

JUNE 1983  
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THE RECORDING INDUSTRY MAGAZINE

# Mix

Interview: Frank Zappa

## Remote Recording and Concert Sound Sound Reinforcement Forum

New York Club Sound  
Papa John Creach  
Showco  
David Grisman  
Consoles, Pt. II

# At last a rival for the SCM 762



## The new Soundcraft SCM 760

For three years now, the SCM 762 multitrack from Soundcraft has been in a field on its own.

No one else has been able to produce a 24 track machine with as many professional features, with the same Soundcraft quality, and for anything like our price.

So it was up to us to improve on our own standards. Like fitting the interchangeable 16/24 track headblock as standard, and incorporating an improved servo control. The new welded steel frame gives extra strength and durability too, while the machine is still transportable enough to move around wherever you need it.

Yet you can still buy the SCM 760 for less than you'd pay for a second hand model of any other multitrack. And that makes Soundcraft the all round winners for 24 track recording – every time.

## Soundcraft

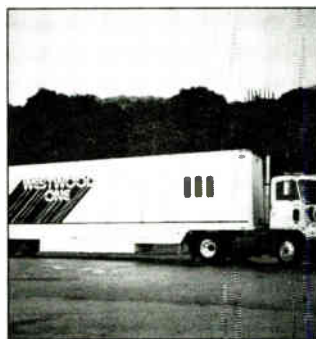
Soundcraft Magnetics Limited, 5-8 Great Sutton Street,  
London, EC1V 0BX, England. Tel: 01-251 3631. Telex: 21198.

Soundcraft Electronics USA, 1517 20th. Street,  
Santa Monica, California 90404. Tel: (213) 453 4591. Telex: 664923.



**Cover:**  
Boasting a Neve console and twin Studer A800 24 track machines, ie Mobile makes its home in North America. The elaborate rolling recorder represents owner Guy Charbonneau's three lifelong obsessions: music, cars and electronics.

**Photo by:**  
Jim McCrary  
**Corner photo by:**  
Gary Weller



Mix takes its annual look at "reels on wheels" - the trucks, people and companies who provide remote recording services throughout the U.S. Our Road Warrior Update begins on page 12.

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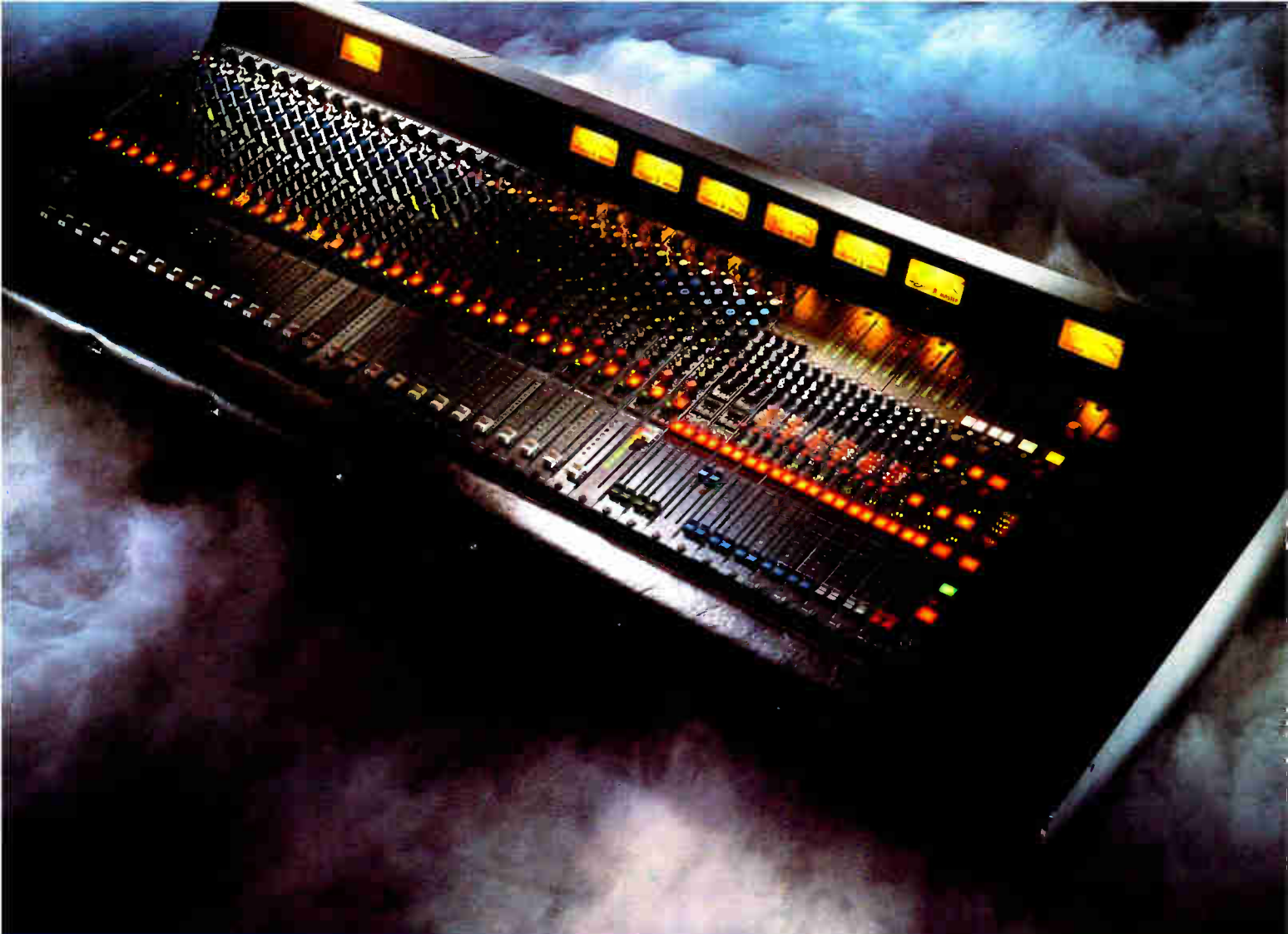
Sound reinforcement has become an art form in parallel with the evolution of the modern recording studio. Robin Tolleson conducts this engineering forum. Page 33.



Papa John Creach was an unlikely candidate to team with a group like the Jefferson Starship. In Lunching with Bonzai, he relates tales of the bizarre. Page 64.

In this issue we complete our survey of recording console manufacturers, in which major designers assess the present and future of console technology. Part II of Mixing Console Forum on page 76.





## MIDAS Presents The PR40 Console System

**Midas.** Pioneers in live sound mixing consoles made by professionals for professionals. Over the last 10 years MIDAS have designed and perfected consoles through direct consultation with top bands, engineers and hire companies worldwide.

**MIDAS** now announce the ultimate in sound reinforcement console systems. The MIDAS PR40 SYSTEM. A system designed to realize the increasingly complex demands of the industry today, tomorrow and in the future.

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World Radio History

# Mix

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## A Letter from the Editor

Entertainment technology has quickly become an industry of vast proportions. In a short time we have witnessed the rampant cross-pollination of music recording, performance, computers, video, film, theatre and ever expanding media forms. The hybrid presentations of these forms have become so common that the behind-the-scenes professional can no longer afford to concentrate in only one area. Gone are the days when one's talent for mixing sounds onto a record meant life on easy street. Today's industry demands that those who plan to be successful acquire a broad understanding of the interrelationships of these arts and sciences. The new industry of entertainment technology is more competitive and challenging than anything that has come before it.

It is with this challenge in mind that we asked ourselves how best to explore, research and present this important information to Mix readers. How do we most effectively deal with the complex visual and sonic elements necessary for a better understanding of the technologies?

After much consideration and valuable input from industry leaders, we have formulated a way of presenting this information by using the technology itself. Working with Speed of Light Communications in a joint effort named Illustrated Mix Productions, we have created MIX VIDEO and we think that you'll agree that it's the next best thing to being there. MIX VIDEO is a series of video cassettes, 60 minutes in length, that feature a depth of information not possible in the print media. Available in VHS or Beta, it is just as convenient to view in the studio or classroom as it would be in the privacy of your own home.

We could go on and on about how much the concept appeals to us, and to those who have helped in its development, but we'd like you to see it for yourself.

On page 9 of this issue is an announcement giving more of an idea of the contents and how to receive Volume One. We think you'll enjoy it as well as find it a valuable addition to your reference collection. And we'd appreciate your comments and suggestions for future volumes of MIX VIDEO.

—David M. Schwartz

# CURRENT

## AES Exhibitors Debate Spring Show

In the wake of the recent Eindhoven AES Convention (see last month's Current) the return to two U.S. exhibitions is facing strong resistance from professional audio manufacturers. As of the end of April, 61 manufacturers had indicated their decision not to exhibit at the 1984 spring convention, currently scheduled for May 12-15 in Anaheim, California. This collective decision was contained in a letter to AES Executive Director Donald J. Plunkett written by AES Governor Dr. Ray Dolby and AES Exhibitor's Chairman Stephen F. Temmer, dated April 20, 1983.

The letter discusses an investigation conducted by Dolby, Temmer and Keith Monks since the Eindhoven show to determine the level of manufacturer support of the Spring 1984 U.S. convention. According to the letter, their survey yielded an overwhelming majority of companies

objecting to the new convention. According to Dolby, "Of the 64 exhibitors we contacted, one was in favor of the spring convention, two were undecided and the rest were opposed."

A list of those 61 manufacturers choosing not to participate in the spring show was also included with the letter to Plunkett, as well as the expressed desire to prevent any serious confrontation between the Society and its exhibitors.

Prior to the release of the aforementioned letter, Plunkett had issued a statement to exhibitors outlining the AES position and justification for the added event, citing "the rapidly changing technology; the maintenance of information flow to membership in the largest section component of the Society (North America); the enhancement and improvement of membership recruitment on a continuing basis; and the provi-

sion of an exhibition facility to manufacturers, designers and specialists who have only regional exhibit interest and feasibility." He added, "It is hoped that manufacturers will choose the location most propitious for them."

Dolby has pointed out that while the manufacturers support the major financial and manpower burdens of a convention, they have no real voting power compared to the 10,000 AES members who largely agree on the desire for more programs. "This whole thing was bound to happen sooner or later," says Dolby, "because, in effect, the manufacturers have to pay a 'tax' to stay bona fide members of the audio community and we have no say in how often the tax is collected."

On the present schedule, the following AES conventions have been announced: 1983: October 9-12 in New York; 1984: March 27-30 in Paris, May 12-15 in Anaheim, California, September 24-28 in Melbourne, Australia, October 7-12 in New York; 1985: February (no specific date) in Hamburg, W. Germany, May 28-31 in Tokyo.

## notes

The *California Entertainment Organization (CEO)* is not yet out of the woods in its battle against "unfair" sales tax interpretations by the State Board of Equalization. For information on how this might affect you, call 213/469-5485. . . . The *Society of Professional Audio Recording Studios (SPARS)* recently hosted a Music Industry Educators Association interface with New York University and presented a teleconference on Audio for Video, linking New York, Atlanta and Dallas/Fort Worth. . . . *JBL* will begin marketing *UREI* brand name products in the U.S. on July 1. . . . *Otari Corporation* has formed a Special Products Division with *Michael Bernard* as Manager; *John Carey* moves up to National Sales Manager. . . . *Lexicon* has named *Philip J. De Santis* as new Director of Marketing and has presented its 1982 Representative of the Year Award to *Lew and Lindy Barrett of Northshore Marketing* of Seattle, WA. . . . *Shure Brothers, Inc.* has announced the appointment of *John F. Phelan* as Professional Products Marketing Manager. . . . *George F. Currie* has been named Vice President and General Manager, *Sony Professional Audio Products*. . . . *3M's* Memory Technologies Group will help develop a \$12 million academic Center for Magnetic Recording Research at the University of California, San Diego. . . . *Itam Corp.* of England has appointed *J.C. Audio Distributors* of Lancaster, MA, as exclusive U.S. distributors for its tape machines and mixing consoles. . . . *NAVA*, the International Communications Industries Association, has pub-

lished a directory of foundations that provide grants for audio, video, microcomputers and library resources in public and private schools. It's available for \$10 by writing to NAVA/ICIA Market Research, 3150 Spring St., Fairfax, VA 22031. . . . *Arthur H. Hausman*, Chairman of the board of directors of *Ampex Corporation* has announced that *Roy H. Ekrom*, vice president and general manager of The Garrett Corporation's Pneumatic Systems Division has been named president and chief executive officer of Ampex. . . . *Virginia Casale* has been named to the newly created position of Manager, Marketing Services for *Lexicon*. . . . *Jim Cassily*, Chief Executive Officer of *EXR Corp.* has announced the appointment of *Melanie Rogers* to the position of President of EXR. . . . *Bruce Dorfman*, President of *Micro-Fidelity Inc.* has appointed *Neil Blatt* as Vice President, National Marketing Manager. . . . The *Senate* subcommittee continues the debate on *record rental*. While representatives of the music industry called for immediate Congressional enactment of the Record Rental Amendment (S. 32 and H.R. 1027), legislation designed to prevent unauthorized record rentals for the purpose of home taping; a diverse group of manufacturers, retailers and consumers told the Senate Judiciary Subcommittee that abolishing the 'first sale doctrine' would limit consumer choice and increase prices, adversely affect recording product manufacturers and retailers, and raise serious antitrust questions. *Let your Senator know how you feel on the subject.*

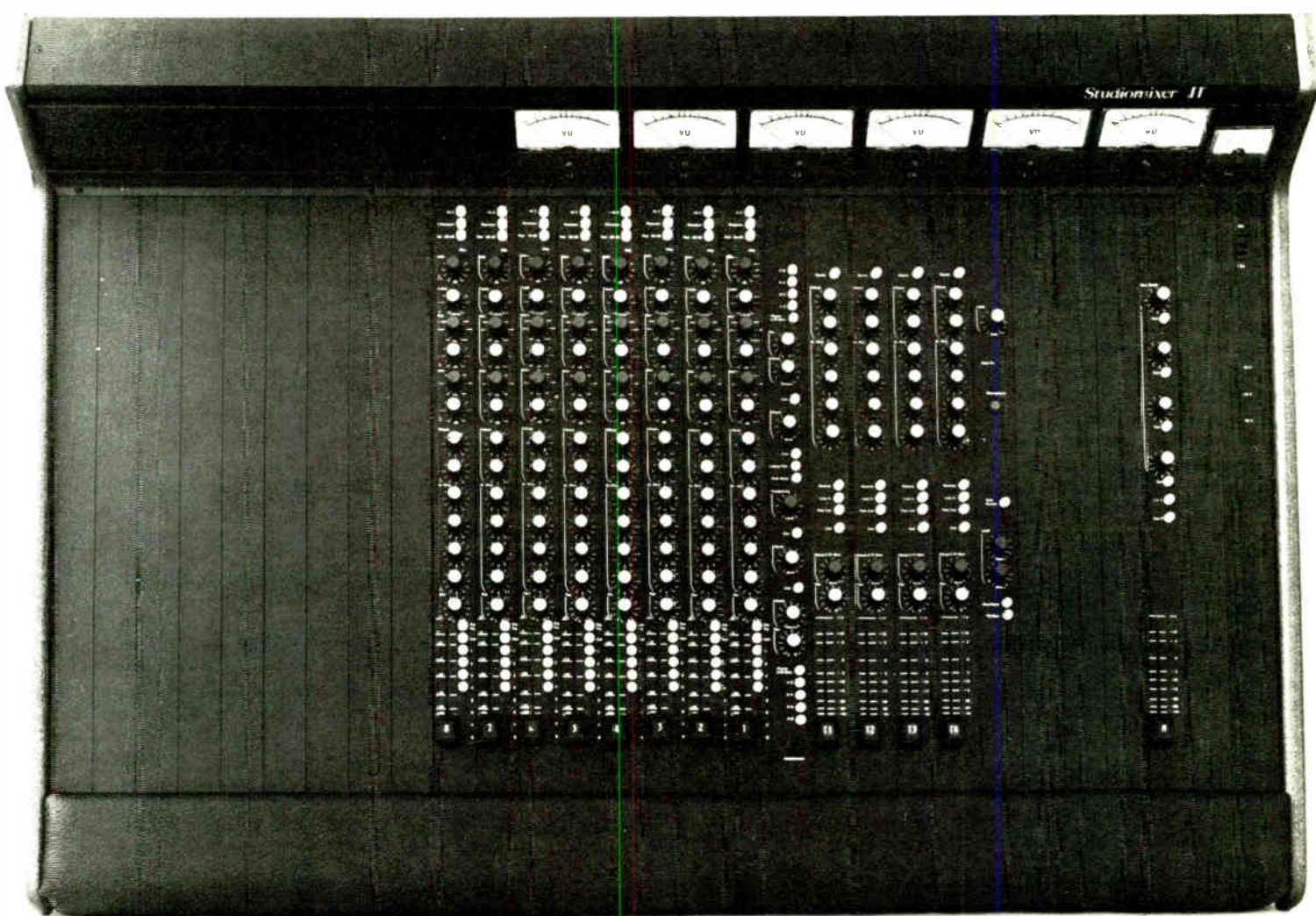
## 'Compact Disc Group' To Be Formed

A "Compact Disc Group" will be launched by some two dozen software and hardware companies, with the support of the Recording Industry Association of America (RIAA) and the National Association of Recording Merchandisers (NARM).

The non-profit, industry-wide organization will focus on promotional activity to support individual company efforts to secure the broadest possible consumer acceptance of the new digital audio technology and the Compact Disc, according to Stephen Traiman, RIAA Vice President and Executive Director.

First project for the Compact Disc Group will be the creation of a CD Catalog to be introduced at the Summer Consumer Electronics Show, June 5-8, in Chicago. It will include generic information on the new digital technology and Compact Disc to educate the consumer; all available CD titles listed by record company; and addresses of all software and hardware companies affiliated with the Compact Disc Group.

The CD Catalog will be available to all interested companies in bulk, at actual cost, for distribution to retailers, mass merchandisers, hi fi dealers and other outlets. Those interested in joining, or in getting more information, should contact Stephen Traiman, Vice President and Executive Director, RIAA, 888 Seventh Avenue, Ninth Floor, New York, NY 10106, phone (212) 765-4330.



# Announcing Some Major Changes

The first is our name. From May of this year onward, **Studiomixer** will be known by the new trademark of TMS Studiomixer. We hope that TMS will substantially identify us as from other products available in the mixer marketplace. Our quality and features already do.

Secondly is our product line. **Studiomixer II** is being joined by two new consoles. The first is a small, standard 19 inch rack mount unit which is still *Totally Modular* and economically priced. With a maximum of 4 submasters and 3 auxilliary busses, this mixer can accomodate most small recording studios and club bands, or even be used on location for cinema or television production with our portable power supply, also rack mounted. And with another rack kit, it can more than double its module complement. Our new top line console will be the serious recordist's dream. Known as the **TMS Studiomixer III**, its in-line format will offer expansion to 24 outputs if desired with 6 auxilliary busses, VU meter or optional liquid LED metering, and tantalizingly priced at about \$12,500 for a 30X24X6X2.

The third change is to several of our specifications. We have begun using a 5534 chip at crucial stages in the console circuitry and can now boast a minimum signal-to-noise ration of 83dB throughout the product line, a 7 dB improvement from previous models. Our consoles perform with virtually no slew limiting, input through output, at +4 or -10dB, and with either balanced or unbalanced outputs. Quiet, reliable mixers in any price range.

With these exciting new changes, **TMS Studiomixer** now offers something for everyone, including existing **Studiomixer II** owners. Any console we have sold thus far can be upgraded to our current, improved specifications. And we'll even put a new TMS logo on your existing console! We promised you that we would continue with our *Totally Modular* philosophy. With our two new consoles and our continuing personal attention to each of our customers, we hope to be able to welcome many sound professionals to the ranks of our satisfied, TMS **Studiomixer** users, soon.

TMS Studiomixer  
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Anaheim, California 92804  
(714)630-6611  
World Radio History

## NORTHEAST

At *Fishtraks Recording Studio* in Portsmouth, NH, New Hampshire based band *Friday*, featuring former members of President, in recording and mixing two songs for a 45 release. Seacoast jazz legend *Charlie Jennison* in recording sax overdubs on *Tom Chandler's* LP project . . . *Tim Biery*, drummer for Frank Marino and Mahogany Rush, has recently completed work at *SoundScape Recording Studios* in Farmingdale, NY. The tracks were engineered by *Bob Lessick*, with Bob and Tim Biery handling production . . . *The Iron City House Rockers* are recording at *Bearsville Studios* in Bearsville, NY, with producer *Mark Dodson*. At *RBV Studios* in Southbury, CT, *Chris Brown* engineered and produced a new jingle for *Peugeot Downhill Ski Races*. *Ronnie Eisenberg* produced a demo for *Sherryl Marshall* . . . At *Studio 4* in Philadelphia, PA, *Carl Josef* of Rage Productions is producing a single for *Shy Town*, with *Obie* engineering. *Da Pliers* have finished their second album, due for release in late May. . . . At *Trod Nossel Studios* in Wallingford, CT, *The Smiffenpools* of Smith College, Northampton, MA, recorded an LP of a cappella music. The Smiffenpools is a 12-woman vocal ensemble, modeled and named after the all-male Wiffenpools of Yale University. . . . At *The Platinum Factory* in Brooklyn, NY, *Vaughan Mason* laying basic tracks for a new album for the Salsoul label with *Barbara Joyce* and *B.T. Express*. *Barry Simpson* is engineering the sessions. *Henry Shillingford* is laying basic tracks for an album project for IRM Productions, Barry Simpson engineering. . . . At *39th Street Music* in New York City, *Randy Goodrum* in the studio producing some tracks for *Hank Martin*. *Man Parrish*, producer of "Hip Hop, Be Bop," is in mixing a project for *Sandy Dillon*. . . . Recent activity at *Electric Lady Studios* in New York City includes *Iron Maiden* for Capitol Records, produced by *Martin Birch*, engineered by *Dave Wittman*, assisted by *Bruce Buchalter*. . . . At *Valley Recorders* in Red Hook, NY, *John Herald* in, with *John Sebastian* producing, *Tom Edmunds* and *Rich Jones* engineering. . . . *The Spys* are mixing their new album at *Kingdom Sound* in Syosset, LI, NY. *Ed Gagliardi* and *Al Greenwood* are producing. *Clay Hutchinson* is engineering.

## SOUTHEAST

*Tony Joe White*, the man who wrote "Rainy Night in Georgia" and "Polk Salad Annie" has recently completed rhythm tracks at Memphis, TN's *Cotton Row Recording* for his new album scheduled for release this spring. . . . At *Woodland Sound Studios* in Nashville, TN, *The Rex Nelson Singers* are cutting tracks for a Word Records album with producer *Ken Harding*. *Rick McCollister* is engineering and *Ken Corlew* is assisting. . . . At *Soundshop Studios* in Nashville,

TN, producer *Archie Jordan* worked on sessions with R&B group *The Tams*, with *Michael Black* engineering. CBS group *Exile* was in the studio for sessions with producer *Buddy Killen* and engineer *Pat McMakin* . . . At *Lamon Sound Studios*, in Charlotte, NC, *Carlton Moody's* "We've Got It All in North Carolina" has been released on a sound track for a movie depicting the life of Eddie Knox, the mayor of Charlotte, who has announced his candidacy for governor for the state of North Carolina in 1984. The film will be viewed by civic groups, fund raising organizations and television specials throughout 1983-84. The project was engineered by *David Floyd* . . . Recent activity at *Doppler Studios*, Atlanta, GA, includes *Larry McBride* of MDJ Records in Studio A producing an album project with video for a new group *Atlanta*, *Milan Bogdan* engineering. *Ken Nolan* of superstation WTBS doing video audio post production on the TV special "It's a Long Way to October" with *Joe Neil* . . . At *Bullet Recording*, Nashville, TN, *Earl Richards*, *Jim Isbell*, and *Fred Carter, Jr.* continue production work on a new *Younger Brothers* project for *El Dorado Productions*. . . . *Eddie Kendricks*, formerly of The Temptations, is recording his latest project in Studio A of *Crescendo Recorders*, Atlanta, GA. Engineering the session is *Gary Ham*. . . . *John Denver* is recording tracks for a new digital album at *Criteria Recording's* superstudio E. A 32-track Mitsubishi X-800 digital machine is recording the sessions with renowned engineer *Roger Nichols* at the controls. The album is being co-produced by John Denver and *Barney Wyckoff* with *Milton Okun* as executive producer. Criteria assistant engineers are *Patrice Carroll-Levinsohn* and *John Slywka* . . . Union Station recording artist *Brice Henderson* was recently at *Sound Emporium Studios* in Nashville, TN, to begin work on his third single. *Scott Tutt* produced, with *Jon "Mr. Big" d'Amelio* engineering. Henderson also recorded some tunes for his first album, which he expects to complete in about a month.

## NORTH CENTRAL

At *Creative Sound Recording Studios* in Brazil, IN, are 13 year old *Kimberly Dawn*, *Kenneth King*, *Kevin McCrea*, *Loretta Pierce*, and *Gary Urbain*. All recording for forthcoming releases on *Natasha Dawn Records*. Engineer is *Steve Brown*, producer is *Joe Anderson* . . . Recording activity at *Studio A*, Dearborn Heights, MI, includes producer *Don Shaw* finishing tracks on *High Blood Pressure*. Arista artist *Michael Henderson* mixing tracks for his soon to be released album. *Eric Morgeson* behind the board. . . . At *Sparrow Sound Design* in Chicago, IL, local rock band *Log-A-Rhythms* recorded 9 songs 8-track for their new demo tape. The project was remixed at *Acme Studios* to make use of their excellent reverb unit and sound distortion devices.

## SOUTHWEST

In Tulsa, OK, at *Long Branch Studios*, *Benny Mahan* and *Black Stallion* have just finished their newest album project with *Bill Belknap* behind the board and *Frank Westbrook* producing. . . . *Chaton Recordings* in Scottsdale, AZ, recently hosted a "listening party" for 50 of Phoenix's radio personalities and record retailers when Columbia Records unveiled *Pink Floyd's* latest album, *The Final Cut*. Guests were invited to listen to the album as it played, not only in the house, but in the studio and mobile audio truck as well.

## NORTHWEST

At *Rosewood Recording Company*, Provo, UT, recent activity includes *Jennifer Madsen* cutting tracks for her debut album on Sacramento-based Flat Magic Records, produced by arranger/husband *Lon Madsen* and former Osmond associate *Kenny Hodges* . . . At *Studio C* in Stockton, CA, recent sessions include *Bob Forman* with *Don Evans* producing and *Drew Palmer* engineering. Studio C's in-house production company, *C-Ductions*, has just completed a sound-track for the Gannett Foundation, produced by *Ralph Stover* and *Drew Palmer*. . . . May was unofficially "girl band" month at *T & B Audio-labs*, San Francisco's newest 16-track studio. The lineup included *Contractions*, *Varve*, *Dogtown*, and *Transisters*. Clients *Norman Salant* (working on his new LP *Sax Talk*) and *Barry Beam* (putting down tracks for a new single) moved over to make room for these energetic females. . . . At *Hyde Street Studios* in San Francisco, CA, *Eric Blakely* and *The Blame* have completed a six-song EP. *Dave Carpenter*, formerly of the Greg Kihn Band, was the producer. *Gary Mankin* handled the engineering chores. . . . At *Tres Virgos Studios* in San Rafael, CA, *Mingo Lewis* (percussionist for The Tubes and drummer with Chrome Dinette) has been working continuously on original material for his own album project. *Gordon Lyon* at the board. . . . Action at *The Automatt* in San Francisco, CA, includes *John Hiatt* mixing his latest LP for Geffen Records with *Ron Nagle* and *Scott Matthews* producing and *Maureen Droney* engineering. *Rosanne Cash* also dropped in to do vocal overdubs on this project.

## SOUTHERN CALIFORNIA

Recent projects completed at *Piper Recording Studio* in Carson include an album by *Gunther Collins* entitled "Classical Country," and the A-side of a new 45 by *Cindy Jordan* called "It Takes a Helluva Woman," *Allen Kaufman* engineering. . . . At *Ivar Recording Studio*, Hollywood, *Leon F. Sylvers III* producing *Shalamar* for Solar Records in studio B. In studio C Leon's brothers *James/Ricky* are co-producing the upcoming *Silvers* album on Solar Records. *Jim Shifflett*, *Steve Hodge* engineering. . . . At *Cal-*





# EXPLORE THE LEADING EDGE OF ENTERTAINMENT TECHNOLOGY

Keeping up with the changes that are revolutionizing our industry is a challenge to even the most dedicated professional. What better way to learn about the new technologies and techniques than through the medium of video? Now, for the first time **MIX** takes you behind the scenes for the sights and sounds of the new entertainment technology.

It's the material that you want to learn and the information that you need to know . . . with the high quality production standards you've come to expect from Mix. And it's available now in stereo (mono compatible) on VHS and Beta cassettes!

Now, Volume One of MIX VIDEO is being offered to readers of MIX Magazine for the special introductory price of only \$39.95. Mail the attached coupon today. **SPECIAL GUARANTEE:** If not absolutely satisfied you may return MIX VIDEO within 15 days for a complete refund.

A few highlights from MIX VIDEO, *Volume One*, the first in a series of one hour programs presenting the best and the latest that entertainment technology has to offer:

- **COMPUTER ANIMATION:** Learn about a new creative tool for artists, engineers and producers
- **STUDIO TOUR:** Visit Criteria, the Miami recording giant with credits for over 100 gold and platinum records, now expanding into music video production.
- **ENGINEERING:** Hear veteran engineer Jim Gaines discuss how he and producers Jerry Wexler and Barry Beckett got the sounds on Santana's latest album, *Havana Moon*.
- **NEW PRODUCTS:** See and hear manufacturers demonstrate some of their latest equipment for recording and music production.
- **PRODUCER'S DESK:** Share the insights, experience and observations of hit record producer David Rubinson.
- **STUDIO MUSICIAN:** Legendary LA session bassist Carol Kaye (Beach Boys, Supremes, . . .) tells of her incredible career and personal struggle.
- **Plus History of Recording . . . Computer Music Systems . . . Convention Updates . . . and much more!**

**YES** Please send me the MIX VIDEO, VOLUME ONE at this special introductory price of **\$39.95**. (CA residents add \$2.60 sales tax)

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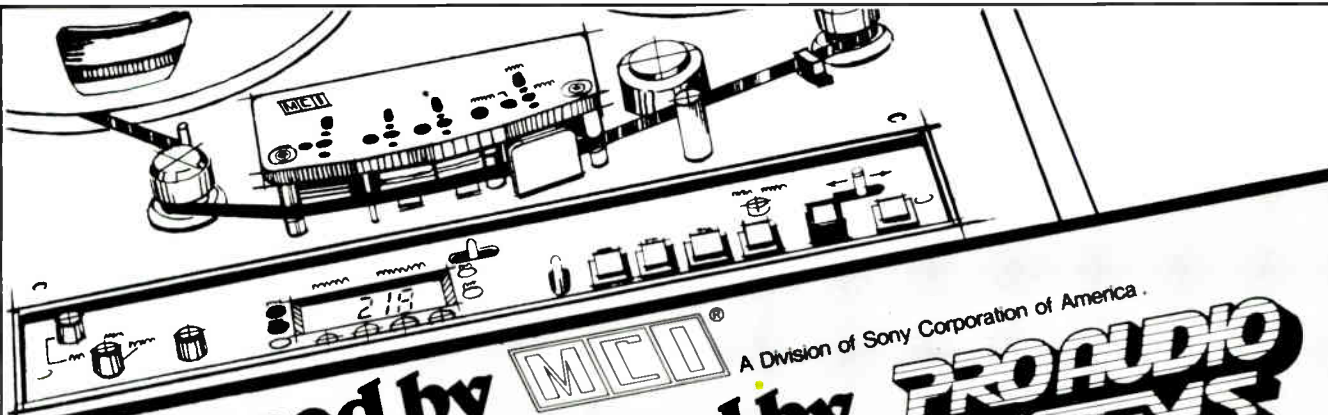
ifornia Recording Studios in Hollywood, *The Ventures* are recording their current album with *John Brady* at the boards and *Todd Van Etten* and *Tim Garrity* assisting. . . . At *Preferred Sound* in Woodland Hills, *Thelma Huston* is tracking vocals on a new musical she co-wrote with *Lester Wilson*, who is producing the sessions. *Paul Sabu* is engineering. . . . At *The Village Recorder* in Los Angeles, artist *Mike Smotherman* working in studio D doing basic tracks and overdubs with producer *Frank Rand* and engineer *Terry Becker*, with assistant engineer *Jim Faraci*. . . . At *Ground Control*, in Santa Monica, finishing final overdubs and mixes for *David Kulik's* rock/reggae album with producer/engineer *Paul Ratajczak*. Basic tracks were recorded in Kingston, Jamaica at *Tuff Gong Studio* with Jimmy Cliff's band "Oneness." . . . At *KDisc Mastering* in Hollywood, cutting engineer *John Golden* has been mastering the new *Men at Work* album *Cargo* with producer *Peter McJan* for CBS. . . . At *Wizard Recording Studios* in Hollywood, producer/engineer *Hank Donig* is in with new groups *Zot and the Teddies*. . . . *Spencer Proffer* is completing the *Vanilla Fudge* reunion album for Atlantic Records at *The Pasha Music House* in Hollywood.

## studio news

*The Workshope Recording Studios*, Douglaston, NY, have recently taken delivery on a 36-input Sound Workshop Series 40 Automated recording console, an Otari MTR-90 Series II 24/16 track recorder, a BTX Shadow System, and a JVC 6650 VTR and monitors. The new equipment represents a serious commitment to Audio for Video post production. . . . *Ampex Corporation* announced it has sold six ATR-124 multi-track audio mastering recorders to the *Hitsville USA* recording studio, Los Angeles, CA. Hitsville, a division of Motown Records, will use the 24 track system to replace their older recorders and expand the studio's mastering capa-

bilities, according to *Guy Costa*, vice president-managing director. . . . *Celebration Recording* in New York City recently announced a major technical renovation of Studio A. New equipment includes a Studer A-80 Mark III 24 track, an A-80 2 track, an Audio Kinetics Q-Lock SMPTE based synchronizer, a JVC 8250 video deck, a Lexicon 224X digital reverberator and many new peripherals. In addition, the Harrison 3624 console was extensively rebuilt under the guidance of *Jim Martin* of *Multimedia Technology* in Nashville, who directed the replacement of all the ICs, VCAs, and over 1800 electrolytic capacitors in the board. . . . The *JVC Cutting Center* in Hollywood, CA, is pleased to announce the latest staff addition, mastering engineer *Joe Gastwirt*, formerly with Frankford-Wayne in New York. Recent mastering projects include latest releases for Ultravox and the Bangles, and soundtracks for the films "Frances" and "Sophie's Choice." . . . San Francisco, CA's *Automatt* studio manager *Michelle Zarin* is pleased to announce the completion of major upgrading of Studios A and C at the Automatt. Two Studer 24 track recorders have been added, with the result that Studio A is now a complete Trident/Studer/Meyer studio. Additional equipment includes two new Lexicon PCM 42 digital delays and two Studer 2 track recorders with 1/2" capabilities. . . . *South Coast Recording Company* announces the opening of its 24 track recording facility in North Miami, FL. The studio shares the complex with *Soundtrack, Inc.*, an 8 track studio specializing in advertising/broadcast-related projects. The South Coast control room houses a 28/24 Sound Workshop Series 1600 console, complemented by two MCI 2 tracks and an MCI 24 track with Autolocator III, all interlocked to video via BTX SMPTE equipment. A large selection of monitor speakers are installed, including JBL 4430 biradial, Rogers Studio One, JBL 4311, Visonik David and Auratone systems. . . . *Mushroom Studios* in Vancouver, BC, Canada, is proud to announce that *Keith Stein*, an independent recording engineer based in Vancouver, is

second runner up in the Best Engineer award presented by Pro Sound News. This was awarded on the basis of the recording quality of the Loverboy album *Get Lucky* which Keith engineered at Mushroom Studios in 1981. . . . *Starlight Sound Studio* in Richmond, CA, owned and operated by *Peter Brown* (chief engineer) and *Norman Kerner* (studio manager, staff engineer), has added a fully automated Harrison 4032 console, Lexicon 224X digital reverb, Ampex ATR-102 1/2" and 1/4" 2 track, and a Yamaha C7 grand piano to its facility. Physical updates include a parquet floor in the large pentagonal piano room and additional hardwood diffusers in Studio A. There have also been additions to their already extensive mike collection. . . . *Sundance Productions Inc.*, of Dallas, TX, producer of programming for commercials, corporate communications, and entertainment media, announced that *Nan Landgon* has joined the staff as director of communications services. . . . *Digital Services* of Houston, TX, is pleased to announce it has acquired the second Sony PCM 3324 24 track digital recorder in the U.S. The second unit joins the first PCM 3324 in the U.S., also owned by Digital Services, as well as the complete digital recording, editing and mastering systems utilized by Digital Services. . . . *Dallas Sound Lab*, located at the Dallas Communications Complex in Las Colinas, is entering its second phase of construction. The Grand Opening is scheduled for the first week in June. Upon final completion Dallas Sound Lab will be able to fill the audio needs for video or film production with up to 48 track recording. . . . *Sound Impressions Recording Studios* in Des Plaines, IL, has recently completed major studio renovations. Studio A/B now features the new Otari MTR 90-II 24 track transport coupled with an expansive Soundcraft Series 1600 24 track console. Studio C has been outfitted with a new Ramsa 12 track board and a full complement of new transports designed for extensive AV production. Newly added Studio D will be used for post services such as music search, editing, impulsing, etc.



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# HALL & OATES CONTRIBUTE TO A MOVING EXPERIENCE.



Rescuing deserted housing in the South Bronx is part of what the Erma Cava Fund is all about. Then it's turned into comfortable, affordable housing for the area's seniors.

Daryl Hall & John Oates found this ongoing project a worthy one indeed. In fact, they contributed two one thousand dollar awards to the Erma Cava Fund. And the Ampex Golden Reel Award made it possible. It's more than just another award. It's a thousand dollars to a charity named by artists receiving the honor.

For Hall & Oates, *Voices* and *Private Eyes*, were the albums, *Electric Lady* and *Hit Factory* were the recording studios, and the seniors were the winners.

So far, over a quarter of a million dollars in Golden Reel contributions have gone to designated charities. For children's diseases. The arts. Environmental associations. The needy.

Our warmest congratulations to Hall & Oates, *Electric Lady*, *Hit Factory*, and to all of the other fine recording professionals who've earned the Golden Reel Award.

## AMPEX

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World Radio History



by George Petersen

Throughout much of 1982, remote recording operations felt the effect of a definite slowdown in live album projects, caused by the economy and decreased record sales figures nationwide. Yet, during these first few months of 1983, record sales have picked up somewhat and the ever-cautious record labels have begun to give the go-ahead to more and more live projects.

And while the record industry is slowly entering its recovery phase, the pace of the video market is accelerating by leaps and bounds. Checking with remote recorders, we have noticed those which deal with the audio-for-video business are hale, hearty, and often overworked. Many trucks are now equipped exclusively for these purposes, while others book a mixture of both visual support jobs and audio-only dates.

This year, we have also included video production trucks into our remote recording listings. With the burgeoning expansion of the video music genre, reader interest in this area is at an all time high.

We encourage all remote recording operations (audio, video, or both) and sound reinforcement companies to contact us here at Mix, so as to be included in our next listings.

—Page 14



# REMOTE RECORDING '83

# FROM OUR HANDS TO YOUR HANDS

*The Otari 1/2" Eight Channel MARK III/8 &  
1/4" Four Channel 5050 BQ-II*

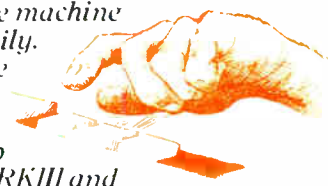


*At Otari, we focus everything we do on innovation, quality and staying close to your music. These priorities are values that are interwoven into every tape recorder we offer the recording professional and serious musician.*

*The commitment to step-up to the level of professional performance in an Otari recorder is a decision that only the successful and knowledgeable musician/engineer can make. Our MARK III and 5050 BQ-II are for those fortunate few who are achieving their musical and artistic goals.*

*Both recorders are designed with microprocessor circuitry for smooth, responsive transport control and precise electronic counting with L.E.D. display. True, three head design, selectable +4 or -10dBm input and output levels, 15/7.5 ips with continuously variable speed control and full remote overdubbing capability deliver flexibility in multitrack recording that's typically reserved only for the big, world-class studio machines. The same goes for the mastering quality performance and spec's. To wring-out every last dB of quality, you won't find a competitive machine that let's you get your hands on a full complement of adjustments as easily. Add to all this the ability to interface both recorders to SMPTE time code synchronization for multi-media video/film projects and compatability with dbx\* and Dolby\*\* noise reduction.*

*The comprehensive feature list goes on. And so does the craftsmanship that is the hallmark of our reputation. From our hands to yours, the MARK III and the 5050 BQ-II professional recorders are engineered like no other tape machines in the world; with the qualities you can hear and feel. \*Trademark dbx Corp. \*\*Trademark Dolby Labs, Inc.*



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World Radio History

### ESPN

ESPN, the satellite sports network based in Bristol, CT, maintains five mobile video trucks which are available for rental nationwide. Two of the units are 40' trailers, the others are 27' trucks.

Each large unit is equipped with six Hitachi SK-70 cameras; one portable Sony BVH-500 and three BVH-1000 one inch C format VTRs; Quantel synchronizer and time base corrector (TBC); Sony SMPTE time coding; a senior video console with switcher; a Grass Valley 1600-7K 24 input, triple re-entry production switcher; three effects banks with rotary/soft wipes, positioners, colorizers, quad split, and downstream keyer with color

matte; and a Vidifont Mark IV-A character generator. Audio is routed via a custom 24 in/8 out console, and a wide selection of microphones is available.

