakeout taking its toll primarily on independent producers, one might expect that larger firms with deeper pockets would be less than mournful over the passing of their smaller brethren. But Philips and Du Pont Optical (PDO) senior vice president Jack Kieman, speaking at a recent

U.S. CD Manufacturing Capacity



"Captured" Production 120 Million
 "Available" Production 80 Million
 Overcapacity 200 Million

Figure 1

a 74-minute maximum program length. Discs must be recorded from start to finish in real time, and, being WORMs, are not erasable for re-recording. The question remains whether Taiyo Yuden actually has a working

International Tape/Disc Association meeting, made clear that the overcapacity problem is hurting all the players in the field. And he expressed the view, also widely held on the retail side of the business, that record com-

CD Prices - Estimated Averages (in Dollars)

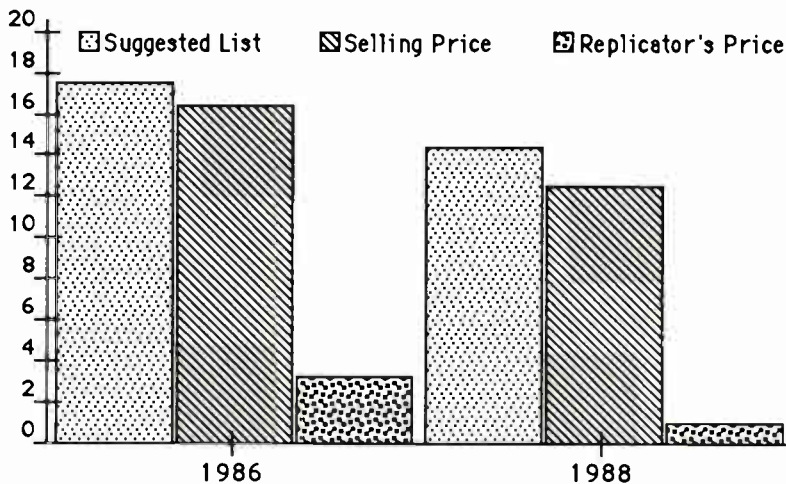


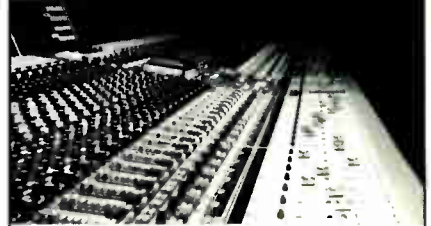
Figure 2

system ready to bring to market, but the company has already designated France, Holland, Italy, the UK and West Germany for initial roll-out of the machines this year.

• • •
Last year's bankruptcies of Discovery

pany wholesale prices on discs are still too high. Reduced software prices are needed, he argued, to encourage the kind of demand for hardware that would translate into an expanded pool of CD consumers. To date, movement on pricing has come at the ex-

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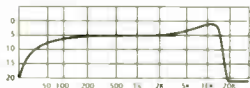
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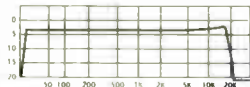
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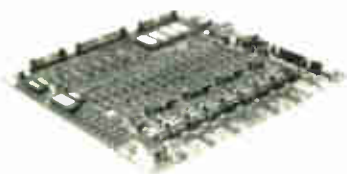
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AFTER · MIX

—CONTINUED FROM PREVIOUS PAGE

pense of replicators, forced to cut margins in the face of overcapacity, and retailers, whose gross margins on CDs, Kiernan noted, are 4% to 5% lower than on vinyl or tape.

In support of his opinions, Kiernan

turally, to drive down replicating prices, regardless of actual manufacturing costs (Fig. 2). Thus, the replicators' share of revenues generated from CDs has fallen dramatically as the number of plants has expanded (Fig. 3). And, while consumers have benefited from a 31% drop in prices on the retail side over the last three years, replicators

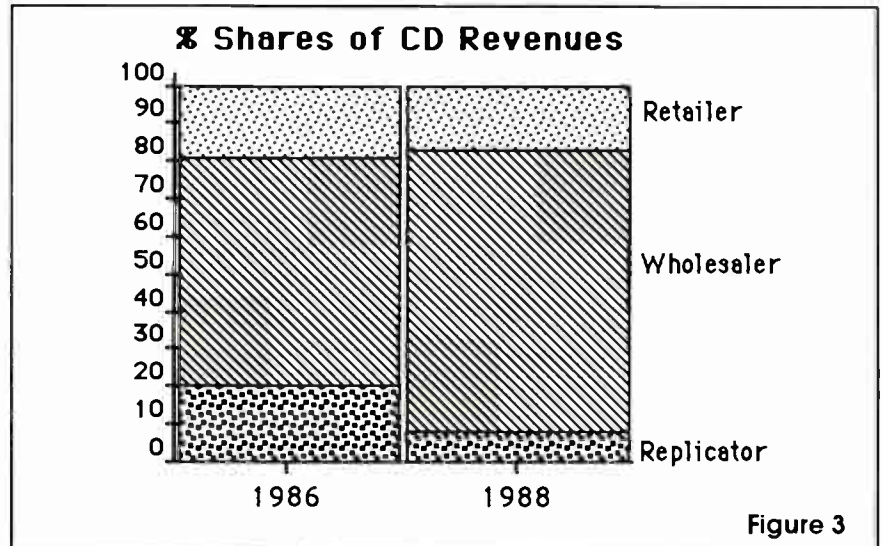


Figure 3

offered some interesting statistics. First, while total U.S. replicating capacity is in the area of 400 million units, actual production is a mere 200 million (Fig. 1). Further, only 80 million of these units are actually available for competition among manufacturers, with the rest "captured" by repli-

have suffered from a 70% drop in what they can charge for their wares (Fig. 4). Wholesale prices, meanwhile, have declined least of all (23%), and the wholesalers' share of total CD revenues has actually increased more than 12%.

Given the above numbers, it's easy

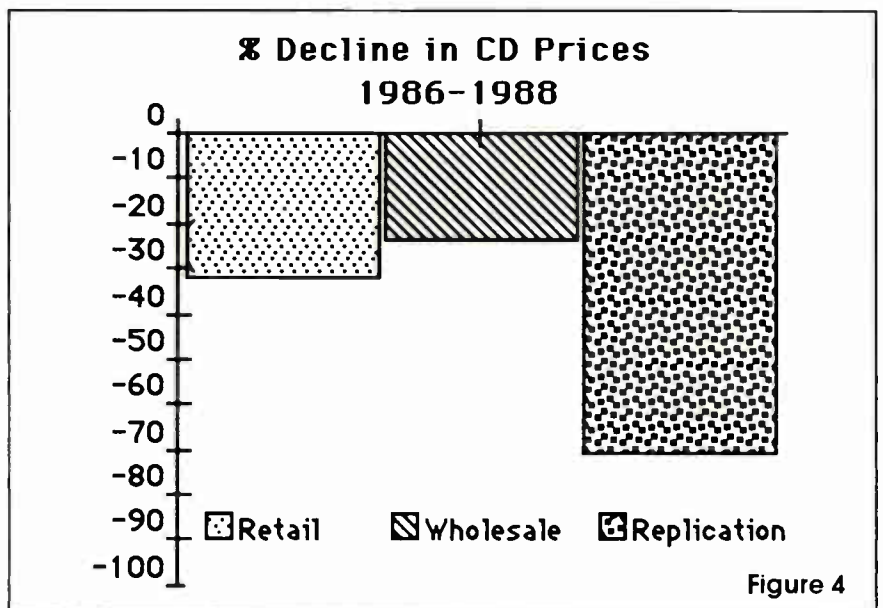


Figure 4

cators owned in whole or part by the record labels they service. The effect of all the independent, non-affiliated replicators competing to manufacture these 80 million available units is, na-

to follow Kiernan's reasoning. To keep their heads above water, the independent replicators need to see a rapid upsurge in demand for their wares. That's not likely unless retail prices drop

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swiftly and significantly, not just on mid-line product, where reductions are already under way, but on current hits as well. Since replicators have absorbed more than they can handle at this point in the way of price cuts, Kiernan feels that the record companies should be first in line when it comes to cutting margins to stimulate sales. Of course, record companies may reason that the capacity glut, not of their own making, is an opportunity that should be exploited profitably for as long as possible, especially in light of the lean years they suffered through early in the decade. But, as Kiernan noted, the long-term interests of all are best served by keeping the existing replicators alive long enough to service the record companies when demand eventually catches up with capacity again.

• • •

In case, after reading the above, anyone is still interested in investing in new CD replication gear, AVAC of Linkoping, Sweden, has introduced a manufacturing system designed to combine the best features of clean room and mono-line production. Despite their expense and inconvenience, massive clean rooms once seemed to be the only feasible environment for CD manufacturing. Newer plant designs have leaned toward the mono-line approach, in which the production line from molder to spin coater becomes essentially one machine contained in its own clean environment. AVAC, however, believes that approach leads to greater potential downtime, because the failure of one link in a production chain takes the whole line out of service. Instead, AVAC proposes the use of vacuum cassettes to transport and store discs between discrete steps in the production chain. Processing machines work continuously, while intermediate handling is performed in batches. Components offered by the company include the CD-12 Metallizer, custom loaders to feed CDs from the vacuum cassettes into the lacquering machine, and the cassettes themselves. ■

Phil De Lancie, a mastering engineer at Fantasy Studios in Berkeley, Calif., is our resident voice on formats, trends and technologies in the world of prerecorded music mastering and manufacturing.

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Each month, *Mix* magazine publishes a directory of facilities and services for the audio and video production industries. The directories include: *Recording Studios of the U. S. and Canada; Video Production and Post-Production Facilities; Manufacturers/New Products; Independent Engineers and Producers; Designers, Acoustical Consultants, Equipment Suppliers & Installers; Remote Recording and Sound Reinforcement Companies; Recording Schools, Seminars & Programs and Mastering, Pressing & Tape Duplication Facilities.*

NEW! INTERNATIONAL LISTINGS FOR 1989

In 1989, *Mix* magazine will publish additional directories listings for facilities and services located in Europe and the Far East. The European directories (United Kingdom and Western Europe) will appear in the March issue of *Mix*. The Far East directories (Japan, Australia, Korea, Malaysia, Hong Kong, etc.) will appear in September.

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* Source: Publisher's BPA circulation statement, December 1988.

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Circle #161 on Reader Service Card

—FROM PAGE 46, MAESTRO

phone our cues and music files into the studio!" enthuses Walsh. After instrumentation is determined, and basic tracks are performed and recorded, Screen Music's engineers handle the final mix. "With the tight deadlines so common in TV, it's teamwork like this that keeps the quality uniform while you work quickly," notes Linn.

"Teamwork—and therefore the quality of the final product—is enhanced by this new technology," Linn continues. "Also, when I program a sample I have complete control. If it went from composer to orchestrator to conductor, I'd have no control over the ultimate, final recording of my music. And when you do your final realization of the music, you can patch the Macintosh II, MIDI-wise, out to any instrument at any time, even if it wasn't something you thought of when you first conceived the score."

Walsh and Linn primarily use Synclavier, Akai and Kurzweil systems, along with other keyboards and modules, to orchestrate their music. Nevertheless, their compositions end up being played by a live orchestra (*Gl Joe* is scored with a 60-piece orchestra; *Dungeons & Dragons*, 40-piece) or as high-gloss, all-synthesized, rap-style tracks. Producers want quality, big-budget sound, but they can't always afford it. So today's composers use digital samples of actual instrumentation, instead of synthesizing approximations of instruments. The result is a more realistic-sounding synthetic score.

Composer and multi-instrumentalist Scott Singer built his San Francisco music studio in 1983. Since then the classically trained pianist has created music for big-name commercials, film pilots and such TV shows as *PM* and *Evening Magazine's* new national theme song. The tune accompanies a gleaming, computer-animated, roller-coaster ride engineered by George Lucas' Industrial Light & Magic in Marin County.

Composers know that tube viewers hear the sound from anything as low-tech as a funky black-and-white set to a high-tech, LED-laden stereo system. With this in mind, Singer lists some important ele-

ments for creating effective, high-quality TV music: a versatile monitoring setup (both small and large speakers, the flatter the better); selective reverb and EQ ("reverb disappears on tiny speakers, EQ causes highs to pop out on them, and lows show more on bigger speakers; you have to make a compromise so it sounds good wherever it goes"); and the ability to create both music and effects ("the hip composers design sound effects because they already have all the sampling and synths; it's a beautiful marriage because one mind does the whole thing, and sometimes the combination of music *and* effects produces the thrills and chills you need").

Beyond equipment, there's technique. "Narration and dialog have a pacing, and the hip composer detects that pacing and matches the music to it," Singer says. "The combination of the voice pacing and the editor's [visual] editing style give me the music's tempo. The color and lighting give me the music's key. Something moody and blue is A-minor. Something cool and green uses the key of F. The *Evening Magazine* opener is neon, flashy and fast, so I used the bright, open key of G.

"Also, it's essential to think in stereo, even if you have to squash the music into mono," Singer continues. "For *Evening Magazine* I designed a roller-coaster sound effect. The roller coaster on the picture starts off center-screen, and as it dips to the right, I pan the effect to the right; as it dips to the left, I pan to left. The music track, however, stays in the stereo spread pattern, because if you move too far out into space, your viewer won't be grounded. Then, there's [camera] perspective; you want to hear things from the point of view of the camera."

If not mixing for left/right imagery, Singer continues, the composer/engineer considers distance (near/far). How far from the scene are you (or the camera)? As the camera moves, you mix with it, moving the mix further up or down. Finally, he says, "You pace the speed of the mix [movement up or down] with the speed of the action on TV." Yes, Virginia, even TV composers can fix it in the mix. —Linda Jacobson



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NEWS

FROM AROUND THE WORLD

SONG FOR PEACE: RECORDING IN EL SALVADOR

(The following report was submitted by Simon Garber.)

Last spring, Aural Tradition Records of Vancouver, British Columbia, was contacted by members of the Salvadoran Cultural Workers Association and asked to help with a very ambitious project. They were organizing the Concert for Peace with Sovereignty and Independence in El Salvador and wanted our assistance to record the event.

The concert featured some of the finest contemporary music groups in Latin America with a few North American guests, including Adrian Goizueta y El Grupo Experimental (Costa Rica), Amparo Ochoa (Mexico), Quinteto Tiempo (Argentina), Grupo Ahora (Venezuela), Thiago de Mello (Brazil), Human Condition (USA), Holly Near with Barbara Higbie (USA), Guinama, El Indio, Zunca, Nuevo America (El Salvador) and a surprise appearance of the FMLN group Cutumay Camones, who had never before performed in the capital city of San Salvador.

Approximately 30,000 people attended the four events sponsored by the University of El Salvador, the Salvadoran Association of Cultural Workers and the Broad Movement of Salvadoran Cultural Identity. It all would have been impossible only a short time ago. All expressions of popular culture in El Salvador have been severely repressed in recent years. The government sought, through use of all possible bureaucratic pretexts and even direct repression by the army, to impede the celebration of the festival.

Ultimately the festival took place, owing to the strength of the popular opposition in El Salvador demanding expression. Throughout the event,

perhaps inspired by the militance and spontaneous participation of the public, the artists put their insecurities aside and clearly expressed their opinions about the situation in El Salvador.

When I was asked to participate in this recording, I did not anticipate the difficulties in just "getting there." El Salvador is a country at war, and

passage of foreigners is carefully monitored.

I had less than three weeks to prepare. I sent my passport to the embassy in Ottawa and proceeded to concentrate on getting together the equipment. The project had very little funding, so we had immediate limitations on recording format. My unilin-



STUDIO SPOTLIGHT

ORF Vienna's Studio SK-1 is a post-production facility built around a Studer 904 36-channel console with Allison automation, and Studer's TLS 4000 synchronizer. A Studer SC 4016 system controller is

built into the console, interfacing with an A820 24-track recorder with Dolby XP. Against the back wall are three of the six Albrecht MB 51 magnetic film recorders, which, along with two Albrecht MP 51 projectors and various video units, are linked via the TLS system.

PHOTO: MARCEL SIEGENTHALER

ual status didn't help much either, and I became increasingly more dependent on my Chilean colleague from Los Angeles, Sig Guzman.

