AUGUST 1984
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THE RECORDING INDUSTRY MAGAZINE

Mix

Interview: Thomas Dolby

STUDIO DESIGN SPECIAL

- Listings of Designers and Suppliers
- Acoustics and Construction
- Building a Garage Studio

Danny "Kootch" Kortchmar

Computerized Music

Sound for the Olympics

Three hundred years ago, it took the hand of a master craftsman to create a concert violin. It also took commitment—a commitment to producing the highest quality, purest possible sound.

Today, at the new Harrison, we still follow the craftsman's tradition—and we share that unwavering commitment. We realize that, even today, there is no substitute for the enduring quality and value of precision craftsmanship. That's why we take the time to listen to your ideas and needs, and why we use that input to build every Harrison console with the same painstaking care that the master violinmaker devoted to his craft.

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COMMITTED TO A SOUND FUTURE

AUGUST 1984
VOLUME EIGHT
NUMBER EIGHT

THE RECORDING INDUSTRY MAGAZINE

Mix

Cover: Rocshire Recording Studios, Anaheim, California
Photo by: Bill Miller
Corner photo of Thomas Dolby by David Gans

DEPARTMENTS

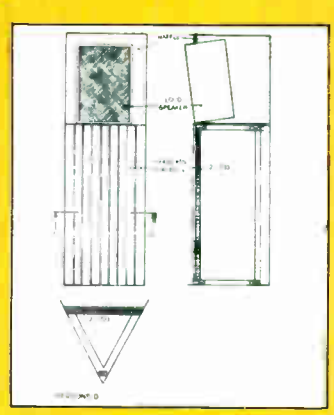
LISTINGS

AUDIO

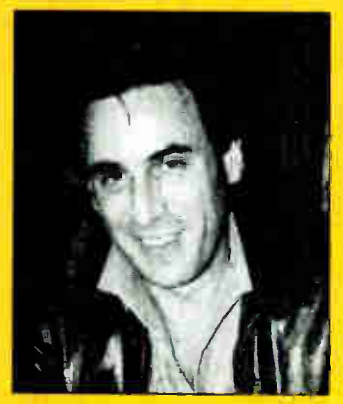
MUSIC

VIDEO

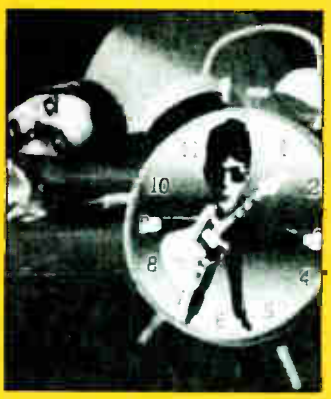
The focus of much of this issue is on the world of studio design. Along those lines, we offer listings of designers and studio supply businesses (starting on page 92); an update on some recent installations (page 80) and a special forum featuring top studio designers (page 32).



Also on the design theme, Vin Gizzi offers an intriguing look at recent developments in studio technology that could help keep down design costs while increasing efficiency. Page 70. And for those on a tight budget, F. Alton Everest tells how to build a garage studio, which begins on page 62.



Mr. Bonzai's repast this month features one of rock's most in-demand players, Danny Kortchmar, "Kootch" talks about his work with the likes of Jackson Browne, Linda Ronstadt, James Taylor and Don Henley in an illuminating lunching. Page 124.



In our Music Video Production (MVP) column, Lou CasaBianca talks to Charlex, the innovative videomakers who shot The Car's "You Might Think" and other creative videos. That piece begins on page 144.

INDUSTRY STANDARD CHAPTER II

The New Otari ¼" Two Channel 5050B-II

The best selling professional two track audio recorder has finally been improved. We've added the refinements you asked for: The inputs and outputs of the new B-II are transformerless, balanced. The elapsed time indicator is a real-time hours/minutes/seconds L.E.D. display—tape accurate at all speeds. The built-in oscillator provides both 1kHz and 10kHz calibration tones. And we added a low frequency adjustment to the reproduce equalizers.

Behind the clean, new look of the B-II are the same features, performance and reliability you expect from our famous 5050B. We didn't change the rugged quarter-inch thick deckplate or the cast aluminum frame. We kept the switch selectable NAB/IEC equalization, +4dBm/−10dBv output levels, half-track and quarter-track playback heads and three standard reference fluxivity levels. And, of course, the B-II still features three tape speeds, XL type connectors, front panel record equalization and bias adjustments, variable speed, "dump edit" function, and an integral splicing block.

The 5050B-II has been engineered like no other tape machine in the world. When you check out the specifications you'll know why we say it's the best $5,000.00 tape recorder available for under $2,500.00. When you work with it, you'll know that we've just raised the industry standard.

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feedback

Dear *Mix:*

I have read your magazine since it first started. At that time I had absolutely no idea that in the not-so-distant future I would own a recording studio. We have read and learned much from the articles that have been written in your publication.

Last year we had Sherman Keene come to our studio and give two separate seminars on recording techniques and engineering. We have even taught some of his recording techniques classes here at Emerald City Recording.

At this point we have many decisions to make regarding our future as a recording facility. I am sure that *Mix* Magazine can and will help us in making some of these changes.

Sincerely,
Bruce Sahroian
Emerald City Recording,
Grover City, California

P.S. I think that an article looking into non-licensed garage studios competing with small, legally set up operations would be of great interest to *Mix* readers, especially those with small 4 and 8 track businesses such as ours.

Dear Bruce,

Thank you for your letter. We would be interested in hearing from other studios concerning the issue of "hobby" studios competing with legitimate business operations.

Dear *Mix:*

We were all taken quite by surprise here at Myers Laboratories upon the discovery of the article, "Audio Animation" by Dan Cracraft in your June, 1984 issue. The reason for this is quite straightforward. Our group (formerly Sonic Mirage Laboratories) has been working in secrecy over the last three plus years in developing the first true three-dimensional auditory display system.

The results, we feel, have been spectacular. We have been able to form one single, coherent, mathematical description of the spectral and time modifications which occur when a sound source is binaurally localized in three-dimensional space by means of the human auditory system.

Additionally, the Myers psychoacoustic format has been designed to be user independent. As Mr. Cracraft reported in his article, there has been a lack of understanding as to the nature of the individual in literally shaping his or her own psychoacoustic response (due to head size, pinna shape, etc.). Exactly what effect variances in these parameters have in changing a person's localization accuracy is also poorly understood. The Myers psychoacoustic format overcomes these problems by "tuning" the psychoacoustic parameters to literally resonate to the persons own sound localization characteristics. Like a car seat, one size adjusts to all.

We feel that Mr. Cracraft missed the fundamental significance of what three-dimensional auditory display systems will bring to the audio industry.

Looking at the technology as a black box, the artist takes one of the digitally recorded tracks of a multi-track recording and digitally feeds it into the black box. The artist then specifies the azimuth, the elevation and the depth of where the sound is to be positioned in three-dimensional, spherical space (i.e., 40 degrees right, 15 degrees high, 20 percent depth). The sound source position can be programmed to move or be placed at any position over SMPTE or MIDI interlocked time code. The black box outputs two channels of digital audio. One for the left ear and the other for the right. Each track of the original recording is processed in this manner until every track has its own unique position or harmonic motion. When a home listener plays back a Myers psychoacoustic format encoded Compact Disc, using headphones, the user will acoustically be "enveloped" at the center of a three-dimensional, spherical, auditory world.

The Myers psychoacoustic format is progressing rapidly, and we are currently preparing for the production of equipment and OEM licensing of the Myers psychoacoustic format.

Thanks for giving us the opportunity to respond to Mr. Cracraft's article.

Sincerely,
Pete Myers, president
Myers Laboratories
San Jose, California

Corrections:

Our June 1984 story on Stanford University's Center for Computer Research in Music and Acoustics (CCRMA) identified the computer music workstations as being based on 6800 microprocessors. It should have read 68,000. Also a portion of our listings of Remote Recording and Sound Reinforcement companies were inadvertently omitted and we have reprinted these in this issue on page 140.

CURRENT

RIAA Five Year Consumer Purchase Data Report

The Recording Industry Association of America (RIAA) has just published 1983 figures in its ongoing, industry-wide trend report on consumer purchases of records and pre-recorded tapes in the US. These figures are included in a comprehensive five-year survey, spanning 1979-1983.

For the first time, all-inclusive data covering the five-year period from 1979 to 1983, is now available in one reference booklet, "Consumer Purchasing of Records and Pre-recorded Tapes in the United States: A Five Year Trend Report, 1979-1983." This survey continues to examine consumer buying habits in the retail and direct marketing sectors, offering in-depth consumer profiles for each sector, based on age, sex, race, region and music type (as defined by the buyers themselves) while also providing information on gift purchases.

The 1983 data concluded: "Cassettes continue to capture a larger share of the market, accounting for 37 percent of the retail sector, a rise of 9 percent over 1982, and 43 percent in the direct marketing sector, a jump of 11 percent over the previous year's total of 32 percent. Singles also moved up 1 percent to 6 percent in the retail area while eight-tracks continue to decline."

1984 RockAmerica Video/Music Seminar

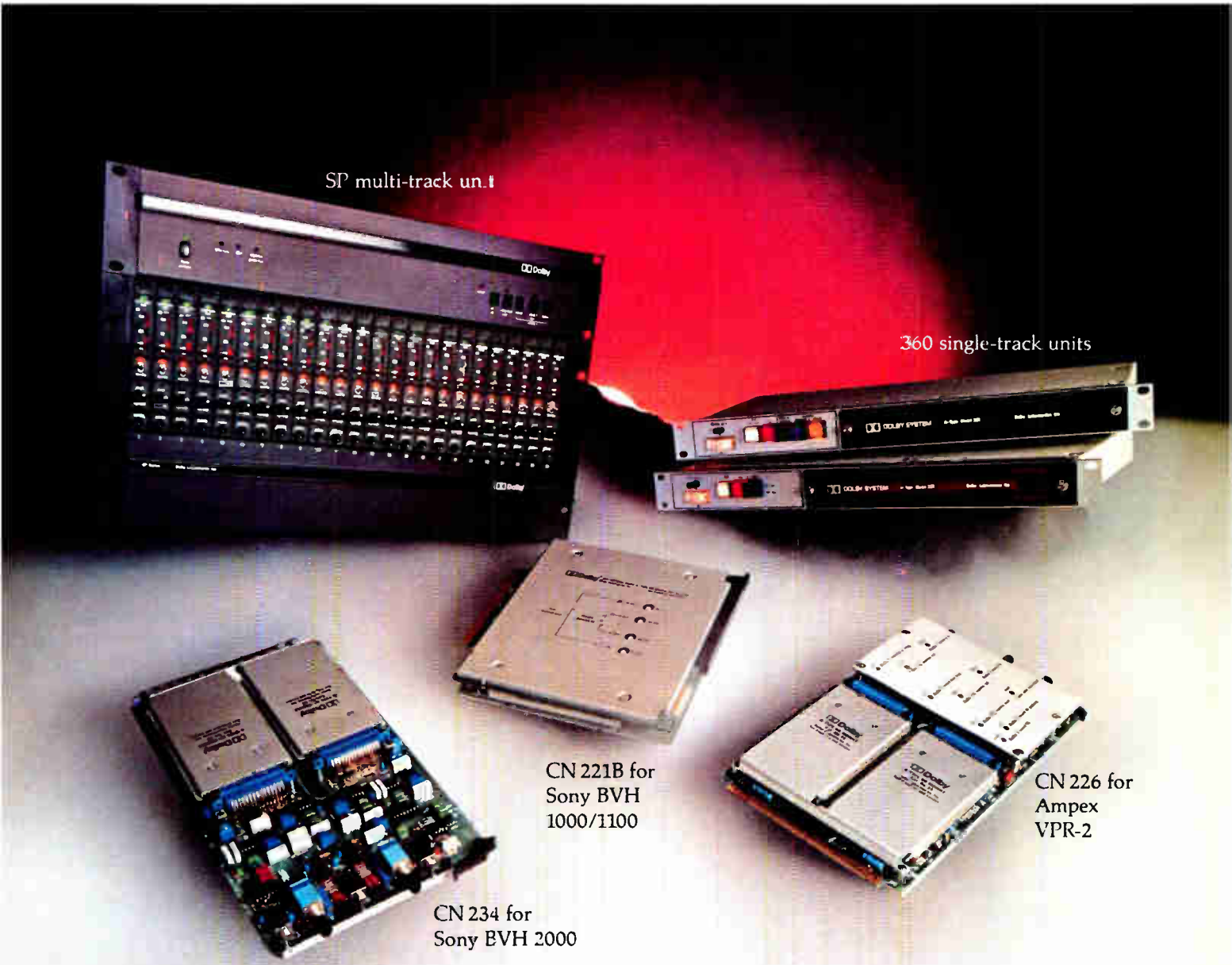
The second annual RockAmerica Video/Music Seminar will be held August 10, 1984 at the Waldorf-Astoria Hotel in New York City. The one-day event, beginning at nine a.m., will focus on the directions the video music industry is taking through panel discussions, exhibitions, and sessions on cable and broadcast TV, video promotion and publicity, directors and producers, audio and video clubs, and the long form music video.

The registration fees are $125 in advance and $140 at the door. For more information contact: Joanna Molloy, Seminar Director, RockAmerica, 27 East 21st Street, New York, NY, 10010, (213) 475-5791.

notes

Yoichi "Sonny" Kawakami, veteran marketing manager for ***Mitsubishi Electric's*** North American Digital Audio operation, has returned to the Tokyo headquarters to coordinate worldwide marketing . . . . ***Soundcraft Electronics*** has formed a new subsidiary, ***Soundcraft Japan, Ltd.,*** and has appointed ***Charlie Day*** as international sales manager and ***Greg McVeigh*** as field service manager . . . . ***Tom Semmes*** has joined the sales staff of ***Valley Audio*** in Nashville . . . . ***Unitel Video, Inc.*** has entered into a five-year lease with Paramount Pictures Corporation for a building on the Paramount lot in Los Angeles, with ***Newton Bellis*** operating as president of the new West Coast operation . . . . ***Synergetic Audio Concepts*** of San Juan Capistrano, CA, will be sponsoring an LEDE control room design workshop September 11 through 13, 1984, at ***Acorn Recording Studios*** in Hendersonville, TN. Call (714) 496-9599 for details . . . . ***Audio Image,*** the Pompano Beach, Florida, recording firm, has been acquired by the video production house, ***Florida Vidcom*** . . . . ***Riveria Broadcast Leasing*** has moved its main office to 6922 Hollywood Blvd., Suite 421, Hollywood, CA 90028, (213) 468-8873 . . . . ***Charles Huber*** and ***Jack G. Sanford*** have recently joined ***Shoreline Teleproduction Systems,*** in Hollywood . . . . ***Audiotechniques, Inc.,*** of Stamford, CT, has appointed ***Geoff Hillier*** as Technical Services Manager and ***James Gillespie*** has been chosen to manage a new Audiotechniques, Inc. parts and accessory department at the firm's Manhattan facility . . . . ***Robert M. Schein*** has been named director of ***Dolby Laboratories'*** motion picture division . . . . ***TOA Electronics*** announces the appointment of ***Steve Caraway*** to the position of advertising and public relations coordinator . . . . ***BASF Systems Corporation*** announced the opening of a new, $7 million, state-of-the-art 80,000-square foot facility in Bedford, MA, solely dedicated to the manufacture of floppy disks . . . . ***Biamp Systems Inc.,*** of Beaverton, Oregon, manufacturers of professional audio equipment, have announced the appointment of ***Richard N. MacLeod*** as company president . . . . ***Laura H. Foti,*** former ***Billboard*** music editor, is now the manager of marketing and public relations for RCA Records' newly formed subsidiary, RCA Video Productions, Inc. . . . . ***Otari Corporation*** recently hosted the executive committee of SPARS (Society of Professional Audio Recording Studios) at their facilities. The SPARS personnel included: ***Mac Emerman*** (Criteria Recording), ***Chris Stone*** (Record Plant), ***Charles Benanty*** (Soundworks), ***Nick Colleran*** (Alpha Audio), ***Bob Liftin*** (Regent Sound), ***Lenard Pearlman*** (Editel/Chicago), ***Murray Allen*** (Universal Recording), ***David Teig*** (Independent Engineer), ***Jerry Barnes*** (United Western Studios), and ***Gary Helmers*** (Executive Director, SPARS) . . . . Nelson L. Goldberg, president and chief executive officer of ***Total Communication Systems*** (TCS), announces the promotion of ***William James Connelly III*** to account executive for TCS Productions . . . . ***AVC*** has announced the opening of their new facility in Minneapolis (2709 E. 25th Street, Minneapolis, Minnesota 55406). Formerly the Sound 80 recording studios, the 12,000 square foot facility has been arranged to provide demonstration capabilities approximating real world conditions . . . . ***William McCullough*** has been named plant manager of ***Convergence Corporation*** El Paso manufacturing facility, reporting to Gary Land, vice president of operations. Also in El Paso, ***Thomas Kulinsky*** has been appointed director of quality control . . . . ***Roy Trakin*** has been named public relations director for the ***Recording Industry Association of America*** (RIAA) and its RIAA/Video Division, by Stanley Gortikov, president, RIAA . . . . ***Brian Gary Wachner,*** president of ***BGW Systems, Inc.*** and Mr. ***Yas Yamazaki,*** president of ***Nakamichi USA Corporation*** have announced a joint venture, under which BGW Systems will provide expertise in design, development, and marketing of professional, commercial, and musical instrument products, as well as certain manufacturing capabilities. Nakamichi will provide R & D funding, tape recording technology, and volume manufacturing capabilities from its various plants in Japan . . . . The ***Compact Disc Group of America*** elected eight of its members and the CDG's four officers in forming the group's first board of directors. Elected were: ***Robbin Ahrold,*** RCA Records; ***John Briesch,*** Sony Corporation of America; ***Chris Byrne,*** Pioneer Electronics; ***Paul Foschino,*** Technics; ***Robert Heiblim,*** Denon America; ***Issac Levy,*** Sanyo Consumer Electronics; ***Alan Perper,*** Warner/Elektra/Atlantic; and ***David Steffan,*** A&M Records . . . . ***Aphex Systems, Ltd.*** has announced the appointment of three new rep firms in the United States. These are: ***Peter M. Schmidt & Co.,*** for Metro New York; ***Secom,*** for Tennessee, Georgia, Mississippi and Alabama, and ***Mike Chafee Enterprises,*** for Florida. In addition, ***Atlantex Music Limited*** has been appointed distributor for all Aphex products in the United Kingdom and ***AKG Acoustics*** (Canada) will distribute the line in Canada. ***Arnoldt Williams,*** the president and founder of Arnoldt Williams Music, whose subsidiaries include ***Sound Solutions*** and ***Destiny Sound*** in Canton, Michigan, passed away on June 26, 1984. His family plans to continue the business....

DOLBY® NOISE REDUCTION FOR THE 1980'S



Dolby noise reduction is keeping pace with today's demand for high-quality sound — everywhere. With the introduction of such products as plug-in modules for VTRs and the SP multi-track unit, it is easier than ever before to protect *all* your irreplaceable audio tracks from hiss, hum, and print-through. From broadcasting to music recording, from video sweetening to motion picture dubbing, Dolby A-type NR reliably continues to fulfill its original promise: effective noise reduction combined with complete signal integrity.

Dolby Laboratories Inc., 731 Sansome St., San Francisco, CA 94111, Telephone 415-392-0300, Telex 34409. 346 Clapham Road, London SW9, Telephone 01-720-1111, Telex 919109.

Dolby®

SESSIONS

NORTHWEST

The *Henry Brothers,* owners of *R.O. Studios* in Concord, CA have been rolling a lot of tape lately. Their latest project was the MTV Basement Tapes winner, *Dancin'* which the Henry Brothers co-wrote, arranged, recorded and produced . . . At Cotati, CA's *Prairie Sun Recording,* Capitol Records artists, *ICON,* completed their soon-to-be-released LP with *Mike Varney* producing, *Allen Sudduth* engineering, and *Steve Buck* assisting . . . *Family Light Music Camp* will take place during the Labor Day week, August 27 through September 3, 1984, at the Feather River Preparatory School which offers excellent meals and private accomodations in a beautiful mountain setting, in the Sierras. For more information call (415) 489-2862 . . . At *Triad Studios* in Redmond, WA *Golden Ram* was in for basics on an LP project the band and *Tom Hall* produced . . . *Water Street Sound* in Vancouver, BC completed post production on local rock video shows *Nite Visions* to air on Super Channel starting this summer. Engineers for the project were *Marty Hasselbach* and *David Raine*. Also at Water Street, *Simon Kendall* of Doug & the Slugs completed the soundtrack for a National Film Board documentary . . . For the second year in a row, San Francisco's 16 track *Oasis Recording Studio* was chosen as the studio to produce radio station KMEL's widely acclaimed station ID breakers. The studio recently saw guitar great *Robben Ford* working with *Charlie Musselwhite* on an original album project . . . Current projects from top Northern California studios recently mastered to disk at *Sonic Arts* by president/chief engineer *Leo Kulka* include a 7-inch single by *John Mabry & Falling Dark,* recorded at Felton (of Confunkshun) Pilate's *Felstar Studios,* located in Vallejo. Also recorded at Felstar and mastered at Sonic Arts is the fourth release from San Francisco's own Clayboard Records' artists, *The Champions* . . . *Jane Fonda* used San Francisco's *Automatt* to cut music tracks for a new Caribbean workout record on CBS with *Leslie Ann Jones* producing, and *Wayne Lewis* engineering. Also at the Automatt *Romeo Void* recorded vocals for 415/CBS release with *David Kahne* producing, *Joe Ciccarelli* engineering; plus super mixer *Francois Kervorkian* at the helm for dance mixes with *Paul Mandl* engineering . . .

SOUTHERN CALIFORNIA

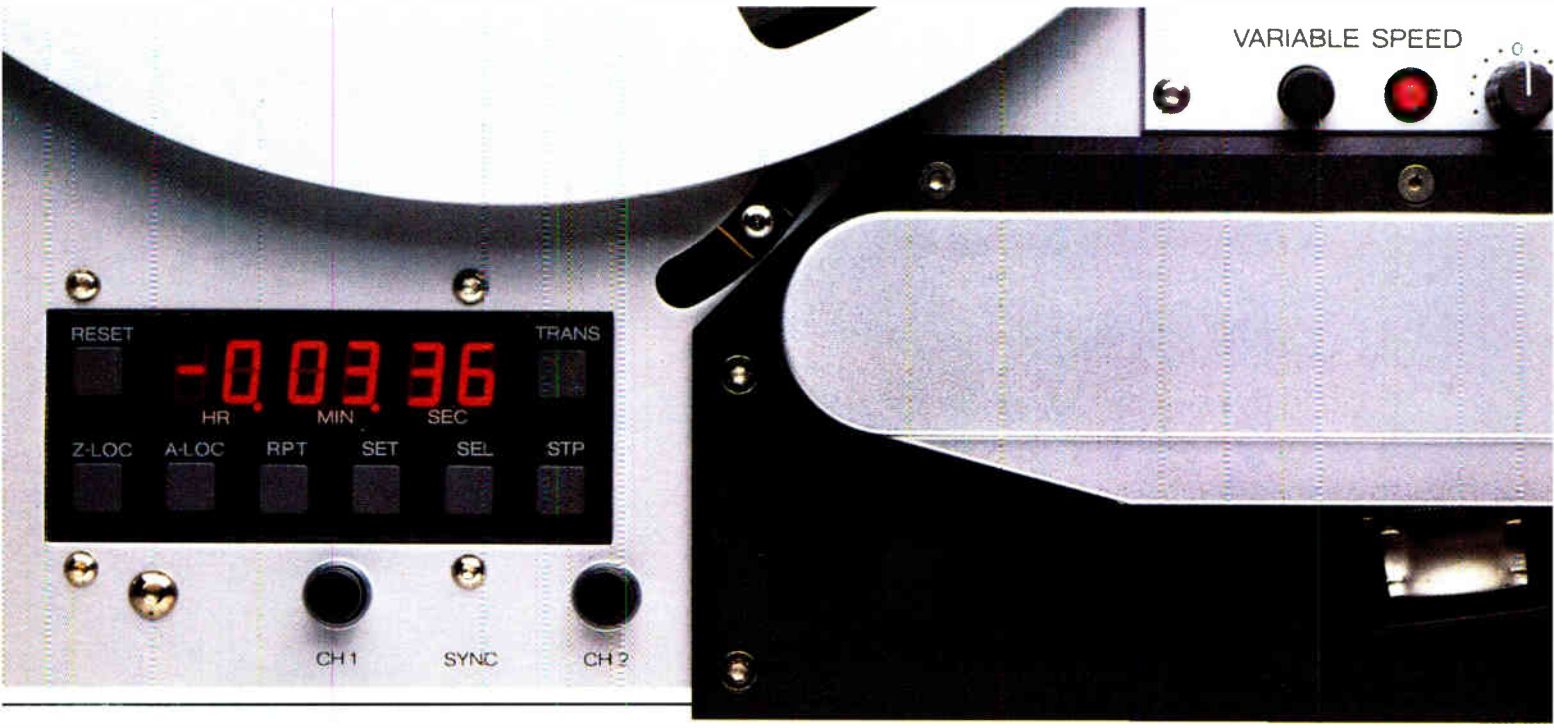
At *Image Recording* in Los Angeles, *Air Supply* mixed the title song for an upcoming Jamie Lee Curtis movie *Grandview, USA, John Van Nest* at the board. Night Ranger producer *Pat Glasser* was in producing EMI rock group *Rail,* Van Nest again at the board and *Harry Maslin* finished up mixes for Atlantic artist *Robbie Patton*. Maslin produced and engineered this one . . . LA's frenetic new wavers *Oingo Boingo* were in at *Ground Control* in Santa Monica working on a new project . . . *Susan Anton* came in to Hollywood's *Conway Recording* recently to do a project for Espy/Goodwin Productions. *F. Byron Clark* and *Paul Lani* engineered with assistance from *Csaba Petocz* . . . *Imaginary Studios* in Venice, CA has completed two LPs, *Zephyr on Sunday,* by guitar virtuoso *David Shawn Waldrop,* and also a collection of songs and readings by songwriter/poet, *Bob Burns*. Both selections engineered were by *Steve Terlizzi* . . . At *New World Recording,* (San Diego) *Lisa Wickham* finished her contemporary Christian Album *Face to Face*. Husband *John Wickham* produced the album, with *Alan Harper* engineering . . . Virgin Records' group *Warrior* was in at *Sunset Sound* in Hollywood doing vocal overdubs with producer/engineer *Doug Rider*. *Peggy McCreary* assisted. *Stevie Nicks* was also in, working on vocal overdubs with producer *Jimmy Iovine*. *Shelly Yakus* engineered the project with *Bill Jackson* assisting . . . *Ric Flauding,* staff composer and arranger of *calMedia Recording Services,* arranged and produced four songs on the new album by Vietnamese singer *Duy Quang* . . . Fiction label recording artists *Hunter,* featuring Sonny Hunter, worked at *The Studio* in Woodland Hills recording their debut EP, *Lady Electrical*. Engineering the tracks was *Robbie Weaver,* owner of The Studio . . . At *Clover Recording Studio,* Hollywood, *Marc Thompson* along with co-producer *Champ Davenport* was in working on his album for Warner Bros. with engineer *Catharina Masters-Bunch,* and assistant *Todd Prepsky* . . . Among the projects at *The Village Recorder* in West LA the past few months were the soundtrack for the smash film *Ghostbusters,* produced by *John Hug,* engineered by *Gary Ladinsky,* assisted by *Clif Jones*; and *Jim Messina,* who produced himself with engineer *Steve Hirsch* . . . *Sound Image Studio,* North Hollywood, had producers *Billy Osbourne/Zane Giles* in tracking Red Label artist *Linda Cliffert,* with *Elliott Peters* engineering. Also, producer *Jerry Marcellino* was in with artist *Debbie Meadows* with *Steve Mitchell* at the board . . . At *Group IV Recording* in Hollywood composer *Herbie Hancock* mixed tracks on the feature film *A Soldier's Story* with engineer *Dennis Sands,* assisted by *Andy D'Addario,* for Caldix Films, Ltd. . . . At *Larrabee Sound* in LA producers *Jimmy Jam* and *Terry Lewis* mixed the new *SOS Band* album for CBS with engineer *Steve Hodge,* assisted by *Fred Howard;* and producer *Andre Cymone* (formerly one of Prince's cohorts) mixed *The Girls* for CBS with engineer *Mike Stone,* assisted by *Sabrina Buchanek* . . . North Hollywood's *Devonshire Sound Studios* had several big names in: *Teddy Pendergrass,* who worked with producer *Michael Masser,* engineer *Michael Mancini* and assistant *Dean Burt-Louis Summers*; *George Benson* and *Peabo Bryson* also worked with the same team . . . At Hollywood's *Artisan Sound Recorders,* disk mastering engineer *Greg Fulginiti* recently mastered LPs by: *Black N' Blue,* with producer *Dieter Dierks* for Geffen; *Annabel Lamb* with producers *David Anderle & Walley Brill* for A&M; *Juice Newton* with *Joe Chiccarelli* for RCA . . . At *Media Masters* in Santa Monica *Patrick Markey* recorded the score for Tri Star Pictures *The Natural,* including a 17 piece band, the *New Dixie Minstrels*. *Jeff Mar* and *Steve Richardson* were at the board . . .

SOUTHWEST

Composer/engineer *Craig Jackson* recently finished production of a music video which is the main attraction in the Space Pavilion at the New Orleans World's Fair. Using flute, a variety of keyboards and synthesizers, percussion, and a LinnDrum computer, Craig performed and engineered all tracks at *Darci Sound Studio* in Beaumont, TX and mixed down at Huey Meaux's *Sugar Hill Studios* in Houston, TX . . . At *Rivendell Recorders,* Inc. in Pasadena, TX, producer/engineer *Brian Tankersley* began recording tracks for *Jim Tucker's* album release. *Trudy Lynn's* first single "Bring the Beef Home to Me" has just released. It was recorded at Rivendell with *Jerry King* producing . . . *Crystal Image* was recently in Austin's *Tim Stanton Audio* studio doing final mixes on a four song EP. *Intruder, Pictures,* and *Hard Attack* completed demos during May. All engineering chores handled by Tim Stanton . . . MCA recording artist *Ronnie Dunn* rehearsed at *Infinity Recording Studios* in Tulsa for his recent tour. Dunn recently signed a five-year recoording contract with MCA Records . . .

NORTH CENTRAL

Activity at *QCA Recording Studios* in Cincinnati, OH included *Robert Guillaume* (of ABC-TV's *Benson*) mixing an album for Air City Records with producer *Beau Ray Fleming* and engineer *Ric Probst;* and Solar Recording artists *Midnight Star* is cutting tracks for the follow-up to their platimum LP *No Parking on the Dance Floor,* produced by *Reggie Calloway* with engineers Probst and *Jim Greene* . . . *Streeterville Studios* in Chicago provided their audio post-production facilities for *Johnny Winter's* first contemporary music video, entitled "Don't Take Advantage of Me," taken from his latest album *Guitar Slinger,* on Alligator Records. The LP was recorded at Streeterville. Also at Streeterville, *James Cotton* recorded in the studio's state-of-the-art Music II room, with sessions produced by *Bruce Iglauer* and Cotton for Alligator Records. The engineer for Streeterville was *Justin Niebank* . . . Among the artists who worked on projects at *IRC Studios* in Indianapolis recently were *Henry Lee Summer,* who put finishing touches on his yet untitled album; *Alan Johnson* engineering with Lee and *Jim Bogard* producing . . .



On adding time-saving production features to a proven audio recorder design.

The updated PR99 MKII, now offering a microprocessor controlled real time counter, address locate, zero locate, auto repeat, and variable speed control, can improve your audio production efficiency. And, as before, it's built to meet strict Studer standards for long-term reliability.

Welcome to real time. The PR99 MKII's real time counter gives a plus or minus readout in hours, minutes and seconds from −9.59.59 to +29.59.59. Counter error is less than 0.5%, and the microprocessor automatically recomputes the time displayed on the LED counter when you change tape speeds.

Fast find modes. Press the address locate button and the PR99 MKII fast winds to your pre-selected address, which may be entered from the keyboard or transferred from the counter reading. Press zero locate and it fast winds to the zero counter reading. In the repeat mode, the PR99 plays from the lower memory point (zero or negative address) to the higher point, rewinds to lower point, and re-activates play mode for a continuously repeating cycle.

Pick up the tempo? When activated by a latching pushbutton, the front-panel vari-speed control adjusts the nominal tape speed across a −33% to +50% range. The adjustment potentiometer is spread in the center range for fine tuning of pitch.

Future perfect. The PR99 MKII also offers a serial data port for direct access to all microprocessor controlled functions.

Much gained, nothing lost. The new MKII version retains all features of its highly regarded predecessor, including a die-cast aluminum chassis and headblock, balanced and floating "+4" inputs and outputs, self-sync, input mode switching, and front panel microphone inputs.

European endurance. Designed and built in Switzerland and West Germany, the PR99 MKII is a product of precision manufacturing and meticulous assembly. Every part inside is made to last.

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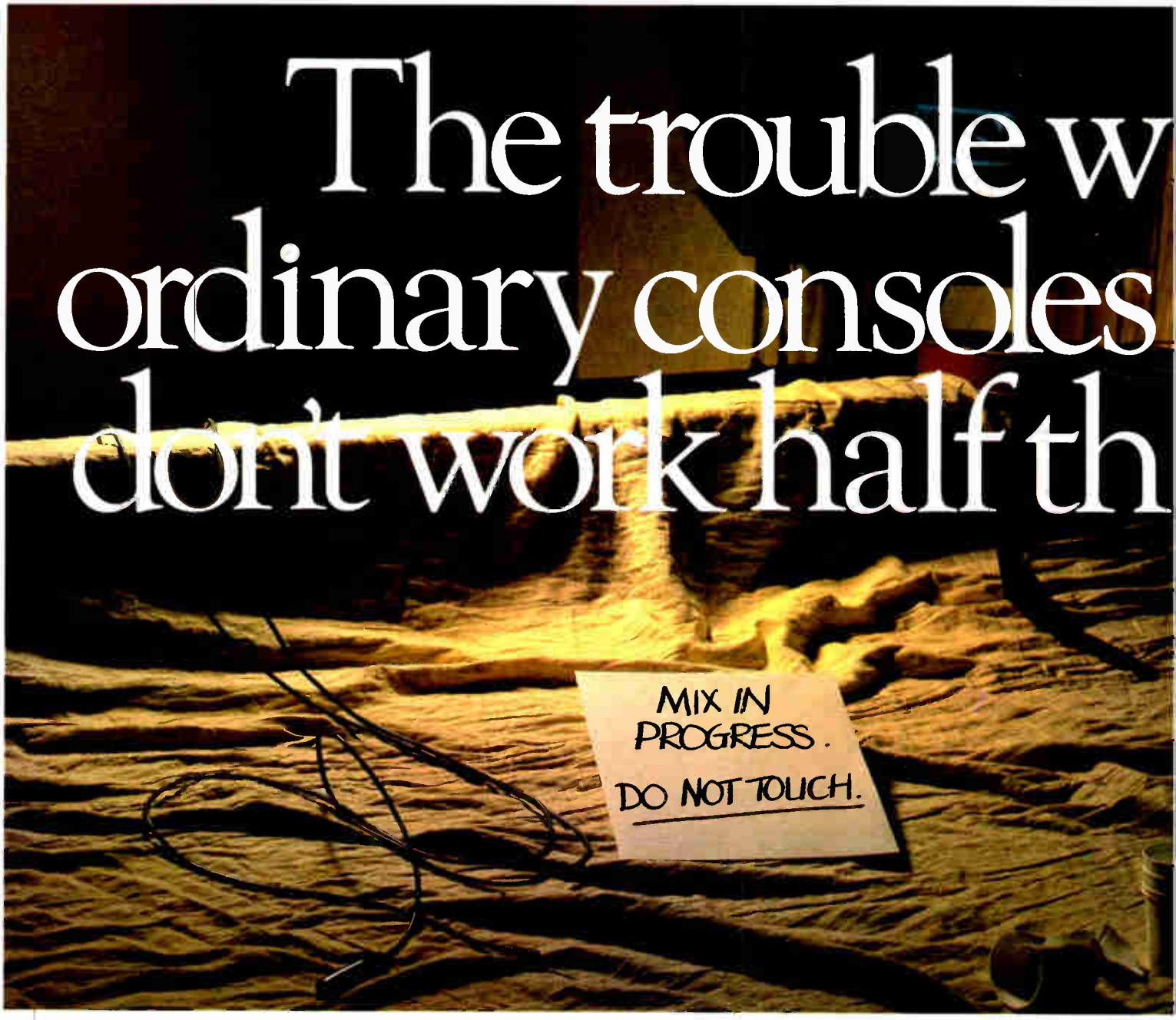
To discover more about the world's most versatile and dependable budget-priced recorder, please contact: Studer Revox America, Inc., 1425 Elm Hill Pike, Nashville, TN 37210; (615) 254-5651.