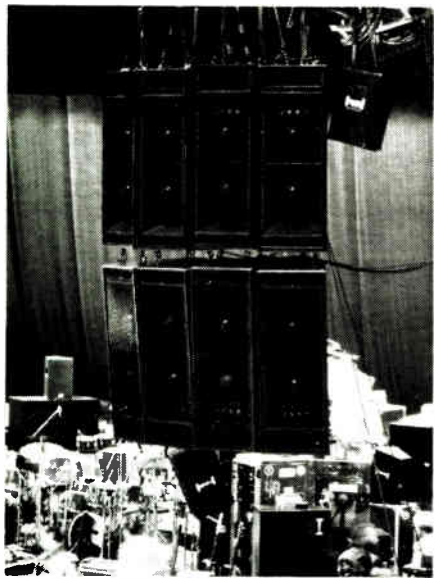
### FANTA

The Fanta remote truck, based in Nashville, has been busy all year with a wide variety of projects, according to owner Johnny Rosen. Some of their recent assignments have included a Mellow Yellow soft drink commercial; a Bob Seeger piece (at Cobo Hall in Detroit) for MTV; the People's Choice Award segment with Kenny Rogers; audio/video for Charlie Daniels with the Nashville Symphony; and live albums for REO Speedwagon, Gold Earring, and Red Rider.

While Fanta's plans for a second 40' remote truck are still in the works, they did add a complete post production facility (audio/video/film) to their current truck.

### FEDCO

Fedco Audio Labs, of Providence, RI, was founded by Lyle Fain who, as a student, often borrowed his family's station wagon to make 2 and 4 track mobile recordings of local musicians. As business expanded, he moved up to an 18 foot van equipped with a custom API console and a Stephens 16 track recorder. Some of Fedco's credits during this early period included The Doors' *Absolutely Live* (Fedco's first major album project), The Mothers'



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*Fedco Audio Labs' remote unit*

*Live at the Fillmore East*, Joe Cocker's *Mad Dogs and Englishmen*, Woody Allen's *Sleeper*, the ABC *In Concert* series and the Band's *Rock of Ages*.

In 1975, design and construction began on their present mobile truck. Based in a 30' turbocharged Mack diesel, the truck housed two MCI 16/24 track machines, an expanded API console, and a new communications system with closed circuit video. The first recordings with the new truck included Gato Barbieri's *Live in New York*, and the phenomenally successful *Frampton Comes Alive* album.

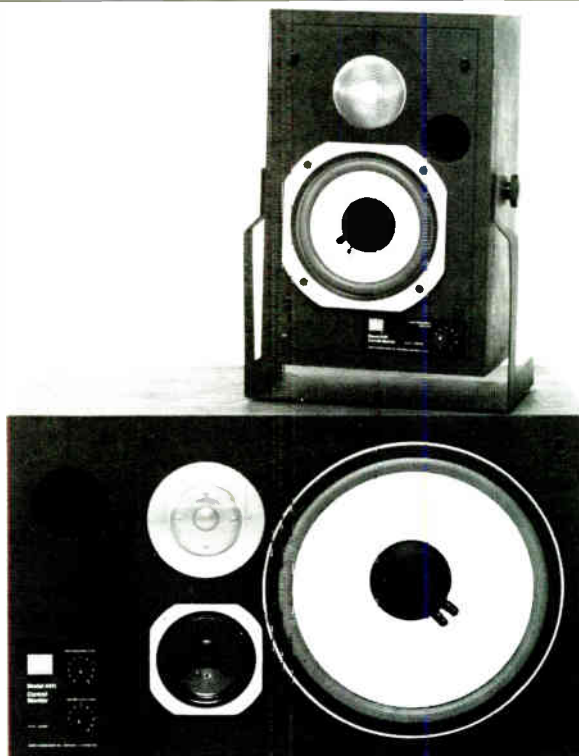
Fedco has since covered tens of thousands of miles recording a variety of artists, sometimes under less than ideal conditions. The Fedco team has braved 108° in New York City on a Sha Na Na project; -48 degrees in Montreal recording Bruce Springsteen; and a muddy Vermont hillside for George Benson.

In the summer of 1980, Fedco used the 3M digital system to record

# JBL Compact Monitors.



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In 1967, the introduction of the first professional quality compact monitor created a small revolution in the recording and broadcast industries. Combining high power capacity, accuracy, and extended bandwidth, the loudspeaker was ideal for close monitoring, yet flexible enough to provide a practical alternative to full size monitors. That speaker was to evolve into the JBL 4311. And since its introduction, it has literally set the standard for compact monitors.

At JBL, we're proud of this heritage. So over the years we've worked to maintain it through design improvement and innovation. And now, JBL engineers have created a new generation of compact monitors—loudspeakers that range from the subtly refined to the totally redefined.

Our new 4312, for example, represents the next step in the evolution of the 4311. Improvements include a new high resolution dividing network for better transient response and a mirror-imaged design that provides enhanced stereo imaging. These refinements significantly improve the loudspeaker's performance, yet maintain the unique sound character that made it an industry standard. And best of all, the 4312 is still priced to fit comfortably in even modest budgets.

For those that require a more flexible or compact monitor, we've created the 4411 and 4401. These loudspeakers incorporate our most advanced component and design technologies. Both the 4401 and 4411 utilize newly developed transducers arranged in a tight cluster to provide outstanding coherency of sound for close monitoring. This design also minimizes off-axis variations in the far field. Additionally, the 4411s are mirror imaged for improved stereo perspective.

For maximum flexibility, the continuously variable levels controls on the 4411 are calibrated for both a flat direct-field response and a rising axial response that produces a flatter power response. And for ease of adjustment, each of the monitors' level controls are baffle mounted. Finally, the low frequency loading has been optimized for flat response when the speakers are placed away from room surfaces. Because of this, the 4401 and 4411 may be console mounted without the loss of low frequency response typical of other designs.

For additional technical data and a complete demonstration of the 4312, 4401, or 4411, contact your local JBL Professional Products dealer. And discover the next generation of compact monitors. From the refined to the redefined.



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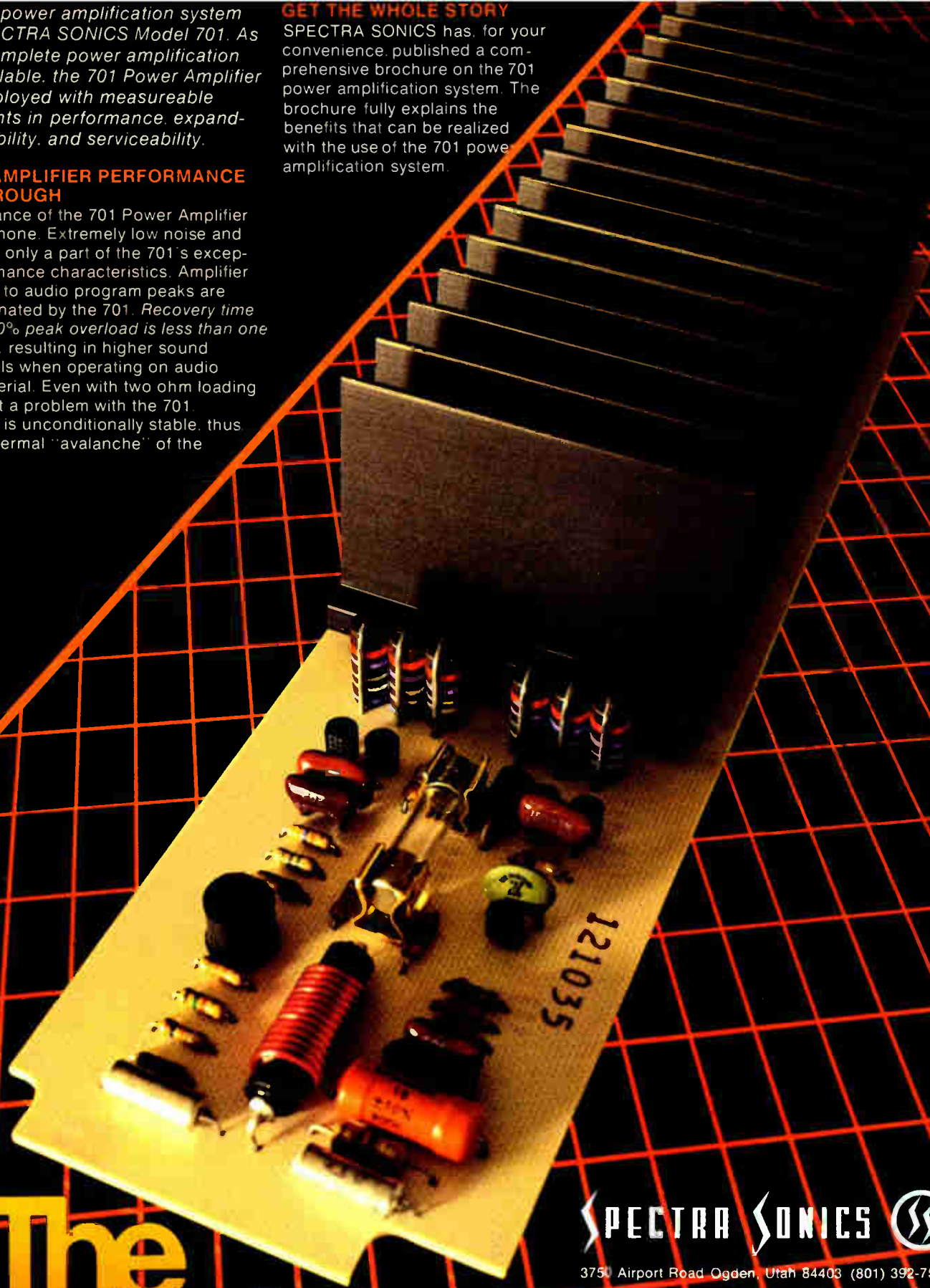
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SPECTRA SONICS has, for your convenience, published a comprehensive brochure on the 701 power amplification system. The brochure fully explains the benefits that can be realized with the use of the 701 power amplification system.



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World Radio History

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The Paul Winter Consort album, *Callings*, one of the first remote digital multi-tracks in the country. In June 1981 they used the Sony digital system for the Miles Davis album, *We Want Miles* (recorded simultaneously analog). The Tony Awards and Miss Universe Pageant are among numerous television specials Fedco has engineered for all three commercial networks as well as PBS.

Last year, Fedco said a fond farewell to the API console which served so well over so many miles and years. The addition of the Trident gives Fedco perhaps one of the most flexible systems on the road today, capable of handling 56 inputs, each with full EQ. Monitoring requirements on location can be very tricky, and the truck's unique room design has resulted in a very workable acoustic environment, eliminating the need for corrective monitor equalization while positioning all the recording gear in front of the engineer within easy eyeshot.

### ROB KINGDOM

After eight years in the remote business, the Rob Kingdom (Sunnyvale, CA) recording truck is still busier than ever. He recently modified his Studiomaster 16x4 console to 20x16 capacity, and added an Audi-ence RFS-2 reverb plate and a 20x2 mike splitter (with Dean Jensen transformers) to keep up with the demand.

Television sound has become an important part of Rob's work, which currently involves engineering audio for a series of Christian rock video concerts produced by Anne Callahan and Jim Crane of Light Distributing and Starsong. Recent credits include De Garmo and Key Band, The Resurrection Band, Phil Keagy, Sweet Comfort, and Randy Stonewall.

### METRO MOBILE

After four years of recording the 7-Up-sponsored Un-concert series, (which has included The Clash, Lene Lovich, The Jam, Shadowfax, and Dexy's Midnight Runners, among many others) for WXRT radio, the Metro Mobile remote truck is now also available for outside projects. Tim Powell, owner of the Chicago based remote, recently installed a Tascam 85-16B 16 track recorder, which is complemented by the truck's Neotek Series I 32 in x 24 out console. Audio for video is another of Metro Mobile's specialties, and they have been doing cable television specials in conjunction with Cutting Room Floor Productions.

### MIDCOM

The new Midcom remote unit was christened in January 1983. "There are lots of fine recording trucks," ex-

What's that buzzing sound?

Why aren't these meters moving?

Where's the bass?

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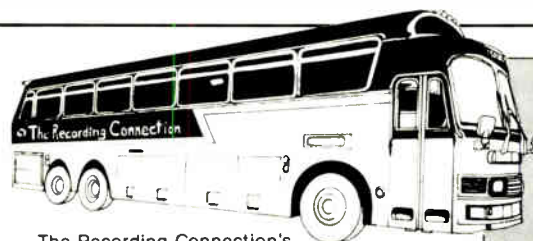
So, call us now before it's too late and you find yourself asking...

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TECHNICS M85 cassette recorder  
JBL 4313 monitors  
McINTOSH MC2205 power amp/200 watt channel  
4 UREI 1176N limiters  
2 UREI LA-4A limiters  
Complete FM Walkie-Talkie system  
12 auxiliary input-output channels  
40 input/output stage box  
6-channel CLEAR-COM intercom system  
B & W TV monitor and camera  
1000' 2-run (40 input) snake  
1750' single run (25 input) snake  
5000' mic line  
250' power line capability to power source  
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Southside Johnny • Yes  
Kansas • Wet Willie  
Jimmy Buffett • Santana  
Eddie Money • Triumph  
The Michael Stanley Band  
The Dazz Band • Rush  
Gary Lewis & the Playboys  
Robin Trower • The Kinks  
Hall & Oates • Loverboy  
REO Speedwagon • UFO  
Ted Nugent • Dave Mason  
Blackfoot • Donnie Iris  
Graham Parker • Rainbow  
Todd Rundgren • Maze  
The Four Tops • Chicago  
The Go-Go's • Saxon  
Shooting Star • The Tubes  
Grand Funk Railroad  
Jack Scott • Men at Work  
Pork & the Havanna Ducks  
Rossington-Collins  
McGuffey Lane • Joe Walsh  
Ian Hunter • Pat Travers  
Dionne Warwick • George Foley  
Peaches & Herb • The Outlaws  
Funkadelic • Rick James  
Sister Sledge • Ozzy Osbourne  
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Boxcar Willie • The Manhattanans  
Peabo Bryson • Stanley Clarke  
George Duke • Musical Youth  
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plained owner Mike Simpson, "but this truck was built specifically for TV audio production, and there's lots of TV work in Texas."

The Arlington (Dallas area) based truck, with 24 feet of internal production space, features an MCI JH-24 24 track recorder, Soundcraft Series 2400 28x34 console with split monitoring, BTX synchronizer, JBL 4435 Biradial monitors, and a 12 input switcher for video monitoring. The truck was also wired to interface with up to 50 telephone broadcast lines.

A recent Midcom remote project was the audio mix from Sam Houston University in Huntsville, TX, for the live Willie Nelson performance segment during the 1983 Grammy Awards.



*The Mountain Mobile recording bus*



### MOUNTAIN MOBILE

The Mountain Mobile recording bus, from Tulelake, CA, (near the Oregon border) which went on line last December, will be relocating farther south, in Redding, CA, during June 1983. According to owner Web Staunton, the remote bus spent six weeks in Florida as part of an educational program in conjunction with Jon Phelps, director of Full Sail Recording Workshops in Altamont Springs, Florida.

Since returning, Web has been involved with a number of projects for Oregon-based C.I.S. Records including Barbara Price and the Posse, and the Kip Ataway Band.

### PHIL EDWARDS RECORDING

The PER remote truck out of San Francisco, CA, was recently upgraded with the addition of two 3M 24 track recorders, UREI 811B monitors, an Adams-Smith three machine synchronizer, and the expansion of their API console to 40 inputs.

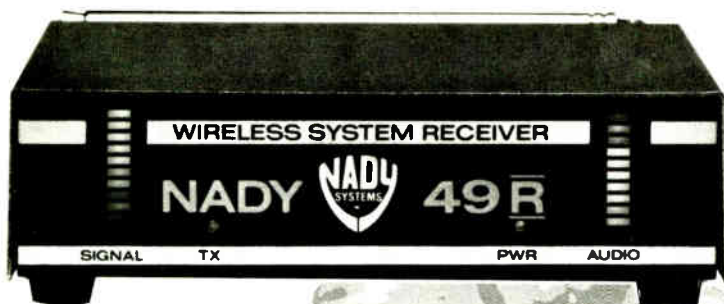
During the past year the company has recorded live audio for a large number of jazz videos, including: Art Blakely, Kenny Burrell, and the Harvest Jazz Festival (for PBS) with Steve Allen, McCoy Tyner, Stan Getz, and Bobby Hutchinson.

Remote manager Phil DeLancie reports five of their recent live projects were nominated for Grammy Awards, including *An Evening with George Shearing and Mel Torme*, which garnered the award for Best Jazz Vocal Performance.

### TIM PINCH RECORDING

Tim Pinch Recording of Glendale, CA, has installed a "new" console into their remote truck. The addition

—Page 20



## MORE WIRELESS FOR LESS!

High performance and low price is what you get with the revolutionary new Nady 49 wireless system. Now for the first time, the very latest in wireless technology is easily affordable for any musician. Featuring our newly developed special receiver filtering circuit, the new Nady 49 system is the only 49 MHz system which allows three separate instruments simultaneously the many advantages of wireless freedom on the same stage. The Nady 49 combines this new exclusive patent-pending filtering technique and the world famous patented "Nady lo-noise" technology with expert overseas manufacturing to offer you a wireless system so advanced in performance, at a price

so affordable, you'll want your whole band to be wireless!

Attractive and portable new receiver design features a retractable antenna and boasts two-multi-color 10-LED displays allowing the musician convenient operation status at a glance. With new hand-held and lavalier microphone options also available, the new Nady 49 offers the musician an adaptable and versatile wireless system for under \$200.00.

With virtually all the major touring acts in the world from the Rolling Stones to Barry Manilow already using Nady wireless systems, you can now also go wireless with the best at a price you can afford. Get more wireless for less from the wireless innovators.

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The all-new EV SH15-2 horn-loaded, two-way speaker system is America's answer to the Yamaha 4115. It's loaded for full-range, high-output action. And we mean action. The SH15-2 is capable of filling the air with a solid, audience-rousing 120 dB. And with an efficiency that is unmatched by most comparably-sized systems.

The high frequency section of the SH15-2 uses an EV DH1202 driver coupled to an HR-Series Constant Directivity™ horn to give you a full 90 x 40 degree coverage pattern. This means that virtually every seat in the house is the best seat in the house. (When every seat's the best seat, it helps all the seats get filled.)

The low frequency section of the SH15-2 features a 15-inch speaker mounted in a vented horn enclosure. This offers the double advantage of wide frequency response and low distortion, plus the "blow-them-away" sound pressure levels that make your audience want to stay for all your music, for all your action.

And if the excitement and the action get tough, the EV SH15-2 is built to take it. Like all EV speaker systems, the SH15-2 comes packaged in a rugged ¾-inch cabinet, covered in spill-proof, scratch-proof, stain-proof black vinyl trimmed with an edge-protecting aluminum frame.

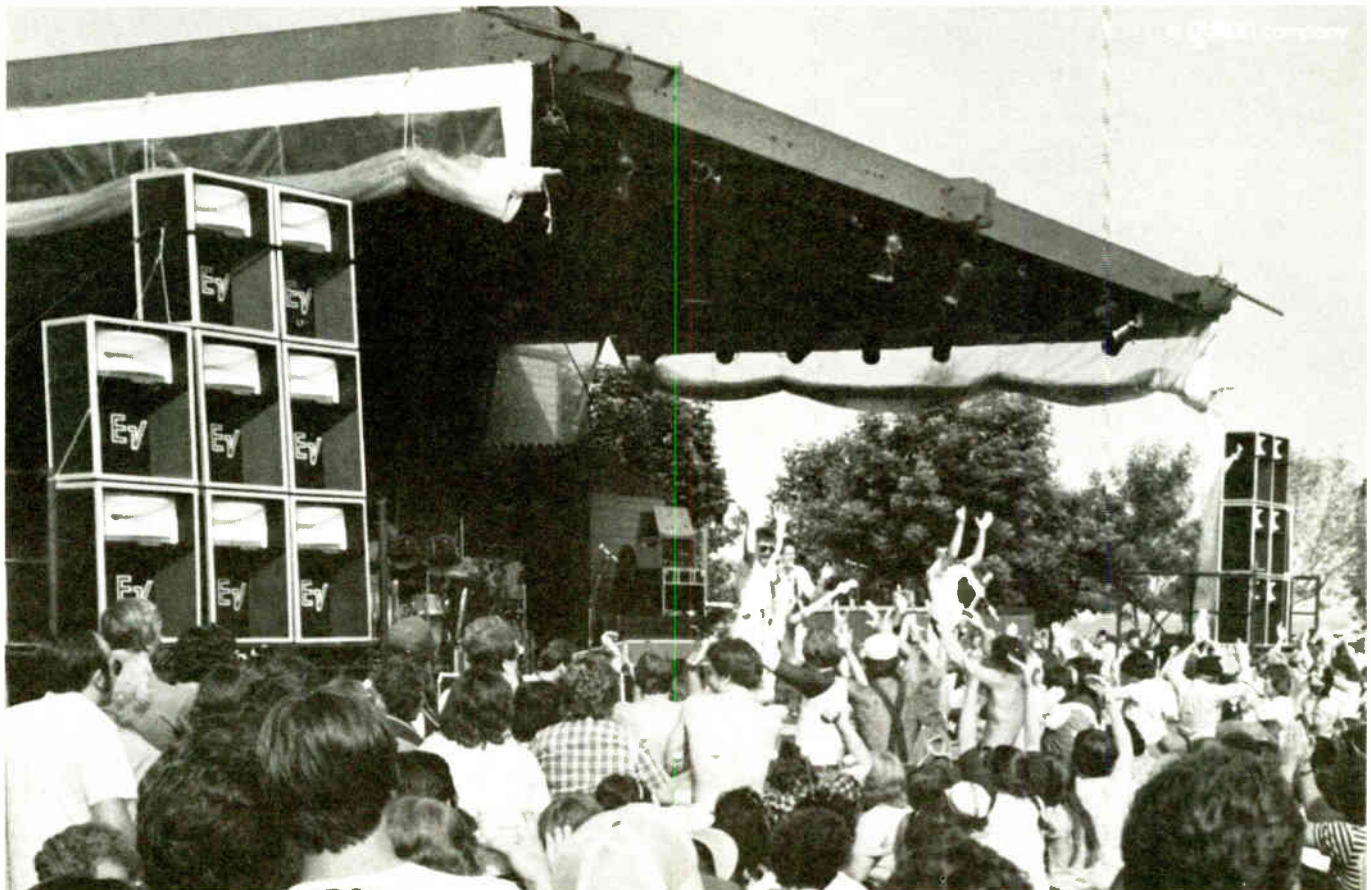
Whatever your sound, whatever your music, whatever your action, catch the EV SH15-2 in action at your nearest Electro-Voice dealer. Hear for yourself how it outperforms the Yamaha 4115 and the rest of the competition as well.

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AND THE HOUSE WITH  
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And while you're there, be sure to check out EV's full family of "Sound in Action" systems and equipment, from mikes to monitors and every-

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- 65 first quality mics
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- 20 Grammy winning or nominated recordings
- 3-engineer crews: expert & cooperative

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Circle #012 on Reader Service Card

—From page 18 ROAD WARRIOR

consists of a customized older-design Amek 44 input board with all new electronics: Trans-Amp mike preamps; Dean Jensen line and summing amplifiers; and special modifications for remote work.

Owner Tim Pinch has noticed a definite increase in audio-for-video business over the past year, and has added specialized video gear to the truck, including distribution amplifiers, video monitors, and tie lines for satellite feeds and live broadcasts. The truck was recently seen in action at the American Music Awards, and the People's Choice Awards.

One unusual project in past months was providing recording gear for the Celebrity Showboat "Jazz at Sea" television special which featured Cab Calloway, Della Reese, and Marlena Shaw. The audio was engineered by Jack Andrews aboard the SS Azure Seas.

### SKYELABS

"Rover," the new Skyelabs mobile unit (Dover, DE) is built into a Greyhound bus body and is slated to become operational June 1, 1983. In addition to a complete 24 track, 18' control room with ½' two track capability, the bus also houses a lounge and a small kitchen. The mobile was designed by owner Bob Skye, who chose a bus

for its light weight, thus avoiding vehicle weight restrictions, which are especially problematic on many streets in the Washington, D.C. area.

While designed mainly for record production chores, Rover is also being fitted with video monitoring and synchronization for maximum flexibility in any situation.

### WESTWOOD ONE

Westwood One Recording, a division of America's largest producer/distributor of nationally sponsored radio programs, unveiled their 45 foot, \$500,000 mobile recording unit last summer. Norm Pettis, Westwood One President, stated the truck was planned as a cost cutting venture. "We were spending close to a million dollars a year to record remotes for many of our national radio programs, concerts and specials. Now we have our own state-of-the-art studio."

Jim Seiter, formerly remote director for Wally Heider Recording, is in charge of Westwood One Recording. Jim supervised the truck's construction and design with Coachcraft Engineering of Southern California.

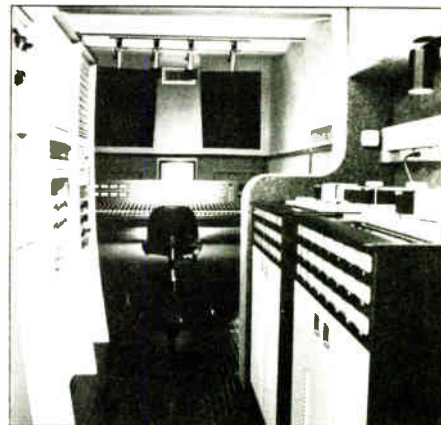
The Westwood One remote truck is equipped with an MCI 636 36 input console, two Ampex MM-1200 24 track recorders, Ampex ATR-102 two tracks, Sony color video monitor-

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Westwood One's mobile recording studio

ing, Altec 604-E monitors in custom De Medio cabinets with Mastering Lab crossovers, a Sphere 1604 sub-mixing system, and a wide variety of outboard gear including limiters, equalizers, a Harmonizer, and an AKG BX-10 reverb system.

The truck features a lounge large enough to accommodate eight people. Isolated from the control room via a pneumatic soundproof door, the lounge offers a bar, refrigerator, ice and coffee makers, telephones, and TV monitors with a remote control camera with zoom lens for artists, producers and executives who wish to view and listen to recording sessions. ■

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The features don't stop here; 8X Series consoles also include super solo sections (giving instant access to pre-fader, post-fader and tape solo), comprehensive slate and talkback systems, a built-in calibration oscillator, and a high speed LED metering array in an easy-to-read meter bridge assembly. Standard module features include XLR balanced inputs (both mic and line), XLR balanced outputs (buss and stereo master outs), continuously variable mic and line input gain controls, switchable phantom power, phase reverse, pad, 12dB octave high pass filter, EQ bypass switch, channel

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# audio & video in the *New York Club Scene*

by Rosanne Soifer

The growing technical demands of today's music (both live and recorded) have electronically metamorphosized the club venue, whose "system" not too long ago consisted of perhaps one Fender amp and a few colored light bulbs. A significant side effect, of course, is that the club now must balance carefully the amount of money it spends on new equipment with what it spends on musical programming. We surveyed seven New York City night spots to get a handle on how they handle the new electronic realities.

## Studio 54

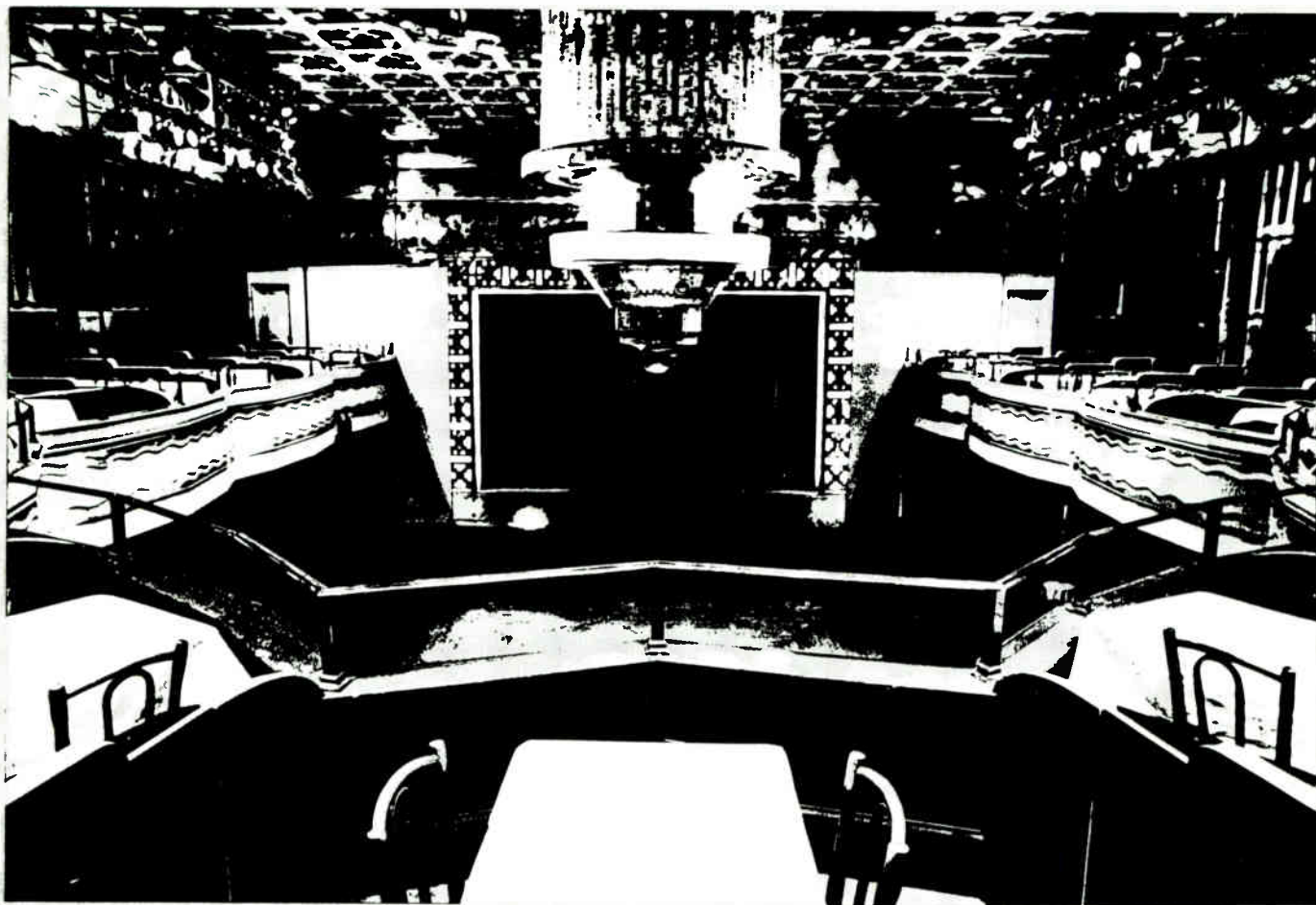
Everyone has heard of Studio 54. If you hobnob with the Beautiful People (or at least try to), Studio 54 is your hangout. Yes, the stories about needing designer clothes, Mick Jagger's personal friendship, and a note from Frank Zappa's mother in order to get in are *somewhat* exaggerated. Nevertheless, Studio 54 prides itself on being a "good looking" nite spot - and its use of technical equipment must help enforce this concept.

The sound is powered by 10,000 watts of BGW amplification. All the theatrical lighting is done by Kliegl II Performers, and an electronic "E"

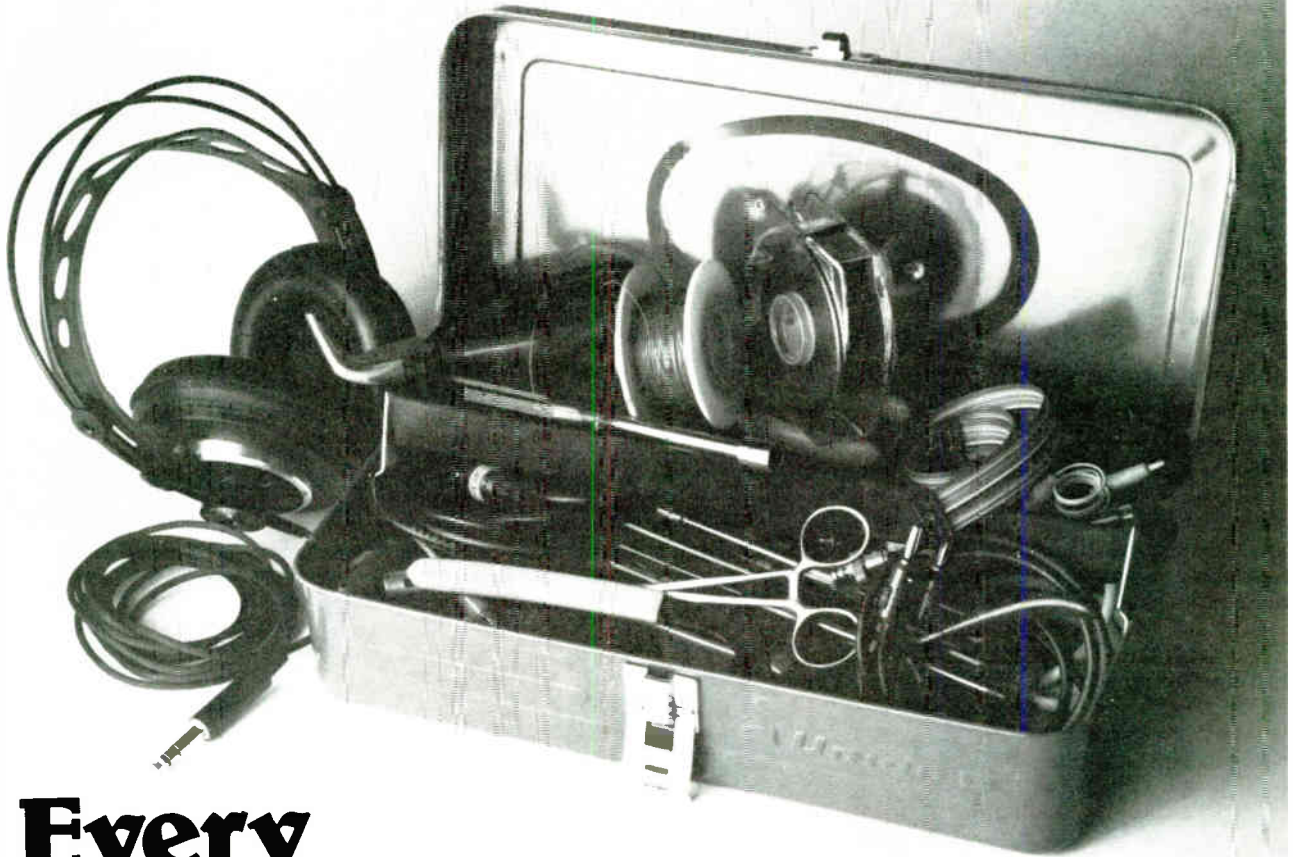
board controls the moving light effects.

According to Harold Wilson, the production director, although Studio 54 is not primarily known as a "live music" club, it does present performers such as Lou Reed and Grace Jones, often with live-to-track tapes. In this instance, the lead vocal is sung live over a tape containing only the musical accompaniment. A video of the performer may also be shown on the 22' X 18' video screen, using an Aqua-Star projector and a Sony V-5600 video tape deck. The club's future plans include securing more equipment for visual effects.

—Page 25



*New York's fashionable music venue, The Ritz*



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### The Bottom Line

An almost total contrast to Studio 54, The Bottom Line on West 4th Street has existed since 1974 primarily as a concert club, with a capacity of 450 people. There is no dancing, no DJ, no video equipment, and the audiences encompass anybody and everybody. Like Studio 54, The Bottom Line has also presented Lou Reed, but obviously in a much different setting. Both Terry Gabis and Tom Pavelka, the sound engineer and lighting designer, respectively, emphasized that The Bottom Line must be able to accommodate any situation in live performance. This may range from a Buddy Rich concert to a one-man show on William Faulkner.

The 4-way sound system uses all Gauss and JBL speakers, with Crest power amps. The audio (in a flown system setup) is driven by SAE and Crown amplifiers.

The lighting effects are "stagey" rather than nightclubby; there are no strobes or fiber lamps. The dimmers are all by T.T.I. and the lightboard is a Consolidated Edification and T.T.I. hybrid.

The Bottom Line has originated programs for Home Box Office and has also presented live radio shows, through a telecommunications hookup with Ma Bell, for WNEW and WPLJ. Eleven live albums, including ones by Tom Scott, Betty Carter, and Todd Rundgren, have been recorded here.

There is easily over \$100,000 worth of equipment at The Bottom Line. According to Gabis, new items are purchased as needed, but much of the club's budget goes to maintaining the present systems.

### The Ritz

Unlike The Bottom Line, The Ritz on East 11th Street has undergone many transformations. It started out as a schoolhouse, but was changed into a Latin dance hall during the Depression. In recent years, it has evolved into one of New York City's largest rock clubs, presenting artists like The Stray Cats, English Beat, and Phil Collins. The facilities for video and full stage shows cost "easily a half million," according to production manager Jon Rosbrook.

The sound system is composed of a Yamaha PM2000 mixing console, 3 Ashly Audio SC-66 stereo parametric EQs, a Roland SRE-555 Chorus Echo, Lexicon PCM-41 digital delay processor, 8 dbx 160 compressor/limiters, 2 Yamaha Professional Series 1/3 octave EQs, 6 Audioarts Engineering 1040 parametric electronic crossovers, and 2 Klark-Teknik DN27 graphic EQs. Power for the whole system is provided by 4

Phase Linear 700B stereo amps, and 11 other power amps by UREL, BGW, and Crown. Flanking the large stage (34' X 25') there are 6 Maryland Sound Industries "Claw" house PA cabinets and 10 stage monitors.

The lighting system is built around a 48 channel 2-scene T.T.I. console, with 3 overhead electronic pips, 4 side ladder positions, 120 Par 64s and Lekos, and 2 Ultra ARC spotlights.

The Ritz prides itself on owning state-of-the-art video equipment, including a \$75,000 GE PG 5050 projector. The Ritz was the only club in New York to get permission from Peter Townshend to broadcast The Who's final concert in Toronto, requiring a private satellite dish and receiver to be rented and mounted on the roof. The Ritz has also been the backdrop for several scenes from Woody Allen's new movie, from the film *Raging Bull*, and private promotional video projects.

The video, stage, sound, and light positions are coordinated by a Chaos Audio intercom system. Tech rehearsals are held 6 hours before showtime. Between shows, a DJ plays rock dance records on 3 Technics SL-1800 Mk II direct drive turntables. The records are often synchronized with a video, sometimes matching, sometimes

not. Hearing Pat Benatar while seeing Kate Smith is an odd, but distinct, possibility.

### Trax

The Ritz is where you play once you've made it. Trax, on West 72nd Street, is where you play while you're still trying. Trax holds 280 people and presents mostly live rock in a showcase setting. Harry Sica, the club's stage manager, says they are starting to branch out into video by setting up an in-house video production room. Trax uses 1350 watts of Crown and BGW amps with an APSI Board (24x4x4), and a Biamp monitor mixer (16x2). The speakers are 4-way active Klipsch Industrial Loudspeakers. Because the club is fairly small in size, there is a ceiling on volume, and a sound level meter is hooked into the DJ's microphone.

Each act is given a lighting cue sheet, which must be filled out before they set foot on stage. The lightboard is a T.T.I. 18 channel, two-scene preset, with T.T.I. dimmers and a followspot. Trax has no facilities at this point for doing its own recording. Outside recording equipment is brought in and plugged into the club's splitter, thus enabling the producers to make their own mix.

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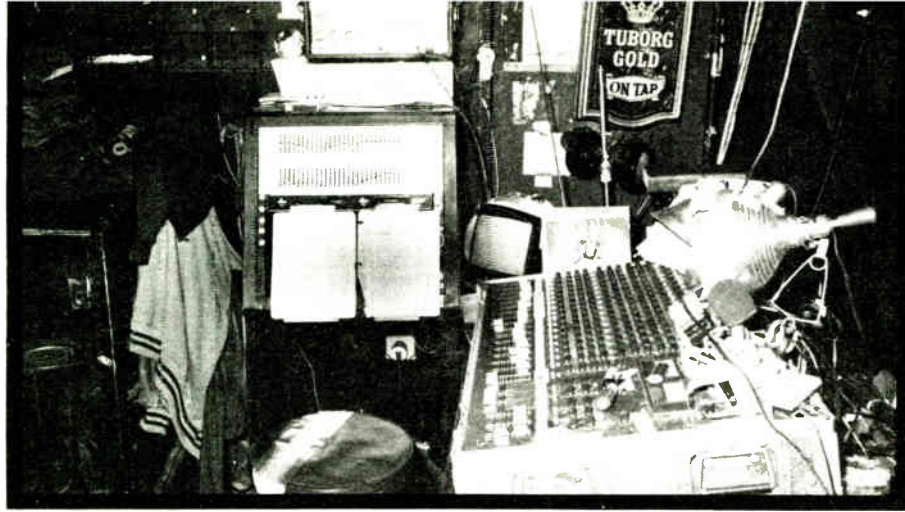
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The mixing position at CBGB's

### CBGB's

CBGB's and Trax have a comparable goal - to present new local and out-of-town groups in a showcase setting. They are about the same size and each has invested between \$75-85 thousand in equipment. This is where the similarities end. Located next to the Palace Hotel (that's on the Bowery, folks), CBGB's attracts the punk and new wave set rather than a rock crowd, and has been the scene of live simulcasts to Europe, and segments of *Good*

*Morning, America* and *Entertainment Tonight*. CBGB's is also part of the backdrop for the upcoming movie *Saturday Night Fever II*.

CBGB's sound system under Tony Holmes' direction uses Crown D60s, as well as Electro-Voice RE10 and Sennheiser 421 microphones. The board is custom made, with 3-way passive electronic crossovers for the monitors. There are 3 UREI graphic EQs. The mixing console is a Scundcraft Series 1S (16x2). CBGB's is also in the process of acquiring recording equip-

ment, a 4 track Tascam and 16 track MCI.