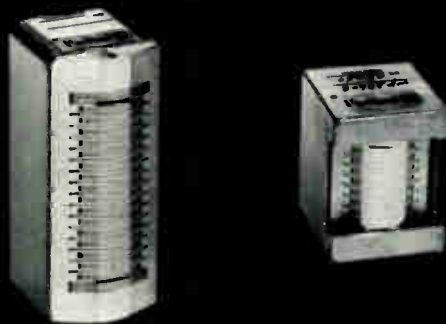
We decided that a 1/2-inch, 8-track format was going to be the most practical under the circumstances. Guzman supplied the Otari 8-track and the Yamaha 2404 console. The console was not ideal because of its four mix buses, no direct assignment to remix, no PFL metering and no tape monitoring. But I compensated by using the auxiliary sends, my Roland P-120 8-channel powered mixer for monitoring and a Radio Shack 4-channel line level mixer so I could monitor the Roland 8-channel monitor mixer for the Yamaha solo bus. The 8-channel mix was dumped to a Sony TC-D5M for reference purposes. I monitored through my trusty old Visonik Davids (trusty until I got home and discovered that I had blown both tweeters).

Three days before departure my visa had not been approved. I requested the immediate return of my passport so I could apply from the United States. After spending two days at the consulate in Los Angeles, I realized that I would not be granted a visa. Since I already had a plane ticket to San Salvador, I decided to fly to Costa Rica via San Salvador and apply for a visa from there. Guzman took all 700 pounds of equipment to San Salvador, and I went to Costa Rica where I got a visa within 24 hours. Off I went to San Salvador.

I missed the first concert in Santa Ana. Guzman attempted to record it, but because of power and other technical difficulties, he abandoned the operation after about an hour of recording.

I arrived at about 10:30 the next morning, with barely enough time to prepare for a 1 p.m. concert at the university for about 3,000 to 4,000 people. We chose not to attempt to record the concert that was being held concurrently at San Miguel, an area of considerable unrest, because of the danger. As it turned out, although permission to hold the festival there had been granted by political authorities, the local military forces

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INTERNATIONAL · UPDATE

were not pleased. They showed their displeasure by tearing down the stage and beating up some of the stage crew. But the audience would not disperse and the musicians agreed to perform. So the New York band Human Condition played to an enthusiastic, dedicated audience while helicopters buzzed the stage.

Meanwhile, the concert at the university was the first in the capital city featuring foreign artists in ten years. We set up in a building directly behind the stage, where we could barely

many respects. If you've ever wondered what happens to the P.A. gear that gets traded in for the newest high-tech toys, look south.

The following day we were to set up in front of the cathedral in the center of San Salvador. This is the same square where, after the assassination of Archbishop Oscar Romero in 1980, the army opened fire on thousands of people who had gathered there. We decided to check out the P.A. setup the night before. It consisted of a diverse collection of more than 70 Peavey cabinets. Much of the system was wired with telephone cable, in-



Grupo Ahores performs for the crowd at the Plaza Civica in San Salvador.

see through the forest of international media from all over Central and North America. A Mexican film crew and an American news crew required last-minute feeds. Power was relatively stable, held constant by a Tripp-Lite line voltage stabilizer.

Although the concert proceeded with no sound checks, everything went rather smoothly, with Sig translating and most musicians being cooperative and understanding. The biggest challenge was second-guessing the stage crew—was the charanga really in channel 7? Because of the limitation of eight tracks, I had to decide how many tracks to devote to the audience. Since this was the documentation of an important historical event as well as a concert, I decided to use two tracks. For most performances this was not a great compromise.

Luckily, we brought along a number of SM58s and some BOSS active DIs, for the P.A. was sadly lacking in

cluding unshielded cable running to the 30 or so Peavey amplifier inputs. I repaired five or six improperly wired snake connections and suggested moving some of the speakers stacked in front of the stage to improve sight lines.

I discovered that from the organizers' point of view, in some cases it was more important to show good intentions than to follow through. We had been promised our own generator, but by 10 a.m. I conceded to plugging into the only generator that appeared on the site. Hydro was out of the question, because it was unreliable and susceptible to military interference. The generator had been placed next to the stage and provided 240 volts split into two 120V legs. I lost a motion to move the generator and quivered when I saw the bare, twisted power cables just lying on the ground. Line voltage often dropped below 95 volts, but my Tripp-Lite



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“Expensive Is Not Always Better”

Gregg Jampol, Recording Engineer

As recording engineer for numerous major contemporary Christian artists, Gregg Jampol has acquired the reputation of obtaining successful high energy mixes on such consoles as AMEK, Trident, SSL, and Neve. Nicknamed “Platinum Ears”, Gregg recently came in contact with the **Dayner Series** console during an overdub session at Fourth Creation Recording Studios.

Upon hearing the warm and clean sound of the **Dayner**, Gregg and the production staff on Ken Parks’ *“Sooner Than Later”* album (originally mixed on a \$90,000.00 British console) unanimously decided to remix the entire project. After the remix session, the mixing team was completely “blown away” with the open/transparent sound and dynamic range achieved by the **Dayner**.

In Gregg’s words, “I was thoroughly amazed with how easily the **Dayner** responded to the complex demands that we placed upon it, as well as precisely obtaining the sounds that we were looking for. This console is definitely an excellent choice for any budget.”



Pictured during mix session at Fourth Creation Recording Studios:
(Left to Right) **Carey Wise**, Owner, **Gregg Jampol**, Engineer,
Ken Parks, Producer/Artist

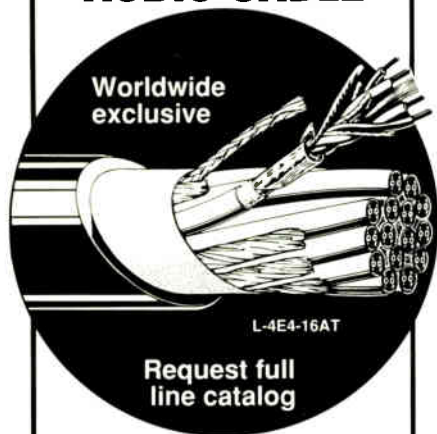
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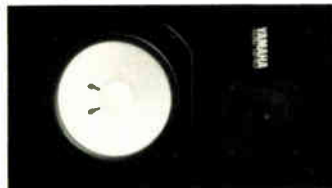
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INTERNATIONAL · UPDATE

saved the day, locking our operating voltage to 120 V.

Instead of the promised room inside the cathedral, we were provided with a plywood booth on the stage. I decided to forgo the booth and set up in a tent between the backstage tent and the cathedral. Needless to say, isolation was impossible—little “Davids” and my AKG headphones to the rescue. This time I had no view of the stage. The promised video feed was a pipe dream. Guzman stationed himself by the stage to monitor mic placement and line numbering. We used cheap RF headphones for communications, which were fine until the band started playing. Walking through the crowd of 20,000, I noticed two things: no sign of either military or washrooms.

We brought a 3-way splitter with us

most of their music was political in nature, everything from songs of hope for peace to instructions on how to assemble and disassemble a rifle. (A few days after the concert I learned that one of the bands had been arrested. One musician disappeared—his whereabouts still unknown.) I can't help admiring musicians and organizers whose interest in performing is not the brass ring, but an overwhelming desire to tell their story to the rest of the world.

JARRE LONDON SPECTACULAR ORCHESTRATED BY EIGHT STUDER MULTITRACKS

Nearly 200,000 people watched Jean-Michel Jarre's two-day multimedia event involving 2,000-plus crew members at London's Docklands last October.

Major elements in the visible part of the show were high-powered lasers



Whitewashed warehouse used as a giant projection screen for part of the Jarre concert.

for recording and onstage monitor mixing. An old Yamaha 16 x 2 cascaded with a dust-laden Peavey 16 x 2 and a 1/3-octave EQ, and we had a monitor system. Now the major problem was the monitor mixer had never mixed monitors before. The house mixer found himself on stage plugging in mic lines between sets, except when his band was playing (he was lead singer).

Sound like chaos? Amid all this confusion and technical compromise, the concert went smoothly, and we came out of it with a record.

Although I was in a war-torn country, I felt somewhat isolated from the danger, partly because I am a Canadian and therefore not a political target, and partly because the enemy wasn't visible. It wasn't until I returned home that I learned that the entire downtown core of San Salvador had been surrounded by tanks and soldiers. The local Salvadoran musicians were certainly in danger, for

and 12 enormous World War II searchlights brought over from America. Behind the scenes, much of the success of the show depended on the eight Studer A820 multitrack recorders provided by F.W.O. Bauch Ltd. and Studer International AG. Synchronization of lights, fireworks, 40 musicians and the 120-voice choir from the Newham Academy of Music was achieved with cue tracks played back by two of the A820 24-track machines, while four of the Studers, fitted with Dolby SR, were recording the offstage music and mixed-down, ambient sound.

F.W.O. Bauch Ltd. engineer Martin Bastin was present for ten days leading up to the shows and was involved in setting up the equipment and laying some of the 40 miles of cable used in the Docklands site.

Jarre has also recently installed two Studer A820 machines with Dolby SR in his own studio in France, preferring the analog characteristics to those

—CONTINUED ON PAGE 183

1989 MIX DIRECTORY

VIDEO PRODUCTION and POST-PRODUCTION

Information in the following directory section is based on questionnaires mailed earlier this year and was supplied by those facilities. *Mix* claims no responsibility for the accuracy of this information. Personnel, equipment, locations and rates may change, so please verify critical information with the companies directly.



Studio 2 at Record Plant's Sycamore Avenue facility in Hollywood features a 72-input frame SSL 4000 G Series console with Total Recall, a Sony PCM-3348 48-track digital recorder and Hidley/Kinoshita 2 way monitors for film L-C-P-S mixing. The facility is designed for acoustic as well as synthesizer recording, and is also equipped with a Macintosh SE with *Finale* software. Photo: Ed Freeman

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Mix listings procedure: every month, *Mix* mails questionnaires to recording studios and/or other vital facilities and services for the recording, sound and video production industries. There is a nominal charge to list a Boldface Listing (name, address, contact) and an Extended Listing (equipment, credits, specialization and photo or logo). If you would like to be listed in a *Mix* Directory, write or call the *Mix* Directories Department, 6400 Hollis Street #12, Emeryville, CA 94608; toll free 800-344-LIST!!!

Upcoming Directory Deadlines:

U.S. Recording Schools: **April 17, 1989**

Southwest Studios: **April 17, 1989**

Pro Audio Manufacturers: **May 16, 1989**

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Although other facilities in town have these machines, few have the required input/output

boards to perform the different transfers and still stay phase-locked to the original signal.

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Services & Equipment Offered:

Audio Post — Consoles: SSL 6000E 32-channel, SSL 4000B 24-channel. Audio Recorders: Otari 24-

track (2), 4-track (2), 2-track w/CTTC, AMS AudioFile, TimeLine synchronizers (8), Sony BVH-2000 VTR. Outboard Equipment: Lexicon 224, PCM70, Yamaha REV7, REV5, SPX90II (2), Klark-Teknik, Roland DEP 5, Dolby A & dbx noise reduction. **Video Production/Post-Production** — Five online edit suites w/CMX 3600, Sony BVH-2000, Sony BVH-1100, Sony DVR-10. One offline edit suite w/CMX 330. Two film-to-tape transfer w/Bosch FDL-60. Three soundstages: 100' X 150', 50' X 60', 40' X 40'. **Other major equipment:** ADO 3000 (3), Abekas A62, Quantel Harry. **Specialization:** NTSC/PAL standards conversion, all formats, mass quantity helical duplication, teleconferencing uplink (stationary), remote video production, motion picture film lab services, videodisc mastering and replication, compact audio disc replication.



BusinessPages! ads are available in both 1/4 - and 1/2 - page units; all production costs for ad preparation are included in the low ad rates (including color separations from supplied photo or logo).

For complete information on how your facility can have a low-cost, four-color BusinessPages! ad, contact Mix Directories toll-free: (800) 344-LIST.

All space reservations and materials are required by the 7th of the month, two months prior to publication.

BUSINESSPAGES!

VIDEO PRODUCTION FACILITIES

FACILITIES

In the following listings each facility's particular capabilities are indicated below its name using the following initials: VPF (Video Production Facility); OLVP (On-Location Video Production); VPP/E (Video Post-Production/Editing); APPV (Audio Post-Production for Video).

Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Washington, DC

AB STARLITE, INC.; VPF, VPP/E, OLVP, APPV; PO Box 1350, Southampton, PA 18940; (215) 752-7491. Owner: B.W. Feldman. Video Tape Recorders: (3) Ampex VPR-80, (3) Panasonic AU-700 broadcast, (2) Ampex CVR-35SP Video Monitors; (4) Ikegami 20" broadcast, Sharp 13" broadcast, (2) Sony 9" broadcast. Switchers/editors: Ampex Vista 18N w/all options, Ampex Ace w/all options. Video Cameras: Sony M-3A, Ikegami 79AEL. Synchronizers: (2) Microtime 220 Interformat. Video Effects Devices: Ampex ADO w/all options (Target-frame store, Digi-Trail). Audio Recorders: Tascam 8-track. Audio Mixers: Tascam 24-channel. Other Major Equipment: Dubner Paint Box w/animation, Dubner character generation w/all software and graphics options, duplication center. VHS ¾", 1", extensive audio processing for post-production. Rates: Variable as per CEO.

ALDEN VIDEO PRODUCTIONS, INC.; VPF, VPP/E, OLVP, APPV; 80 Commerce St.; Glastonbury, CT 06033; (203) 633-9481. Owner: Dennis Prueher. Manager: Herb Wagreich

AMERICAN RE-INSURANCE COMPANY AUDIO VISUAL COMMUNICATIONS GROUP, VPF, VPP/E, OLVP, APPV; 555 College Rd. East, Princeton, NJ 08543; (609) 243-4203. Owner: Aetna Life & Casualty. Manager: Ralf W. Augstroze

AUDIO POST, INC.; VPF, VPP/E, APPV; 27 E. 21st St.; New York, NY 10010; (212) 475-3522; FAX: (212) 674-0788. See Our Ad in the BusinessPages! Owner: Edward Steinberg. Video Tape Recorders: Sony BVH-2800. Switchers/editors: Grass Valley. Sony Video Cameras: Ikegami HL-79. Audio Recorders: Sony PCM-1630. D2. Sony DMR-4000. Other Major Equipment: Extensive outboard equipment. Rates: Call for rates.

AUDIO VISUAL ARTS, INC.; VPP/E, OLVP, APPV; 146 W. 57th St., Ste. 51F; New York, NY 10019; (212) 397-3733; FAX: (212) 397-1953. Owner: Jim Tripp. Manager: Jim Tripp

AV3, INCORPORATED; VPP/E, OLVP, APPV; Southgate Center; 12 McCullough Dr.; New Castle, DE 19720; (302) 652-5300. Owner: Joseph R. Tuckosh. Manager: Rebecca A. Tuckosh. Video Tape Recorders: (3) Sony BVW-15 Betacam, Sony BVW-10 Betacam, Sony BVW-40 Betacam, Sony BVH-3100 Type C 1", (5) Panasonic 9000 Series, Sony BVW-25 Betacam, Sony BVW-21 Betacam. Video Monitors: Sony JVC, Panasonic. Switchers/editors: Grass Valley 100C component switcher, Convergence 900 Plus edit controller. Video Cameras: Sony BVP-30 Betacam w/Plumbicon, Sharp XC-800, (2) JVC 2700. Synchronizers: (2) TimeLine Lynx. Video Effects Devices: Microtime Genesis/Act 1, Chyron VP-2, Chyron Super Scribe, Cubicomp (3-D Modeling, Animation and Paint system). Audio Recorders: (5) Tascam, MCI, Otari. Audio Mixers: Ramsa WR-8616, Soundcraft Model 200 24-channel custom. Soundstages: 40' x 60'. Other Major Equipment: 12' automated camera boom. Rates: Location production \$700/day. Full component or interformat \$150/hr. Post-production at AV3

BALLENTYNE BRUMBLE COMMUNICATIONS; VPF, OLVP; 906 N. American St.; Philadelphia, PA 19123; (215) 923-5454. Owner: John Ballentyne, Dianne Brumble.

CAMERAWORK BY TONY BARBON; OLVP; 533 E. 13th St. #GA; New York, NY 10009-3508; (212) 533-3216. Owner: Tony Barbon, director of photography.



EDITEL NEW YORK
New York, NY

EDITEL NEW YORK; VPP/E, APPV; 222 E. 44th St.; New York, NY 10017; (212) 867-4600. Owner: Scanline Communications. Manager: Jill Debin Cohen. Switchers/editors: (5) online edit room, (2) offline edit room, multiformat edit suite, (2) digital edit suite w/Paint Box, Harry, Encore, (3) Telecine room w/(2) Sainburst, Dubner w/manual and electronic pin registration and Ultimatte 5. Video Cameras: (2) Warren Smith animation stand w/Ikegami HL-79EA cameras, full animatics capacity, ADC, Kaleidoscope, Mirage, Quantel, 3-D animation suites (Alias and Wavefront). Other Major Equipment: Sound room equipped w/SSL 6000 console, Studer multitrack machines, Dolby stereo capacity, Sony multitrack digital audio, sprocketed film facility, 1", ¾", VHS, Beta duplication.