STUDER REVOX

PR99 MKII with optional carrying case and monitor panel. Roll-around console also available.

The trouble w ordinary consoles don't work half th



It's a situation that every studio manager recognises. A client has been in, done some work, and departed to return some time later. Expecting to find the desk as it was left.

Of course, the engineer could always note down all the settings and then reset the desk. But that's extremely time consuming and not entirely reliable.

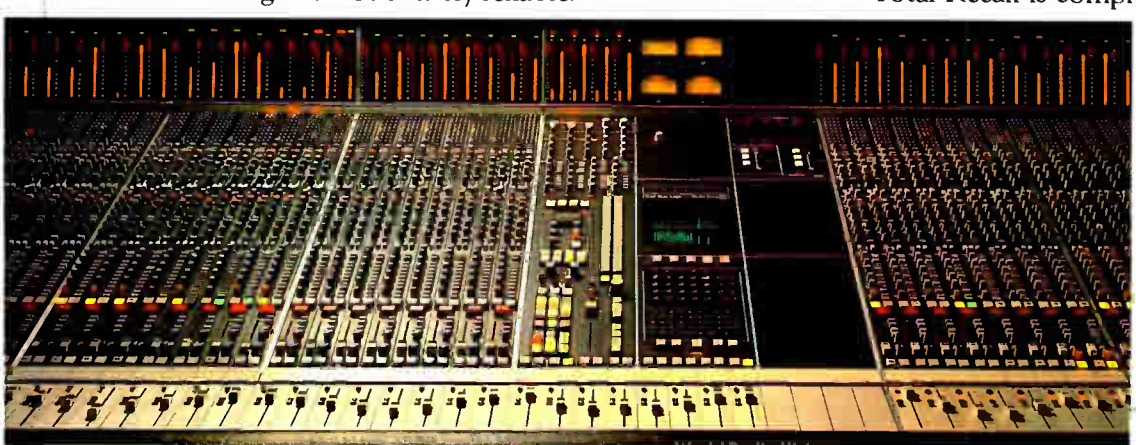
So, usually, the studio has to stand idle between sessions. Keeping the customer happy, but not keeping the money coming in.

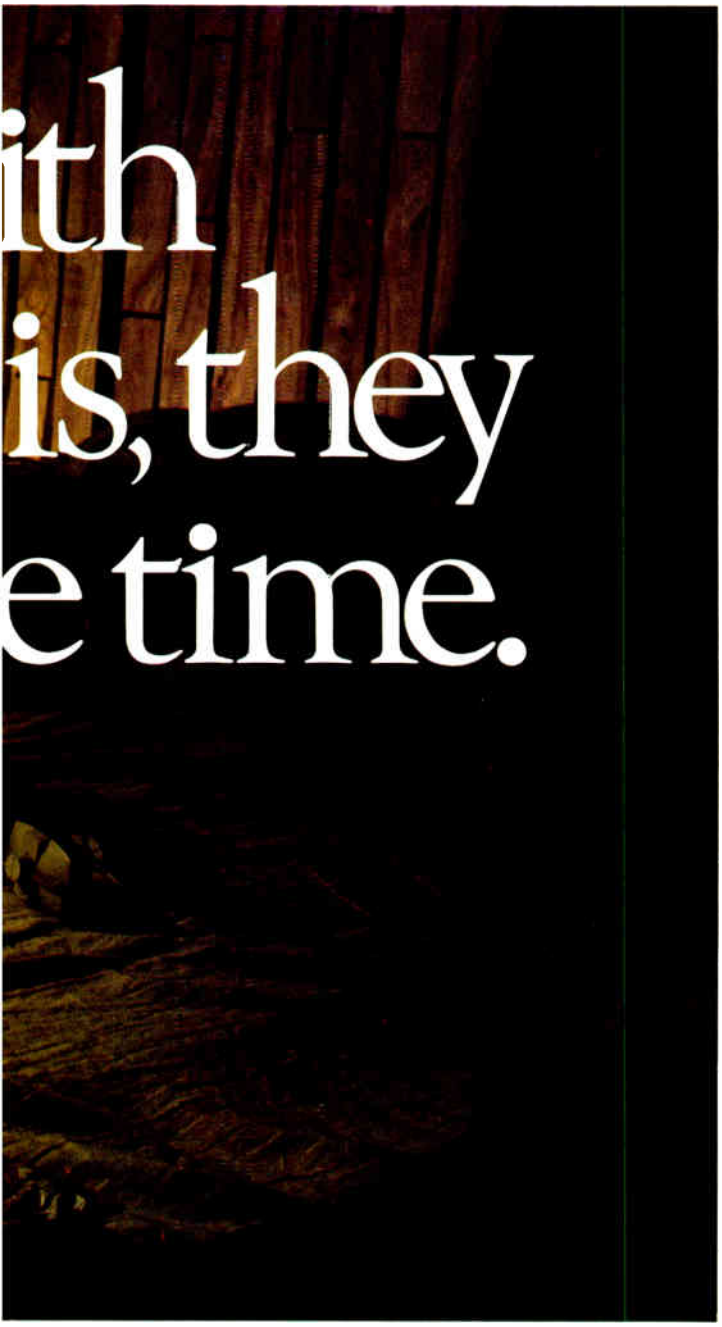
At Solid State Logic, however, we've developed a rather more practical solution to this dilemma. We call it the Total Recall System.

Total Recall is completely independent of all audio paths and allows the console settings to be permanently stored on floppy discs within a few seconds.

So, at the next session it takes only minutes to reload this information, check it on the colour video monitor and return the console to its original settings.

The same thing can be done at the end of each mix





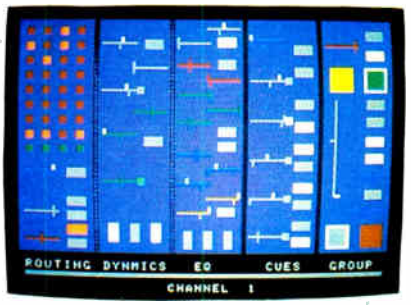
to save time at a later re-mix. And engineers can even store their personal EQ and dynamics settings and create their own libraries on floppy disc.

Total Recall is just one of the functions of the SL 4000 E's on-board computer. The computer will record all the details of a session – title entries, track lists, cue points, dynamic mixes, synchroniser information and so on – and store them on a floppy disc.

These unique facilities give the Solid State Logic Master Studio System several important advantages.

It allows the manager to keep his studio working, and earning, for the full 24 hours a day. Because even the most complex set-up can be precisely reproduced in about 20 minutes before the start of a session.

It saves the engineer wasting precious time and lets him concentrate on the creative process, from track laying to over-dubbing through to mixing. Because the studio computer speeds up everyday tasks like autolocation, drop-ins, mixing and synchronisation.



And it gives producers and musicians real flexibility and continuity. After recording in an SSL studio, they can return there (or to any other computerised SSL studio in the world) and continue work with absolute accuracy and the minimum of fuss.

Yet the computer is simplicity itself to operate. Even inexperienced assistants and tape-operators will soon master its basic functions. While feed-back from studios with SSL systems shows that more advanced expertise is acquired quickly and naturally with use.

The SL 4000 E Series Master Studio System could only have been developed through an understanding of the needs and problems of people who spend their lives in studios.

So it's not surprising that SSL's design team include not only computer and electronics experts, but engineers, producers and musicians. People who both improve studio technology and use it.

What this group sets out to devise, and SSL sets out to produce, are real answers to real problems. Finding ways to improve quality and streamline audio production. But we also produce machines that are built to last.

You will never outgrow an SL 4000 E System because you can start with the basic mainframe and then add extra modules and facilities as your needs and budget dictate. By designing systems with the future in mind we make sure that hardware and software developments can always be integrated into existing systems.

We can build you an SL 4000 E Series Master Studio System in around three months. So if you would like to start cutting the amount of time and money your studio wastes, cut the coupon or call Antony David in the UK or Piers Plaskitt in the USA.

Solid State Logic

Please send me further information on the SL 4000 E Series Master Studio System. MIX 8/84

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Joey Carvello and *Eric Morgeson* did final mixes on *Megatwa Fatman* for Critique Records with producer *Bill McKinney;* and self-produced rockers, *Natasha,* cut additional material for their upcoming album; Morgeson behind the console . . . The *Comfort Sound Mobile* based in Toronto was very busy through the spring with broadcasts for Toronto's two top rock FM stations. One station featured live performances of *UB40* at Massey Hall, *Paul Young* at Ontario Place, *Bill Nelson, 20th Century Rebels, Darkroom,* and the *Pukka Orchestra* . .

NORTHEAST

At *Songshop* in New York City the *Liggett/Barbosa* production team have recently produced cuts for *Robin Gibb* on Mirage, *Jimmy Tunnell* for MCA, and *Jay Novelle* for Emergency. *Wayne Vlcan* engineered . . . *Denny Sewell,* formerly of Wings, was in at *Sheffield Studios* (Phoenix, MD) producing *Monarch,* with *Dave Hines* engineering. Also, *Jan Brooks* finished up some new tracks. *Debbie Jacobs-Rock* produced, *Bill Mueller* engineered . . . *Galt MacDermot & his New Pulse Jazz Band* recorded *The Boogie Man,* their third LP for Kilmarnock Records, at Manhattan's *RPM Studios.* The album, featuring eight horns and Synclavier synthesizer, will be available in the fall . . . The *B. Willie Smith Band* single "Let's Have a Party," recorded at *Trod Nossel Recording Studios* in Wallingford, CT was recently released on TNA Records . . . At *Secret Sound Studio* in New York City, *The Del Lords* cut tracks for their next Capitol/EMI album with *Lou Whitney* producing and *Terry Manning* and *Warren Bruleigh* engineering. Secret Sound also mixed the *Bar-kays* for *Polygram Records,* with *Jerome Gasper* producing, *Scott Noll* engineering, and *Warren Bruleigh* assisting.

At *Duplex Sound* in New York City, *Eumir Deodato* produced two tracks for the hit film *Beat Street,* soundtrack by the group *Juicy* for Atlantic Records. Deodato also completed his fifth album for Warner Bros. called *Motion.* Both projects were engineered by *Mallory Earl* . . . *Herman Sebek* star of the Broadway musical hit *Cats,* was in at New York City's *Quadrasonic Sound Systems* with *O.C. Rodriguez* recording a 12 inch entitled *Going Insane,* dance-oriented record. *Matthew Kasha* engineered the session . . Sessions at *Inner Ear Recording* in Queens, New York have included the metal-rock band *Renegade,* who cut and mixed four original cuts for demo and future release purposes with *Steve Vavagiakis* engineering; and producer *Roy Altman,* who prepared tracks for a future EP on Microcosmic Music . . . At *Celebration Recording Studios* in New York City, *Peter Wood* and *Joe Deangelis* produced tracks for *Joeseph Costick.* Featured musicians included Martin Briley on guitar, Steve Holley on drums, and John Seigler on bass. *Holly Peterson* engineered with *Maurice Puerto* assisting . . . At *Evergreen Recording* in New York, *Ted Hayes* produced *Alfonso Ribeiro's* first single, "Dance Baby," for release on Prism Records. Also, *Morrie Brown, Marc Blatt, Lottie Golden, Larry Gottlieb* and *Richard Scher* produced tracks for the *Manhattans'* upcoming album . . . *Westrax Recording Studio,* New York City, completed the recording of "You Got It," for the soundtrack of the movie *Beat Street,* featuring vocals by *Peter Link,* owner of Westrax, and Atlantic Records artist, *Jenny Burton* . . . *ICE Associates* of Bala Cynwyd, PA was busy with radio and television endeavors for Boscov's and Ports of the World retail outlets, Senator Jim Saxton, and Moview Unlimited. Their current musical energies have been directed to jingle projects for Sunshine Blue jeans store, Kingsway Mitsubishi, Nathans Furniture, and Norristown Honda . . . At *Sigma Sound,* Philadelphia, sessions were completed for *Lou Rawls'* latest album, with *Dexter Wansel* producing. *Michael Tarsia* engineered, with *Scott MacMinn* and *Barry Craig* assisting. Also Sigma made a remote recording of *Edwin Hawkins, Walter Hawkins & Family* at the Nu-Tec theater in Philadelphia. *Arthur Stoppe* engineered with MacMinn assisting. Remote recording facilities were provided by Sigma Sound along with *Sound Specialties* . . . At Sigma Sound Studios, New York, *Yoko Ono* worked on "Dog Town," with *Mike Barbiero* mixing; *Linda Randazzo* assisting; *Talking Heads* worked digitally, with *Eric Thorngreen* engineering, *Glenn Rosenstein* and *Nick Del Re* assisting . . . At *Normandy Sound,* Warren, RI, *Phil Greene* and *Ron Saint Germain,* in association with executive producer *Phil Gernhard,* engineered and produced "Back On The Streets" performed by *3-Speed* for Curb/MCA Records for a soundtrack for *Savage Streets,* a Universal picture starring Linda Blair . . . Recent activities at *The 19 Recording Studio* in S. Glastonbury, CT included *Project Future,* for Capitol Records, *Ron Scalise* engineer, *Rahni Harris* composer/producer on the Fairlight CMI . . . At *Greene Street Recording* in New York City, *T-Bone Wolk* (of Hall & Oates) and *Bob Riley* produced *Elly Riley* for Dominoz Productions, *Rod Hui* engineered, *Erika Klein* assisted. Also, *John Cale* produced his album for Ze Records, Hui engineering, Klein assisted . . . Recent activities at Boogie Hotel in Port Jefferson, New York, included *Joey Lynn Turner,* lead singer of Rainbow, working on a forthcoming solo project for Geffen Records. Band members include Chuck Burgi (Hall & Oates, Rainbow), Al Greenwood (Foreigner), Steven Dees (Hall & Oates, Novo Combo), and Bob Kulick (Everyone and Everything). *Don Berman* engineered with *Chris Isca* assisting . . . At *Extraterrestrial Sound* in Glen Cove, New York, *George A. Wallace* produced and engineered three *Fit Kids* albums for Cyclops Records, a recorded fitness program for preschool children . . . Meanwhile at *Skyline Studios* in New York City, *Lillo Thomas* was in recording and mixing his album for Capitol Records with special guest appearance by Melba Moore. *Paul Lawrence Jones* produced with *Carl Beatty* behind the board, assisted by *David Young* and *Scott Ansell* . .

SOUTHEAST

Mick Jagger of the Rolling Stones has been recording his long-awaited solo album at Island's *Compass Point Studios* in Nassau, the Bahamas, with *Bill Laswell* of Material producing. The as yet untitled album is tentatively scheduled for a fall release on CBS Records . . . At *Reflection Sound Studios,* Charlotte, NC, *Awareness Art Ensemble* cut a new 45 for an upcoming LP. *Jamie Hoover* produced and *Mark Williams* engineered for OVO Productions . . . At *Bullet Recording,* Nashville, TN, they've finished taping the Nashville Network's *Bobby Bare and Friends; A Songwriter's Showcase!* Recent guests included: Waylon Jennings, Jessi Colter, Emmylou Harris, Mickey Gilley, Delbert McClinton, Jim Ed Normon, The Judds, Michael Murphy, and Gary Morris. Album projects at Bullet included Ann Murray, TG Sheppard, Bandana, Sandi Patti, Kenneth Copeland, Kathy Troccoli, Shel Silverstein, and Autumn . . . The newest solo album and single release from Bee Gee *Robin Gibb* was recently mastered by engineer *Mike Fuller* at the *Criteria Cutting Center* in Miami, FL. The album, titled *Robin Gibb: Secret Agent* was recorded and mixed during the spring at Criteria's Studio E. Also at Criteria was *Stephen Stills,* who has recorded several gold albums at Criteria over the years as *CSM, Manassas* and *Long May You Run.* He put the finishing touches on his next LP, *Right by You* which is due for an early fall release. Producing and engineering the album were *Ron* and *Howard Albert. Mark Draeb* was the assistant engineer on the sessions . . . At *New River Studios* in Fort Lauderdale, FL, jazz pianist Ahmad Jamal was in mixing his upcoming double album for La Maj Records with producer *Jimmy Johnson* and engineer *Pete Greene* (Muscle Shoals) with New River engineer *Ted Stein* assisting . . . Recent activity at *The Bennett House* studios in Nashville included *John Hiatt,* working with producer *Norbert Putnam,* engineered by *Don Cobb,* and *Mark Gray,* produced by *Bob Montgomery* and *Steve Buckingham,* engineered by *Gene Eichelberger* . . . *Hidden Meaning Studios* in Warner Robins, Georgia completed several vinyl projects: *Tony T.* for Toll-Free Records; *Gilbert Lyons* for Unlike-All-Other Records, *The Circle Band* for PCR Records, and the *New Cotton Bros.* for Blue Top Records . . . *John Coates* was in *Stargem Studios* in Nashville producing an album for the *Living Word Singers* and working with Wayne Buchannon on music for a Hospital Corp. of America multi-media presentation. Also, *Andy DiMartino* of Moonshine was in overdubbing vocals on his latest *Nichols Bros.* project . . . Activity at *A.M.I. Studio* in Hendersonville, TN included: producer *Brien Fisher* working on projects for *Joe Sun* and Australian artist *Johnny Paycheck,* with co-producers *Tommy Jennings* and *Miles Sillis;* producer *Hank Cochran* cutting tracks on the group *Rock Killo* with engineer *Jimmy Birch* . . . At *Scruggs Sound Studio* in Nashville, *Randy Scruggs* produced *Earl Scruggs'* new instrumental album for CBS . . . At *Future Music* in Atlanta Georgia, *John Serrie* recently composed and produced the soundtrack for *Starquest,* the current sky show at the Hayden Planetarium in New York City. The production was narrated by Leonard Nimoy . . . *Woodland Studios* in Nashville found new recording artists *Pat Daisy* and *Lisa McNeal* in doing demo sessions with *Floyd Cramer* producing and *Ken Criblez* engineering; and *The Lewis Family* doing vocal overdubs with producer *Herman Harper* and *David McKinley* at the controls . . .

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THE SOUND SYSTEMS OF THE OLYMPICS

by Tony Thomas

When you think of an Olympic-sized swimming pool, your mind's eye produces a picture of a large, rectangular, man-made body of water by which all other swimming pools are measured. But an Olympic-sized sound system? This summer, the eyes and ears of the world will be focused on the city of Los Angeles for an event that is held only once every four years. What they will hear will be determined largely by the efforts of the men and women whose job it is to bring the sounds of the Olympics to the 2.5 billion watching on television world-wide and the 350,000 spectators in the stands.

Ramsa to the Rescue

The objective of the Los Angeles Olympic Organizing Committee (or LAOOC for short) was to find a single supplier of audio equipment with a product line broad enough to supply everything needed to adequately outfit each of the 30 or so Olympic venues. "In that category, there are not that many companies that can do the job," says Tom Bensen, marketing manager of Panasonic's Ramsa Professional Audio Systems Division, the LAOOC's ultimate choice. "There are certain advantages to having a single turn-key supplier," according to Bensen.

The benefits of engaging a single company for audio systems clearly outweighed any added flexibility which may have been gained by using customized commercial installations made up of components from various manufacturers. First of all, the sheer logistics of dealing with several suppliers would have made the project essentially untenable. Secondly, equipment failure could be a disastrous occurence if several companies were involved. Finding and replacing a defective component under such circumstances could prove to be a time-consuming process. And when considering the fact that the Ramsa Olympic inventory consists of 57 mixing consoles, 215 power amplifiers, 900 speakers, 250 microphones, and an assortment of cassette decks, turntables, equalizers and accessories, reliability and replaceability are essential ingredients to the successful continuous operation of the various systems which will be employed.

Although Ramsa is known primarily for their consoles and power amplifiers here in the states, they have built a significant reputation as a major supplier of sound reinforcement equipment in Japan. There, the Panasonic Corporation is known as National. For example, Ramsa Japan makes sound reinforcement consoles in the $100,000 range, not to mention a wide variety of professional quality speakers, amplifiers and microphones which are not currently available in the U.S. Additionally, Ramsa's sister division, Technics, will provide the ancillary equipment which will be needed, such as turntables and cassette tape decks. Such an extensive array of equip-

ment, from microphones to speakers, produced by a single manufacturer, therefore, made Panasonic/Ramsa a natural candidate to be designated the supplier of sound systems for the 1984 Olympic Games, according to Panasonic's Olympics project manager, Nick Hudak.

Putting it All Together

While amassing all of the necessary equipment is certainly an essential prerequisite to quality sound reproduction, unless it is properly configured and installed, even the best gear cannot yield sound output that is qualitatively and quantitatively sufficient. dB Sound, the Chicago-based audio contractor, was chosen as the paid contractor to install the permanent systems at the LA Memorial Coliseum and the East Los Angeles College arena, which will remain after the Olympics. They will also set up and take down numerous other systems designed specifically for temporary use at various venues. dB Sound brings to the project extensive experience gleaned from providing sound reinforcement for some of the largest rock acts and musical groups in the business.

Coordinating assembly and maintenance for dB's western division, dB/West, is James Ash, who has among other things, travelled around the world with George Thorogood providing sound. It is his job to make sure that all sound reinforcement equipment is in place and functioning within the very narrow construction time-window afforded by the

One Pass Goes to the Olympics

by Blair Jackson

Sitting at home in front of the TV with a cool Budweiser in one hand and only half paying attention to the action on the screen, it's very easy to forget what a massive undertaking it is to bring the Olympics to us on television. With literally dozens of events spread all over Southern California to cover, ABC has, not surprisingly, had to enlist the services of numerous outside video and sound companies. The other element to consider is that ABC is not the only organization covering the Olympics—virtually every country that participates in the Games beams coverage back to the motherland, and that means an additional corps of several hundred people, on top of thousands already involved with the domestic coverage on some level.

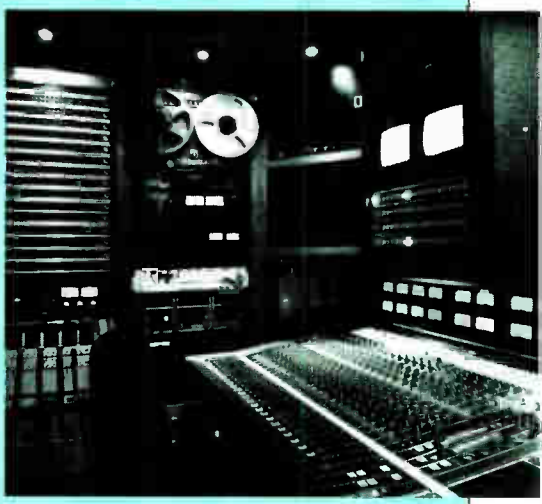
For a glimpse at how one company is covering just one event at the Olympics, we recently visited San Francisco-based One Pass Video and toured their Mobile One 60-foot video truck, which was such a hit at the NAB show this spring. The brainchild of One Pass' Scott Ross and Taylor Phelps, the truck was commissioned about a year ago and built by the Centro Corp., a San Diego-based design and construction firm. Originally, Ross had merely wanted to develop a good, portable fly pack system that would give them a lot of flexibility, but, as Darlinda Dovolis One Pass' Manager of Mobile Services says, "It grew and grew until it blossomed into a 60-footer. In the process it went from being a $600,000 project to one that cost $2.5 million."

It was money well spent, however. Mobile One is arguably the nicest facility of its kind, with state-of-the-art equipment through and through (see box), and a main production area that is more spacious than any comparable vehicle, with tiered, luxury seating for 12, a bar area and plush interior. Aside from the huge production area, with its monitor wall, switchers and DVE, there is an audio control area, a videotape center, a graphics section, and a camera control area. Wisely, One Pass consulted the major networks before they built the truck, in an effort to determine their special needs. When ABC finally saw the truck at NAB, Dovolis says, they were so impressed they wanted to reassign it to a larger Olympic event.

Even as it stands now, however, covering the relatively minor sport of water polo will constitute something of a baptism-by-fire for Mobile One, which has really only been operational for a couple of months. George Palmer, chief engineer for Mobile One, is supremely confident that his truck is more than up to the challenge. "We've had time to work with it a bit, see what it can do, and it's definitely ready to go." he says. "It's very well shaken down. I'm very comfortable with it." Before joining One Pass' staff, Palmer worked for both ABC and ESPN (for whom he managed five mobile units), so he is well acquainted with the capabilities and requirements of a good video truck.

During the Olympics, Mobile One will be stationed at Pepperdine University in Malibu, site of the water polo events. ABC will utilize four One Pass cameras, three one-inch machines, a back-up ¾-inch and a Chyron to help provide the "world feed" for the event. As Palmer explains, "ABC will have a unilateral operation which is for the US. They provide a copy of that feed to

Interior, Mobile One of One Pass.



the world as a cut feed, minus graphics. On each venue, they provide supplemental coverage that the world broadcasters use to spice up the coverage and to focus on the individual athletes of their country." In other words, while ABC is necessarily concentrating on the glories of American athletes in their coverage, the other nations can utilize a more general event feed and add whatever elements they choose to make the broadcast more meaningful for the viewers in their home countries.

From the truck, Palmer continues, "the international feeds go back to the International Broadcast Center, at the Sunset and Gower Studios. It's been set up specifically to handle that. It's a satellite area they've set up on four huge soundstages—it's like a little city. [Palmer was project manager for the Broadcast Center for nearly five months.] So they'll be getting all these unilateral feeds plus the international feed, and then the world broadcasters are able to cut another show

—PAGE 55

LAOOC and the various facilities. The logistical challenge of conducting the small army of trained engineers and technicians that preside over enough equipment to fill four 40-foot semi-trucks is mind-boggling, to say the least.

Meeting the Challenge

Numerous obstacles had to be overcome in bringing the various systems from the drawing board to the staging area. For example, the LA Coliseum system had to be configured to provide acceptable sound pressure levels for the 90,000 people accomodated by that outdoor stadium while taking into consideration the camera angles needed by ABC-TV to provide satisfactory coverage to the massive worldwide television audience. The configuration chosen by the designers was a twin-cluster system on one end of the Coliseum. Each of the two speaker clusters contains 12 15-inch low frequency speakers and 12 horns powered by 28 400-watt Ramsa WP-9210 class A-B amplifiers. The 9210's earned a reputation for reliability for operating without failure 14 hours per day in the humid heat of the Knoxville World's Fair. The cluster speaker configuration was deemed superior to the existing perimeter system design because of phase considerations and possible obstruction of television equipment.

Sophisticated mainframe computer-generated acoustical models were used to determine the characteristics of the Coliseum and the pattern and sound

> The benefits of engaging a single company for audio systems clearly outweighed any added flexibility which may have been gained by using customized commercial installations made up of components from various manufacturers.

pressure levels of each individual speaker at various frequencies, as well as the synergistic effect of all the speakers operating in unison. One of the unique components used in the clusters is the Ramsa WUS-948 P ultra-directional horn, which when used in pairs, allegedly provides 6 dB of additional output as compared to 3 dB for most horns.

The heart of the system is the Ramsa WR-8616 console which is transformer balanced in and out. It provides 12 mike-level inputs, four stereo line-level inputs, four sub-masters and a stereo master output. Although the board was designed as a recording and post-production console, it is expected by the manufacturer to work well as a sound reinforcement mixer. According to Ash, construction of the system was invaluably aided by Bob Bradley of Langevin, who installed the original perimeter system in 1951. Bradley evidently knows the ins and outs of the Coliseum and the various patch points and cable locations.

Of the new Coliseum system,

Discover a high-performance mixer with a personality all your own.

The Ramsa WR-8616.

Inside every recording engineer is the desire for more creative control at the board.

Now there's a post-production/recording mixer designed to make your sessions sound more like you. And less like everybody else's. The Ramsa WR-8616. And its modular design is as ambitious as your needs.

You can have 16 channels of either full stereo or mono modules. Or a combination of the two.

The WR-8616 will also save you valuable time. By letting you simultaneously monitor as many as 16 channels on a multi-track machine while recording.

What's more, this high-performance mixer gives you two discrete mixes. This allows for full monitoring capability, which can be independent from the control room's mix.

And in the mixdown, you'll have access to all 16 inputs without having to repatch or reset the board.

You'll also find the 3-band continuously variable input EQ will give you more precise control over the highs, midrange and lows. And the six-channel remote start/stop capability lets you program materials using turntables, or tape and cart machines.

To make the WR-8616 even more compatible, we've given it a dual set of meters. Eight LED bar graphs will monitor the 16 input signals. While the six VU meters handle the Master, Group, Send, Echo outputs and Solo level.

And the balanced Mic and Line inputs and Main outputs won't let any unwanted noise come between you and your sound.

The Ramsa WR-8616. A post-production/recording mixer designed to treat you like an individual.

SPECIFICATIONS:

- +4dBM, 600-Ohm Line Input and Output Signal Levels
- Frequency Response: 20-20,000Hz; $^{+0.5}_{-2.0}$dB
- Noise: −128dB (IHF "A" WTD, 150 Ohm)
- THD: 0.05% typical at 1kHz, +20dBM
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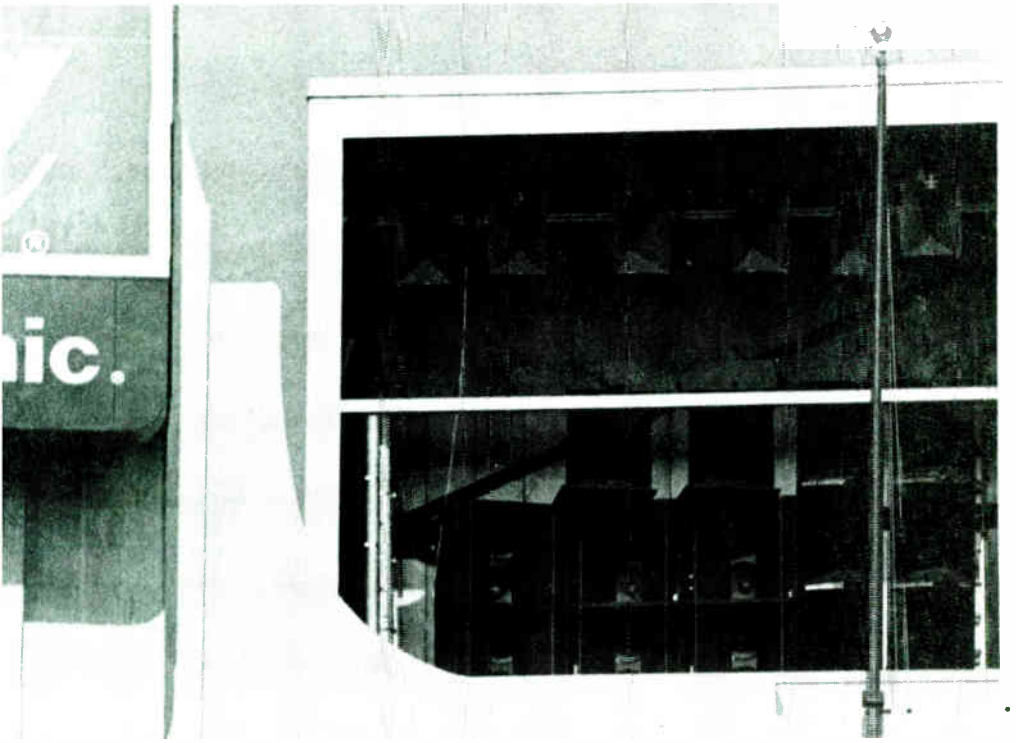

Detail of one side of the main system cluster in place at the Los Angeles Coliseum.

Ash says: "We are giving the system expanded capabilities which will be more than sufficient for many years to come." The only other permanent installation will be made at East Los Angeles College. While not as complex as the Coliseum design, Ash confidently says "It will be a very good system for the size of the arena. It will expand their present capabilities to do any number of things."

Creative Solutions

At some of the other venues, challenges were presented by the environment in which the various sports occur. For instance, a delay system will be installed at the USC swim stadium so that the swimmers underwater can keep pace with those above the water during synchronized swimming events. At Lake Casitas, where the rowing and canoeing events will be held, a modified, hands-free, walkie-talkie system will be used so that the event announcer can follow the 2,000-meter events in a boat and communicate with the spectators over the PA system. At Fairbanks Ranch, where the equestrian events will be held, a sound system had to be designed to effectively cover an entire golf course. Eight to ten days of setup time will be required for an event that will last only a day, and four to five miles of cable has been ordered for that venue alone.

Conversely, the simplest systems (in the press interview rooms) will only require a few speakers, an amplifier, a mixer, five or six microphones, and a distribution amplifier/patch box where the reporters can all obtain a common feed for their tape recorders. Transformer isolated feeds will be provided at every venue for the ABC Television Network.

All in all, providing audio support for the summer games in Los Angeles proposes to be a task of truly Olympian proportions.

Coping with Contingencies

Due to the size and complexity of the systems involved, extensive preparations have been made for backup equipment and personnel. Several members of the dB Sound crew will be assigned the task of keeping the equipment functioning properly once installed. Others will set up and take down temporary installations. There will be two repair teams in vans with spare parts and troubleshooting gear, in addition to two "motorcycle Mercurys," as Ash termed them, to hustle through the anticipated traffic congestion with smaller pieces of equipment.

To demonstrate the sophistication of contingency plans in effect, all of the anthems and music for the games will have two backups. Broadcast-type endless-loop cart machines will be utilized for the master copies of the music. Backup carts and machines will also be on hand and the third line of "defense" will be cassette tape decks with cassette backup copies of the musical material.

The Wireless Connection

One of the more interesting audio considerations of the games is the preparations that the ABC Television Network has made to assure that their commentators can communicate effectively with each other and their massive television audience. While wireless microphone technology has been utilized consistently and effectively for several years in the rarefied and crowded atmosphere of the political conventions, this summer's Olympics will put wireless technology to the ultimate test.

The Sony Corporation has risen to the occasion by providing ABC with the state-of-the-art in wireless microphones, body pack transmitters, receivers, and lightweight headphones. Although they were used successfully at the winter games in Sarajevo, the congested airwaves of Los Angeles will provide an even greater challenge for the Sony systems and ABC.

An Olympian Task

All in all, providing audio support for the summer games in Los Angeles proposes to be a task of truly Olympian proportions. Only through proper planning, timing and teamwork can the job of bringing high quality sound to the masses be carried out. One of the most difficult aspects of the planning process is expecting the unexpected. The various Olympic sound crews must, in effect, be ready for anything. To quote a sign hanging in the dB/West offices: "Murphy was an optimist."