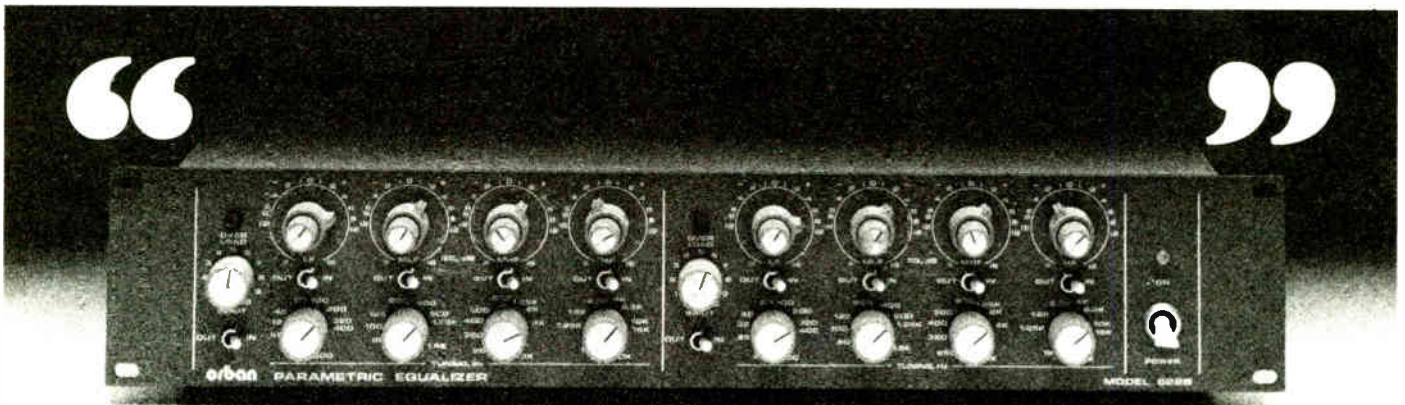
The lighting system, run by Dennis Dunn, is all T.T.I. overheads, and the DJ (again, between shows) uses a Technics SL/2D turntable. A thorough tech rehearsal with mike checks is done before all shows. The club is also wired for cable TV, and shows have been broadcast over cable channel J.

### Peppermint Lounge

About 20 years ago The Peppermint Lounge hit the Big Time as a rock and roll dance hall on West 45th Street and mainly as the home of the Peppermint Twist, as well as Joey Dee and the Starlighters. After several relocations and identity crises (as a gay bar, a disco, and a transvestite hangout), it has relocated at 100 Fifth Avenue as a 3-story rock club for live and recorded music. WLIR produced a concert series here, and Squeeze, Iggy Pop and English Beat have all performed here.

Peppermint Lounge holds 1700 people, making it the largest club we surveyed. It owns none of its own equipment, rather leasing it from Jim Toth, an independent owner-operator who assumes the cost of normal repairs and insurance. Apparently this is a smart arrangement for some clubs,

—Page 112



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# SOUND ON STAGE

by Robin Tolleson

**A**s sound companies gear up for summer touring, there seems to be a real consensus about touring philosophy.

The question of getting one's PA to match a hall is long gone," says Steve Griffiths of Tasco in Newbury, CA. "The main thing now with touring is getting in fast and out fast, and using as little truck space as possible."

Steve Dubuc of Audio Concepts in Quebec says, "The faster it goes in, the faster it goes out, and the more time you have to sleep."

"If people aren't thinking about size and weight, they're going to be left behind," says Roy Clair of Clair Brothers in Pennsylvania. "Truck space is an important commodity these days."

While everyone seems to agree this is a day of economic responsibility and cost-efficient touring, few can agree on what the ideal touring system is. Each company is excited about its own system.

"It's all subjective, you know," Clair says. "What sounds good to some people sounds terrible to others. That's why we're all going to be in business. There's no such thing as the ultimate sound system. If everyone liked Meyer I think I'd close my door tomorrow. Or Showco or Turbosound, etc.; I think there's room for all of us."

What follows is a sampling of a few of the sound and light companies that deal day in and day out with new halls to rig and EQ, new stages to build, systems to fly, union requirements, and of course the ever changing technology. These are people that generally don't have time to talk, but did.

"I assume you know I'd rather talk to a customer than a magazine," Roy Clair says. Clair is preparing for a busy summer schedule, and will be supervising the sound at the second US concert in Southern California.

"Few would argue that our speaker cabinets are more widely known throughout the world than any other cabinet," Clair says. "At the AES

convention it was a recognized fact that Clair Brothers was the pioneer of the all-in-one cabinet. We've had one for twelve years. It's still in use, and is still the most widely accepted box in the industry."

What does this Clair cabinet have in it? "A lot of speakers," Clair says. Clair Brothers uses JBL and TAD speakers.

"Basically speaking, the low end is bass reflex, the mid-range is bass reflex, infinite baffle, and the mids and highs are horn-loaded. The S-4 cabinets can be stacked or flown."

"Each system of ours goes out with an equalizer and an analyzer," says Clair. "Our analyzers show up with little red dots, and follow the bouncing ball. We have a frequency spectrum on LED lights, and try to get a straight line of LEDs. Once you have a straight line of LEDs, your room is supposed to be relatively flat with your sound system. It's no differ-

do some concerts, but working hotels is superior to working concerts in my opinion. It's cleaner and they pay more money."

Pace has recently done convention work for Seven-Up, Redken Hair Products, and the Louisiana Bankers' Association. They have also worked with the New Orleans Symphony, Randy Newman, ZZ Top, Willie Nelson, and Issac Hayes, to name a few.

Pace Sound has a two-cabinet system of their own design that they use on all the rock shows and some industrial work. "It uses a bass bin and a mid-range high frequency cabinet. It's a two-cabinet system that is a four-way. We use it for industrials where they're going to want heavy music - fashion shows or big AV productions. We'll just use the same equipment as for a rock show and scrim it. If it's the kind of meeting where it's more important that they don't see the sound system than exactly how strong it is, then we hang it."

Schulman prefers his two-cabinet system to an all-in-one box. "The things that I've been reading, people like TFA are going with a system like ours. It's real hard to get enough bass out of a single cabinet. And you have to make the cabinet so big to go full four-way. That's what Clair does. They use a lot of them.

"We built a bass bin that is a folded-horn cabinet, and our three-way cabinet, which is mid-bass, horns, and the super-highs. We put the mid-bass into a horn-loaded enclosure.

"The bass bin and the three-way cabinet are the same size, so everything stacks, and it's all on multi-

## FORUM:

# Concert Sound Trends

ent from a chart or whatever other techniques people have. It all comes down to listening: if one doesn't have a good ear, it's all bullshit anyway."

Pace Sound and Lighting is a New Orleans-based company that spent several years doing mainly rock concerts in the Louisiana area, but has shifted its emphasis more towards industrial shows and conventions.

"I prefer industrial work," says Pace's Peter Schulman. "We don't get as much as we'd like. We still have to

pin connectors. It's just faster for setup, and a lot of times we're in a hurry. We don't have time to patch together 40 different kinds of cabinets."

"We don't want to go to a full range cabinet," explains Steve Griffiths of Tasco. "Our company policy is that we like horn-loaded systems and so do our clients, which is why we get them."

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who this year has been on tour with Ozzy Osbourne, Blue Oyster Cult, Judas Priest, Eric Clapton, and Diana Ross.

"We have a new system, whereby we still use three pieces. There's a bass cabinet which is horn-loaded, a low-mid cabinet which is horn-loaded, and another cabinet which contains the mid-range horns and the high horns. This is a Martin system. The mid-high cabinet and the low-mid cabinet are the same size exactly. The bass cabinet is the same width and depth, with a different height, which means it's very easy to fly."

Griffiths explains that Tasco has spent a lot of time engineering their flying beams, so that now the sound system goes up in the air as quickly and easily as a full-range system. "Obviously the full-range boxes go up very quickly where ours didn't used to. But with this system we have all the benefits of a horn-loaded system, which is much more efficient.

"The flying beams we designed can carry three stacks wide, and it's arranged so that any of the three stacks can swivel in any direction from the beam itself. And the hanging is arranged so that any stack can be pointed anywhere in the vertical

plane, including upwards for the top ones. It's very important. When was the last time you've gone to a concert and been up at the back and the top, and realized that there's nothing pointed towards you, and you can't hear a thing?

"We have fixed plans of hanging these systems," Griffiths explains, "and the same system will point a different way every day. In addition, when the systems were designed we deliberately limited some of our dispersion figures. In other words, the bass cabinet, the low-mid, and the horns have the same dispersion pattern. We worked out the system as a whole as opposed to the individual cabinet, so you don't get hot spots from the high end or cancellation.

"The other thing with the flying system (also known as the Harwell System) is when we angle our cabinets, unlike some systems, they actually meet around a central radius from a point behind the cabinets. This means if you're in an area where you get hit by the spill from two cabinets, both the cabinets' sounds reach you at the same time. If you've got a millisecond delay on one of the cabinets, 1K and all its harmonics will in fact be cancelled or they'll peak. You get cancellation because you're hearing the

same sound at two different times. That's been taken care of because they all emanate from the same source at the same time - the same virtual source, I should say, because the sound actually appears to come from a point about seven feet behind the cabinet."

Tasco uses Midas mixing boards. "We like Midas," Griffiths says. "One of our consoles which has gotten great reviews is painted in seven colors of day-glo, and it glows in the dark under ultraviolet light. It sounds like an extreme gimmick until you use it, and you suddenly realize you can see every piece of writing in full detail with no glare. And when you mix the class acts, nobody behind you is going to tap you on the shoulder and ask you to turn the console lights down."

Go to see Ann Murray or Melissa Manchester in Las Vegas and you're likely to hear Stage Sound of Phoenix, Arizona hard at work. Toby Payne explains that Stage Sound works with acts like Roberta Flack, Tom Jones, The Beach Boys, and recently provided sound for Frank Sinatra before 14,000 people at the Arizona State University activities center.

"The system we used for Frank," Paynes says, "is the only hanging Meyer system for in-the-round shows in existence. To have Joe Parnell, Sinatra's conductor, tell me that it was the first time Frank came onstage and smiled, and came over to him and said, 'The sound is good tonight...' Now after a lot of hard work and a lot of rigging, I felt good."

Payne finds that many people just don't believe the Meyer speakers (Meyer Sound Labs) can do the job when they see them because they are so small.

"When we did The Beach Boys a short time back at the USFL game, their people walked in and did nothing but say the sound system couldn't do the job," says Payne. "They were on the phones trying to find more sound. Then they hit sound-check and it was a situation of the guys telling our mixers, 'Hey, you've got to turn these monitors down, back the system down.'"

The Meyer system features horn-loaded all-in-one cabinets, with a unique coil cooling system, according to Payne. "In a conventional speaker system the voice coil has to cool itself inside the air gap of the magnet, because there's nothing in there to cool other than air. When you start putting power to it to make the speaker or AC generator move, you start to heat the coil. At the point you heat the coil too far you blow the speaker up.



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What Meyer has done is fill that gap with fluid, a fluid that couples the rise in temperature of the coil over to the magnet structure. Instead of coupling it through air now we're coupling it through a fluid. We can now deliver three to four times the power to that driver and never burn it out."

According to Payne, the Grateful Dead's Meyer system includes 16 MSL3 cabinets per side. Where they were using 25 tons of Martin bins, they are now using five tons of Meyer. Ann Murray recently ordered four Meyer MLS3s and two 65OR2 subwoofs for an outdoor show. The Beach Boys played outside for 42,000 people with six MSL3s per side, with four subwoofs. "You can see why they felt it would not work. It is not big," Payne says.

Convention groups are using the Meyer system too, according to Payne. IBM, Mars Candy, and Flying Tigers have listened to the Meyer sound at recent conventions. "Size is coming down, and efficiency is way up," Payne says. "It's expensive, but I'd have to say it's become state-of-the-art. It's the only real change in speakers for a long time."

Audio Concepts is a four-year-old company based in Quebec. They have toured with Jon Anderson, Simple Minds, Mahogany Rush, and many other Canadian and British bands. According to Johanne Pelletier of Audio Concepts, they can send out five systems at one time, ranging from 6K to 20K.

Pelletier explains that they have been using a Martin system (David Martin Audio, England) with a bass bin, mid-bass bin, a horn and a tweeter. But she says they are working on a new Martin system - all-in-one cabinets which are horn-loaded.

"The reason we didn't have all-in-one boxes before now was because we were using a four-way system - bass cabinets were horn-loaded so the bass had more punch and got good results," Pelletier says. "But the new system is horn-loaded and it's very interesting. Very good sound."

Steve Dubuc of Audio Concepts adds, "The new trend in PA is to have everything in one cabinet just like a hi-fi box, just like a studio monitor." The new Martin system is 1200 watts per cabinet, according to Dubuc, and utilizes Gauss speakers on the low end and JBLs on the top end. It will be a 40kw system.

"Rigging is easier when the boxes are all the same size and dimension," Dubuc says. "Rigging four different boxes that aren't balanced, if your bass bin is heavy in the rear, mid-bass is heavy in the center, usually you end up strapping it to a

platform and flying it to the ceiling for large venues. Most of the all-in-one PAs like Showco uses or the Clair Brothers S-4s are hung from the top. You just wheel it into position; rigging points have already been done in the morning by your rigger; you hook it up and fly it. People are trying to avoid stacking PA.

"A producer can sell more seats if there are no floor stacks, or very little floor stacks. If you've got a good sightline, you've got maybe three or four thousand more tickets sold."

In addition to the new Martin all-in-one system, Audio Concepts is ex-

perimenting with some new outboard gear. They like the Lexicon 224X, but are also impressed by the Advanced Music System delay unit (AMS) and the Quantec room simulator.

"We're studying the AMS and the Quantec," Pelletier says. "The main thing for us is to have something special to offer. We liked Lexicon 224. We like the sound and all, but we just want something special to offer our customers. If it's possible to get something better, good. If it's possible to get something that's equivalent that is special, maybe we'll go for that one." ■

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# SHOWCO

## Between the Stars and the Fans

by Ben Hunter Boyett

It started as a by-product of the rock music era, seemingly born more of necessity than inspiration. A rock music guitarist, Jack Calmes, began having success as a promoter of Dallas-Fort Worth area appearances by artists like Janis Joplin and The Doors. In association with the well-to-do Angus Wynn III, Calmes promoted the Texas Pop Festival just two weeks after Woodstock. The show, featuring

twenty top acts, was a bust financially. Wynn's subsequent departure meant that Calmes was left with a local booking and promoting agency.

So Calmes, a charming promoter, began booking local concerts using a public address system owned by his own band, The Soul Society. Their PA became the beginning of Showco, a Dallas business that has grown from the garage in which that band's PA was constructed into a thirty-five thousand square foot

headquarters filled with enough speakers and amplifiers to shake the rafters in Fort Worth.

H.R. "Rusty" Brutsche III played bass in Calmes' band. Although his daytime job was as a mechanical engineer at Texas Instruments, he admits that the main reason he was put in charge of building the PA system was because "the bass player always winds up building the PA." But Rusty had trouble trying to

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*(Above) Showco setup for Van Halen concert (using the old Pyramid System).*

— From page 33, SHOWCO

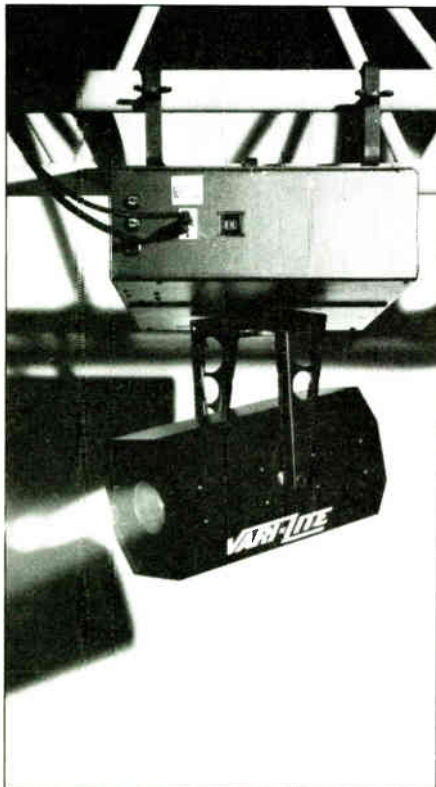
link an Altec 1567 6-input mixer, four Dyna 60 watt amplifiers, and four Altec A-7 Voice of the Theatre speaker

systems. So he turned to his friend Jack Maxson, who owned and operated Delta Studio in Fort Worth, a four track operation where The Soul Socie-

ty recorded. Maxson, who hand built his first hi-fi system at the age of 13, and also hand-built his recording

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# Vari-life



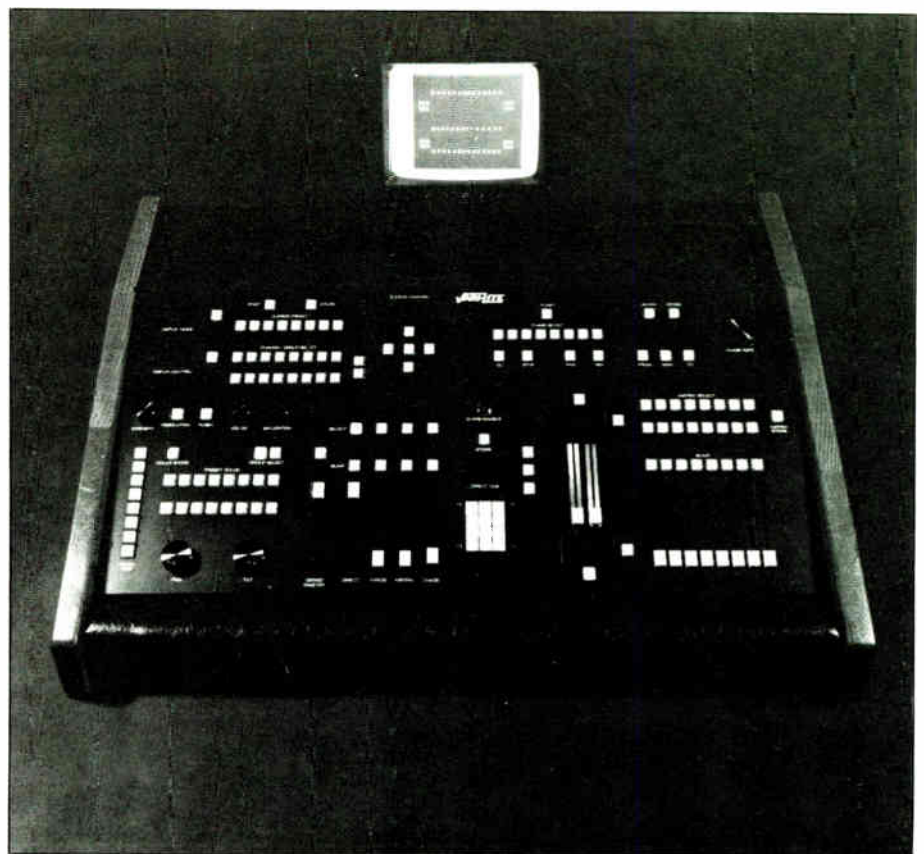
(Above) Moving 'Panic' cue, random colors, beams; for 1982 Genesis tour. (Left) The Vari-Lite Unit with remote computer controller (below).

by Ben Hunter Boyett

A couple of years and perhaps one and a half million dollars in R & D money ago, Showco decided to work out a remote-controlled way to change the colors of the lights at rock shows. Showco engineer Jim Bornhorst, one of those credited with creating the orange slice speaker array idea, reportedly figured out the process, mechanism, or whatever it is that changes the colors in these lights. Vari-Lite lighting director Tom Littrell will only say riddles about the process: It's mechanical rather than electronic or nuclear in function; the colors are permanent; they are selectable over the whole spectrum of color, including UV; it's bigger than a breadbox; and it is patented. The Showco engineers seem to delight in pointing out that the process is so simple that it will give people flat foreheads from banging their palms, lamenting, "Why didn't I think of that?"

The next step seemed logical. As long as they had found out how to

—Page 37



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—From page 34, **VARI-LITE**

make such a good remote controlled color changer, why not make the lighting fixture itself move via robotics? Precision servos easily handled that. Okay, how about changing the lights' intensity? Again, a piece of cake with an electrically-controlled mechanical dimmer.

Before it was over, the Vari-Lite had five distinct functions—pan, tilt, color, beam size, and intensity—except the functions were remote controllable while the fixture hung high over a concert hall.

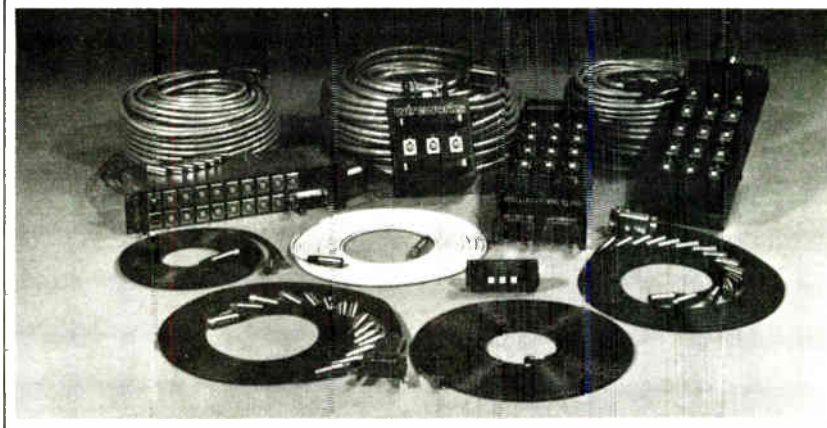
There is a virtually instantaneous selection of 60+ different hues and shades, six different beam sizes plus two special multi-beam pattern effects; smooth, constant color, change in light intensity, 360° panning motion, and a tilting movement of 270°.

All those lighting variables are controlled at a central light board which would be familiar to an experienced lighting director. That board is linked to a Showco-manufactured computer which retains its 128K byte memory when unplugged at the end of the day because of the magic of EAROM (electrically alterable read only memory). The computer—road heavy in durability—features six microprocessors operating in asynchronous mode and parallel processing architecture managing each function of the Vari-Lite when installed and stores in any of its 255 available cues dispersed through each of 96 separate lighting channels. (One cue equals settings for each of the five variables for up to 96 lights.)

All this means if you are sitting at a concert with Vari-Lites, the lights overhead coordinate as though there were dozens of elves up there with spotlights.

So far, you can't buy Vari-Lites. Showco only rents the fixtures, computers, and operators for now. If you could buy a Vari-Lite fixture, it would cost about \$5,000. But Showco is jealously guarding its secrets—not only about the mysterious process which makes the color changes but the patented information on their approach in linking lighting, robotics and computers. The only computer-to-stage connection is a single 2-wire cable telling up to 96 lights what to do every 50 milliseconds.

Rock and roll show lighting is only the beginning, according to Rusty Brutsche, now president of Showco. A smaller tungsten version of the fixture will soon be available for smaller bands, nightclubs, theatres, high school auditoriums, even department store windows. As Brutsche predicts confidently, "I believe an industry will be created on the principle of lights that change colors." ■



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—From page 34, *SHOWCO*

studio, had no trouble assembling the PA. And he enjoyed indulging his loves of music and twisting wires.

At about this time, a promoter named Terry Bassett moved to the Dallas area with the company that became Concerts West. Concerts West hired the fledgling Showco for sound reinforcement jobs with Three Dog Night and Spirit. Soon the company was mixing and amplifying area performances for Jefferson Airplane, Chicago, and Steppenwolf.

One day Calmes, the promoter, brought in The Beach Boys for a concert. His two partners attended the performance as observers, presumably to count the number of A-7 Voice of the Theatre enclosures. Instead, the Californians "brought out four little columns and blew the place away!" says Brutsche. "And that's when I decided that JBL was it."

Brutsche and Maxson then began the first of a long line of sound system renovations. Rusty ordered what the JBL factory man assured him was "the ultimate system," consisting of two single 15" rear-loaded scoop-type cabinets each using a radial horn with a 1" driver for each side of the stage. Confidently, Brutsche and

Maxson took their nicely compact ultimate sound system to the first gig Calmes had booked for them. It was to be an awesome display of public address system power demonstrated by Mountain, one of the hot major recording artists of the day. Brutsche set up folding tables on which he placed not only the company's inventory of four Dyna 60 watt amplifiers, but other amplifiers borrowed from friends. Maxson had even assembled a mechanical passive biamp crossover unit. It was to be a triumph.

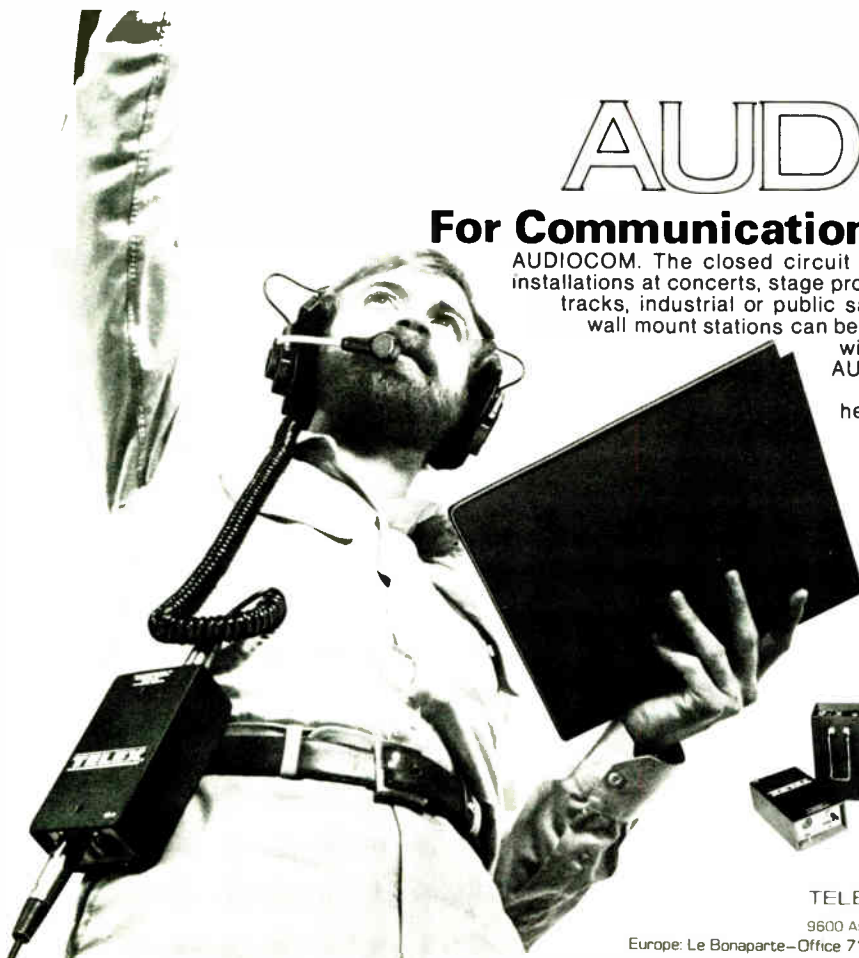
Instead, Rusty and Jack watched in horror as Mountain "unloaded a semi-truckload full of Sunn amps." Leslie West and the rest of Mountain blasted these ultimate sound boys into mega-decibel oblivion. West made the humiliation even more unbearable by mocking the hapless technicians in the orchestra pit and, finally, kicking over a microphone stand in disgust at Brutsche and Maxson.

That did it! Showco scrapped the desire for compactness and ordered eight double 15" rear-loaded JBL bass cabinets plus 12 radial horns, Grommes tube type mixers and 3000 watts worth of solid state Marantz amplifiers. "Nobody understood con-

cert sound," Brutsche confesses now. But at least Leslie West and Mountain had made Showco understand the concept of brute force.

The more powerful system came along advantageously at about the time "touring" began around 1970. Lucrative contracts for sound rentals sent Rusty almost constantly on the road with Led Zeppelin and Jack with Three Dog Night. Calmes stayed behind in Dallas and continued, now as president, to promote the company. Those early successes were heady and fast and Showco soon had six to eight separate sound systems on the road. Craig (the Chief) Shertz, a longtime Showco live engineer, remembers, "In 1972, it was a bunch of hippies in trucks. You were the truck driver, too. It's more of a legitimate business now."

With the two technically-oriented partners touring, Calmes came to see Showco as more of a full service company. He added stage lighting rental services and promoted package deals for sound and lights at rock concerts. Calmes recalls, "We pioneered things that are the norm today. I feel we were the [leaders] of the industry, like [developing] trusses and portable lighting systems. We



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were the first to use pneumatic towers. We were more innovative in lighting than in sound. Our systems were easy to maintain, easy to set up. The artists were responsible for pushing us. The clients wanted it just so. We were the first to fly monitors. We knew we were doing things that were to become the norm!"

Calmes added more division to the company, like set building, manufacturing of disco speaker systems, manufacture of mixers, installations of commercial sound systems, rental of laser special effects lighting, show staging, and the promotion and recording of bands. But the largest diversification for Showco, and the biggest single ill-fated decision, was trucking, complete with a fleet of 15 semi tractors and 20 to 25 air ride trailers. During this period the company grew too quickly to be effectively managed by the partners, who were creating the business as they went.

Though Calmes considers that Showco was a major part of his career, a part of which he is very proud, "I felt that sound was limited. I didn't want to be in the hardware business. I felt the business had peaked."

Calmes has since done well on his own. He is currently producing television programs for his company, the World Showvision Network, which beamed by satellite The Who's last Toronto Show live to theatres on December 17, 1982. [Estimated audience: 5,000,000 viewers. HBO rebroadcast scheduled for May 17, 1983.] The setup is similar to the way live boxing matches are sent to local shows via satellite or phone lines. Calmes points out that the major difference is the excellent sound quality for the live rock concert.

In 1979, Maxson and Brutsche took Showco back to the basics, which to them meant sound rental. Other services were kept on a need-to-have basis. More recently, the company has added a division featuring a developmental computerized lighting system. [See accompanying article.]

Sound system rental by Showco has not only been the company's mainstay, it is a part of the history of music in that Showco installations linked to a 24 track Studer recorder have captured such performances as the albums *Wings Over America*, Jackson Browne's *Running on Empty*, *Kinks Live* and *Willie [Nelson] and Family Live*, to name but a few. Showco's installations have provided sound for such diverse concerts as the controversial "Havana Jam" in 1979,

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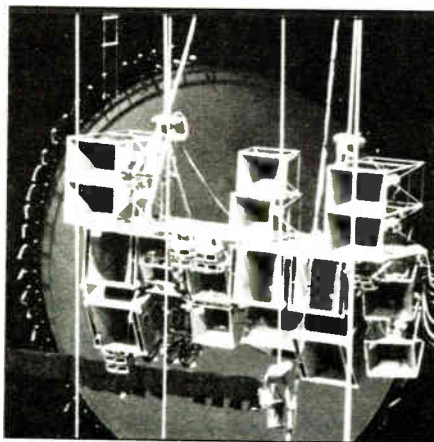
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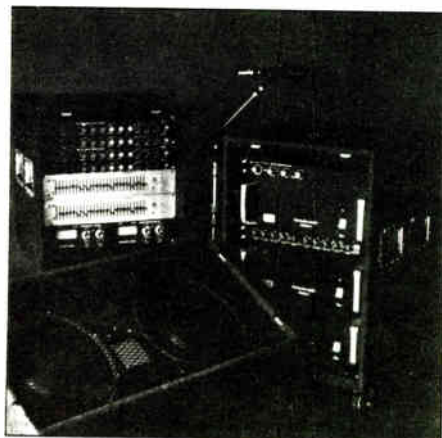
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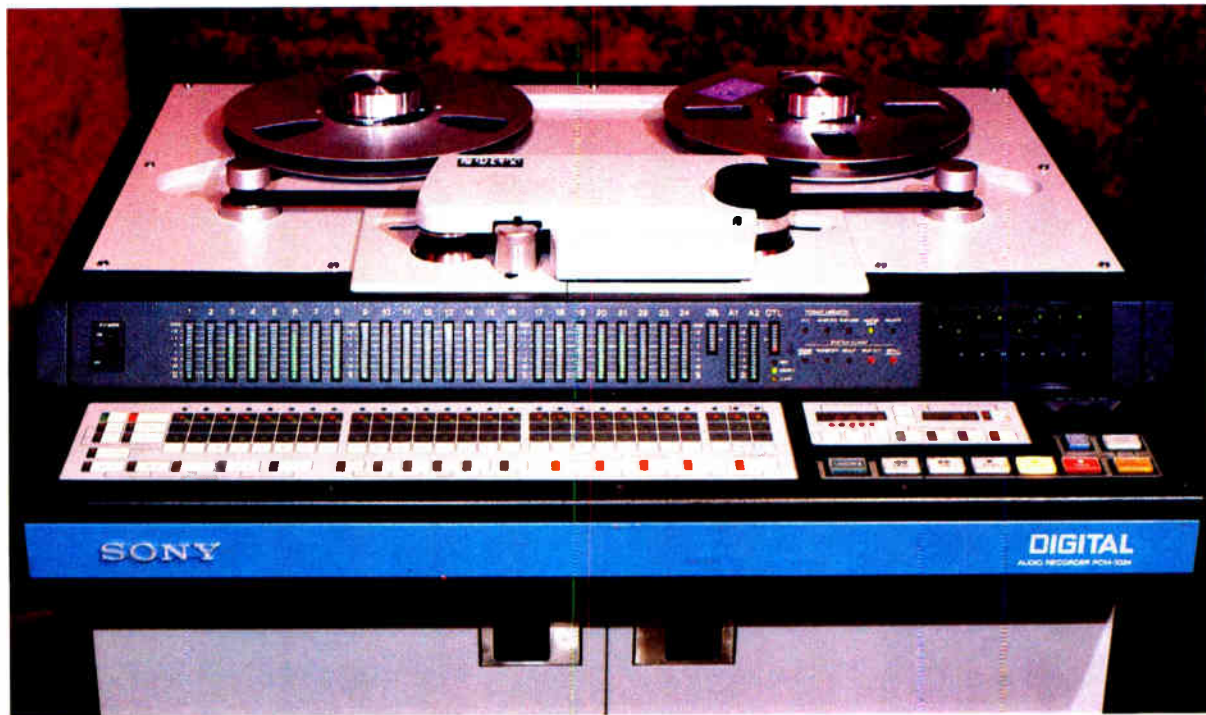
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Symetrix noise gates, Clear Com Intercom system, Panasonic video camera and monitor, "Sola" voltage regulation, 250' 24 pair audio snake, 250' AC power snake, Sony direct drive turntable, G.A.S. Servo Loop pre-amp headphones, mike cords, mike stands, AKG M66 phantom power, AKG, Sennheiser, E-V, Shure, Crown P2M, Sony and Beyer mikes, Countryman Direct Boxes. **Services Available:** Digital recording, video synchronizations and any other outboard gear available on request.

**ANDROMEDA UNLIMITED**  
**SOUND REINFORCEMENT**  
 120 York Ave., Kensington, CA 94708  
 (415) 524-1022  
 Contact: Tom Septon

**AUDIO SYSTEMS RENTAL**  
**SOUND REINFORCEMENT**  
 21169 West River Rd., Stevinson, CA 95374  
 (209) 632-7098 or (209) 576-8632  
 Contact: Ray Verra, Donald Setaro

**AUDISSEY SOUND**  
**SOUND REINFORCEMENT**  
 1020 Auahi St., Bldg #6, Honolulu, HI 96814  
 (808) 521-6791  
 Contact: Allan Cravalho/Loy

We have in our inventory exclusively products which exhibit the highest degree of professional audio to serve you in the professional way - the only way we know how. Some of the products are Aphex Audio Arts, Biamp, BGW, Clear Com, Crown, Community Light & Sound, dbx, Electro-Voice, JBL, John Meyer, Revox, Sennheiser, Shure, Soundcraft and much more.

**Services Available:** We are set up to do an 8 or 10-way monitor mix complete with 4 way bamped floor monitors or 4 way quad-amped side fills and all equipment necessary to give you the proper mix. We also are equipped to handle all important front of the house mix. We have worked with such acts as Tony Orlando, Willie Nelson, Grand Funk, Sergio Mendes, Burt Bacharach, Carole Bayer Sager and others. If it has anything to do with audio, you should be seeing Audissey.

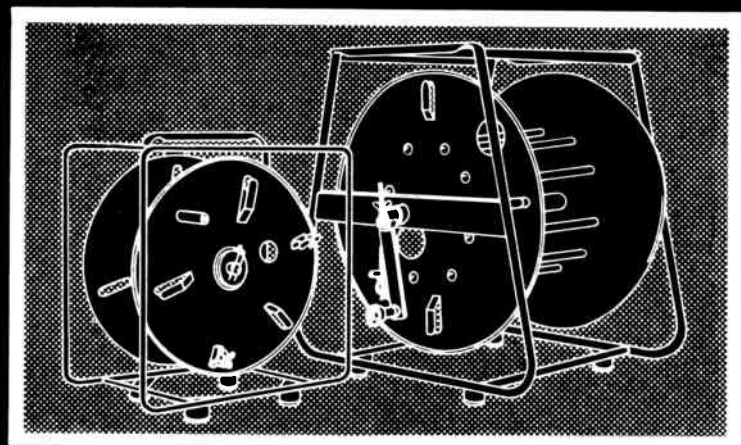
**AUTHENTIC SOUND LOCATION RECORDING**  
**REMOTE RECORDING**  
 30 Princess Ct., Sausalito, CA 94965  
 (415) 331-2889

Contact: John Overton

**Equipment:** Truck is 24x8x8. Control room is acoustically engineered for flat response above 65 Hz. Console automated MCI 618 without transformers. Up to 24 I/O available with additions. Recorders: 2 MCI 1108 transformerless 8 tracks, one ATR 102 modified transformerless, one Nagra IV S. Also on request: RM 79 24 track Mitsubishi, digital 2 track Mikes Neumann, Schoeps, Sennheiser, Beyer, Shure, RCA and others. Complete Tektronix test bench in location.

**Services Available:** Location recording for records, film and video. Client may supply own engineers or those from our staff. ATR may be configured for two track 1/2" 30 ips to provide audiophile recording. Price between \$500 - \$2,000 per session depending on project complexity and personnel and equipment necessary. A technically satisfactory result is guaranteed.

**BANDBOX MUSIC**  
**SOUND REINFORCEMENT**  
 537 So. Main St., Ukiah, CA 95482  
 (707) 462-5386  
 Contact: Frank Short



## Big, Tough Cable Drums From Keith Monks

With five sturdy models to choose from you can wind 300, 1300 or more feet of cable onto these unique cable drums.

Built of strong reinforced steel, Keith Monks cable drums are nylon dipped for a long-wearing, rust resistant finish. Each frame has a removable center reel. Use one frame and several reels to save time, cost and space. Rubber feet add stability and allow stacking of same model.

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**KEITH MONKS AUDIO (USA) INC**  
 1169 Tower Road Schaumburg, IL 60195 (312) 885-0066

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**BLUMER BROS MUSIC**  
**SOUND REINFORCEMENT**  
 1137 Lincoln Ave., Napa, CA 94558  
 (707) 252-7035  
 Contact: Jeff Blumer

**BODACIOUS AUDIO INC**  
**REMOTE RECORDING**  
 301 Harbor Drive, Sausalito, CA 94965  
 (415) 331-7559  
 Contact: Bob Eulaly  
**Services Available:** Complete TV system, set up and repaired especially for radio wave. SMITH for get your music done. Pro studio quality video production, live and studio, analog and digital. Complete album in a room. Packages which include air transport, post production, outdoor photography, album cover design, and distribution.

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

**BROADCAST SUPPLY WEST**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 7012 27th St. W., Tacoma, WA 98466  
 (206) 565-2301  
 Contact: Bill Hark (800) 421-8444

**CAPITAL COMMUNICATIONS INDUSTRIES, INC**  
**SOUND REINFORCEMENT**  
 P.O. Box 481, Olympia, WA 98507  
 (206) 943-5378  
 Contact: Mike Hannon (800) 421-8444

**CARAWAY AUDIO**  
**REMOTE RECORDING**  
 3224 Bay Rd., Redwood City, CA 94063  
 (415) 366-1690  
 Contact: Bill Caraway

**CASABLANCA MUSIC**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 2107 James Ave., Box 7838, So. Lake Tahoe, CA 95731  
 (916) 542-1176  
 Contact: Bill

**CHONK MOONHUNTER**  
**REMOTE RECORDING**  
 2721 Bellaire Place, Oakland, CA 94601  
 (415) 436-6978  
 Contact: Jeff Chonk

**COLORADO CONCERT SOUND, INC**  
**SOUND REINFORCEMENT**  
 Box 1652, Longmont, CO 80502  
 (303) 772-3933  
 Contact: Tom Bergman

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

**FAST TRACK STUDIOS**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 1906 E 115 Pl., Northglenn, CO 80233  
 (303) 457-0730  
 Contact: Terry N. Miller

**FM PRODUCTIONS**  
**SOUND REINFORCEMENT**  
 1275 Minnesota St., San Francisco, CA 94107 3489  
 (415) 647-5600  
 Contact: Frank Hill (800) 421-8444

**GUITARS ETC**  
**SOUND REINFORCEMENT**  
 11810 N E 8th Ave., Bellevue, WA 98005  
 (206) 451-3878  
 Contact: Carl Nelson (800) 421-8444

**HAIGHT ASHBURY MUSIC CENTER**  
**SOUND REINFORCEMENT**  
 1458 Haight St., San Francisco, CA 94117  
 (415) 863-7327  
 Contact: Mike Hill

# Remote & Recording & Sound Reinforcement

**HIGH TECH AUDIOSYSTEMS**  
**SOUND REINFORCEMENT**  
 P.O. Box 24571, Denver, CO 80224  
 (303) 777-3561  
 Contact: Mark A. Foster

**Equipment:** Full line Audio Visual gear, complete studio equipment for all types applications. In the employment of our staff we use a wide variety of quality Hater to our professional studio equipment, including Yamaha, computer mixer and other equipment from UREI, Orban and MXR. IRI and Electro Voice are used exclusively for main monitoring speakers. Many of our units are custom made to meet the specific needs of each client.