GARRETT FILMS INTERNATIONAL; OLVP, APPV; Box 353, Rt. #3; Bernville, PA 19506; (215) 488-7552. Owner: R. Garrett. Manager: G. Garrett.

GROUPE ANDRE PERRY, LTD.; VPP/E, APPV; 1155 21st St. NW; Washington, DC 20036; (202) 331-9600. Manager: Anthony Johnson, dir. of marketing. Video Tape Recorders: (10) Anipex VPR-3/Zeus, (4) Sony BVU-950, (3) Sony BVW-75 Video Monitors; (20) Ikegami 10 Series. Switchers/editors: (2) Ampex AVC-330 Century, Grass Valley 100, (2) Grass Valley ED 51-8 Em. Video Cameras: Hitachi SK-97, Hitachi 231A, (3) Sony DXC-3000H. Synchronizers: Sony BVX-30, Tektronix 110S. Video Effects Devices: (4) Ampex ADO, Ampex Concentrator/Infinity. Audio Recorders: (2) Studer A810-2/2TC, (2) Studer A820-2/2TC, Studer A820-24 SR. Audio Mixers: DDA DCM-232, (2) Sony MXP-2000. Other Major Equipment: Synclavier digital audio system, Rank Cintel MkIII Telecine w/Digiscan 4, DaVinci color correction system, Abekas A62 digital video recorder, Wavefront 3-D graphics system, Quantel Paint Box system. Rates: Available upon request.

GWSC POST; 250 Harbor Dr.; Stamford, CT 06904; (203) 965-6060. Owner: Group W Satellite Communications. Manager: Dennis Long, director, Steven Mendel, senior editor. Video Tape Recorders: (4) Sony BVH-2000 w/Dolby A, (2) Sony BVW-10, (2) Sony BVU-800. Video Monitors: Shibasoku CMM :0-7HR(U), (4) Sony BVM-1201. Switchers/editors: Sony BVE-5000, Grass Valley 1600-1X w/E-MEM. Video Cameras: Hitachi C-2. Video Effects Devices: Abekas A-53D. Audio Recorders: Otari Mx-5050. Audio Mixers: ADM 1200. Other Major Equipment: Chyron 4100-EXB character generator w/Int compose and graphics, ¾" BVU-800 offline edit room, announce booth. Rates: Call for rate card or quote. Specialization & Credits: GWSC Post produces television network promotion material for both on-air and sales and

marketing presentations. Our other broadcast credits include a limited amount of commercial agency production, feature-length program production and program conformation. GWSC Post also serves corporate video users as well. We have helped to create a number of training programs and image presentations for some of the country's largest corporations. In addition to post-production facilities, Group W Satellite Communications operates a state-of-the-art satellite transmission and program origination center. A major part of the GWSC transmission complex is an extensive microwave and fiber optic network with connectivity to all major New York City communications hubs and production facilities. This integrated service allows clients the flexibility to downlink audio and video, post produce, and then distribute the finished product without ever having to leave the GWSC Post edit suite.

HBS PRODUCTIONS; APPV; 56 Aberdeen Ave.; Cambridge, MA 02138; (617) 492-5836. Owner: HBS Productions, Inc. Manager: Alan Mattes

IMAGE PRODUCTIONS; VPF, VPP/E; 50 Water St.; South Norwalk, CT 06854; (203) 853-3486. Owner: Frances Cornwall. Manager: Kenneth Coffelt

MICHAEL MOSER/MEDIA; VPP/E, OLVP; 1429 21st St. NW; Washington, DC 20036; (202) 293-1780. Owner: Michael Moser. Manager: Michael Moser

MUSICISION, INC.; VPF, VPP/E, OLVP; 185 E. 85th St.; New York, NY 10028; (212) 860-4420. Owner: Fred Kessler



NATIONAL VIDEO CENTER/RECORDING STUDIOS, INC.
New York, NY

NATIONAL VIDEO CENTER/RECORDING STUDIOS, INC.; VPF, VPP/E, APPV; 460 W. 42nd St.; New York, NY 10036; (212) 279-2000. Manager: Andrew Lustig, Bill Kelly. Video Tape Recorders: Over 50, including Ampex VPR-3 and VPR-6 1", Ampex VPR-300 D2, Ampex CVR-75, Sony BVW-40 ½", Sony Betacam SP and BVU SP, Sony BVU-850 and BVU-820 ¾", Sony BVU-800 ¾". Video Monitors: Over 75, including Barco, Asaca Shibasoku, Conrac, Tektronix. Switchers/editors: (10) Grass Valley 300, Grass Valley 1600, Grass Valley 200, (7) Paltex Esprit Plus controller, CMX 3400A controllers. Video Cameras: (7) RCA TK-47B EP, Ikegami HL-79D, Vinten Fulmar camera pedestals, Fujinon zoom lenses. Synchronizers: (3) Adams-Smith video/audio SMPTE interlock, Audio Kinetics Q.Lock SMPTE interlock. Video Effects Devices: Alias real-time 3-D computer graphics, Digital FX 200, Quantel Mirage, (2) Quantel Paint Box, Abekas A-62 digital disk recorder, Grass Valley Kaleidoscope digital effects, Ampex ADOs, Ampex Concentrator w/Infinity, Ampex ESS-3, Chyron 4100 EXB. (4) Aston character generator, RIG computer-controlled video animation stand w/color camera. Full design capability. Grass Valley DVE 2-channel, Ampex Zeus TBC/framestore. Audio Recorders: (10) Otari and Studer 24/16/8/4/2-track recorders, Nakamichi DMP-100 digital 2-track, broadcast audio cart machines. Audio Mixers: SSL 6000 56-channel Total Recall, MCI stereo audio console. Soundstages: TV-1 60 x 80 x 21, TV-2 40 x 50 x 21, TV-3 20 x 30 x 12. Other Major Equipment: (2) SMPTE interlock audio-for-video studio, Dolby noise reduction, Lexicon 2400 time compression/expansion, 3M videodisc cue inserter, color liting cameras, Sony BVX-30 video image enhancement/noise reduction, Bosch FDL 60B negative and positive transfer, Super Sync™ transfer w/center-track time code, Corporate Communications color corrector for scene-to-scene color correction, Lipsner-Smith ultrasonic film cleaning, custom sound effects and music including 45,000 sound effects, 34 music libraries, newly recorded stereo digital sound effects, Kurzweil 250 synthesizer w/digital sampling, Juno-106, DX7 and ARP synthesizers, Sony PCM-1630 digital audio processor, Adams-Smith 2600 AVJ synchronizer. Specialization & Credits: National's new music studio, "The Edison," (60 x 60 x 24) with SSL 6000E 56-channel Total Recall console, 48-track recording, video/audio interlock, all outboard equipment, microphones, etc. The Edison's enormous recording space and Tom Hidley-designed control

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VIDEO PRODUCTION

FACILITIES

Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Washington, DC

In the following listings each facility's particular capabilities are indicated below its name using the following initials: VPF (Video Production Facility); OLVP (On-Location Video Production); VPP/E (Video Post-Production/Editing); APPV (Audio Post-Production for Video).

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room make this studio ideal for acoustic recording of major acts, orchestras, commercial jingles, etc. Also, two interlock video sweetening rooms, live voice studios, time compression, reel-to-reel and cassette duplication, transfers, music and FX libraries, scoring and soundtrack design. Video: three shooting stages, seven online computer editing suites, two offline/interformat suites, negative color correction, remote production, videodisc premastering, computer graphics, animation stands, duplication—all formats.

NEW BREED STUDIOS; APPV; 251 W. 30th St.; New York, NY 10001; (212) 714-9379. Owner: Stewart Lerman, Andrew Ebberbach. Manager: Stewart Lerman.

PRODUCTION MASTERS, INC. (PMI); VPF, VPPIE, OLVP, APPV; 321 First Ave.; Pittsburgh, PA 15222; (412) 281-8500. Owner: David Case. Manager: David Case.

RBV RECORDING AND VIDEO; VPF, VPPIE, OLVP, APPV; 920 Main St. North; Southbury, CT 06488; (203) 264-3666. Owner: Jack Jones. Manager: Marjorie Jones.

REBO HIGH DEFINITION STUDIO; VPF, VPPIE, OLVP, APPV; 350 W. 25th St.; New York, NY 10001; (212) 989-9466; FAX: (212) 627-9083. Manager: Marc Isaacson, production; Alan Miller, post-production.

RESOLUTION VIDEO AUDIO AND FILM PRODUCTION; VPF, VPPIE, OLVP, APPV; Chace Mill, One Mill St.; Burlington, VT 05401-1514; (802) 862-8881; (800) 862-8900. Manager: Susan Henry, Richard Eyre. Specialization & Credits: Resolution's full-service approach to duplication offers much more than quality volume dubbing: 1" post-production, graphic design, custom printing and direct-response order fulfillment, (800) 862-8900.

ROAR PRODUCTIONS RECORDING AND MUSICAL SERVICES; APPV; 6655-H Dobbin Rd.; Columbia, MD 21045; (301) 596-2600 (Washington); (301) 381-1440 (Baltimore). Owner: Steven Rosch. Manager: Larry Adler.

RODEL AUDIO SERVICES; APPV; 1028 33rd St. NW; Washington, DC 20007; (202) 338-0770. Manager: Renee Funk.

SOUND CONCEPTS; VPF, VPPIE, OLVP, APPV; 80 Great Hill Rd.; Seymour, CT 06483; (203) 888-6712. Owner: James E. Lush, president. Manager: Paul J. Gregory, vp/production services.

SOUNDWAVE INC.; APPV; 2000 P St. NW #210; Washington, DC 20036; (202) 861-0560. Owner: Jim Harmon. Manager: Sabina Emerson. Video Tape Recorders: Ampex VPR-80 1", (2) Sony 5600 ¾", Sony 9600 ¾", Ampex 8250 ¾". Video Monitors: Sony 2550 26", JVC TM-13U 13", (7) Sony 13" Synchronizers: (2) Audio Kinetics Eclipse 4.10, Audio Kinetics Q.Lock 3.10. Audio Recorders: 3M M79 24-track, Studer A80 16-track, Otari MX-70 8-track, Otari 7800 8-track, Studer 807 2-track, Studer 810 2-track, Otari 5050 2-track, 3M M79 2-track. Audio Mixers: Neve 8232, (2) NEOTEK Series 2, TAC Scorpion 16 x 8, (2) Soundcraft 200B. Other Major Equipment: New England Digital Direct-to-Disk multitrack recorder. Specialization & Credits: Since 1979, Soundwave has specialized in the creation of award-winning soundtracks for commercial and nonbroadcast productions. Over the past decade, Soundwave has evolved from a single-studio facility into a six-studio complex where half the control rooms are custom-designed for video sweetening. Features include: a New England Digital Direct-to-Disk multitrack recorder, layoff/layback to 1" video, automated mixing for up to 24-tracks, as well as the ability to handle audio in any format. Waveworks, a subsidiary of



SOUNDWAVE INC.
Washington, DC

Soundwave, composes, arranges and produces original music for client projects. A national satellite network allows full-spectrum live recording between Soundwave and any other studio on the system. The facility also has music and sound effects libraries on CD, handles talent casting and payment, and is a member of ITS, SPARS and the Better Business Bureau. Please contact Jim Harmon, president, for a tour and additional information.

SYNC SOUND, INC.; APPV; 450 W. 56th St.; New York, NY 10019; (212) 246-5580. Owner: Bill Marino, Ken Hahn. Manager: Sherri Tantleff. Video Tape Recorders: Sony BVH-2000 1" w/Dolby, Sony BVH-2830, (3) JVC 8250, (3) Sony BVU-850, VHS Hi-Fi, Betacam SP playback. Video Monitors: (2) Panasonic PT-101 100" video projection system, Sony PVM-220, Sony 19" and 25" monitors. Switchers/editors: Monitor switches in all areas for multivideo source operations. Synchronizers: Proprietary edit system allowing lockup, edit rehearsal and editing to subframe accuracy of all audio, video and digital machines. Audio Recorders: (2) Sony PCM-3324 24-track digital, Sony PCM-1630 2-track digital, (3) Otari MTR-90II w/24/16/8-track heads, Otari MTR-20 4-track, (4) Otari MTR-12 2-track w/mono, center T.C. and stereo Nagra capability, Neve stereo limiter, dbx subharmonic synthesizer, Tubetech PE-1B, Sontec EQ, AMS 15-80. Rates: Call for information. Specialization & Credits: Sync Sound is a full-service audio post-production house, ready to meet your audio needs with experience and enthusiasm. Our facilities are specifically designed to accommodate editing and mixing to picture (digital or analog), dialog replacement, overdubs to picture, sound effects design, audience sweetening and Dolby Surround mixing for film. Sync Sound also provides ancillary functions such as technical consultation, Nagra and mag dubs, SFX library and videotape laybacks.

TOWNHOUSE POST-PRODUCTION; VPF, VPPIE; 1449 N St. NW; Washington, DC 20005; (202) 462-EDIT. Owner: John J. Prescott. Manager: Judy A.K. Peizer. Video Tape Recorders: Sony BVH-3100, (2) Sony BVH-2000, Sony BVW-65SP, Sony BVW-75SP, Sony BVU-900, Sony BVU-950SP. Switchers/editors: Grass Valley GVG-200, Grass Valley GVG-100, Sony BVE-900, Grass Valley GVG-141. Video Cameras: Sony DXC-3000. Video Effects Devices: Ampex ADO-1000. Audio Recorders: Otari MX-5050 2-track, Otari MX-5050 4-track. Audio Mixers: Grass Valley GVG-AMX170S. Other Major Equipment: Chyron Super Scribe, Quantafont Q8, Ultimatte News-Matte II. Rates: Online—\$195 and up. Offline—\$50 and up.

VIDEO ONE, INC.; VPF, VPPIE, OLVP, APPV; 100 Massachusetts Ave.; Boston, MA 02115; (617) 266-8200. Owner: Yale Marc, Jim Herzig. Manager: Jay Gravina. Video Tape Recorders: (4) Sony BVH-2500, Sony BVH-3100, (4) Sony BVH-2000, (4) Sony BVH-1100A. Video Monitors: (4) Ikegami TM20-8RH, Ikegami TM20-9RH, various Sony. Switchers/editors: (4) CMX 3400A/340X, (6) BVW-75, (2) BVW-40, BVW-15, (2) BVW-35, (3) Grass Valley 100/200, CDL 680. Video Cameras: Ikegami HL-79D, (2) Ikegami HL-79E. Synchronizers: NEC DME DVP-15. Video Effects Devices: (2) Ampex ADO-3000 w/concentrator, Abekas A62 disk recorder. Audio Recorders: Studer A80, Otari MX-70, Otari JH-110 layback. Audio Mixers: Sound Workshop Series 34, (2) Panasonic WV-1800 Ramsa. Other Major Equipment: Abekas A42 still store, RIG (computer-animation stand), Quantel DPS-7000 Paint Box, WaveFront, Digital Arts Targa 24.

VISUAL MUSIC PRODUCTION SERVICES; VPF, APPV; 235 E. 13th St. #3-D; New York, NY 10003; (212) 505-9281. Owner: Visual Music. Manager: Brigita.

SOUTHEAST

Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia

Alpha Audio

music & recording services

- ▶ Digital and 24 track audio to video interlock
- ▶ Home of the Boss™ Automated Audio Editing System



ALPHA AUDIO
Richmond, VA

ALPHA AUDIO; APPV; 2049 W. Broad St.; Richmond, VA 23220; (804) 358-3852. Owner: C. Nicholas Collier, Jr. Manager: Carlos Chafin. Specialization & Credits: Alpha Audio specializes in everything from the mundane to the most advanced random-access digital audio recording techniques. Beginning as a single recording studio in 1971, which grew to four by the end of the decade, Alpha Audio occupies a unique position in the professional audio community due to its related business activities. These include the in-house creative team who write and produce original music for national and international radio and television advertising, as well as for major motion picture and record companies. Alpha Audio's involvement in sound with picture led to the development of The Boss™ Automated Audio Editing System, now in its second generation, used throughout the world to conform audio to film and video. This, together with acoustic product distribution and active involvement in the Society of Professional Audio Recording Services, where our president is immediate past chairman, keeps Alpha Audio in step with the state of the industry.

AMI VIDEO/POST; VPF, VPPIE, OLVP, APPV; 3167 Tucker St. Ext.; Burlington, NC 27215; (919) 227-0171. Owner: Bill Britt. Manager: Alan Kirby.