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SIGNAL/NOISE RATIO: 104dB below +4dBv, 20kHz bandwidth
OUTPUT IMPEDANCE: Less than 1 ohm, typically .3 ohm

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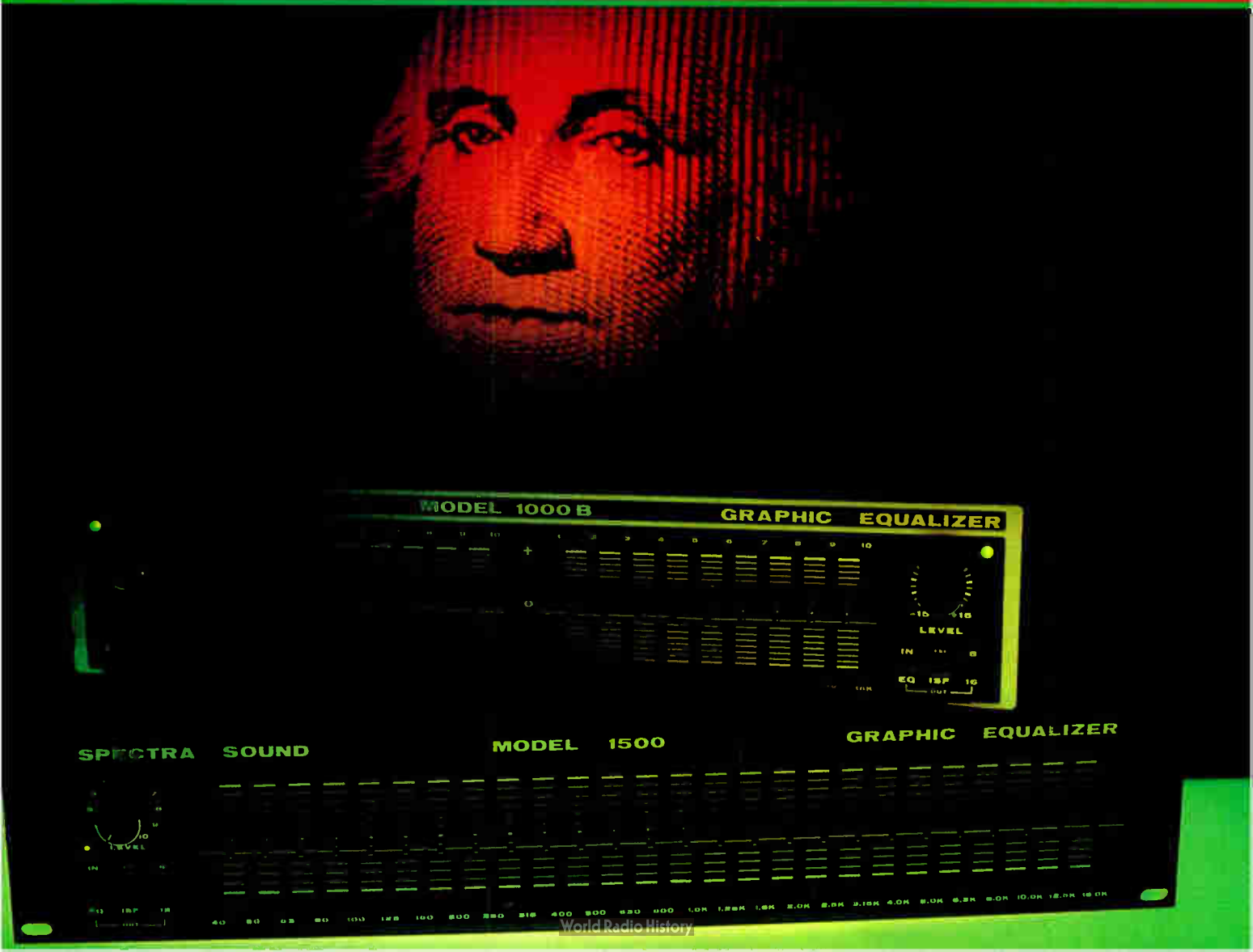

DIGITAL-QUALITY ACOUSTICS

The problem is, on some CD recordings, the recording is a little too real. I hear full fidelity music and other full fidelity sounds such as air conditioners, noise ventilators, street traffic, and poorly designed acoustics.

By Ken Pohlmann

When I listen to Compact Discs, I hear things I never heard before on my home stereo system. I hear drums and percussion with a solid low end and transparent high end. I hear brass with startling impact, and the intimate resonance of woodwinds. I hear the fingernails of a pianist clicking on the keys as he plays. I hear rock 'n' roll and orchestral music with realism unprecedented in a consumer medium. And that's not all. Realism in music entails a host of factors such as documented or created perspective, depth and volume of performing space, and environmental acoustics. CDs can bring that extra information which can make recorded music seem even more live, that is, more real.

The problem is, on some CD recordings, the recording is a little too real. I hear full fidelity music and other full fidelity sounds such as air conditioners, noisy ventilators, street traffic, and poorly designed acoustics. The sound on a CD can be as smooth as a baby's bottom, and about as naked. Extraneous acoustic junk which otherwise becomes lost in the analog replication chain is now unashamedly present in the consumer's living room. The CD will clearly require a rethinking on the part of the audio engineers as to technique. But while a little reserve in the use of EQ, a few extra inches in close microphone placement, or an extra ounce of caution in tape splicing and editing might be easily adapted to, the problem of recording acoustics will not be nearly as simple, or cost-free. This month I'd like to focus on some acoustic troublespots in studios which are guaranteed to be particularly troublesome when making digital recordings.

The wide signal to noise ratio of digital recordings necessitates low noise criteria levels in the studio. A noise level of NC-20 or less is required (NC-15 if possible), while a studio with a noise level of over NC-30 would be unsuitable. Some acousticians recommend a 24-hour instrumentation recording of noise level with an hourly A-weighted sound equivalent level. Combined with hourly noise spectrums, an accurate picture of the isolation characteristics of the studio may be obtained. Of course, before construction begins, a site survey should be undertaken to determine noise level. Don't forget the question of future development (a proposed freeway a quarter mile away, or a future flight path?). A studio with insufficient isolation may be in for trouble. As I discussed in my January column, acoustic noise reduction is often costly. Bulky partitions such as staggered stud or concrete block walls are often required. With less bulk, but higher cost, sheet lead is a very effective isolation material. Its coincidence effect frequency is higher than any other building material and a relatively thin lead partition can achieve better sound transmission loss (TL) compared to other building materials of equal surface density; this is especially true at high frequencies. Because of the mass law, low frequency isolation is achieved primarily through an increase in surface weight. An increase in STC of about 5 dB is obtained for every doubling of surface weight. But the law of diminishing returns soon intercedes and barriers become very massive for high STC, thus more effective constructions have been developed.

Low frequency isolation is the nemesis of acousticians everywhere and as we have noted, massive walls are one solution but floated floors are the most efficient. Floated floors are especially crucial in controlling structure-borne transmission inherent in any building's floor/ceiling barriers; TL of 80 to 90 dB at 500 Hz can be achieved. Everything from footsteps and kick drums to automobiles and locomotives create low frequency vibrations which (like all sound) travel quite easily through solid mediums. Thus vibrations from traffic could travel through the earth, into a studio floor, up the microphone stand, into the transducer, and eventually find its way into your flat-to-DC frequency response digital tape recorder, later to emerge from your monitors as rumble. Floated floors, whether wood or concrete, mounted on fiberglass isolators or springs, provide protection. The remedy is complicated

by the fact that any floating system must be properly designed to insure that the isolation material has proper static deflection.

Other rumble problems come from air conditioners and other mechanical equipment. Any heavy machinery should be located away from the studio or should be thoroughly decoupled. Compressors, for example, should be mounted on isolation blocks which in turn are isolated on springs. Once again, that isolation must be mathematically calculated to provide best results; manufacturers can provide information on recommended isolation procedures. Any connecting ductwork between the machinery and the studio should be decoupled with flexible pieces to prevent vibration transmission.

Air conditioners present additional problems; air turbulence must be minimized through the use of large ducts and unlouvered ventilation fixtures. The trick is low air velocity, dumping the air into the room as unobtrusively as possible. Supply and return rates must be balanced to eliminate whistling. In-line baffles and lined ductwork are sometimes required to prevent transmission; any twists and turns in the duct path help to trap noise. Independent ductwork should service the studio to prevent transmission from other rooms into the studio. Don't overlook the obvious details. I was once called in to quite a noisy studio in which thorough precautions had been taken except that the ductwork passed through a machine room. Noise from the machinery was entering the duct and traveling into the studio. (We wrapped the duct with fiberglass blankets).

Massive walls and floated floors are only as effective as their construction integrity. Sound levels can short-circuit any structure's isolation properties because sound will travel through any opening with little loss. Any cracks, ceiling fixtures, louvered doors, back-to-back electrical outlets, gaps around doors, etc. are instant disaster. For example, a one square inch hole in a 100 square foot area of gypsum board will transmit as much sound as the rest of the partition. A quiet studio is an air-tight studio.

While checking a studio for noise, don't forget about the studio itself. Send some swept oscillator tones into the studio monitors at high volume; as resonance points are reached, anything loose will begin to rattle. That is a distinctly un-musical kind of sound generation; anything loose must be identified and secured to eliminate rattles.

Of course the criteria for a quiet studio does not necessarily correlate with a good-sounding one. As digital recordings become more accurate in conveying ambient information, studio acoustics must be carefully designed to complement the performance. Basic room dimensioning and geometry must be considered. Bass traps, cavity resonators and slot absorbers must be used to achieve a smooth bass response. A variety of mid and high frequency absorbers and reflectors, with a wide variety of sizes and geometrical shapes must be used to give a studio utility, as well as a feeling of ambient character. Gone are the days of studios with totally absorptive surfaces; a room must be designed to be as musical as the instruments playing in it.

As digital technology changes our conception of recorded sound, I think it is reasonable to expect much larger rooms, over 1,000 cubic feet per musician; there is nothing quite like open acoustic space. New studios will have large interior floor area and high multilevel ceilings. Walls will be irregularly shaped with low soffits and varied treatment such as slot absorbers, polycylindrical diffusers, resonators and splays. Acoustics will be appropriate for multimicrophone techniques as well as stereo pair methods, even though the acoustic requirements for the two are sometimes contradictory. Adequate floor area and controlled reverberation will be determined so that intermicrophone acoustic separation will be 15 dB or more for multitrack recordings. There will be a uniform frequency response of reverberation time; at low frequencies reverberation time should be suppressed for better percussion and low string sound. Diffusion will permit freedom and variety in microphone placement.

Thus we have briefly touched on some of the considerations important for good recording rooms, doubly important for good digital recording rooms. Good studios, like good concert halls, have always been scarce. With digital recording and CD playback in the consumer's living room, those spaces will be increasingly more valuable. Everything from good isolation to smooth reverberation characteristics will distinguish a good digital studio from the not-so-good.

I can already see studio owners breaking out in a cold sweat. Just when they have taken out a seventh mortgage to buy a digital multitrack, they find out they have to redesign the acoustics in the studio, and we haven't even addressed the need for better electrical grounding and wiring in the control room harness. I'll tell you what—close down for a week and have your technicians clean up all the ground loops, then re-open as an all-digital studio—no acoustic instruments allowed—just synthesizers, drum machines, and computers. If you couldn't ever get your act together acoustically, there might still be hope. ■

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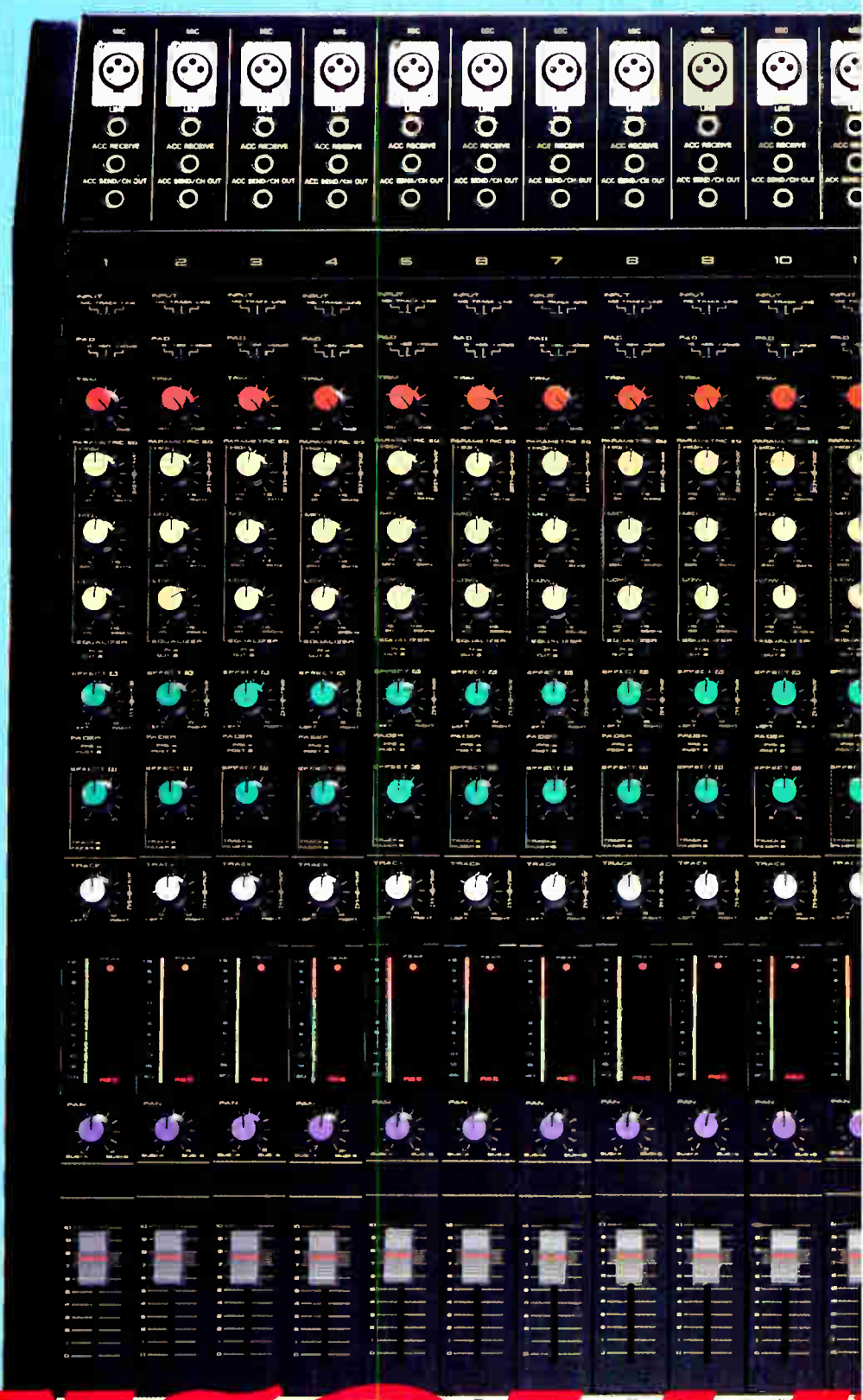

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DIGITAL DISCUSSIONS

CompuSonics: Another Digital Audio Standard

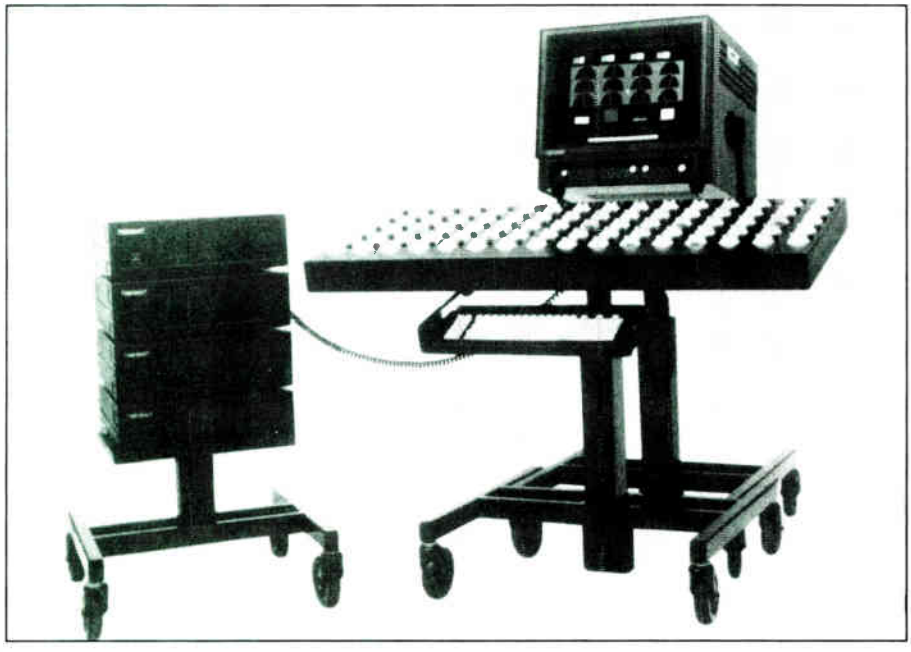
by Neal Weinstock

At a May press conference in New York, a little David named CompuSonics announced its intention to take on the Goliaths behind the Compact Disc. The company showed two basic products, both in prototype form, both doing things with digital audio that had perhaps never been done before. The Studio DSP-2000 Series is the more conventional product, if conventional is the right word: this is the first American-made all digital mixer/recorder. The DSP-1000, a consumer product, is the real revolution—if it works: a play/record module for digital audio on floppy disk.

In other words, CompuSonics president David Schwartz (no relation to *Mix's* mastermind) proposes a complete change in the record distribution business. Consumers would be able to call in an order to a distributor, then connect a modem to the phone line so the distributor could ship out an album. Music on floppies cut out several record retailers, too. It would dramatically lower costs to the record labels (no pressing, no shipping) and probably increases grosses, too (since customers would find it so easy to buy.) If it works.

The DSP-1000 didn't work at CompuSonics' press conference, but Schwartz promised to have it up and running at the Consumer Electronics Show. We caught it there, in a demonstration that A-B switched between the CompuSonics system and a source recording on Compact Disc. Schwartz stressed that the floppy sound system was still in the research stage, and would not be finalized till the AES show this fall. Still, to this observer's ears, the DSP-1000 (having been recorded through the DSP-2000) played its floppy ***almost*** as nicely as the Compact Disc sounded. It ***was*** distinguishably inferior, but not more so than a standard record album, and Schwartz is still improving things.

Essentially, CompuSonics is using the most dense floppy disks it can get (yes, we are spelling "disk" or "disc" two different ways herein: Compact Disc is a registered trademark; the computer industry has always spelled its disks with a Greek "k" while the record industry has generally gone Latin), and is compressing its digital signal to fit within the disk's storage capacity. Schwartz said he is playing around with compression ratios of from 5:1 to 9:1; standard Delta Modulation runs 3:1 maximum. Howev-



The CompuSonics Studio DSP-2000 series is designed for recording and mixing in a variety of digital formats based on four track modules.

CompuSonics proposes a complete change in the record distribution business. Consumers would be able to call in an order to a distributor, then connect a modem to the phone line so the distributor could ship out an album.

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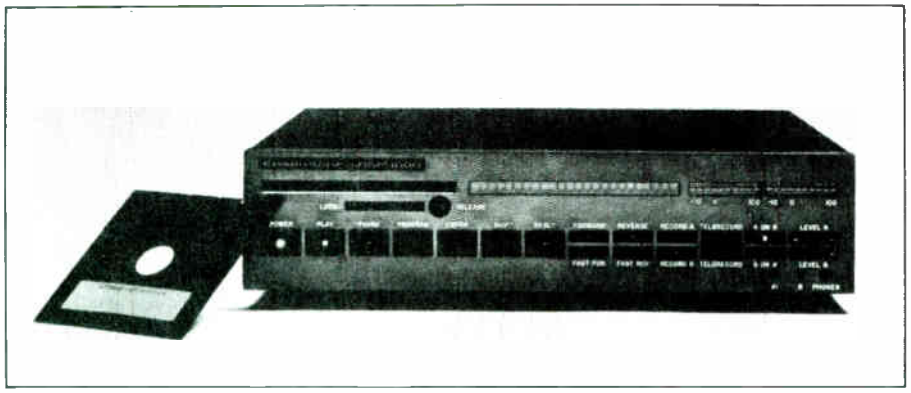

CompuSonics has also introduced the DSP-1000, a consumer digital disk recording/playback system which stores up to one hour of stereo material on a floppy disk.

er, CompuSonics' compression ratio should soften when Eastman Kodak's Spin Physics division comes out, as they have promised, with 10 megabyte floppy disks. Conveniently, those may be out by the AES show.

CompuSonics will present a paper at the AES, with details of their compression system. The company also hopes to be able to announce some system licensees there. Schwartz says he has had many handshake agreements at the CES, but declined to give details till the names are in ink.

Schwartz said he expects the DSP-1000 to sell for, "around $1,000" at retail. "But what would you buy one for? What would a vendor a thousand times our size sell one for?" he asks. "I think this is a mass technology."

As for the digital mixer, CompuSonics is already manufacturing and ready to take orders, at $30,000 for a four-track mixer alone, $40,000 with recorder and disk drives. Schwartz describes the mixer as standard 16 bit digital, and expects it to be very useful to recording studios that want to master CDs, even if his larger system never flies. The DSP-2000 will record eight hours of digital mono, mix and record four hours of stereo, two hours of four tracks, one hour of eight tracks, a half hour of 16 tracks, etc. It includes a CRT screen that shows synthetic VU meters for up to 32 tracks, according to Schwartz, and the accompanying picture shows a 16 track board; however, in demonstration, CompuSonics used only an eight track board and CRT. Schwartz says the series of recorder/mixers is made to be available in four track modules.

The DP-2000 utilizes off-the-shelf components, including M68000 CPU, trackball-arrayed control panel, fullstroke computer keyboard, printer, and standard input/output modules. The DSP-1000 home unit also uses off-the-shelf technology, including four TI TMS320 chips and serial RS-232 interface—so the user can hook it up to his/her home computer. Schwartz says he expects the consumer hardware to be very attractive to audio dealers; "As CD players come down in price, they'll want a truly high end product."

The consumer's home computer could be used to edit songs together from different albums, Schwartz says. Similarly, when ordering a disk from a distributor, Schwartz expects the consumer of the future to take a "one from Album A, one from album B" approach, assembling their own albums of the singles they want. Electronic ordering would greatly appeal to music copyright holders, Schwartz believes, since his system would automatically register purchases for more accurate record-keeping than ever before. ■

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How the listening environment affects our perception of stereo.

STEREO IN THE CONTROL ROOM

by James Cunningham

Considerable progress has been made in the last decade in improving the acoustics of the monitoring environment. This progress is most remarkable when one considers that the number of parameters which characterize these acoustics is so large that only the highly developed mathematics of modern acousticians can begin to cope with them. New types of intrumentation such as TDS™ and TEF™ are helping designers gain new insights in controlling these parameters, and employing new techniques such as the LEDE™ approach.

Although most designers have been careful to optimize control rooms for stereo listening, the two widely divergent components which comprise stereo perception make this difficult. For the sake of clarity, even though they seldom appear in their pure form, let's give them names: amplitude stereo and spatial stereo. Because spatial stereo depends upon the first 100 milliseconds (after the onset of the direct sound) for its effect, the way in which the designer handles the reflected sound in the control room is critical. Amplitude stereo, on the other hand, poses other problems in room layout. An examination of these two types of stereo will better prepare us to speculate on this aspect of control room design.

Amplitude stereo consists primarily of intensity differences between channels which enable the listener to locate a sound source somewhere between a pair of loudspeakers. This is known as imaging. The MS microphone technique also relies on amplitude cues for localization; the MS technique imparts a sense of space whereas amplitude stereo, in its pure form, cannot. The device used to accomplish amplitude stereo, the pan pot, was developed by the film industry as a means to control the dialog track placement in the early days of multi-track film mixing. Its primary drawback is that only the full left or right positions are stable with respect to movement of the listener. The ideal microphone technique for this type of stereo is the close mike, preferably a unidirectional one. This avoids the comb filter sound caused by strong early reflections entering the microphone along with the direct sound.

Spatial effects using two channels, which we shall call spatial stereo, utilizes early reflected sound to convey a sensation of space and timbre enhancement. The principle may be simply demonstrated: If you take the output of a 20 ms delay line and mix it equally with the original signal, you will have a comb filter or an "off-mike" sound. If, however, you feed the direct sound to one speaker and the delay to the other, instead of the "off-mike" sound, you will have a spatial effect, resulting from the similar but separate comb filter responses present from each speaker. You are giving the listener what he gets when he hears sound in a room, that is, incoherence. This simply means that each ear receives a slightly different replica of the same signal. A pair of microphones will accomplish this naturally but there are several principles involved which have to be met to achieve the maximum effect:

1) The spatial effect is associated only with early reflections, those under 100 ms. 2) The later reflections must not mask the early ones. 3) Lateral reflections arriving at the pair of microphones result in more disimilarity (incoherence) than non-lateral. In other words, the microphone patterns should be arranged to receive more wall reflections than floor and ceiling reflections.

Also, the mechanism of the subtle but important effect of timbre enhancement should be examined. When a reflection and the direct sound meet at some point in space (your ear or microphone), because of their differing phase relationships (in-phase at some frequencies, out-of-phase at others), the relationship will not only have a very ragged frequency response, but because the reflected sound has its waveform altered by absorption any complex waveform will suffer harmonic distortion. Because each ear receives a different version of this process, the ear-brain performs a simultaneous cross-correlation and short time spectral analysis. Finally, the glue that holds it all together is reverberation. As opposed to the early energy that constitutes spatial stereo, reverberation is dense and diffuse, but similarly, it also exhibits incoherence. The final result being full rich sound normally only associated with live sound.

It is possible, to some extent, to synthesize this incoherence by merely using delay lines; unfortunately this method suffers from mono incompatibility. Because the spatial effect is confined to the first 100 ms, some digital reverberation devices are not designed for this purpose. The Studio Technologies Stereo Simulator Model AN-1 was designed specifically as a spatial effect synthesizer that is mono compatible. It employs interleaved comb filters in-phase and out-

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of-phase by a small delay time, when the channels are combined, phase compatibility is restored. Utilizing interleaved comb filters of great density and with random spacing, adequate incoherence is simulated to establish the sensation of space. This type of synthesis can be especially helpful with electronic instruments as they can now be given the more interesting timbre and "air" of real acoustic instruments.

Back in the control room, where this discussion started, it might seem reasonable to attempt a control room design which was completely anechoic. There would be no room reflections to mask those all-important recorded reflections which serve to place the images in the panorama, and no fluctuations of frequency response to interfere with the critical intensity differences of amplitude stereo. In support of this idea is the imaging of a good stereo recording heard outdoors. But besides cost, there are other problems with this approach, especially with amplitude stereo. Anything panned center or near center would generate excruciating combs as you moved your head, and the low frequencies—forget it.

Most modern control room designs aim at broadband diffusion, that usually means enough reflected sound to smooth out the mid and high frequencies and just enough low frequency absorption to prevent the usual anomolies caused by standing waves. While this may be fine for amplitude stereo, the reflected sound may cover the subtle effects of spatiality. A good test of this type of stereo as well as the control room, is to seat yourself about 3 feet in front of one speaker. If the other speaker is about 10 feet away you will still clearly hear the other speaker. Switch to mono and it will disappear.

With the aim of controlling the reflected sound in the monitor environment, most recent designs of control rooms such as LEDE do not aim at broadband diffusion per se but try to limit the reflected sound to that area that supports the sound structure rather than detract from it. For example, it is well known that short time delays (0-10 ms) produce more audible colorations than do longer one (10-25 ms) and that over 25 ms percussive sounds will have a rough character as we begin to perceive the individual reflections, unless they are somewhat attentuated (absorbed) by the wall or ceiling surfaces. Other experimental techniques to improve the stereo listening have been to use reflectors to slightly increase the lateral reflections and thus the incoherence.

It is hoped this discussion will stimulate designers and all the experimentally-minded to continue to quest for better stereo. It may be one of the toughest challenges still ahead. ■

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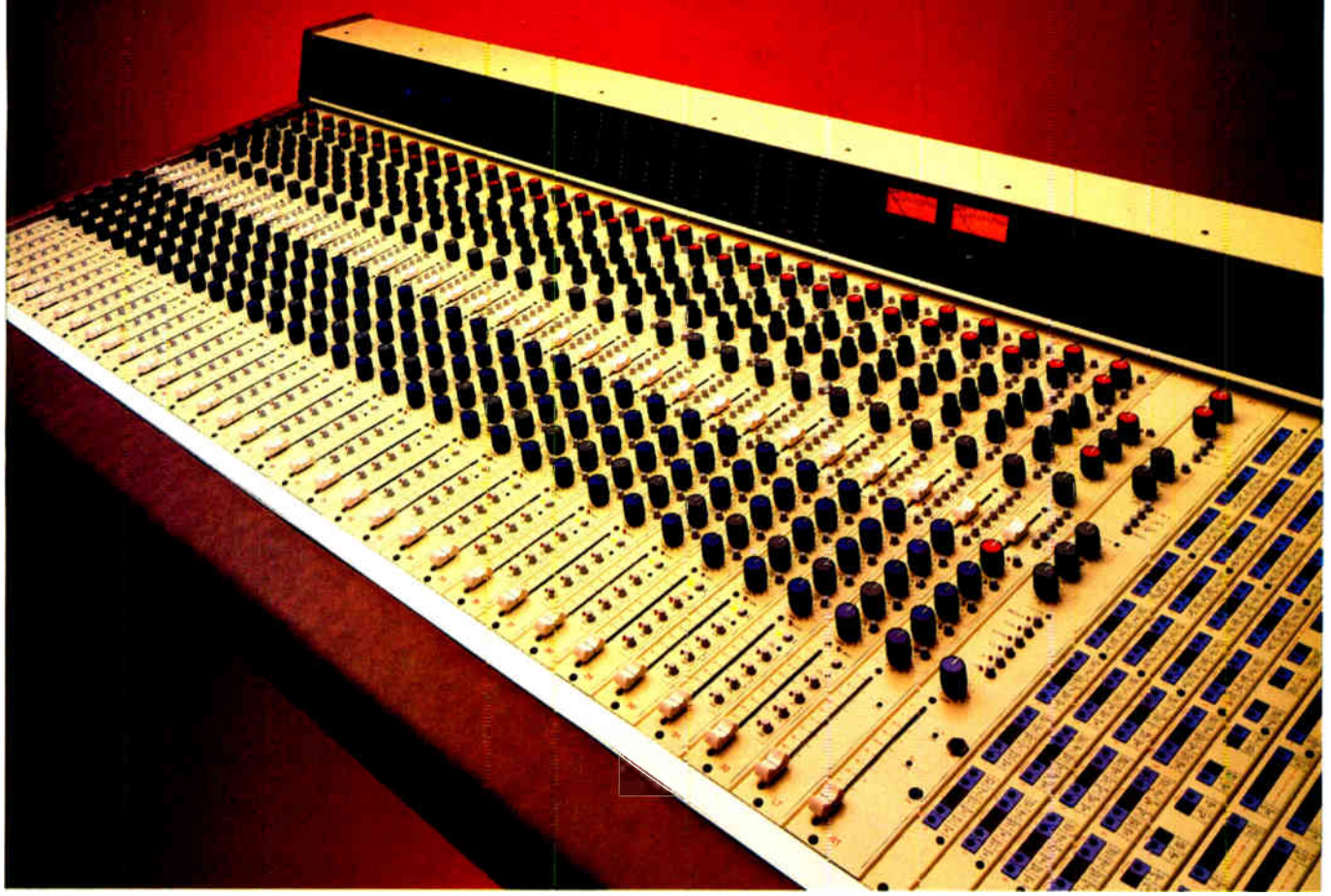

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STUDIO DESIGN FORUM:

DESIGNS FOR THE '80s

by George Petersen

The changes in studio design over the years have been just as spectacular and revolutionary as the changes in recording technology since Edison cylinders, wire recorders, and the later introduction of modern multitrack recording. Breakthroughs in acoustical technology, electronics and monitor design, advancements in computers and even the programmable hand calculator have all had a major impact on the performance and accuracy of recording studio design today. Over the past 15 or so years another change has been accepted into the industry: that of an aesthetically pleasing studio, rather than the more somber, almost clinical studio environments of the 1950s and 1960s.

The advent of digital audio is an event which has already had a dramatic effect on studio design, as the new medium shows up every flaw of ambient noise leakage, poor studio isolation and bad studio acoustics. And yet the challenge of designing a studio for digital can be met, but at a price. Designing and installing a digital-quality studio can be a financial burden to even a well-heeled studio concern, and new studios should keep the notion of even better quality sound reproduction systems as a very real possibility looming in the future.

We talked to several well-known studio designers about how some of their recent designs reflect the changing technologies and economic climate of the 1980s.

Randy Sparks, of Sonic Landscapes-Acoustic Architects, in Sausalito, California, has recently completed a number of diverse design projects, ranging from corporate studios for Atari, Pacific Telephone, and BART (the San Francisco Bay Area Rapid Transit system); control rooms for the remodeling of a large Bay Area theater into an audio/video production facility; and recording studios such as Robert Berke Recording (a San Francisco two-studio complex which went on line last month) and Live Oak Recording, an artist studio for composer Jim Gardiner.

"Live Oak Studio represents a growing trend," explained Sparks, "of a musician-owned studio. In this case, it is also a commercial studio, but the owner mostly uses the room for scoring and soundtrack work. He wanted a studio which could serve both functions. So in implementing the studio, we had to accommodate a wide variety of acoustic spaces—there's a large degree of variability in the studio's acoustics."

Sparks feels that while a lot of studios have been upgrading with digital gear, studio design and better acoustics are areas where not as much attention has been paid. "There's a need to look at studio design from a 'quiet' studio standpoint. We've been trying to get any of the amplifiers or noise producing machinery out of the control room, to eliminate fan noise. The same goes for dimmer controls, no matter how high quality they may be. We've been recommending a digitally controlled dimmer system that is manufactured by AFAB America. The controlling keypad can be located near the console or producer's desk and then

The studio shown here is Live Oak Recording in Berkeley, California. Designed by Randy Sparks of Sonic Landscapes—Acoustic Architects for composer/musician Jim Gardiner, the home studio has a warm, comfortable look and feel.

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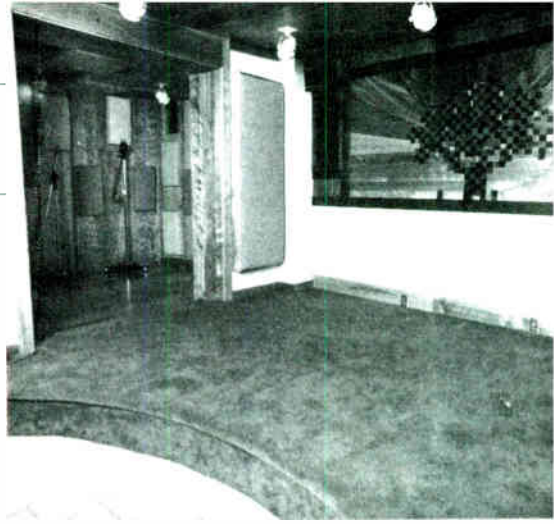
remoted out via an RS-232 cable to the actual dimmer pack.

"For example, at Live Oak, we remoted all the amplifiers into a separate amp room which also contained the brains for the Lexicon 224x because that can also be a potential source of noise. The tape machines were placed in absorbent-lined soffits, and we located the dimmer pack in the sound lock, behind double studio doors. Another advantage to this is that it allows you more space in the control room."

Sparks sees such attention to detail as only a small part of how studio design is changing in the '80s, especially due to the emergence of digital recording, which can reveal all sorts of problems in a studio noise floor. "Up until very recently, acousticians did not have the access to and availability of equipment to be able to look at specific parameters," the designer explained. "With the advances in technology such as the TEF system, and the things the industry as a whole has learned from that technology, acousticians are designing rooms much more accurately. The control room monitor manufacturers are also advancing their art, so we can now design rooms which require no equalization. Everybody has now realized that an order of perfection is now attainable. People aren't settling for anything less."