**Services Available:** New installations and reinforcement including all types of equipment. It is our intention to provide a higher degree of professionalism and dedication to our clients with our best quality and lowest company rates. We are ready to offer an excellent product personally and with the utmost care and attention to your needs. We will be glad to provide a free estimate on any project.

**HORODKO SOUNDTRAX**  
**REMOTE RECORDING**  
 111 Vallejo St., San Francisco, CA 94111  
 (415) 956-8729

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

**Equipment:** Stereo 44, mixer, 24, 12, 8, 6, 5, 4, 3, 2, 1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

**Services Available:** In-home recording studio, mobile recording, live sound reinforcement, PA system rental, complete production sales and service. We will provide a new studio with a total 40 input dual track mobile recording.

**KENNELLY KEYS**  
**SOUND REINFORCEMENT**  
 816 N W 45th St., Seattle, WA 98105  
 (206) 632-8989  
 Contact: Sam E. Kenelly (800) 421-8444

**ROB KINGDOM**  
**mobile**  
 16 Track Location Recording  
 (408) 732-5305

**ROB KINGDOM MOBILE RECORDING**  
 Sunnyvale, CA

**Fanta**  
 PROFESSIONAL SERVICES  
 NASHVILLE, TENNESSEE  
 615-327-1731  
**40 INPUT DUAL 24 TRACK**  
**MOBILE RECORDING**

Circle #032 on Reader Service Card

**ROB KINGDOM MOBILE RECORDING  
REMOTE RECORDING**

120 Remington #415, Sunnyvale, CA 94087  
(408) 732-5305  
Contact: Rob Kingdom

**Equipment:** Complete and rental equipment includes 4-way tape transfer system, Yamaha 44B24, Yamaha PM1000, two UREI processors, JBL bx35 1/2" stereo speakers, QSC console power amps, 1000 and 32x10 monitor systems, 4-way JBL sound field monitors, complete line of mix consoles, Lexicon DDL, Master Room and AKG 4815 HI Trans w/30 trailer.

**Services Available:** Full-time mobile recording studios, audio engineering, mixing, and post-production. We have the expertise to handle any size project, from live performance to commercial recording. We have the equipment and experience to provide the highest quality recordings.

**KUOP - MOBILE RECORDING  
REMOTE RECORDING**

3601 Pacific Ave., Stockton, CA 95211  
(209) 946-2582  
Contact: Bob King

**LITTLE BIRD PRODUCTIONS  
SOUND REINFORCEMENT & REMOTE RECORDING**

4416 S.E. Hwy 101, Lincoln City, OR 97367  
(503) 996-2575  
Contact: Little Bird

**MATEL SOUND CO  
SOUND REINFORCEMENT & REMOTE RECORDING**

432 Church St., Garberville, CA 95440  
(707) 923-3388  
Contact: Mael Sound

**MATRIX SOUND SERVICE  
SOUND REINFORCEMENT**

191 Oakridge Drive, Daly City, CA 94014  
(415) 587-1240  
Contact: Matrix Sound

**MCCUNE SOUND  
SOUND REINFORCEMENT**

951 Howard St., San Francisco, CA 94103  
(415) 777-2700  
Contact: McCune Sound

**MELODY MUSIC  
SOUND REINFORCEMENT**

3451 So. Acoma, Englewood, CO 80110  
(303) 789-4496  
Contact: Melody Music

**MRT - MOBILE RECORDING TECHNICIANS  
REMOTE RECORDING**

Main office: 436 Pukoi St., Suite 201, Honolulu, HI 96814  
Marin, CA, office: 145 Hawthorne, Larkspur, CA 94939  
Main (808) 538-6292, Marin (415) 924-5761  
Contact: Main: Mark Muzakata; Marin: Chris Hanson



**MOGAN SOUND**  
Lynnwood, WA

**MORGAN SOUND, INC  
SOUND REINFORCEMENT**

2004 196th S.W., #2, Lynnwood, WA 98036  
(206) 771-7257  
Contact: Charlie Morgan or Bruce George

# Remote & Recording Sound Reinforcement

**Equipment:** Complete and rental equipment includes 4-way tape transfer system, Yamaha 44B24, Yamaha PM1000, two UREI processors, JBL bx35 1/2" stereo speakers, QSC console power amps, 1000 and 32x10 monitor systems, 4-way JBL sound field monitors, complete line of mix consoles, Lexicon DDL, Master Room and AKG 4815 HI Trans w/30 trailer.

**Services Available:** Full-time mobile recording studios, audio engineering, mixing, and post-production. We have the expertise to handle any size project, from live performance to commercial recording. We have the equipment and experience to provide the highest quality recordings.

**MOUNTAIN MOBILE RECORDING INC  
REMOTE RECORDING**

Rt 1 Box 25, Tulelake, CA 96134 (30 miles south of Klamath Falls, Oregon)  
(916) 667-5508  
Contact: Mountain Mobile

**Equipment:** Stereo and mono recording equipment, Otari MTR90 24 track w/ auto mix, 24 track 1/2" 32 channel splitter, 6-way JBL, outboard gear includes: Lexicon Prime Time, AKG BX10 stereo, Otari DeLacat, Valley People cabs, dbx 160L comp, White active analyzer, etc. Monitor speakers UREI 811A.

**Services Available:** Mobile recording. Anywhere, anytime. Extremely reasonable. 24 track 1/2" base price \$750. Additional 24 track add-on \$1000. At Mountain Mobile, we pride ourselves with offering the best and most professional service, with a full complement of equipment and facilities for relaxation. Try it, you'll like it.

**NORTHWEST SOUND INC  
SOUND REINFORCEMENT**

P.O. Box 3586, Portland, OR 97208  
(503) 286-9411  
Contact: Northwest Sound

**OUTBACK MOBILE RECORDING  
REMOTE RECORDING**

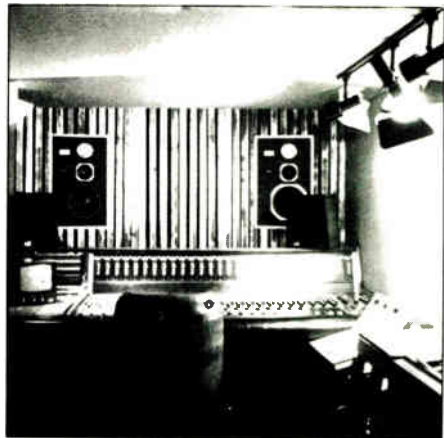
489 1/2 Cavour St., Oakland, CA 94618  
(415) 655-2110  
Contact: Wilson Dyer

**Equipment:** Complete and rental equipment includes 4-way tape transfer system, Yamaha 44B24, Yamaha PM1000, two UREI processors, JBL bx35 1/2" stereo speakers, QSC console power amps, 1000 and 32x10 monitor systems, 4-way JBL sound field monitors, complete line of mix consoles, Lexicon DDL, Master Room and AKG 4815 HI Trans w/30 trailer.

## Outback Studios/Mobile

489 1/2 Cavour St  
Oakland, CA 94618  
(415) 655-2110

**OUTBACK MOBILE RECORDING**  
Oakland, CA



**PACIFIC MOBILE**  
Sacramento, CA

**PACIFIC MOBILE RECORDERS  
REMOTE RECORDING**

2616 Garfield Ave., Sacramento, CA 95608  
(916) 483-2340  
Contact: Kat Hibbard

**Equipment:** Otari MTR90 24 track w/ auto mix, modified Tanaent 32 to 48 line transformerless 3M 2 track, JBL 4515 monitors, M&K loose field monitors, Avatronics Outdoor gear includes UREI dbx and five-tide qebers and limiters, DeLacat and Ibanez delay lines, Otari stereo reverber and active direct boxes, several mike snakes totaling 34 pair with 28 isolated stage splits. A wide assortment of mikes, stands, adaptors, etc., video monitor, turntable all in a system designed by GIMMEX.

**Services Available:** Complete 24 track recording for albums, demos, video productions, commercials, etc., video, TV broad casts and film soundtracks. Competitive rates and turn times. Hot day rates start at \$500.

**PAOLETTI/LEWITZ/ASSOCIATES INC.  
ACOUSTICAL CONSULTANTS  
SOUND REINFORCEMENT**

40 Gold Street, San Francisco, CA 94133  
(415) 391-7610  
Contact: Joel A. Lewitz, P.E.

**PATCHWORK PRODUCTIONS/PATCHBAY RECORDING  
SOUND REINFORCEMENT & REMOTE RECORDING**

P.O. Box 486, San Quentin, CA 94964  
(415) 459-2331

**PERFORMANCE AUDIO  
SOUND REINFORCEMENT**

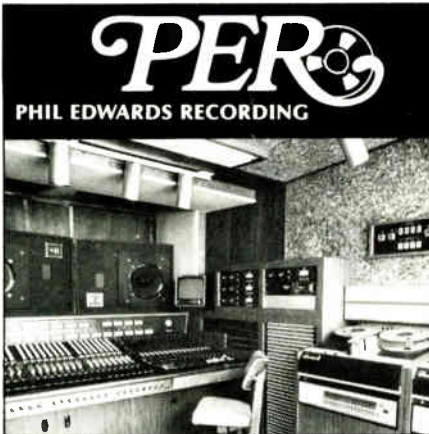
2358 So. Main, Salt Lake City, Utah 84115  
(801) 355-8890  
Contact: Klay Anderson

**PFS RECORDING  
REMOTE RECORDING**

P.O. Box 6840, San Jose, CA 95150-6840  
(408) 275-6322  
Contact: Mike Halloran

# Remote & Recording Sound Reinforcement

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



PHIL EDWARDS RECORDING  
San Francisco, CA

PHIL EDWARDS RECORDING (PER)  
REMOTE RECORDING  
1338 Mission Street, San Francisco, CA 94103  
(415) 861-4439

Contact: Phil DeLaine, remote manager

**Equipment:** PER's Mobile II has 121X8X/ body air ride air conditioning and all state Cor. ops. API mix in 40x24 main API 164 auxiliary Mixers 4M, 54.4 track 2, 26 track 2, 8 track 2, track MCTH, 10B - Amplex 4400 2 Scry Awa. 55 sets 51 Monitor/ UHF 1011B or Ales 604s Airtones M/dest, amp/ Mike 20 cond-mers Neumann (8) AKG 41 Star-D 2 Scry 2 F V 4 46 dynamic Sennheiser 41 Shure 50 F V 41 BGA 2 Countryman direct 2 Access 105 64 transistor isolated mike split 28 channels Dolby noise reduction 7 UHF limiters AKG stereo echo ClearCom Alter state com systems CI mod circuit video assorted signal processing studio stands etc.

**Services Available:** We work through the talents of the artists in studios we serve. Twenty-four hours a day are for many winners or nominees. With our latest facilities, we are fully equipped for any type of on location video album, broadcast film or commercial production. Same day color or tint and the latest packages are available. Well over one hundred synchroized max 1/4 inch 1600 production facilities. Secondary 1984 Mix for credits.

PINE APPLE STUDIOS  
REMOTE RECORDING  
P.O. Box 1192, Philomath, OR 97370  
(503) 757-8702  
Contact: Clayton Ashley, Henry Zellers, producers

POLL SOUND  
SOUND REINFORCEMENT  
3473 So. West Temple, Salt Lake City, UT 84115  
(801) 484-8747  
Contact: Dew and Timothy

**Equipment:** Concert Sound System features JBL and E.V. speakers. All constant directivity mids and highs. Electronic time compensation for main c/s. Amplifiers are Crown and Crest. Equalizers and limiters are UHF1. We use some custom signal processing. Main console is Neotek monitor consoles are PS. All popular vocal mikes are available, also PZMs, 421s, etc. Direct boxes are UHF1. Monitor system has 8 mono, UHF1 EQ, Crown power. Side fill and wedge mics are time aligned.

**Services Available:** Services include sound services for shows from small variety shows to medium size concerts. All technical and operational personnel are provided. Also, over the counter, rental and lease professional systems and components repair sales including over 50 professional sound lines, permanent sound systems engineering, sales, and installation. Call or write for complete detailed information.

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



PRO MEDIA  
San Francisco, CA

PRO MEDIA  
SOUND REINFORCEMENT  
185 Berry St., Suite 358, San Francisco, CA 94107  
(415) 957-1383  
Contact: Dottie Kay

**Equipment:** Pro Media supports both professional users of audio equipment and amateur musicians. The most up-to-date professional equipment is available at very low prices. The most complete collection of music sound lines, box sets, 2000 RF system, auto-tune, auto-tuner, crown, Voco, Revox, HME, Studer and FV TEAC tape machines, Shure JBL, Amplex, UHF1 limiters, AKG, etc., are continuously available from Pro Media. Specialized mobile recording equipment, Assorted mobile recording vehicles are available. Mobile recording services.

**Services Available:** Pro Media's technical staff is available to assist in the support of your audio reinforcement equipment needs from basic delivery and installation to complete on-site system maintenance. Custom designed systems with feature Meyer sound lines, custom designed portable systems have been developed from Pro Media's extensive technical experience. From Pro Media's extensive mobile recording power and mobile recording services, Pro Media systems can provide the most complete mobile recording services available to meet your specific mobile reinforcement needs.

PRODUCTION ST MICHEL  
(formerly PARALANDRA PRODUCTIONS)  
REMOTE RECORDING  
840 E. 3925 S., Greenbank, WA 98253  
(206) 421-6697  
Contact: M. L. and Lisa Baker

RAINBOW SOUND STUDIOS  
REMOTE RECORDING  
24289 Mission Blvd., Hayward, CA 94544  
(415) 882-9980/886-6048  
Contact: J. A. The R. P. & W. A. Ales, remote equipment

BILL RASE PRODUCTIONS INC.  
REMOTE RECORDING  
955 Venture Ct., Sacramento, CA 95825  
(916) 329-9181

RICH SOUND  
SOUND REINFORCEMENT  
P.O. Box 3385, Chico, CA 95927  
(916) 891-1972  
Contact: Bill Rase

**Introducing...**  
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Ft. Lauderdale, FL 33334

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# SKYELABS

THE MOBILE RECORDING UNIT

58 W. TIDBURY DRIVE  
DOVER, DE 19901  
302/697-6226

(See Listing)

Circle #033 on Reader Service Card

**ROAD WEST RECORDING INC**  
**REMOTE RECORDING**  
 964 Lorraine Ave., Salt Lake City, UT 84106  
 (801) 484-6539  
 Contact: A. Shultz

**ROSE CITY SOUND**  
**SOUND REINFORCEMENT**  
 1939 S.E. Morrison, Portland, OR 97214  
 (503) 238-6330  
 Contact: Wayne Jones

**SAUSALITO RECORD PLANT INC.**  
**REMOTE RECORDING**  
 2200 Bridgeway, Sausalito, CA 94965  
 (415) 332-6100  
 Contact: Jerry DeBari

**RANDALL SCHILLER PRODUCTIONS**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 1207 Fifth Ave., San Francisco, CA 94122  
 (415) 661-7553  
 Contact: Randall Schiller

**SHYNE SOUND**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 40 Woodland, San Rafael, CA 94901  
 (415) 459-2833  
 Contact: Jerry Bremer

**Equipment:** M111, B1, track console B14, 44, 46, track  
 TRAC 8000 track, TRAC 10500, NB cassette, Soundcraft  
 15 mixer, A&H 122 mixer, 4 mikes, TBA 7510 10 track  
 analog, Wetmore 24 part track system, console, track, mixer  
 patch, disk, 250 amp, mixer. Control panel, 60 part, DLZ  
 Avoust computer, DBL & MXI, 81 band graphics, 80 W and  
 Sweet 12 speaker, Klipsch M.M. 1900 4 way speaker system,  
 4 Klipsch LS100 speakers, 4 m, 100 watt, 100 x 4 part  
 at 200 W.

**Services Available:** Complete sound reinforcement serv-  
 ices, system design, consultation, installation, 6000 channels for  
 professional, studio and live performance. Also, complete stage  
 lighting, lighting control, power distribution, control, for rental.

**SILVER LABEL RECORDING**  
**REMOTE RECORDING**  
 305 Melville, Palo Alto, CA 94301  
 (415) 321-5776  
 Contact: Eric Dahlberg, M. E. Jr.

**SKIP'S MUSIC, INC**  
**SOUND REINFORCEMENT**  
 2740 Auburn Blvd., Sacramento, CA 95821  
 (916) 484-7575

**SMEED SOUND SERVICE**  
**SOUND REINFORCEMENT**  
 790 8th Ave., P.O. Box 2099, Eugene, OR 97402  
 (503) 686-1654  
 Contact: Glenn H. Smeed Sr. or Jr.

**SONRISE PRODUCTIONS**  
**REMOTE RECORDING**  
 696 Maylen Dr., Livermore, CA 94550  
 (415) 449-8566  
 Contact: Anthony or Krista Tallas

**SOUND ADVICE SOUND SYSTEMS — SASS**  
**SOUND REINFORCEMENT**  
 P.O. Box 647, Saratoga, CA 95071  
 (408) 257-4015  
 Contact: Frank Chavira

**SOUND ON STAGE, INC**  
**SOUND REINFORCEMENT**  
 100 Northhill Dr., #30, Brisbane, CA 94005  
 (415) 468-2990  
 Contact: Jerry Heiber

**Equipment:** Mixers, 4 in x 16 out, 40 m, 4 in x 8 out, 24  
 in x 8 out, 20 in x 6 out. Certified, bonded, fully speakers in all rol-  
 l, assumes House, 32 in x 8 out, 42 in x 8 out, 42 in x 4 out, 10 in x 4  
 out, EQ, octave, 1/2 octave, octave, 1/2 octave, 1/2 octave, 1/2 octave,  
 including Neodymium wireless mikes, Effects, tape, and matrix delays,  
 echo and reverb, and Harmonizer, Flangers, and phasers, house  
 speakers, 117 proprietary 4 way cabinets, Monitors, 50 monitor  
 cabinets, 4 amp, 4 amp, 4 amp, 4 amp.

**Services Available:** Complete sound reinforcement serv-  
 ices, system design, consultation, installation, 6000 channels for  
 professional, studio and live performance. Also, complete stage  
 lighting, lighting control, power distribution, control, for rental.

# Remote & Recording Sound Reinforcement

**THE SOUND PRESERVERS**  
**REMOTE RECORDING**  
 911 East 4th Ave., Olympia, WA 98506  
 (206) 352-9097  
 Contact: Allen Giles

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

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

**STEELHEAD PRODUCTIONS**  
**REMOTE RECORDING**  
 Box 366, Blackfoot, ID 83221  
 (208) 785-7298  
 Contact: Jan Lykett, owner/mgr.

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

**SUNSET AUDIO-VIDEO CENTER**  
**REMOTE RECORDING**  
 856 Airport Rd., Monterey, CA 93940  
 (408) 373-1300  
 Contact: Tom Brown

**THE THIRD EAR SOUND CO**  
**SOUND REINFORCEMENT**  
 1507 Hillcrest Dr., San Pablo, CA 94806  
 (415) 233-2920  
 Contact: John Hasbald, Bill Stated, Dave Trapp,  
 Greg Tullis

**TIME & SPACE**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 445 Natoma, San Francisco, CA 94103  
 (415) 777-0494  
 Contact: Joe Towler

**TRANSPARENT RECORDINGS**  
**REMOTE RECORDING**  
 883 Golden Gate Ave., San Francisco, CA 94102  
 (415) 563-6164  
 Contact: Lolly Lewis

**TRAX AUDIO**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 2470 North Fairfield Rd., Layton, UT 84041  
 (801) 776-4271  
 Contact: Jeff Custer

**ULTIMA MOBILE UNIT I**  
**REMOTE RECORDING**  
 P.O. Box 20604, Sacramento, CA 95820  
 (916) 446-6301  
 Contact: Alvin and V. Covatta, M. Marla A. Covatta

**UNION GROVE MUSIC**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 1013 Pacific Ave., Santa Cruz, CA 95060  
 (408) 427-0670  
 Contact: Geoff Miller

**VERSATILE VIDEO INC**  
**REMOTE RECORDING (Video Only)**  
 151 Gibraltar Court, Sunnyvale, CA 94086  
 (408) 734-5550  
 Contact: Jeff White, Bruce Grier, Steve

**WAH SOUND**  
**SOUND REINFORCEMENT**  
 1115 R St., Sacramento, CA 95814  
 (916) 444-5491  
 Contact: Walter Horstman

**DON WEHR'S MUSIC CITY**  
**SOUND REINFORCEMENT**  
 817 Columbus Ave., San Francisco, CA 94133  
 (415) 673-9700  
 Contact: Don Wehr

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



**XANDOR RECORDING**  
 Orinda, CA

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

**PHIL A YEEND PRODUCTIONS**  
**REMOTE RECORDING**  
 1624 King Rd., Winlock, WA 98596  
 (206) 785-4428  
 Contact: Phil Yeend, Bill Yeend

## Southwest

**A-1 AUDIO SYSTEMS**  
**SOUND REINFORCEMENT**  
 537 E. Sahara, Suite 210, Las Vegas, NV 89104  
 (702) 735-3407  
 Contact: Mark F. Smith

**ALPHA AUDIO SYSTEMS, INC**  
**SOUND REINFORCEMENT**  
 P.O. Box 26460, Austin, TX 78755  
 (512) 250-9794  
 Contact: Ed Lewis

**ASI ABADON/SUN, INC**  
**SOUND REINFORCEMENT**  
 P.O. Box 6520, San Antonio, TX 78209  
 (512) 824-8781  
 Contact: Woody Smith  
**Equipment:** 4 in x 16 out, 40 m, 4 in x 8 out, 24  
 in x 8 out, 20 in x 6 out. Certified, bonded, fully speakers in all rol-  
 l, assumes House, 32 in x 8 out, 42 in x 8 out, 42 in x 4 out, 10 in x 4  
 out, EQ, octave, 1/2 octave, octave, 1/2 octave, 1/2 octave, 1/2 octave,  
 including Neodymium wireless mikes, Effects, tape, and matrix delays,  
 echo and reverb, and Harmonizer, Flangers, and phasers, house  
 speakers, 117 proprietary 4 way cabinets, Monitors, 50 monitor  
 cabinets, 4 amp, 4 amp, 4 amp, 4 amp.



# UNLOADING AREA



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For the fast-paced, hurry-up, load-it-up, load-it-in kind of abuse found on the road, you need a speaker that does more than sound good.

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KLIPSCH Professional Series Loudspeakers may be the toughest. Cabinets are built of stout plywood panels, fitted together with several pounds of glue and screws. Then they're sprayed with black fiberglass and epoxy to make 'em even more durable. And finally, every edge and corner is custom fitted with die cast aluminum trim to take the bite out of the hardest knock.

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All this attention to toughness results in a loudspeaker that takes it as well as it puts it out—a loudspeaker that stays together, delivering clean sweet sound, for years and years.

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# Why Beyer microphones give you more extraordinary performance for the most ordinary applications.



Beyer M 88



Beyer M 201



Beyer M 160

**There are other microphone alternatives when high sound pressure is a factor.**



As Sennheiser claims, the MD 421 undoubtedly stands up to extremely high decibel levels and has other features that have contributed to its popularity. But if you're already using the MD 421 to mike loud instruments or voices, we suggest that you investigate the Beyer M 88.

The Beyer Dynamic M 88's frequency response (30 to 20,000 Hz) enhances your ability to capture the true personality (including exaggerated transients) of bass drums, amplified instruments and self-indulgent lead vocalists.

The Beyer M 88 features a matte black, chromium-plated brass case for the ultimate in structural integrity. Beyer microphones are designed for specific recording and sound reinforcement applications.

**When you need a rugged and versatile microphone, consider the alternatives.**



For over 10 years, engineers have used mics like Shure's SM57 for the widest variety of applications in the studio. And we feel that one of the main reasons more engineers don't use the Beyer M 201 in this context is simply because they don't know about it. Those who have tried it in the full gamut of recording situations have discovered how it can distinguish itself when miking anything from vocals to acoustic guitar to tom toms.

The M 201's Hyper-Cardioid pattern means that you get focussed, accurate reproduction. Its wide and smooth frequency response (40 to 18,000 Hz) provides excellent definition for the greatest number of possible recording and sound reinforcement situations.

Each Beyer Dynamic microphone has its own custom-designed element to optimize the mic's performance for its intended use.

**You may not always need a condenser microphone for "critical" recording applications.**



Some engineers prefer condenser microphones like the AKG C 414 to accurately capture the subtle nuances of a violin or acoustic piano. But should you have to deal with the complexity of a condenser system every time this kind of situation comes up?

The Beyer Dynamic M 160 features a double-ribbon element for the unique transparency of sound image that ribbon mics are known for. While its performance is comparable to the finest condenser microphones, the M 160's compact size and ingenious design offers significant practical advantages for critical applications.

Beyer Dynamic microphones offer state-of-the-design technology and precision German craftsmanship for the full spectrum of recording and sound reinforcement applications.

**The Dynamic Decision**

**beyerdynamic**

# Remote & Recording Sound Reinforcement

Remote Recording & Sound Reinforcement, Inc. is a leading provider of audio services for live events. We offer a wide range of services including live sound reinforcement, recording, and audio production. Our experienced technicians and state-of-the-art equipment ensure the highest quality sound for every event.

**AUDIOGENICS**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
Box 141325, Dallas, TX 75214  
(214) 826-5984  
Contact: Rick Ferguson, Ed Webb

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

**Equipment:** The chat equipment ChatMHSR, a 16 track 24 channel MABOBI, the tape recorder, a dual channel, a new wide patch bus & most important 200 noise reduction. Using 3 SM12b monitors, a 4x9000 amp amplifier, & noise of the Master Room XL 900 receiver and Neumann AKG condenser P.V. Stereo microphone, a wide track, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc.

**Services Available:** The chat equipment chatMHSR, a 16 track 24 channel MABOBI, the tape recorder, a dual channel, a new wide patch bus & most important 200 noise reduction. Using 3 SM12b monitors, a 4x9000 amp amplifier, & noise of the Master Room XL 900 receiver and Neumann AKG condenser P.V. Stereo microphone, a wide track, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc.

**CISCO SOUND**  
**SOUND REINFORCEMENT**  
P.O. Box 16583, Lubbock, TX 79490  
(806) 763-3537  
Contact: A. N. P. S.

**COOKSOUND PRODUCTIONS**  
**REMOTE RECORDING**  
6626 Hornwood, Houston, TX 77074  
(713) 772-1006  
Contact: Bob Turner, Rick

**DIGITAL SERVICES**  
**REMOTE RECORDING**  
2001 Kirby #1001, Houston, TX 77019  
(713) 520-0201  
Contact: Jim Martin

**Equipment:** The chat equipment ChatMHSR, a 16 track 24 channel MABOBI, the tape recorder, a dual channel, a new wide patch bus & most important 200 noise reduction. Using 3 SM12b monitors, a 4x9000 amp amplifier, & noise of the Master Room XL 900 receiver and Neumann AKG condenser P.V. Stereo microphone, a wide track, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc.

**Services Available:** The chat equipment chatMHSR, a 16 track 24 channel MABOBI, the tape recorder, a dual channel, a new wide patch bus & most important 200 noise reduction. Using 3 SM12b monitors, a 4x9000 amp amplifier, & noise of the Master Room XL 900 receiver and Neumann AKG condenser P.V. Stereo microphone, a wide track, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc.

**E A R PROFESSIONAL AUDIO**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
947 S. 48th St., Tempe, AZ 85281  
(602) 968-8675  
Contact: Ed Vokat, John Gibson  
**Services Available:** E.A.R. Professional Audio provides a wide range of audio services for live events. We offer a wide range of services including live sound reinforcement, recording, and audio production. Our experienced technicians and state-of-the-art equipment ensure the highest quality sound for every event.

**GENERAL SOUND COMPANY**  
**SOUND REINFORCEMENT**  
P.O. Box 2367, Richardson, TX 75081  
(214) 231-2541  
Contact: Paul Martin

**HIGHLAND SOUND CO. PHANTOM PRODUCTIONS**  
**REMOTE RECORDING**  
P.O. Box 4870, Austin, TX 78765  
(512) 443-7965

**JANUARY SOUND**  
**REMOTE RECORDING**  
3341 Towerwood, Ste. 206, Dallas, TX 75234  
(214) 243-3735  
Contact: Dan Johnson

**JUSTICE SOUND SYSTEMS**  
**REMOTE RECORDING**  
Rt. 3 Box 771, Los Lunas, NM 87031  
(505) 869-3527  
Contact: Dave Taylor

**Equipment:** The chat equipment ChatMHSR, a 16 track 24 channel MABOBI, the tape recorder, a dual channel, a new wide patch bus & most important 200 noise reduction. Using 3 SM12b monitors, a 4x9000 amp amplifier, & noise of the Master Room XL 900 receiver and Neumann AKG condenser P.V. Stereo microphone, a wide track, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc.

**Services Available:** The chat equipment chatMHSR, a 16 track 24 channel MABOBI, the tape recorder, a dual channel, a new wide patch bus & most important 200 noise reduction. Using 3 SM12b monitors, a 4x9000 amp amplifier, & noise of the Master Room XL 900 receiver and Neumann AKG condenser P.V. Stereo microphone, a wide track, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc.

**L D SYSTEMS, INC.**  
**SOUND REINFORCEMENT**  
467 W. 38th St., Houston, TX 77018  
(713) 695-9400  
Contact: Bill Martin

**Equipment:** The chat equipment ChatMHSR, a 16 track 24 channel MABOBI, the tape recorder, a dual channel, a new wide patch bus & most important 200 noise reduction. Using 3 SM12b monitors, a 4x9000 amp amplifier, & noise of the Master Room XL 900 receiver and Neumann AKG condenser P.V. Stereo microphone, a wide track, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc.

**Services Available:** The chat equipment chatMHSR, a 16 track 24 channel MABOBI, the tape recorder, a dual channel, a new wide patch bus & most important 200 noise reduction. Using 3 SM12b monitors, a 4x9000 amp amplifier, & noise of the Master Room XL 900 receiver and Neumann AKG condenser P.V. Stereo microphone, a wide track, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc.

**LOST MOUNTAIN RECORDERS**  
**REMOTE RECORDING**  
7308 S. Congress Ave., Austin, TX 78745  
(512) 444-5762  
Contact: Jim Martin

**LUCHETTI DRUM & GUITAR, INC.**  
**SOUND REINFORCEMENT**  
2617 Rhode Island, N.E., Albuquerque, NM 87110  
(505) 298-5519  
Contact: Dick

**MID-COUNTY MUSIC CONCERT SOUND**  
**SOUND REINFORCEMENT**  
2370 Eastex Freeway, Beaumont, TX 77703  
(409) 892-6570  
Contact: Frank Huber

**MIDCOM, INC.**  
**REMOTE RECORDING**  
2231 E. Division, Arlington, TX 76011  
(817) 461-2211 metro  
Contact: Mike

**Equipment:** The chat equipment ChatMHSR, a 16 track 24 channel MABOBI, the tape recorder, a dual channel, a new wide patch bus & most important 200 noise reduction. Using 3 SM12b monitors, a 4x9000 amp amplifier, & noise of the Master Room XL 900 receiver and Neumann AKG condenser P.V. Stereo microphone, a wide track, a 16 channel 11000 BIA Stereo & BIA Compact disc, a new stereo Video disk, a 16 channel 11000 BIA Stereo & BIA Compact disc.

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# SOUND MASTER RECORDING STUDIOS



- 24-track recording
- Video pre/post-production
- Sound reinforcement
- Live recording
- Disc mastering

## Sound Master Recording Studios

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N. Hollywood, CA 91601  
(213) 650-8000

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In addition to reducing RFI the PS-1 can also protect your sound reinforcement equipment from:

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centerville, oh.45459

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**MORON STUDIO**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 2301 East Prince, Tucson, AZ 85719  
 (602) 323-2145, Diane or Gale  
 Contact: (602) 323-2145

**M.P. PRODUCTIONS**  
**SOUND REINFORCEMENT**  
 2024 Arkansas Valley Dr., Ste. 807, Little Rock, AR 72212  
 (501) 224-9308

**Equipment:** Most of our equipment is in excellent condition and we have a wide variety of equipment available. We have a large inventory of equipment and we can help you find what you need. We have a large inventory of equipment and we can help you find what you need. We have a large inventory of equipment and we can help you find what you need. We have a large inventory of equipment and we can help you find what you need.

**Services Available:** We provide a wide variety of services including sound reinforcement, remote recording, and more. We have a large inventory of equipment and we can help you find what you need.

**MULTI-MEDIA, INC**  
**SOUND REINFORCEMENT**  
 3023 Central N.E., Albuquerque, NM 87106  
 (505) 255-8619  
 Contact: Patricia Howe or Vicki Hal

**THE MUZIC COMPLEX**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 305 S. Main, Jonesboro, AR 72401  
 (501) 972-0321  
 Contact: Jimmy Byline



**OMEGA AUDIO**  
 Dallas, TX

**OMEGA AUDIO, INC**  
**REMOTE RECORDING**  
 8036 Aviation Place, Box 71, Dallas, TX 75235  
 (214) 350-9066  
 Contact: Paul A. Johnson

**Equipment:** We have a wide variety of equipment available including microphones, mixers, and more. We have a large inventory of equipment and we can help you find what you need.

**Services Available:** We provide a wide variety of services including sound reinforcement, remote recording, and more. We have a large inventory of equipment and we can help you find what you need.

**Services Available:** We provide a wide variety of services including sound reinforcement, remote recording, and more. We have a large inventory of equipment and we can help you find what you need.

# Remote & Recording Sound Reinforcement

**PAINT HORSE PRODUCTIONS**  
**REMOTE RECORDING**  
 1515 So. Fitzhugh, Dallas, TX 75223  
 (214) 823-0091  
 Contact: [Name]



**REELSOUND RECORDING**  
 Manchaca, TX

**REELSOUND RECORDING CO**  
**REMOTE RECORDING**  
 P.O. Box 280, Manchaca, TX 78652  
 (512) 472-3325, 282-0713  
 Contact: [Name]

**Equipment:** We have a wide variety of equipment available including microphones, mixers, and more. We have a large inventory of equipment and we can help you find what you need.

**Services Available:** We provide a wide variety of services including sound reinforcement, remote recording, and more. We have a large inventory of equipment and we can help you find what you need.

**Services Available:** We provide a wide variety of services including sound reinforcement, remote recording, and more. We have a large inventory of equipment and we can help you find what you need.

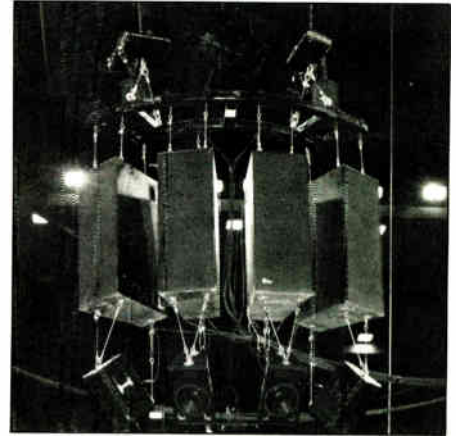
**SHOWCO INC**  
**SOUND REINFORCEMENT**  
 9011 Governors Row, Dallas, TX 75247  
 (214) 630-1188  
 Contact: [Name]

**SOUND ARTS RECORDING**  
**REMOTE RECORDING**  
 2036 Paskett, Houston, TX 77052  
 (713) 688-8067  
 Contact: [Name]

**SOUND AND INTERCOM SYSTEMS**  
**SOUND REINFORCEMENT**  
 3146 W. Clarendon, Phoenix, AZ 85017  
 (602) 279-0551  
 Contact: [Name]

**SOUTHERN RECORDING**  
**REMOTE RECORDING**  
 56 E. 53rd Pl., Tulsa, OK 74105  
 (918) 747-7380  
 Contact: [Name]

**SPECTRUM SOUND**  
**REMOTE RECORDING**  
 P.O. Box 1151, Bisbee, AZ 85603  
 (602) 452-4424  
 Contact: [Name]



**STAGE SOUND INC**  
 Phoenix, AZ

**STAGE SOUND INC**  
**SOUND REINFORCEMENT**  
 4708 E. Van Buren, Phoenix, AZ 85008  
 (602) 275-6060  
 Contact: [Name]

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

**VESELY MUSIC CO**  
**SOUND REINFORCEMENT**  
 1729 E. Charleston Blvd., Las Vegas, NV 89104  
 (702) 382-8777  
 Contact: [Name]

**WESTWOOD RECORDING STUDIOS**  
**REMOTE RECORDING**  
 964 West Grant Rd., Tucson, AZ 85705  
 (602) 622-8012  
 Contact: [Name]

**WOODEN STUDIOS**  
**REMOTE RECORDING**  
 7334 Rampart, Suite 102, Houston, TX 77081  
 (713) 988-9872  
 Contact: [Name]

# North Central

**AAA SWING CITY MUSIC**  
**SOUND REINFORCEMENT**  
 1312 Vandalia, Collinsville, IL 62234  
 (618) 345-6700, (314) 421-1558  
 Contact: [Name]

**ACME RECORDING STUDIOS**  
**REMOTE RECORDING**  
 3821 N. Southport, Chicago, IL 60613  
 (312) 477-7333  
 Contact: Mike Hsieh

**Equipment:** Mottchen Technics 1520 and modified Sony PCM 111 with phase compensation. Schoeps Neumann AKG Sennheiser.

**Services Available:** Digital and analog audio plus direct to two track remote recording. 1/2" E track remote recording. Full in house studio facilities. Custom recording and real time cassette duplication and playback and remote audio for video.

**AFTER DARK RECORDING STUDIO INC**  
**REMOTE RECORDING**  
 5510 Pearl Road, Cleveland, OH 44129  
 (216) 845-5455  
 Contact: Kirk Yano

**ALTER-NATIVES RECORDING**  
**REMOTE RECORDING**  
 4339 Fairmount, Kansas City, MO 64111  
 (816) 753-7388  
 Contact: Paul Rosenstern

**AUDIOCRAFT RECORDING CO**  
**REMOTE RECORDING**  
 915 W. 8th St., Cincinnati, OH 45203  
 (513) 241-4304  
 Contact: Bill Herzog

**THE AUDIO CENTER**  
**SOUND REINFORCEMENT**  
 1546 Alexis Rd., Toledo, OH 43612  
 (419) 476-8410  
 Contact: Mike Marko

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

**AUDIO HOUSE**  
**REMOTE RECORDING**  
 P.O. Box 219 Lawrence, KS 66044-0015  
 (913) 843-4916  
 Contact: Bruce N. Laddell

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

**AUDIO ONE**  
**SOUND REINFORCEMENT**  
 51 Hawthorne St., Elyria, OH 44035  
 (216) 323-6414  
 Contact: Rick Galbraith, Bill Webster

**AUDIO RENTAL SERVICE AND SALES**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 268 W. Normandy, Chicago Heights, IL 60411  
 (312) 754-9191  
 Contact: Gary Corbin, president

**AUDIO TECHNOLOGY KEITH MONKS AUDIO (USA) INC**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 1169 Tower Rd., Schaumburg, IL 60195  
 (312) 885-0066  
 Contact: Glenn Mullis

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

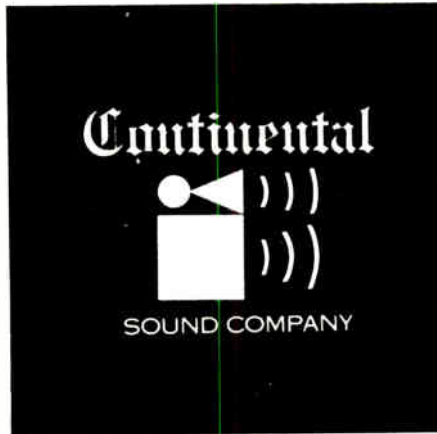
**BODDIE RECORD MANUFACTURING**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 12202 Union Ave., Cleveland, OH 44105  
 (216) 752-3440  
 Contact: Tom and Louisa Boddie

**BRIDGEWATER CUSTOM SOUND**  
**SOUND REINFORCEMENT**  
 15957 South Halsted, Harvey, IL 60426  
 (312) 596-0309  
 Contact: Paul D'Amico

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

**CLEARWATER PRODUCTIONS**  
**SOUND REINFORCEMENT & REMOTE RECORDING**  
 232 Silver Cr. Rd., Marquette, MI 49855  
 (906) 249-9669  
 Contact: Daniel A. Lott

**CONTINENTAL SOUND CO INC**  
**SOUND REINFORCEMENT**  
 P.O. Box 388173, Chicago, IL 60638  
 (312) 284-0418 or 581-6446  
 Contact: George H. Ma  
**Equipment:** 2-way stereo system, 24 track 4 channel rack  
 console w/4 track selectable, 24 track 4 channel w/24 track  
 mixer, 8 multitrack channels w/4 channel limiters and 8 track  
 analog delay, 24 track 4 channel stereo system, 24 track  
 system, computer, master control, 24 track 4 channel w/24 track



**CONTINENTAL SOUND**  
 Chicago, IL

For information on any of our products or services, please contact us at (312) 284-0418 or (312) 581-6446. We are located at 232 Silver Cr. Rd., Marquette, MI 49855.

1/2 inch, 2 monitor amp racks each containing 4 2 way elec-  
 tronic crossovers, 4 IFCs, 2 hi amp, 2 hi amps, 40 assorted  
 mixers, F.V. Shure Audio Technica Main interface rack, para-  
 meter EQs, quad limiter, flanger, doubler, compressor, delay,  
 phaser, transistor, opto-state GRCs, 2 way electronic crossovers,  
 cassette deck, reverb. For more information, call or write

**CUSTOM STUDIOS**  
**REMOTE RECORDING**  
 3829 Scott Ave. North, Minneapolis, MN 55422  
 (612) 535-2587  
 Contact: Jim Ryan, Jr.