ARDENT TELEPRODUCTION, INC.
Memphis, TN

ARDENT TELEPRODUCTION, INC.; VPF, VPPIE, OLVP, APPV; 2000 Madison Ave., Memphis, TN 38104; (901) 726-6553. Owner: John Fry, Robert Williams. Manager: Joe Dyer

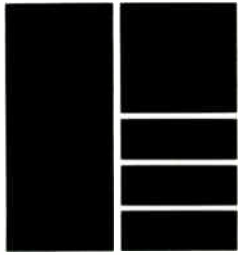
DIXIELAND PRODUCTIONS, INC.; VPF, VPPIE, OLVP; 3440 Oakcliff Rd., Ste. 104; Atlanta, GA 30340; (404) 458-1168. Owner: Dick Rex. Manager: Glen D. Fisher. Video Tape Recorders: (3) Sony BVU-2000 broadcast, Sony BVH-500A broadcast, Sony BVW-35 broadcast, Sony BVU-110 broadcast, Sony BVW-75 broadcast. Video Monitors: Tektronix 690SR, (4) Tektronix HR-650, (2) Sony PVM-8020, SR-690. Switchers/editors: Grass Valley 300 switcher, Grass Valley

Model 41 editor, Grass Valley 1600 switcher, Video Cameras: (3) Sony BVP-330A broadcast, (2) Toshiba PK-60. Video Effects Devices: Ampex ADO-2000, ADDA AC-20A. Audio Recorders: Otari MTR-10, Ampex AG-440. Audio Mixers: Harrison Pro-7 stereo, Sony MXP-21. Soundstages: 30' x 60' w/two walls of hard cyc, 16' highlighting grid w/dimmer. Other Major Equipment: Sony BVU-820, Sony BVW-75, film-to-tape telecine: RCA TK-28B, RCA FR-35A 35mm projector, RCA TP-66 16mm projector, Ampex VR-2000A quad VTR, teleprompter package. Specialization & Credits: Dixieland Productions, Inc. is a full-service video facility serving the Southeast for over 12 years. Our services include studio production for single-camera or multicamera packages with a dedicated control room, a full location package for ENG or EFP-style shooting, utilizing Sony broadcast VTRs for 1" Betacam SP and 3/4" videotape formats. One-inch computer edit suite with a Grass Valley 300 switcher and ADO, intermat editing, 3/4" online and 3/4" offline edit suites, film-to-tape transfers, 2-D/3-D computer animation and paint capabilities, and video duplication.

DOPPLER STUDIOS, INC.; APPV; 1922 Piedmont Cir.; Atlanta, GA 30324; (404) 873-6941. Owner: Pete Caldwell. Manager: Bill Quinn.

KNOWLES VIDEO, INC.; VPF, VPP/E, OLVP; PO Box 12127; Tallahassee, FL 32317-2127; (904) 878-2298. Owner: Karl Knowles, president. Manager: Guy Kathé.

LIMELITE VIDEO, INC.; VPF, VPP/E, OLVP, APPV; 7355 NW 41 St.; Miami, FL 33166; (305) 593-6911. Owner: Frank Tolin. Manager: Ronald Fenster.



POST EDGE
2040 SHERMAN STREET
HOLLYWOOD, FL 33020
(305) 920-0800

POST EDGE, INC.
Hollywood, FL

POST EDGE, INC.; VPF, VPP/E, OLVP, APPV; 2040 Sherman St.; Hollywood, FL 33020; (305) 920-0800. Owner: Mike Orsburn. Manager: Chris Orsburn.



Joe Foglia
PROFESSIONAL AUDIO
EQUIPMENT RENTAL AND
PRODUCTION SERVICES
1791 Blount Road #206
Pompano Beach, FL 33066
(305) 974-1500

SOUTHEAST AUDIO SERVICES
Pompano Beach, FL

SOUTHEAST AUDIO SERVICES; APPV; 1791 Blount Rd. #206; Pompano Beach, FL 33069; (305) 974-1500; (407) 843-9160 (Orlando); FAX: (305) 979-9383. Owner: Joe Foglia. Manager: Don Hamzik. Video Tape Recorders: Sony, Panasonic. Video Monitors: Sony. Switchers/editors: Adams-Smith synchronizers, TC audio editor, United Media computerized looping system. Synchronizers: Adams-Smith Audio Recorders: Otari, Nagra, MCI, TEAC. Audio Mixers: Yamaha, Sony, Panasonic, Shure, Sonosax, Sela. Other Major Equipment: Full professional audio and communications, production and post-production facility. Rates: Upon request. Specialization & Credits: Audio engineering services, boom, professional audio, communications and video assist equipment rental for

film and TV, production and post-production facility. Clients include: *Miami Vice* three seasons, HBO, Don Johnson Productions, Pepsi-Cola, Budweiser, ESPN, F&F Productions, Fairbanks Films, CBS, Jack Nicklaus Golf, Puma, Big City Films, *Hollywood Squares*, NBC, September Productions, General Motors, Greenback Films London, MTV, *Unsolved Mysteries*, Shooting Star Productions *Bob Hope Special*, SIN, Walt Disney World Productions, IBM, *Superboy*, Viacom, Universal Studios, Bee Gees, MGM, CCI Productions "James Bond License Revoked," Elton John, Partners USA, Apple Computer, AT&T, McDonald's, Miami Sound Machine, Giraldi Films, Richard Dreyfuss "Let It Ride," United Artists, Superbow, Burt Reynolds' Blue Period Productions, Central Agency for Jewish Education, Sony Corporation, 38 Special, Diet Coke, Billy Idol, Harris Computer Systems, 20th Century Fox, Pratt Whitney, *Revenge of the Nerds*, Ridley Scott Productions, *Friday Night Videos*, Unitel, Showco, Philip Michael Thomas Productions.

VIDEO IDEAS PRODUCTIONS, INC.; VPF, VPP/E, OLVP; 4762 Hwy. 58, Ste. G; Chattanooga, TN 37416; (615) 894-2677. Owner: Jerry Waddell, Martha Knight. Manager: Jerry Waddell, Martha Knight.

VIDEO TAPE ASSOCIATES; VPP/E; 1575 Sheridan Rd. NE; Atlanta, GA 30324; (404) 634-6181; (800) 554-8273. Owner: W.K. (Ken) Chambliss. Manager: Mike McNally.

VISIONARY AUDIO DESIGN; APPV; 808 N. John St., Ste. 5; Orlando, FL 32808; (407) 297-8560. Owner: Paul Pavelka.



Illinois, Indiana, Iowa, Kansas, Michigan,
Minnesota, Missouri, Nebraska, North Dakota,
Ohio, South Dakota, Wisconsin

ADMARK, INC.; VPF, VPP/E, OLVP; 3630 SW Burlingame Rd.; Topeka, KS 66611; (913) 267-4712. Owner: Sondra and Barry Busch. Manager: Dale Hammer, video dept. mgr.

ALLEN-BRADLEY CO.; 1201 S. 2nd St.; Milwaukee, WI 53204; (414) 382-4213. Manager: Robert Linder. Synchronizers: Adams-Smith 2500 editing system, TimeLine Lynx. Audio Recorders: (2) Otari MX-80, Otari MTR-10, Ampex ATR-800, Otari 5050 1/2-track. Audio Mixers: Soundcraft TS 12/24. Soundstages: (2) 30' x 35'. Other Major Equipment: Macintosh SE, Southworth Jam Box/4+, Emulator II, Yamaha D717FD, Yamaha TX802, Yamaha TX81Z, keyboards, Alesis HR-16 drum machine, wide assortment of outboard equipment including Orban parametric, Valley Audio parametric, UREI compressor, dbx compressor, Lexicon reverb, Alesis reverb, Yamaha reverb, Drawmer gate, UREI 8116 monitor, Yamaha NS-10M monitor, Auratone monitor.

AUDIO ART RECORDING STUDIOS, INC.; APPV; 403 SW 8th St.; Des Moines, IA 50309; (515) 282-3223. Owner: Dr. James Skinner, Patrick McManus. Manager: Patrick McManus.

BUSBY PRODUCTIONS, INC.; VPF, VPP/E, OLVP, APPV; 1430 Locust St.; Des Moines, IA 50309; (515) 244-0404. Owner: Busby Burnell. Manager: Busby Burnell.

GENERAL TELEVISION NETWORK; VPF, VPP/E, OLVP, APPV; 13225 Capital Ave.; Oak Park, MI 48237; (313) 548-2500. Owner: Joan Binkow. Manager: Doug M. Cheek. Video Tape Recorders: (6) Sony BVH-3000 1", (6) Sony BVH-2000 1", (3) Sony BVH-1100A 1", (4) Sony BVU-800 3/4", (3) Sony BVW-40 Betacam, Sony BVW-10 Betacam, Sony BVW-75 Betacam. Video Monitors: (4) Sony BVM-1900, (10) Ikegami TM 20-9. Switchers/editors: (2) GVG 200 switcher, GVG 100 switcher, (3) CMX 3600 edit system. Video Cameras: (2) Sony BVP-3A, (2) Ikegami HL-79EAL. Synchronizers: (4) TimeLine Lynx, TimeLine keyboard control unit. Video Effects Devices: Ampex ADO-3000, (2) Abekas A53D w/combiner, Abekas A52, Abekas A62 digital disc recorder. Audio Recorders: (2) Otari MTR-12 2-track w/center-track time code, Otari MTR-12 4-track, (3) Otari MX-5050 2-track. Audio Mixers: Lexicon Opus, (2) Shure FP2. Soundstages: Studio A 40' x 80', Studio B 20' x 40'. Other Major Equipment: Bosch FDL-60B2 film transfer w/DaVinci color correction, (2) Symbolics 3650 3-D paint system, (2) Vidifont V character generator. Remote services—Betacam, 3/4" BVU, 1" packages. Duplication center—(6) 1", (6) 2", (4) 3/4", (20) VHS, (4) Beta. Dolby SR processing for all in-house tapes.

HEYWOOD FORMATICS AND SYNDICATION; VPP/E, APPV; 1103 Colonial Blvd.; Canton, OH 44714-1837; (216) 456-2592. Owner: Max Heywood. Manager: Jon Russell.

INNERVISION PRODUCTIONS; VPF, VPP/E, OLVP, APPV; 11783 Borman Dr.; St. Louis, MO 63146-4120; (314) 569-2500; FAX: (314) 569-3534. Manager: Michael Stroet, DeLancey Smith. Video Tape Recorders: (4) Ampex VPR-3 w/Zeus, (3) Ampex VPR-6, (2) Ampex VPR-80, (4) Sony BVU-800, (4) Ampex VPR-2B. Video Monitors: Ikegami, Sony. Switchers/editors: (3) Ampex ACE-200, Ampex ACE-Micro,



INNERVISION PRODUCTIONS
St. Louis, MO

INNERVISION PRODUCTIONS
St. Louis, MO

Grass Valley 100. Video Cameras: Ikegami ED-35, (2) Ikegami HL-79E, Ikegami HL-79A. Synchronizers: (4) TimeLine Lynx. Video Effects Devices: (3) Ampex ADO-3000. Audio Recorders: Otari MTR-90, Ampex ATR-102, Otari MTR-20. Audio Mixers: Sony MXP-3000 auto, (2) Sony MXP-2000. Soundstages: Studio A: 60' x 90' w/130' hard cyc, Studio B: 30' x 35'. Other Major Equipment: BTS FGS-4000 3-D animation, Matthews Tulip crane, (3) grip/remotes trucks (22', 20', 10'). Rates: On request. Specialization & Credits: With two studios, three online edit suites, 24-track audio recording/sweetening, computer animation and graphics, set design/construction and prop storage all in-house, there is virtually no limit to our ability to produce your concept. Since 1973, our 32 staff professionals have been producing television commercials, non-broadcast programs and broadcast programs for advertising agencies, Fortune 500 companies and businesses of all sizes. Our reputation among, and business relationships with, our clients are built on creativity, service and quick response. Call DeLancey Smith for more complete information.

MARX PRODUCTION CENTER; VPF, VPP/E, OLVP, APPV; 3100 W. Vera Ave.; Milwaukee, WI 53228; (414) 351-5060. Owner: Robert Marx. Manager: Tom Deming

MOBILE IMAGES CORP.; VPF; 21775 Melrose Ave.; Southfield, MI 48075; (313) 350-9300. Owner: Irwin Danto. Manager: Tom Hardy, sales.

MOTIVATION MEDIA, INC.; VPF, VPP/E, OLVP; 1245 Milwaukee Ave.; Glenview, IL 60025; (312) 297-4740. Owner: Frank Sledronsky. Manager: Peter Tanke. Video Tape Recorders: (2) Sony BVH-2000 Type C 1", (2) Sony BVW-75 Betacam SP, Sony BVU-800 3/4", Sony BVU-950 3/4", Panasonic AU300 M-1. Video Monitors: (2) Ikegami 9 Series 20" color, (3) Ikegami 9 Series 14" color, Tektronix, Sony, Panasonic. Switchers/editors: Grass Valley Model 200 switcher w/all options, Grass Valley 51 EM editor. Video Cameras: (2) Sony BVW-550 Betacam SP, Ikegami 730A, Panasonic AK100P. Synchronizers: Cipher Digital Phantom. Video Effects Devices: Ampex ADO 2000 w/per. and rot., Dubner Turbo video Paint Box w/animation. Audio Recorders: Otari MX-5050B 1/2-track 1/4", Otari MX-5050 MkIII 4-track 1/2" under SMPTE control, Vector VCX510 cassette. Audio Mixers: Ramsa WR8812 16-input stereo w/AFV, Shure FP31 field mixers, Shure FP32 field mixers. Soundstages: Stage: 31' x 48' x 15' 6" (L x W x H) AC, 600 amp power; insert one: 20' x 12' x 15' 6" MOS; insert two: 15' x 8' x 8' MOS. Other Major Equipment: Dubner 20K anti-aliased character generator, Abekas A42 dual-channel still store, color insert cameras, Dolby dbx noise reduction, Orban and dbx signal processing, VHS offline edit suite w/EDL, location van, extensive EFP, lighting and grip equipment. Rates: Please call for quote.

NEFF PRODUCTIONS, INC.; VPF, VPP/E, OLVP, APPV; 10420 Old Olive St. Rd., Ste. 200; Saint Louis, MO 63141; (314) 991-4949. Owner: Chuck Neff. Manager: David Howard

OPTIMUS, INC.; VPP/E; 161 E. Grand Ave.; Chicago, IL 60611; (312) 321-0880. Owner: Scott H. Kane, president. Manager: Thomas P. Heinz, dir. of video serv. Video Tape Recorders: (12) Ampex VPR-3, (3) Sony BVH-2000, (10) Sony BVU-800, Sony BVU-820, (6) Sony BVW-75, (2) Sony BVW-40, (4) Panasonic NV 8500, (2) Sony DVR-1000, Sony BVH-35, Sony BVW-5. Video Monitors: (11) Sony BVM-1900, (2) Sony BVM-1300, (5) Sony BVM-1201. Switchers/editors: Ampex Ace editor, Ampex AVC 33B switcher, (3) CMX 3400A, Grass Valley 300-3B, Ross 508, Grass Valley 1600-3K, Grass Valley 1600, CMX 6000, Quantel Harry, Abekas A62, Grass Valley 100CV. Video Cameras: (2) Ikegami HL-79EAL w/BVH-35, Ikegami HL-95B w/BVW-5, (2) Hitachi FP-21. Synchronizers: Adams-Smith, TimeLine Lynx, Time Logic-controller. Video Effects Devices: (2) Ampex ADO-2000 w/concentrator, Grass Valley Kaleidoscope, Quantel Paint Box, Ultimatte V, (2) Symbolics 3650, Quantel Harry, EPR electronic pin registration. Audio Recorders: Ampex ATR-104, (2) Nagra II, Nagra IV.

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VIDEO PRODUCTION

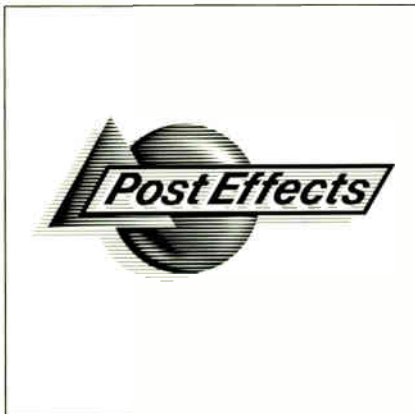
FACILITIES

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In the following listings each facility's particular capabilities are indicated below its name using the following initials: VPF (Video Production Facility); OLVP (On-Location Video Production); VPP/E (Video Post-Production/Editing); APPV (Audio Post-Production for Video).