Live Oak Studio

Lakeside Associates, of Mission Viejo, California, recently completed Sound Summit, a 48 track facility built for noted engineer Phil Bonanno, in the Americana Lake Geneva Resort Complex (Lake Geneva, Wisconsin) which is 65 miles north of Chicago. Steve Fouce of the firm reports that the former Shadetree/Castle Studio site was "completely gutted... not a wire, two by four or nail remained."

One of Bonnano's main criteria was that the control room be very large. "He wanted a large control room, and more and more clients are specifying an additional 150 to 200 square feet in the control room to accommodate synthesizers and related gear," Fouce notes. "It's a popular trend."

Lakeside designer Carl Yanchar comments that the facility was a first-class design from the dual Studer 24 track recorders, Mitsubishi X-80 digital two track, Neve 8028 console with Necam (totally rebuilt by Neve) to the Lakeside custom monitoring system. "They are similar to Sierra/Hidley, Eastlake or Augspurger monitors, with TAD components, but we're now using a Northwest Scund horn, which has less distortion than a wooden horn. The studio also features acoustics which are completely variable, through sliding wall panels and a louvered ceiling. It's something like the room we did for Lion Share."

Yanchar also feels video has become firmly integrated as a basic part of studio design in the '80s. "Video has become almost standard—in fact we've designed for video in every room we've

done. They always at least put a monitor in so, if nothing else, they can watch football games. But seriously, since most rooms we do have dual 24 track recorders and a synchronizer, as far as sweetening goes, they're already pretty much there."

When asked whether the rise of digital recording has brought an increased awareness of a studio's isolation and noise floor from the client level, Yanchar replied, "It really depends on the client. Some say they can live with a few airplanes a day in order to save costs, but I think that kind of outlook can really hurt them in the long run, because that kind of fixing is very expensive and difficult to do at a later point in time."

"Video has become almost standard—in fact we've designed for video in every room we've done."

Sierra Audio Acoustics has been involved in a number of interesting projects, including two digital control rooms for the CBS/Sony Compact Disc manufacturing plant in Indiana, which is slated to go on line next month, and a large control room for Radio Copenhagen, which is attached to a 400-year-old concert hall. The company has also opened an office in London, headed up by Tom Hidley.

Concerning the Radio Copenhagen project, designer/partner Kent Duncan notes, "We built a control room that measures something like 36 x 38 feet, and introduced that we call the Phase Coherent Studio, which involved picking room dimensions where certain critical frequencies achieve full wavelength at just the dimension of the studio. Typically you would control low frequencies which extend below the maximum dimension of the control room with active trapping.

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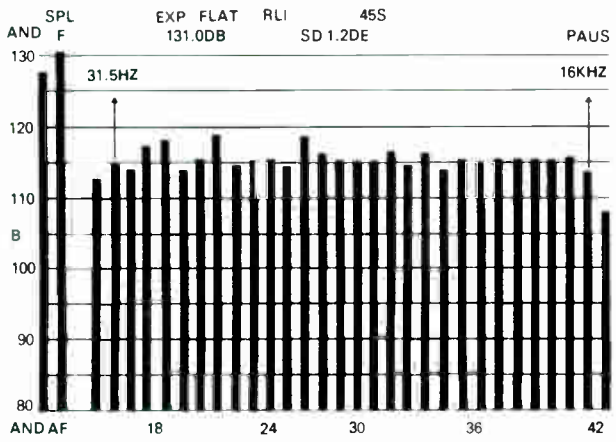

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"One section of the room, which we call the multiple decay isolation room, brings together all the ideas of variable acoustics: the floor and ceiling are hardwood, and in a situation such as this where the ceiling is louvered and the walls can be either reflective or absorptive, the ceiling has more effect on the microphone, primarily due to proximity. The ceiling is at a slant, but the perimeter walls are nearly parallel—in the rhythm areas of the studio it's important that things be non-parallel—but what we are trying to achieve in this room is a lot of reflectivity that's under a lot of control. The goal, as any acoustician would say, is to be able to put a good mike in a good room and be able to cut it flat."

Duncan also sees the amount of isolation in about 75 percent of the studios in existence today as being wholly inadequate for digital recording. "It's the old story—if a designer blows the acoustics in a room, it can probably be fixed for twenty dollars-a-foot, but if a designer blows the isolation, then everything has got to come out to fix the problem. This is where the 1980s are going to separate designers who are acousticians from designers who are merely decorators.

"In our designs, 40 to 45 percent of the budget is eaten up by isolation costs. We're doing a studio in Dallas now for $59 a square foot, plus air, electrical, and concrete work. The owner picked a good shell to build in and he will get 80 dB of rejection at 40 Hz to the outside world." Selecting a building to start with is extremely important, says Duncan, and the selection of a good site can save a studio owner thousands of dollars in construction costs. "There are a lot of desanctified churches, schools and other locations which can be ideal for studio construction," Duncan continued. "We are also doing one studio in an old ice cream factory that has two 16-inch thick walls with an airspace between them, because they wanted to cut down on refrigeration costs. Another advantage to those kind of places is the landlord is usually stuck with a very special purpose building and you can usually make a great deal."

> "The goal, as any acoustician would say, is to be able to put a good mike in a good room and be able to cut it flat."

Steve Durr, of Nashville-based Steve Durr Associates, has designed a wide variety of studios over the years, including Chips Moman's studio in Nashville, Cook Sound for Jeff Cook of the band Alabama, the mastering room at Master Mix in Nashville, and a new project underway, Soundscape in Atlanta, which is a two room audio/video complex.

But Durr concedes that a successful studio is based on people, more than equipment. "You can build the finest facility in the whole world," he explains, "and if there's one jerk in there, he can ruin the place. A mediocre drummer

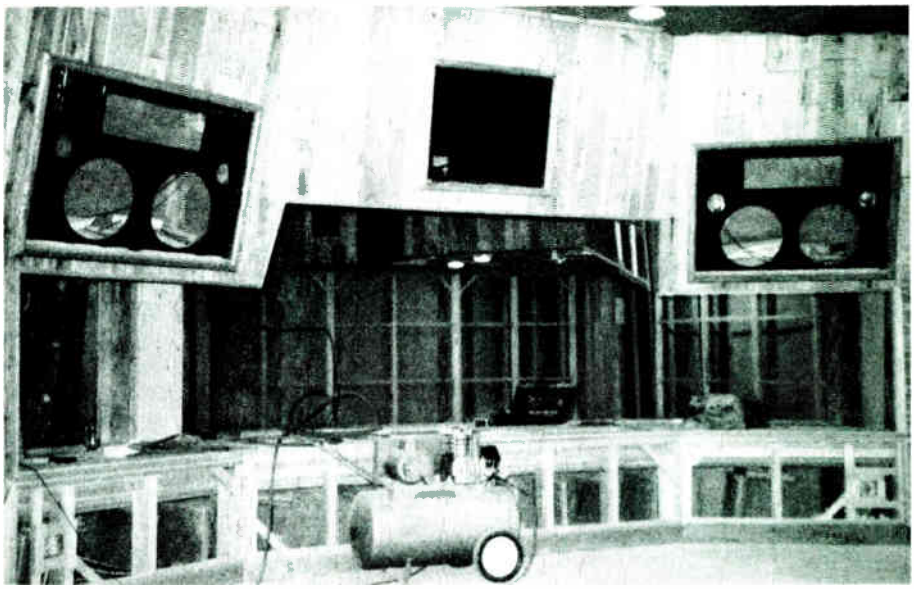
sounds mediocre in any studio, and it's the same with producers and engineers. I try to use a very personal touch in my studio designs: if somebody wants a lot of glass in their control room, and if I can make it work, I'll do it. I'm not committed to any one design or approach. I build people studios."

Another of Durr's recent projects incorporating his personalized studio design philosophy is Sound Trek, a video editing and sweetening complex in Kansas. "They needed a big control room where they could bring a lot of people in and not lose the warm feeling you should get in a control room. One of my complaints about a lot of control rooms is that they only sound good in one spot. The control room at Sound Trek is 28 feet deep and it sounds as good in the back as it does at the console. I used Altec 9844 monitors, updated them with TAD drivers and biamped them, and they get a good sound all over the room. Years ago, John White, a guy I was working with, told me that if 'your monitors sound like loudspeakers, then something's wrong—your monitors should sound like music.' You should be able to close your eyes and be able to hear the music, not the monitors, and this philosophy has stuck with me over the years."

Durr also feels that while computers are a valuable tool in studio design, they are not the ultimate answer. "I'm a graduate of Syn-Aud-Con, and I learned a lot from those classes, and I use my computer much more now, but it's only a set of numbers," he explains. "I don't use only pink noise or analyzers to tune rooms. Test equipment can get you to a point, but from then on you have to use tapes you're familiar with and make the studio sound right with music. It's the same with computers: I input all the numbers and math, and it's a great place to start, but I'll never be blinded by numbers."

Chips Davis, of Chips Davis LEDE Designs in Las Vegas, is a staunch supporter and innovator in the area of Live End-Dead End studio design. Some of his recent projects include Starmusikproduktion in Hamburg, Germany and Sounds Interchange in Toronto. Davis usually recommends either UREI Time Aligns or Fortier monitors to his clients, but also feels that correct monitor placement can be just as critical to a successful design as any other single factory.

"The placement of monitors in a control room, where they are placed in the soffit, can be as important as the modal design of the room. No matter who designed the room, this is where a lot of mistakes occur—in the coupling of the speaker to the room. The low frequency wave and low frequency pressure coming from the monitor in a plane

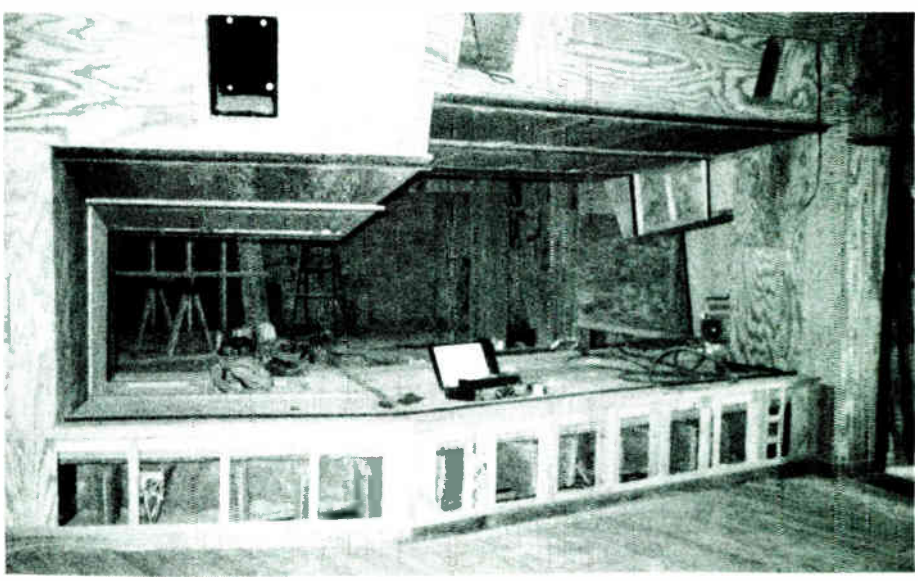


Two views of Phil Bonanno's Sound Summit during construction. The studio, designed by Lakeside Associates and built at the former site of The Castle Recorders in the Americana Lake Geneva (Wisconsin) resort complex, was slated to be on line by the end of last month. The photo above shows the front studio wall with the custom Lakeside speaker enclosures in place and the soffit above the window allows for the installation of a video monitor. The bottom shot looks into the large control room from the main studio room.

interferes and strikes the side walls, ceilings, and floor—everything in the room can cause problems. Even if the room is modally correct, you're going to have problems unless the speaker is correctly placed."

Another major problem, Davis explains, "is caused by hard front rooms, which smear the image and mask a lot of things. More and more, I'm seeing a lot of acceptance towards the LEDE philosophy because it totally deals with the laws of physics, and doing a correct LEDE room is really the only way to go. If you can get rid of the color from both the room and speaker system and electronics, then you have a very good chance that what's 'up there' is what's on the tape and is what everybody else is going to hear."

Neil Muncy, of Rockville, Maryland-based Neil Muncy Associates, (who will be relocating to Toronto this fall) is another designer who has found the For-



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tier loudspeakers to be extremely accurate, and he specified them for his design of the dedicated remix room at Nashville's Master Mix that went on line late last year. Master Mix marks the first US installation of the Canadian speakers, which are a four-way, quadamped, all-cone system. The pair used in this particular installation have single bass drivers,

"The placement of monitors in a control room, where they are placed in the soffit, can be as important as the modal design of the room. No matter who designed the room, this is where a lot of mistakes occur."

rather than the dual woofer version used in Sounds Interchange.

"On the Master Mix project, we started out with an almost square room in an existing building," says Muncy of the basis for his LEDE design for the studio. "One of the principal objectives in an LEDE design is to get bilateral symmetry, so if you split the room down the center line from front to back, the two sides would be as symmetrical or as mirror-imaged as possible. We accomplished this by using several sets of non-parallel surfaces so the tendency of the room to develop axial modes is minimized.

"Another thing we did was to place the monitors as close as possible to the intersection of the side and front walls and ceiling, to make use of the room boundaries as a sort of horn. By doing this," Muncy explains, "you minimize the possibilities of getting early reflections back towards the mix position, and the

absorbent material on the walls took care of the reflections that were left. The front ceiling is finished with acoustically transparent fabric which covers the fiberglass, and the front and side dead end walls have Sonex over fiberglass."

"After a lot of years fixing acoustical and design problems, I have found out what you need in a control room, and what you don't need. So for the Master Mix project, I had a pre-conceived notion that the LEDE approach would be emminently satisfactory. The two goals of an LEDE design are: to provide a real initial time delay comparable to what you'd hear in a concert hall, and to eliminate early reflections. This pretty much eliminates the comb filtering which people sometimes try to fix with EQ. But you can't equalize something that's happening out in the air. EQ is an electrical remedy, and it won't work once the 'horse has left the barn.' It's the recombination of delayed sounds, whether in or out of phase, that causes the measured response at the mixing position to appear to be bumpy. If you have enough EQ range, you can make any particular point in a room relatively flat on an RTA, but the minute you move that calibrated microphone to another point in the room, it's a new ball game."

Control room at Sound Trek Studios. Design by Steve Durr.

Another point which hadn't been overly focused upon in years past, says Muncy, is the subject of monitor isolation. "There's a lot of energy radiating out from a speaker enclosure, and if that couples into the shell of the room, the shell begins working as part of the speaker. Since sound travels much faster through hard materials than through air, you can measure what Don Davis calls 'early-early reflections'. This is sound that gets to your ears before the direct acoustical sound. You can imagine the blurring effect this has on your perception of sound. This problem had been predicted, but until TEF came along, there was no way to quantitatively measure it. This is one of the many subtle points a designer should be aware of."

Muncy concedes that the art of "studio design today is more challenging than ever—trying to build a control room which emulates any one of the infinite number of places where people listen to music. I've never seen a home hi-fi where the speakers were mounted two-thirds the way up a glass wall, and people don't usually place a console-sized piece of furniture between the speakers and the couch. And I haven't seen anybody's home with a bass trap on the wall." ■

Speaker/Boundary Interference Response

A guide to determining how monitor placement affects low frequencies in the control room.

by Russell E. Berger II

Of critical importance in optimizing the quality of a control room, or any listening environment, is the placement of the monitor speakers. There are many popular methods of determining monitor focus angles and spread, most of which are defendable by logical acoustic principles, classical psychoacoustic research and listening preference. Of equal importance is the effect that placement has on low frequency energy propagation in an enclosed space, which is the topic of this article.

As a low frequency source is moved closer toward a rigid, massive boundary, the output of the source over a broad frequency spectrum is both reinforced and cancelled by interference from reflected spectra. The speaker/boundary interference power response (SBIR) shows the combining of the speaker's output with the boundary reflection when the signals are relatively in phase or when the boundary reflection when the signals are relatively in phase or when the boundary to speaker distance is less than ¼ wavelength away at the frequency under analysis. If the boundary is located between ¼ and ½ wavelength away from the source, cancellation occurs. From ½ to 1 wavelength distance separation of the source and reflecting boundary, the response smoothes out. (See Figure 1) In control rooms, monitors are usually mounted close to the ceiling and side walls. There are multiple boundaries to deal with in this condition and in similar

*** Formula for SBIR - Speaker/Boundary Inteference Response

Assumes:
C = speed of sound in Hz/unit
F = frequency of interest
Pi = 3.1416
A = amplitude at F
X,Y,Z = dimensions in units

Note: The LOG function is base 10. If your computer offers only Napierian (LN or base e), LOG(x)/LOG(10) will convert to base 10.

*** FORMULA 1 - For one-boundary condition:

$$A = 10*LOG\left[1+\frac{SIN\left[\frac{4*Pi\ [X]}{C\ /\ F}\right]}{\frac{4*Pi\ [X]}{C\ /\ F}}\right]$$

Notice that:
- C/F = wavelength of F
- X/(C/F) defines the location of the source
- 4Pi relates the source to 4Pi steradian, spherical space
- 1+SIN(a/a) is the spherical Bessel function
- 10LOG converts to dB

* The two- and three- boundary conditions are identical excepting that a root of the sum of the squares term has been added.

*** FORMULA 2 - For two-boundary condition:

$$A = 10*LOG\left[1+\frac{SIN\left[\frac{4*Pi\ [X]}{C\ /\ F}\right]}{\frac{4*Pi\ [X]}{C\ /\ F}}+\frac{SIN\left[\frac{4*Pi\ [Y]}{C\ /\ F}\right]}{\frac{4*Pi\ [Y]}{C\ /\ F}}+\frac{SIN\left[\frac{4*Pi\left[X^2+Y^2\right]^{.5}}{C\ /\ F}\right]}{\frac{4*Pi\left[X^2+Y^2\right]^{.5}}{C\ /\ F}}\right]$$

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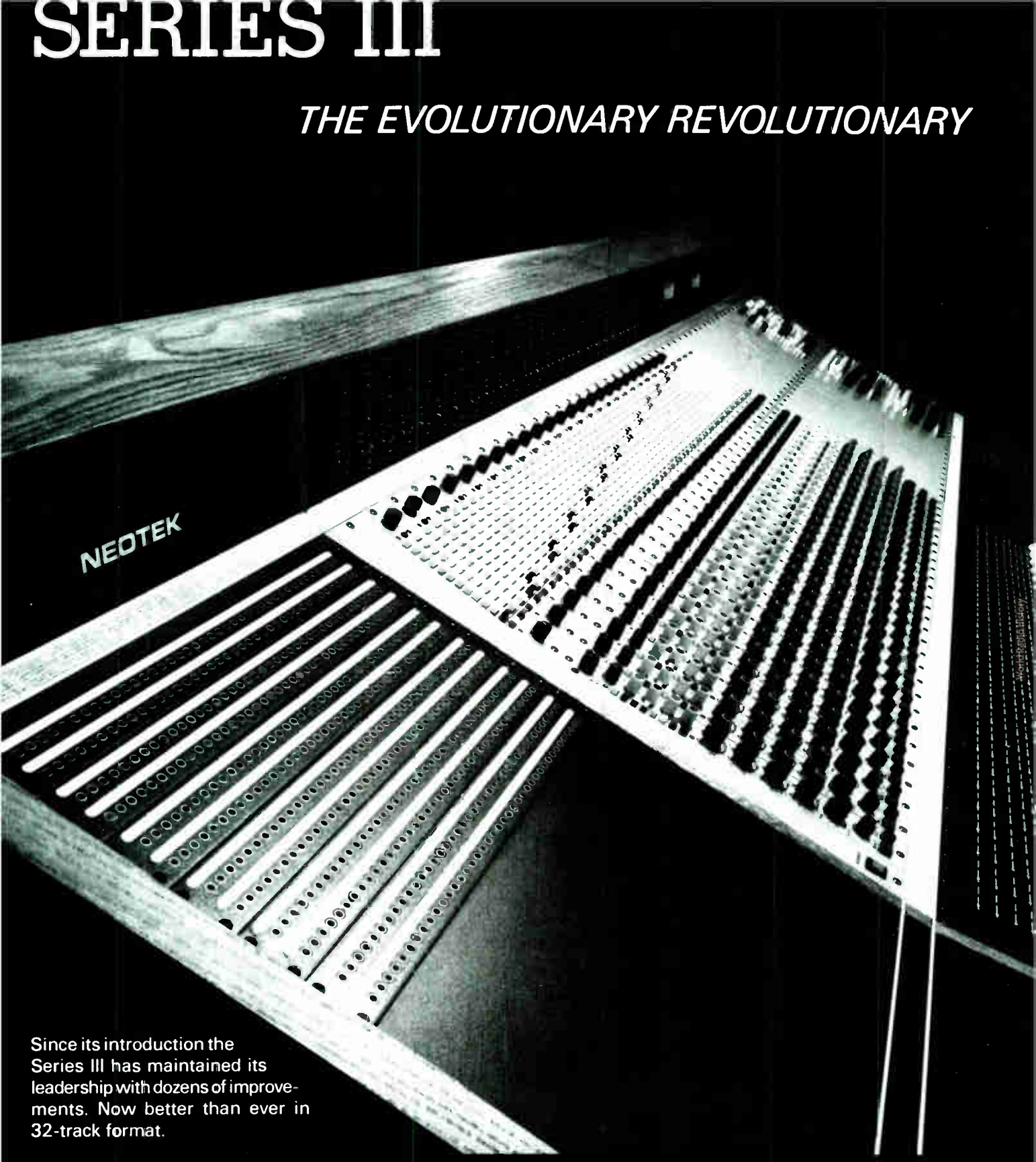

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*** FORMULA 3 - For a three-boundary condition:

$$A = 10*LOG\left[1 + \frac{SIN\left[\frac{4*Pi\ [X]}{C\ /\ F}\right]}{\frac{4*Pi\ [X]}{C\ /\ F}} + \frac{SIN\left[\frac{4*Pi\ [Y]}{C\ /\ F}\right]}{\frac{4*Pi\ [Y]}{C\ /\ F}} + \frac{SIN\left[\frac{4*Pi\ [Z]}{C\ /\ F}\right]}{\frac{4*Pi\ [Z]}{C\ /\ F}} + \frac{SIN\left[\frac{4*Pi\left[X^2 + Y^2\right]^{.5}}{C\ /\ F}\right]}{\frac{4*Pi\left[X^2 + Y^2\right]^{.5}}{C\ /\ F}} + \frac{SIN\left[\frac{4*Pi\left[X^2 + Z^2\right]^{.5}}{C\ /\ F}\right]}{\frac{4*Pi\left[X^2 + Z^2\right]^{.5}}{C\ /\ F}} + \frac{SIN\left[\frac{4*Pi\left[Y^2 + Z^2\right]^{.5}}{C\ /\ F}\right]}{\frac{4*Pi\left[Y^2 + Z^2\right]^{.5}}{C\ /\ F}} + \frac{SIN\left[\frac{4*Pi\left[X^2 + Y^2 + Z^2\right]^{.5}}{C\ /\ F}\right]}{\frac{4*Pi\left[X^2 + Y^2 + Z^2\right]^{.5}}{C\ /\ F}}\right]$$

situations with PA clusters and in homes with hi-fi speakers sitting in the corners on the floor. To optimize the placement of the monitor in the room, we need a way of predicting the SBIR.

When compared to a free-field response, a point source located flush on a large boundary will show an increase in the measured acoustic power response of up to 3 dB. A source located at the intersection of two boundaries will demonstrate up to a 6 dB increase and of three boundaries up to a 9 dB increase. Formulae 1, 2, and 3 describe the SBIR from one-, two-, and three-boundary conditions when the boundaries are mutually perpendicular. The spherical Bessel function is implemented to resolve the j-operator (complex portion) into a form which is not overly cumbersome to work with if you have a computer or programmable scientific calculator. First, look at the math mechanism used to describe this SBIR phenomenon and get a feeling for the relationships involved.

The points of reference used to obtain the dimensions are seen in Figure 2. For simplicity, the plane of the baffle board will be used for the front-to-back measurement, and a point at the center of the speaker which inter-

Fig. 1

POWER OUTPUT OF A SMALL ACOUSTIC SOURCE CLOSE TO 1, 2, AND 3 BOUNDARIES RELATIVE TO POWER OUTPUT IN 4 π SPACE

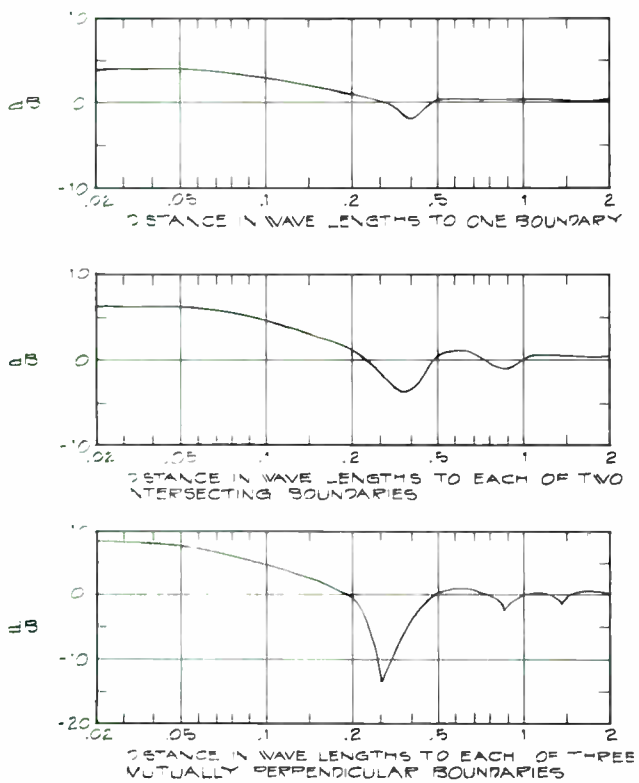
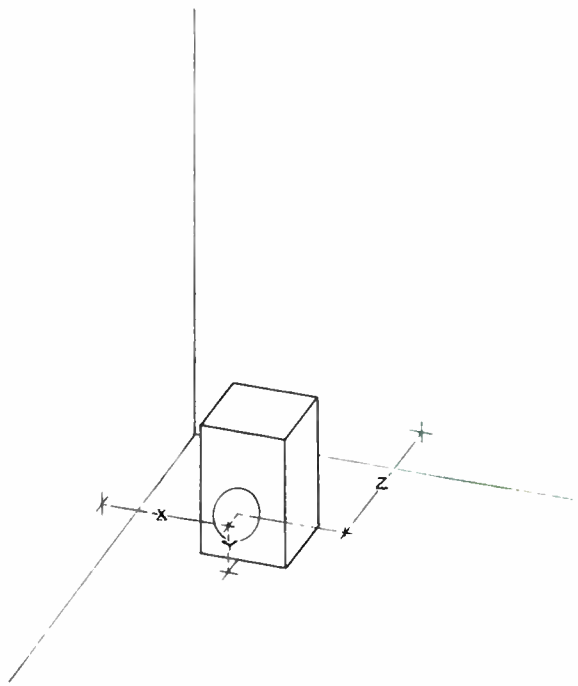


Fig. 2



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sects the plane of the baffle board will be used to dimension the X and Y distances. This assumes that this is the acoustic center of the speaker, which from TEF measurements we know is rarely so.

If you have a computer or programmable calculator, plug the SBIR formulae inside a loop. Increment frequency each time through the loop: logarithmically by F=F*2 (1/oct) [whereas oct=octave increment] OR linearly by some integer value. By doing this and plotting the results for each of the three boundary conditions, we get a response like Figure 3.

Example 1:

Given a speaker flush-mounted in a wall near the ceiling with no other boundaries acoustically nearby, plot the SBIR of the condition.

Notice that at 141 Hz the in-phase addition of power ceases and a notch-shaped cancellation reduces the output 1.1 dB up to 283 Hz. This tells us that if the operating range of the speaker is less than 141 Hz, then a useful addition of low frequency energy will be derived from the same input power when the acoustic center of the speaker is mounted two feet away from a single boundary. If, for example, the speaker is crossed over at 200 Hz in the same mounting condition, then potentially undesirable cancellation of the power response would occur and the speaker should either be relocated or the crossover frequency lowered. See Figure 4 for the SBIR plot and listing of the plotted points.

For the single-boundary condition, very little is lost through cancellation, but the three-boundary condition can exhibit swings of energy change over 20 dB.

Example 2:

This example assumes that we know the crossover frequency and are looking for the optimum speaker location, where the boundary interference will combine over a 200 Hz operating range.

Since we know from Figure 1 that we get addition below the ¼ wavelength distance from a boundary, find the length of ¼ of a wave at 200 Hz:

$$\frac{\text{Speed of Sound}}{\text{Frequency}} = \text{Wavelength}$$

$$\frac{1130 \text{ ft./sec}}{200 \text{ Hz}} \times \frac{1}{4} = \text{Quarter Wavelength}$$

From this we know that the speaker should be mounted no closer to the boundary than 1.41 feet in order to avoid reduction of the power response. (See Figure 5.)

These first two examples assume that if there is another driver mounted in the cabinet, that the Q (directionality constant) of that driver is high enough so that it will not be influenced by the nearby boundary surfaces.

Example 3:

Let's take a speaker system that has two bass drivers: the first, a sub bass driver, operating from approximately 20 Hz to a crossover point of 125 Hz; the other, a mid-bass driver, operating from 125 Hz up. Each of the two woofers is 15 inches in diameter and is separated by 6 inches from the other. As in Example 2, first find the ¼ wavelength distance at the crossover point to determine the maximum distance that the sub-bass driver should be mounted from the boundary.

$$\text{Maximum Sub-Bass Distance} = \frac{1130}{125} \times \frac{1}{4} = 2.26 \text{ ft.}$$

Do the same for the mid-bass driver, only this time use the ½ wavelength value to determine the minimum mounting distance for 125 Hz and up. This will put the operating range above the ¼ to ½ wavelength notch.

$$\text{Minimum Sub-Bass Distance} = \frac{1130}{125} \times \frac{1}{2} = 4.52 \text{ ft.}$$

The mid-bass speaker should, therefore, be no closer to the boundary than 4.52 feet and the sub-bass speak-

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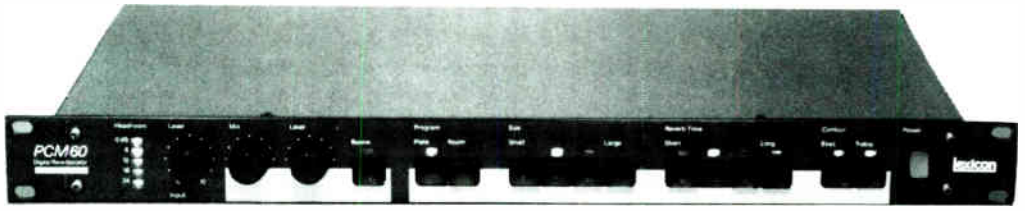

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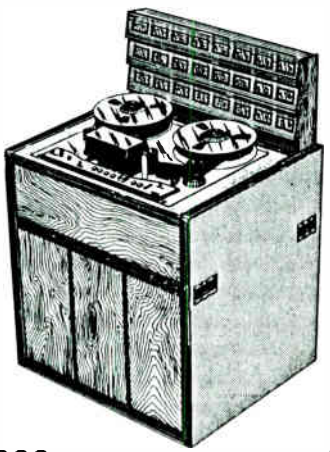

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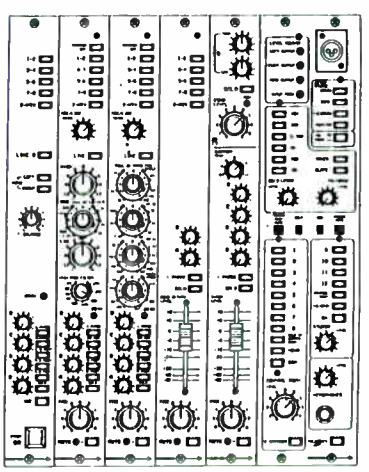

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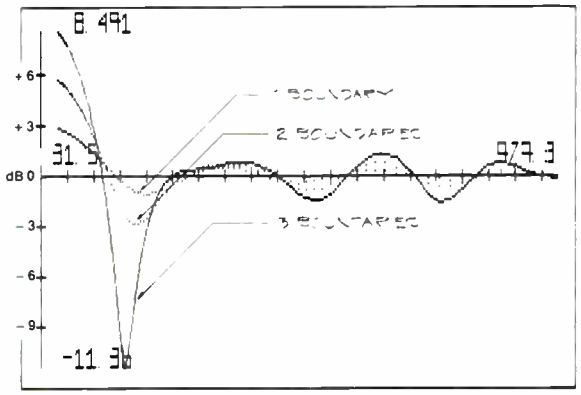
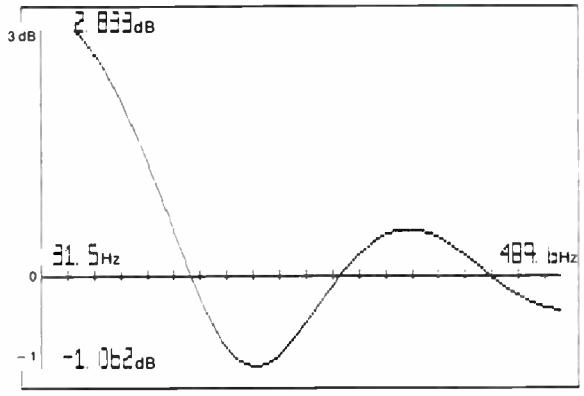
Fig. 3



F SPACING = 50 Hz. (Linear Scale) - Y SPACING = 3 dB PER DIVISION

FIG 3 1 2 and 3 boundaries each with 2 ft spacing

Fig. 4



F SPACING = 25 Hz. (Linear Scale) - Y SPACING = 3 dB PER DIVISION

EXAMPLE 1 - Flush mounted speaker in wall 2 ft from ceiling

er no further than 2.26 feet. See Figure 6 for the SBIR plot.

These examples were selected to demonstrate the basics of speaker/boundary interference response. The formulae will allow you to plot the SBIR for one, two or three surfaces and see the variety of interaction from changing the mounting locations.

This is a powerful tool for selecting an optimum speaker location. For example, in a flush-mounted monitor situation if construction or client constrains you to a specific location that is less than desirable, many times the power response can be smoothed out to an acceptable curve. Varying the distance that the speaker baffle board protrudes from the wall will have considerable effect when combined with the contributions of the other nearby boundaries.

It is also interesting to ponder the effect on the SBIR of a protruding monitor shelf. The acoustically large cavity formed by a shelf over-hanging the window can have great effect on the performance of the bass because of the pathlength difference from the woofer to the window underneath and behind. (See Figure 7 and 8.)

PROGRAMMING NOTES

Many computer systems (IBM-PC, Apple, etc.) are unconventional in their implementation logarithmic functions. One would assume that LOG(x) is the LOG of x to the base 10. Not so! It is listed in the conventional form indicating base 10 but instead it performs the LN(x) function or the Naperian LOG to the base e. To convert from base e to base 10 (or any other base) where LOG=LOG base e:

Base.?.LOG(x) = LOG(X) / LOG(?)

OR

Base.10.LOG(x) = LOG(x) / LOG(10)

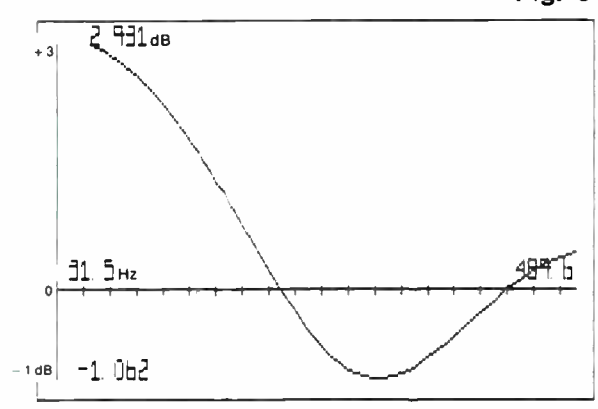
Also, beware of the way your machine handles the transcendental functions assuring that the units are in the desired form of radians or degrees.