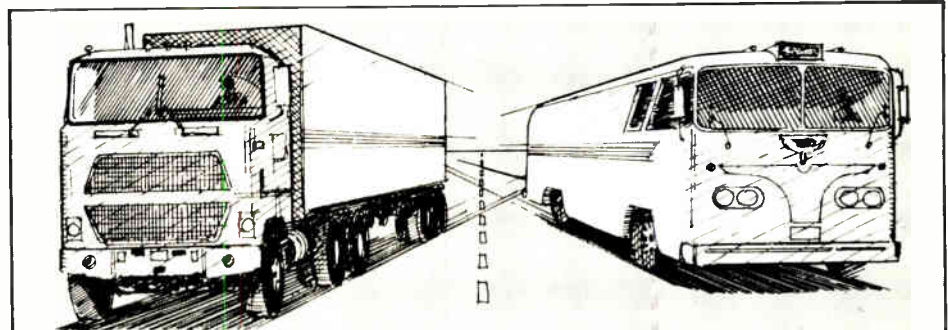
**db SOUND**  
**SOUND REINFORCEMENT**  
 1220 Rand Road, Des Plaines, IL 60016  
 (312) 299-0357  
 Contact: Bruce G. Dean

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

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

**ELECTRONIC DESIGN COMPANY**  
**SOUND REINFORCEMENT**  
 2958 Cleveland Ave. North, St. Paul, MN 55113-1199  
 (612) 636-3550  
 Contact: Louis Miller

**GAND SOUND**  
**SOUND REINFORCEMENT**  
 780 Frontage Rd., Northfield, IL 60093  
 (312) 446-4263 (Chicago)  
 Contact: Gary Gand, Jess Gonda



## Twice as ready to roll!

Now we're busing AND trucking—Reelsound's new tractor trailer mobile unit is ready to roll! This latest addition to the Reelsound fleet enables us to produce the highest quality sound recordings with all the latest equipment at almost any location. In addition to our MCI 24 track equipped Bus, our new Sierra/Hidley designed truck studio is equipped with MCI 600 automated series console, two MCI 24 tape machines, MCI half-inch and quarter-inch 2 tracks and an overdub room. Outboard equipment includes Urie, dbx, and Valley People limiters and processing units, DL-1, Space Station, Ursa Major 8 X 32 digital reverb and a complete collection of microphones. We're equipped with a SMPTE system for video sweetening and interlocking of multitracks. All of which means we're geared for the best possible concert and TV

production sounds. And behind the reels we have the same experienced team with 12 years of know-how. Ask some of the people we've worked with for our golden and platinum results: Ted Nugent, Carole King, Journey, Tom Petty, Genesis, Joe Ely, Bee Gees, Willie Nelson, Frankie Beverly and Maze, Quarter Flash, Christopher Cross, Loretta Lynn, Alabama, Oak Ridge Boys, Statler Brothers, Tommy Tutone, The Gap Band, Judas Priest, and MTV.

For more information, contact

**Malcolm H. Harper**  
 at (512) 472-3325 or (512) 282-0713.  
 P.O. Box 280, Manchaca, Texas 78652  
 (Located near Austin)



Circle #039 on Reader Service Card



# Remote & Recording & Sound Reinforcement

**PYRAMID SOUND & LIGHTING**  
SOUND REINFORCEMENT  
1134 Kentucky, Lawrence, KN 66044  
(913) 841-1306  
Contact: Mark DeGard

**QUALITY MEDIA PRODUCTIONS**  
SOUND REINFORCEMENT & REMOTE RECORDING  
1425AR West Whittaker, Salem, IL 62881  
(618) 548-2031  
Contact: Donald Costy



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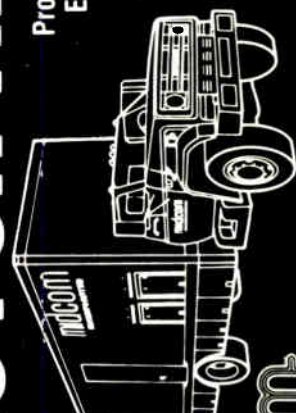


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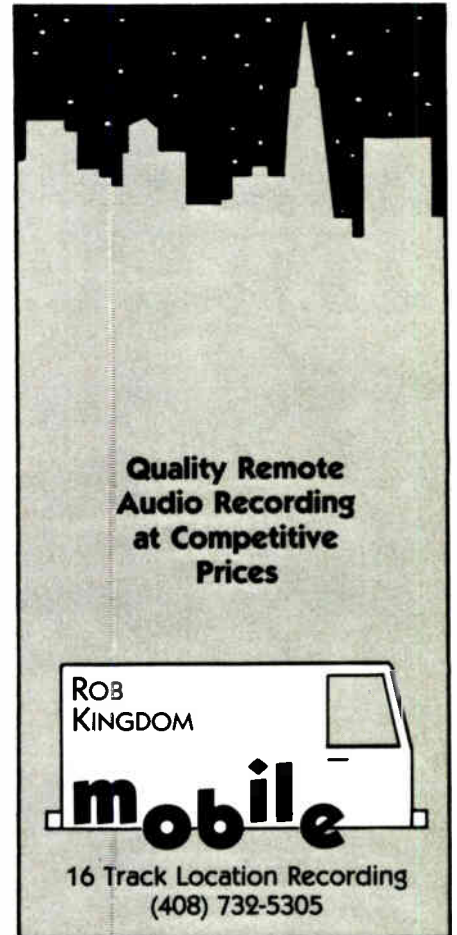
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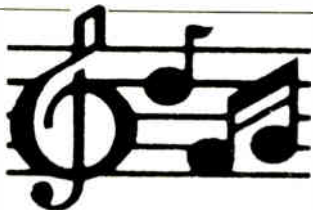
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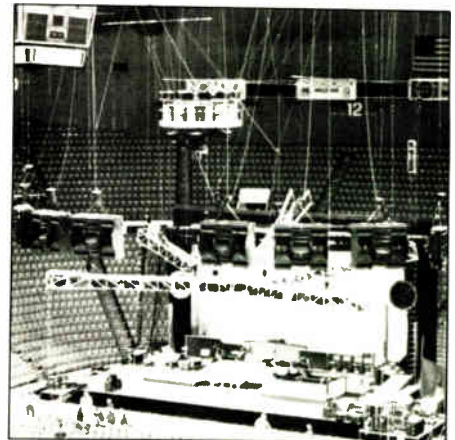
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**Correction:** On page 86 of our previous issue (Vol. 7, No. 5) we inadvertently discussed Eventide's SP 2016 as 2106. We've got it straight now.

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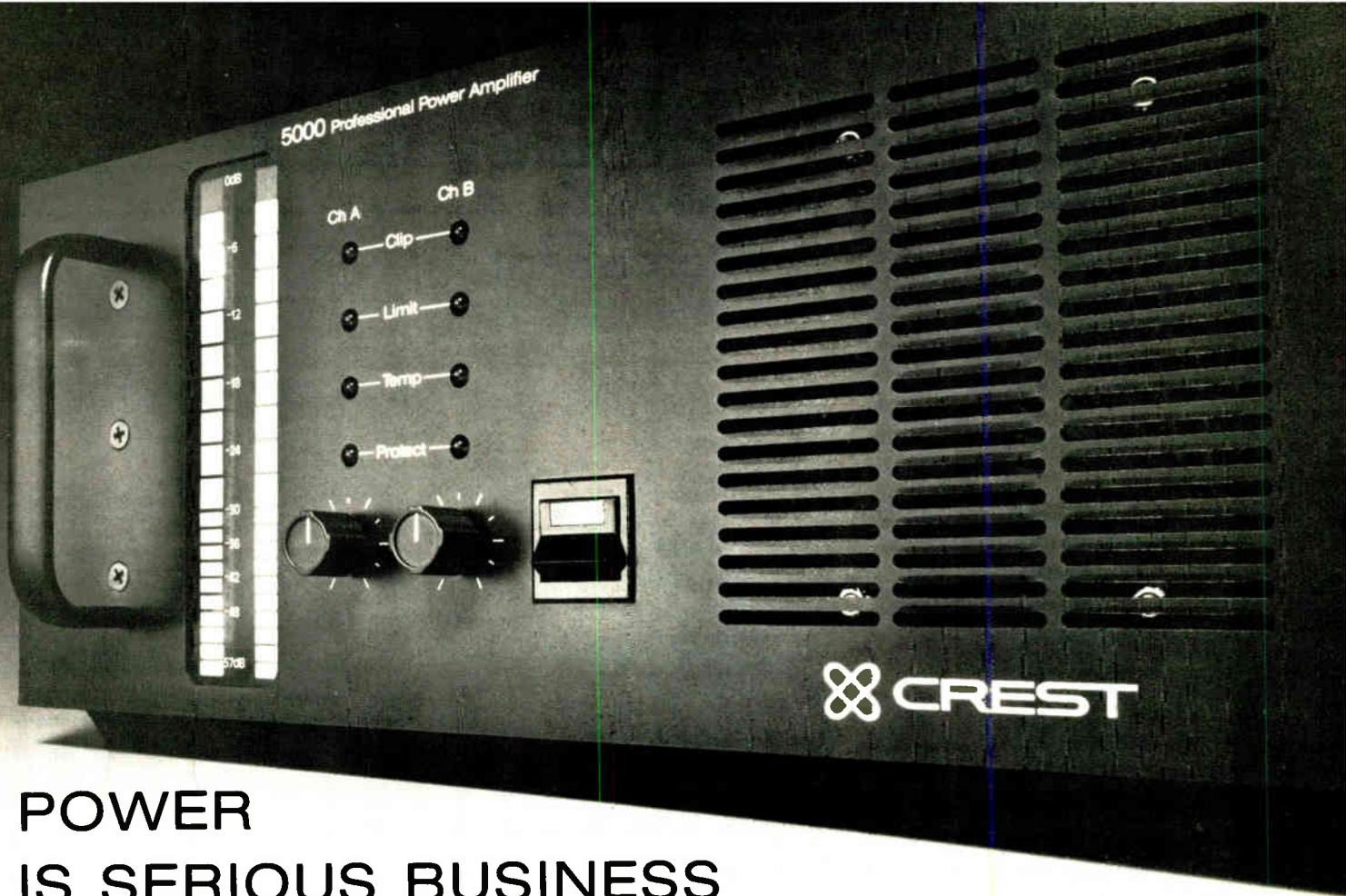
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# Papa John Creach

take a bow and tell a story



LUNCHING  
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BONZAI

by Mr. Bonzai

One of the most endearing qualities of the Jefferson Airplane/Starship/Hot Tuna collective was the inclusion of that ol' fiddlin' rascal, Papa John Creach. The violin is an instrument that can't be faked and Papa John has been playing it for a real half century.

When I was introduced to his drummer, Kurt Farquhar, I immediately pursued a lunching. Before meeting Papa John and his wife Gretchen at their home, I had the opportunity to catch his show at "At My Place," a tasteful little club in Santa Monica. Papa John was appearing in Los Angeles for the first time in three years and I had a front row seat for a performance that ranged from soaring rock to "Over the Rainbow" enchantment. He's got a naughty twinkle in his eye and could make Stradivarius boogie in his grave.

Papa John has been working for the last ten years with Reid King who joins on vocals, but also operates the Roland echo units and special effects

which increase the already spacious range of the maestro. He has been amplified since 1943 when he broke new ground with his National violin with the modified telephone receiver pickup. He was showing me this working historical artifact as we began to chat about all the trash and glory of his career.

**Bonzai:** Was playing an amplified violin shocking at that time?

**Creach:** I guess it was. There weren't many of them around.

**Bonzai:** How did people react?

**Creach:** They condemned it. I used the amplifier just a little, until I got in a place where there was a lot of noise and then I turned it up – so I could be heard. I could play as loud as a horn and I could make my violin sound so sweet.

**Bonzai:** Did you study the classics?

**Creach:** Yes, I studied some classics. I went to conservatory in Chicago, and I was well advanced as far as being able to read and play my instrument before I went there. I also played in a little symphony orchestra. Roosevelt had projects for everybody, even to the symphony people downtown. That was because everybody had to work together. It was really education and you *really* had to play.

**Bonzai:** What is the personality of the violin?

**Creach:** A violin has many personalities. You can play it sweet and it can bring tears. You can pick it and make it a hoedown. You can make it classical, and you can play the blues on it. It was a challenge for me to play the blues – they said no violin player can play the blues. When I opened up that case and pulled that fiddle out, they said, "Oh, no, Jack Benny's goin' on now." Oh yeah, I played violin with the blues shouters and after they heard me play the blues, and the people started swoonin', right away everybody wanted me to play with them.

**Bonzai:** Who are your favorite violinists?

**Creach:** I have several. The first one I had was Eddie South, as far as jazz and classical – and there's Joe Venuti, Stephan Grapelli, Stuff Smith.

**Bonzai:** Who's your best musical friend?

**Creach:** Charlie Daniels on Country and Western . . . Red Callendar in the jazz field—a bass man I hung out with day after day, year after year—and Calvin Ponder. These are the people I used to hang out with. We used to get

together and rehearse at the house 'cause we wanted to learn how to play these tunes. One guy would say, "Here's one I bet you can't cut." That puts the ol' knowledge bump up there for you, 'cause you got to learn how to read it, you got to know what it's all about. So if one can outread the other one, he's got to scuffle and catch up.

**Bonzai:** What was your hardest lesson as a professional musician?

**Creach:** Oh, things came pretty easy. If it's something hanging me up—learning a chord change or something—I'll go get the book. It's more or less mathematics. Working with the Starship, they didn't write notes. They wrote names, letters – it was like a code thing. They'd put Xs for bars. It wasn't the ol' clef operation, but it didn't make no difference. I just said, "What are you guys doing? Oh, I see " If I understand that X means the bar, then it's four beats for each X.

**Bonzai:** What effect do you think you had on The Airplane?

**Creach:** I think I helped them musically. And they were having a problem at one time. Everybody was fighting and I had just got in there. I had to stop this stuff. I said, "Y'all gotta

cool down – I haven't made me a quarter yet." And that's for real, too.

**Bonzai:** If all that hadn't happened with the Airplane, what difference would it have made for you?

**Creach:** Oh, I'd be playin' somewhere, 'cause it's in me.

**Bonzai:** What have you been up to lately in the studio?

**Creach:** I've done a single and I have to go back in and straighten out a few songs. They have to be remixed. I'm doing it as easy as I can, and also I'm shootin' for a big contract.

**Bonzai:** If you hadn't become a musician, what do you think you would have been?

**Creach:** Either a farmer or else I would have worked in interior decorating. Maybe electrical work. I do my own wiring and soldering. I'm good with my hands – painting, mechanical work.

**Bonzai:** What was your most outstanding moment on stage?

**Creach:** It was the abrupt change from playin' here for 100 to 200 people and right overnight going off to play to 7,000 in San Francisco. It was

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for a concert when Janis Joplin died. There was Santana, Jerry Garcia, The Jefferson Airplane. I just went up to play the concert and boy, that just blew me down. They had a stack of Marshalls – it was so loud, I couldn't hear myself, but the guys told me, "You just listen and think about your violin. Don't pay any attention to what they're playin' over there." Everybody had their thing turned up to ten. I used to put cotton in my ears, but I said, "If these guys are standin' up here takin' it, I'm gonna find out if I can take it." I found me a dead spot on the stage where I could hear myself, but it sure was loud. I went home to bed that first night at the motel and thought the telephone was ringin' all night long. I never could get used to it, 'cause my ears still ring sometimes now.

**Bonzai:** I imagine you've had some groupies – how do you handle that?

**Creach:** You put up with them for awhile and then try to ease 'em out, according to where you are. A lot of musicians put on a great big front and give you to get out there and then after awhile it seems when they get a little grease in their belly, they change on you and they want to tell you what

to do. Here you are feedin' 'em, helpin' 'em to get out on the road, putting money in their pockets.

**Bonzai:** You thought I meant musician groupies – I meant fans

**Creach:** Oh, I see what you mean. Well, we were travelin' on the road once and these workin' girls got into one of the musician's vans. They wanted to get in to go along with Papa John. I guess they were gonna turn tricks as they went. Well, normally, that's what they would be doing, 'cause they were *workin'* girls. They went out just for the ride and that's not something we can take from one state to the other. Somebody might be looking for 'em and that would put me in hot water.

**Bonzai:** Did you ever get any LSD dumped in your Coca Cola?

**Creach:** No, no, no – they tried it. The boys tried to put that on the ol' boy. You know what they used to have? They'd take the eyedrop bottle, dump it out, press it in and suck up the LSD and put the cap back on. We used to have these spreads—fine foods in the dressing room—and there was this joker who wasn't even supposed to be in there. He got to

doctorin' everybody up with LSD. I chased his butt outa there, but he had already messed up the food. These girls, the caterers for The Jefferson Airplane, they thought they were gonna do something real beautiful and he messed up the cake.

I used to tell my wife, if she was at the concerts, "If you go and get a can of beer, you keep it in your hand. Don't set it down, and don't drink nobody else's." You have to do that – you'd be hangin' off the side of the wall.

**Bonzai:** What was the biggest mistake of your whole life?

**Creach:** Not knowing Gretchen sooner. I didn't really have the proper education that Gretchen had and it's something I like, because it just helps me. So, I think that's a beautiful thing and I'm very comfortable. I guess I should be – I been around her for years and I'm not gonna change. I'm not gonna go get me a new copy.

**Bonzai:** I understand that you're going to be posing naked for your new album cover

**Creach:** Well, I'm gonna do a slow strip tease, and it's gotta be real warm, 'cause I can't stand cold weather.

**Bonzai:** What will the audience be for this album?

**Creach:** I'm trying to get me a program like when I stand up and play a concert, where I have the chance to reach out and mix just a little bit. The audience today is kinda mixed – there's lots of people who go to a concert who would accept something pretty along with the hard core rock and roll. I like to give a little different flavor. That's my style and that would be the style I would like to shoot for in an album – drop in a beautiful tune where it's gonna fit, like a breather. That just blows everybody's mind – then you go back on up to the climax.

You noticed my ending, my finale at the club. It was cooking – everybody is up on their feet. They don't know why it happened, but I shot 'em with a little serum. They go crazy – the boss at the club thought they were gettin' kinda wild. When I hit that stage, I'm workin'. I look right in your eyes and if you're dead, I figure out a way to get you goin'. Once I get two or three of 'em goin', I move on and you can't turn 'em off. ■

In a totally unrelated story, Cream's Neil Young turned up with Cream.

\*Adept since the age of 14, he is not only respected for his work in rock, but also for his contributions to jazz, country, and the blues

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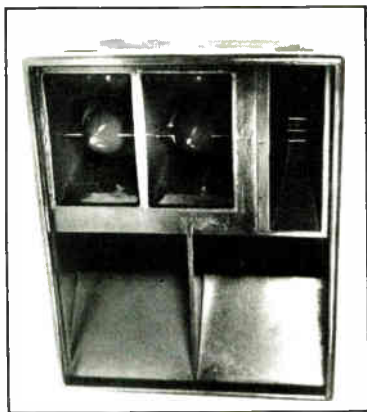
# PREVIEW



## NEUMANN KMR 81i SHOTGUN MICROPHONE

Neumann has introduced the KMR 81i shotgun microphone, a 9" complement to Neumann's widely used 15½" shotgun, the KMR 82i. Both microphones use an especially developed capsule and amplifier located inside an interference tube which is acoustically open but results in a high diaphragm driving force at a low capsule pressure gradient. The new KMR 81i combines a high degree of sound rejection at its sides with an excellent front-to-back ratio. The microphone is largely insensitive to wind and popping and has an internal elastic suspension to suppress handling noise. There is a full line of accessories. The KMR 81 is available from stock through Neumann franchised microphone dealers. Price: \$695.

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## TURBOSOUND TMS-3

A full-range PA cabinet, Turbosound, Inc.'s TMS-3 enclosure offers high fidelity sound quality in an efficient, compact touring package. The cabinets feature the Turbo-BassDevice™ which increases low frequency velocity for accurate reproduction, while a TurboMidDevice™ provides 4 octaves of crossover-free mid-range. The extended mid range coverage increases high frequency crossover points by 3 octaves for clear high end response.

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## TOA MX-106 POWERED MIXER

The TOA MX-106™ is a compact, self-powered mixer with a wide array of sophisticated features, designed for use in applications requiring "console level" standards in a portable configuration.

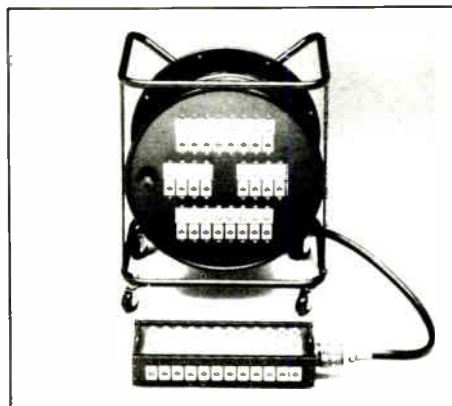
The MX-106 features: 6 input channels; 1 program output; 1 foldback output; 1 effects output and 1 record output.



The internal power amplifier is rated at 120 watts (RMS) into 8 ohms, 200 into 4, and 300 into a 2 ohm load. A specially designed heatsink rolled from solid aluminum stock provides excellent heat dissipation for maximum system reliability.

The MX-106 Master Control section features a one-octave (9-band) graphic equalizer, an analog echo delay, auxiliary input controls, fluorescent high-intensity bar-graph output meters, and a complete patch bay with TOA's exclusive Buss-Link™ capability.

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## CANARE JUNCTION BOX SYSTEMS

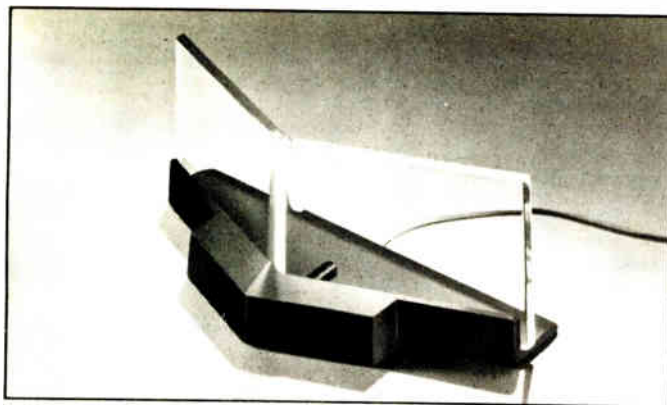
Canare Cable, Inc. is now offering pre-packaged systems that combine multi-channel cables with junction boxes that mate via multi-pin connectors and provide XLR terminations on each side. The 24 channel cable reel, shown here, has parallel male and female XLRs on the reel flange permanently connected to the multi-pair cable. The multi-pin connector on the other end of the cable joins to the junction box with parallel male and female XLRs.

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## INTERFACE MODEL 310 STAGE MONITOR MIXER

Interface Electronics has announced the Series 310, the latest development in their line of stage monitor mixers. The Series 310 is modular and plug-in for ease of maintenance and is built in frame sections, each holding 6 modules so it is readily expandable from 12 to 42 inputs, with 8 output mixes plus a side-fill pair with send and panpots. New advanced features include transformerless input, four equalizers (2 tuneable with wide/narrow switch), high and low frequency cutoffs, five level LED indicators on each input for instantaneous identification of changes, solo to operator's monitor to permit checking each input, master solo to check outputs, and return solo to permit listening to signal after external processors, 10-segment LED level indicators on master's and operator's monitor, slider masters, 6dB panic buttons on outputs to permit catching a problem quickly, and built-in mike splitters to permit mikes to feed another mixer at the same time. List price: \$7,000.

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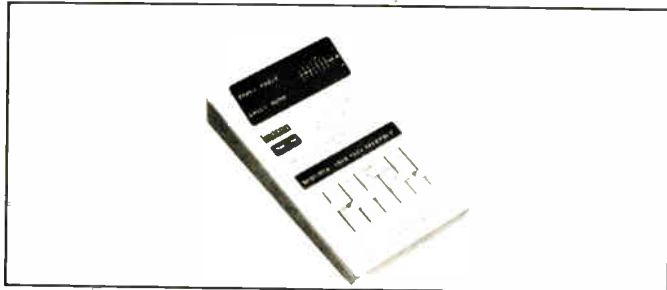


## CROWN PZM® 2.5 FOR DIRECTIONAL PICKUP

Crown International is introducing a new microphone, the PZM<sup>®</sup> designed to improve directional pickup. The new low-profile, minimum visibility microphone combines a precision-calibrated pressure capsule with a nearly invisible corner boundary to achieve improved directionality of coverage. It effectively captures and emphasizes sound approaching from its front while rejecting sounds from behind.

The PZM<sup>®</sup> 2.5 is recommended for applications such as theater productions, conferences and public speaking. List price is \$259.

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## USER-FRIENDLY CONTROLLER FOR LEXICON 224X

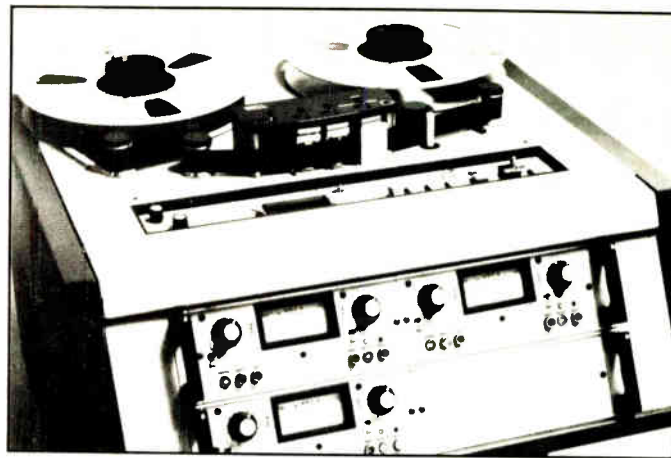
The new Lexicon Alphanumeric Remote Controller (LARC) adds control power and operator convenience to the 224X Digital Reverb System. The LARC is an option on new 224X systems and is easily retrofitted to existing installations.

A 48-character alphanumeric display guides and prompts users in applying the full range of capabilities of the 224X and speeds mastery of the system by even inexperienced operators. Registers for user-created programs in the 224X can store up to 36 setups which can be off-loaded to a cassette by the LARC and reloaded in less than one minute. The LARC measure 6" x 10" x 3" and may be operated up to 1000 feet away from the mother chassis.

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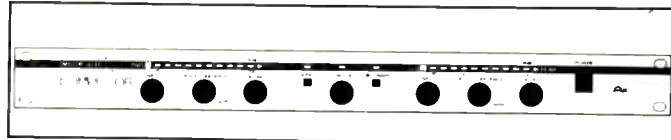
## MCI LAYBACK RECORDER/REPRODUCER

The new MCI/Sony Audio Layback system uses audio electronics and heads, and a transport optimized for top-notch audio performance. Once video editing is completed and time code is correctly resolved between the audio master tape and the edited video master, there is often no need to monitor video during the audio layback process. The 1" video master can then be loaded onto an audio transport equipped with the proper heads and electronics, and the audio recorded in the proper position. "Laying Back" the audio in this manner can eliminate the inherent drawbacks of the audio tracks on 1" C format video tape, say the manufacturers, and result in greatly improved signal to noise,



dynamic range, and wow/flutter over what could be obtained by using a VTR for audio re-recording.

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## APHEX COMPELLOR

The Compellor is a versatile audio processing tool that combines the functions of audio compression, leveling and peak limiting. The gain platform maintains long term audio output level within 1 dB for a 20 dB in/out level change. The action is slow enough to have minimal effects on program transients or short term dynamics.

Dynamic range compression is accomplished over a 30 dB range of input levels, varying the ratio from about 1.1:1 to 20:1 the resulting "soft knee" prevents the "choked" sound associated with deep compression. This is an "intelligent" compressor with attack and release time dependent on the program material. Retail price: \$995.

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## MDM-TA 2 TIME-ALIGN® NEARFIELD MONITOR™

Calibration Standard Instruments' MDM-TA2 Time-Align<sup>®</sup> Nearfield Monitor™ incorporates a "position program" switch on the front panel to adjust the response for listening position (NFM™ or distant) and program material (original or final) so that proper equalization may be applied to the original recording or broadcast to overcome upper range losses in the recording or broadcast chain. The MDM-TA2 provides a polarity switch on the front panel to allow the absolute polarity to be checked easily. The response of the MDM-TA2 is  $\pm 3$  dB 60 to 20k Hz and can produce 108 dB SPL at 1 meter.

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# DIGITAL DISCUSSIONS

## SAMPLING & QUANTIZING

by Ken Pohlmann

As a conceptual experiment, let's suppose I put on a pair of clean blue jeans and attend a performance of the Beethoven Ninth Symphony. When I settle down into my seat I am surprised to see that a recording engineer is seated on my left, and another is on my right. I can tell they are recording engineers because they are both obviously prepared to record the symphony; however, their recording systems are quite different. The engineer on my left has a long roll of paper and two pens, and the engineer on my right has a notebook and one pen. The house lights are lowered and the performance begins. I can't help but notice the two engineers. As the music plays, the one on my left traces out two wiggling lines; it appears that the lines somehow mimic what the music is doing. When the timpani on the left stage are struck, his left line swings with wider arcs while the flute in the middle of the stage gives quick arcs to both pens. In contrast, the engineer on my right writes down a steady stream of 1's and 0's, page after page. I am astounded by his rapid pace - I estimate that he is writing over 1½ million digits per second. Furthermore, I note during soft passages he tends to write more 0's and for loud passages come more 1's. But the steady pace of writing never speeds nor slows.

With the crashing chords at the end of the Ode to Joy, the symphony ends with wild applause. Both engineers record even that sound with wiggles and digits, then lay down their pens as the house lights come up. Then both engineers return to the beginning of their documentation and prepare to play back their recordings.

The left engineer lays a finger on each wiggle, rolls the paper, and

begins to sing the Ninth. It is a good reproduction, yet I notice that the paper's speed is uneven, and his fingers cannot exactly trace the lines. I note that no matter how careful he might be, errors will always occur in both recording and reproduction due to of the linear nature of his method. In other words, the line can never be an *exact* analog of the music; therefore, it fails as a perfect means of documentation.

Meanwhile the right engineer has begun his playback. To my amazement he flips through his notebook, merely reading the binary bits, yet he manages to sing an excellent Ninth. Furthermore, when he gets careless and varies the speed of his page turning, the very precise rate of his read-out is unaffected. I observe that he misses a bit now and then, but quite honestly I cannot perceive any error. I recognize the benefits of his strange method - by converting to numbers he gains the advantage of the intelligibility and repeatability of a written, quantified representation over a drawn one. With these observations, my experiment ends.

Both analog (left method) and digital (right method) systems aim for the same result: accurately storing and replaying sound. However, their immediate goals are quite different. The analog system must strive to form a continuous record of the electrical waveform. On the other hand, the digital system periodically checks the waveform and records its approximation of the instantaneous value, thus its record differs considerably from the analog record. The analog method provides one set of infinitely variable information, whereas the digital method provides many discrete pieces of information. I suppose it would be fair to say that compared to analog, the digital method is a somewhat mundane and unassuming way to

record data - something that a book-

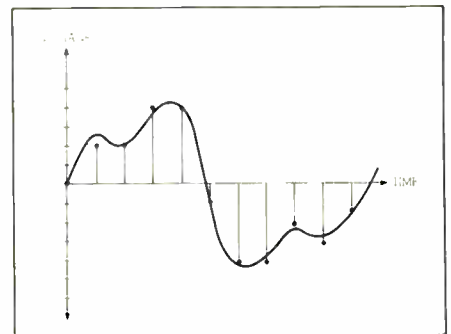


Fig. 1

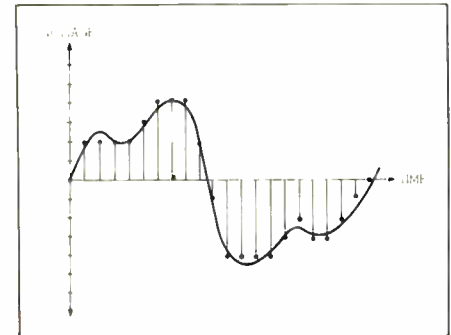


Fig. 2

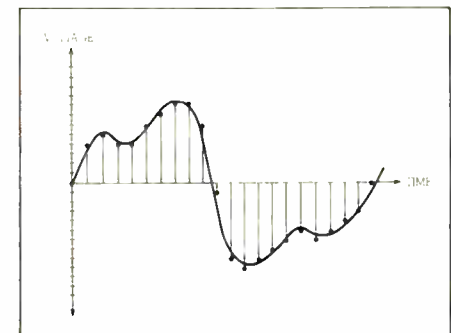


Fig. 3

keeper might dream up. The method merely takes samples, and documents them for future reference – simple. By the same token, the digital method is also incredibly efficient.

The task of mapping analog sound into a digital storage medium relies on the twin pillars of digitization – sampling and quantizing. It is through these techniques that the infinitely variable analog waveform can be encoded as discrete values. Consider the waveform in Fig. 1. The continually changing analog signal has been mapped by a series of pulses; the amplitude of each pulse is chosen from our vertical scale, and ultimately will yield a number which represents the analog value at that instant. It is apparent that the greater the rate of the pulses, the better the representation of the waveform, as shown in Fig. 2. Similarly, but dictated by vastly different theoretical causes, the more amplitude increments available, the closer our chosen approximate value can be to the actual value, as shown in Fig. 3.

Sampling is thus the process of reading an instantaneous value from an analog waveform. To quantify this, we define the sampling rate as the number of samples per second; thus its reciprocal, sampling time, is the time between

each sample. For example, a sampling time of  $\frac{1}{48,000}$  second corresponds to a rate of 48,000 samples per second. As we have already noted, the higher the sampling rate, the better the representation. Specifically, a quickly changing waveform, that is, one with high frequencies, would require a shorter sampling time. Thus, sampling time determines the high frequency response and overall signal throughput bandwidth of the digitization system. Furthermore, Shannon, Nyquist, and other sampling gurus have shown that  $N$  samples per second are needed to perfectly represent a waveform with a bandwidth of  $N/2$  Hertz. Thus a sampling rate of 48,000 could successfully encode a signal with a maximum frequency of 24,000 Hertz. In fact, it is critical to insure that no frequency information higher than half the sampling rate enters the sampler. Otherwise, aliasing error would occur: extraneous waveforms would be generated at multiples of the difference frequency between the sampling rate and the input signal. For example, a 30 kHz tone sampled at 48 kHz would yield samples corresponding to a 30 kHz waveform as well as an 18 kHz waveform.

The aliasing problem is true for

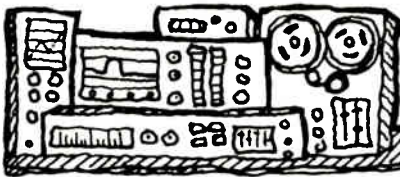
harmonics of the input signal as well as fundamentals. Because of aliasing, the input to any sampler must be carefully low-pass filtered to remove all frequency components above half the sampling rate.

The need to bandlimit the signal is not as detrimental as it might first appear. As long as the sampling rate is twice the highest frequency we desire to encode, we can handle as large a bandwidth as we want. Likewise, perhaps contrary to intuition, the sampling method itself—the trick of taking a finite number of values—doesn't eliminate or skip over information. The discrete time method of sampling defines instantaneous values and ignores changes between sampling times. However, it can be mathematically proved through convolution that a sampled bandlimited signal contains the identical information as the original unsampled analog signal. In other words, as far as sampling is concerned, there is absolutely no loss of information between the original signal and the sequence of digital words.

The other important aspect of our digitization process is quantization – the subdivision of the analog signal into quantized amplitude values. As we've already noted, the more increments we have to choose from, the closer our

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chosen value will be to the actual value. In terms of the quantizing hardware, the number of increments is determined by word length; an eight bit byte would encompass  $2^8$  (256) increments, a sixteen bit byte would map  $2^{16}$  (65,536) increments.

Moreover, we can choose different strategies for how the analog signal is mapped onto the increments; we could use linear or nonlinear distribution, monotonic or magnitude and sign, or many-to-one or one-to-many. Those algorithm decisions determine how the amplitude information is mapped, and the relative effects of the error. But no matter how mapping is accomplished, and no matter how long a word length is employed, an error must always occur. This is because a limited number of amplitude choices can never cover an infinite number of analog possibilities. There is always the chance for an error when quantization takes place. Thus, any digital scheme must reckon with quantization error – no matter how many increments are available, there will always be analog amplitudes in between. Sometimes our increment will be exactly at the analog value, sometimes it won't be quite exact; at worst, the analog level we desire to encode will be  $\frac{1}{2}$  increment away – that is, an error of  $\frac{1}{2}$  the least significant bit of the quantizing word. The range from the maximum expressible amplitude to this error determines the signal-to-noise ratio of the digital system. The approximate S/N ratio inherent in a given number of digits is the maximum number expressible divided by the maximum error. For example, a sixteen bit system would yield a S/N ratio of  $2^{16} = 65,536$  or more easily recognized as being almost 100 dB. This S/N (dB) relationship can be conveniently expressed in terms of word length as  $S/N \text{ (dB)} = 6.02n + 1.76$  where 'n' is the number of bits.

Sampling and quantizing are thus the two fundamental design criteria for a digital system. Sampling rate determines frequency response, whereas word length determines signal-to-noise ratio. Although bandlimited sampling is a lossless process, quantizing must always introduce error. Incidentally, quantization error is very much akin to noise. Fortunately, it exists far below most analog noise floors, and can be masked with a purposefully introduced noise called dither. In general, digitization systems are very successful in encoding analog waveforms, storing them as binary data, then decoding them back into analog waveforms. Of course, that task is not slight. As you might remember, our digital engineer was writing  $1\frac{1}{2}$  million bits per second – no small task to process, store, and retrieve. In terms of audio, it has been found that digital systems using sam-

pling rates of 48 kHz, with a word length of sixteen bits, yields very remarkable fidelity, comparable to or better than the best analog systems. Comparisons between digital and analog recordings reveal differences in their sound qualities, and judgment of which sounds better (as opposed to which is more accurate) will undoubtedly remain a point of contention for some time to come.

In essence, digitization is quite simple. We have seen that sampling and quantization form the basis for the method. Of course, there are considerations for a digital audio system other than these two concepts. For example, we have neglected an important inter-

mediate step – after the signal has been sampled and a quantization level determined, it exists in a netherworld as a staircase of voltage levels. To enter the digital domain, these voltages must be converted to binary digits. That input conversion, and its output counterpart, will form next month's digital discussion. ■

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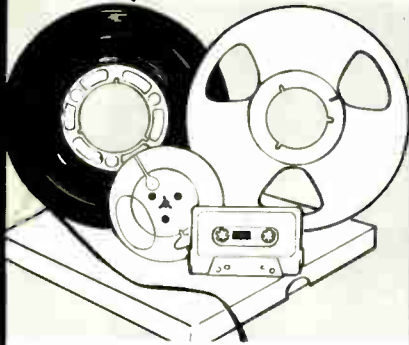
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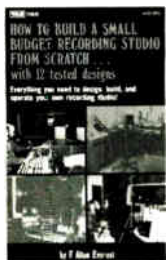
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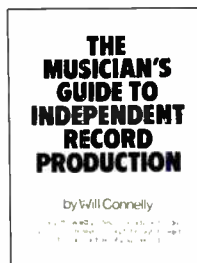
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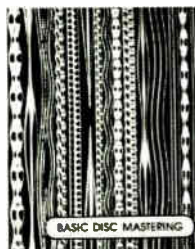
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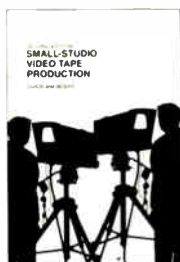
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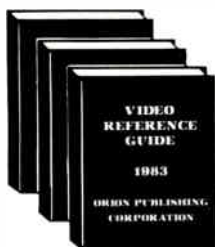
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## E-mu's Drumulator



by Craig Anderton

Programmable drum units with digitally recorded drum sounds have been around for a while; however, their expense (typically \$2,500 to \$3,000) has—until now—limited their availability to all but the most affluent studios and groups. That situation is certain to change with E-mu's introduction of the Drumulator, a digital drum unit that holds its own against the competition but, thanks to extremely efficient use of computer technology, lists for under \$1,000.

**The drum sounds.** The Drumulator includes twelve drum sounds: bass, snare, snare sidestick, three toms (high, mid, and low), clave, cowbell, handclaps, open and closed hi-hat, and ride cymbal. These are all recorded using digital techniques, with the resulting sounds stored in computer memory chips. Thus, when you program a drum sound you will not hear a synthesized drum, but a solid-state recording of a real live drum played by a real live drummer. With a little added room ambience and EQ, it is possible to fool even some sharp-eared listeners into thinking they are hearing "real" drums.

Unlike its higher-priced relatives, the Drumulator offers neither variable drum tuning nor a crash cymbal. However, a little variable speed tape recorder action can help "tune" the drums, and if you need to add cymbals, it's a simple matter to mike a real cymbal and play that as the Drumulator drums away.

In addition to a 1/4" phone jack output containing all drum sounds (with associated volume control), the

drum sounds are also brought out to eight RCA phono jacks so that you can run the drums through a mixing board. Some drum sounds are doubled up; the snare/ sidestick share a common output, as do the open/ closed hi-hat sounds. This is entirely logical, since both sounds are produced from one "drum." The clave and cowbell are also doubled up (which is not always what you want), as are the high and mid toms (which is somewhat of a limitation — the three toms sound so gorgeous, they deserve to be spread across the stereo field).

The drum sounds themselves are remarkably quiet, well-defined, and musically useful. Like other digital drums the cymbal sounds are the weakest link, but even these come to life if you add a little high-end EQ. The kick drum is superb and "cuts" on small speakers, the snare is fat and full, the toms are flawless, and the various percussive effects are excellent. The handclaps might initially be somewhat of a disappointment but with proper use of dynamics and processing, they can be as effective as the other drum sounds.

The Drumulator has two major modes of operation: segment mode (where you create individual rhythm patterns), and song mode (where you link segments together to form complete songs). Both are well thought out and, once you become familiar with the machine's protocol, relatively easy to use. Note, however, that the Drumulator is not a device whose functions are intuitively obvious: to get the most out of the Drumulator, you have to spend a good couple of hours getting acquainted with it.