—CONTINUED FROM PREVIOUS PAGE

AMPX AG440, Ampex ATR-700, Tascam 122, Nagra T. Audio Mixers: (7) Neve 8 x 2 suitcase. **Soundstages:** 15 x 20 hard cyc 3 wall, 25 x 40 hard cyc 2 wall. **Other Major Equipment:** (2) Symbolics Graphic System, 2-channel Chyron 4100 EX, (2) Chyron Scribe, laser disc ODC recorder, CMX 6000, (2) FDL 608 telecine, Corporate Sunburst secondary color correctors, Ampex ZUEs TBCs, Dolby A, Quantel Paint Box and Harry, FGS 4000, Abekas A-62, (2) Magna Tech 4-channel dubber, Lexicon time compression, Orban 622B, (4) UREI 1178 limiter, (4) UREI Little Dipper, Crown and BGW amps, JBL monitors, RTS 24-channel intercom, dual-mode closed-captioning, Ultimate V, MkIII enhanced rank telecine w/Corporate Sunburst II, Encore electronic pin registration, Lexicon stereo time compression, interactive motion control.



POST EFFECTS
Chicago, IL

POST EFFECTS: VPF, VPP/E, OLVP; 400 W. Erie, Ste. 101, Chicago, IL 60610; (312) 944-1690. Owner: Michael Fayette. **Manager:** Dave Sorensen, Dessa Samardija, Britta Fayette, scheduling. **Video Tape Recorders:** (8) Sony BVH-2000 1", (2) Sony BVH-2500 1", (3) Abekas A-62 digital recorder, (2) Sony BVW-10 Betacam, (2) Sony BVV-1A Betacam, Sony BVW-25 Betacam, Sony BVW-40 Betacam, Sony BVW-20 Betacam, (2) Sony BVH-500A 1", (2) Sony BVU-110 3/4", Sony BVU-800 3/4", Sony BVU-820 3/4", Sony BVU-150SP 3/4", (4) Sony DVR-103 (D-2), Sony DVR-1000 (D-1), Abekas A-64DDR, Sony BVU-150SP 3/4", (2) Sony BVU-950SP 3/4", (2) Sony BVU-900SP 3/4", (2) BVW-65SP Beta, Sony BVW-70SP Beta, JVC BR-S810U S-VHS, (2) JVC BR-S610U S-VHS. **Video Monitors:** Ikegami TMR-20, (3) Ikegami TMR-14, (3) Tektronix 1740, (8) Sony PVM-1220, (4) Sony 8021, (7) Sony BVM-1900. **Switchers/editors:** Ross 508A switcher, CDL 1080 switcher, (2) Grass Valley 200 switcher, Grass Valley 100 switcher. **Video Cameras:** Ikegami HL-79EAL, (2) Ikegami HL-95B, (3) Sony DXC-3000CD, Mitchell MOD-GC 35mm, (2) Sony DXC-M7, Sony BVP-7, (5) Sony DXC-M3A. **Video Effects Devices:** (2) Ampex ADO, (2) Abekas A-53D, NEC DVE Optiflex, NEC DVE E-Flex. **Audio Recorders:** (4) Tascam 42B, Otari MTR-12. **Audio Mixers:** (2) Orion AMU, (2) Graham Patten. **Soundstages:** Stage A-40' x 50' x 24' w/180-degree hard cyc 18'H, drive-in access, control room, dressing/makeup room, working kitchen, A/C. **Other Major Equipment:** Computer graphics: Alias/1 3-D computer animation, D/F X 200 4:4:4 component digital paint and effects system, Quantel Paint Box, Dubner CBG-2 3-D animation, Dubner painter, (2) Chyron Scribes and VP2, ADDA-ESP-2 dual-channel still store, motion control: IMC 3565 system w/14' camera mover w/rotating column and track, (2) 4 x 4 flat artwork tables, 4 x 10 model mover, slide/transparency transfer system, Ultimate 4. **Specialization & Credits:** Post Effects pride themselves on innovation,

both in their work and in the techniques they use to create it. Recognizing this, Sony and Abekas asked them to launch D-2 for them at NAB. So they produced "The D-2 Diner," combining elements shot with their IMC camera mover, 3-D animation on the Alias/1 and Dubner, 2-D animation with the Paint Box and retouching with the Dubner Painter. Post Effects also became the first in Chicago with S-VHS offline editing and the new D/F X 200 4:4:4 digital production system that combines RGB digital paint and etc.

PRODUCERS COLOR SERVICE, VPF, VPP/E, OLVP, APPV; 24242 Northwestern Hwy.; Southfield, MI 48075; (313) 352-5353; (800) PCS-8700. See Our Ad in the Business-Pages! Manager: Bruce Calmer, gen. mgr. **Video Tape Recorders:** (11) Sony BVH-2000, (16) Sony BVH-1100, Bosch BCN-50, (10) Ampex AVR-2, (4) Sony DVR-10, Sony DVR-1000. **Switchers/editors:** (4) CDL 480 model 5, GVG 300, (2) CDL-1240. **Video Cameras:** Ikegami EC-35, (3) Sony BVP-3A. **Synchronizers:** (7) TimeLine Lynx. **Video Effects Devices:** (3) ADO 3000, Abekas A-62, Cubicomp Picturemaker, Quantel Harry. **Audio Recorders:** (2) Otari 24-track, Ampex 24-track, (4) Ampex 2-track, Otari 4-track, Ampex 4-track, (2) MCI 2-track, (3) Otari 2-track w/T.C., AMS AudioFile. **Audio Mixers:** SSL 4000B 24-channel, SSL 6000E 32-channel. **Soundstages:** "A" stage: 100 x 150 x 30, "B" stage: 50 x 60 x 20, "C" stage: 40 x 40 x 20. **Other Major Equipment:** (2) Bosch FDL-60, CTR-3/CK-35 Teledyne tape-to-film recorder, Quantel Harry, Cubicomp, (5) online edit suites w/ CMX3600, Ultimate, Betacam, offline edit suite w/CMX 330. **Specialization & Credits:** Three studios: 100 x 150, 50 x 60, 40 x 40. NTSC/PAL standards conversion, all formats, mass quantity helical duplication, teleconferencing uplink (stationary), remote video production, motion picture film lab services, video disc mastering and replication, compact audio disc replication.

RTG MUSIC; APPV; 130 E. 6th St.; Cincinnati, OH 45202; (513) 381-0506. Manager: Ed O'Donnell.

SOLID SOUND, INC.; VPF, APPV; PO Box 7611; Ann Arbor, MI 48107; (313) 662-0667. Owner: R.G. Martens. **Manager:** R.G. Martens.

SOUND/VIDEO IMPRESSIONS; VPP/E, OLVP, APPV; 110 River Rd.; Des Plaines, IL 60016; (312) 297-4360. Owner: Bill Holtane, president.

STOKES SOUND AND VIDEO; OLVP, APPV; 100 Stokes Ln., PO Box 398; Hudson, OH 44236; (216) 650-1669; (216) 656-2169. Owner: A.J. Stokes, Jr. **Manager:** A.J. Stokes, Jr. **Video Tape Recorders:** (2) Sony VO-5800 3/4", Sony VO-5850 3/4", Sony VO-6800. **Video Monitors:** (7) Panasonic BT-5701 5" color, Panasonic BT-S1900N 19" color, (6) Sony PVM-1270. **Switchers/editors:** JVC KM-2000 8 x 3 switcher, Sony RM-440 edit controller. **Video Cameras:** (4) Hitachi FP-Z31. **Synchronizers:** BTX Softouch, Shadow, Cypher. **Audio Recorders:** MCI JH-114 24-track, MCI JH-110 4-track, (3) Otari 5050B 2-track, Otari 5050 MkIII 8-track, **Audio Mixers:** Soundcraft 500 32 x 8, Yamaha RM-2408 24 x 8. **Other Major Equipment:** (4) camera remote video production system contained in road cases, RTS intercom, location audio recording van, Yamaha REV7 reverb, Yamaha SPX90 reverb, Gatec noise gates, dbx limiters, UREI, Valley People, Sony 501 digital processor, (4) Sony video projector, Laird 1500 EX character generator, For-A and Nova TBCs. **Rates:** Quoted on a per-project basis. **Specialization & Credits:** Stokes Sound Services specializes in on-location sound and video for all types of projects, from corporate presentations to concert and musical specials. Audio post-production specialties include audio editing and program assembly, dialog replacement and foreign language overdubs. Also available for rental are audio and video EFP systems.



STUDIO M
Saint Paul, MN

STUDIO M/WORLD THEATER; APPV; 45 E. 7th St./10 E. Exchange; Saint Paul, MN 55101; (612) 290-1500; (612) 290-1453. Owner: Minnesota Public Radio. **Manager:** Tom Mudge.



WORLD THEATER
Saint Paul, MN

Video Tape Recorders: JVC 8250 U-matic. **Video Monitors:** JVC GX59U. **Switchers/editors:** Panasonic. **Video Cameras:** JVC GXS9U. **Synchronizers:** Cipher Digital Softouch, Cipher Digital Shadow. **Audio Recorders:** 3M 32-track digital mastering system, Otari MTR-9001, Otari MTR-12 w/SMPTe center stripe, MCI 110B 4-track 1/2", (4) Otari MTR-10, (3) Studer 810. **Audio Mixers:** Neve V Series 36 x 36 x 36, Neve 51 Series 36 x 12. **Soundstages:** World Theater stage 36 x 35, house seats 916. **Other Major Equipment:** (2) Lexicon 224X LARC, Lexicon 200, EMT 140, Ecoplate I, Ecoplate II, ADR Scamp Major rack, (2) UREI LA-4 limiter, (2) Eventide 969 Harmonizer, (2) Lexicon PCM42, (2) Marshall Time Modulator, Trident parametric EQ, B&K, Neumann, Schoeps, AKG and other quality microphones. The World Theater lighting consists of a Strand Century Mini Light Palette, a Colortran Scenemaster with focus remote and more than 400 lighting instruments. **Rates:** Analog \$125/hr., digital \$140/hr., video/audio interlock and World Theater rates upon request. **Specialization & Credits:** As host location for the Disney Channel's *A Prairie Home Companion* cable series, Studio M/World Theater has earned a reputation as a state-of-the-art facility for live performance video, simultaneous multitrack recording, synchronized audio post-production and live national satellite distribution of radio and television in a uniquely inspiring facility. The World Theater, opened in 1910 as a "two-balcony dramatic house," was completely renovated in 1986 to its original elegance. The interior offers a sense of intimacy, with no seat further than 87 feet from the stage. The fully staffed theater is complemented by an exceptional sound reinforcement system and a dedicated audio recording/broadcast control room having direct hardware multitrack interconnect to Studio M. In addition to six dressing rooms, a green room and a rehearsal room, the theater includes a sufficient lighting system to accomplish demanding video lighting designs.



SZABO TOHTZ EDITING, INC.
Chicago, IL

SZABO TOHTZ EDITING, INC.; VPP/E, APPV; 301 E. Erie; Chicago, IL 60611; (312) 787-6255. Owner: Jack Tohtz. **Manager:** Vivian Marie Craig. **Video Tape Recorders:** (3) Sony BVU-950SP 3/4", Sony BVU-870 3/4", (2) Sony BVU-850 3/4". **Video Monitors:** (3) Panasonic ST 1310 color, (4) Panasonic BT 5702 color, Videotek AUM13 color, Mitsubishi 32" color. **Switchers/editors:** Grass Valley 100 switcher, Grass Valley VPE-151 editor. **Video Cameras:** Hitachi FP-C1 color. **Synchronizers:** Audio Kinetics Eclipse. **Video Effects Devices:** Laird 1500 character generator. **Audio Recorders:** AMS AudioFile w/1610 digital interface, (2) Otari MTR-10 2-track w/CITC, (2) Magna-Tech Mag R/P 1/3-track. **Audio Mixers:** Yamaha DMP7, Ramsa WR-8616. **Other Major Equipment:** (2) Macintosh SE computer w/Performer/Q-Sheet/SFX database soft-

ware, Kurzweil Midboard, Akai S900 and various sound modules, AMS DMX 35T time compression/expansion, Drawmer M500 dynamics processor, 8,000+ compact disc SFX library, Sony CD-3000 player. Rates: Studio 1: \$170/hour (hour minimum)



UNIVERSAL RECORDING CORPORATION
Chicago, IL

UNIVERSAL RECORDING CORPORATION, APPV, 46 E. Walton, Chicago, IL 60611; (312) 642-6465; FAX: (312) 642-7126. Owner: Murray R. Allen. Manager: Foote Kirkpatrick. Video Tape Recorders: (10) JVC 8250 3/4", (2) Sony 2800 1". Video Monitors: (14) Sony. Switchers/editors: (3) Synclavier, (3) Direct-to-Disk, AMS AudioFile. Synchronizers: (20) BTX Softouch, (2) TimeLine. Audio Recorders: (37) Magna-Tech dubber, (20) 2/32-track digital (55) analog. Audio Mixers: Neve, SSL, Sony, ADM, Ramco, Harison. Soundstages: Studio A 68,000 cubic ft. Other Major Equipment: Sony video projectors, ADR, optical disk—optical transfer. Rates: \$200-\$500/hour. Specialization & Credits: Omimrax Production "The Great Barrier Reef," Mannheim Steam Roller, Manowar, Top Gun, Hoosiers, Grammy Lifetime Achievement Award.

VAUGHN BROADCAST RENTALS, DIV. OF VAUGHN COMMUNICATIONS, OLVP, 7951 Computer Ave. S., Minneapolis, MN 55435; (612) 831-2248. Owner: Kenneth E. Nichols, president. Manager: Clint Townsend.



DAN YESSIAN MUSIC
Farmington Hills, MI

DAN YESSIAN MUSIC, APPV, 33117 Hamilton Ct., Ste. 175, Farmington Hills, MI 48018; (313) 553-4044. Owner: Dan Yessian. Manager: Dan Yessian. Video Tape Recorders: JVC CR600U. Video Monitors: NEC. Synchronizers: Fostex 4030/4035. Audio Recorders: Otari MTR-9011 24-track, Otari 5C50 4-track 1/2", Otari 5050 2-track 1/4". Audio Mixers: Soundcraft 600. Other Major Equipment: Yamaha REV3, Lexicon PCM70, DigiTech 128, (2) Orban 642B, (2) dbx 166, (2) dbx 263X, EXR exciter, (2) Dyna-Mite compressor, E-max, Roland D-50 E-III w/Mac II sequencing, Optical Media CD-ROM sound library, Marshall amps, AKG "The Tube" and other mics. Rates: Give us a call. Specialization & Credits: Dan Yessian Music strives to give you the best in jingle work and audio post-production. Here at our newly opened recording facility, we offer advertisers and video post houses custom music, special effects and multitrack recording for all types of projects. Credits include: Whirlpool, Chrysler/Plymouth, Dodge Boys "Have More Fun," FTD, Mr. Turkey, AC De'co, as well as music for Sesame Street, Hanna-Barbera Productions, Hot Fudge. We arrange taxi and limo services from Detroit Metro Airport as well as hotel accommodations. Our new facility, added with our talented and courteous staff, places Dan Yessian Music in the forefront for your jingle and audio post needs of the future.

ZENITH/DB STUDIOS, APPV, 676 N. La Salle St., Chicago, IL 60610; (312) 944-3600; FAX: (312) 944-2843. Owner: Coken & Coken, Inc. Manager: Richard A. Coken.

SOUTHWEST

Arizona, Arkansas, Las Vegas, Mexico, New Mexico, Oklahoma, Texas

AMS PRODUCTIONS, INC., VPF, VPP/E, OLVP, 6221 N. O'Connor, Ste. 109, Irving, TX 75039; (214) 869-4911. Owner: Andrew M. Streitfeld. Manager: Alicia Harris, prod. manager. Video Tape Recorders: (2) Sony 3100 1" VTR w/high-performance TBL, Sony 2000 1" VTR, (2) Sony BVW-75 Betacam SP, (3) Sony BVW-10 Betacam, (2) JVC CR850 3/4" Video Monitors: (3) Ikegami TM-209RH. Switchers/editors: Grass Valley Model 200, Grass Valley Model 100, (2) Grass Valley Model 141. Video Cameras: Sony BVP-5 CCD, Sony DXC-3000 CCD, Sony DXC-M3A. Synchronizers: Fostex 4030. Video Effects Devices: Abekas A530 w/warp. Audio Recorders: (2) Fostex Model 20. Audio Mixers: (2) Soundcraft 16 x 4. Other Major Equipment: (2) Dubner 20K character generator, all editing format both online and offline, Grass Valley editing systems, full-service duplication.