APPLICATION NOTE

A majority of the formulae we use to model and predict acoustic events in small enclosed spaces (control rooms, listening rooms, etc.) are derived from empirical test results obtained in large spaces (auditoriums, concert halls, etc.). It is tempting to indiscriminately predict or describe a room's acoustic performance by using one of the many formulae we have come to take for granted. The normal room mode formula and the Sabin formula and its derivatives are excellent examples.

The latter describes an environment's sound decay in both the far field (in the reverberant field) and some distance away from the room's boundaries (floor, walls, ceiling). In most control rooms, the basic definition cannot be met; therefore, the resulting number

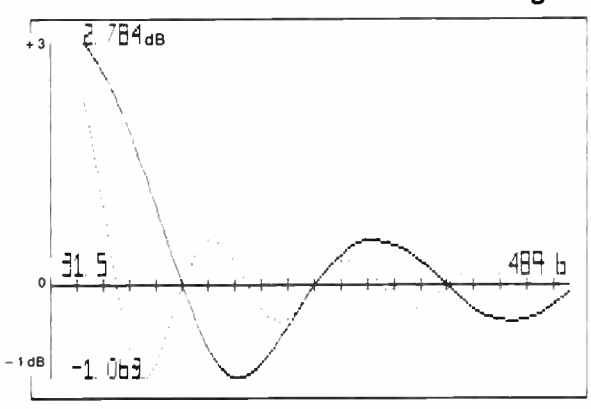
Fig. 5



F SPACING = 25 Hz. (Linear Scale) - Y SPACING = 3 dB PER DIVISION

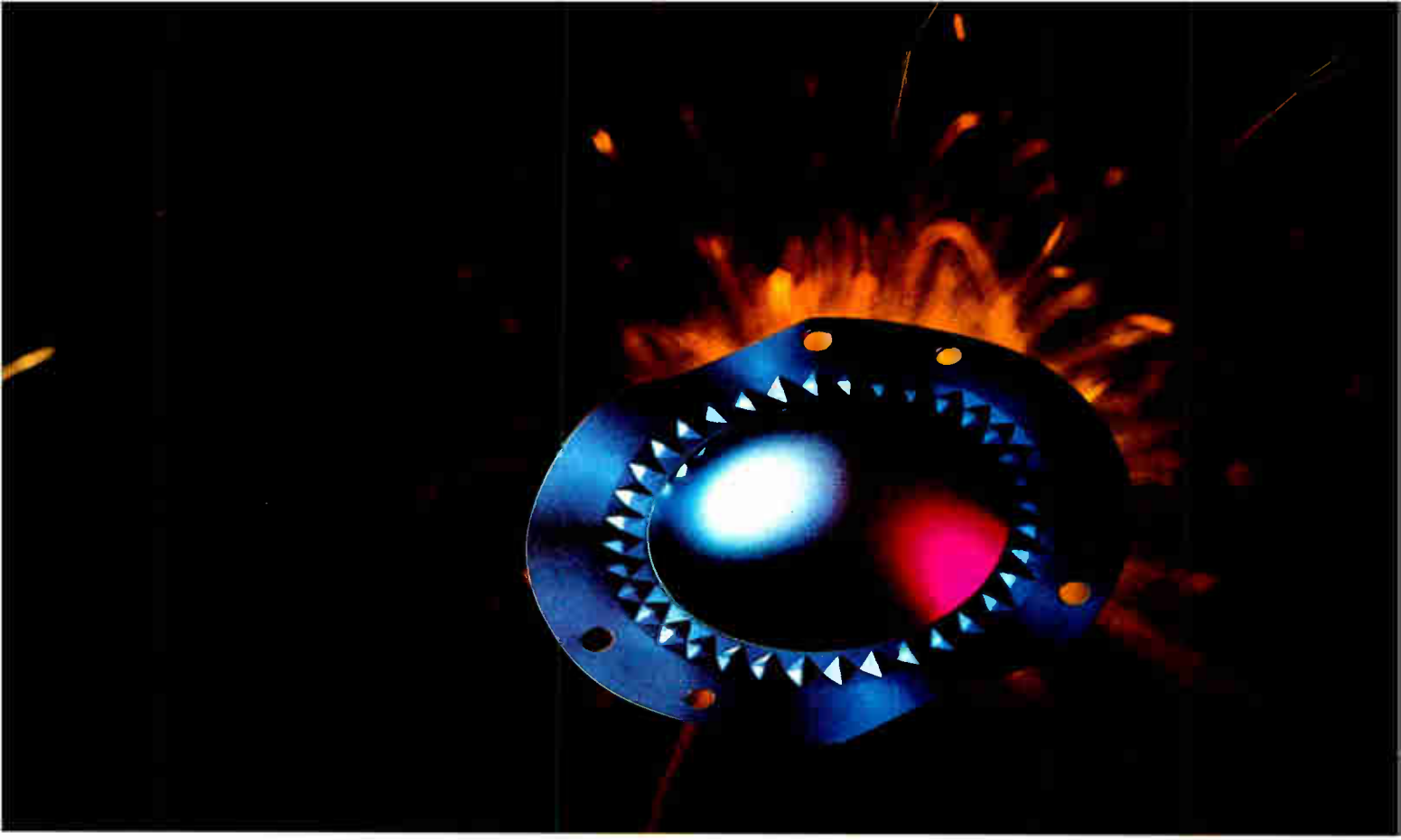
EXAMPLE 2 - Speaker suspended 1 ft 4 in away from wall

Fig. 6



F SPACING = 25 Hz. (Linear Scale) - Y SPACING = 3 dB PER DIVISION

EXAMPLE 3 - Sub Bass = ____ Mid Bass = ...



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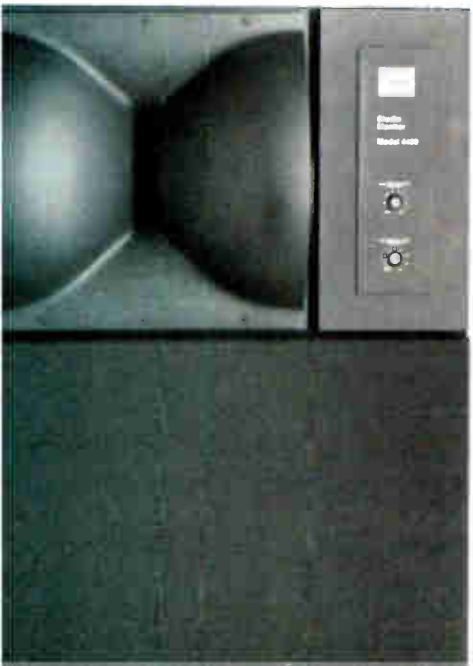

The result? A diaphragm that delivers and sustains a power and purity to high frequency response never before approached in the industry.

Perfecting titanium technology is just one of innumerable ways in which JBL science is re-shaping the quality of sound. From ultimate accuracy in laying down your initial tracks, to capturing the full power and subtlety of your final mix, JBL audio systems are focused on the most exacting demands of the recording studio professional. To find out which system is designed to meet your specific requirements, contact your authorized JBL professional products dealer today.

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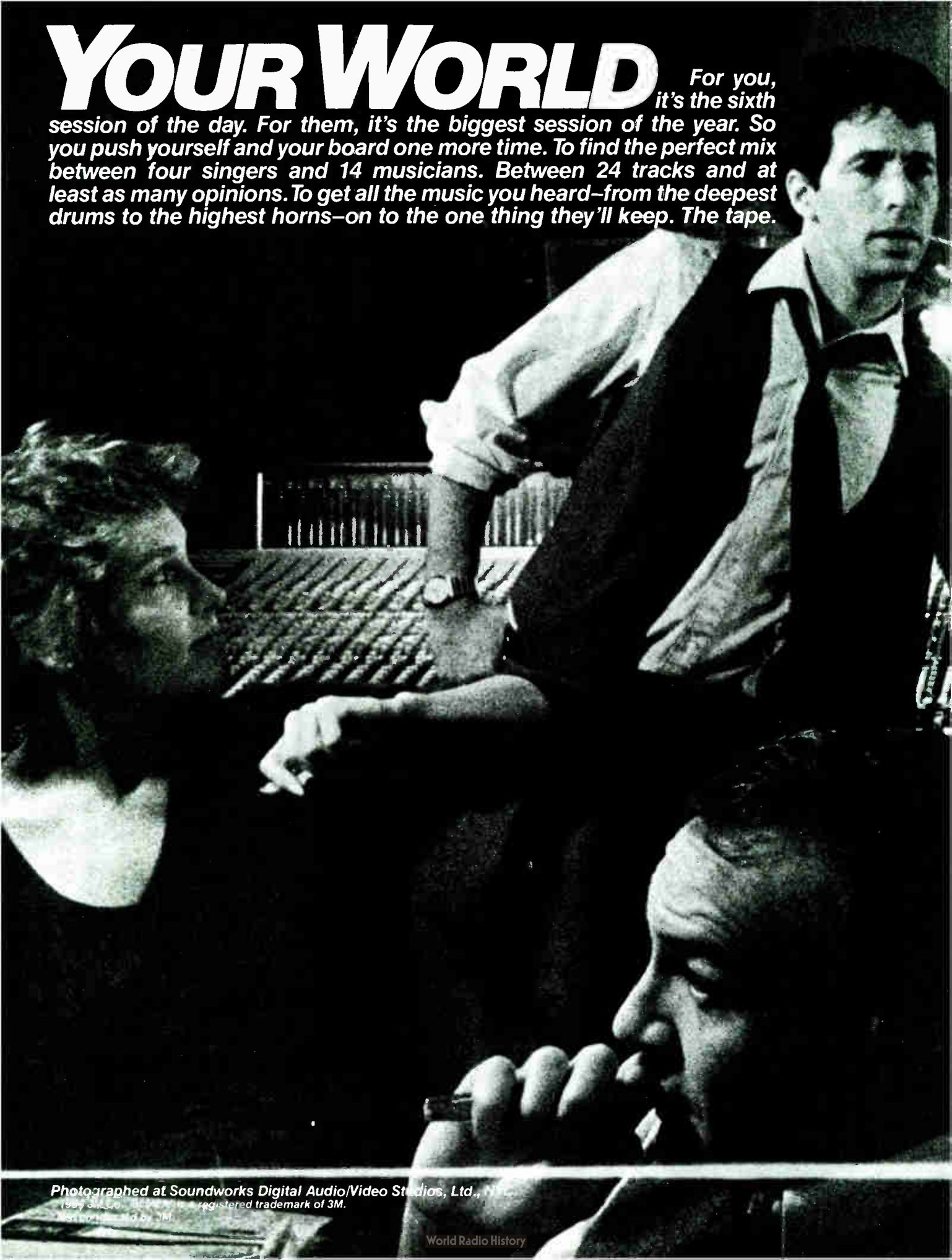

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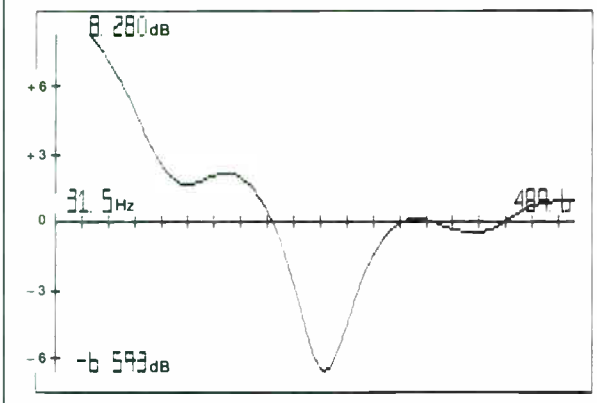
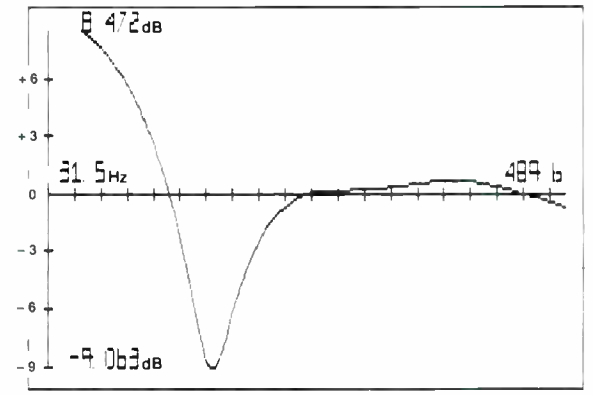
Fig. 7



F SPACING = 25 Hz. (Linear Scale) - V SPACING = 3 dB PER DIVISION

Shelf mounting-1.33 from window-1.5 from ceiling-3.5 from side wall

Fig. 8



F SPACING = 25 Hz. (Linear Scale) - V SPACING = 3 dB PER DIVISION

Shelf mounting -2.0 from ceiling-2.25 from side wall-1.75 from window

that drops out does not accurately describe the acoustic event. Similarly, the normal room mode formula produces reliable results only when the walls and floor/ceiling are mutually perpendicular, which is seldom the case.

As you would guess, there are caveats involved in applying the SBIR formula. It assumes that your source is an infinitely small point (see Beranek, *Acoustics,* page 103) and that the boundaries are mutually perpendicular. But, this modeling tool will provide you with a rough cut starting place for monitor placement and will help you avoid problematic mounting locations. Imagine trying to equalize a dip measured at the mix position caused by a combination of the speaker system's crossover region and a coinciding dip from poor placement. The resulting notch could be greater than 30 dB deep!

We must exercise great skill in applying the convenient results that drop out of formulae, being sure that we are not violating basic physical principles. If you are like me, you need to be careful not to fall into the trap: "When the newest tool you have is a hammer, every problem becomes a nail." SBIR is one of many formulae handy to have in your acoustical modeling tool kit.

ACKNOWLEDGEMENTS

Sources:

- articles and papers by Roy Allison
- *Acoustics* by Leo Beranek
- communications with Don Davis
- staff of Joiner-Pelton-Rose, Inc.

Russell Berger, who has designed over 150 production and broadcast studios, is a senior consultant with Joiner-Pelton-Rose, a Dallas, Texas-based architectural acoustics/design firm.

—FROM PAGE 15, ONE PASS

there. They can really make their own show."

Though the truck has superb audio capabilities, they will not be utilized for the Olympics. Instead, the truck will just pass along a general ambient feed generated by ABC (which will probably have 20 or 30 mikes on the event) and then sent back to the Center. Each country has its own broadcast booth at the Center, so in effect they will mix sound for each international broadcast there.

One Pass is hoping that ABC will be impressed enough with the truck's performance in Malibu that they'll get more bookings from the network. "This truck is great for sports," Palmer says, "but really, it was designed to be able to handle any kind of television event. It's the most versatile truck I've ever been associated with."

Mobile One will be doing other work in the Los Angeles area before and after the Olympics; it's been enlisted for two different series being produced by Universal Pictures: ***E.R.***, a new comedy doctor show starring Elliot Gould; and *Charles in Charge*, featuring Scott Baio. In addition, there are several corporate jobs coming up, and sports events looming in the future for the truck. "The state-of-the-art has taken a great leap in the last few years," Palmer says, "and this truck is *it* right now."

Mobile One's Equipment

Production: Grass Valley 1680 24 input switcher; Quantel DPE 5000+ digital effects generator; Utah Scientific routing switcher with breakaway stereo audio, five RTS 802 master stations. **Cameras:** Four triaxed Ikegami HK357 with 44:1 Fujinon lenses; three triaxed Ikegami HL 79 EAL, three multicore Ikegami HL 79; RTS VIE iso electronics for camera/video control communications, Auto Set-Up Computer. **Audio:** 24x16 Auditronics console with 8 VCA subgroupings; Yamaha submixer; MDM4 audio monitors; Otari MX 5050 reel-to-reel, TEAC cassette deck; Nikko FM tuner; two ITC cart machines, direct output capabilities for recording 24 track audio with live mix. **Communications:** RTS PL intercom with 7 RTS 802 master stations; RTS 8-channel IFB, full telephone interface; five-position pushbutton phone system; QKT lines, Studer hybrid. **Videotape:** Three Ampex VPR 2 1-inch type C VTR's, slo-mo capable with SMC 100's; three Sony BVH 500 1-inch Type C VTR's, three Sony VO 5800 ¼-inch VCR's. **Graphics:** Chyron 4100 dual channel with channel control module; Chyron scoreboard package; seating for operator and graphics producer, RTS 802 master station. ■

An interior view within One Pass' Mobile One.

DESIGN PRECISION:

The Effect of NASA and Military Specs on Commercial Manufacturing

by Jon Rowe

You may not know it, but the Pentagon and NASA had a hand in building your audio and video studio equipment. No, your mixing console wasn't designed to fly you to the moon, nor was your 16 track tape deck designed to take a direct hit from a 20mm cannon, but Mil specs and NASA specs have influenced the quality of these and every other electronics device nonetheless. In the world of military and aerospace electronics, everything that goes into a product is tightly controlled by these specifications: from the reliability of each electronic component, to the metalurgical composition of the solder used to connect them, to the qualifications of the person doing the soldering. The need for such tight controls is obvious. When a pilot launches a missile at an attacking aircraft, his life depends on that missile operating perfectly; there aren't any second chances. And when NASA launches a Voyager interplanetary probe for a half-billion mile rendezvous with Saturn three years later, they want to be sure that the spacecraft responds to commands flashed across all those miles of space; if it doesn't, a once-in-a-hundred-year encounter could be missed and millions of dollars could go down the drain. In short, the key word is RELIABILITY.

But the kind of reliability demanded by the military and NASA carries a huge price tag that only Uncle Sam can afford. The commercial manufacturers who sell electronics to the likes of you and me have to bend the rules a little to get the price down to the levels that we can afford. In the commercial electronics world, the manufacturing controls aren't as tight, but Mil specs and NASA specs have a definite spillover effect. Most commercial electronics assembly practices and quality control techniques have their roots in Mil specs. Even the Japanese, with their vaunted reputation for product quality, learned the underpinnings of quality control by studying the Mil specs that arrived with the U.S. occupation following World War II.

What Makes Equipment Built to NASA or Mil Specs So Different?

The difference between Mil/NASA spec electronic equipment and commercial electronic equipment is like the difference between a Mercedes and a Chevy. Granted, the quality of Chevies has improved in recent years; but given the choice (and the disposable income), which car would you rather have? Budget deficits aside, the Military and NASA need the best equipment money can buy, and they're willing to pay a premium price for it. In electronic equipment as in cars, the biggest contributor to higher price is handcrafted limited production as opposed to mass production.

Perhaps the most expensive electronic equipment to build is space hardware. There are two reasons for this. First, space hardware production is strictly limited—the economies of mass production never enter the picture. Secondly, the equipment must be utterly reliable, with built-in redundancy, extremely conservative component derating, and extraordinary care at every step of production. Figure 1 illustrates a typical electronic "black box" designed for a 10-year operating life in a synchronous-orbit satellite stationed 22,500 miles above the equator. The housing is machined out of a single block of aluminum. All connector pins are gold plated. The circuit board is typically multi-layered, with up to 20 individual circuit planes sandwiched within it. All components and wiring subject to vibration are epoxy-bonded to their mounting surfaces, and everything is protected by a layer of tough, transparent polyurethane resin. Through a multitude of specifications, NASA controls every step in the production of a piece of equipment such as this to ensure total reliability. Every resistor, capacitor and integrated circuit chip must be certified by its manufacturer

—PAGE 58

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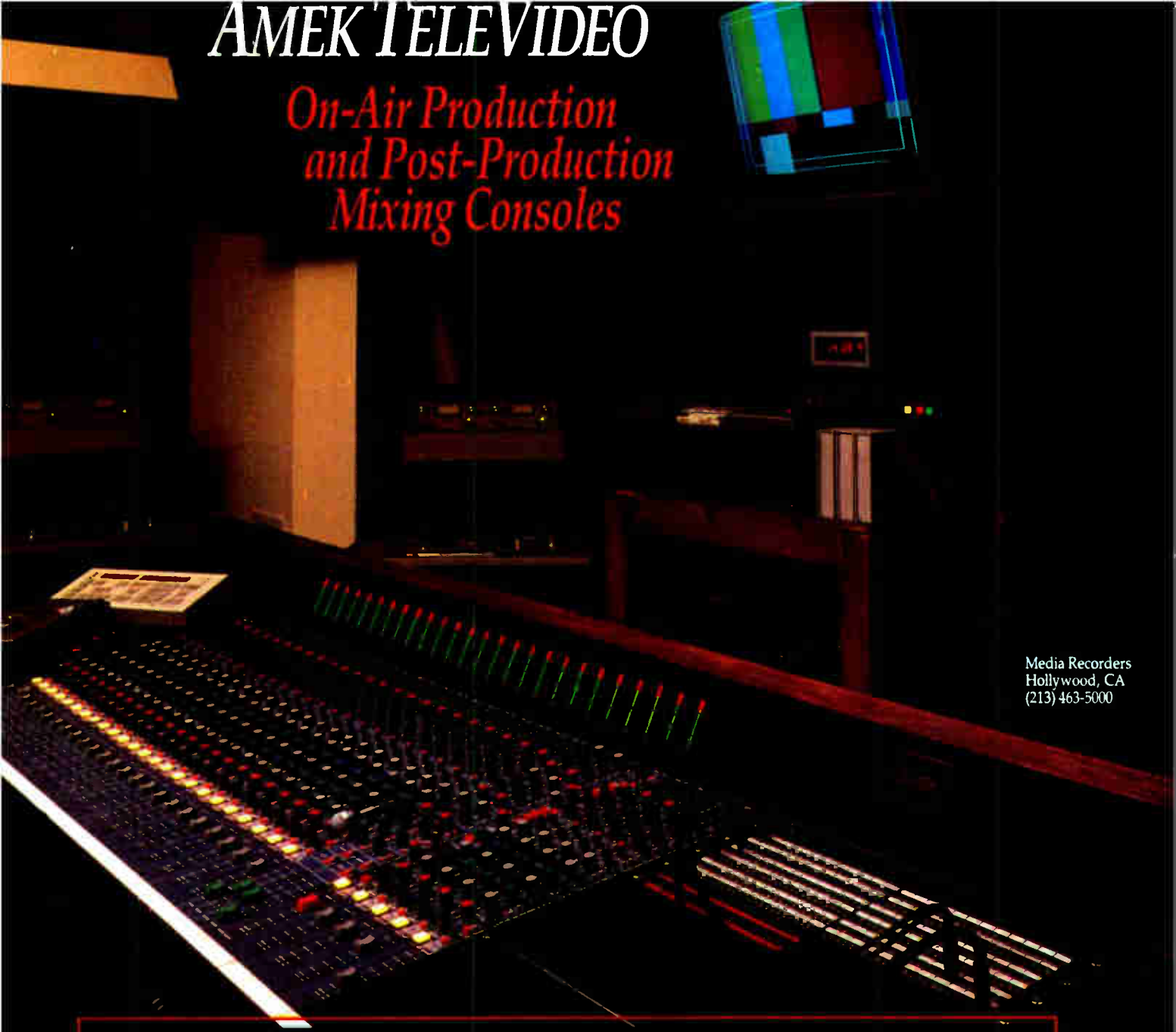

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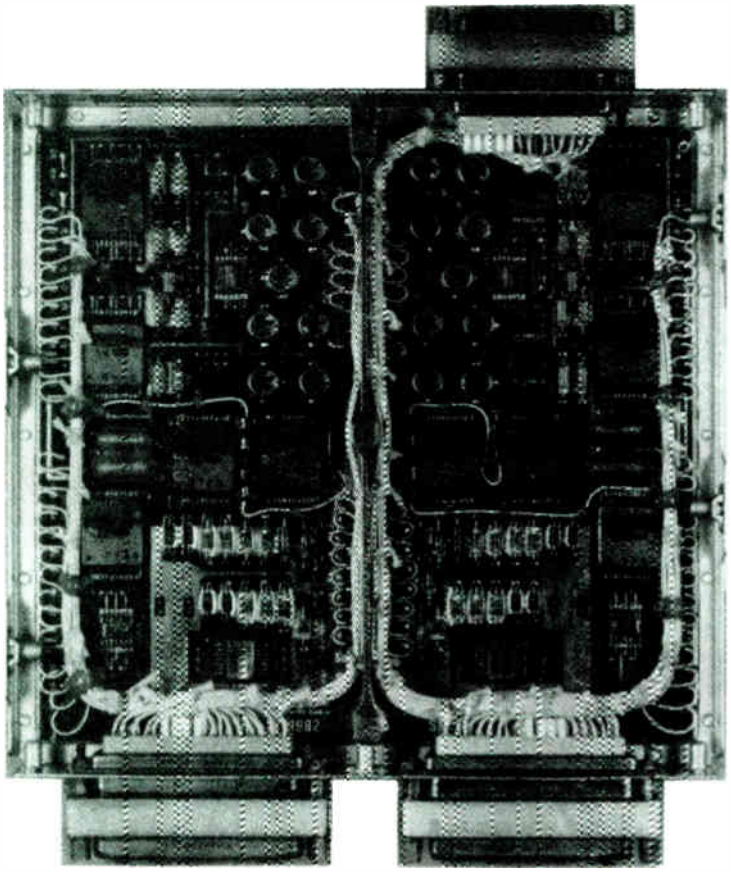

Figure 1. Typical "slice" assembly designed to operate in a space environment.

to meet Mil-spec burn-in requirements before it is ever considered for use in a piece of space hardware. Then it must pass a rigorous incoming inspection by the space hardware manufacturer, also dictated by applicable Mil specs. The fabrication is performed under clean room conditions, with the levels of cleanliness controlled by a NASA spec. All electronic assembly personnel involved in space hardware manufacturing must be NASA certified through attendance at a NASA-approved training center where they are taught the proper methods for installing electronic components on circuit boards, making flawless solder connections, bundling and spot-tying wiring harnesses, epoxy-bonding components and wires, and performing a score of other electronic manufacturing operations. And the tight controls don't stop when manufacturing is completed. Space hardware must successfully pass a battery of temperature cycling and vibration tests conforming to NASA test specifications before it is certified for flight. If a failure should occur at this point, the most likely result would be an exhaustive failure analysis, performed in accordance with NASA guidelines. It's a lengthy process, and a costly one. Lead times can stretch to four times as long as commercial-type systems of equal complexity, and the costs can multiply by as much as fifteen times.

The military is almost as demanding as NASA when it comes to workmanship and reliability in its electronic equipment. If you doubt this fact, witness the plight of two semiconductor manufacturers in California's Silicon Valley: National Semiconductor only last month got back into the DoD's good graces after being cited for not performing the proper burn-in tests on certain military qualified ICs. And the DoD has just removed some of Fairchild Semiconductor's military qualified ICs from its QPL (Qualified Parts List) because Fairchild's testing records were not up-to-date.

Despite the military's high reliability standards, it is able to economize somewhat on certain ground equipment and avionics gear subject to preventative maintenance on a regular schedule. The MTBFs (Mean Time Between Failures) of this type of equipment are measured in hundreds of hours, as opposed to MTBFs of up to ten years for spaceborne equipment of approximately the same complexity. Also, this type of military equipment is built in fairly large quantities that allow manufacturers to operate automated assembly lines utilizing such time and money saving techniques as automatic component insertion and wave solder-

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With the coming of the Space Age, sound engineers will finally acquire power over acoustic space and time. They will create reverberant spaces of almost limitless variety, from tiny chambers to vast echoing canyons. They will tune their effects to achieve a richness and realism that once seemed beyond the reach of any technology. And they will command equipment so easy to use, it becomes an extension of their own creative abilities.

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ing. Even in this environment, however, Mil specs control every step of the production process, albeit to slightly less stringent standards than applied to space hardware or strategic weapons systems such as ICBMs.

Commercial Quality Control

Commercial electronics quality control standards range from better-than-Mil-Spec for medical electronics equipment to absolutely shabby at the low end of the consumer electronics market. However, on average, the quality, reliability and serviceability of commercial electronic equipment have improved dramatically in the past decade. The catalysts responsible for these improvements have been competition and economic pressures.

Many sectors of the commercial electronics marketplace are crowded with competitors jockeying for a piece of a finite market (Microcomputers, for example). Under such intense competitive conditions, a customer can be won or lost on the basis of a manufacturer's product reliability track record. And this kind of competition also forces prices down to the point where profit margins become razor thin . . . so thin that only a few returns for warranty service can wipe out profits. So it behooves the manufacturer to make sure that his products work right from the start and continue to provide reliable service over their entire useful life.

To a great extent, rapid advances in integrated circuit technology have helped commercial electronics manufacturers meet these goals. The push from Medium Scale Integration (MSI) to Large Scale Integration (LSI), and from there to Very Large Scale Integration (VLSI) has constantly driven down the parts count in electronic products. Lower parts counts lead to better reliability (there are fewer parts that can go bad), faster and cheaper assembly (fewer, less critical connections performed by semi-skilled labor or by machines) and easier serviceability (troubleshooting and repair can be accomplished through simple substitution of "throw-away" modules).

In order to upgrade product design quality and production workmanship standards, commercial electronics manufacturers in the United States have, in many cases, turned to Mil specs and NASA specs for guidance. Some general-coverage quality control program specs such as MIL-STD-785A, "Reliability Program for Systems and Equipment Development and Production" and NASA's NHB 5300.4 (1A), "The Reliability Program Provisions for Aeronautical and Space Systems Contractors" have provided the basic guidelines for establishment of successful QA programs at a number of commercial electronics companies. On the production side, there are dozens of Mil-standards and NASA specs covering workmanship standards for almost every type of mechanical and electronic production process. A sampling of these include:

* NASA MSFC-PROC-158, "Procedure for Soldering of High Reliability Electronic Connections"
* NASA MSFC-PROC-154, "Printed Circuit Design and Construction"
* MIL S 6872, "General Requirement for Soldering"
* MIL E 16400, "Electronic Equipment Naval Ship and Shore"
* MIL E 5400, "Electronic Equipment, Aircraft"
* FED QQ-S-571, "Solder, lead alloy"

Most of these specs require mountains of paperwork to establish conformance; these provisions have been modified by commercial producers to reduce the costs involved, but the workmanship standards set forth in these specs have provided a basis for those applied to commercial electronic production operations. The differences between the military standards and their commercial offshoots are in degree of adherance rather than basic substance.

Well-known names in audio and video equipment manufacturing, such as Ampex, EECO and Datatron can trace the linegage of their QA and manufacturing workmanship standards back to Mil and NASA specs. Some of these companies got their start selling equipment almost exclusively to the military or NASA, so adoption of modified government specifications for application to their commercial product lines was a natural extension. For the Japanese, it was a case of intense study of foreign quality control practices, including study of available literature (books, papers, industry standards and, yes, government specifications from the U.S. and Western Europe). From these studies evolved the overlapping strategies of "just-in-time" production and "total quality control" that are at the heart of the Japanese manufacturing success story.

The bottom line is this: regardless of what you personally feel about the good or bad impacts of the military and the space program on our lives, if it hadn't been for the high quality standards that the Pentagon and NASA have set for their electronics equipment over the years, we commercial equipment users would have lost the war on shabby equipment quality and poor reliability a long time ago. ■

It copies tape Fast!

What else is there to say?

Well . . . to be perfectly clear we should say that the Telex 6120 Duplicator copies reel or cassette tapes fast. Then we should add that it does it automatically, easily, efficiently and economically. In fact, we **really** should say that the 6120 produces **high quality** tape duplicates — fast.

Yes, the Telex 6120 high speed duplicator has many time-saving, money-saving benefits, including many **automated** features such as end-of-tape stop and auto rewind on the reel master, with a choice of auto or manual rewind on the cassette master. These automated features can eliminate unnecessary down time between copy cycles. All key set-ups and adjustments are **efficiently** accomplished from the front of the system, with all operating, function controls and LED level indicators **conveniently** grouped together on the easy-to-read control module. These automation and convenience features allow even non-technical employees the ability to operate the 6120 **easily.**

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Make no mistake, the 6120 is fast. It has a speedy 16 to 1 speed ratio and copies both sides at once, so it will duplicate full one hour programs in less than two minutes. As you can see it's not just another high speed duplicator. To learn more about the 6120, call or write today for complete specifications and production tables. While you're at it, make an appointment to see our informative video tape presentation entitled "Beating Real Time."

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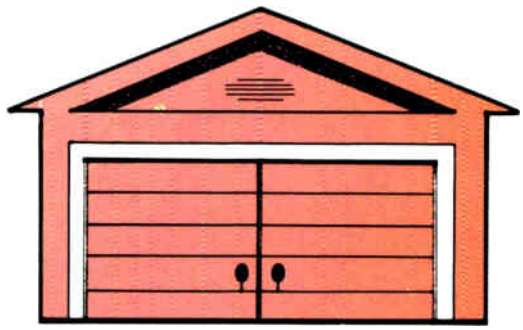


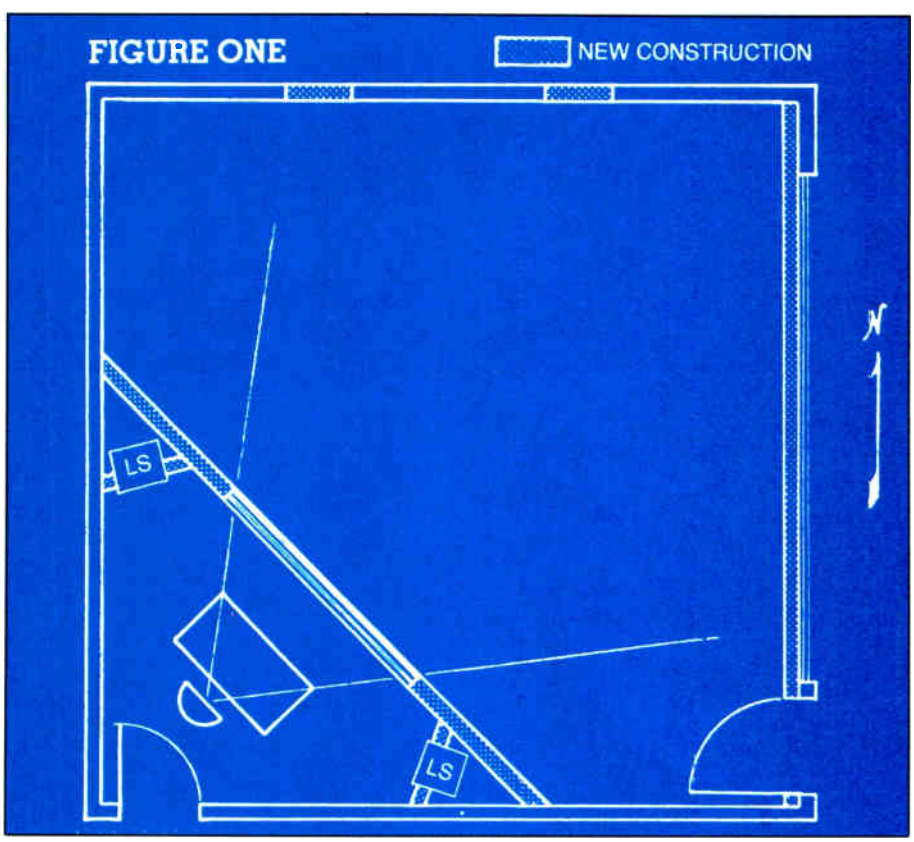
BUILDING A GARAGE STUDIO

Maximum Track Separation in a Minimum Space

by F. Alton Everest

There has been a proliferation of small studios in basements, barns, garages and other locations in and around private residences. Some of these are built by members of bands who use such a facility to help them develop their musical techniques and record demos at leisure without high studio charges. Others are built by advanced audiophiles who have become jaded to further improvements in the living room hi-fi, but really are challenged by recording techniques. Such a private studio is a logical next step after experimenting with multichannel recording with a four track consumer-type tape recorder. This type of experimentation soon runs headlong into the frustrations of household noise, limitations in the number of tracks and problems created by haphazard, temporary lashups.