### Programming: segment mode.

While in segment mode, you may record any combination of the twelve drum sounds into any one of 36 segments. A segment may be up to 99 measures long (although a segment this long uses lots of memory), and you may assign it any common time signature (as well as time signatures which are not so common). You can erase segments, copy one segment to another, append a segment to increase its length, set tempo from 40 to 240 BPM, and add varying degrees of "swing" (different rhythmic "feels") to the segment.

To record, you assign up to four drum sounds you want to record to four "drum play" buttons, then tap these buttons where you want the appropriate drum sound to occur in the segment. You may re-assign the drum play buttons for different sounds after recording the first round of drums, and continue recording with new sounds. Two features greatly simplify the recording process: "auto correct" rounds off your playing to your choice of the nearest eighth, eighth triplet, sixteenth, sixteenth triplet, thirty-second, or thirty-second triplet note (a high resolution mode is also available if you want to play without rounding off); and a metronome may be programmed to click every quarter note, or click at any of the auto correct rates. The first click of each measure is accented. Note that there is no provision for step time programming—all programming is done in "real time." However, between slowing down the tempo, setting auto correct differently for different parts, and programming different metronome click rates, you can play highly intricate drum parts.

An outstanding feature, unique to the Drumulator, is programmable mix and dynamics for all twelve drums. (However, different segments cannot have different mixes; when you program a mix, it is a "master" mix which affects all segments.) Drum sounds can assume any of 15 different volume levels, and there are also 15 levels of dynamic accent (in practice, modest accents—with a few striking exceptions—give the most realistic results). You record accented sounds by playing them where you want them to occur in the segment; if a non-accented sound is already on a particular beat, the accented sound will replace it. Being able to program both drum mix and dynamics lets you create drum parts with more of a flesh-and-blood feel than drum units where the mix is fixed, or may only be varied by hand.

Editing options include erasing an entire drum sound from a track, or (while recording) punching out



specific notes you don't want.

#### Programming: song mode.

You can create up to 8 songs by chaining individual segments together. Each segment you specify is a "step" in the song, and each song may have up to 99 steps. (A step could also be an instruction such as change tempo, activate output trigger pulses, etc.)

Each song may also be programmed individually for tempo, drum mix, and dynamics. Note, though, that the drum mix is static—in other words, once you've specified a particular drum mix, those levels remain the same throughout the song. However, songs may also be linked together so that upon ending, one song jumps immediately to the beginning of the next song; so, if you treat these different "songs" as sections of *one* song, you can create an automated mixdown effect by programming different mixes for each section of that one song.

Songs may end in three ways (jump back to the beginning, jump to another song, or end unconditionally), be erased, or edited. The editing functions let you insert additional steps into a song, or delete existing steps.

Two useful song mode special effects are tempo change, where you can speed up or slow down a song at

predetermined points in the song, and a programmed trigger output option, which can drive a synthesizer's arpeggiator, sequencer, or similar synchro-sonic device in sync with the Drumulator.

**Other functions.** To aid in programming, the Drumulator provides beep messages which confirm certain operations or warn you of certain conditions, and two seven-segment LED readouts which provide a tremendous amount of information about the unit's status. The Drumulator also includes a cassette interface for dumping, loading, or verifying drum programs; two ¼" phone footswitch jacks, one to remotely start or stop the unit, the other to let you exit from infinite repeat loops (which you might program if you wanted to accommodate a solo of indeterminate length); gate inputs which let you record or trigger drums from Synare-type drum pads; and a metronome/trigger pulse output jack. You can also dump a sync track to tape and recover it with the Drumulator, or feed the Drumulator with an external clock which follows any of the 24, 48, or 96 pulses-per-quarter-note standards (you can even feed it with an audio rate clock). There are some other features such as being able to clear the memory, select

117V or 230V operation, and so on... but I think we've hit the major points.

**Overall analysis.** Like many musicians, I had wanted a digital drum unit but had not been able to afford one. Fortunately, when I first saw the Drumulator I was so impressed with both the functions and the price that I asked E-mu if they needed someone to help write the manual. They said yes, so I managed to take one of the first prototypes home. After having used the device now for a couple of months in my studio, I'm still as impressed with the Drumulator—in fact, more so—than I was initially. What with the superbly recorded drum sounds and musically useful programming features, you really have a lot to work with.

The Drumulator does lack a few features of the higher-priced models (for example, the LinnDrum includes a frames-per-second readout, voltage-controlled drum tuning, and a library of user-changeable plug-in sounds). Your particular application and budget will go a long way towards deciding which drum unit is best for you, but I know one thing for sure: the Drumulator is for real, and if you thought you'd *never* be able to afford digital drums... think again. ■

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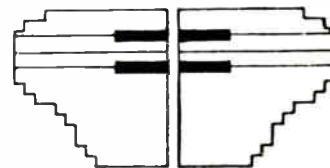
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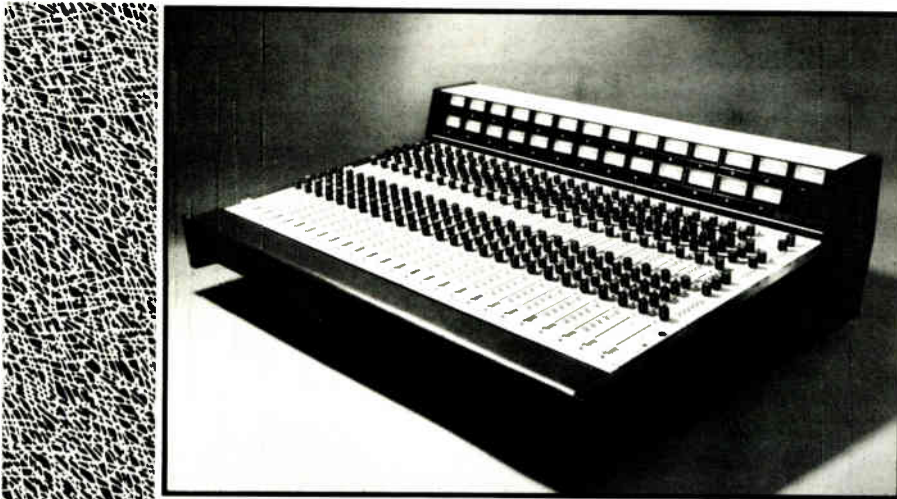


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# Mixing Console Technology

by **George Petersen** Last month we began a manufacturer's forum to discuss mixing console technology; some predictions, some observations, and how the manufacturer's current line of product reflects their view of the situation. We continue:

## Part 2



Wheatstone Corporation  
Audioarts Engineering  
by Gary C. Snow

The recording industry has advanced to the state where technological demands upon equipment manufacturers have brought digital recording to a reality. For years the recorder has been the weakest link in the recording chain; but with the advent of the 16-bit recording process, demands have now shifted towards the console manufacturers. Consoles designed just years ago are often out-performed (and hence, made obsolete) by the recorders of the eighties. The challenge to console manufacturers of the eighties is to design new mixing systems that match the dynamic range, distortion specs, and frequency response now possible on magnetic tape. It is our opinion that these newer mixing systems will be divided into two categories: the totally digital super budget consoles, and highly refined analog consoles.

The digital approach will for the near future remain extremely expensive but in the long run promises the maximum ultimate flexibility and control. For now, digital systems will be used mainly by the very large commercial recording studios, television networks, and major film studios. Since the

hardware/software development costs are so incredibly high in this technology, the cost of the final product will necessarily be high. Beyond the eighties, however, VLSI (very large-scale integration) technology will eventually bring these systems to the market economically. (Witness the revolution in the personal and business computer industry.)

The highly refined analog recording console is the result of our current engineering program. We believe the majority of recording studios and video editing facilities are interested in upgrading their audio systems and that the newer analog systems approach is for the present time a more practical step to being competitive, both technologically and economically. While studio clients are demanding greater complexity and more audio processing for their work, the demand for human engineering and reliability has intensified.

Audioarts/Wheatstone presently manufactures the 8X Series recording and production console. This console, introduced in early 1983, utilizes the latest fifth generation semiconductor

technology coupled with very careful circuit board layout techniques. The semiconductors in themselves, of course, don't make the console; the emphasis must also shift toward careful circuit topology and component selection so as to optimize the technical performance and, of course, the sonic result. And the end result is a console that can easily outperform the best digital technology presently offered.

Equally important to performance is reliability. Reliability can only be achieved when it is held out as a design goal from the very start and is a considered factor at every stage of the design and production process, from circuitry layout and component selection to the actual production execution of the design. Because production facilities of all types have intense economic demands this factor cannot be ignored, and for this reason we believe modular construction principles will prevail in both analog and digital systems.

As for the evolution of console format through the eighties, we see (as evidenced in our 8X console) the need for comprehensive equalization and plenty of flexibility for special effects and subgrouping. At the same time these features are being demanded by the client, space requirements will result in more compact consoles. Compact consoles like the 8X are also in great demand by those engaged in remote and on-location situations. This trend will continue as consoles get smaller and local broadcasters get more involved with production.

It is our view that the big budget sophisticated facilities are going to get bigger budget and more sophisticated as time progresses. On the other hand, we believe the majority of the creative process will continue to take place in smaller, technologically competent facilities throughout the country.

Current demand, brought about by digital recording and transmission, and the counter-balancing force of a tremendous demand for program material at the local level, are

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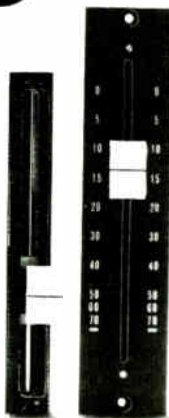
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A.C. Electronic Services (A.C.E.S.) of England has for several years enjoyed an enviable reputation in England and Europe for producing 4, 8, and 16 track consoles and a 16 track recorder. When it decided to enter the American market through its exclusive

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American distributor A.C.E.S. (USA), the company developed and introduced a line of products for the professional 24 track studio including the TR24 multi-track recorder, the TR2 1/2" mixdown machine, and the ML24'24 console.

The ML24'24 is designed to provide maximum ease of operation and maintenance at minimum cost. Its fully modular construction allows for easy repair, expansion, and upgrading, while its in-line design provides maximum recording/monitoring/mixing flexibility as well as the option of sub-grouping any number of channels. Each channel features 5 points equalization with 8 turnover frequency points, three auxiliary sends (the first pre-fade and the second and third pre/post switchable), an output VU meter, and, for input level monitoring, a 9 segment LED PPM display mounted alongside the 105 mm audio fade conductive plastic fader. Each channel also features 48V phantom power, with transformer input balancing and low noise input circuitry.

Various controls on the ML24'24 have different functions depending upon whether the unit is in the recording or mixdown mode. The pan control, for example, serves as a chan-

nel status switch while recording and as a routing switch to L/R during mixdown. The monitor and pan controls have different relationships in the different modes as well, as the monitor send goes to pan in the record mode but not in playback. Both the monitor and pan controls have buttons which assign them to an appropriate mode of operation, as does every other section of a channel, be it the gain controls, (line/mike select switch, tape/aux select switch) or equalizer (EQ in/out switch select).

The ML24'24's master module allows the engineer to control the headset, monitor output, and L/R levels, as well as use a talkback mike to communicate with the musicians recording. This console's designers have taken great pains to see that this unit is most comprehensive in meeting the needs and wants of its potential market. It has a list price of \$15,900.



Trying to see into the future, "crystal ball gazing," or whatever can

be pretty dangerous to one's credibility, particularly when it comes to this business. But the recording console is changing—and the industry with it. An examination of the past may help to put the future in perspective.

The past decade has seen the parallel development of recording/remixing consoles and multi-track production techniques. Successful manufacturers listened well to producers and engineers as they developed their technique, and provided the necessary features on range after range of new boards. Perhaps the greatest indication of how closely allied console development is to production development is the example of the "in-line" or "American" type of console. Pioneered by MCI, the "in-line" concept was a direct outgrowth of production requirements for multi-track recording, unlike the older "split console" designs which trace their heritage back to the early days of stereophonic and three track recording. Hardware performance characteristics were also improved to a point hardly imagined years ago, based on the types of "chips" available from other industries. For example, it's unlikely that the op-amp in an integrated circuit package would have been developed at the prices we now find it if

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its only use was to be in pro audio.

Today the console designer is up against a number of unstable factors, and first among them is the fact that multi-track production techniques are changing. For instance, it's no longer possible to take for granted that the majority of sounds will be live pickups via microphones, since so much of today's music is synthesized or emulated by digital equipment. Second, the melding of digital and analog concepts is already happening in some consoles, and

the question becomes, "Where do we draw the line?" Some conceptual digital thinking has been applied to consoles available today, like MCI's very popular JH-600 series. Although purely an "analog" board from a signal chain standpoint (exclusive of automation), the JH-600 has some "soft" functions, that is, a button or switch which can have more than one function depending on mode selection. This brings us to the nut of the matter.

For years everybody's been

talking about the enormous "piece of iron" we find in our control rooms, and the acoustical problems that it presents. It would be nice to make consoles more compact, but circuitry size is not the problem - your fingers are. There simply is a physical limit to the packing density of knobs and switches before the human interface becomes impossible. On the other hand, the production community is constantly seeking more inputs, more sends, more returns and so forth, and it is the job of manufacturers to satisfy these demands. So the console grows bigger, and more redundant. Redundancy is another difficult aspect of design. At some time, maybe *all* 56 or 112 equalizers must be used at every frequency... and at some time maybe *all* input channels of a major console will be required. But at most times, for most jobs, this is far from the case. We sit at these big pieces of iron and use ten or fifteen I/Os, and possibly half of the available sends, returns, and equalization (but then the range or the "sound" of the equalizer isn't what we've been looking for, so we patch in outboard gear!).

It could be that the entirely "soft" console may be the wave of the future, and today's microprocessor technology can make it happen - albeit at a high price. One would simply spend time prior to every session "writing the board" into the configuration required. Perhaps mag cards could be used for the basic presets. Equalization could be space in RAM into which any number of curves can be written, or perhaps a set of pre-written emulations of the sounds of popular equalizers. Characteristics of the most favored reverb and delay devices, to say nothing of myriad compression/limiting curves, could be written in as well, or made available on mag cards. Even such things as channel assignment can be "soft," and the necessary crosspoints written in as needed. The "size" of such a console might be described almost as a computer would be - in terms of speed and available memory.

How would such a console be accepted? Probably with great difficulty, for all of its advantages would necessitate a whole new education for engineers and producers who have spent the last ten years just learning to grapple with today's hardware. The versatility made possible by technology must be balanced against ease of familiarization and operation, since all the automation and versatility in the world does no good if it stands in the way of the artistic process because of operational requirements. Any console has to be as "user friendly" as possible, and the operator/computer interface should be transparent - making it unnecessary to retrain mixing engineers into computer operators, or producers into software specialists. In this light the totally "soft"

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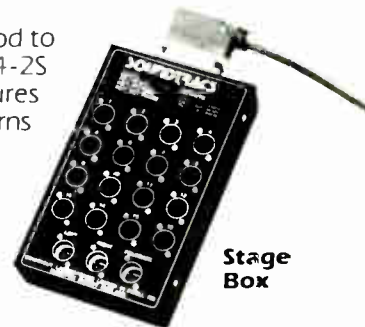
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console may be only a "hardware possibility" instead of a viable product.

Perhaps we will see console developments yield "softer" and "softer" boards until we ultimately arrive at the kind of console described. Today, time code controlled operations are just now receiving the attention they deserve and any console should be capable of operation in real time, as well as offering the ability to manipulate edit or level change points in the mix "off-line." The jargons of film editing, audio editing and mixing, and video editing and mixing are coming closer and closer, and the console of the future should probably take another stab at standardized "machine language" and control nomenclature.

Whatever the future brings us in recording and remixing consoles, the successful manufacturers will again be the ones who never lose track of what goes on on the "other side of the window"; those designers who remember that the music is what this business is all about, and that the creative process in the studio is the product of a cooperative spirit - encompassing hardware, software, and most importantly, people. Who knows? Maybe some day we will see the development of a "user friendly" producer!

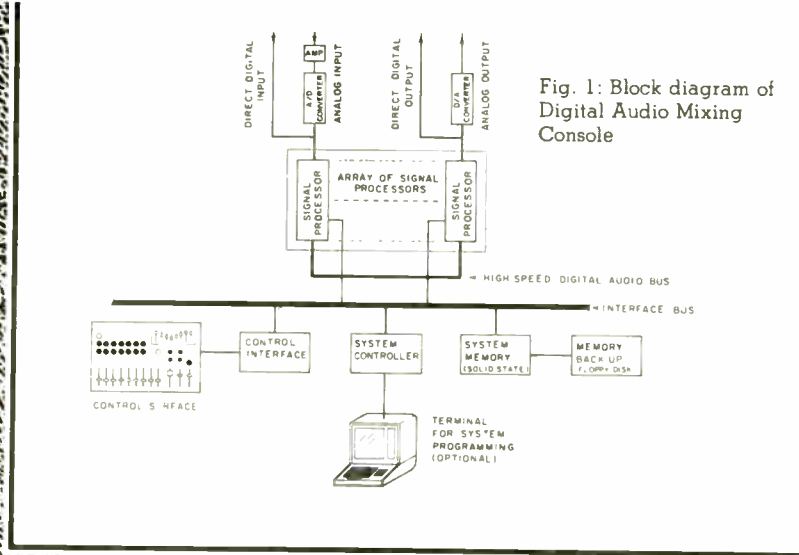


Fig. 1: Block diagram of Digital Audio Mixing Console

### ELECTRO-VOICE

by Christoph Heidelberg,  
Senior Product Engineer

While computers have captured the imagination of the world and found their way into our everyday lives, audio engineers are still only talking of the ultimate audio mixing console. This mythical console would be fully automated and programmable.

However, a short review of the present state of console design technology indicates that this ultimate goal is

difficult to achieve with the present analog-digital hybrid technique. The limitation of digitally controlled analog consoles is mainly the excessive cost for the required level of performance.

In particular, the large number of interfaces between analog and digital circuits would be very expensive to implement in a fully automated console. For example, the number of VCAs

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(Voltage Controlled Amplifiers) or multiplying DACs (Digital/Analog Converter) can easily exceed the number of op amps. Severe degradation of noise performance would be expected due to the introduction of a large number of noise sources and the proximity of sensitive analog signals and fast digital signals. These constraints restrict the degree of automation of most existing consoles to two functions: fader and mute switch.

It appears, then, that digitally controlled analog consoles may always have a limited level of automation.

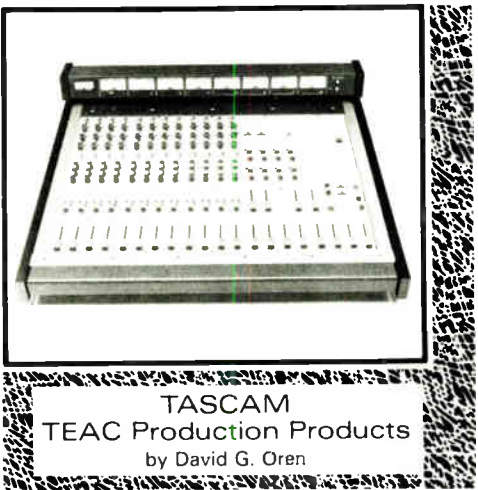
Digital audio signal processors promise an improvement of audio quality, but they are expensive. As digital circuit technology advances, a reduction in the cost of these processors can be expected. At Electro-Voice we are presently investigating alternative methods of digital audio signal processing that will make low-cost digital signal processor building blocks feasible in the near future.

As an example, let us consider the fully digital console. The interfaces between analog and digital circuits are reduced to a few high resolution A/D and D/A converters. Digital crosstalk into analog circuitry is minimal. Headroom and system noise can be independently specified and are mainly dependent on the coding scheme. As integration technology advances, the speed and complexity of digital circuits increase while the cost and power consumption decrease. All of these factors will contribute to the eventually affordable digital console.

Fig. 1 illustrates a possible implementation of a digital console. The control interface, system controller, system memory and memory backup are standard and inexpensive computer components. The cost of A/D and D/A converters will start to decrease when fully monolithic components become available.

Unfortunately, there is no digital signal processor commercially available which has the performance required to simulate a console input channel. In the past, bit slice processors were used, but those designs needed several 19" racks of space, were difficult to program, and last but not least, used a lot of power.

The use of custom programmed chips is an attractive solution. This type of hardware can be programmed optimally for digital audio signal processing. The low power consumption and high operating speed of CMOS gate arrays make them possible solutions to previously unsolvable problems. If this type of technology proves to be economical, it is certain that the ultimate and affordable audio mixing console will be within reach.



**TASCAM**  
TEAC Production Products  
by David G. Oren

It's not often that a publication of this calibre offers manufacturers an opportunity to blow their own horn. We almost fell prey to the temptation. Bottom line, jumping on the soapbox probably won't help sell magazines, and it sure won't sell mixers. Sooner or later the end user cuts through the fog by putting one hand on the product, the other on his wallet, and waits to see what his stomach says.

After six months with the product, there's still twitches and jerks. Why? Because nobody jumps into the business exercising his full potential as an artist. Basic to any creative process is growth.

The need to create in new and changing terms is the carrot in front of the jackrabbit of technological advancement. Consoles of the future will come from the creative process itself, not from an isolated R&D department.

Is digital a practical reality? Yes, in dedicated facilities such as Soundstream, the BBC and Lucasfilms. Current growth in analog technology can give us products of sufficient quality until we can more accurately define the digital console in terms of functional and economic needs. We think that when this finally comes about, we won't be talking consoles anymore... we'll be talking computers.

The movement into digital technology will have to be an evolution, not a revolution. The "advanced analog era" will groom us for the emerging new medium. Gradually, we will acquire the language and procedures needed to prevent future shock from invading the world of man and machine interface.

Today's high visibility products were designed, primarily, to serve the requirements of the music business, where it's "art for art's sake." First it was 24, then 48, and sometimes even 72. The working realities of today's production environment, unlike the no-holds-barred seventies, has to operate under different constraints. The luxury of tak-

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ing three months to cut the tracks, and another three to six months for remix are fast becoming history. A movie made for TV isn't the same animal as an album. The working reality for audio production in video/film and their specialties just won't allow it.

In multidisciplinary production, automation is part of the key, but not in today's terms. Fader and mute control isn't enough. Pan, auxiliary system assign and returns, pre-sets for subgroups and effects returns are a few of the functions with high probability for automation in the complex assembly required for visual mediums. What the video editors offer in terms of creative flexibility, speed, and accuracy, the audio console of tomorrow must provide.

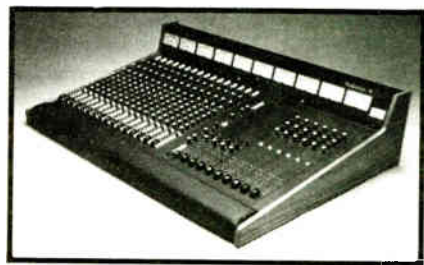
While the specifics may still be illusive, the trends are apparent. At

TEAC, analog and digital technology, and more complex automation, have been under continuous development by our Instrumentation, Computer Products and Video Design groups since we introduced the first PCM audio disk in early 1975.

This technology will be incorporated in Tascam consoles, increasing functionality and, at the same time, reducing the cost of product. High visibility consoles will continue to set the pace. Our part in the evolution will be very little different than the role we've played for a dozen years. We will continue to bring capability and economic feasibility into closer harmony.

The most current example of this effort is our M-50 12x8x8 production console. Two years ago the features and benefits found on the M-50 would have cost almost twice what we're able

to place it in the market for today. We listen, we design and we produce products with unchallenged cost/performance characteristics.



**TMS STUDIOMIXER**

by Eric Johnson

Because the audio industry has been as volatile as any in the area of advancing technology, it is a rather fatalistic approach for one to "lock in" his thinking in terms of any specific direction for the recording (or PA) medium. We have heard much talk about digital, but equally as much about "second generation analog." Perhaps we are already in the middle of such an age, with the incredible improvement in integrated circuits in recent years. As to how current analog technology compares to that of digital, it is certainly in the ears of the listener... and who is to say whether the upcoming "third generation analog" will far surpass digital advances?

Rather than to try and predict what an audio operator or recordist deems to be the best direction, TMS Studiometer has attempted, by design, to leave the maximum flexibility in its product line so that as technology changes or the operator's needs increase, TMS Studiometer can adapt to the new situation. Because Studiometer is Totally Modular, the mixer can be switched around... expanded, modified, customized... to the user's needs. Computers and other high tech devices have utilized modularity for a long time, letting the user expand or modify to keep up with high technology. TMS Studiometer predicts that in the future, most sophisticated mixing consoles will only be available in a modular format, avoiding the instant obsolescence or rigid mainframe models.

Another concept of the TMS Studiometer is the location of ICs on sockets for quick service, and, as was recently the case in our own upgrading process, the ability for instant modification of our entire line of consoles... simply by substituting new tech chips in crucial places in the circuitry.

Since the mixing console industry will progress in the footsteps of audio technology, the console with the most flexibility will be the one which remains the most modern. TMS Studiometer intends to accomplish just that. ■

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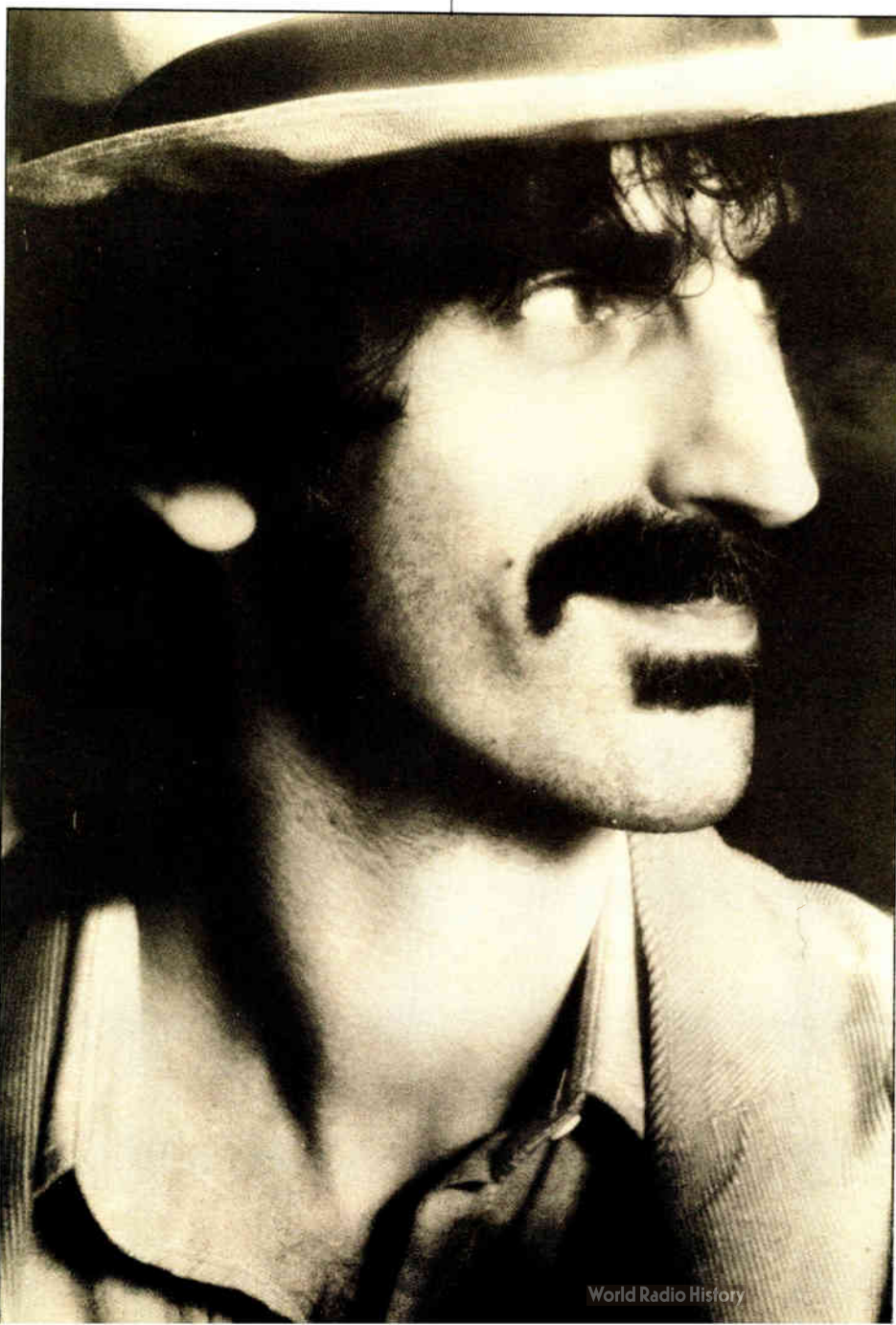
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World Radio History

# An Interview with Frank

# ZAPPA

by Dan Forte

Frank Zappa is at it again. Or, to be more accurate, Zappa has been "at it" continuously since *Freak Out*, his landmark debut with the Mothers



of Invention, in 1966. The liner notes to that and several other early Mothers LPs include the epigram, "The present-day composer refuses to die," a quote from Frank's idol, Edgard Varese. If Zappa himself is any indication, the present-day composer also refuses to take a vacation.

Zappa is quite probably the most prolific rock artist active, and at 42 he shows no signs of slacking off. Early this year he released his latest album, *The Man from Utopia*, on his own Barking Pumpkin Records. The record's inner sleeve features an ad for another LP, a picture-disk soundtrack to his film, *Baby Snakes*, available by mail order only. Originally released a couple of years ago as a 2½ hour opus, the film was seen only at selected screenings; Zappa recently edited it down to ninety minutes. He has also finished another feature-length video, *The Dub Room Special*, and is currently remixing all of his early catalog items—most of which are out of print—for reissue, along with some previously unreleased material from those periods.

Along with his massive output of rock & roll, Zappa has continually written contemporary symphonic pieces, which are only now beginning to be performed by orchestras. Twelve-tone composer Pierre Boulez commissioned Frank to compose music for his ensemble, slated to be performed in Paris early in 1984. In January, the London Symphony Orchestra did a program of Zappa's music, conducted by 31-year-old Kent Nagano, conductor of the Berkeley and Oakland, California, symphonies. Zappa also produced and engineered a studio album of the LSO performing his compositions, soon to be released on Barking Pumpkin. Nagano, one of the foremost champions of new music, declares, "As a composer, I rank him right up there with the other great masters of the century. It was one of the most exciting projects I've ever worked on."

In February, Zappa shared the

baton with maestro Jean-Louis LeRoux for a 100th anniversary celebration of the music of Varese and Anton Webern, performed by the San Francisco Contemporary Music Players at the city's War Memorial Opera House. Though the concert was a bona fide success, Zappa admitted afterward, "It was the first time I've conducted anything by anybody else, and we only had two rehearsals. I didn't even know if I was going to be good enough to do the *Integrale*, because it's a lot harder than *Ionisation*, the other Varese piece I conducted."

The day after the San Francisco performance, Frank sat still long enough to answer a few questions about what he's been up to lately and what he'll be into next.

**Mix:** How did you interact with the San Francisco Contemporary Music Players in the rehearsals?

**Zappa:** Did I tweeze it out? Yeah, I tweezed it. They knew the stuff very well before I got here; they had played it before. They knew what the notes were – it was just a matter of spiffing it up. Ultimately, it's up to the musician. What the conductor is doing is showing where the beat is, and then telling them things about style to taper

it to his own taste. The instructions I gave them about style were not extensive, because the minute I started conducting them they sounded like they had a pretty good grasp of what the piece was supposed to be. The only things I told them, for instance, was

how to **say** certain parts – don't just play the notes, but make it talk.

**Mix:** What's your feeling regarding the success of having your name connected with a program of classical music by other people?

—Page 90



## Nagano on Conducting Zappa

*In between his duties as assistant conductor of the Oakland Symphony, music director of the Berkeley Symphony and the Oakland Youth Orchestra, and conductor of the Oakland Ballet Orchestra, Kent Nagano somehow found the time to go to England and conduct the London Symphony Orchestra in a program of Frank Zappa's music. Here are some comments on the experience:*

One of my big interests is new music. But not just any new music; it has to be of quality sufficient enough to enter into traditional repertoire. I'm not

—Page 88

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—From page 87, NAGANO

interested at all in experimental music or avant-garde music; I'm interested in new music that already has the bugs worked out of it and is a highly refined form of art. When I heard that Frank Zappa had been commissioned to write some pieces for Pierre Boulez, I was really curious, because that's one of the biggest honors a composer can possibly get — to have Boulez ask you to write a piece for his ensemble.

So I contacted Frank's management and met with him backstage when he played the Berkeley Community Theater, late in 1981. He showed me a score and said, "This is what I do." So I sat there and looked at it, and it was just an amazing score. It was not some-

thing that I could just sit and casually glance over. Very, very sophisticated stuff; I couldn't even hear it — I had to take it home and look at it at the piano. He let me borrow it to study and gave me a couple of other ones. It took me a long time just to get through it. Bear in mind, I'm one of those overly educated erudite jerks — heavy theory background. I was very excited by it. For someone like me, who peruses—without exaggeration—maybe 50 or 60 brand new scores a year, it was so refreshing to see a very finely crafted score like that. So I called Frank and explained that I'd like to perform the piece. His answer, which now I realize is typical but at the time sort of took me aback, was, "What makes you think you

can play the piece?"

We had a meeting about it, but the main issue was being able to pull together enough rehearsal time to do it properly, which is a very expensive venture. The music is so difficult it requires maybe five times the normal amount of rehearsal, so if you're working with a union orchestra it means big dollars. But then Frank called me with the invitation to go to London.

The biggest obstacle to Frank's music entering into standard repertoire is the fact that it demands a technique that is not normally required of your average symphonic musician. That's not to say that they can't play it, but the technique involved is way ahead of its time; 30 years down the road, orchestral musicians will have that technique.

The composition itself uses very conservative elements, in terms of the basic constructs that go into building the piece. The form is identifiable and traces back through music history; there's nothing that radical about the harmonies — he uses the 12-tone scale in his own particular mode that he's invented. The meter sometimes is very sophisticated, but for the most part there's nothing really new there for symphonic players. But what *is* new for them—what I consider almost pioneering in symphonic writing—is his use of what are called "irrational" rhythms. An example would be 7 against 6, 8 against 3, 17 against 2, 9 against 2. They're just a very common part of Frank's language. When you have maybe 32 people playing the same rhythm in unison, you have to sit there and figure out how to do it precisely. That kind of discipline, I think, will have very far-reaching effects.

I'm very committed as a proponent of new music to Frank's orchestral literature, because of the very high quality of the techniques that went into writing the scores. There's no virtuosity for virtuosity's sake; there are no effects for their own sake. This is not fusion in any way; this is totally uncompromised symphonic writing, written within that tradition. And built into it are so many dimensions that every time you go back and work on a piece you see a new level of depth that you weren't able to see before — which is one aspect of the great works. Every time you hear the Mozart *Jupiter*, if you're a perceptive and sensitive person, you hear something that you hadn't really heard before. Another aspect of great works of art is that people of all levels of sophistication can hear it and relate to it on some level; from a person who only knows rock music and baseball to an overly educated, scholastic, erudite jerk, anyone can be moved in some way. And Frank's music passes those two tests.

—Dan Forte

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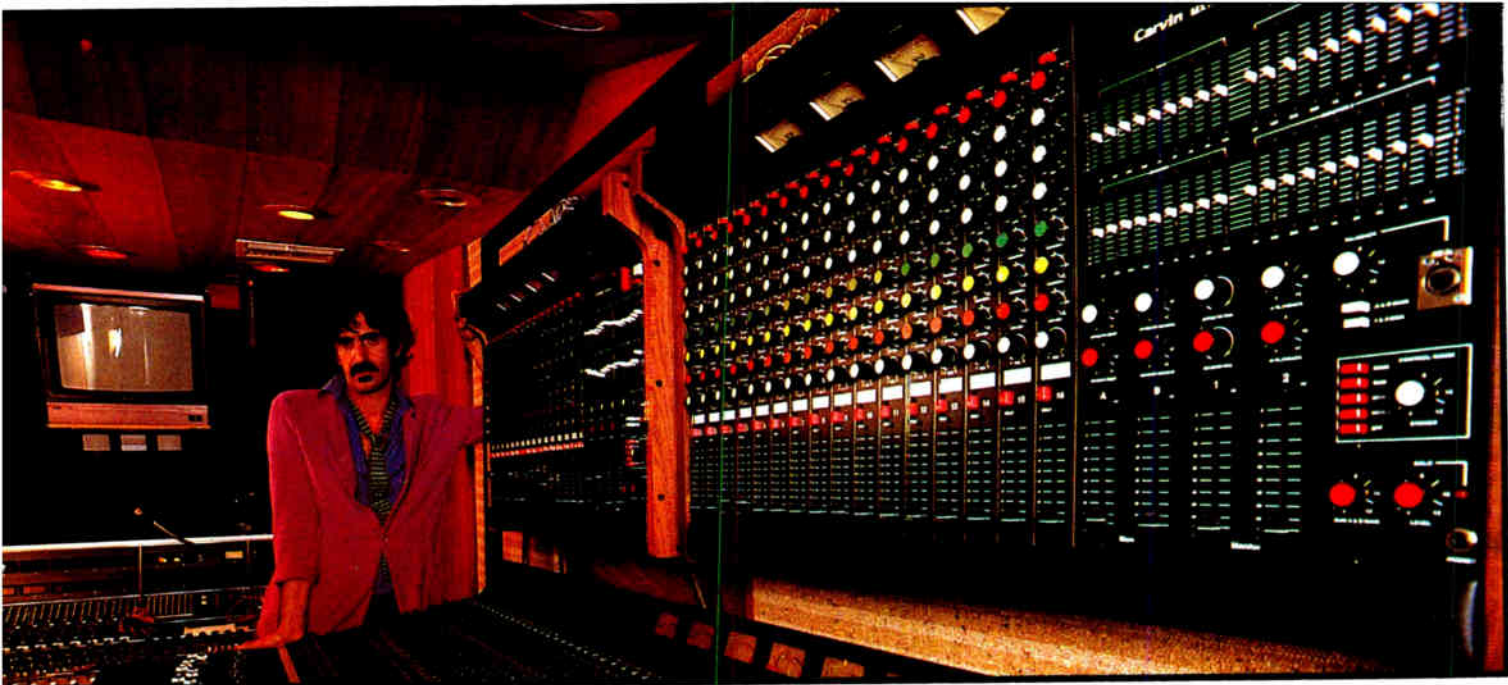
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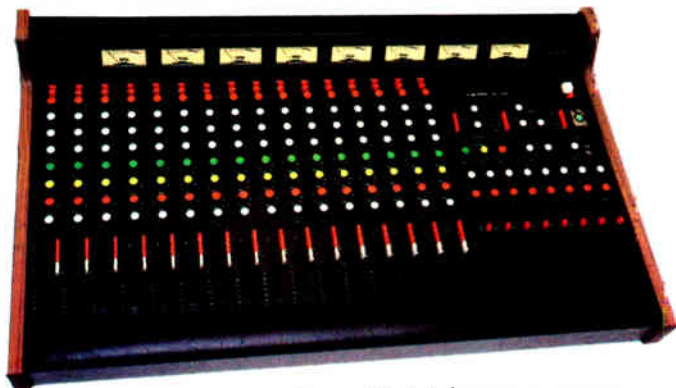
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MX-46

—From page 87, ZAPPA

**Zappa:** Well, I think it helps to sell tickets.

**Mix:** To whom? To your audience?

**Zappa:** Well, yeah. There's probably more of them than there is of the audience for contemporary music in general. The fact of the matter is unless you sell tickets to *somebody*, that music is going to die. Some of the people in my audience have never heard that kind of music, and if they heard it they might like it, so it's a good thing because it spreads out the base of the ticket-buying potential for modern music in the future. Otherwise, it's the same 25 people who go to the concerts in an art gallery. Unless you can broaden the base out, that music is just going to be museum stuff.

**Mix:** Producing and engineering a symphony orchestra must be drastically different from the albums you've produced with rock musicians, electric instruments, and overdubs.

**Zappa:** Well, here's the way I did it: First of all, we performed in the London Symphony Orchestra's new permanent hall, the Barbican — a huge, gigantic, multi-million dollar cultural complex, English style. A real shitty



THE TC GARY WELLSER

hall. The acoustics are not great, and they vary drastically from seat to seat. The stage is too small for a major production. It was so tight for our setup, in fact, that we had to leave two violas out of the orchestra because there was no place to sit them. So I wouldn't have wanted to record it in there anyway.

The two halls in London where orchestras ordinarily record, with good acoustics, were both booked, so we wound up recording at a place called Twickenham Studios Stage One, which is a movie sound stage. Very dead acoustics — which at first I thought was going to be a disaster. But after getting the tape back and finding out what I can do with different types of reverberation added to different sections, it's better than having done it in a live hall where you have no control over it. So we miked it with PZMs, 90% of the orchestra, plus we had a[n Eddcor] Calrec [microphone] over the conductor's head.

**Mix:** How many mikes?

**Zappa:** Mmm . . . 62. 24 track digital. I've rented a digital 24 track so I can do the editing in my studio. It's a dream, the Sony PCM 3324.

**Mix:** Would you ever record your own band digitally?

**Zappa:** If I could ever afford one of those machines — they're \$150,000.

**Mix:** The complaint has been that the digital tape sounds great, but when you transfer it to an analog medium you get a whole different sound.