CROCKER'S COUNTDOWN PRODUCTIONS, OLVP, 5526 McCommas Blvd., Dallas, TX 75206; (214) 823-2775. Owner: Thomas C. Crocker. Manager: Thomas C. Crocker. Specialization & Credits: Need an independent Betacam or Betacam SP package now? Looking for a production company that handles the details? Working in the Dallas area, who do you call for help? Countdown Productions can complete your production package. We carry Betacam and Betacam SP format. Founded 1986, Countdown Productions is one of the busiest Betacam production companies in the Dallas-Fort Worth area. Clients include many nationally syndicated programs. Twelve years professional as director of photography, producer, director. Full production support. Package: Sony BVP-30 Plumbicon camera with BVW-1A or BVW-5 SP Betacam recorders. Lowell light package, BVP-21 playback, 8" color monitor, O'Connor tripod, full audio. Syndicated programming, commercial production, music, corporate communications, litigation, sports, fashion or late-breaking news, Thomas C. Crocker and associates offer the Southwest the best videotape production and producer services. Request Reel.



DALLAS SOUND LAB
Irving, TX

DALLAS SOUND LAB, APPV, 6305 N. O'Connor Blvd., Ste. 119, Irving, TX 75039; (214) 869-1122. Owner: Russell Whitaker. Manager: Johnny Marshall. Video Tape Recorders: MCI JH-110 LB-3 1" layback. Video Monitors: Assorted by Sony, Mitsubishi, RCA, Barco, NEC. Synchronizers: BTX Softouch/Shadow (4-machine), Audio Kinetics Q Lock 3 10. Audio Recorders: Sony PCM-3324 24-track digital, Otari MTR-90 24-track, MCI JH-114 24-track, additional recorders by MTM, MCI, Otari, Sony and Nagra. Audio Mixers: SSL 6056E automated w/Total Recall, MCI JH-536 automated, MCI JH-636. Soundstages: 15,000 sq ft., 6,000 sq ft., 3,000 sq ft. (the studios at Las Colinas). Other Major Equipment: MTM 35mm and 16mm high-speed projectors and dubbers, SFX library on CD, extensive MIDI synthesizer setup by Kurzweil, Yamaha, Linn, Korg, Sequential Circuits, Simmons and Oberheim, and a fully equipped 48-voice Synclavier Music Production System. Rates: \$50-\$235/hr, bulk and block rates available upon request. Specialization & Credits: Dallas Sound Lab is proud to offer the largest and most sophisticated facility of its kind in the Southwestern United States. Studio A, up to 48-track digital/analog recording to video or film for orchestra scoring-to-picture, video sweetening and mixing audio/video tielines. —CONTINUED ON NEXT PAGE

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VIDEO PRODUCTION

FACILITIES

Arizona, Arkansas, Las Vegas, Mexico, New Mexico, Oklahoma, Texas

In the following listings each facility's particular capabilities are indicated below its name using the following initials: VPF (Video Production Facility); OLVP (On-Location Video Production); VPP/E (Video Post-Production/Editing); APPV (Audio Post-Production for Video).

—CONTINUED FROM PREVIOUS PAGE

to three soundstages. Studio B: 2/4-track voice-over and SFX production studio. Studio C: 24-track digital/analog post-production control room interlocked to video or film with a large isolation booth for ADR (looping), SFX assembling and mixing to picture. Studio D: 24-track studio with interlock to video. Studio E: 16-track MIDI production studio with SMPTE video interlock. Studio F: film chain for 16/35mm transfers. Studio G: Synclavier hard disk-based digital production studio for SFX assembling and synthesized scoring-to-picture.

DUKE CITY STUDIO; VPF, VPP/E, OLVP; 4121 Cutler NE; Albuquerque, NM 87110; (505) 884-5151; (800) 225-6185. Owner: H. Jay Leikowitz, president. Manager: H. Jay Leikowitz. Video Tape Recorders: Sony BVW-60, Sony BVW-65, Sony BVW-75, Sony BVW-25, Sony BVW-35, Sony BVH-3100, Sony BVH-500, Sony BVU-110, Sony BVU-950, Sony BVV-5, Sony BVV-1. Video Monitors: (3) Ikegami TM 19-9, (5) Videotek 13" color, (15) Panasonic 9" B&W. Switchers/editors: Intergroup 902, Grass Valley 100CVN, Grass Valley 51EM. Video Cameras: (2) Ikegami HL-79EAL, (2) Ikegami HL-79DAL, Ikegami HL-95B. Video Effects Devices: (2) Abekas A53D w/WARP, Abekas A42. Audio Recorders: Nagra, Tascam 4-track Soundstages: 60 x 40 w/18" ceiling, 400-amp power, dressing room, makeup room, prop room, production offices. Other Major Equipment: Chyron 4200W MGM/CCM dual-channel, 16", 4-cam remote truck, RTS intercoms, Panavision film camera, CCA VTYA wireless intercom, grip trucks, Fisher camera dollies, Tulip crane, generators.

THE EDITING COMPANY; VPP/E; 8600 Westpark, Ste. 107; Houston, TX 77063; (713) 783-2655. Owner: Nancy Clinton. Manager: Nancy Clinton.

LANE AUDIO PRODUCTIONS, INC.; APPV; 1507 Wesley; Springdale, AR 72764; (501) 750-2803. Owner: Richard Eby, Mark Vanderhoof, v.p. Manager: Richard Eby.

METROPOST; VPP/E; 906 E. Fifth St.; Austin, TX 78703; (512) 476-3876. Owner: Corporation. Manager: Vincent Hollister, contact.



OMEGA AUDIO AND PRODUCTIONS, INC.
Dallas, TX

OMEGA AUDIO AND PRODUCTIONS, INC.; APPV; 8036 Aviation Pl.; Dallas, TX 75235; (214) 350-9066. Owner: Paul A. Christensen, Charles R. Billings. Manager: Donna Christensen. Video Tape Recorders: D1, D2, 1", Beta SP, ¾", ½" S-VHS, VHS, (11) RCA TH-200/2000/2500 Video Monitors: RCA 26". Switchers/editors: (2) Grass Valley, (2) CMX 3400A. Video Cameras: RCA/CEI. Synchronizers: CMX Cass 1, 5-machine audio-for-video/film editor with CMX 8" disk reader and CMX disk-based mixing automation. Video Effects Devices: ADO, Abekas A-62, ADO 2 channels, NEC E-Flex 2

channels. Audio Recorders: (3) Otari MTR-90 24/46-track, (3) Otari MTR-10 2/4-track w/CSTC, Otari 5050B, Mitsubishi X-80 digital. Audio Mixers: Amek M2500 36 x 24 w/CMX automation, API 32 x 24, custom 24 x 24. Other Major Equipment: Full Scamp rack, Harmonizer, (5) DeltaLab Super TimeLine, Yamaha SPX90, DDL-1 digital delays, Lexicon 224XL, MXR, Ola digital reverbs, Master-Room MR11, Audicon plates, UREI Little Dippers, stereo synth, EXR exciter, dbx program processors, Aphex Compellor, BBE Aural Exciter. Rates: 24-track interlock with picture \$150/hr., 46-track w/picture \$200/hr. Specialization & Credits: Co-located with Video Post & Transfer, Inc. at Dallas Love Field. Recent music specials mixed/sweetened: Fats & Friends for HBO, Texas 150 for ABC, Johnny Cash for CBS, Bob Hope for NBC, Joe Bob Briggs, Gingerbrook Faire, Cotton Patch Gospel, Prince, Quarterflash, Carl Perkins, Jerry Jeff Walker, PBS—Van Cliburn International Piano Competition and Handel's Messiah, Joe Ely, Eddie Rabbitt, Oak Ridge Boys, Commodores, Helen Reddy. Omega also maintains a 46-track remote-recording facility with full SMPTE interlock.

PRODUCTION MASTERS, INC. (PMI); VPF, VPP/E, OLVP, APPV; 834 N. 7th Ave.; Phoenix, AZ 85007; (602) 254-1600. Owner: David Case. Manager: Bruce Reid.

TELE-IMAGE; VPF, VPP/E, OLVP, APPV; 6305 N. O'Connor LB 6; Irving, TX 75039-3510; (214) 869-0060. Owner: Robert Schiff. Manager: Diane Barnard. Video Tape Recorders: (10) Sony BVH-2000/2500, (9) Sony BVU-800/820, (3) Ampex CVR-755, Ampex CVR-35, Ampex CVR-5. Video Monitors: (9) Sony BVM-1900. Switchers/editors: Grass Valley 300, Grass Valley 1680, Grass Valley 100, Grass Valley 1600-1L, Grass Valley 51 E editor, (2) Grass Valley 41 editor. Video Cameras: (2) Ikegami 357A, (2) Ikegami HL-79EAL, (2) Sony DXC-3000 CCD, Ampex CVC-50 w/CCU. Synchronizers: Alpha "Boss" controller, (3) BTX Shadow, (4) TimeLine Lynx, BTX Cypher time code reader/generator. Video Effects Devices: Quantel Paint Box, (2) Ampex ADO w/Infinity, Abekas A-53D w/key channel and WARP option, Abekas A-42 still store, Abekas A-62 digital disk rec/interface. Audio Recorders: Studer A800 24-track, (2) Studer A800 8-track, (3) Studer A810 2-center t.c., Studer A820 2-center t.c. Audio Mixers: SSL 4000E 34 x 32, Sony/MCI 618 12 x 2, Studer 169 12 x 2, Graham-Patten 612ESAM 12 x 2 automated. Soundstages: 900 sq ft. (27' x 36'3" x 29'6" x 29'4"). Other Major Equipment: Sony BVX-30 digital noise reduction, Magna-Tech dubber, (3) Chyron Scribe character generator, multicamera remote truck (20' boatail). Rates: Contact Mark Terry, sales mgr.; Jack Johnston, acct. exec.

VIDEO POST & TRANSFER, INC.; VPP/E; 8036 Aviation Pl., Box 53; Love Field Terminal; Dallas, TX 75235; (214) 350-2676; FAX: (214) 350-8342. Owner: Neil Feldman. Manager: Jaxie Bryan.

SO. CALIFORNIA & HAWAII

AMERICAN VIDEO FACTORY; VPF, VPP/E, OLVP, APPV; 4150 Glencoe Ave.; Marina Del Rey, CA 90292; (213) 823-8622. Manager: Terry Sorensen. Video Tape Recorders: (14) Ampex VPR-36 1", (4) Sony BVW-75 Betacam, (8) Sony BVU-800 ¾" Video Monitors: (10) Conrac 5722, (12) Ikegami 14" high-resolution. Switchers/editors: (3) Ampex Century, (3) CMX 3400A. Video Cameras: (4) Ikegami HL-79EAL, (2) Sony BVP-30 Betacam. Synchronizers: Adams-Smith 2600. Video Effects Devices: (2) Ampex ADO, Vital 4-channel squeezezoom, Sony BVX-30. Audio Recorders: (2) Otari MTR-90 24-track, Otari 5050 4-track, (3) Otari 5050 2-track. Audio Mixers: Sound Workshop Model 30. Soundstages: 60 x 45. Other Major Equipment: Mobile video truck, Cubicomp 3-D computer graphics system, Bosch FDL60 film-to-tape transfer systems w/DaVinci color corrector, (100) duplication decks.

ANNENBERG CENTER, COMMUNICATION SERVICES GROUP; VPF, VPP/E, APPV; 39000 Bob Hope Dr., Rancho Mirage, CA 92270; (619) 773-4500. Manager: Jim Huff. Video Tape Recorders: (3) Sony BVW-75 Betacam SP, (3) Sony BVU-800, Sony BVH-3100, Sony BVW-35. Video Monitors: (3) Ikegami 6" B&W, (12) Panasonic 6" B&W, (2) Ikegami 19" color, Ikegami 12" color. Switchers/editors: Grass Valley 141 editor, Grass Valley 1600-1A switcher. Video Cameras: (2) Ikegami HL79E w/CCU, Ikegami HL79D w/CCU, Ikegami ITC730. Video Effects Devices: NEC DVE System 10, Chyron RGU-2. Audio Recorders: MCI 16-track w/Adams-Smith synchronizer, Otari MX-5050, Revox PR99, Tascam 22-4. Audio Mixers: MCI 618. Soundstages: 25 x 35 w/computerized lighting, Vinton camera pedestals, teleprompter, Barber Boom, full grip package, Westlake control room and vocal booth. Other Major Equipment: Laird 16mm/35mm film chain, outboard audio signal processing: dbx, Aphex, Furwen, Lexicon, UREI, For a CCS 4300 color corrector.

CANDLEWICK PRODUCTIONS, INC.; 1161 N. Highland Ave.; Hollywood, CA 90038; (213) 462-7979. Manager: Larry K. Smith.

CREATIVE AUDIO/VISUAL PRODUCTIONS; VPF, VPP/E, OLVP, APPV; 14511 Delano St.; Van Nuys, CA 91411; (818) 909-0011. Owner: Craig W. Durst.

EDIT POINT; VPP/E; PO Box 55760; Valencia, CA 91355; (805) 254-2108. Owner: Jon Stromp, Randy Peele.

FACE BROADCAST PRODUCTIONS; VPP/E; 115 N. Hollywood Way, Ste. 102; Burbank, CA 91505; (818) 842-9081. Owner: Ron Malvin. Manager: Ron Malvin.

FOTO-KEM/FOTO-TRONICS; 2800 W. Olive Ave.; Burbank, CA 91505; (818) 846-3101.



FUTURE POST
Burbank, CA

FUTURE POST; APPV; 2414 W. Olive Ave.; Burbank, CA 91506; (818) 843-8200. Manager: Jim McIntosh, Tom Hilbe—sales. Video Tape Recorders: Ampex 1", Sony BVU-800 ¾", JVC 850 ¾", VHS Hi-Fi. Video Monitors: All sizes as required. Synchronizers: Lynx, Cipher Digital Softouch, BTX Shadow. Audio Recorders: Otari MTR-90 MkII 24/16-track 2", Otari MX-70 16-track 1", Ampex ATR-100 4/2-track, Otari MX-5050 MkII 8/4-track ½", Fostex center time code. Audio Mixers: Soundcraft 2400 28 x 24, NEOTEK Series II 28 x 8. Other Major Equipment: In addition to our digital sound effects library and a full complement of outboard equipment, Future Post offers 24-track MIDI sequencing with a variety of digital samplers and keyboards. Studios: (2) sweetening room w/ separate vocal booths for voice-over, ADR looping, Foley sequencing, MIDI sequencing. Rates: On request, call Tom Hilbe. Specialization & Credits: Future Post specializes in audio post-production for film and video. Our services include audio sweetening, mixing, video layouts, laybacks and tape transfers in all formats. We have the capability of locking up to four audio or video machines as well as an event controller configured to provide preprogrammed sound effects from CD, ATR or cart machine. Our newest room features an IBM PC-based MIDI studio with 24-track sequencing software. Our selection of synthesizers, drum machines and effects provides a very flexible MIDI system.

GROUP IV RECORDING; 1541 N. Wilcox Ave.; Hollywood, CA 90028; (213) 466-6444. Owner: Angel Balesier. Manager: Elissa Kline. Specialization & Credits: Long recognized as one of Hollywood's leading film and TV scoring studios, Group IV has established itself in the area of audio post-production and film and TV sound packaging. While continuing to contribute to the scores of such box office hits as *Broadcast News* and *Who Framed Roger Rabbit*, Group IV handles all the audio post-production needs for *The Tracey Ullman Show*—from dailies to dubbing. Group IV is fully equipped for ADR, Foley, Custom Digital Sound Design, dubbing and transfers to and from any format.

INDEPENDENT PRODUCERS STUDIO, INC.; VPP/E, APPV; 1741 N. Ivar Ave.; Hollywood, CA 90028; (213) 461-6966. Owner: IPS, Inc. Manager: Ray Poskatis.

MAJESTIC DUPLICATING SERVICE; VPP/E; 1208 W. Isabel St.; Burbank, CA 91506; (818) 843-1806. Owner: Clifford Sawyer. Manager: John Northrop.