Some may look to a private recording studio as a stepping stone to getting into professional recording. As far as gaining experience is concerned, excellent, but if renting the studio to musical groups is contemplated, beware. Most communities look with disfavor on commercial activities in residential areas. Construction of the studio to be described here definitely requires a building permit and the usage planned for the facility is sure to come up. Now that this point has been made, it is possible that the studio can have limited commercial possibilities.



FLOOR PLAN

A typical two car garage to be converted into a multitrack studio is almost square and is covered with a simple A-roof. Open ventilation louvers and a 15-foot wide door opening emphasize that the garage is just a wide open shell with unfinished walls inside.

The first step is to make the garage into a tight structure and to make provisions for a monitor control room. Figure 1 shows one way of distributing the 464 square feet of total area between the studio and control room. This gives a studio floor area of 352 square feet and a control room area of only 85 square feet.

This may be sufficient incentive to drive the recording technician to us-

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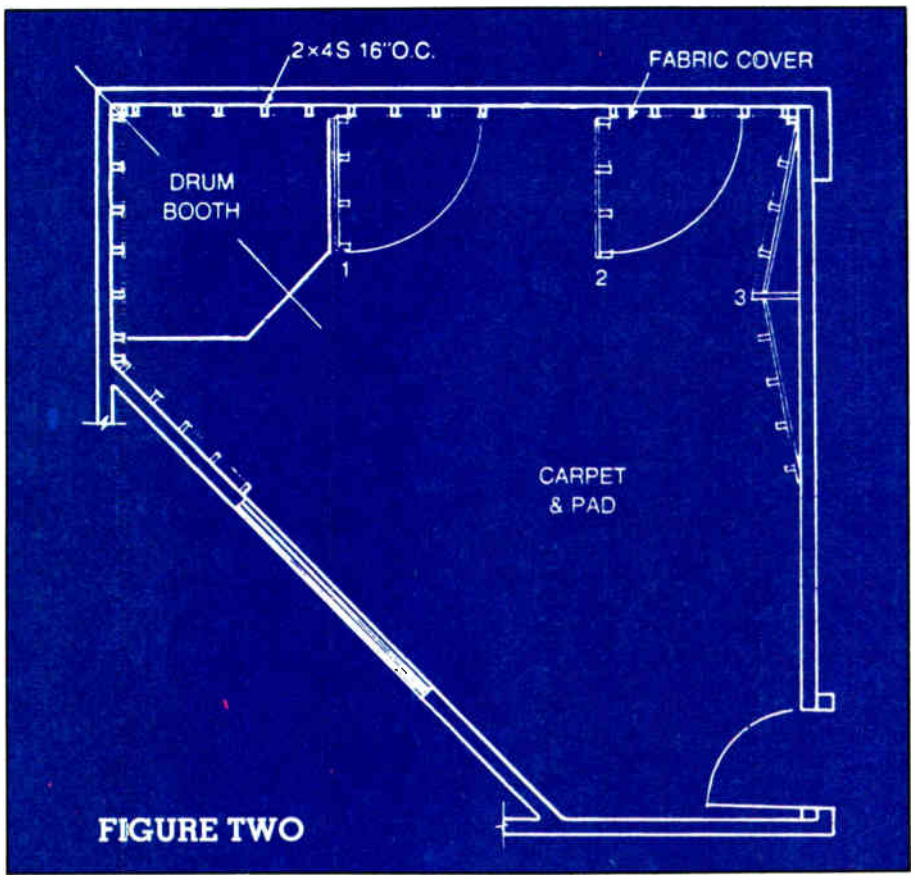


FIGURE TWO

ing high quality headphones instead of monitor loudspeakers. The fact is that with a square garage, any location for the control room other than a corner results in serious degrading of studio space. The floor plan shown favors the studio. A demo recording may have greater impact with a reasonably sized studio and operator wearing headphones than a tiny studio with its poor separation and more accurate monitoring room.

The louver ventilators in the north wall are abandoned and the opening framed in and covered to conform to the other external walls. The overhead door probably should be retained for external appearance, although the bulky hardware may be removed and stored for possible future use. A new frame closes off the 15-foot door opening. A door (3 feet wide to accommodate instruments) is cut in the east wall for access to the studio. This should be a 1⅜-inch solid core door and well weatherstripped. The sound lock corridor in this case is the great outdoors. The existing doorway in the south wall serves the control room, but the hollow core door is replaced by a 1¾-inch solid core door and is also weatherstripped.

WALL AND CEILING CONSTRUCTION

The internal wall and ceiling surfaces are covered with ⅝-inch gypsum board. Great care should be exercised to assure tightness, as this layer is the chief assurance against complaints from the neighbors. This requires filling all cracks and taping all joints as well as a liberal use of non-hardening acoustical sealant at all intersections of surfaces. This drywall layer goes in the control room as well as the studio. The diagonal wall between the studio and the control room has a ⅝-inch gypsum board on each side.

The conversion of this garage to a studio is fraught with compromises. The result will be something like midway between the living room and a first class studio. The wall between the studio and control room is such that studio sounds will sometimes be heard in the control room without using the monitors. Neighbors will probably hear a lively number being played in the studio, but hopefully at a low enough level that they will not call the police.

Unless the two single doors are made impervious to sound passing through them, there is little advantage in strengthening the walls. A good, tight interior wall has an STC rating of 30 to 35 and the stucco plaster exterior wall is only slightly better. Great care must be exercised in weatherstripping doors to get STC 30. 3½-inches of insulation between the walls contributes very little (about 2 dB) to the transmission loss. It does help somewhat in discouraging cavity resonances. Because of its minor effect, it could be omitted if the budget is very tight.

STUDIO TREATMENT

Multitrack recording requires acoustical separation of the sounds of instruments or groups of instruments which are recorded on separate tracks. One way of achieving such separation is to physically separate the sources and place a microphone close to each source. Space is limited in this studio, but this logical and desired approach is more effective in an acoustically dead space than in a live one.

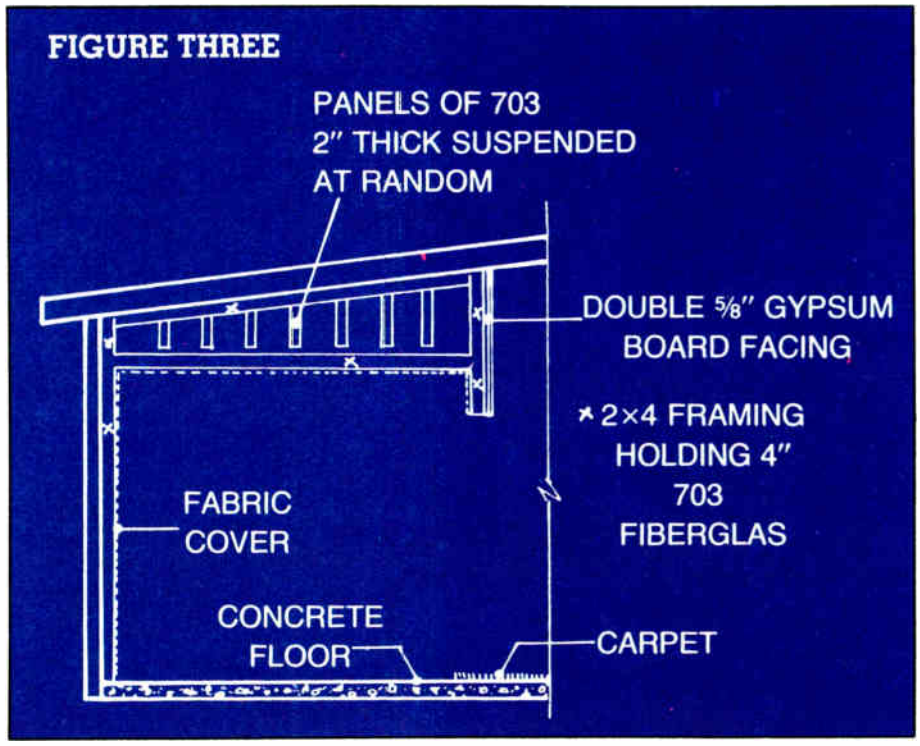
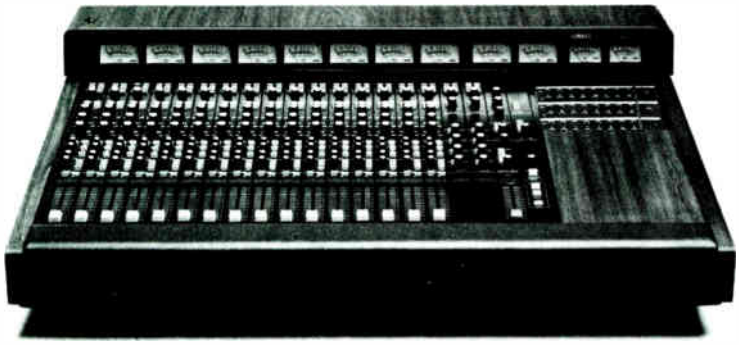


FIGURE THREE



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SPECIFICATIONS

TOTAL HARMONIC DISTORTION (T.H.D.)
Less than 0.1% at +4dB *output, 20Hz to 20kHz (all Faders and controls at nominal)

HUM & NOISE (20Hz to 20kHz) Rs = 150 ohms
(INPUT GAIN "–60")

–128dB	Equivalent Input Noise (E.I.N.)
–95dB	residual output noise: all Faders down.
–80dB	(84dB S/N) PGM Master volume control at maximum and all CH PGM assign switches off.
–64dB	(68dB S/N) PGM Master volume control at maximum and one CH Fader at nominal level.
–73dB	(77dB S/N) STEREO Master Fader at maximum and all CH STEREO level controls at minimum level.
–64dB	(68dB S/N) STEREO Master Fader at maximum and one CH STEREO level control at nominal level.
–80dB	(70dB S/N) ECHO SEND volume at maximum and all CH ECHO volumes at minimum level.
–75dB	(65dB S/N) ECHO SEND volume at maximum and one CH ECHO volume at nominal level.

CROSSTALK
–70db at 1kHz: adjacent Input.
–70db at 1kHz: Input to Output.

MAXIMUM VOLTAGE GAIN (INPUT GAIN "–60")

PGM	74dB: MIC IN to PGM OUT.	ECHO	70dB: MIC IN to ECHO SEND.
	24dB: TAPE IN to PGM OUT.	C/R	74dB: MIC IN to C/R OUT.
	34dB: ECHO RETURN to PGM OUT.		24dB: 2 TRK IN to C/R OUT.
	14dB: PGM SUB IN to PGM OUT.	STUDIO	74dB: MIC IN to STUDIO OUT.
STEREO	74dB: MIC IN to STEREO OUT.		24dB: 2 TRK IN to STUDIO OUT.
	24dB: TAPE IN to STEREO OUT.		
	34dB: ECHO RETURN to STEREO OUT.		

CHANNEL EQUALIZATION
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HIGH: from 2k to 20kHz PEAKING. MID: from 0.35k to 5kHz PEAKING. LOW: from 50 to 700 Hz PEAKING.

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OSCILLATOR Switchable sine wave 100Hz, 1kHz, 10Hz

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Hum and Noise are measured with a –6dB/octave filter at 12.47kHz; equivalent to a 20 kHz filter with infinite dB/octave attenuation.
*0dB is referenced to 0.775V RMS.
• Sensitivity is the lowest level that will produce an output of –10dB (245mV), or the nominal output level when the unit is set to maximum gain.
• All specifications subject to change without notice.

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Musician reaction places a limit on the deadness of such a studio because they must hear themselves and other musicians to play effectively. The studio of Figure 2 has been made as dead as practical to allow the achievement of reasonable track separation, even though the space is small for this type of recording.

Heavy carpet and pad are applied to the entire concrete floor except the drum booth area. This opposes the sloping, reflective ceiling surfaces which are bare gypsum board. Reflections from this ceiling could contribute to leakage between tracks. If this proves to be a limiting factor, absorbent material could be applied to critical areas of the ceiling.

WALLS

Much of the wall is faced with 4 inches of Owens Corning 703-type semi-rigid fiberglass boards. These fiberglass panels are inserted between vertical 2 x 4s which are mounted against the gypsum board wall covering and run from floor to ceiling. Figure 2 shows the 2 x 4s spaced 16-inches center to center, lined up with the studs of the exterior wall to which they are nailed. After the fiberglass is installed between these inner studs, a fabric cover is stretched over all, tacked in place and finished strips nailed on the edge of each 2 x 4 to complete the floor to ceiling job. The south half of the east wall and the south wall are left reflective to provide an area in the southeast corner of the studio, near the door, which would have somewhat brighter acoustics than the other areas near absorptive walls. Such localized acoustics can be of great help in instrument placement.

On the north wall are two swinging panels 4 feet wide running from an inch above the carpet to a height of 6 to 8 feet. These panels are framed by 2 x 4s with ¾-inch particle board or plywood backs for strength holding 4 inches of 703 fiberglass covered with fabric like the walls. The back of panel 1 in Figure 2 in open position, presents the drummer with the only reflective surface apart from the floor.

On the east wall the same 2 x 4 framing filled with 4 inches of 703 is followed except that here a space behind is provided to augment absorption in the very low frequencies (element 3). At these frequencies the sound penetrates the 4 inches of fiberglass, causing the ¾-inch plywood or particle board to vibrate as a diaphragm, absorbing sound in the process. It may be found that an instrumentalist in space 1 would be too close to the high level drum sound. It would be quite acceptable to move the low frequency element to the north wall and the instrument alcoves 1 and 2 to the east wall if this would meet separation needs better. Such a move would increase the distance between instrumentalists (and their microphones) and the drumkit. Barriers 1 and 2 would provide separation only between instruments,

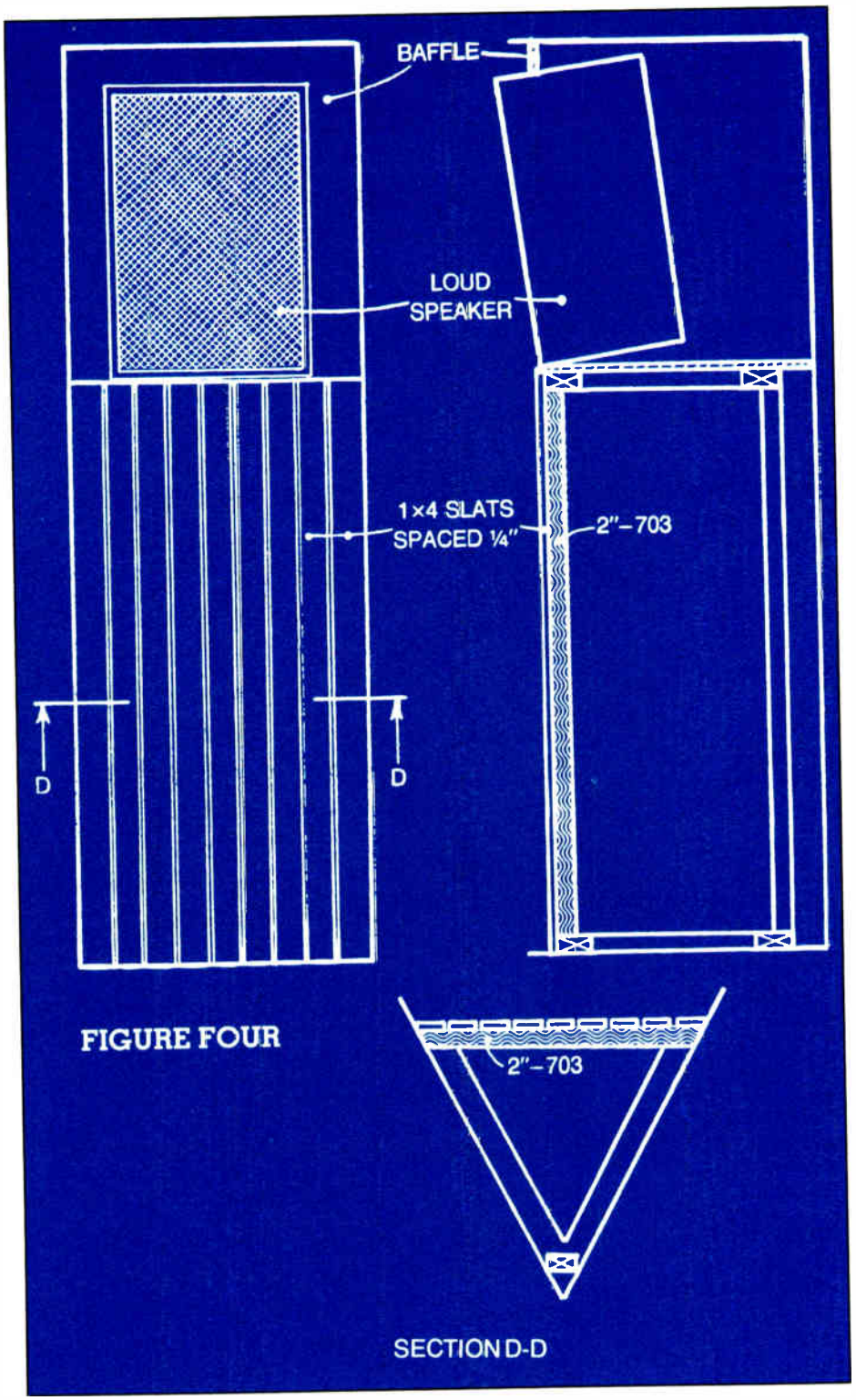

FIGURE FOUR

not between instruments and drums unless more complicated double hinged panels were installed.

DRUM BOOTH

The corner area for the drum booth is indicated in Figure 2. The concrete floor of the booth is left bare under the drums to give the desired effect. Another reflective surface for the benefit of the drummer is the surface of swinging panel 1. Apart from these, all surfaces around the booth are highly absorptive to contain the drum sounds and thus improve separation from the sounds of other instruments.

Without adequate separation the advantages of multitrack recording disappear. There is general agreement on two points: sounds from the drumkit are hard to contain, and a good drum sound is basic to any group. This is justification for doing something extra for the drummer, even in a budget facility such as this. It would be nice if we could do the same for the vocalist.

Leaving the bare ceiling over the drum booth would defeat the whole purpose of the booth. Drum sounds must be absorbed rather than allowed to float over the entire area. A canopy of 2 x 4 framing is dropped down from the ceiling to a point 6 feet above the concrete floor as shown in Figure 3. The shape of this canopy follows the general drum booth front edge shown in Figure 2.

The face of the canopy toward the studio is covered with a double layer of ⅝-inch gypsum board, but the inside of the entire 2 x 4 framing on 16-inch centers is left open to receive 4 inches of 703 fiberglass board.

A fabric cover is then applied and held in place with finished strips nailed to the 2 x 4s. This 4 inches of 703 treatment faces the drummer on all sides including walls, underside of canopy and inside of canopy lip. The construction leaves an attic between the canopy ceiling of 4 inches of 703 and the 4 inches of 703 affixed to the uppermost ceiling gypsum board. Because drums have a hefty low frequency content, the attic can be made into an effective absorber for very low frequencies, frequencies lower than the 4 inches of 703 can handle. The term basstrap has been applied to such absorbers. Low frequency absorbers, however, do come in varying degrees of lowness. The 4 inches of 703 is essentially a perfect absorber down to 125 Hz and its absorbing effectiveness decreases as frequency is lowered. For this drum booth attic, a trick of the builders of early anechoic, free-field chambers or dead rooms is used. This is the hanging of spaced absorbing panels to extend the useful low frequency range of the room.

CONTROL ROOM TREATMENT

Figuring the axial mode frequencies of a triangular room is far beyond the scope of this article but the average ceiling height of about 9 feet would yield a fundamental of around 60 Hz and the others would not be too far from this. Cutting off the sharp corners near the window provides a shelf for the loudspeakers. To remove the bad effects of the cavity in which the loudspeakers sit, a heavy plywood baffle should be fitted around the face of the loudspeaker (Figure 4).

The triangular space below the loudspeaker may be utilized as a low frequency absorber to help counteract the carpet effect. To coin a euphonious phrase, this is a slit resonator utilizing the slots between the slats and the cavity behind. It is made simply of 1 x 4s spaced about ¼-inch apart with 2 inches of 703 pressed against the rear of the slats. The cavity itself serves only to contain the springy air.

On the walls behind the engineer, about thirty 12 x 12 x ¾-inch acous-

—PAGE 164

DIFFERENT DRUMMER

We don't call the TR-909 a drum machine for some very good reasons. True, it's a machine that makes drum sounds, but that's the end of any similarities between run-of-the-mill drum machines and the TR-909 Rhythm Composer. In fact, playing with the TR-909 is more like playing with a real drummer than anything else. Here's why. The Best Sounds. We start with digital recordings of real drums, then through a 3-D waveform analysis, re-create the sounds through a hybird digital/analog process. Not only does this provide the best drum sounds, but also the most flexible. Change the snap of the snare, the decay of the bass, you call it. The sounds you get are the sounds you really want. Even better—in addition to the 11 internal drum sounds, add up to 16 more drum sounds (digital and analog) through external sound modules. That means 27 drum sounds with no major surgery. The Best Programming. Program a roll on most drum machines and you'll see why they're called machines. That's why the TR-909 gives you the choice of Step Programming (highly visual and accurate) PLUS the additional spontaneity of Real-time Programming. The TR-909 also gives the most expressive and easily programmed dynamics. The Most Flexibility. Think of any way to interface, and you'll find it on the TR-909. MIDI, Sync-24, Tape Memory Save/Load, RAM-Pak Program storage, they're all here. So what does this mean? It means that years from now, when other drum machines are sitting in the closet gathering dust, your TR-909 will still be on the job. Hook up the TR-909 through MIDI to a personal computer (like the Apple II or IBM PC). Only Roland has the Hardware and the Software to make it possible. The Most Expression. Compare the results you get from the TR-909 Rhythm Composer with any drum machine. Because why would you want a machine, when you can have a Rhythm Composer?
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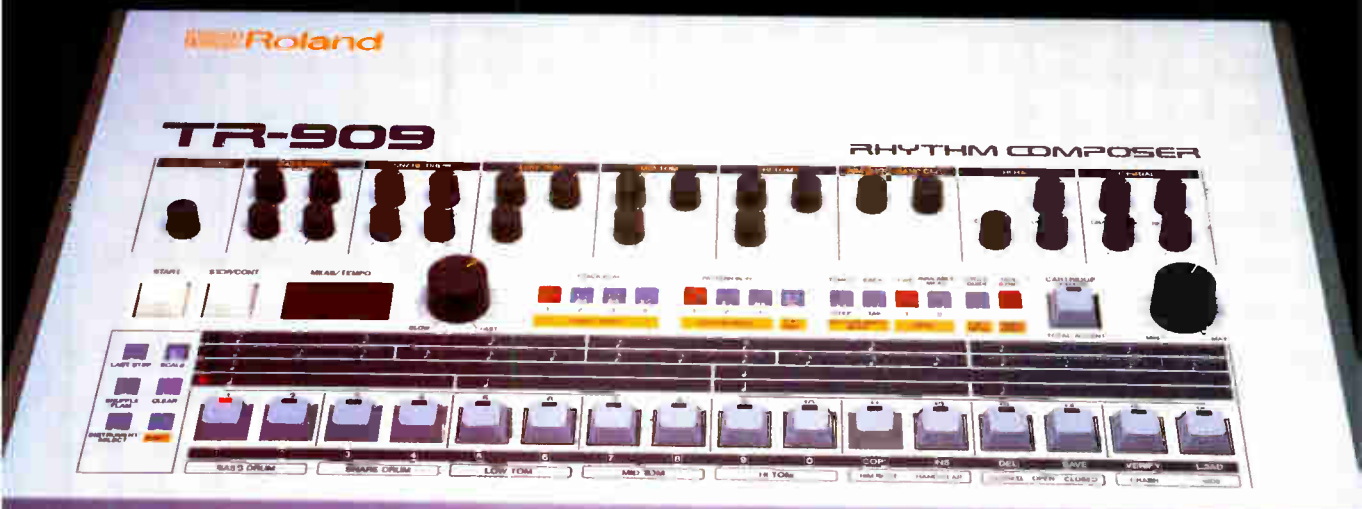

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STUDIO DESIGN & CONSTRUCTION

KEEPING COSTS UNDER CONTROL

by Vin Gizzi

Wallace Sabine, one of the pioneers in the science of acoustics, advanced the concept that the ideal absorber of sound would be an open window. All sound striking it passes on to the outside and none is reflected. Since the purpose of this article is to explore low-cost materials and techniques for construction of sound facilities, it might be interesting to consider open window absorbers. They would allow tuning the acoustics of the room if they were operable windows and would permit natural light to enter, saving electricity during the daytime. Room ventilation would be a snap. And they'd be handy for the studio owner to jump out of when his business failed. No, I'm afraid open window absorbers are about as sensible as volunteering your studio roof as a chemical waste dump in order to get a free source of massive material for soundproofing. Better to volunteer your site as a nuclear waste dump—you wouldn't have any neighbors so noise wouldn't be a problem.

Let's take a serious look, though, at the requirements and problems encountered in building a sound facility.

> Sound isolation and sound absorption are often confused: a common misconception is that materials which control one problem will also be effective in treating the other.

Many of the basic needs for recording or critically monitoring sound are quite similar; an extremely quiet environment, excellent isolation from unwanted noise, ideal acoustics and an atmosphere conducive to working productively. Most of the business engaged in this sort of work must be located in major metropolitan areas—sites that are noisy, often cramped and built with the thinnest walls and floors that building codes will allow. Studio owners, designers and builders must frequently utilize much ingenuity and skill to fit audio facilities into environments that can seem hostile and uninviting.

The problems faced break down into two distinct groups that are often confused: sound ***isolation*** and sound ***absorption***. The most common misconception about the subject is that materials that control one problem will also be effective in treating the other. Pretty much the opposite is true—hard, rigid, massive materials block the transmission of sound and absorb very little, while soft, flexible surfaces absorb some of the sound striking them while allowing most to pass through. Both classes of material must be used carefully in the construction of a sound facility to achieve the proper degree of isolation from unwanted noise, along with a good balance of reflected sound within a room.

Lets deal with the question of noise isolation first. Noise is defined as unwanted sound—your neighbor's stereo, traffic rumble, or Vladimir Horowitz playing the piano when you're try-

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ing to sleep. Of course, there is always noise present everywhere, so a determination must be made of how much, or little is acceptable for a given situation. Tolerable levels of background, or ambient noise are generally expressed as Noise Criterion (NC) contours which take account of the ears' varying sensitivity to different parts of the frequency spectrum. A recording studio that measured an NC 20 would be a good, quiet studio; in order to achieve this level, the acoustic design goal would be to reduce the level of intrusive sound to this NC value.

You might expect that intrusive sounds lower in sound pressure level than the ambient noise level would not be perceived, but this is not the case. Pure tones and noises in the middle to high-frequency bands will be heard under broad-band ambient noise. However, as a general design guide, NC curves are a useful aid in determining the approximate amount of sound transmission loss required for a particular space. The other information required is a measurement of the noise already present at the site of the planned facility.

To accomplish effective noise isolation, the sound transmission loss (STL) of all partitions—wall, floor or ceiling—must be high enough to reduce intruding noise below the chosen NC contour. Generally, the more massive the partition, the more effective it is. However, at some point the increases in mass necessary for meaningful improvements in STL become impractical. The mass law predicts an improvement in STL of about six dB for every doubling in mass; to improve the transmission loss of a 6-inch thick concrete wall from 50- to 56-dB would require another 6-inches of thickness. Fortunately, there are other ways of producing effective walls and floors, chiefly multiple-layer partitions.

A warning on the use of sound transmission class values (STC) is in order here. An STC, like an NC, is a one-number value assigned to a given material or partition to express its sound transmission loss potential across a five octave spectrum, from 125 Hz to 4 kHz. The STC curve drops considerably at low frequencies; furthermore, when assigning an STC to test results, deviations from the standard curve of 8 dB are allowed at any one octave band. What this means is that a wall construction rated at STC 50 could have as little as 26 dB of sound transmission loss at 125 Hz. Figures for frequencies below 125 Hz, when they are available, will probably be even lower. Numbers in that range would not be adequate for professional audio facilities where extremely high levels of sound will be produced. Make sure to check complete test data on a partition before including it in building plans.

One very effective sound wall is constructed from several layers of sheetrock and sound board (homasote). Depending on the size and number of studs used and, most importantly, the thickness of the air gap between layers, these walls can achieve very impressive STL's. For example, the wall shown in Illustration 1 has an STC rating of 56, equal to that for a 24-inch thick stone wall. A big advantage of sheetrock and stud walls is their relative ease of construction and their good availability. Materials can be purchased and stored in small quantities as the builder's schedule requires.

Similarly, a floor having properties similar to those of a concrete slab can be constructed of layers of sheetrock, plywood, and soundboard (Illus. 2). Although the density of this composite floor is less than half that of 4- or 6-inches of concrete, the non-homogeneity of the partition improves its performance in blocking the transmission of sound significantly. An analogy can be made here with the power loss that occurs with an electrical impedance mis-match. What is undesirable in most electrical circuits is very effective here in reducing the transmission of sound by forcing it to pass

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The RPG Reflection Phase Grating Acoustical Diffusor

Many approaches have been used to improve the diffusion of sound in critical listening environments. Room dimensions have been optimized, ceilings have been inclined and walls splayed. Room surfaces have been covered with geometrically irregular shapes, polycylindrical columns and/or alternating reflecting and absorbing panels. These conventional diffusors have limited application, however, because they do not simultaneously scatter uniformly over a wide enough range of frequencies and directions necessary for good diffusion. The RPG is a new reflection phase grating acoustical diffusor which offers a novel approach to providing sound diffusion over a broad frequency bandwidth with uniform wide angle dispersion. An incident wave is scattered into many wavelets having equal energy over a wide angular range (half space). In addition, this polar energy response is practically constant over a broad, designable range of frequencies. In essence, the RPG's highly diffusing surface provides efficient backscattering over a broad range of frequencies with wide angle coverage.

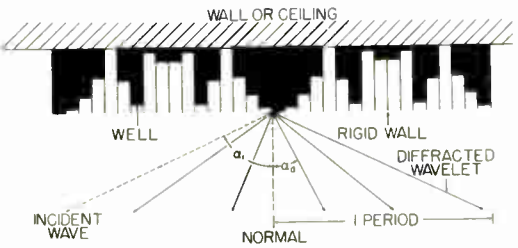

Figure 1: Scaled top view cross section of a QRD-17 has two periods with 17 wells per period.

The one-dimensional diffusor consists of a periodic grouping of an array of wells of equal width, but different depth, separated by thin and rigid walls (Figure 1). The unique properties of the RPG result from varying well depths, determined by quadratic-residue (QRD™) or primitive-root (PRD™) mathematical number sequences—the Fourier transform of the exponentiated sequence values is of a nearly constant magnitude. This insures equal energy in all the scattered directions.

PRD diffusors are characterized by a unique energy dip in the specular reflection direction. For a one-dimensional, laterally diffusing RPG (wells running vertically), the scattered energy is concentrated into a hemidisc whose thickness is proportional to the projection of the well length. As units are stacked this thickness increases, as does the coverage. This hemidisc can be conveniently directed by orienting the diffusor or source. Two-dimensional models using either sequence are also possible. These diffusors spread the scattered energy into a hemisphere.

APPLICATIONS

Audio recording, radio and television studios:

The acoustics of the studio can be tailored to provide the necessary early reflections and dense diffuse sound field, with a uniform decay time over the full frequency spectrum, which provides a spacious sound with the sweetening of a concert hall. The RPG can also be used as a movable gobo, allowing the acoustical characteristics of selected "live" areas, to be easily altered. The spatially diffuse reflections from the RPG arrive over a sound field, providing an open, airy sound. With appropriate microphone techniques these diffuse reflections can be used to "thicken" the sound of acoustic and amplified tracks.

Voiceover rooms, drum booths, isolation rooms, mobile studios and acoustic reverberation chambers:

The RPG can be used to psychoacoustically create the impression of a much larger room, by positioning the diffusors to adjust the arrival time between the direct sound and the spatially and temporally diffuse early reflections. This significantly reduces the "boxy" sound character and adds ambience and body to the sound. The RPG provides

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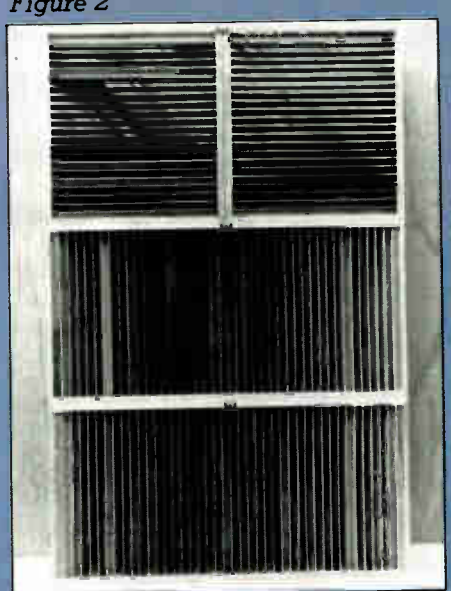
Figure 2



through multiple impedance (material) changes.

Many studios in metropolitan areas are not on ground floors, and pouring a concrete slab on high floors presents several problems. One is that the load bearing limits of many buildings will not support a 50 lb/ft² floor slab in addition to the normal load found in a studio. The other complication is that concrete weighs a great deal more wet than dry and may strain the buildings limits dangerously during construction. If the weight is not a problem, the cost of transporting the concrete to a high floor site may be. Concrete is a very cost-effective sound barrier when it can be poured easily and directly into place; the cost of moving it any distance from a truck can make it quite expensive.

Sound absorbing materials used in studios for the control of excessive reverberation and the uneven build-up of sound have tended in the past toward the unattractive and harshly functional. This was due, in part, to the scarcity of absorption test results. If the performance of a material was unknown the safe course was to use something familiar, even if it was less than desirable esthetically. Here too we often find a misleading one-number rating, the NRC, specified by manufacturers. Since the performance of a material at each octave band is critical in calculating quantity and placement, the sound absorption coefficient must be used. Today, there is information on the sound absorbing qualities of many common materials, and a growing number of proprietary products, that allow the designer much more freedom in planning a room.

Sound absorbers fall into two general categories: ***absorptive,*** which includes soft, porous materials; and ***resonant,*** which includes membrane and Helmholtz absorbers. The first group, which takes in building insulation, foams, Sonex and other manufactured absorbers, exhibits an absorption curve that falls off considerably at low frequencies. The thicker the material, the better the low frequency absorption; low frequency performance is also improved by spacing the material out from the mounting surface. The layer of air takes the place of additional material and is much cheaper. Membrane absorbers—large, thin sheets of a hard substance mounted over a cavity—offer fairly broad low-frequency absorption. Tuned absorbers deal with narrow frequency bands and are generally used where unavoidable build-ups of sound have been caused by less-than-ideal room dimensions.