—Page 104

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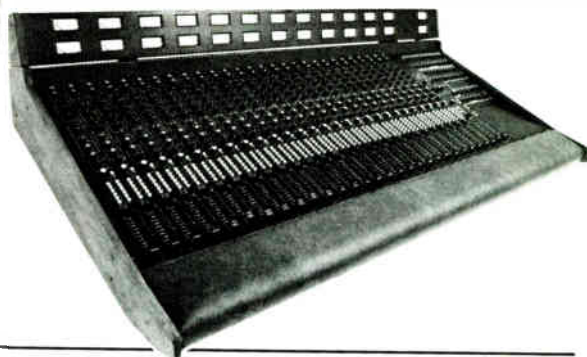
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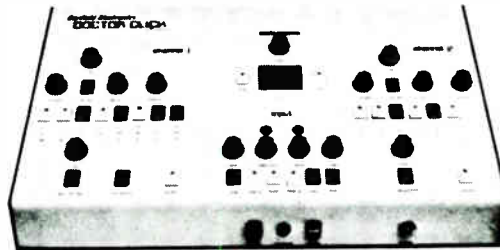
The Doctor Click Rhythm Controller makes it possible for the first time to synchronize the world of sequencer, drum machine, synthesizer composition with any one of the systems on the market or combinations of the systems on the market. Furthermore, the Doctor Click will cause sequencers, drum machines and synthesizers to play in time with a human drummer. It will also read click tracks and sync codes. The internal metronome provides both beats per minute and frames per beat calibrations.

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done with virtually any sequencer, drum machine or synthesizer.

The ability of the Doctor Click to read live tracks allows sequencers, drum machines and synthesizers to play in sync with the varying tempos of a human drummer or a built click track.

The ability of the Doctor Click to accept external clocking or either of the types of FSK sync to tape codes allows sequencers, drum machines and synthesizers to be synced to any existing track.

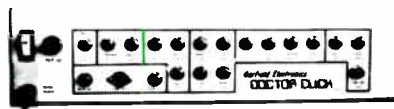
The pulse shaper circuit turns a pulse from an instrument into a trigger waveform allowing synthesizers to sync to a drum fill.

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by Jack McDonough

**A**ce mandolinist David Grisman is best known for his creation of "dawg music," an effervescent hybrid of jazz, bluegrass, classical and ethnic idioms played in all-acoustic style by the talented players who have united in various Grisman aggregations since *The David Grisman Quintet* (Kaleidoscope F-5) appeared in 1977.

But Grisman is as active a producer as he is musician, perhaps because his style of music is so idiosyncratic and personal. He has produced and arranged all the material for all of the Grisman group LPs; and, in a career that stretches back to the heart of the Greenwich Village folk days in 1964, has produced artists ranging from Red Allen & Frank Wakefield to the Rowan Brothers. He has also produced, since 1974, the soundtracks for four different films.

Grisman's own records, because of their unusual sound and dazzling playing, have always received attention. He will no doubt get more attention this year for his new *Dawg Jazz/Dawg Grass* album, which features Stephane Grappelli and part of the "Tonight" show band on the jazz side and Earl Scruggs on the bluegrass side.

There has never been any question of anyone other than Grisman producing his records, although, he says, "I'd check it out if someone wanted to put up a budget I might hire a producer if I decided to do a whole album of big band tunes, for instance. But all a producer is is someone who's good at putting things together. One of the problems I have with the English language is words like 'producer.' It can mean a million different things. It can mean the arranger, or it can mean the guy who signs the checks or the guy who got the deal. It just breaks down into roles: arranger, conductor, union contractor, whatever.

"Essentially the producer is in charge of the budget. The record company is handing someone a large check and saying, 'Give me back an album.' For me, a producer would take away from that budget. He'd have to compensate by saving me a proportionate amount of something somewhere else.

## David Grisman



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"Producers are very expensive, and for me to pay someone \$10,000 to do it, someone would almost have to prove that I'm not my own best producer. I'm good at putting things together. I know when I'm playing well. I can hear arrangements pretty intuitively. And I know how to edit. That's probably the best thing I do. Editing is very important. It's ultimately saving time for the listener or anyone else. I always respect anyone who can make a point in just the exact amount of time it should take to make that point."

**G**risman's first production was a 1964 Folkways LP with Red Allen and Frank Wakefield and the Kentuckians. Grisman had helped them secure some gigs at Village clubs and had heard a tape of potential album material. "My reaction was that I had heard them do what I considered stronger material and I also thought there weren't enough tunes. So they said, 'Call Moe Asch at Folkways and see if he'll do more.' So I called—I was just 18 and I looked up the number and asked for the guy. He approved a session and said, 'Do what you want.' Of course at that time, 'Do what you want' meant three hours in a little studio at \$35 an hour, and I didn't think to send a bill for my services in those days. I was just excited to be involved. I had Bill Keith on that session. He was revolutionizing the banjo at the time.

Another friend, Fred Weiss, played bass. That record is still in the catalog—Folkways FA 2408."

**A**fterward Grisman did a few more Red Allen records, "and then I got into editing various country records, all in mono. Bluegrass production then meant just recording the band, in mono, with some mixing and echo and fading at the end, and I got to think of it as all one thing. I didn't know anything about the technology end of it; it was just, 'Wow, a recording studio, this is what they do to make the shit sound good.' That's probably why I don't like to spend a lot of time on that stuff now, because my initial exposure was to just go in and cut the song and get the performance and the balance, and it was all one thing."

Grisman continued his country-oriented work until 1969, when he joined the experimental rock group Earth

Opera. At that point, he says, "I began to see the possibility of becoming a rock producer rather than a mandolin player, because bluegrass by then had pretty much gone down the tubes. None of my bluegrass friends were interested in playing bluegrass anymore and all the guys who had served time with Bill Monroe were now trying to make it in some new form of rock. Staying with bluegrass would have meant moving to Nashville and becoming a sideman in a bluegrass band. I didn't want that, so I became involved with producing demos instead."

One of Grisman's most exciting demo projects—although one never released—was a 1969 session in Boston "to do all sorts of songs with a bunch of different people—Maria Muldaur, Richard Greene, Martin Mull, Chris Rowan, Jack Bonus, John Herald." Later he ended up producing the Columbia debut for the Rowan Brothers, Chris and Lorin, a record engineered at Sausalito's Record Plant by Bill Wolfe, with whom Grisman had worked in Boston. "He's taught me more than anyone else about the recording process," says Grisman of Wolfe.

Another early 70s project was with *Old & In the Way*, an ad hoc bluegrass group put together by Jerry Gar-

cia of the Grateful Dead. "Nobody wanted to be the heavy in the group," recalls Grisman, "so things got weird. Everybody just wanted to sit around and get high and play whatever, but it's not that simple. Bluegrass is a very precise form of music, and I was bummed out at the various musical aspects of the venture. I didn't feel there was a record there and neither did Garcia, so we

## Grisman

canned it. But then later, Owsley Stanley—after he had been released from jail on an LSD bust—started following Old & In the Way around with a stereo Nagra and a bunch of mikes. Maybe for lack of anything better to do, maybe because he felt he had lost his place in the Dead hierarchy. I was hired to go through the tapes and put an album together, and that was the *Old & In the Way* LP on the Dead's own Round label. That was the first time I mastered at Artisan and I've mastered all of my records there ever since."

Grisman's own recordings be-

gan with a 1976 Rounder album which exposed the world for the first time to "dawg music." This was followed by the very successful 1977 Kaleidoscope LP; then one for A&M (*Hot Dawg*, 1979); and then four for Warners, of which *Quintet 80* was the first. The 1981 live LP featuring Grisman and Grappelli contained a little bit of the music from the *King of the Gypsies* soundtrack, a wonderful score that was never released because the film producers and the record company could not agree on a deal. (Grisman's other soundtracks include *Big Bad Mama*, 1974; *Capone*, 1975; *Eat My Dust*, 1976).

Grisman's arrangements are a signature of his work and a key factor in his concept of recording. "As a composer and arranger," he says, "a record for me is a medium to express myself in a fixed way. I don't write out every note, I don't want it frozen, but the record is a process of fixing or defining my work in a certain way. When I write a tune I have a vision, or at least an intuition, of how that tune should be defined. I can also imagine a lot of other, alternate arrangements of that same tune; I can imagine hundreds of ways of doing it. So making a record is a means of refining all those possibilities down to one practical thing." ■

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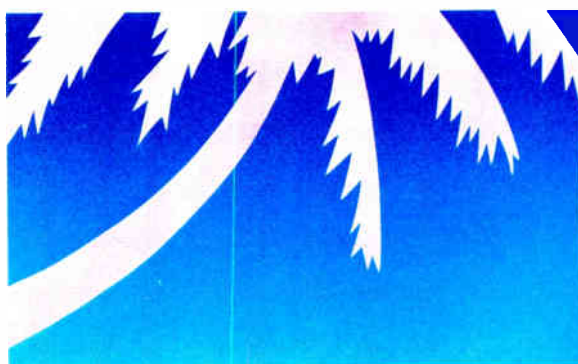
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The system incorporates a computer-driven rhythm section that enables just the two of them to produce the arena-sized sound of a full rock band and to achieve in live performance the kinds of dynamics that before this could be captured only in the studio.

The project, they say, represents "the Renaissance ideal reborn. We designed everything, built everything and did it all with our own capital. There were no record companies or managers involved, so there was no sort of compromise." The plot was carried out in an upstairs room at Studio Instrument Rental in San Francisco, and the duo credits the Lexicon company with a special assist in making arrangements for use of a large amount of digital delay equipment.

The system consists of three components, each of which can be considered to some degree as an autonomous satellite in the system, since each produces its own stereo feed into a fourth mixer which serves as the house mixer. All sounds are produced via direct line; there are no live mikes on stage.

The first component centers on Montrose's guitar. Its signal is run through a pre-amp and power amp, through the digital delay units, and then into an isolated box, where a microphone picks up the sound from inside the closed speaker cabinet and runs it back to the guitar mixer, where it is treated as a direct input.

The "Iso-Box" (Montrose has applied for a patent) is manufactured by Harbinger of Menlo Park, CA, and was created "because we needed speaker isolation from the central PA and didn't want an exposed mike on stage. It's like taking your Marshall cabinet and putting it into another room, as you would in a studio, and running it back in," says



Montrose.

Also in Montrose's mixer are Simmons drums mixed back into the guitarist's monitor. Montrose also invented his own setup for these synthesized drums, creating two triangular triggering pads, each containing three equal lengths of ABS plastic plumbing pipe, with the two triangles joined by a seventh length of pipe. Each tube of pipe carries a synthesizer pickup in its underside, and when Montrose beats on these triangles with drumsticks a whooshing, metallic, percussive sound results.

Also at Montrose's station is a heavy stand to hold an acoustic guitar (which also runs through the Lexicon DDL and reverb) so that he can play the acoustic without removing his electric axe.

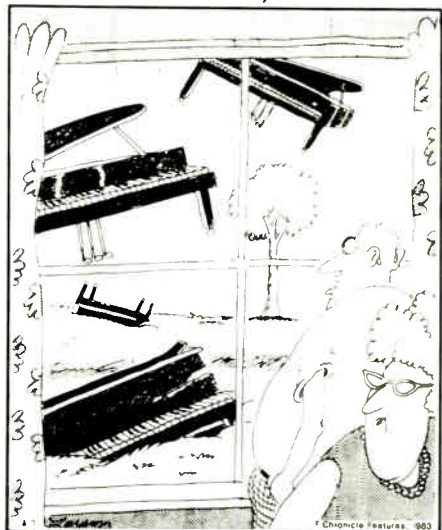
Froom's keyboard component consists of two racks: on one side are stacked a Roland Vocoder Plus, a Sequential Circuits Prophet-5 and a Memorymoog; and on the other a Roland Jupiter-8 and a Yamaha CP 70. All units go through Mitchell's on-stage mixer, using the Lexicon and reverb for signal processing on stage.

The third component, and the heart of the experiment, is the Roland MC4 Microcomposer, which runs four synthesizers independently and provides overall tempo control. The four synthesizers thus controlled are a Moog Source, which provides an all-synthesizer bass; two Oberheim synthesizer expander modules for high-frequency sequencing; and the Jupiter-8, which Froom sometimes operates directly and sometimes runs from the Microcomposer for special effects. The Microcom-

poser also supplies the clock for the LinnDrum LM-1 unit, which has a full LinnDrum computer and Schultz cymbals stored (three cymbals, two crash and one ride).

The ultimate stereo feed from each of the three components of the system goes into a fourth mixer, which, says Montrose, "acts as a house mixer, except that we have it on stage." This submixer allows for a stereo mix going from left to right across the large array of cabinets at the rear of the stage (with one particular pallet of cabinets near Froom and another near Montrose providing them each with their own monitor) and the PA reproduces the same stereo result.

## THE FAR SIDE By GARY LARSON



"My word! I'd hate to be caught outside on a day like this!"

What this means, enthuses Montrose, is that "we have complete control over the way we sound. In a band you lose that because of the chaos you can have on stage. When you're playing with a band the mixer has more control than you do. But with no live mikes on stage we're closing the gap between us and the audience. We're controlling what they're hearing and we know we're hearing exactly the same thing."

The speaker system is a combination Harbinger/AB Systems/JBL set-up. There are eight pallets, each containing four cabinets bolted together. The two top cabinets each contain one JBL 15" woofer and a Harbinger horn, powered by an AB 710 bi-amp crossed over at 3500 Hz. The signal is also split and sent to the bottom two cabinets, each with two 12" JBLs. The entire system weighs five tons and runs on 5,000 watts, and two technicians—former keyboard roadies with computer training—accompany the duo on the road.

A highly sophisticated Elgar battery system, in a continual stage of charging, provides necessary power backup, since, as Froom notes, "If we lost power for even a sixteenth of a second all the computer memory would be dumped. All the LinnDrums would reset to zero, the digital delays would reset to zero, all the keyboard voices would reset to zero." The Elgar can sense any possible power loss before it hits and can run the entire setup for at least a half hour.

The two pioneers hope to take the system further by eventually having the microcomposer control the clock for a stage lighting system and for video effects.

The partners first exposed the system at live dates in Sacramento, CA, in March and followed up with a late April San Francisco premiere, with dates projected for Los Angeles and the Southwest.

Montrose says that, despite the common judgment of computer music as sterile, he doesn't feel he is losing any spontaneity. "If it were an intense jazz fusion situation, then we would be giving something up. But in most rock performances, there is not a tremendous amount of spontaneity. Mitchell and I can actually be *more* spontaneous because we don't have to deal with a five-member ensemble which continually requires great talent from every player. For us this has an edge because we've really got to be on our toes to pull it off; we've got to make it real for the audience. All the machines are doing is helping us express music. In no way do we disguise the fact that we're using machines."

—Jack McDonough

—Page 98

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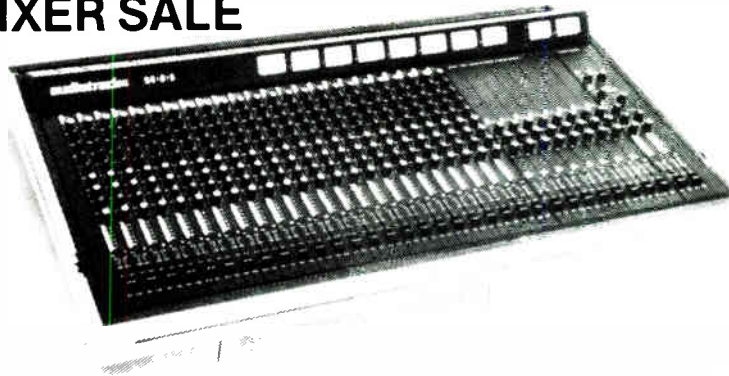
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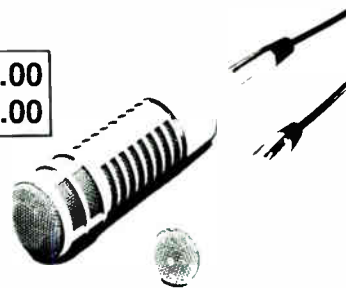


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## Digital Interface Standard for Instruments

Sequential Circuits' Prophet-600 and Roland's JP-6 are the first instruments to enter the market equipped with the new Musical Instrument Digital Interface (MIDI), an important new development in the electronic-music industry. MIDI-equipped instruments can be connected with a single cable and work together as a unit, and many such devices can be operated synchronically – and MIDI promises to make home computers a part of more electronic music systems, too.

The idea for a standard digital interface was first proposed by Dave Smith, President of Sequential Circuits, at the 70th Audio Engineering Society Convention in New York in the fall of 1981. By January of this year, five manufacturers—Sequential Circuits, Roland, Yamaha, Korg and Kawai—had agreed on a system which will be included in synthesizers, sequencers, drum machines, computers, and other devices. The Prophet-600 and JP-6, both featuring the MIDI system, were

displayed at the winter NAMM trade show in Anaheim, at which time adoption of MIDI was also announced by the five companies.

A five-pin DIN jack will be the external connector for MIDI interfacing; with this system, one or many additional synthesizers can be controlled from a single keyboard, and other com-

munication advantages will be realized through MIDI, too. Participating manufacturers note that the compatibility of many different makes and styles of electronic instruments will greatly expand the possibilities of the medium as a whole, and forthcoming advances in microcomputer technology won't render current products obsolete. —D.G.



## Peavey Amp and Guitar: Value and Personality

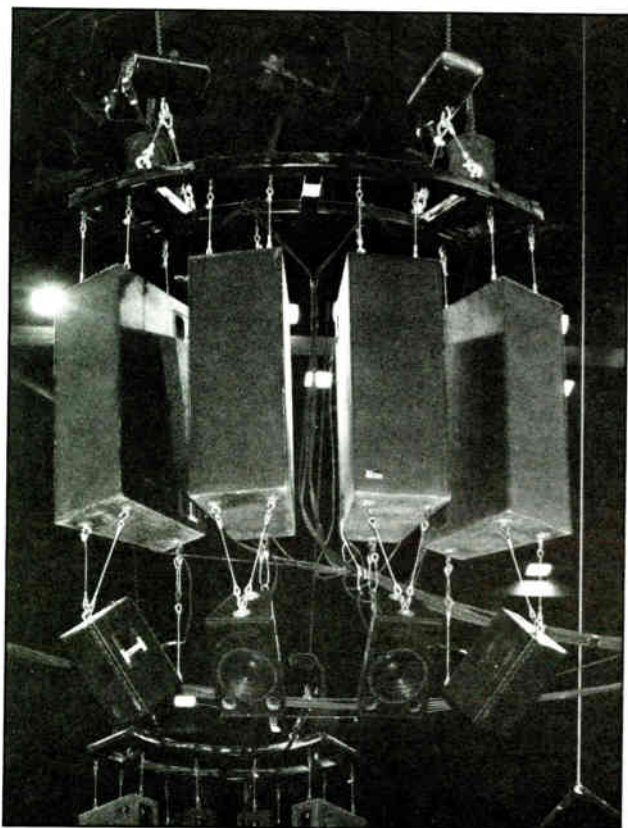
*VTX series  
MX amp*

Image counts for a lot in people's perception of a musical instrument. The classic status of companies like Fender, Gibson and Martin has been enduring in rock and roll hearts, even through fallow periods of indifferent product. Peavey has not yet attained a comparable level of affection and myth, even though the company has achieved a high level of technology and innovation in both product and production methods (not incidentally inspiring their competitors to get their instruments

happening again).

But Peavey's provincial, battered appeal (instruments for the workin' musician playin' Sadie's Bar & Grill) eludes some players – those who, perhaps, didn't care for Peavey's amplifiers in the late '60s and '70s and who've failed to follow their evolution over the past decade, and others for whom cost-effective is synonymous with cheap. But consumers shouldn't consider Peavey equipment just because it's affordable, but because it represents distinctive, high-quality professional value, with unique features and design philosophies behind each instrument.

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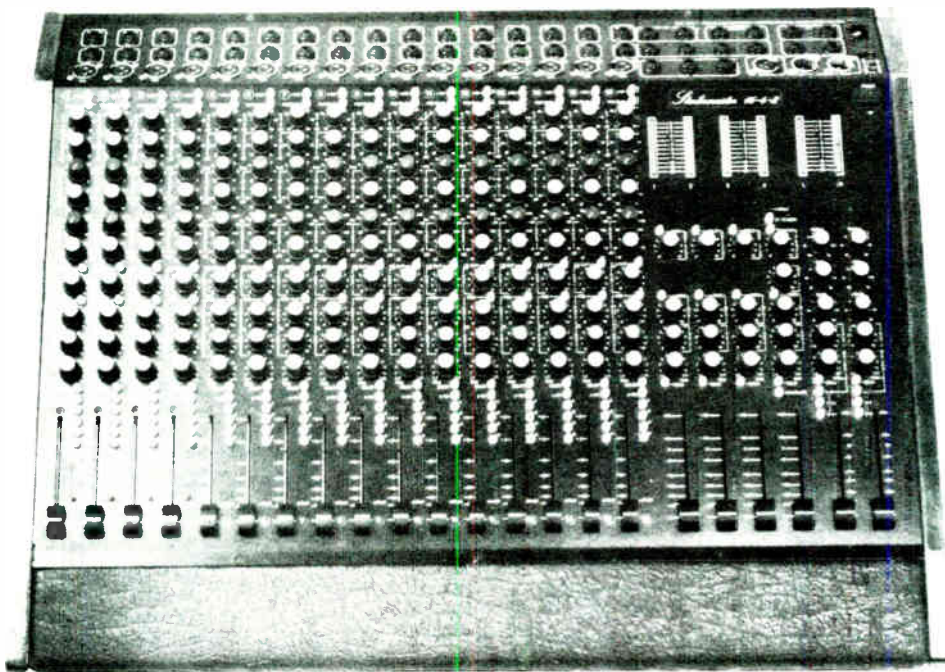
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bo from the VTX Series, flagship of an innovative line of hybrid amps that is fast becoming the instrument of the '80s. And while we have certain reservations about their new guitar offering, the T-27, it comprises several interesting refinements and new twists that make it a very likeable, versatile axe with a personality all its own.

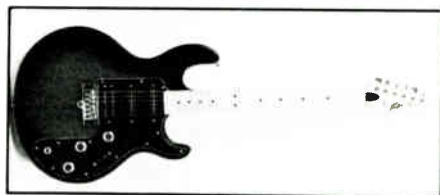
The Heritage is a 130-watt combo amp equipped with two 12" Scorpion Speakers, which will put out a very respectable 102 dB at 1 watt/1 meter; the Scorpion is a light, efficient speaker with field-replaceable baskets that sounds for all the world like the old paper-cone Jensens which gave vintage Fenders their barking attack - that is to say, the sound of the cone breakup is very pleasing and gradual. And plenty loud, too, with a fat, punchy sound, minus the edginess but not the honk; still, I wouldn't be too brazen with the *post-gain* controls (master volume), like cranking them above six with pre-gain on ten), because I don't think the speakers could absorb a steady diet of such hyperthyroid transients.

You don't have to push the Heritage that hard to get a righteous rock and roll sound, but for a cleaner jazz attack or for greater overall clarity at higher output levels, the optional Black Widow premium loudspeakers add about 25 pounds and \$100 to the price. Guitarist Robert Quine of the Lou Reed band (a longtime Peavey buyer, currently using the MX, a single 12" Black Widow version of the VTX series) feels that the Black Widows have much the same warmth and dynamic character of Electro-Voice EVMs. I found I preferred the Black Widows with the Heritage, because when adding tone color and distortion with the pre-amp section, you're adding gain; the Black Widows give you a lot more headroom and bandwidth before the note starts breaking up; for those who prefer the more saturated speaker sound, the Scorpions will rock out fine.

The signal chain from your guitar to the speakers passes through either a high- or low-gain input (-6dB for hotter outputs and pickups), then flows through a solid-stage preamp with two fully-independent channels (each with its own separate EQ and overload characteristics for distorted and clean pre-sets); next are a beautiful phaser (with depth and range controls, plus a special variable EQ function) and reverb (Hammond Mark IV Delay Line); you may then patch in noise gates, delay lines and other effects through the *pre-amp out/power amp in* patch on the back panel; and the final stage is a tube-driven power amp.

Powered by four 6L6 tubes,

the amp may be run at full power or at 1/4-power (for greater headroom or a more strained, overdriven sound), selected by a rocker switch on the front panel. The mellow, quiet characteristics of the frontend coupled to the sweet, open drive of the tubes makes for a rich, smooth-sounding amp with plenty of punch in reserve. Better yet, the amp has a massive power transformer and is *self-biasing*, so that in a pinch, you could use virtually any set of tubes *without* having to make internal adjustments to compensate for the differing power output specs and requirements (think of *that* when you're on the road); this also has the effect of allowing the



Peavey T-27 Sunburst w/maple neck

tubes to run really cool.

You can create an impressive variety of sounds and textures through the *lead gain* and *normal gain* channels. The lead channel contains passive *low*, *mid* and *high* EQ with an active presence control ( $\pm 12$  dB), and a *pull thick* switch on the *high* control for a fat, rounded midrange honk. When properly balanced with the *pre-gain* (with pull bright), *saturation* (a unique circuit for tuning the tube-type distortion-like instant Allan Holdsworth/Van Halen overdrive) and *post-gain*, you can create some of the sweetest, wettest, surfingist parfaits of distortion imaginable. The normal gain's channel lacks only *saturation*, and has active *low* and *high* controls ( $\pm 15$  dB) to sculpt tonal parameters, and a very useful, musical *para-mid shift*, which allows you to choose a full  $\pm 15$  dB of cut or boost between 150 Hz and 1500 Hz. And the phaser, when not used for gauche pedal steel, rockabilly, R&B or "Star Wars" effects, may be locked in its sweep when the *range* is pulled out; this lets you create a vowel-like envelope or tremendously enhance attack. All of this is fully mixable through Peavey's *Automix* footswitch, which allows you to separately EQ clean or dirty sounds, combine *both* channels for new effects, and switch the phaser and reverb in or out for dramatic accents. The Heritage is pretty much all you could ask for in a performing amp, with a distinctive midrange quality that sets it apart from the crowd; perhaps if they could piggyback both channels (like on Paul Rivera's Pignose Crossmix) they could get all that flexibility into a single 12" combo. At \$649 for the

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2-12" Black Widow option this amp is a bargain, and if you live where they discount from 20%-40%, it's a steal.

At \$350 list, the T-27 is a perfect sonic complement to the Heritage, one of the most versatile, interesting-sounding instruments at any price. It affords you the flexibility to set up the amp so that *it* sounds good, and then control all volume and timbre functions from the guitar itself. "The Circuit," as it's dubbed, offers seven distinct sounds by mixing between single and double-coil (humbucking) modes. Curiously resembling a Strat, the T-27 features two single-coil blade pickups, a humbucker in the bridge position, a five-way selector switch, two tone controls and a volume control (conveniently located for pinky rolls). Ah, but here the similarities end. First off, the pickups are unusually quiet, fat and powerful (the sound's somewhere between an SG and a fat Strat-Tele); second, the frequency-compensated volume control fattens the sound as you reach full volume, and grows brighter and crisper as you turn down (for clean rhythm sounds); third, when in the fifth position—even though you're looking at a humbucker—the wiry sound you hear is single coil until you roll off the tone control to around 7, which brings in the second coil for a hit, humbucking sound (in position two, you can combine the neck and middle single-coils or roll off the tone control and have a whooshy, out-of-phase humbucker).

All of this is nicely fit into a computer-crafted body of ash or maple, finished in natural or deep, luminous colors (like a Sunfire Red that rivals Gibson's famed gold-top). The T-27's tonal colors range from the pearly jazz tonality of position one to the nasal honk of position 4 (mixing single-coil and humbucker). And the 24 $\frac{3}{4}$ " scale neck of bi-laminated maple (a Gibson Scale, formed by a patented method of gluing two pieces of rock maple around a reinforcing torsion bar and *then* carving it on a numerically-controlled machine) features a 12" radius for flatter feel, improved string bending (without notes fretting out) and a soft, beautiful action that will immediately enchant Les Paul players who always wanted the chunka-chunka of a Strat but who couldn't deal with Fender's thin sound or 25 $\frac{1}{2}$ " scale. The frets are nicely finished, and I've rarely encountered any neck that feels so supple to the touch.

On the minus side, the T-27's tuners (Kluson—Gotoh) are substandard (we'd recommend a set of Sperzels). The neck/body joint rides on Peavey's micro-tilt adjustment to set the neck playing angle; on the model we tested it's pretty whiplashy, cool for

Adrian Belew neck-bend effects but not so much fun for intonation (Peavey reports that they've beefed up the neck joint, made it stiffer, and refined the neck tilt, so that once you determine proper adjustment it may be firmly locked into place). And finally, we weren't sure about the location of the bridge (fretted harmonics up high seemed a tad flat). Some players thought it could be positioned a little farther forward. Also, many desired the body-through string-mounting as used in Fenders (Peavey says they're considering it). Still, despite its faults the T-27 is pointed in the right direction, and this model was only around \$100 away from perfection. Then we could truthfully say not simply that the T-27 is a good guitar for the money, but a great guitar at any price.

—Chip Stern



ance—solid black, with a tiny body and no headstock—or perhaps because of it, the Steinberger Bass has become one of the industry's most talked-about success stories in the two years since it hit the market. Now comes the **Steinberger Guitar**, a six-string counterpart made from fiber-reinforced epoxy for light weight and extreme rigidity for sustained and brilliant tone. Its impact-resistant polyester gel coat finish makes the Steinberger guitar resistant to variations in humidity and temperature. Two active, low-impedance EMG/Overland pickups offer extremely good signal-to-noise ratio; controls include a three-way pickup selector, volume and tone knobs. Micrometer tuners maintain fine pitch control, and Steinberger's unique double ball-end strings make changing simple and quick—but conventional strings can be used on the instrument, too. Scale length is 25 $\frac{1}{2}$ ," overall instrument length 29 $\frac{1}{2}$ ." Steinberger Sound Corporation, 475 Oakland Avenue, Staten Island, NY 10310.

—Page 102

## Product News

### Steinberger Guitar

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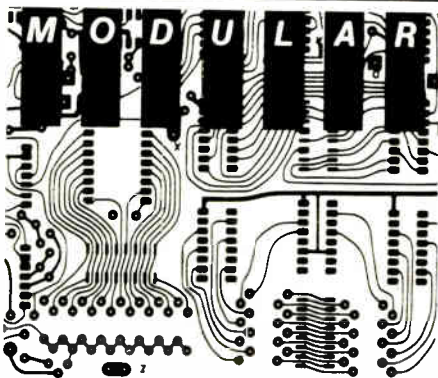
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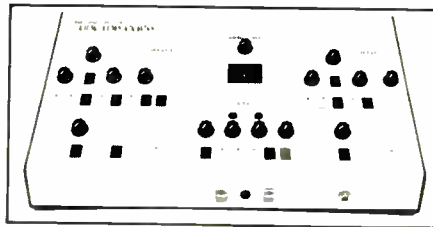
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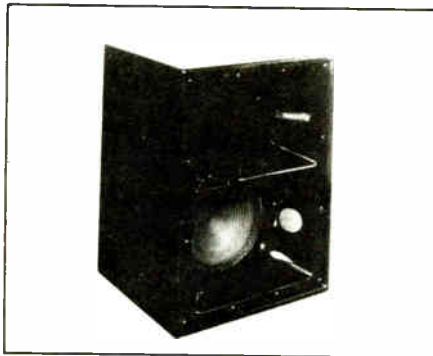
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## Doctor Click Rhythm Controller

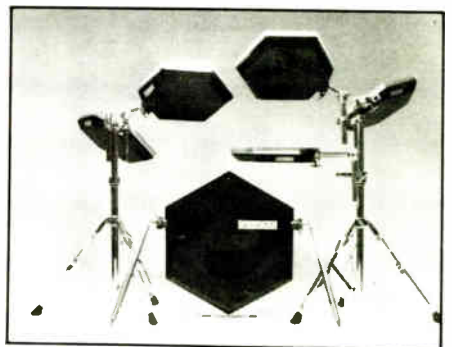
The unique feature of Garfield Electronics's *Doctor Click Rhythm Controller* is that, in addition to standard operating modes, you can sync the machines to a human drummer instead of having to start with a click track or drum machine. Doctor Click provides interfaces between a variety of sequencers, synthesizers, drum machines and related devices with various timebases, voltage levels and polarities; its foot-switch control makes it useful for live work; the metronome can be set in beats per minute or frames per minute (including fractional tempos such as 118½ bpm); two independent, rhythm-actuated envelopes can be used to control parameters of outside devices in 32 rhythm values; and many more functions. Garfield Electronics, P.O. Box 1941, Burbank, CA 91507.



## Community's Compact Loudspeaker System

Community Light & Sound's *RS320* is a three-way *compact loudspeaker system* with a high-performance midrange driver with a constant directivity type midrange horn. The low end is handled by a high-power 12" woofer in a vented enclosure terminated by an exponential coupler. A pair of piezoelectric super-tweeters mated to a constant directivity horn provide the highs. All components are mounted on a fiberglass faceplate, reducing the overall size of the enclosure and reducing unwanted resonances; the plywood cabinet is fitted with stacking corners and pocket handles and coated with a spackle finish. Options include an equalizer (*RS320-EQ*)

to improve low- and high-frequency response and protect against excessive low-end power - but Community stresses that the EQ is not required. A high-power 15" auxiliary woofer is available, offering improved low-frequency output in a same-size enclosure, and the Grille 30 option hides the *RS320*'s components when a subtler visual presentation is required. The *RS320* is also available without the enclosure (Model *RS320 KIT-1*), from Community Light & Sound, 333 East Fifth Street, Chester, PA 19013.



## Simmons Electronic Drums

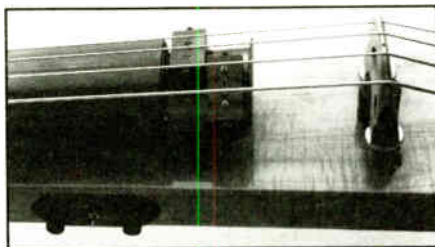
For any drummer who ever wished he had a couple of extra legs and/or arms—or some magical way of turning his toms into tympani—*Simmons Electronic Drums* are here. The playing surfaces of the hexagonal drums are made of polycarbonate; bounce comes from the stick, so the response is the same as with conventional drums. Four different sounds may be stored for each drum—tight, slack, low- and high-pitched snares, for example—and can be recalled at the touch of a button even in the middle of a performance. The toms can be switched from roto-tom to tympani to standard toms, with control over brightness, pitch, direction of pitch change, decay, noise content, etc. The hi-hat has a separate pedal to "open" and "close" it, plus control over the length of the open sound, timbre, etc. The bass drum is played with a conventional pedal and by hitting the rim with a stick.

Five modules are currently available for the electronics package—bass drum, snare drum, tom tom, hi-hat and cymbal—with cowbell and special effects modules coming soon. Each module has four presets, one of which is hardwired at the factory; the others are user-programmable. A Sensitivity control on the master panel enables the player to adjust the response to his style and to tailor the output to the application at hand. A seven-channel mixer feeds the drum sounds to a single output; Left and Right outputs enable stereo imaging, and each module's output can be taken separately.

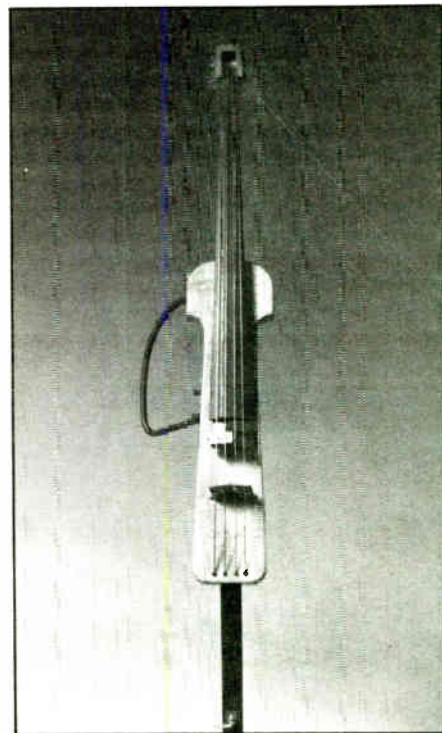
The *SDS6 Sequencer* has 8 channels and a unique "matrix" - 32x8 LED grid upon which patterns are programmed. Each channel corresponds to a drum in the kit, and the 32 steps are subdivisions of a measure or musical phrase. Patterns (up to 99 of them) may be programmed and stored, then chained together in up to 99 Sequences - and up to 99 Songs can be built from the various sequences. Programmability includes dynamics for each drum channel with values from 1 (quietest) to 9 (loudest); a load and dump feature enables offline storage of programs. Simmons Group Centre, Inc., P.O. Box 1444, Reseda, CA 91335.

produce the purest tone," Clevinger asserts, adding that "the lack of applied technology in upright bass construction" has been responsible for the fact that "the pure tone of full-length strings" has not been amplified faithfully until recently. The advent and increasing popularity of fretless instruments has rekindled interest in electric uprights, and the worldwide popularity of The Police—whose bassist, Sting, plays an upright call the Z Bass (well, he calls his "Brian") on some numbers—has helped spread the concept beyond jazz circles.

pickup, mixable to any degree; and active bass and treble controls. Clevinger, 69 Bluxome Street, San Francisco, CA 94107.



The Clevinger bass features an ebony fingerboard supported for almost its entire length for even tone and sustain, feedback resistance and optimum frequency response; a rock maple body with a small head; a special bridge guard for durability and rigidity; one magnetic and one piezoelectric



### Clevinger Bass

Martin Clevinger, designer of the *Clevinger Bass*—and a bassist himself, of course—points out that over the past few decades there have been several attempts to electrify the upright bass, but that the perfection of the bass guitar in the 1950s more or less put the idea of an electric upright to rest for a while.

"Those who listen closely to the tonal quality of basses know that the full-length strings of an upright bass

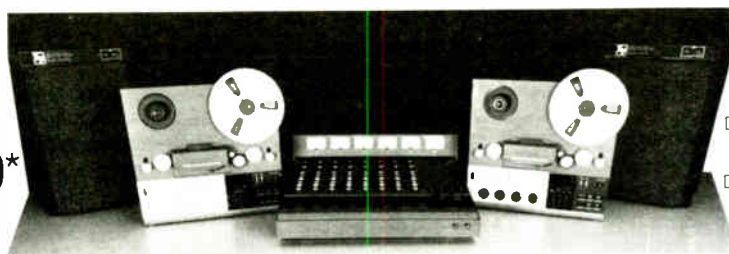
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—From page 90, ZAPPA

**Zappa:** You do get different stuff, and the reason you do is that the dynamic range of the digital tape is 90 dB and the dynamic range of a record is about 45 to 50 dB. So you can't let all the peaks go where they would normally go — you have to compress it. But if you're going to plan for the future, I think ultimately records are going to be released on compact discs, little laser discs, and they've got 90 dB. There's a way to do it. I'll compensate to get it on a piece of vinyl and still have the right thing digitally.

**Mix:** This was the first time you heard most of your pieces performed. Any surprises?

**Zappa:** A few. The surprises came in terms of things I thought would be easy for people to play but actually tortured them to death to do. I don't want to be critical of the LSO, because they really gave it their all and struggled valiantly with the problems at hand. They weren't fuckin' off; they were really putting out the energy. But there was a certain unevenness from one section to another, in terms of the quality and style of the players in the section. The strings were generally quite good, especially ensemble-wise. Good concertmaster. The winds, great — except the first flute had immense problems with *Moe 'n' Herb's Vacation*. But other than that, wonderful. In the brass, the trumpets — a little bit of a problem [laughs]. If what I had written had sounded just a *liiiiittle* bit more like *Star Wars*, they would have been okay. Trombones and French horns, good. Percussion, good, except for one guy. Piano, great. Harp, great.

When Kent went to tweeze everything out, certain things had to be taken slower than I would've liked to have heard them, just in order to get people to play the parts. There was this one run in *Moe 'n' Herb's Vacation* that was just driving this flute player crazy [laughs].

**Mix:** Do problems like that arise because you're writing for instruments that you don't play yourself?

**Zappa:** Oh, no, I've calculated all of that in advance. The problem is that certain musicians have certain types of skills and certain musicians don't. And if you write everything for the lowest common denominator of musical skill, you're going to have—

**Together:** *Star Wars* [laughter].

And *Star Wars* is nice music, you know — for *Star Wars*-type consumption, okay? But if you're going for something else, you have to presume that out there someplace lurking is a maniac who can do the hard stuff. I'm offering the challenge for the guy who

wants to play something rougher than *Star Wars*.

**Mix:** You had the same sort of problems with LA studio players on projects like *Lumpy Gravy*, right?

**Zappa:** Yeah, but if you ever saw the *Lumpy Gravy* music and compared it to what these guys in London had to do, *Lumpy Gravy* was the easiest stuff you ever saw in your life. It's just that most studio players are lazy. Most studio players get paid by the whole note, by the pound for chordal backgrounds for singers. They don't want to sweat. I mean, the hardest thing in *Lumpy Gravy* was this one section where everybody had to play in 5/8. In 1966 when that session took place, you never saw anybody hand you a piece of music in 5/8. It just wasn't done. But with the proper amount of rehearsal, there are guys who can play the stuff. A lot of the trumpet stuff written for the concert in London was based on the fact that I know two guys in LA who can play it without sweating any tears. It's not written just to be arbitrarily punitive.

**Mix:** At the end of your European tour last year you stated that you will never again tour Europe with a rock band. Do you see this period as a transition in your career, moving towards your orchestral works, or are you just setting the rock & roll aside temporarily?

**Zappa:** Well, as of right now, I've got at least the next five records already on tape, 37 tunes ready to mix, with the last road band. I have no plans to go on the road with the band in the next year, because I have another big project I'm trying to get off the ground: a Broadway show. It's a little idea I came up with over Christmas vacation. Not *my* vacation, but since everybody who works for me went on vacation, I couldn't do anything in the studio. So I wrote this Broadway show — and also three film treatments.

**Mix:** You have said in print that you think you'd miss playing hockey rinks if you stopped touring.

**Zappa:** Well, they are reasonably addictive. There's something about a hockey rink. But not in Europe, I can tell you. I have no qualms whatsoever about never playing rock & roll in Europe again. Over the years I have learned to dislike going there; I really don't enjoy it. And unless I'm having a good time, I can't convey that to an audience.