MASTER DIGITAL, INC.; VPP/E; 1749 14th St.; Santa Monica, CA 90404; (213) 452-1511. Owner: Roger Pryor. Manager: Paul Addis. Video Tape Recorders: (5) Ampex VPR-6 1", Ampex VPR-80 1", Ampex CVR-755P, (2) Sony BVW-10 Betacam, (3) Sony BVU-800 U-matic. Video Monitors: (3) Tektronix 1750 I-M/Vectorscope, (3) Ikegami TM-20, Ikegami 9-RH, (9) Ikegami PM-9, Ikegami PM-5, (7) Sony PUM-1220, (3) Tektronix 1710B Waveform. Switchers/editors: Ampex AVC-31 3M/E switcher, Ampex AVC-200 Ace editing system, (6) Videotek RS-10A, Grass Valley 100 Convergence 195+. Video Cameras: Sony Plumbicon Betacam, Cohu 4200 high res matte. Synchronizers: (2) TimeLine Lynx. Video Effects Devices: Ampex ADO digital optics. Audio Recorders: Sony



MASTER DIGITAL, INC.
Santa Monica, CA

PCM-1610 digital audio processor, Nakamichi DMP-100, Ampex ATR-104 1/2" and 1/4", Studer B67, Nagra IV-S. Audio Mixers: Harrison Pro 7 automated 8-channel stereo. Other Major Equipment: Chyron Scribe high res character generator, DHP 525 TCB and frame storer, (6) Nakamichi BX-300 audio machine, Dolby Type A, dbx Type I, dbx Type II. Specialization & Credits: Our post-production clients range from broadcast and cable programming to music video, home video, TV commercials and industrials. Two complete edit bays feature one interformat (one inch, Betacam SP, U-matic) and one A/B roll with Grass Valley switcher. Clients include Nissan, Honda, Tanday Corporation, Columbia Records, Epic Records, RCA Records, L.A. Gear, Mattel Toys and IBM. Post-production for music videos has included Earth Wind & Fire, Judas Priest, Joan Jett, Marlon Jackson, Sammy Hagar and Def Leppard. We specialize in stereo digital audio lockups for video. Master Digital has created the first service bureau for desktop video production. We generate broadcast-quality NTSC from the Apple Macintosh and provide complete graphics services.

MODERN VIDEOFILM; VPP/E, APPV; 7165 Sunset Blvd., Hollywood, CA 90046; (213) 851-8070. Owner: Moshe Barkat. Manager: Richard E. Greenberg. Specialization & Credits: Modern Videofilm offers high-quality, full-service, state-of-the-art videotape and sound post-production facilities ranging from dailies to delivery. Film-to-tape mastering/dailies: (5) Rank Cintel MkIIIs w/Digiscan IV, Amiga and secondary color correction and Faroudja encoders, for film-to-tape mastering (D1, D2, 1", 3/4", Betacam), as well as transfer and sync of dailies (16 or 35) using Nagra T for direct time coded 1/4" audio transfers. Offline editing/montage: (3) CMX 3400 offline edit suites with 3/4" BVU-800 playback and BVU-850SP or 950SP for record. Other offline available are Montage systems in custom-designed and well-maintained edit rooms. Online editing/assemblies/opticals: online recording is either BVH-2000, D2 or D1 record or playback. Switchers are Grass Valley 300 or 100x, w/2-ch. DVE. 2-ch. ADO and 2-ch. Chyron available in all suites. B&W or color cameras available for mattes and inserts. Programmable Graham Patten audio consoles make stereo editing easy. Abekas A42 still store and Abekas A62 DDR also available. Tape-to-tape color correction: DaVinci color correction system with all formats, including digital-to-digital capability. Sound services: Complete tape sound editorial facilities include (7) fully outfitted (24-track) CMX class I pre-lay rooms, (2) Synclaviers (for sound design), ADR and Foley recording stage and facility (45' x 75'), re-recording from (4) 24-track to 3324 digital 24-track using 72-input, 3 mixer, SSL 6000E console w/G Series automation.

SOUND VISIONS; APPV; 10201 Hayvenhurst Ave., Granada Hills, CA 91343; (818) 368-8830. Owner: Jerry Lindman, Joel Smith. Manager: Jerry Lindman.

STUDIO M PRODUCTIONS UNLTD.; VPF, OLVP, APPV; 8715 Waikiki Station, Honolulu, HI 96830; (808) 734-3345; FAX: (808) 735-9937. Owner: Mike Michaels. Manager: Mike Michaels.

VIDEO-IT; VPP/E, OLVP; 5000 Overland Ave., Ste. 6, Culver City, CA 90232; (213) 280-0505; FAX: (213) 280-0193. Owner: John and Felisa Kohan-Matlick. Manager: Felisa Kohan-Matlick.

WAVES SOUND RECORDERS; APPV; 1956 N. Cahuenga Blvd., Hollywood, CA 90068; (213) 466-6141. Manager: David Green. Video Tape Recorders: Sony BVU-800, (3) Sony VO-5600, Sony BVH-3000 1", Sony VP-7000 Video Monitors: (5) Sony Switchers/editors: Sigma Electronics VSS-120 video/stereo audio. Synchronizers: Audio Kinetics Q.Lock 4.10 w/ADR and SFX assembly programs. Audio Recorders: Sony/MCI JH-24 24-track, (2) Sony/MCI JH-110C 8-track, Sony/MCI JH-110C 4-track, (5) Sony/MCI JH-110C 2-track. Audio Mixers: Sony MXP-3000, Wheatstone 8 x 18 x 24 x 2, Tangent 3216 16 x 16 x 2, Soundcraft 6000. Other Major Equipment:

NED PostPro, Sigma Electronics color sync generator, Tektronix Waveform/Vector monitor, Yamaha, Orban, dbx, Dolby A, ADA, Omni Craft, Ecoplate, UREI, Crown, Hafler, JBL, Neumann, AKG, Sennheiser, E-V, Technics, Revox signal processing and amplification equipment, (5) sound effects libraries (2 on CD), (8) music libraries (3 on CD).



WEBSTER COMMUNICATIONS
Los Angeles, CA

WEBSTER COMMUNICATIONS; VPF, VPP/E, OLVP, APPV; 607 N. Ave. 64, Los Angeles, CA 90042; (213) 258-6741. Owner: Van Webster. Manager: Adele Gold. Video Tape Recorders: (2) Sony BVU-800, Sony BVU-850SP, Sony BVU-110. Video Monitors: Ikegami 14", Panasonic 19", (6) Panasonic 8" B&W. Switchers/editors: EECO/EMME 795 editor, Crosspoint Latch 6109/7209 Video Cameras: Hitachi Z-31. Synchronizers: Adams-Smith 2600 System. Video Effects Devices: DSC Illusion DVE, Fortel freeze frame. Audio Recorders: 3M 79 24-track, Studer B67 2-track, Sony 1610. Audio Mixers: MCI 428B 28 x 24, Interface 100 8 x 4. Soundstages: 30 x 40 x 12. Other Major Equipment: Fortel time base correctors, 3M 3600 character generator, CMX compatible edit list, digital audio services, CD sound effects library. Specialization & Credits: Webster Communications is a full-service video and audio production company serving the entertainment

industry for more than 20 years. Our experience ranges from corporate video to entertainment to broadcast commercials. Clients include WEA Corp., Cannon Films, Warner Bros. Records, Elektra/Asylum Records, NARM, The Compact Disc Group and RIAA.

WORLD VIDEO PRODUCTIONS; VPF, VPP/E, OLVP, APPV; 10625 Scripps Ranch Blvd., San Diego, CA 92131; (619) 695-1045. Owner: Roman Yerema. Manager: Vic Everett, gen. mgr.

NORTHWEST

Alaska, California, Colorado,
Idaho, Montana, Nevada, Oregon, Utah,
Washington, Wyoming

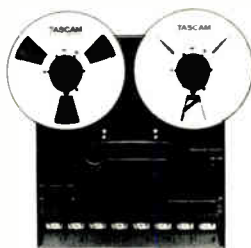
AVID PRODUCTION; VPF, VPP/E, OLVP, APPV; 235 E. 3rd Ave., San Mateo, CA 94401; (415) 347-3417. Owner: Henry Bilbao. Manager: Chris Craig

ROBERT BERKE SOUND; APPV; 50 Mendell St. #11; San Francisco, CA 94126; (415) 285-8800. Owner: Robert Berke. Manager: Mark Escott. Specialization & Credits: Robert Berke Sound Production & Recording specializes in post-production audio for TV, radio and multi-image. Our new state-of-the-art facility features one of the most versatile and sophisticated audio-for-video computer systems in Northern California and includes multitrack machine synchronization, event control and electronic audio editing. Our thousands of music and sound effects selections, digital reverb and effects devices, and our highly experienced and creative staff make us a valuable production resource.

FOCUSED AUDIO; APPV; 30 Berry St., San Francisco, CA 94107; (415) 777-3108. Owner: Jeff Roth. Manager: Jeff Roth. Video Tape Recorders: JVC 850 3/4", (2) JVC BR8600 1/2" VHS. Video Monitors: (2) Sharp, NEC, JVC. (3) Sony Synchronizers: (5) Cipher Digital Shadows. Audio Recorders: Otari MX-80 24-track w/Dolby SR, Otari MTR-10 2-track w/Dolby SR and center time code, (3) Fostex 16-track, Fostex 2-track w/Dolby SR. Audio Mixers: Studio A. NEOTEK 32 in/32 out Series 3, Studio B. Allen and Heath. Other Major Equipment: —CONTINUED ON NEXT PAGE

RECORDING EQUIPMENT

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VIDEO PRODUCTION

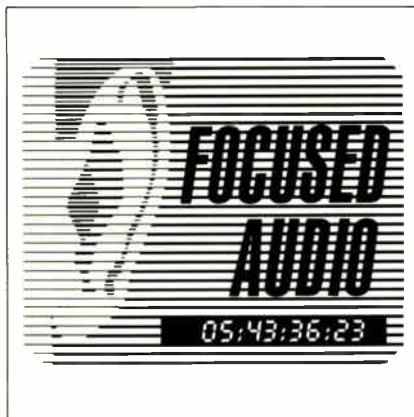
FACILITIES

Alaska, California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming

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SMPTÉ-based automated mix, Kelly Quan Research synchronizer controller software, (2) Yamaha SPX90, DeltaLab Effectron DDL, MICMIX, Gain Brains, Kepex, Orban EQs and de-esser, UREI peak limiters, (2) Roland S-50 digital sampler, (2) Technics SL-P1200 CD player, (2) Macintosh SE computer w/40MB hard disk, (2) digital drum machine, (4) MIDI keyboard, (19) software programs for digital sampling, editing and sequencing, hard disk digital editing system. Rates: Please call. **Specialization & Credits:** Focused Audio specializes in post-production sound for theatrical, broadcast and corporate film and video. Working with SMPTÉ synchronization since 1983. Focused has been an innovator in the development and application of software for audio post-production (see *Mix* article April 1987 "Focused Audio Meets Kelly Quan Research"). With audio engineers experienced in film, video and music/MIDI production, Focused has pioneered the development of new techniques that bring together the best qualities of these previously distinct audio disciplines. Speed, flexibility and creativity in soundtrack design and production are the result of our hardware, software and talent mix. From feature films to documentaries, Universal Studios to *Gumby*, HBO to MTV, Focused Audio is committed to client satisfaction. In three 16-track and one 24-track SMPTÉ studio, Focused offers total audio post-production services, including:



FOCUSED AUDIO
San Francisco, CA

original music and sound FX creation (as well as vast CD libraries), ADR, Foley, narration recording, digital sampling and editing, MIDI sequencing, and SMPTÉ-based automated mix.

LIVE OAK STUDIO; APPV; 1300 Arch St.; Berkeley, CA 94708; (415) 540-0177. Owner: Jim and Priscilla Gardiner. Manager: Priscilla Gardiner. Synchronizers: Audio Kinetics Q.Lock 4.10 E w/Eclipse editor. Audio Recorders: MCI JH-24 16/24-track w/autolocator, Sony PCM-F1 2-track digital, Otari MTR-10 1/4" and 1/2" 2-track. Audio Mixers: MCI JH-636 32 x 24 console w/ARMS II/Diskmix automation. Other Major Equipment: 100" diagonal viewing screen w/Sony VTH 1020-Q1 high-resolution color video projection system, Pubison Internal Machine 90 w/SMPTÉ and MIDI, complete synthesizer pre-production room w/Kurzweil 250, Yamaha TX816 rack system, E-mu Systems SP-12 sampling drum machine, Oberheim Matrix-12, complete sound effects library on CD. Rates: Very reasonable. Please call for further information.

MCCUNE STUDIOS; VPF, VPP/E, OLVP, APPV; 951 Howard St.; San Francisco, CA 94103; (415) 777-2700. Manager: Jim Draper.

MONTEREY BAY PRODUCTION GROUP/MBPG; VPF, VPP/E, OLVP, APPV; 563 Arther Rd.; Watsonville, CA 95076; (408) 722-3132. Owner: Denise Collins, Duane Cox. Manager: Denise Collins.

MUSIC ANNEX, INC.; APPV; 69 Green St.; San Francisco, CA 94111; (415) 421-6622. Owner: Music Annex, Inc. Manager: Angela Goodison. Video Tape Recorders: Sony BVH-1100 1", (2) JVC 850 3/4", JVC 8250 3/4". Video Monitors: Asaca 9" color critical, (4) Sony 27", Sony 13". Synchronizers: (3) Audio Kinetics Q.Lock 3.10. Audio Recorders: (2) MCI 114 24-track, (3) Otari MTR-12 CTC, Otari 1/2" 4-track, Sony portable R-DAT. Audio Mixers: (2) Amek 2500 36 x 24 fully automated, Amek TAC 16 x 8. Other Major Equipment: New England Digital POSTPRO™ 8-track Direct-to-Disk digital multitrack recorder, E-mu E-III digital audio workstation (8-meg) w/Mac II controller, worldwide digital audio recording via satellite (uplink or downlink).

ON SIGHT VIDEO; OLVP; 1079 Tennessee St.; San Francisco, CA 94107; (415) 641-8600. Owner: T. Robin Hirsh. Manager: T. Robin Hirsh.

ONE PASS, INC.; VPP/E, APPV; One China Basin Bldg.; San Francisco, CA 94107; (415) 777-5777. Owner: Jack Shaeffer, president. Manager: Ruth Scovill, vp/operations; David Angress, vp/sales and marketing.

PACIFIC VIDEO RESOURCES; VPP/E; 2339 Third St. M-4; San Francisco, CA 94107; (415) 864-5679. Owner: Jim Farney, Steve Kotton, John Zimmerman. Manager: Jim Farney.

PHILIP PERKINS PRODUCTION SOUND; OLVP, APPV; 45A Wright St.; San Francisco, CA 94110; (415) 824-6137. Owner: Philip Perkins. Manager: Nancy Baddock.

THE PLANT RECORDING STUDIOS; OLVP, APPV; 2200 Bridgeway; Sausalito, CA 94965; (415) 332-6100. Owner: Bob Skye, Arne Frager. Manager: Alice Young. Video Tape Recorders: JVC CR-850U, Sony 5850. Video Monitors: Panasonic 19", (2) Sony 19" and 13" ("Rover"), projection system for "Studi 01". Switchers/editors: New England Digital Synclavier 8-track tapeless "Post Pro" system. Synchronizers: (2) Adams-Smith Zeta-3 w/remote, Otari EC-101 synchronizer. Audio Recorders: Sony APR-5003 3-track w/time code, Ampex ATR-102 2-track, (2) Otari MTR-90 II 24-track, Studer A80 24-track. Audio Mixers: DDA AMR24 36 x 24 (84 total inputs, "Studi 01"). Sound Workshop Series 30 32 x 24 ("Rover"). Other Major Equipment: "Rover" features full-monitoring and synchronization for location audio-for-film and video, (80) Jen-

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Equipment Spotlight: Loudspeaker Survey.

Special Feature/Forum: Remote Engineers—Comparing Venues.

Bonus Distribution: NAMM Music & Sound Expo, Chicago, June 17-20.

Ad Closing: April 7

Materials Due: April 14

JULY

AUDIO EDUCATION/ SOUTHWEST RECORDING

Directory: Recording Schools of the U.S.; Studios of Texas, Oklahoma, Arizona, Arkansas, New Mexico, So. Nevada.

Equipment Spotlight: Digital Recording Update.

Special Feature/Forum: DAT in the Studio; Testing the Limits of DAT.

Ad Closing: May 8

Materials Due: May 15

MIX THE RECORDING INDUSTRY MAGAZINE

For complete advertising information and a 1989 *Mix* Editorial Calendar, call advertising director Ron Taff at (415) 653-3307.



THE PLANT RECORDING STUDIOS
Sausalito, CA

sen mic splits and multiple DAs for audio and sync feeds are available. "Studi 01" features many additional synthesizers and computers. Rates: Please call or write for rates and information. Specialization & Credits: "Studi 01" is The Plant's latest addition and is capable of handling all your needs for locking sound to picture with New England Digital's Synclavier synthesizer and Post Pro system. The all-digital 8-track tapeless system allows for incredible speed and accuracy in composition, sound effects and all lock-to-picture requirements. The Dyaxis digital, tapeless mastering system is also available at The Plant for digital mastering and special application picture work. Please call us to make an appointment to see how "Studi 01" can make your project a success. "Rover," The Plant's mobile recording unit, offers the finest in mobile acoustic environments and equipment for live concert recording, remote broadcast, audio-for-film and video, in-house recording and post-production/audio sweetening. Some of our film and video clients/projects include: Turner Broadcast, GBH Productions, John Denver, KSNR Radio, Jacques Cousteau, WNET Television, NFL Films, Anita Baker, Ronnie James Dio, KFOG Radio, Island Films, Reeves Teletape, King Biscuit Flour Hour, Picture Vision, Peter, Paul and Mary, KQED Television.