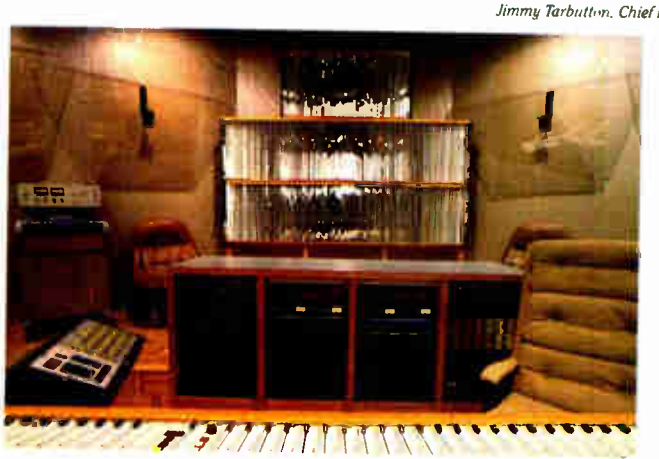
There are a number of products manufactured specifically to absorb sound over a wide range of frequen-

Jimmy Tarbutton, Chief Engineer

'Come On In'

When the Oak Ridge Boys wanted a new control room for their Acorn Sound Recorders in Hendersonville, Tn., they entrusted their chief engineer, Jimmy Tarbutton, with the responsibility of contracting the best services available for the job. He chose Bob Todrank and Valley Audio.

"I wanted the latest in control room technology with a large functional space. Since we were building from the ground up, it had to be right. I chose Bob to completely design the room and oversee the construction. I wanted Valley Audio's technical services to do our equipment interface because of their more than ten years' experience in audio installations, and selected the new Harrison MR-4 32-24 console based on its flexibility and innovative design. We then selected a long term associate, Jim Aanderud of Viking Enterprises as our contractor."



Rear wall showing diffusion/reflection

Todrank says, "Since Jimmy wanted a large, open room with a very "live" feel, I designed a control room incorporating the latest *LEDE (Live End/Dead End) concepts. I chose a rear wall diffuser system designed by Peter D'Antonio of RPG Diffusor Systems, Inc., to accomplish a widely dispersed sound field around the console. We built and installed the very first of its kind anywhere and I was thrilled with the results. I also used our TECRON TEF equipment to place the final room interior treatments. The proper implementation of the LEDE design theory along with the use of on-axis monitoring, correct room geometry and accoustical equalization (selective diffusion/reflection/absorption techniques) has resulted in a room I'm very proud of."

The Oaks are proud of it too. Duane Allen's reaction... *"It's like a dream come true."*

*LEDE is a registered trademark of Synergetic Audio Concepts.

The Oak Ridge Boys

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—FROM PAGE 74, RPG
early reflections which fatten drum tracks and both enhance and complement the reverberant sound from plate or digital reverberation units added in post processing. Customarily, absorption has been used to reduce the acoustic disadvantages of mobile studios. The RPG offers a complementary surface treatment with a sense of openness in this restricted space. Live acoustical reverberation chambers can be designed or modified to provide a diffuse sound field with a natural buildup and decay.

Recording, broadcast, disk mastering and film mix control rooms:

The RPG acoustical diffusor can be used to provide the necessary diffusion in conventional and LEDE™ recording control rooms to enable more accurate monitoring. In a LEDE room the RPG provides the required diffusion in the live end and helps maintain a uniform stereo perspective and spectral balance across the entire width of the mixing console. The accuracy of the stereo image is increased because the listener is immersed in a diffuse sound field, which increases the dissimilarity of sound reaching each ear and aids the binaural aspects of music perception. We recommend stacking the modular units into clusters in the live end of the LEDE rooms. A typical cluster would consist of two QRD-43 units atop one another, with two QRD-23 units above these, making a panel 48-inches wide and 73-11/16 inches high, as shown in Figure 2. The QRD-43 units cover the horizontal plane and the QRD-23 units provide dispersion in the vertical plane. In conventional control rooms, the QRD-43 diffusors can be mounted above and to either side of the console to provide the necessary early reflections and uniform coverage over a considerable area, including both the mix position and the producer-client position.

Auditoria, performing arts facilities, theaters, churches, convention centers, clubs, and orchestral shells:

The RPG can be used to increase the lateral diffusion in these large rooms, immersing the listener in a diffuse sound field with a high degree of binaural dissimilarity. This low interaural coherence increases listener preference by providing an improved stereophonic experience. RPG can be effectively coupled with sound reinforcement systems to help provide uniform broad bandwidth, wide angle coverage, which minimizes acoustic hot spots and voids. The RPG can be used to create effective orchestral and choral shells, affording performing artists a heightened sense of ensemble playing and pitch control.

—Peter D'Antonio and John H. Konnert

cies; many are already finished with a choice of fabrics and trim and can be very attractive. Most of these are fairly expensive and require skilled installation. One very cost-effective alternative is the use of compressed fiberglass building insulation (Owens Corning 703, for example) covered with a stretched fabric. There are numerous fabrics that will work effectively this way and finding an inexpensive example is not usually difficult. Ordinary speaker grill cloth is eminently suitable since it allows virtually all sound striking it to pass through to the absorbent material. It is commonly available in wide rolls at very reasonable prices. The fiberglass insulation is also very cheap and easy to install.

Wood has long been the mainstay of studio design and with good reason. It has a nice balance of reflective and absorptive qualities and can assume almost any appearance that might be needed.

A popular technique for this sort of installation is to attach several inches of fiberglass to a wall between wood lath the same thickness, on 2-foot centers. Fabric is then stretched over the fiberglass and attached to the lath. The fabric can be stapled and the seams covered with moulding or trim. There are also "seamless" systems using plastic track and splines that produce a finished appearance close to a continuous wall of fabric. These systems must be installed by a firm specializing in such work, however, as the technique is tricky.

Expanded metal grills can also be used as wall coverings providing the area of metal is not too great compared with the open area. Careful calculation of the proportion of metal to open area would be required here, since the hard metal would act as a reflector at high frequencies. Metal wall coverings are very rugged however and are suitable for many locations where fabric would be too delicate.

Wood has long been the mainstay of studio design and with good reason. It has a nice balance of reflective and absorptive qualities and can assume almost any appearance that might be needed. Installed in slats, it can be spaced to allow absorption of sound by a soft backing material. Large thin sheets can be mounted on lath with an air space behind; this membrane will act as a broad-band low-frequency absorber. Although good quality hardwoods are quite expensive, construction grade plywood can be covered with hardwood veneers relatively cheaply. If the job is done carefully, the results can be impressive.

Finally, one of the most important factors in keeping costs down in a construction project, is a careful and thorough design. This may sound simplistic, but I bring it up because I have seen so many jobs bogged down in on-site design decisions or changes. These can be costly and result in compromises that affect acoustical performance or appearance. They can also be avoided by a design that encompasses all aspects of the construction stage. For example, interior and acoustic designs should not be considered separately as they are integrally related. In the same way, incorporation of the mechanical systems—lighting and air conditioning—into the initial design will allow better use of available space and coordination of all the visual elements. Soffits tacked on to cover A.C. ducts, or lighting systems hung in awkward places take away from the smooth visual flow that characterizes a good design. It's no different than a home or office building; good architecture makes a statement by its apparent effortlessness. I'm not suggesting that the only way to build a successful studio is to hire a world famous architect. A large part of good design is common sense, careful planning and skillful use of space; many laymen have an instinctive talent for design. And no project can be successful without a clear definition of the goals for the space—determinations that can only be made by owners and users.

So before you start that new studio, consider your needs carefully; articulate your requirements in as much detail as possible. And remember the Boy Scouts motto (for the sake of those who were too busy learning to play the electric guitar during their scouting years, it's "Be Prepared"). A comprehensive, well documented design that includes all elements of the construction, will produce a better space, allow accurate budgeting, and keep a project on schedule. ■

Biography: Vin Gizzi is a consultant and designer of audio facilities. He is based in New York City and writes occasionally on audio subjects.

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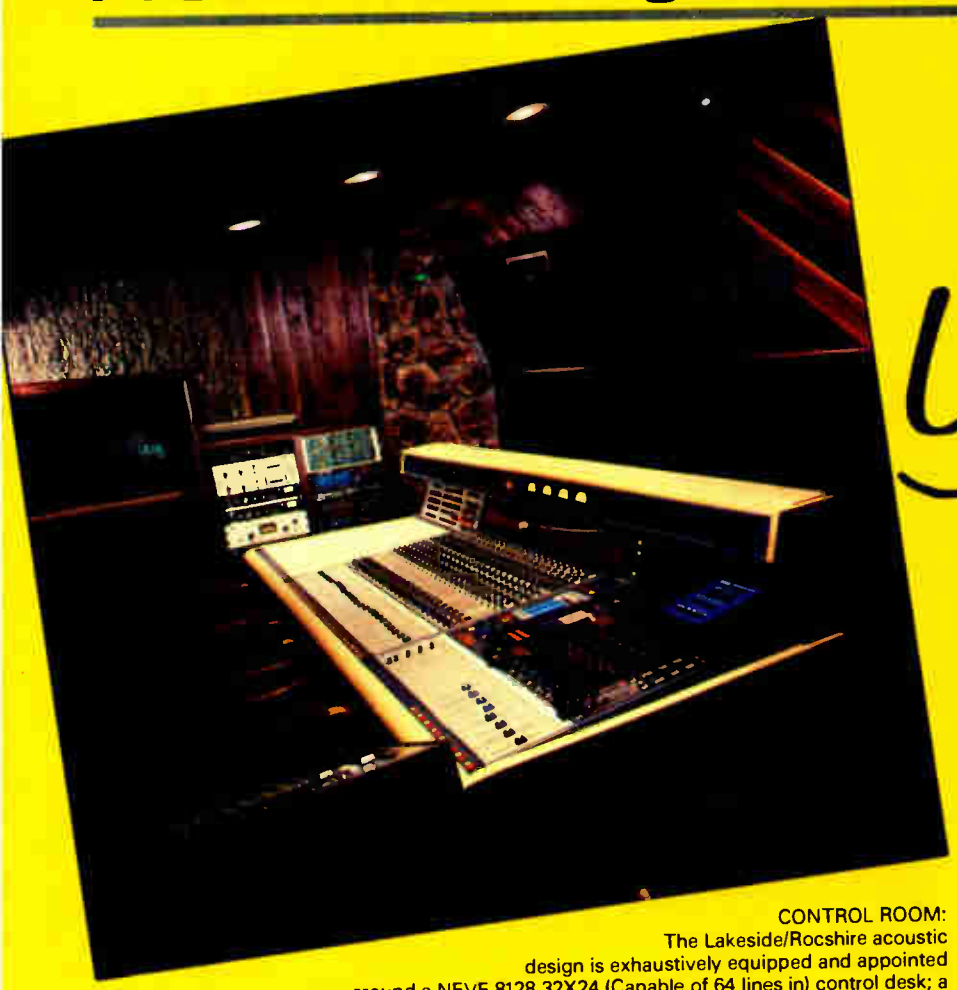

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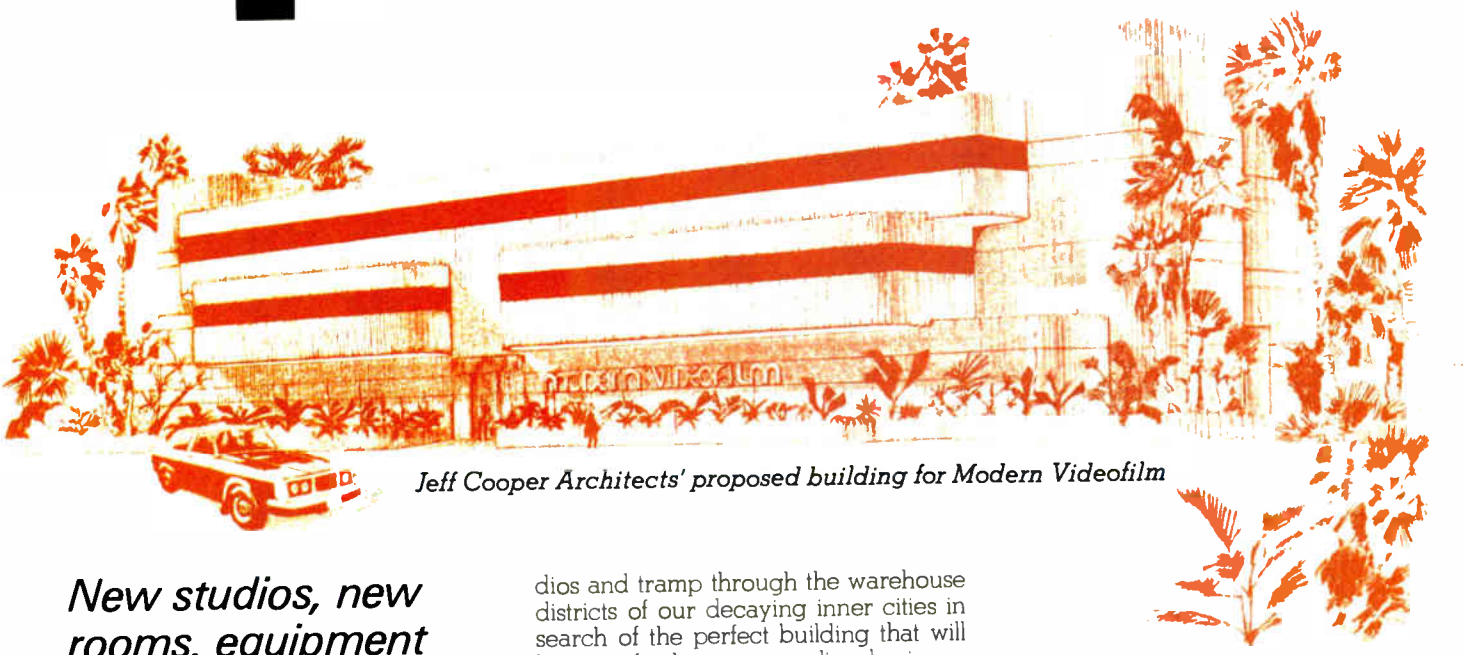
Studio Update



Jeff Cooper Architects' proposed building for Modern Videofilm

New studios, new rooms, equipment additions

by Blair Jackson

As the economic climate throughout the audio industry continues to improve steadily, if not dramatically, an ever-increasing number of businesses are taking advantage of the post-recessionary times to either launch new studios or refurbish existing facilities. In an industry where staying on top of the latest trends is more a survival tactic than a mere obsession with technological gadgetry, the struggle to keep up with the changing state-of-the-art becomes more difficult every day. There are now so many good recording studios that keeping up with the Joneses has become a very expensive and time consuming proposition: there's always someone with the cash to put into upgrading, so you better start looking for capital, too.

With real estate and rental prices still skyrocketing nationwide, it has gotten to the point where there is no cheap solution to finding a place to put a new studio. But prospective owners continue to scour existing old or failing studios and tramp through the warehouse districts of our decaying inner cities in search of the perfect building that will house a fresh new recording business. Finding the right property is just the beginning, of course. It's what the new owner or tenant does with the space that will determine if the business is a success.

Take Clinton Recording Studios in Manhattan, for example. Open only since Christmas of last year, the facility has managed to attract a steady clientele in the highly competitive New York market by simply entering the fray with a well-designed and equipped studio. According to Clinton co-owner Bruce Merley, the two-story building that houses the studios was a Latin American record distributing company before he and his partner bought it; earlier it had been a brass foundry. So you can imagine that turning the 50 x 100 structure into a studio took a bit of work, to put it mildly. They constructed one studio on each floor, and had to raise the ceiling on the second floor so they could have a 22-foot ceiling. "A lot of people like that big-room sound," Merley says, adding with a chuckle, "I wish we could have made the ceiling even higher!" Merley says that "We went into it with the idea that we were building a commercial music facility. It was functionally designed to accomodate jingle work, though we can handle album sessions, too."

Clinton brought New York's Martin Audio in to provide the equipment, and little debate was needed before they

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STUDIO NEWS

Songshop Recording Co., of New York City, which added a new Harrison MR4 32 channel automated console last summer, has recently added to its equipment rack a Lexicon 224X, two Kepex II's, two Gain Brain II's, two LA 4's, an Orban Paragraphic EQ, two DeltaLab Effectron delays, a LinnDrum digital drum machine, and a Dr. Click. Also ½-inch 2 track and ½-inch 4 track mastering has been added with the Otari MTR 12 . . . ***The Group Four Companies*** of Boston, MA was selected to design, construct and supply all necessary equipment to provide New England Sports Network with their new master control and studio facility. Scott Bears, Eric Pfaff, Joel Foner and Steve Blake, Group Four's designer, worked closely with John H. "Buddy" Rath, director of engineering, and Bob Whitelaw, producer/director, from New England Sports Network to devel-

—*PAGE 83*

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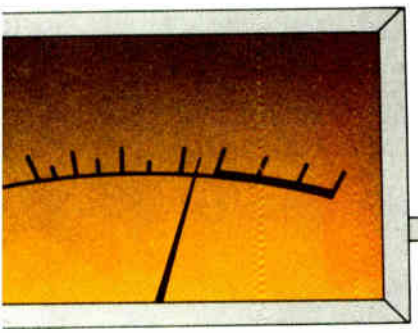
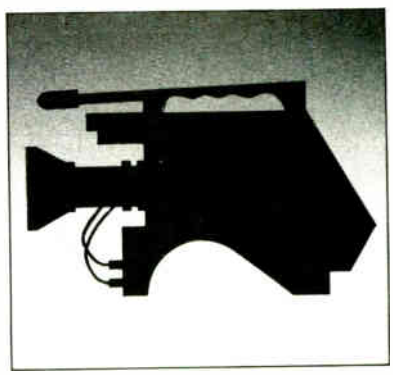
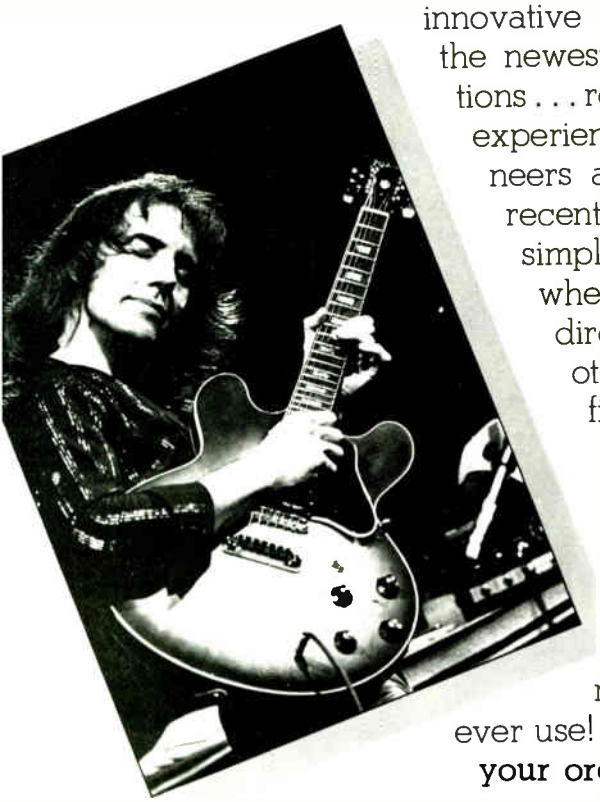
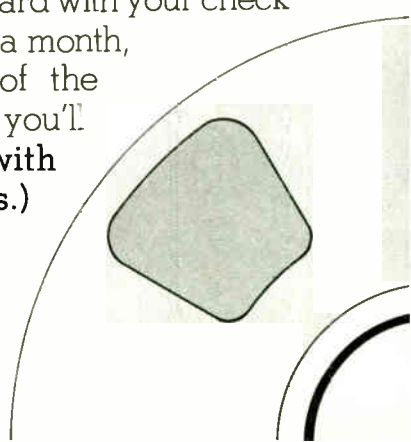


No doubt about it: the recording industry is changing as never before. Digital recording... Video music... declining record sales... computerization in the studio... home taping of records and radio... new markets. As a serious professional, you're probably changing too, and doing your best to keep up with these new developments. That's where **Mix** comes in. No other publication offers such a wide variety of informative columns and feature articles on today's dynamic audio/video scene. Whether you want to learn about the latest hardware and innovative production techniques... tour the newest, state-of-the-art studio installations... read the views and personal experiences of leading producers, engineers and performers... catch up on recent sessions and other events... or simply be entertained by some of the best writing anywhere—**Mix** has it all! (And only **Mix** publishes detailed directories of studios throughout the U.S., as well as other vital facilities and services.) We want you to find out for yourself how ***you*** can benefit from reading **Mix** each month, so we're making a special introductory offer: **12 months—one whole year of Mix—for just $19.95!** That's one-third off our newsstand price. ☐ Just return the enclosed card with your check or money order. For only $1.43 a month, you'll begin receiving one of the most valuable tools of the trade you'll ever use! **(Special bonus: Send payment with your order and receive two extra issues.)**







—FROM PAGE 80, STUDIO NEWS

op and design their facility. Group Four supplied a custom turnkey operation for NESN with a completely modular concept design . . . ***Seagrape Recording Studio*** (Chicago) has just updated its sound equipment with a 16 channel Neotek Series II with six echo returns, an MCI JH-114 16 track, with autolocater III, and a 3M M-56 16 track, with autolocater. Recently added to their extensive source of outboard gear are an Eccoplate II, the Lexicon Super Prime Time, and an Eventide H949 Harmonizer . . . ***Sheffield Recordings*** of Phoenix, MD has just installed a new Solid State Logic SL400E series automatic console with primary studio computer, total recall computer and transformerless mike inputs. Also, just added to the list of equipment is the BTX Softouch audio editing system with Cypher time code generator . . . Founder/owner Eric Schabacker has announced his plans to sell ***Bee Jay Recording Studios*** and pursue other interests. The 32 track, automated studio, has a long list of clients including such notables as Michael Jackson, Menudo, The Commodores, Molly Hatchet, Cameo, Blackfoot, Judas Priest, Krokus, Pat Travers, Gladys Knight and Long John Baldry . . . ***East Coast Video Systems*** of New York City has completed state-of-the-art editorial suites for The Tape House, also in New York City. The new Tape House one-inch editing suite houses the latest mix effects switcher, Sony BVH-2000 one-inch videotape machines, and the Sony BVE-5000 editor along with sophisticated video and audio monitoring gear . . . A state-of-the-art audio/video facility, ***Sound Vault Studios,*** has been created in what was formerly the Verdugo Savings branch in Sunland, CA. Unique to the studio is a natural echo chamber formed by the bank's safe deposit vault. The new complex offers 24 track audio recording, ¾-inch and 1-inch video recording services. The studio also provides remote services, tape duplication and a full production staff . . . Many new additions have been made to Miami's ***South Coast Recording*** including a Sound Workshop 1600 28x24 console with automation, a Lexicon 200 four-program digital reverb, an Echoplate III, two Lexicon PCM-42 digital delays, an Eventide 949 Harmonizer, an Aphex-Type B, Yamaha NS-10 monitors and a new duplex phone patch (for long-distance producers) . . . ***Ernie Earnest Productions*** of Smyrna, GA is now operating with a Tascam 38, 8 track recorder, a new mixing console, a Hill Multimix in addition to a new Symetrix patching bay and a Vector Research room equalizer . . . ***Muscle Shoals Sound Studios*** has installed a Mitsubishi X-80Z two track digital recorder in Studio B to complement their NECAM-equipped Neve 8088 mixing console, which is used for project mastering . . . ***Alpha Recording*** in Chicago has just replaced their existing 24 track console with a new Sound Workshop 32x24 series 34 console with ARMS automation. In addition to this and other new outboard gear, they have extensively remodeled both their studio and control room . . . ***Multi-Trac Recording & Productions*** has opened a new 24 track facility in Redford, MI. The studio now includes an APSI console, a 24 track 3M recorder and multiple cassette units for tape duplication . . . ***Studio 4*** in Philadelphia

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—FROM PAGE 80

decided to go with all Studer gear. Noted designer Maurice Wasserman handled the conversion of the building, including raising the 14-foot ceiling to 22 feet. "It's worked great for us so far," Merley says. "We're in the heart of the jingle business, which is what we wanted, and the word seems to be spreading fast."

At the other extreme is the experience of David Picken of NYC's new Clack Recording. Purchasing the former studios of a large New York jingle concern—Minosky, Zimmerman & Ham—Clack had relatively little work to do when they moved in, although they took a large existing studio and chopped it into three different, smaller studios. Clack does voice work only—they cater to the radio commercial industry—so not nearly as much planning had to go into the redesign as if they were going to be dealing with rock bands or orchestras and the like. Gear purchased for Clack included more than a dozen Otari MTR-10's (provided by Martin Audio), and MCI eight tracks (from Audiotechniques).

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PHOTOS: RUSS BERGER

The two in-construction views are from Russ Berger's (of Dallas-based Joiner, Pelton & Rose) LEDE design for Otis Connor's new Studio Centre, which is due to be completed this month. The back wall of the large control room was fitted with twelve RPG quadratic residue diffusors. The top photo is taken from the rear of the control room looking outward over the mixing position. The lower shot shows the drum booth (in background, behind scaffolding) and some detailing of the control room front wall construction (upper right corner of photo). Compare these to the studio's floor plan, printed on page 90.

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—FROM PAGE 83, STUDIO NEWS

has completed a major upgrading of its 24 track studio and, through the services of Video Rock Inc., will offer full video facilities right on the premises. New equipment includes a Studer A80MK III 24 track and Studer ½-inch two track with two other Studer ¼-inch machines. Their new console is a custom Neotek Series III C 38x24 with sub grouping . . . At ***Triad Studios*** in Redmond, WA the heavy demand placed on Studio A and the need to provide their clients with an increasing range of equipment and service, has led them to begin the construction of Studio B. Studio B will incorporate the same high quality acoustical treatment and attention to detail as in Studio A. In addition there will be the same feeling of spaciousness, with a total of 5,000 square feet of studio, control room and lounge area available . . . ***Electrotec Productions*** of Canoga Park, CA recently took delivery of two Soundcraft Electronics Series 4 consoles. Both were to go out on the road with Lionel Richie . . . After years in a basement, ***Melon Studio*** of San Francisco, CA has moved to a three-story building with a totally soundproofed recording studio facility complete with two large isolation rooms. It was built by KQED radio 12 years ago, and then used by Steve Miller. In addition, Melon is now 16 track with plenty of new outboard gear . . . ***Sound Solution*** of Santa Monica, CA recently announced the completion of a six month studio expansion which includes a complete upgrade of the facility as well as the acquisition of an impressive array of equipment: a Lexicon 224 XL digital and EMT 140 plate reverb system; an MCI console and 24 track machine; a Yamaha grand piano; the new Yamaha DX 7 digital programmable synthesizer, a LinnDrum computer and a huge selection of new and vintage microphones . . . ***Pinebrook Recording Studios,*** north of Indianapolis, IN now has three studios in operation, offering its clientele a full range of recording options from voice-overs to audio/video orchestra sessions. Designed by Los Angeles audio architect John Edwards and acoustically tuned by George Augspurger, the new Studio C is equipped with a 44 input Quad/Eight "Coronado" Series fully automated console featuring "discrete" circuitry. The 2,600 square foot of parquet recording floor offers two isolation booths and a raised platform. Other features include: 48 track recording and mix, Ampex ATR 100 two-track and four-track machines, MCI JH-24/24 recorder, UREI 813-A time align monitors, Hafler and Crown power amps, Echo Plate and Digital Echo as well as a wide array of outboard gear, mikes, special effects and auxilary monitors . . . ***Makin' Tracks Recording Services*** of Washington, OH have added a Tascam M-16 mixing console, Tascam 85-16 B recorder, Ecoplate III, Symetrix gates and dbx compressors to its facility. In addition the studio has built a new control room . . . ***ICE Associates*** of Bala Cynwyd, PA has recently upgraded their recording studio with the addition of the following equipment: Yamaha 1608 recording console, Otari MK III 8 track and 2 track recorders, Yamaha D-1000 digital reverb, DeltaLab Effectron II digital delay, and the Yamaha DX-7 digital synthesizer . . . ***A Step Above Recordings*** of New York City has announced the following additions: a Memory Moog Plus, a Yamaha DX-7, Oberheim OB-8, Moog Source and Jupiter 6, all interfaced through MIDI . . . ***Lion & Fox Recording*** in Washington, D.C. has installed the brand new BTX Softouch System in Studio "A", which will facilitate their 24 track automated video sweetening and dialogue replacement work . . . ***East Coast Video Systems, Inc.,*** New York City, has completed state-of-the-art editorial suites for The Tape House, New York. The new Tape House one-inch editing suite houses the latest state-of-the-art hardware including ADO, Grass Valley 300-3 mix effects switcher, Sony BVH-2000 one-inch videotape machines, and the Sony BVE-5000 editor along with sophisticated video and audio monitoring gear. East Coast Video Systems fully integrated this new system into the existing Tape House plant, providing hardware reconfiguration, operations efficiency, and duplication capabilities . . . A new Apex CA-30 on-cassette labeling machine is now on-line at ***Bonneville Media Communications,*** in Salt Lake City . . . . Veteran Nashville engineers ***Rick Horton*** and ***Mike Poston*** have announced the formation of ***Digital Associates,*** a Nashville-based digital audio rental service, featuring the Mitsubishi X-800 32 channel and X-80 2 channel master recorders. Call (615) 256-4487 for information.

—FROM PAGE 84

John Loeper of Waukesha, Wisconsin-based Flanner's Pro Audio, reports that their business has been booming, thanks in part to a few recent studio installations. A big one they just finished outfitting with a selection of Neotek, MCI, Ampex, and Adams-Smith gear (among other brands) is Sound Trek in Kansas City, a 24-track facility equipped for a wide variety of recording and synchronization needs. Designed by Steve Durr, Star Trek was built inside a cavernous existing warehouse structure, making the studio "a building within a building," as Loeper puts it. The building had a 28-foot ceiling, giving the design team plenty of space to work with. "It was a dream," Loeper says. "It was a nice and easy space to work with, so there were no problems at all dealing with the electrical runs, cables, air conditioning and that sort of thing."

Flanner's also equipped Sound Summit, a new studio in Lake Geneva, Wisconsin run by engineer Phil Bonnano, known for his production work with Survivor. Here, though, the work was done with an already existing studio structure—the Shade Tree. Loeper says that Flanner's filled the 24 track studio with Studer and Neve equipment, "and a ton and a half of signal processing gear."

Loeper characterizes the current climate in the business as "very positive. There's not a tremendous amount going on, but there *has* been a tremendous amount of interest. We're getting more inquiries than we've gotten in a long time and that means that there are a lot of people out there who are looking to build or equip studios. There seems to be a lot of interest right now in post-production, in part, I think, because of the rise of MTV, the increasing use of good stereo sound in films, and the prospect of stereo TV becoming a big thing soon. Also, the corporate marketplace continues to grow." Flanner's is the exclusive Midwest dealer for Adams-Smith synchronizers, and Loeper reports that sales are good because, he speculates, "people can tailor them to their own needs. It's modular so we can put one in for a lot less than some other units."

One of the most successful studio additions must be the new room added to the Sound Castle in Los Angeles. Designed by the studio staff under the direction of owner Buddy King, and with considerable input from Robert Ross, who did so much work on LucasFilm's facilities, the new room has a Neve 8128 console, twin Studer 800 recorders, a Q-lock synchronizer and much more. According to Darryl Caseine, "The studio was designed with '80s music in mind, with a much larger control room than you usually find, and a slightly smaller studio." George Augspurger designed the control room, leaving plenty of room for synthesizers. "More and more people, from Michael Boddicker to various others, have said they want to be right there in the control room and this situation allows that to happen with no problem." In addition, the new studio has a machine room off to the right of the control room which houses the disk drives, various power amps and much more. Although it opened only in April, the new room has already hosted a number of heavyweights, including The Jacksons, who finished their new *Victory* album there, Gladys Knight, Barbra Streisand, and The Commodores.

The Walt Disney organization has long been in the vanguard when it comes to pushing the limits of technology (just look at Disneyland and EPCOT), so it is not surprising to hear that Disney is spending over $3 million on a pair of projects—reconstruction of the studio's main theater, and updating their primary orchestra scoring stage. The theater project will hopefully be a prototype for a

"There seems to be a lot of interest right now in post-production because of the rise of MTV, the use of good stereo sound in films, and the prospect of stereo TV becoming a big thing soon."

new generation of showcase theaters with state-of-the-art picture and sound equipment, in addition to having equipment for mixing and dubbing for films-in-progress. By updating the scoring stage, Disney will be able to record large symphonies as well as smaller pop music sessions for movie soundtracks. A 24 track control room will be added, featuring a still-to-be-decided-upon computer-controlled mixing console, and video capabilities. Disney has retained Jeff Cooper Architects of Calabasas, California to design and engineer the two projects, and work is expected to begin later this fall. Incidentally, the Disney Theater was originally built in 1939, to coincide with the release of ***Fantasia,*** and it was the first theater in Hollywood to be equipped with stereo sound.

Jeff Cooper has another big project in the heart of Hollywood coming up, this one designing and building the new corporate headquarters and production facilities for Modern Videofilm. Cooper, who specializes in high-tech, entertainment-related projects, and over the years has worked for the likes of George Lucas, Steven Spielberg and others, has designed a 50,000 square foot building that, remarkably, will be Hollywood's first post-production facility to be built from the ground up. The building will house the latest computer controlled equipment in a futuristic layout of work areas for video editing, telecine transfer, tape duplicating and 24 track audio sweetening. The building's innovative design features a mix of concrete (for energy control and soundproofing) and solar glass. Construction on that project begins this fall, too, and ***Mix*** will certainly keep you abreast as the facility develops.

At Lion Share Recording in Los Angeles, there has been some major expansion, with even more planned. "Studio A has exploded so much that we went in and completely revamped our Studio B," comments studio manager Terry Williams. Studio B used to have a 32 input Harrison console, but Williams says they completely gutted the control room, made some geometric alterations (changing the monitor proximity, among other things) and B now houses a Neve 8128 and a pair of Studer 800s. The design changes were handled by Jay Antista and Howard Weiss. Williams says he hopes Studio B will be operational by September 1.

Meanwhile, Lion Share is also proceeding on plans to build what will be their largest room, Studio C, sometime in the not-so-distant future. It will have a capacity for 50 to 60 people, perfect for scoring sessions, though Williams says he expects album work to continue to be the studio's bread and butter. Though no firm decisions have been made about equipment for the proposed studio, Williams expressed the hope that they could be the first studio in the area to have one of the new Neve DSP digital recording consoles.

Ham Brosius of New York-based Audiotechniques, tells us he sees "a heightened interest in digital equipment of all kinds. If people are building a new studio or adding a new room, chances are they're looking into the advantages that digital offers. That's been affecting the design of the new rooms, because digital requires a different treatment of the low-end response of a room.

"From our viewpoint, the most popular and significant piece of equipment most studios will buy in the next couple of years will be a digital two track reel-to-reel," he continues. "A lot of people are waiting to see what happens with the new Sony and Studer units that will be available in early '85. I'd predict that a minimum of 300 to 400 of these two tracks will be sold in the next couple of years. They'll sell as fast as Sony and Studer can make them."

Finding the right property is just the beginning, of course. It's what the new owner or tenant does with the space that will determine if the business is a success.

Brosius points to the improved performance of digital two track over existing analog recorders as a primary reason for their demand. "Some nay-sayers feel the quality of digital still can't match a 30 ips, two channel recorder, but the fact remains, if you've got a digital, you're in the digital game and that's increasingly important, what with the proliferation of compact discs and all the other advantages, from the improved capability on the low-end, to the fact that you can make a number of digital copies of a tape that will be virtually identical."