**Mix:** How different are the creative processes for writing an orchestral piece as opposed to a tune for the band?

**Zappa:** Six of one, half a dozen of the other. Some are so simple, you just

—Page 106

# THE SYNERGY'S DIGITAL EVOLUTION



## 1978

### THE GENERAL DEVELOPMENT SYSTEM

The General Development System (GDS) was completely developed from digital technology, the result of years of research at Bell Labs and continued by Digital Keyboards, Inc. A \$30,000 musical system, the purpose of the GDS is to formulate & pioneer many kinds of digital synthesis techniques, create a library of sounds, and aid musicians in the design of instruments and significant features. Consequently, the GDS is a continuing source of new technologies, new software, and new voices. Included among the GDS users

are Wendy Carlos, Klaus Schultz, Billy Cobham, Kansas State University, the University of Oklahoma, Jefferson Research, Leo's Music.

## 1982

### THE SYNERGY

At Digital Keyboards, we realized that very few musicians were in a position to spend \$30,000 for a GDS. However, our long years of R&D opened several new doors, allowing us to create a keyboard that offered the most demanding sonic aspects of the GDS—at a fraction of the cost. That keyboard? The Synergy. The Synergy offers an astounding array of features. There's programmable touch sensitivity for each voice, making expressive nuances part of each sound, like the breath on the mouthpiece of a flute or the bowing of a violin. These extraordinary voicings are the result of the Synergy's totally digital sound generation that produces perfect acoustical and electronic representations. Other qualities inclusive to the Synergy are 8-16 key polyphony for each voice, four track over-dubbing built-in recorder with memory, seven key modes including floating

split, a portamento that follows your hands, separate vibrato per sound per key, upgradable and expandable software, and two sets of 24 voices, one set built-in and the other found on the Synergy cartridges.

## 1983

### THE SYNERGY CARTRIDGES

The Synergy will always be ready for the future through its unique cartridge port which allows the addition of 24 new voices per cartridge. These cartridges are developed by the GDS and its users on an ongoing basis. Each cartridge is designed for a specific musical application, running the gamut from synthesizer/ keyboard sounds to special effects, percussion and gospel to a complete set of orchestral timbres created by Wendy Carlos especially for the Synergy. There are several cartridges currently available, with corresponding cassettes for previewing these sounds prior to purchase. The Synergy's cartridge port is also used for interfacing to other computer systems and for future software access. An Interface box will be available in early fall.

The features and subtleties of the Synergy require "more than a passing" demo to be experienced. If you haven't been able to find a demonstration (that supports our claims) please call 516-747-7890 for references, or write to us for full literature and software information.



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—From page 104, ZAPPA

hum them to everybody. Of course, for an orchestrated piece you don't have time to hum it to a hundred guys — and besides, they won't remember it anyway.

They're all composed different ways. I'll sketch some things out while I'm waiting in an airport, and come back from a tour with a briefcase full of sketches. The lyrics to "Dumb All Over" were written on a Lufthansa flight coming back from Europe. The march at the end of "Sad Jane" is an orchestral setting of a transcription of a guitar solo from the Shrine Auditorium in 1968, transcribed by Ian Underwood.

**Mix:** So a whole orchestra is playing your improvised guitar solo.

**Zappa:** Yeah, but harmonized out and orchestrated. You'd never know it came out of a guitar. The reason I chose it is that it sounded so composed. The third movement of "Sinister Footwear" is an exact transcription of a solo that Steve Vai transcribed. That's fiendishly hard — probably the hardest thing on paper I've got.

**Mix:** Could we trace the various creative processes through a couple of your songs? How about "Duke of

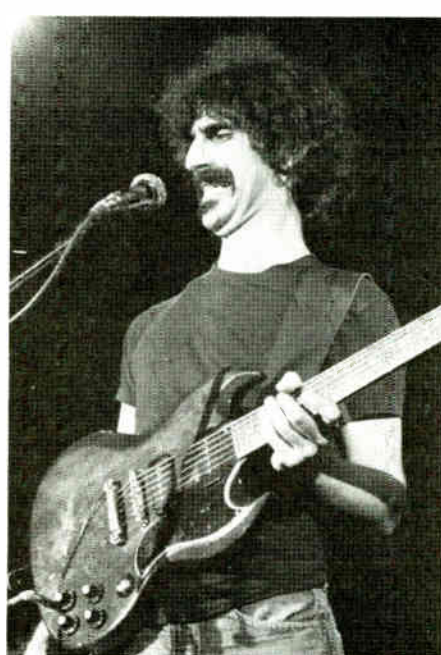


PHOTO: GARY WELLEN

Prunes," which was originally on *Absolutely Free* and showed up in orchestrated form on *Orchestral Favorites*?

**Zappa:** The melody to "Duke of Prunes" was part of a film score I did when I was twenty years old for this western movie called *Run Home Slow*. It was the background music for a scene where a cowboy nymphomaniac is pooching a hunchback in a stall next to a dead donkey [laughs]. That's where the melody came from, okay? So then I wrote words to it and it went into the *Absolutely Free* album. Then I did that orchestral arrangement of it.

**Mix:** How did "Dwarf Nebula" [from *Weasels Ripped My Flesh*] come about?

**Zappa:** "Dwarf Nebula" started off as a piano exercise. During the time we were doing *Uncle Meat*, I was working with an engineer [Richard Kunc], who was real cooperative, just trying to do any kind of weird thing we asked him to do. During the 60s, who knew what was right? "Let's try this. Plug it in backwards and see what happens." So we were dealing with different types of short-term distortion, and he built a little box with three pushbuttons; we called it the Apostolic Blurch Injector. And we took various tracks of different types of material and cranked them up into the distortion range and then by poking the buttons you'd get these little rhythmic bursts of white noise, brown noise, pink noise, and gray noise — in a rhythm that you'd select. But instead of being derived from a noise generator on a synthesizer, it was completely distorted voices, instruments, percussion, whatever. We cranked off reams and reams of tape of this kind

of material, and that was intercut with the piano exercise.

**Mix:** One thing you seem to be able to do that is lacking in most rock performers is think abstractly.

**Zappa:** My secret is I know what I'm doing.

**Mix:** Did you have the ability to project things abstractly in, say, adolescence?

**Zappa:** Yeah, I could always do that.

**Mix:** Did that cause any strangeness in any of the early rock bands you played in?

**Zappa:** Well, it's a little bit hard to convince people that a marimba has a place in a rhythm and blues band. In my band in high school, I was the marimba player. I always thought that type of sound would be good for boogie guitars and so forth. Not a traditional approach.

**Mix:** You're planning on reissuing everything and more from the old albums?

**Zappa:** I've got it all. The only things I don't have are the masters for *200 Motels*; United Artists has them. I'm thinking of releasing them in either 7- or 8-record boxes. All the Verve stuff would be the first box, ending with *Ruben & the Jets*. Then there'll be an extra disk in there that has all the stuff that was left out of those sessions, that era. I've got some real nuggets lurking around. The next box would start off with *Uncle Meat* and go all the way up to the band with Mark [Volman] and Howard [Kaylan] [Flo & Eddie], and I have more than a disk's worth of unreleased material with them.

**Mix:** You're one of the few artists who absorbs virtually all of the production costs for all of your projects, rather than being subsidized by a label or someone.

**Zappa:** Well, it's for a worthy cause. It's for entertainment of a special type. Nobody else is going to invest in it, because they're too fucking stupid and scared. Now, if I've got money to invest in something, would it be fun for me to invest in a goddamn condo someplace, like these other assholes do? I don't want to own a condo; I don't want to be a partner in a shopping center. If I make some money, I turn around and put it back into the work that I do. I've got no condos, no stocks — I've got unfinished projects all over the place is what I've got.

I've also got a wife with a great sense of humor [laughs]. I think it's a traditional American thing to do. If you have a small business, you reinvest in the business. ■

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—From page 39, *SHOWCO*

the "US Festival" in 1982, and the Led Zeppelin "Knebworth" concert in England in 1979 which played to a quarter of a million people.

Showco owes its existence to the rock era. Maxson points out that the firm has been fortunate to work with "some super groups." He lists Paul McCartney and Wings, The Who, Bee Gees, The Kinks, The Beach Boys, James Taylor, Genesis, Three Dog Night, Van Halen, David Bowie, ZZ Top, Linda Ronstadt, Willie Nelson, Robert Plant, and Led Zeppelin as long-time Showco customers. "But," he adds, "the responsibility for making their sound right is there whether it's a super group or a not-so-super group."

Showco's marketing director, Wil Sharpe, a former rock musician himself, claims that the next step, further by actively attempting to develop a major league system for rock groups. Sharpe tries to spot the new tomorrow which will be the earthshakers of tomorrow. A new group really should make their name in the days. He tries to find if new groups are "new" or just break they will be a great group to impress their new audience with their sound and in time to come. Sharpe believes the group

will then stay with Showco since "we're trying to develop friendships and working partnerships."

Some jobs are so big that it requires a team effort of the sound giants. The US Festival, for example, teamed Pennsylvania-based Clair brothers and Showco to the tune of 300 speaker cabinets and 400,000 watts of sound.

The need for durability is at least as important to Showco's engineering criteria as are the technical aspects. This two-fold approach to reason is what chiefly differentiates on the road sound systems from in-place installations. There is the need to be able to take down perhaps 56 speaker cabinets which are flown about 30 feet off the floor of a coliseum park everything, put it all in a truck, and drive away in less than 4 hours' night after night. So, understandably but not unduly, Maxson's speaker design begins by measuring the inside dimensions of a trailer. Solid men then, but partially obvious, is the need to be able to hang those concrete speaker cabinets, which weigh about 40 pounds each, with the assurance that there will be no trouble holding them in place after the concert. At all this must be done in a way that is clear what the partners will

a "junkyard in the sky," visually.

Showco's current speaker inventory numbers 150 to 200 on-stage monitors and 420 full size speaker cabinets. The main speaker sets come in two distinctly different, though identically-sized, enclosures collectively called the A S-1 Arena System. All of these speaker assemblies are currently being cutted and replaced with new interior speaker placement configurations. The system features JBL's new bi-radial midrange horn. The bass cabinets house three JBL 18" speakers facing forward with tuned ports. The old style bass cabinet had four rear-loaded 15" speakers.

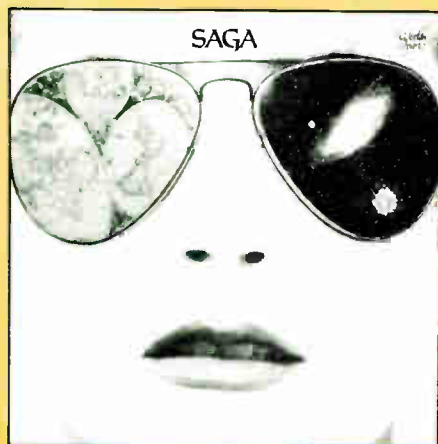
"We want to give everyone a good chest-thumping bass," says Maxson. A former pure studio engineer who became a pure live engineer, Maxson believes that "bass is where it's at!" During his live mixes, "I always went for more bass than was on the record." Now, as a live engineer, Maxson has the advantage of being able to witness an live reaction to mixes in real time. "I like the immediate of a live mix," he says. "There aren't second takes, there is a real time about this. You must react. I like the reaction nobody is between The Rolling Stones and a hundred thousand people for me!" ■

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## WORLDS APART

**Saga**  
Portrait FR 38246

*Produced by Rupert Hine; engineered by Stephen W. Taylor, with Ian Morais and David Rolfe, at the Farmyard, Little Chalfont, Buckinghamshire, England*

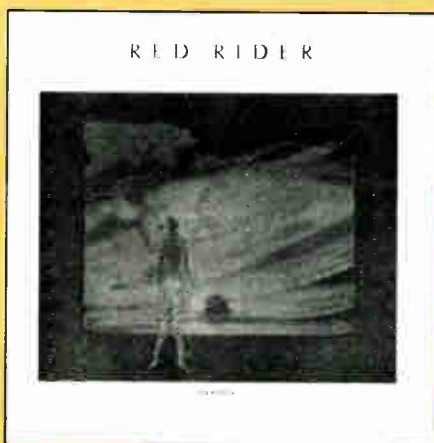
*Worlds Apart* is a cleverly arranged album: the most accessible tracks come first, and the music gets progressively more, uh, progressive as the record moves on. (Most of side two is for prog-rock buffs only.) While a good many may argue that the last thing we need in 1983 is another musical dinosaur, Saga redeems itself by bringing a fresh and modern approach to the genre. With Michael Sadler's distinctive tenor and the band's intense/airheaded (take your pick) lyrics, Saga at least comes up with a style all their own in a world of sound-alike bands. They may not be worlds apart from Asia and Kansas, but Saga does seem like the logical successor to the fading or faded prog rock stalwarts Yes, UK and ELP.

Although this five-piece Canadian rock band has released a total of five albums outside of the United States and has become a major attraction in Europe and South America, *Worlds Apart* is Saga's first release in America. Saga's sound is keyboard-oriented progressive rock (although Jim Gilmour is the only fulltime keyboardist; vocalist Michael Sadler and bassist Jim Crichton often augment the band's multi-layered sound with even more keyboard parts) but the band has managed to keep the pretentious trappings of progressive rock to a tolerable level on *Worlds Apart*.

The first two songs of the LP, "On the Loose" and "Wind Him Up," are the most streamlined (read: 'commercial') songs Saga has ever done; considering Saga's high level of musicianship and the crystal clear production of Rupert Hine, it's not surprising that both numbers have garnered widespread airplay on AOR stations across the country. Both manage to combine the most appealing elements of pop-rock and progressive rock: "On the Loose" is a hard rock 'night out on the town' rave-up dressed up in fine silk textures, while "Wind Him Up" is essentially a progressive rock opus cut down to popular size.

(By the way, the latter features the Simmons electronic drum kit and synthesized bass in addition to the usual Saga electronics storeful of synthesizers.) While none of the album's other tracks are nearly as succinct and accessible as the first two cuts, there are some brilliant passages nestled inside the more bloated numbers like "Framed" and "No Stranger."

—Stu Simone



## NERUDA

**Red Rider**

Capitol ST-12226

*Produced and engineered by David Tickle and Ed Thacker (two of ten songs); recorded and mixed by Tickle and Fraser Hill at Metal Works Studios, Mississauga, Ontario; additional mixing and recording at the Sound Castle and Capitol Records, LA; mastered at MCA Whitney, Glendale, by Kevin Gray and Steve Hall.*

Despite beautiful melodies, satisfying arrangements and clear production, Red Rider is no ordinary AOR band. The Canadian quintet stands as an interesting stylistic bridge between romantic, semi-metal AOR and socially-conscious new wave. Lead vocalist and second guitarist Tom Cochrane's songs are more starkly introspective than standard AOR love-song fare—and whereas the new wavers tend to take a cool and standoffish posture to convey their alienation, Red Rider walks hotbloodedly along a steady edge of foreboding and mystery.

*Neruda*, the band's third album, pays homage to the Chilean poet, diplomat and Communist leader, Pablo Neruda, who received the Nobel Prize for Literature in 1971 and died in Chile two years later during the week of the U.S.-abetted coup. Neruda is not referred to specifically in song titles or lyrics, but Cochrane's sensual/mystical poetry and surrealistic metaphors throughout the album constitute a continual symbolic reference to the poet—and "Winner Take All" seems to deal with his ambassadorships in Argentina and Europe: "I know the face you can remember the name/The high step roller from the Argentine/The one they call the Wolverine /Win or lose you've got the Berlin Blues/Your back is to the wall."

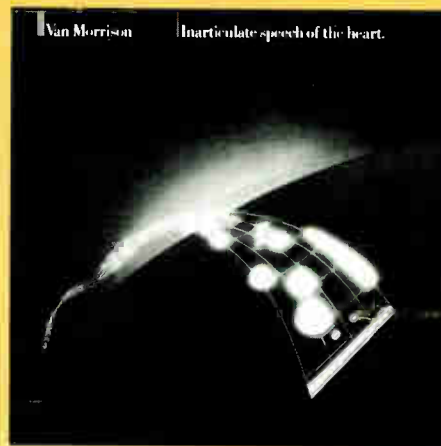
Having recently secured opening spots on tours by Pat Benatar and REO Speedwagon—and with "Human Race," from the new album, getting appreciable play on MTV and FM radio—it seems likely that *Neruda* will finally get Red Rider some well-deserved attention. There is some irony in this, though, since the album isn't as good as their debut, *Don't Fight It*, a richly layered and roaringly crisp album, produced by Michael James Jackson and to my mind the best rock album of 1980. (Red Rider's second album, 1981's *As Far As Siam*, was produced by Richard Landis.)

Red Rider's grand sound provides royal-hued dramatic landscapes behind Cochrane's cinematic narratives, which he delivers in warm, forceful and memorable style—as in my favorite track, "Napoleon Shed His Skin:"

The streets are covered in chalk  
Some shops are boarded up  
Bodies are carried back down from the square  
He begins to wonder  
If it always was this hot  
Or is it just the clothes that he now wears?  
Napoleon sheds his skin  
In the summer when the sun is high  
He never knew when to quit  
When to stop  
Or when to say die.

—while "Crack the Sky (Breakaway)" shows these forces at work in a tale of personal love, rather than historical imperative. This all may seem a little overwrought to some, but Red Rider deserves a fair hearing—and I personally can't wait to hear what they sound like live.

—Jack McDonough



## VAN MORRISON

**Inarticulate Speech of the Heart**  
Warner Bros. 23802-1  
*Produced and directed by Van Morrison; assistant producer David Hayes; recorded at The Townhouse (London), The Record Plant (Sausalito), Tres Virgos (San Rafael, CA), and Lombard Sound Studios (Dublin, Ireland); engineered by Mick Glossop, Jim Stern ("September Night"), Tom Anderson ("Inarticulate Speech")*

For a glimpse of where Van Morrison's career *might* have led, listen to the reworking of his "Wonderful Remark" on the *King of Comedy* soundtrack album. Producer Robbie Robertson (who gave Morrison a sizzling cameo on The Band's *Cahoots*) has an insider's touch, treating Morrison's leonine force of a voice with gutsy country/R&B tracks reminiscent of both The Band and early Morrison records.

It is so much wishful thinking, though; Morrison's last few albums have found him searching for other musical pastures, sometimes greener, sometimes hazier. *Inarticulate Speech of the Heart*, one of the best and strangest of this Celtic bluesman's records, is a strong indication that Morrison may have found what he was looking for. Where the Van of old sang convincingly of late-night revelry and romantic horn-locking in such classic tunes as "Brown-Eyed Girl," "Wild Night," "Turn It Up" and even "Wavelength," the new album—much of it wordless—looks inward and skyward for subject matter.

Morrison's new directions don't come without warning. Last year's *Beautiful Vision* marked a departure from the bulk of his previous, Irish soul sound, pulling his resident spirituality to the surface. The blissful tone of the album was manifested in congregational backup vocals on tunes like "Across the Bridge Where Angels Dwell" and the unapologetic homespun hymn of the title cut. The album's joyful noise, its salient lack of cynicism, took listeners by surprise, and it failed to gather much commercial steam. *Inarticulate Speech* finds Morrison further distanced from the sound that earned him an honorable spot in pop.

The first distinction of the new album is spatial. Bathed in reverb and making extensive use of droning synthesizer chords—like aural underpainting of sky blue—the album illustrates his overriding theme of transcendence, shoring up an overall coherence that asks for the label of "concept album." At the risk of topographical stereotyping, it's fitting that the album was produced and "directed" by Morrison mostly in Dublin and points in Northern California—verdant areas that seem to cultivate music of a contemplative nature. Among figures in the current pop arena, the album compares closest with the soaring textures of Roxy Music and, to some extent, Steve Winwood (unintentional inroads to commercial viability, no doubt).

Like the majority of great soul singers, Morrison has had a running feud between head and heart, between concerns high-minded and street-wise. He states it outright on the opening cut, "Higher than the World," in which he nearly chants the title over a chord vamp that seems to fade into existence. Two other cuts on side one are instrumentals; "Connswater" is as springily and infectiously Irish as St. Paddy's day, while "Celtic Swing" is a gliding groove with a simple-yet-muscular sax (Morrison?) at the fore. "River of Time" is as rueful and tinged with resignation as "Rave On, John Donne" is an oddly disarming tribute to a parade of poetic pillars through the

centuries.

Strange, though: the new album finds Morrison swaying and scating much more than raving on. His legendary long-winded swathes of hip poesy—the sort of Celtic-hued prototype of rapping on such platters as *St. Dominic's Preview*—are notably absent here. In fact, the repetitive, ambient-minded arrangements—tethered to synthesizer timbres but liberally studded with traditional rhythm instruments and Irish folk tools—accent the group effort over individual shining (there's nothing you could call a solo). The winsome balladry of "Irish Heartbeat" has its vocal melody bolstered with guitar and embellished by Irish flute flurries.

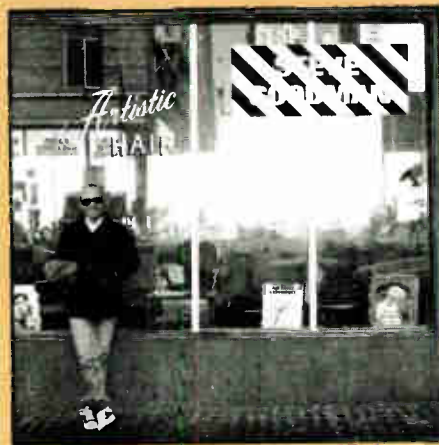
Probably the only discernible candidate for radio airplay is the striding R&B of "The Street Only Knew Your Name," with Morrison atop Chris Michie's Stratocaster gallop and Mark Isham's hollow, ringing synth pads, redolent of Eno before ambience. "Cry for Home" signals Morrison's dual patriotism—to the call of Irish music and the torch of Soul.

But the title track tells all. Not incidentally, there are two versions—one instrumental and the other with Morrison and his hearty backup chorus singing, "Inarticulate speech of the heart... I'm a soul in wonder." The message of soul music from the heart, we all know, is an inner power that words can't hold a candle to. Recognizing this, Morrison has gambled a record that dispenses with the small talk and provides listening both atmospheric and accessible. As much as I like Morrison the fire-breathing soulman, the new Van is a sturdy, emotional rock, and the new album a resonant gem.

—Josef Woodard

### New and Noteworthy

Steve Goodman, *Artistic Hair* (Red Pajamas) – A generous (12 cuts) collection taken from ten years of live performances by this intelligent, sensitive, wide-eyed songwriter who has remained funny, poignant and entertaining while



the radio and record industries moved steadily away from his brand of music. Goodman takes a unique approach to the acoustic guitar, as evidenced by the hot picking of "Red Red Robin,"

"Old Fashioned" shows his unself-consciously tender side; and the comedy classics—his strongest suit of all—here include the shutkicker parody, "You Never Even Call Me By My Name," Shel Silverstein's batty "Three-Legged Man," and a wondrous number called "Elvis Imitators." He's selling the album at his gigs, or you can order it from Red Pajamas Records, P.O. Box 233, Seal Beach, CA 90740, for \$7.00 postpaid.

Soundtrack, *King of Comedy* (Warner Bros.) – The assemblage of talent for this project is extremely New York in its diversity—The Pretenders, B.B. King, Rickie Lee Jones, David Sanborn, and others, even though they're not necessarily from New York—and the various tracks hang together beautifully. Robbie Robertson, who produced the album, contributed an affecting track of his own, "Between Trains." The music is used subtly in this unsettling film, which stars Robert DeNiro as a self-styled comedian who acts upon his obsession with a talk-show host (portrayed by a decidedly un-maniacal Jerry Lewis), but the record stands on its own.

Pink Floyd, *The Final Cut* (Columbia) – Paranoids making fun of paranoids, beautifully produced and dynamic, featuring something called "holophonics." But it's a bummer, as usual; how long must we endure this drawn-out sham of a public suicide? If life on this mortal coil is such torture, why don't they get it over with? Cut up or shut up!

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# VIDEO NEWS

by Mia Amato

## Video Tour Support: The Birth of a Business?

Video's become a vital part of tours. For major acts playing to tens of thousands of fans, large screen video projectors have become indispensable when playing ball parks and stadiums. Fans like the added visuals, and many critics have hailed the big screens as an important new step in concert safety – as festival-type seating and the crush for "good seats" were widely blamed for the deaths of eleven people in a Cincinnati arena in 1981.

"Live video projection makes every seat in the house a great seat. The kids in the grandstand get as many closeups and feel as involved as the people in front of the stage," says **Pat Morrow**, who handled video support for last year's Who tour and the current Journey tour. While The Rolling Stones, The Who, and even country stars have toured with video projectors on stage, only **Journey** has seen fit to staff and equip its own video production company.

**Nocturne** is run by Pat Morrow, who was Journey's tour manager for seven years. "When the band started to use video onstage we discovered that no one was offering a turnkey system. And we found it was possible to do it cheaper ourselves." With rented equipment and talent "raided from network staffs" Morrow expanded **Nocturne** to serve prestigious outside clients such as The Who.

"Besides the Journey tour we've got two other full crews out on the road," Morrow says. "We've done some of the Marlborough Country Music shows – backed up **Merle Haggard** with two 20-foot screens in an indoor hall, backed **Barbara Mandrell** and **Ronnie Milsap** with three Eidophors. We also videotaped a **Judas Priest** concert and one for **Sammy Hagar** in the St. Louis Checkerdome, which will be on cable TV.

"For the Journey tour we have a 20' x 14' screen over the lighting system, flush with the front of the stage.

The audience will have a clear view over 270° of arc. About 7/8 of the seats in most halls will get a clear view."

In January Morrow purchased a GE 5000 series video projection system plus four Ikegami HL79A cameras and a Grass Valley switcher. The equipment is controlled from backstage, out of a "flypack" trunk setup custom built by **Delcom** in Tulsa. Eidophors and additional gear are rented as needed, and the taping crews are augmented by freelance pros from the large talent pool of Northern California. The company's services are, of course, not just video: Morrow offers clients lighting, staging, sound support, "even tour accountants."

Journey's unique expansion into a sideline business offering video services to the music industry presages the birth of a new specialty business. Morrow already finds himself bidding against established video companies who also specialize in the concert business. Companies like **PVS**, the New York facility which provided video and projection for a part of the last Who tour, including the taping of a video program for 20th Century Fox.

"PVS does a terrific job," Morrow admits, "but they come from video. We come from rock and roll."

## Promo: Generating "Atomic Dog"

Eighteen hundred dollars in shiny quarters and the HOMER computer generate the glittery magic of **George Clinton's** "Atomic Dog" video promo. Produced by the team of **Peter and Coco Conn** (Homer & Associates, Los Angeles) for client **Capitol/EMI**, the clip plunges Clinton into a video game à la **Tron**.

The Conns designed a pursuit-type video game using a video animation paint system. This was mixed with slides and 16 mm film on HOMER, the firm's sophisticated 24 track visual mixing console. Live action sequences were lensed by **Bran Greenberg** in a maze of abandoned studios on the old Columbia Pictures lot nearby. The arcade set was sprinkled with quarters

and liberally dressed with neon and video game machines. Dancers dressed as dogs and cats flit by, choreographed by **Russell Clark**, who appears as the Atomic Dog character. The chased cat is played by **Cat Ramos**. A final mix on video was performed by **David Blum**.

As Peter Conn points out, "Video viewers want something **beyond**," and the company continues to create a cornucopia of visual styles evinced by the clip for Steve Miller's "Abracadabra" done last year. Like that promo, "Atomic Dogs" is an equally rich fruitcake of images.

More Faces Behind the Clips: **Bruce Gowers** directed "So Wrong" for ex-Doobie Brother **Pat Simmons'** solo album **Arcade**. **Jayne Paul** of **Alcon** in San Francisco masterminded the postproduction. The **San Francisco Production Group** created the promo for "Hard Up" with an Egyptian theme for **Sylvester** and client **Megatone**. **Jeff** and **Mark Cretcher** share the credit for a lively mix of pyramids and snakes. **Lou Reed** and **Harvey Keitel** make cameo appearances in the video for "What Does It Take (To Win Your Love)" as covered by **Garland Jeffreys** for **Epic**. **Phil Messina** directed, on film. **Adam Freidman** returns to the promo biz for the **Nitecaps'** "Go to the Line." **Arnold Levine** produced "Jump" for **Loverboy**; **Russell Mulcahy** directed "My Kind of Lady" for **Supertramp**. **Don Letts** does the cheery promos for **Musical Youth**.

## Cable/Home Vid Markets Revive

A spate of original product for cable TV and sensible price cuts in the cassette/disk market appear to have revived corporate enthusiasm for music video programs. Kudos to **Embassy Home Entertainment** for putting a \$39.95 price tag on Beta and VHS versions of the **Rolling Stones** tour tape (\$29.95 for disk). **Let's Spend the Night Together** is a bargain for fans: 90 minutes long, lavish in closeups and classics like "Satisfaction" and "Under My Thumb." —Page 112

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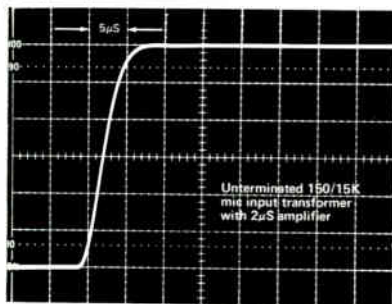
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—From page 110

Besides the attractive price to consumers, Embassy execs handled this product with simultaneous cassette and theatrical release, two tactics to protect the show from piracy losses. (The film is still enjoying a theatrical run.) *Hal Ashby* directed and *Ronald Schwary* produced. *Dave Hewitt* and The Record Plant supervised the 24 track stereo recording of the live mix done by *Jeff Wexler*.

*Rockamerica* has entered the cable and TV program area with a short, six-cut compilation of promos by *Lene Lorich*. *Ed Steinberg* has the exclusive rights for cable and broadcast by way of arrangements with *Stiff*, *London*, and *Epic Records*.

Also in the cable area *Music Court Productions* is pitching an off-beat musical special, an hour of pro tennis and rock music videotaped at a benefit in Forest Hills last year. *Todd Rundgren*, *Joe Cocker*, *Nona Hendryx*, and *Commander Cody* sing and play, and *Vitas Gerulaitis* turns a surprisingly good guitar solo. There's a hilarious doubles match as well, pairing Gerulaitis and *Carlos Santana* against *Meat Loaf* and *John McEnroe*. *Bob McKinnon* directed this for *Jacques Allouf* and *Robert Yuhas*, who share producers' credits for *Music Court*. The 24 track mix was done by *Roy*

*Yokelson* at *National Video Center*.

## Technology Scoreboard

Video game machines are usurping the place of the VCR in the hearts, minds and wallets of TV consumers, but the lust for cartridge consoles may have peaked last year. According to the *Electronic Industries Association* there are 83.6 million TV homes out there, and in 1982, 13.5 million bought a video game console to hook up to their home sets. Compare this to the cumulative population of videocassette recorders - a mere 5 million machines. The EIA does estimate, however, that nearly 3 million VCRs will be purchased in 1983 as prices descend to under \$300 for a reasonably equipped deck. The total population of videodisk players, both EED and laser, is about 345,000, and that number is expected to double by the end of this year.

The EIA also reports that more than half of all television homes can receive cable if they want it, and in fact some 27 million do get cable. Slightly over 20 million also receive a pay service of some type. About 2 million homes have some type of small computer, a jump of 343 percent in 1982. ■

—From page 26 NY CLUB SCENE

since many that own their own systems sometimes get in "over their heads" and may not have expert sound people who know how to operate and service equipment. The cost of incidentals can kill the club owners, and many find it more practical to rent the equipment from one source.

The sound system consists of a 24x8 Neotek board, 7 Crown PSA2 amplifiers and 2 dbx 160 compressors. The house crossover is a UREI, and the equalizer is a Klark-Teknik. The loudspeaker system employs 5-way T.A.D. components, except for the 18" John Meyer loudspeakers. The monitor system consists of a 32x10 Neotek monitor console; the wedges are 3-way bi-amped with two 12s, one 2" driver, and a slot tweeter.

The lighting system mainly uses Par 64 lights, with T.T.I. dimmer packs and one followspot.

Peppermint Lounge does own an SL 1200 Technics turntable, on which a DJ spins new wave rock records between shows.

The video setup uses an Aqua-Star projector, and there is also an Ikegami camera to videotape performers. The area of video, by the way, is where Peppermint Lounge seeks to expand, and it is apparently willing to spend whatever it takes to do so.

## Zappa's

The last club surveyed, both alphabetically and chronologically, is Zappa's, in Brooklyn. It is also the smallest (capacity 250) and is considered a good setting for local bands. There is about \$10,000 worth of equipment - which Zappa's leases from Tommy Dean, an independent owner-operator. However, how this is apportioned is interesting. Gary Penovich, the audio engineer, estimated that approximately \$2,000 of the total is spent on video alone: a Hitachi projection system with VHS tapes of current movies and bands.

Dean's audio equipment consists of Yamaha and Crown power amps, Peavey monitors, a Tapco mixing board, JBL and Gauss speakers, a huge speaker cabinet by Eastern Acoustics, and Shure microphones. A DJ spins records on a Pioneer stereo system between shows. A new console and monitor system are in the near future. Ironically enough, some nights Zappa's gets crowds that only want to dance to records, and the club winds up playing records all night through the sound equipment that was leased for the live bands!

## For your information:

1. Both the largest club surveyed (Peppermint Lounge) and the

smallest (Zappa's) do not own sound equipment, but lease it from an owner-operator.

2. A video taping facility of some kind was rapidly becoming a club necessity, and club representatives advised that bands will soon need video tapes of their performances to present to potential backers and agents.

3. With the exception of The Bottom Line, all the clubs had at least a few video games.

4. Every system in every club represented a combination of many brands, using only one manufacturer for everything was unknown.

5. All the clubs' DJs played records, never tapes.

6. None of the club stages, no matter what the size, had footlights. This is probably due to the danger of constant breakage caused by moving equipment around.

7. Video equipment represented the fastest growing expenditure of each club. ■

•••

The author wishes to thank Tommy Dean, Dennis Dunn, Terry Gabris, Tony Holmes, Tom Pavelka, Gary Penovich, Jon Rosbrook, Harry Sica, Jim Toth, and Harold Wilson for so generously giving of their time and knowledge.



# The 4 Track of Video

by Neal Weinstock

"The initial point: the utilization of the camera as a cinema eye—more perfect than the human eye for the purposes of research into the chaos of visual phenomena filling the universe."

—Dziga Vertov, in  
*Way of the Machine*

In the history of every art form, there is some nexus that comes along when technology suddenly jumps—suddenly the art is within the reach of so many would-be practitioners that an era ensues that can be *defined* by the art. Sound recording's nexus came along in the '60s. How many readers began their love affairs with rust-coated Mylar and a 4 track quarter-inch tape deck all at once, all about fifteen years ago? This reader did, anyway. (And in the '50s everybody wanted to write the Great American Novel, because in the '40s somebody invented the ball point pen.) Now in the '80s somebody has invented the MOS imaging video camera and 1/2" video cassette recorders capable of editing to professional quality. Now is the video nexus.

Recently I reviewed the Hitachi MOS camera, but its image is still burnt into my own integrated circuits in a way that is not possible for any image to be burnt into an MOS camera. No after-image will ever be

produced by the VK-C2000 or its following members of the MOS generation; and there will be video pros who resent that fact, who complain that this new invention is too small, too light, too easy, and who will resent the new generation of video people who come to use it. Well, we may as well call the whole generation an after-image—it's the only after-image the technology will produce. Go ahead, point at the sun, record its image on video for the first time.

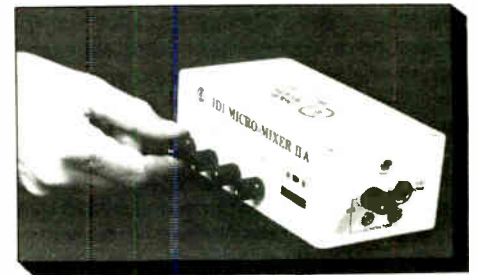
The meaning of a high quality production camera-and-recorder that sells for just a few thousand dollars is plain enough. For those who would involve themselves in video music, the meaning is even plainer. Film and video budgets have been ten to twenty times that of record albums; with the possibility now of budgetary necessities deflating, producers will chance many more moves into the virgin ground we yearn to colonize.

Let's not hype the Hitachi MOS technology alone. So many new developments are developing that this camera is hardly enveloping the concept of a video 4 track. From every direction, the fortress of television technology is being battered by the video masses—masses of new, simpler, cheaper product, that is. And the people of the television fortress are just beginning to be battered, too.

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VE 90A Editing Controller

to explain this, we'll take yet another look backwards to the coming of the 4 track. While the typical Mix reader may remember his/her first multi-track as a wonderful initiation into joyful mysteries, the audio industry before us got no such thrill out of their encounter with either the new technology or with us. That older audio industry often went by another name, the "radio" industry. The parallel to the current TV/video name change is not absolute—audio records have been around all along—but the personnel change *is* very comparable. Did the audio generation gap result more from technological change or from musical change? The question is moot; the changes were inseparable.

Similar inseparable artistic and technological changes are going on now in TV/video. Similarly, this pundit feels qualifiably qualified in guaranteeing that many a member of the old TV guard will be horrified at the new generation of equipment and people. But the change is coming nevertheless; TV has for too long been locked in the same three networks' same studios. Yet for our hypothetically typical graduate of the 4 track generation, now comfortably ensconced in the driver's seat of a now sputtering vehicle, the TV/video changeover promises a new vehicle.

The new vehicle, video with high quality audio, poses equal changeover problems for the old TV

people and the old audio people. Graduates of the 4 track generation have a psychological edge—the new video is moving towards our way of doing business. The TV old guard has a technical edge, however—even aside from any innate understanding of video production equipment: new video equipment is made to interface with old video equipment, not with audio.

David Oren, national marketing manager over at TEAC/Tascam, reports that many a studio owner and would-be video-musicmaker rely on him—for advice on how to take the plunge. Just getting video equipment that will synchronize to the audio you already have, or synchronizing the audio to the new video, can be a major problem for studios. "For instance," says Oren, "there is just one JVC unit that will work as a slave to a time coded audio master. If an engineer has a [Tascam] 80-8 or, say, an early Otari 5050, he now has two alternatives. A, fit a tach to it, or B, replace the machine. The video manufacturers are not now really addressing these problems, and recording studio people make their investment, they get their big bank loan for video, and then find they can't hook it all up to what they've already got. When we begin to get hardware with ergonomic design, when we can cut down on the whole re-learning process, then we'll see a rapid escalation of production in video."

Ergonomic design, that's the word from TEAC. Ergo, we can soon look for designs from them which will attempt a measure of technical transparency. Video people, audio people, computer people, and just plain analog people: for the next quantum generational change in audio/video, TEAC and others are shooting for machines that make it easy. The inspiration may be Apple's Lisa, which simulates the clutter of an office desk, or other members of the new generation of industrial design/office graphics computers—which can be used by engineers, managers, artists, secretaries.

If we all start using the same machines, maybe we can all start understanding each other. ■

#### Kloss Video Model II

Henry Kloss founded Advent back in '67 to make projection televisions (this after founding KLH and AR). As the company passed out of his control it eventually was not making projectors the way Kloss wanted to make projectors. In the mid-seventies he invented an elegantly simple, and extremely bright and

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accurate projection tube, then formed Kloss video to manufacture and market it.

After a year of pre-publicity, the Model II is now finally available. Using Kloss's Novatron tube, it projects an extremely bright picture onto any white wall, requiring no screen. The unit contains no TV tuner—unlike most projection sets—and is only about the size of a portable 25 inch monitor. The set features all the picture controls that most of the best monitors do, and accepts video and RF inputs. It does have small stereo speakers, just in case, but one is obviously not expected to use them.

We found the projector easy to set up, and its color and contrast to be subtle and true. For \$2,250, the five foot picture should come in very handy for all sorts of A/V presentations.

By the way, NEC licenses Kloss's tube and makes a very similar product, for a similar price. Then again, the Kloss can announce proudly on its box, "Made in Cambridge, Massachusetts, USA."

### JVC VE-90A

JVC has updated its VE-90 edit controller. Now called the VE-90A, the changes incorporate edit decision lister and time code reader options. The TCR-90 time code reader reads SMPTE time code and displays the frame numbers and time, or automatically converts to control track when no time code has been recorded. The EDL-90 is the edit decision lister. Edit decisions are listed by control track or SMPTE time code, and can be stored on paper (with a printer), on punch card (for those who like low tech), or on magnetic disk drive. The EDL-90 is also compatible with the RS-232C micro-modem standard interface.

Other functions of the VE-90A itself include one second fades to and from black, generation of NTSC, or "crystal" black.

### Image Devices Micro Mixer IIA

The Image Devices International Micro Mixer IIA surely sports a name larger than the product itself. About the size of a closed fist and weighing in at 1 pound 14 ounces, the IIA is a fine size for portable applications. It features four inputs for either mini jacks or 1/4" phone jacks—for either video or film, that is. If you are not addicted to three line, XLR connections, you will find the IIA, and its associated line levels, much easier to deal with on video. With disposable battery pack, the IIA is \$595; with NiCad pack, it is \$695. IDI is in Miami and Atlanta.

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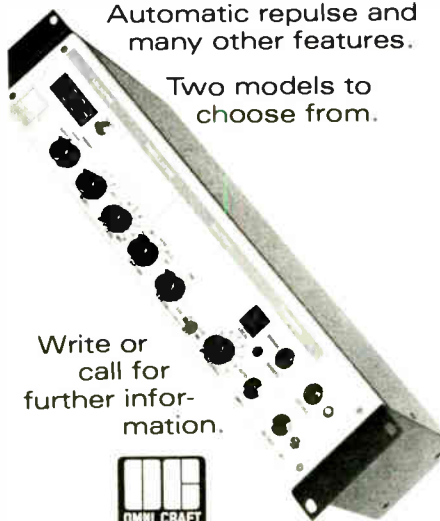
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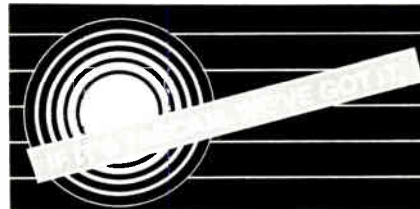


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