PRODUCTION WEST, INC., VPF, VPPI/E, OLVP, APPV; 1001 S. 24th St. W., Ste. 311/312, Billings, MT 59102; (406) 656-9417. Manager: Jim Abel.

BILL RASE PRODUCTIONS, INC., VPF, VPPI/E, OLVP, APPV; 955 Venture Ct., Sacramento, CA 95825; (916) 929-9181. Owner: Bill Rase. Manager: Bill Rase.

RUSSIAN HILL RECORDING; APPV; 1520 Pacific Ave., San Francisco, CA 94109; (415) 474-4520. See *Our Ad in the BusinessPages!* Owner: Jack Leahy, Bob Shottland. Manager: Gail Nord.

SAN FRANCISCO PRODUCTION GROUP, VPPI/E, APPV; 550 Bryant St., San Francisco, CA 94107; (415) 495-5595. Owner: Joel Skidmore, Jeff Cretcher. Manager: Peter Viek. Specialization & Credits: cSan Francisco Production Group (SFPG) specializes in providing high-quality post-production and computer graphics services, utilizing the Vertigo and Wavefront 3-D animation systems, the Quantel Paint Box and Images II paint systems, Ultimatte IV, Lynx Robotics motion control system and effects editing using Ampex ADO, Abekas DDR, Grass Valley switchers and CMX controllers.

STUDIO CENTER SAN JOSE, INC., VPF, VPPI/E, OLVP, APPV; 434 S. First St., San Jose, CA 95113; (408) 993-1040; FAX: (408) 993-1056. Owner: Corporation. Manager: Jerry McReynolds. Video Tape Recorders: (3) Sony BVU-950 SP 3/4" U-matic, Sony BVU-150SP 3/4" U-matic portable, Sony VO-5850 3/4" U-matic, Sony VO-2860 3/4" U-matic. Video Monitors: Sharp XM-1300 color, Sony PVM-1271 Q. (6) Panasonic 9" B&W Switchers/editors: Sony BVE-900 edit controller, Sony SEG 2550 2551 automated switcher, Video Media Eagle One. Video Cameras: (3) Ikegami 730A studio configuration. Synchronizers: Audio Kinetics Pacer. Video Effects Devices: On order. Coming soon! Audio Recorders: Otari MX-70 16-track, Otari MX-5050 MkIII 2-track, TEAC 3340S 4-track, TEAC 2340SX 4-track. Audio Mixers: Sound Workshop Series 30 24 x 24 w/Diskmix and automation, Tascam M208 8 x 4 x 2 8-channel, Neptune 8 x 2. Soundstages: 1,200 sq ft. w/chroma key and cyclorama 40 x 30 x 24. Other Major Equipment: A custom computer graphics system, Lumena 2-D, Fairlight CVI digital effects, (3) IBM computer for automation, edit list management, MIDI studio. Rates: Call for rates.

TELEIMATION PRODUCTIONS, VPF, VPPI/E, OLVP, APPV; 1200 Stewart St., Seattle, WA 98101; (206) 623-5934. Owner: Teleimation Productions, Inc. Manager: Lance D. Kyed.

TRANSTAR PRODUCTIONS, INC., VPF, VPPI/E, OLVP, APPV; 9520 E. Jewell Ave., Ste. C, Denver, CO 80231; (303) 695-4207. Owner: Doug Hanes. Manager: Doug Cyphers, Paul Romero.

VARITEL VIDEO, VPF, VPPI/E; 350 Townsend, San Francisco, CA 94107; (415) 495-3328. Owner: Art Porter. Manager: Chris Lathrop, general manager.

OUTSIDE U.S.

THE MAGNETIC FAX CORPORATION, VPPI/E, APPV; 550 Queen St. E., Ste. 205, Toronto, Ontario, M5A 1V2 Canada; (416) 367-8477; FAX: (416) 367-8356. Owner: Dan McGuire, president. Manager: Douglas Morris, Bob Clemson. Bill Mather Video Tape Recorders: (2) Sony 3000 1", (2) Sony BVU-950 AP. (2) Sony BVO-870 SP, (9) Sony BWV-75 Beta SP Video Monitors: (2) Ikegami, (3) Sony Switchers/editors: (3) Grass Valley VPE-151 edit controller, (2) Intergroup 9600 switcher, Grass Valley 100 switcher. Video Cameras: Sony BVW-530 Betacam SP camera/recorder, 3-tube plumbicon Synchronizers: Adams-Smith 2600 w/compact controller, 5-machine tape lock. Video Effects Devices: (2) Abekas A53D digital effects. Audio Recorders: MCI JH-24 24-track, Otari MTR-12 4-track 1/2", Ampex ATR-102 2-track, Studer A820 2-track w/center-track time code, MCI layback machine. Audio Mixers: MCI 636 automated console. Other Major Equipment: Lexicon 224X w/LARC digital reverb, (2) Computer Animation, Time Arts w/Lumena Paint and Crystal 3-D animation package. (3) Sound Cart offline sound effects and music selection from CD w/sampler, Roland DEP-5 digital reverb, Lexicon PCM41 digital delay, DeltaLab Effectron II digital delay, (8) Scamp 100 noise gate, (2) UREI LA-4A compressor, Valley People leveler, Orban 536A stereo sibilance controller, (2) Klark-Teknik DN27 1/2-band graphic EQ, (2) Aphex Aural Exciter, Apple Mac II w/Opcdde MIDI interface, PPS MIDI time code, Q-Sheet, Casio FZ-1 16-bit sampler, Steadi-Film Manipulator 2000.

MCCLEAR PLACE RECORDING AND POST-PRODUCTION STUDIOS; APPV; 225 Mutual St., Toronto, Ontario, M4M 1T4 Canada; (416) 977-9740; FAX: (416) 977-7147. Owner: Robert K. Richards. Manager: Jane Rowan, contact.

SRS—SOUND RECORDING STUDIOS; APPV; 500 Newbold St., London, Ontario, N6E 1K6 Canada; (519) 686-5060. Owner: Paul Steenhus. Manager: Geoff Keymer.

STUDIO PLACE ROYALE, INC., APPV; 640 St. Paul W., 6th Floor, Montreal, Quebec, H3C 1L9 Canada; (514) 866-6074. Owner: S. Brown, N. Rodrigue. Manager: S. Brown. Video Tape Recorders: Sony/MCI 1" layback, JVC 3/4", (2) JVC 1/2" Video Monitors: (5) JVC, Sony, Hitachi, Philips. Synchronizers: BTX system, Soundmaster system (CMX). Audio Recorders: Otari MTR-90 24-track, Otari 8-track, Scully 8-track, Otari center-track and more. Audio Mixers: Amek Angela (Studio A), Allen and Heath Syncon (Studio B). Other Major Equipment: Foley Roland keyboards, S-50, complete library of stock music and sound effects on CD and tape.

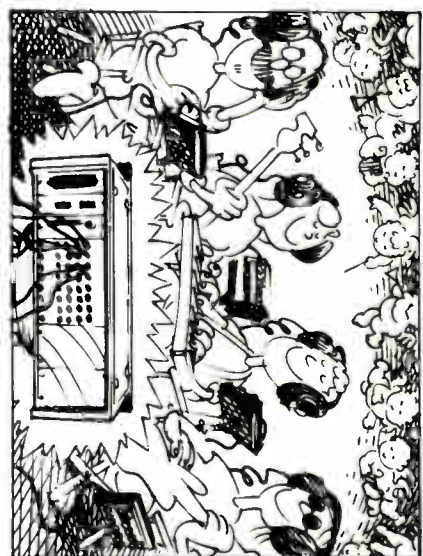
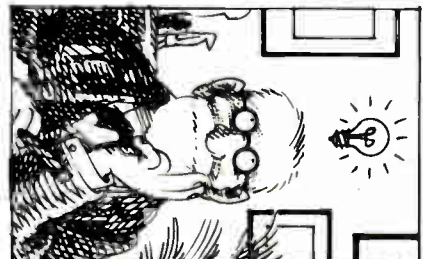
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FEEDBACK

Another Side of Samplers

Thank you for articulating the many ethical problems that face both the "acoustic" and "electronic" musician (Nov. '88 "Ethically Speaking"). The potential effect of emerging technologies is sending shock waves throughout the musical community, and there is a great need for more careful scrutiny. I commend you for your very clear and thought-provoking article on this sensitive issue.

I would only like to add that as an educational tool, samplers and sequencers seem to help carry out tasks that were quite impossible a few years ago. For example, "mock" orchestrations of musical scores can be accomplished in little time; ear training dictation using various instrumental combinations help students to hear "inner" parts more easily; and now there are a number of musicologists attempting the reconstruction of Renaissance and Baroque pieces (never before performed) with the use of samples of authentic instruments. Students are not only learning the hardware but also coming to grips with the more difficult prospect of developing their own imaginative software applications. Hopefully, to borrow a phrase from Larry Fast, they will never have to "take the cheap way out."

Frank Opolko, producer
Morin Heights, Quebec

A Question of Qualifications

I am writing this letter in response to the article printed on page 6 of your January 1989 issue, entitled "American Recording Orchestra Debuts." The second sentence reads: "Few graduating students consider a career in recording or other options."

I think that this statement should

be reformulated to: "Few graduating students consider a career in recording because the recording industry does not even want to acknowledge their existence." For years I have sent letters to dozens of studios and record companies asking them to at least consider me for an interview. I am a conductor-composer-pianist with a Master's in composition and an Associate Degree in electronics. I am also well-versed with microcomputers and have built stereo tape recorders. I know the symphonic, operatic and instrumental repertoire inside out, and my ears are among the finest, so what better candidate for the job, right?

Quite wrong, for all I have gotten through the years were hundreds of Dear John letters, all stating that no one had anything for my qualifications. Am I under-qualified or over-qualified, or does anyone have another term for my expertise? How many more diplomas do I have to acquire before I catch someone's attention?

The pundits of the industry should stop complaining and give more opportunity to aspiring people with the potential to become valued contributors. I, for one, am still available and waiting for an opportunity.

John T. Sylvanis
Rochester, NY

In Defense of Jamaica

We found Bruce Pilato's article on Eddy Grant's Blue Wave Studio both interesting and informative. We take exception, however, to engineer Roland Stephens' statement that "most of the [studios in Jamaica] have Soundcraft boards and stuff like that. They really don't need more than that."

Grove Recording Studio in Ocho

Rios has a Sony MXP-3036 board, an Otari MTR-90II recorder, a Sony APR 5000 Series 2-track tape machine, and Tannoy and Yamaha monitors. We also offer a full complement of outboard equipment.

Jamaica's music has had an enormous impact on world pop music. Mr. Stephens should know better than to make the comment "they really don't need more than that." Karl Young
Grove Music Recording Studio
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A Plea for Standardization

Haven't manufacturers learned a lesson about standardization and compatibility from MIDI? I'm referring to the way that digital inputs and outputs are beginning to appear on all types of gear; yet every manufacturer seems to be using their own proprietary system. C'mon, guys... maybe I'm being idealistic, but aren't you ultimately interested in serving the end-user?

MIDI gave *everyone* interested in recording freedom to purchase their choice of equipment with a reasonable assurance that it'd be compatible with other gear they already owned, as well as future purchases.

With digital equipment still rather pricey, are those of us on any type of "less than the big guys" budget going to be left out? And if so, aren't manufacturers going to lose as much as end-users?

David J. Pavlovitch
Los Angeles, CA

Correction

The classified advertisement for Audio Video Research (AVR) in the February 1989 issue should list the correct phone number as (617) 924-0660.

CLASSIFIEDS

Employment Offered

San Francisco career opportunity. Established audio-post studio seeks energetic, experienced studio/business manager to assist with its expansion to a new multiroom facility. Please respond to Mix Classifieds, PO Box 8845, Dept. 3, Emeryville, CA 94608. Experienced, serious inquiries only, please.

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Maint./prod. engineer. Successful, dynamic production house needs self-starting audio engr. who has: formal training in both music & electronics; 1-5 yrs. exp. recording & mixing spots, A-for-V & music; the ability & drive to maintain all types of pro audio equipment. Send demo & resume to PMI, 321 First Ave., Pgh., PA 15222.

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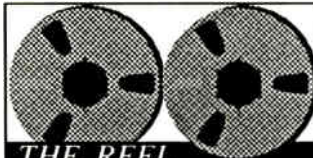
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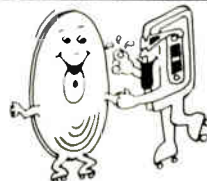
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INTERNATIONAL · UPDATE

—FROM PAGE 166

of current digital technology.

LONDON'S TAPE GALLERY USES TAPELESS TECHNOLOGY IN HIT BRITISH TV SERIES

Round the Bend was this winter's hit children's TV series in Britain, and its music, sound effects and post-production by London's Tape Gallery blazed some new trails in audio post-production.

"To my knowledge," says Tape Gallery chairman and engineer Lloyd Billing, "*Round the Bend* is the first TV show in England with all-digitally created, recorded and post-produced music, dialog and sound effects."

A New England Digital Tapeless Studio was used to bring together the various audio aspects of the series, called a "video comic strip" by its director, John Henderson. Prior to shooting and animation, original dialog was recorded on NED's Direct-to-Disk digital multitrack recorder. Music was composed on the Synclavier by pop composer Simon Franglen. Meanwhile, Billing culled sound effects

from the Synclavier's 2-gigabyte optical disk.

Next, Henderson used 1-inch videotape to create and edit a picture-and-sound version, making numerous timing changes in the audio. The Tape Gallery then resynched the original Direct-to-Disk audio to the director's edited version.

The result was spectacular first-generation digital sound, created at a time savings of "at least 20% to 40%," according to Billing. Several members of the British press agree, calling *Round the Bend* the best sounding TV show they've ever heard.

INTERNATIONAL STUDIO NEWS

Among the recent equipment installed at **Moles Studio**, a 24-track DDA/Otari facility based in Bath, England, is an MTR-90 MkII 24-track recorder, 64 channels of Optifile II HD for its DDA AMR 24 and an Akai digital patch bay system... Soundtracs Plc. announced delivery of its 50th In Line Series console, this one going to **Studio Kactus** in Finland. The 36-channel version equipped with Soundtracs Tracmix Fader Automation is intended for use for broadcast clients... Other

recent sales of Soundtracs consoles include a PC24 to **Transat Music Studio** in Brussels and IL Series boards to **Pace Studios** in Milton Keynes and **Aosis Studios** in central London... Several Canadian studios have purchased new Neve consoles, including **VTR Productions/Eastern Sound** in Toronto, which added a 60-input V Series with Necam 96 automation; **Sonolab** in Montreal, which installed a 48-input V Series Film Re-recording desk; and **Sounds Interchange** in Toronto, which was fitted with a new 36-input V Series board... Another Canadian facility, **Le Studio** in Morin Heights, Quebec, has taken delivery of a new console, this one an SSL G Series desk, and marked that event with a party in January... Total Audio Concepts Australian dealer, ATT Audio Controls, reports that the **Melbourne Arts Centre** is using a TAC SR9000 to front the sound system on a touring production of *My Fair Lady*... Digital Audio Research has delivered an 8-channel SoundStation II digital audio recording/editing system with an optical disk subsystem to **Autograph**, the UK's premier theater sound production company. ■

One Step Ahead

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• **Sound Reinforcement News:** Sound Contractors and Installers' Advice on Troubleshooting with PC Hardware and Software

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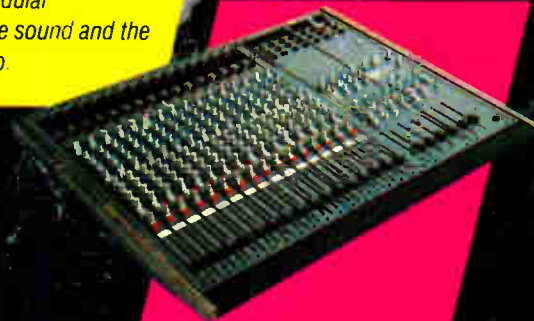
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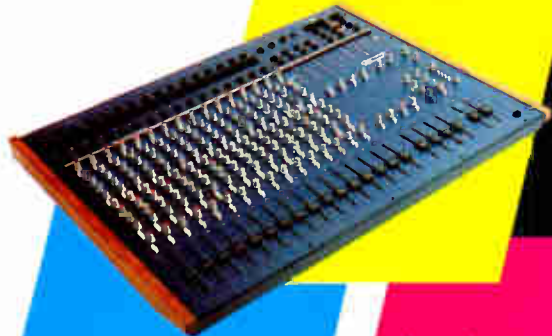
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Soundcraft 6000

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