Milam Audio of Pekin, Illinois just completed its largest installation to date, the new Washington D.C. headquarters of United Press International, the news service. Milan designed the complex, wired it and fully equipped it, which was a massive undertaking, according to Jerry Milam. "There were lit-

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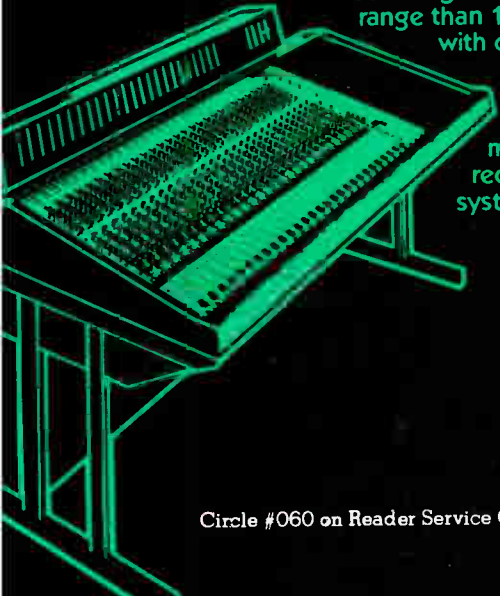

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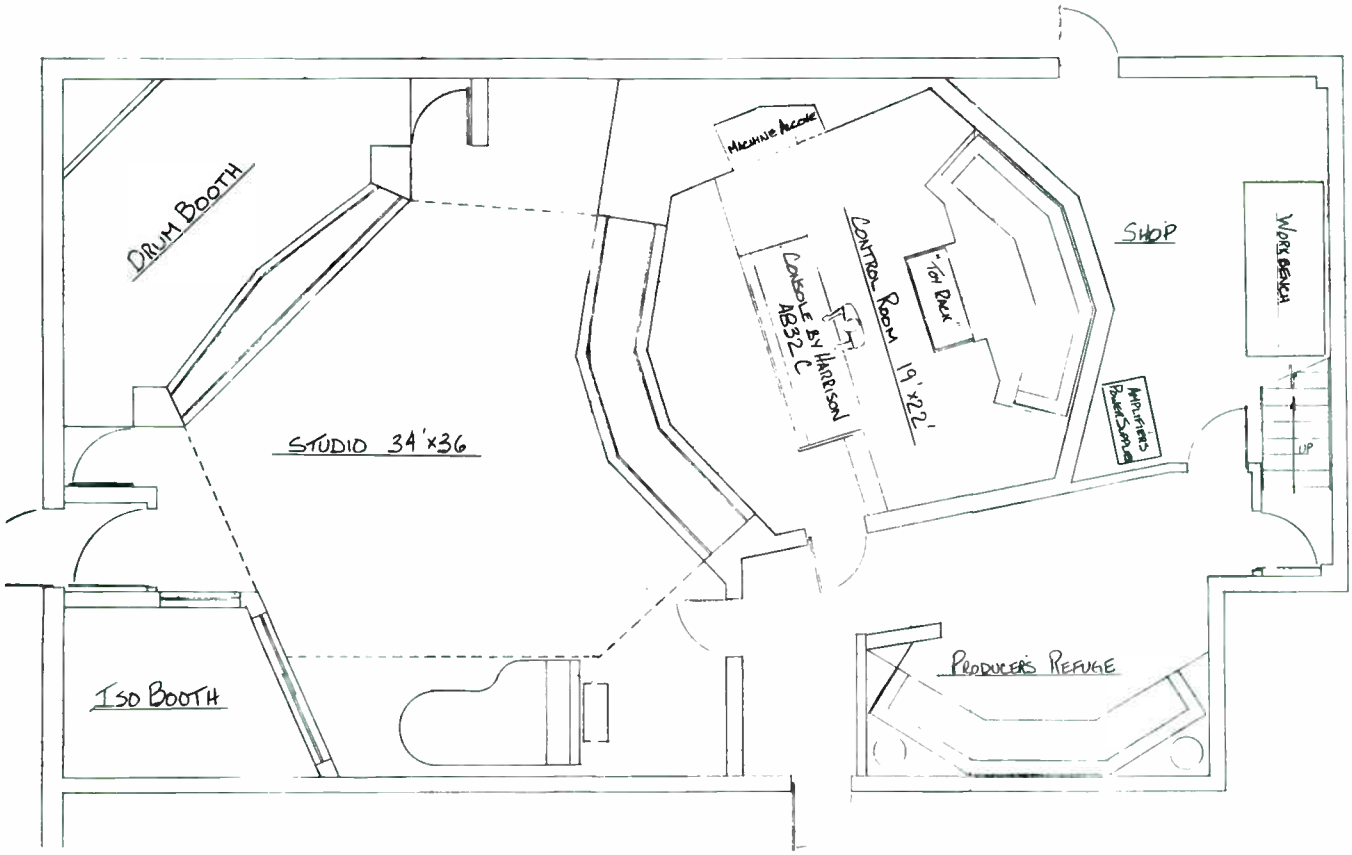

Above: Floor plan of Russ Berger's LEDE design for Otis Connor's Studio Centre, in Dallas, Texas, which is slated to go on line this month. Compare this to the two in-construction photos shown on page 84. (Design © 1984 by Joiner, Pelton, Rose)

erally thousands of connections," he says. Because of the nature of UPI's business, the job required designing a multi-studio set-up— some 20 suites were involved, Milam says. Milam installed 20 MCI tape machines and an elaborate switching system utilizing equipment by numerous manufacturers.

On the studio front, Milam got together with Russ Berger of Joiner, Pelton & Rose to put together TRC's new studios in Indianapolis. Milam Audio had built TRC's last studio about ten years ago, and when the owners decided they wanted to open a larger new facility, Milam got the call again. With Chuck Ballard handling the actual construction, Milam and J, P&R put in an LEDE™ control room, which was filled with equipment from the previous site, including a rebuilt Harrison board and MCI 24 track. "I really think that the LEDE is the wave of the future," Milam says. "Controlling the early reflections is really the key to the whole thing. Most people we've talked to who are building new studios or redoing older ones are interested in the LEDE or some sort of modification of it."

Barry Bremmer of Studiobuilders, in Los Angeles, California, reports that business has been very strong this year, with a good cross-section of big and small installations. They just finished putting in a new studio in the home of a Laguna Beach, California musician (who prefers to remain anonymous), using MCI and Amek equipment, and Bremmer says, "There's been a big across the board increase in home 24 tracks. "In addition, Studiobuilders has done a lot of electrical design work and recently installed the synchronization gear in Lion Share's new Studio B.

Henry Root, of Farmington, Michigan's Hy James—The Audio Professionals, says that the biggest project his company has been involved with recently was the construction of Pearl Sound in nearby Canton, Michigan. Owned by Ben Grosse, the studio was a gutted shell when Hy James came in. The studio used a Westlake design, for which Hy James provided a 40 input Neotek board and a slew of other top-of-the-line gear. Other projects Hy James has been involved with of late include CBS-Fox Video, who took a dbx 700 processor (an item Roots says has generated a lot of inquiries); installation of Otari MTR-80s in Joseph Productions and K&R Recording; and work on a home studio for musician Gary Spaniola.

Root comments that a positive trend he sees is that "People are much more willing to think for themselves when they're putting together a studio. They don't just automatically buy whatever they think people are talking about. That's been good for us and for the whole industry." ■

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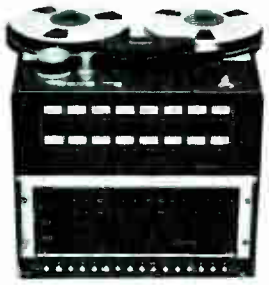

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LANE AUDIO & RECORDS
SD, AC, SES, for sonic restoration studios only
P.O. Box 29171, Los Angeles, CA 90029
(213) 469-8007
Contact: Michael R. Lane

LIVINGSTONE AUDIO
SES, Rentals
8456 W. Third, Los Angeles, CA 90048
(213) 653-0270
Contact: Mike Freas

MARCOM
SES, EI
PO Box 828, Hollywood, CA 90078
(818) 703-0381
Contact: Doug Howland

STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

SOUTHERN CALIFORNIA

NEOTEK WEST
SES, EI
4007 W. 6th St., Los Angeles, CA 90020
(213) 387-7999
Contact: Lincoln Zimmanck

NEW ERA WOOD WORKS
SD, AC, EI
14851 Aetna St., Van Nuys, CA 91411
(213) 785-3358
Contact: Dick Pyles

NEW WORLD AUDIO, INC.
SD, AC, SES, EI
4877 Mercury St., San Diego, CA 92111
(619) 569-1944
Contact: Jim Scott

PERCEPTION INC.
Los Angeles, CA

PERCEPTION INC.
SD, AC
P.O. Box 39536, Los Angeles, CA 90039
(213) 933-5271
Contact: G.L. Augspurger
Services offered, credits, specialization: This consulting group is headed by well-known acoustician and studio design expert, George L. Augspurger. His wide experience with commercially successful TV, film and recording studios covers every major record label as well as the most prestigious independent studios. Projects currently underway include four major recording complexes, a number of studio remodeling designs, acoustical consultation for auditoriums and film sound stages, two TV sweetening room designs, and acoustical corrections in three existing studios. Perception Inc. provides professional consulting and design services to architects, builders and studio owners; it has no association with any contractor or equipment supplier. In addition to studio design services and acoustical consultation, the company provides extensive acoustics testing capabilities. Mr. Augspurger is a member of the Audio Engineering Society, Acoustical Society of America, U.S. Institute for Theatre Technology, American Theatre Association and National Council of Acoustical Consultants.

PROAUDIO SYSTEMS
West Covina, CA

PROAUDIO SYSTEMS
SD, SES, EI
239 North Azusa, West Covina, CA 91791
(818) 966-1781
Contact: Russ Rosenfelo
Services offered, credits, specialization: ProAudio Systems offers state-of-the-art professional audio equipment in a hands-on environment. Multitrack systems for the songwriter-producer as well as studio systems are featured. Complete audio consultation, service and instruction are part of our audio package. A full-time recording school and workshop series are available in our 32-track facility. "From architectural planning to the top of the charts."

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(818) 843-6320
Contact: Bob Hacken

PROFESSIONAL AUDIO SERVICE & SUPPLY
Burbank, CA

PROFESSIONAL AUDIO SERVICE & SUPPLY
SD, AC, SES, EI
4628 West Magnolia Blvd., Burbank, CA 91505
(818) 843-6320
Contact: Bob Hacken

PROJECT ONE A/V
SES
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(213) 464-2285
Contact: Dalton Priddy

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(818) 786-8288
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Contact: Michael Rettinger

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(213) 877-8877
Contact: John Tait

BRYAN J. RUSENKO
EI
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SCHAFER WORLD COMMUNICATIONS CORPORATION
SES
PO Box 1279, Carpinteria, CA 93013
(805) 684-7686
Contact: Jerry Clements

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SD, AC, SES, EI
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(714) 961-8870
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SHOOTING STAR PRODUCTIONS
EI
1165 Harding, Orange, CA 92667
(714) 997-8145
Contact: Bob Joly

SHORELINE TELEPRODUCTIONS SYSTEMS, INC.
EI
3459 Cahuenga Blvd. West, Los Angeles, CA 90068
(213) 851-1236
Contact: Chris Baumgart, managing director/owner

SIERRA AUDIO ACOUSTICS, LTD.
SD, AC
721 South Glenwood Place, Burbank, CA 91506
(213) 843-8200
Contact: Kent Duncan

SIERRA HIDLEY ACOUSTICS LTD.
SD, AC
721 So. Glenwood Place, PO Box 7736,
Burbank, CA 91506
(818) 843-8200, Telex: 662745 (K. Duncan Bubk)
Contact: Kent Duncan, Tom Hidley
Services offered, credits, specialization: Sierra Hidley Design has completed over 325 studios on six continents. Projects under way include Atlantic Records, New York; a 4th project for Danish radio, Copenhagen, a 16th studio for CBS-Sony in Hong Kong, Contec TV in Hong Kong, Studio South in Austin, mobiles for Danish radio and Reelsound in Texas. From Caribou Ranch to Kendun Recorders, can you afford not to take advantage of the experience?

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(213) 393-5332
Contact: David Epstein

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LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

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Huntington Beach, CA

SOUND ADVICE
SES, EI
7611 Slater Ave., Suite N, Huntington Beach, CA 92647
(714) 842-2213
Contact: David Kennedy

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SD, AC, SES, EI
6315 Laurel Canyon Blvd., N. Hollywood, CA 91606
(213) 506-8216
Contact: Ed King

SPEAKER REPAIR OF CALIFORNIA
EI
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(213) 666-4161
Contact: Stephan Christofferson
Services offered, credits, specialization: Sonex acoustic foam panels, Hafler amplifiers, Altec speakers, Soundcraftsmen, McIntosh. Custom paging and intercom designs. Services: speaker rebuilding, tailoring, magnetizing. Costs: approximately $3.50 to $9.00 per cone-inch. Send by UPS. Freight free return after 3-day cleaning, glueing, re-centering, and fatiguing process. Clients include: Rod Stewart, Frank Zappa, The Who, Stanley Clarke, Supertramp, Heider Studios, Glen-Glen Sound, The Record Plant, The Complex. All major and uncommon brands

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Contact: D. Sprague

STUDIO INSTRUMENT RENTALS/PRO AUDIO
SES
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(213) 466-3417
Contact: Tom Espby
also
826 Folsom St., San Francisco, CA
(415) 495-3200
Contact: Tim Scott
310 W. 52nd St., New York, NY
(212) 975-0920
Contact: Bo Holtz
310 5th Ave South, Nashville TN
(615) 255-4500
Contact: Dave Burkett

STUDIO MAINTENANCE SERVICE INC.
SD, AC, SES, EI
12458-60 Magnolia, N. Hollywood, CA 91607
(213) 877-3311
Contact: Dave Michaels

SUNTRONICS
SES
7127 Balboa Ave., Van Nuys, CA 91406
(818) 781-2537/781-2604
Contact: Stan Jones

SUNTRONICS
SES
1620 W. Foothill Blvd, PO Box 734, Upland, CA 91786
(714) 985-0701/985-5307
Contact: Tracy Patterson

SVEN LINDE ASSOCIATES
Architecture/Acoustics/Engineering
SD, AC
1019 E. California Ave., Glendale, CA 91206
(818) 500-7718
Contact: Sven Linde AIA Architect

SYE MITCHELL SOUND CO., INC.
SD, AC, SES
22301 Cass Ave., Woodland Hills, CA 91364
(818) 348-4977
Contact: Sye Mitchell

VERTIGO RECORDING SERVICES
EI
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(818) 769-5232
Contact: Charles Bolois

WESTERN PRO AUDIO, INC.
North Hollywood, CA

WESTERN PRO AUDIO, INC.
SD, AC, SES, EI
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(213) 980-5605
Contact: Greg Lamping
Services offered, credits, specialization: MCI/Sony sales, service and parts support. Over 50 lines of other professional audio equipment. Complete audio systems design installation and service.

WESTLAKE AUDIO INC.
SD, AC, SES, EI
7265 Santa Monica Blvd., Los Angeles, CA 90046
(213) 851-9800
Contact: Chris Carey

WEST LA MUSIC
SD, AC, SES, EI
11345 Santa Monica Blvd., Los Angeles, CA 90025
(213) 477-1945
Contact: Lisa Horn or Phill Manor

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WHITTIER MUSIC COMPANY
Whittier, CA

Whittier Music Company
SD, AC, SES, EI
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(213) 947-4671
Contact: Cliff Spiegel
Services offered, credits, specialization: Whittier Music Company has over the past seven years, discovered a large group of consumers that need more than a new set of strings and less than a 32-track recording studio. The movie and video industry has created a demand for post production audio studios that range from 4-16 track and beyond. Within its relaxed, low pressure interior, knowledgeable sales and technicians and over 250 product lines satisfy most recording needs. Whittier Music Company can supply the smallest home recording setup, design and supply mid-size SMPTE ready production and public recording facilities, and fully construct, wire and design 1" 16-track studios to state-of-the-art 24-track 2" complexes. Whittier Music Company sells the musical instruments and pro sound systems for the musician to be heard by his friends and the recording equipment for the music to be heard by the world.

NORTHWEST

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SES
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(800) 426-9233 (orders only)
(206) 621-9222 (information only)
Office also in Portland, OR, San Francisco, CA, midwest and southeast

APPLIED TECHNOLOGY, INC.
SD, AC, SES, EI
11 North Highway 89, North Salt Lake City, Utah 84054
(801) 292-0075/292-0184
Contact: Bill Cheney

ARTISTS' ENGINEERING
SD, EI
14444 Skyline Blvd., Woodside, CA 94062
(415) 851-0388
Contact: Harry Sitam
Services offered, credits, specialization: **SERVICES OFFERED:** A full range of technical services for recording studios and related pro-audio facilities, (except acoustical or computer work). Both shop and field services are available by appointment. **CREDITS:** Owner/Operator was employed at Wally Heider's San Francisco maintenance department 1970-76, provides technical services for Neil Young's studio 1971 Present, established Artists' Engineering in 1976 to provide service for various Northern California studios, factory trained at 3M and Ampex. **SPECIALIZATION:** 1. Installation and modification of recording systems. 2. Custom design and fabrication of sub-systems and interface assemblies for recording systems. 3. Tape recorder service, experienced on most brands and models, facilities for complete overhaul.

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(916) 443-4773; Reno: (702) 329-2401
Contact: Wally Clark, Tom Lewis

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

NORTHWEST

AUDIOCOM, INC
AC, EI
719 E. 11th Ave., Anchorage, Alaska 99501
(907) 276-5242
Contact: Dave Traver

AUDIO - VIDEO - COMPUTER SERVICE CENTER
EI
519 East Pine Street, Seattle, WA 98122
(206) 329-2580

AURACOUSTIC RESEARCH & ENGINEERING
SD, AC, SES, EI
448 DuBois, San Rafael, CA 94901
(415) 459-5152
Contact: Dr. Richie Moore

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Contact: Sharon K. Barath

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EI
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(206) 546-1316
Contact: Ed Blackwood

BROADCAST SUPPLY WEST
SES
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(206) 565-2301

BROWNELL SOUND & HI FI, INC.
SES, EI
3601 S.E. Concord, Milwaukie, OR 97222
(503) 659-0394
Contact: Curtis Brownell

CALIBRATION STANDARD INSTRUMENTS
AC
P.O. Box 2727, Oakland, CA 94602
(415) 531-8725
Contact: Debbie

CAPITAL COMMUNICATIONS INDUSTRIES, INC.
AC, SES, EI
PO Box 481, Olympia, WA 98507
Contact: Mr. Shannon L. Ericsson

RICK DAVIS, AUDIO ENGINEER
SD, AC, SES, EI
456 W. Charleston Rd., Palo Alto, CA 94306
Contact: Rick Davis

DB AUDIO
Berkeley, CA

DB AUDIO
AC, SES
2578 Shattuck Avenue, Berkeley, CA 94704
(415) 548-8733
Contact: Doug Blackwell
Services offered, credits, specialization: Specializing in reference room, engineers home, and playback systems. Consultants, suppliers and service agents for the San Francisco Opera's music library, Bay Area Music Archives, IUC cutting Center, Oakland Museum, KQED and the UC Berkeley Music Library. Doug Blackwell, owner of DB Audio is a graduate in electronics, musician, lecturer, designer, member of N.S.C.A. and A.E.S. (Audio Engineering Society).
My wish for studio reference rooms: Quality equipment for quality listening. Use equipment like Audio System buyers use, not P.A. system amps and theater speaker systems. The many users of my systems are quite pleased with the increased enjoyment of their improved monitor systems.

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Contact: Thomas Mullins

E.M. LONG ASSOCIATES
AC
4107 Oakmore Rd., Oakland, CA 94602
(415) 531-8725
Contact: Edward M. Long

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San Jose, CA

GUITAR SHOWCASE
AC, SES, EI
3090 S. Bascam Ave., San Jose, CA 95124
(408) 377-5864 or (800) 2-GUITAR
Contact: Ken Dugan

HORSESHOE MUSIC COMPANY
SES
2419 S.E. 39th Ave., Portland, OR 97214
(503) 235-7095
Contact: Mark Miller, Rudy Battjes, Doug Fraser

HUN SOUND INC. (HUMAN'S UNDERSTANDING NEEDS)
San Rafael, CA

HUN SOUND INC. (HUMAN'S UNDERSTANDING NEEDS)
SES
647 Irwin St., San Rafael, CA 94901
(415) 454-2911
Contact: Al or Don Podesto

HUPPIN'S
SES
421 W. Main, Spokane, WA 99201
(509) 747-6055
Contact: Sam Huppin

LASCO AUDIO, INC.
SES, EI
PO Box 919/1215 Griffin Ave., Enumclaw, WA 98002
(206) 825-3600
Contact: Alan

LEO'S PROFESSIONAL AUDIO
Oakland, CA

LEO'S PROFESSIONAL AUDIO AND MUSIC TECHNOLOGIES
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5447 Telegraph Ave., Oakland, CA 94609
(415) 652-1553
Contact: Bob Ulius, General Manager
Services offered, credits, specialization: Sales, service, and installation of Sony/MCI Professional Audio Equipment and virtually every major brand of professional recording, broadcast, and sound reinforcement equipment. Extensive inventory of keyboards, synthesizers, computers, and software for studio and stage use including the new and highly innovative Kurzweil 250. Leo's maintains four showrooms including a working 24 track control room and is uniquely able to demonstrate the complete product lines of over 120 manufacturers. Our sales staff is particularly attuned to the marriage of multitrack audio, computers, and keyboards. Factory trained service available on most major lines.

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(303) 778-0949
Contact: Bill Rollin

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SD, EI
926 Newman Drive, So. San Francisco, CA 94080
(415) 755-1342
Contact: Peter Lude'
Services offered, credits, specialization: Lude' Broadcast Engineering is a design and installation firm providing high-quality, cost-effective audio and video facilities of all sizes. Services include designing operator-friendly systems using existing equipment, or consultation in specifying the appropriate new hardware. Custom equipment modification and design is also available.
Regardless of the size of the facility, Lude' Broadcast Engineering installs all systems with logical design, impeccable craftsmanship and painstaking documentation. Specializing in video post-production and mobile units, recent projects have ranged from state-of-the-art videodisc pre-mastering edit systems, to modest outs-only edit suites, and from mobile EFP units to broadcast studios.
Clients have included commercial and non-commercial television stations, corporate media centers, educational and government institutions, production houses, equipment manufacturers, and cable TV operators.

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(415) 783-8043
Contact: Don Pifer

MEYER & ROSS
SES
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(415) 348-6800
Contact: M. Foodym

MIRACLE MUSIC
SES
2363 Pacific, Stockton, CA 95204
(209) 466-4388
Contact: Jerry Senderov

MUSIC MACHINE INC.
SD, AC, SES, EI
205 W. Kennewick Ave., Kennewick, WA 99336
(509) 582-3568
Contact: Dave Carpenter

THE MUSIC ROOM
SES
137 W. Center, Kalispell, MT 59901
(406) 755-3677
Contact: F. Weber, A. Boveng

NEVADA SOUND & COMMUNICATIONS
SD, AC, SES, EI
60 Glen Carran Circle, Sparks, NV 89431
(702) 331-5555
Contact: Walter Wellman

NORTHWESTERN, INC.
SES
1224 S.W. Broadway, Portland, OR 97205
1-800-547-2252
Contact: Bob Lindahl, Paul Boescher

OLYMPIA AUDIO/VIDEO PROFESSIONALS
SES, EI
5711 Lacey Blvd., #307, Lacey, WA 98503
(206) 459-3841
Contact: Joe Contes

STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

NORTHWEST

PAOLETTI/LEWITZ/ASSOCIATES INC.
SD, AC
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(415) 391-7610
Contact: Joel or Dennis

PATCHBAY STUDIOS
SD, AC
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(415) 459-2331
Contact: Gordon Elliott, Ron Saurman

PERFORMANCE AUDIO
AC, SES, EI
2358 So. Main, Salt Lake City, UT 84115
(801) 355-8890
Contact: Klay Anderson

P & G SOUND AND PHOTO
SES
931 DiGiulio Ct., Santa Clara, CA 95050
(408) 988-4503
Contact: Paul Goeltz

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AC, SES, EI
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(808) 735-3625
Contact: Whitter Davis

PRO MEDIA
SD, SES, EI
185 Berry St., Suite 358, San Francisco, CA 94107
(415) 957-1383
Contact: Debra Kay

DENNIS RICE STUDIO SERVICES
SD, AC, EI
1907 Ardith Dr., Pleasant Hill, CA 94523
(415) 686-6493
Contact: Dennis Rice
Services offered, credits, specialization: Acoustic consultation and design for the new audio complex or expansion on existing studio. Computer assisted evaluation to insure an acoustically sound room environment, while maintaining a pleasing aesthetic quality. Full installation and maintenance services offered as well.

RMS SOUND
SES, EI
17517 15th N.E., Seattle, WA 98155
(206) 362-0491
Contact: Greg Paisley

RMS SOUND
SES
3235 S.E. 39th Ave., Portland, OR 97202
Contact: Ray Bloom

SELECTRONICS
SES
So. 125 Stevens, PO Box 521, Spokane, WA 99204
(509) 624-4430
Contat: Alan Perry

SKIP'S MUSIC, INC.
SES
2740 Auburn Blvd., Sacramento, CA 95821
(916) 484-7575
Contact: Matt Flynn

SONIC LANDSCAPES
SD, AC
1811 Grand Avenue, Suite C, San Rafael, CA 94901
(415) 459-1675
Contact: Randy Sparks
Services offered, credits, specialization: At Sonic Landscapes our goal is to help build your studio. We work directly with our clients to assist in the realization of their project. Reinforcing your ideas with solid acoustic principles, and innovative design concepts, we can build a strong foundation for your successful venture.
All our clients receive the benefit of our computer assisted design process. Sonic Landscapes has developed proprietary computer programs to assist our consultants in designing acoustically accurate studios. The increased efficiency which the computer brings to our design process allows Sonic Landscapes to keep overall design costs down.
Services Offered: LEDE Type or traditional Recording Studio Design, Broadcast and Video Post-production Studio Design, Soundstage Design, Small Theatre Design, Construction Blueprints, Interior Design, General Acoustic Analysis and Consulting, and Design Related Mechanical, Electrical, and Structural Engineering.
Clients Include: Atari Inc., Avid Studios, Inc., Redwood City, CA, Robert Berke Recording, S.F., CA, KZST Radio, Santa Rosa, CA, Live Oak Studios, Oakland, CA, New Life Broadcasting, Quincy, CA, Pacific Telephone, Spazelle Films, S.F., CA, Theatre on the Square, S.F., CA

sound genesis®

SOUND GENESIS
San Francisco, CA

SOUND GENESIS
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(415) 285-8900
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(415) 459-3043
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1-800-354-7252
Contact: Scott, Tom, Roger or Bill

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(408) 395-2448
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(916) 484-7575
Contact: Larry Lauzon

TRAX AUDIO
AC, SES, EI
2470 North Fairfield Rd., Layton, UT 84041
(801) 776-4271
Contact: Jeff Ostler

WILSON, IHRIG & ASSOCIATES
AC
5776 Broadway, Oakland, CA 94618
(415) 658-6719
Contact: George Paul Wilson, President
Services offered, credits, specialization: Based on nearly twenty years experience in the acoustical design of all types of recording and performance facilities and in the measurement, evaluation, prediction and control of noise and vibration, Wilson, Ihrig & Associates, Inc. (WIA) has earned a reputation as one of the nation's leading acoustical consulting firms. By virtue of the technical expertise developed by our professional staff, we are eminently qualified to provide consulting services on a wide range of acoustical projects. In addition, our precision noise and vibration measuring equipment and extensive laboratory facilities provide us with the capability of performing detailed acoustical analyses when required to solve complex problems. Whether your project requires innovation, state-of-the-art engineering and architectural solutions, or simple answers to more routine noise and vibration problems, WIA can provide you with the appropriate level of assistance and design you need.

NORTH CENTRAL

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(312) 794-0224
Contact: Tom Harle

ALLIED BROADCAST EQUIPMENT
SES
635 South "E" Street, Richmond, IN 47374
(317) 962-8596
Contact: David Burns

ANTECH LABS
SD, AC, SES EI
11118 Olive St. Rd., St. Louis, MO 63141
(314) 997-5666 or (800) 325-1960
Contact: Bill Scheurmann

AUDIOLIGHT, INC.
SES, EI
22017 Grand River, Detroit, MI 48219
(313) 531-8892
Contact: Russell Jewell

AVC SYSTEMS INC
SD, AC, SES, EI
2709 East 25th St., Minneapolis, MN 55406
(612) 729-8305 *and*
747 Church Rd., Suite A6, Elmhurst, IL 60126
(312) 279-6580
Services offered, credits, specialization: Complete design, equipment selection, installation and maintenance services available. Showrooms in both Minneapolis and Chicago, displaying over 150 lines of professional audio equipment for recording studio, audio for video, film or AV products, remote vans, permanent sound systems. Sales and sevice on Otari, MTR series 2 24 tracks, Harrison Systems, Soundcraft, Lexicon, IBL, Ampex, Tascam 2-16 track, Eventide, BTX, Ramsa, Echo Plate, MICMIX, AKG, DeltaLab, Dolby, Neumann, Sennheiser, Fostex pro, Crown, BGW, MXR, Orban, Klark-Teknik, Omnicraft, Clear Com, Bose, Altec, Biamp, ADR, MRL, IVIE, Shure, Technics,

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

NORTH CENTRAL

HME, Vega, Telex, Calrec, Atlas, Symetrix, UREI, Studer-Revox, CSI, Switchcraft, Neutrik, Scotch, Agfa and Sonexfoam

AVC SYSTEMS INC.
Minneapolis, MN and Elmhurst, IL

BAY MUSIC
SES
3668 Bay Road, Saginaw, MI 48603
(517) 799-9443
Contact: Edward Kurth/Brian Bennett

BIG DUDE'S MUSIC CITY
SES, EI
3817 Broadway, Kansas City, MO 64111
(816) 931-4638
Contact: Joe Cannon

BRIDGEWATER CUSTOM SOUND
SD, AC, SES, EI
15957 South Halsted, Harvey, IL 60426
(312) 596-0309
Contact: Paul Driggs

BROADCAST ELECTRONICS, INC.
SES
4100 North 24th Street, PO Box 3606, Quincy, Illinois 62305
(217) 224-9600
Contact: Joe Engle

CLINE COMMUNICATIONS
EI
1242½ Remington Rd., Schaumburg, IL 60195
(312) 882-2433
Contact: Brian Cline

COOK CHRISTIAN SUPPLIES
SES
219 Prospect, Alma, MI 48801
(517) 773-1935
Contact: Rob Cook

CSE SYSTEMS
SD, AC, SES, EI
1381 South Hamilton Road, Columbus, OH 43227
(614) 235-3103
Custom: Mr. Chet Hall

CUSTOM STEREO
SD, AC, SES, EI
1381 South Hamilton Road, Columbus, Ohio 43227
(614) 235-3103
Contact: Mr. Chet Hall

C-TAPE DEVELOPMENTS, INC.
SES
PO Box 1069, Palatine, IL 60078
1-800-562-5872
Contact: Glenn Mullis
Services offered, credits, specialization: C-Tape Developments manufactures Flexible-Tape Microphones for use on acoustic stringed instruments, piano and drums. These capacitive strips provide studio quality reproduction with high rejection of ambient noise and adjacent instruments.
Each system consists of from one to six "tapes" and a phantom powerable Preamp with simultaneous Lo-Z balanced and Hi-Z unbalanced outputs. Output is continuously adjustable from mike to line level. A power supply is provided for use where no phantom is available. Frequency response, downstream of the preamp is 45-22 kHz ± 3dB.
The tapes are applied to the instrument using double-sided tape. Ease of installation is indicated by the typical time required to mike-up a piano: UNDER 5 MINUTES!!

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

ELECTROMEDIA SERVICES (EMS), INC.
EI
24166 Haggerty Road
Farmington Hills, MI 48024
(313) 477-6502
Contact: Jim Pashkot
Services offered, credits, specialization: As the Detroit area's only service company to specialize in the needs of the audio professional, EMS offers a full range of services. EMS provides fast, economical bench and field service for all brands of professional and semi-professional audio equipment, studio installation and maintenance, and custom electronic design, modification and fabrication. Complete head re-lapping services are offered along with precision mechanical and electrical tape recorder alignments. EMS makes available Studio Maintenance Plans and Extended Warranty Contracts for most brands of professional audio equipment.

ELECTRONIC SOUND EQUIPMENT CO. INC.
SES, EI
2249 Division Ave S, Grand Rapids, MI 49507
(616) 241-3425
Contact: Harvey Jay Kingma

FLANNER'S PRO AUDIO, INC.
SD, AC, SES, EI
2323C Bluemound Rd., Waukesha, WI 53186
(414) 785-9166 (800) 558-0880
Contact: John Loeper, Mark Linton or Scott Leonard

FULL COMPASS SYSTEMS
Madison, WI
—*PAGE 106*

Midwest Success Story

AUDIOGRAPH·PRODUCTIONS·INC

Okemos, Michigan

WORLD CLASS ACP PRODUCTION

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UREI 813 Monitors
Neotek 32x24 Series II Console
Otari Two Track Recorders
Lexicon 224X Digital Reverb
Lexicon Prime Time Processors
Lexicon PCM 42 Processor
Eventide H-910 Harmonizer
Eventide Instant Flanger
Aphex Type B Aural Exciter
UREI 1176 & 1178 Limiters
UREI 546 Parametric Equalizer
dbx 160X Compressor/Limiters
Valley People Kepex II & Gain Brain II
Orban De-esser

For the Ultimate in Professional Audio and Audio Post-Production Equipment and Consultation, CONTACT

HY JAMES *The Audio Professionals*

24166 Haggerty Road, Farmington Hills, Michigan 48018 U.S.A.
(313) 471-0027 - from Ann Arbor 994-0934

Circle #073 on Reader Service Card

STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

NORTH CENTRAL

—*FROM PAGE 104*

FULL COMPASS SYSTEMS
SD, AC, SES
6729 Seybold Rd., Madison, WI 53719
(608) 271-1100
Contact: Jonathan Lipp
Services offered, credits, specialization: Consultation, specification, budget, design, custom work, installation.
Consultation, specification, budget: Full Compass Systems, Ltd. offers expert help in the specification of equipment for any production facility to fit any budget. Design control room layout for best human engineering. Design studio layout for best efficiency and co-existence with video production. Custom work: Full Compass Systems, Ltd. will modify existing equipment or create equipment that may not exist. Installation: expert wiring of patch fields and system interface. Full Compass systems, Ltd. offers rebatable against purchase consultation. Attention to budget and appropriateness are first criteria.

GHL AUDIO ENGINEERING
SD, AC
PO Box 273, Hilliard, OH 43026
(614) 876-1057
Contact: Gary Hedden
Services offered, credits, specialization: Due to active participation in current music production, GHL is particularly qualified to develop a design which is sensitive to a client's unique preferences and needs. GHL does not retail any equipment nor does GHL subscribe to any rigid approaches to acoustic design or control room geometry. Credits include several artist's personal rooms, Hidden West, the Diskworks, The Mult Shop, Bison Recording, Full Sail's, Dream Machine and the GHL Remote Audio facility. Special services include custom manufactured interfacing, electronics and complete audio truck construction.

GILL CUSTOM HOUSE, INC.
SD, SES, EI
8813 W. 95th St., Palos Hills, IL 60465
(312) 598-2400
Contact: John Gill, Greg Messer

GOURLEY PRO AUDIO
SES
400 N. Main Avenue, Sioux Falls, SD 57117
(605) 336-1456
Contact: Dick Bowman

GREAT AMERICAN MUSIC CO.
SES, EI
810 Dennison Drive #3, Champaign, IL 61820
(217) 351-1080
Contact: Albert Morr

HAZEL ST. SOUND & INTERFACE
EI
108 N. Hazel, Ames, IA 50010
(515) 232-0408
Contact: Jim Pfitzinger

HOOD INDUSTRIES
EI
5700 Superior Ave., Cleveland, OH 44103
(216) 431-4663

HSA/HEATHER SOUND AMPLIFICATION
AC, SES
121 Lincolnway West, Mishawaka, IN 46544
(219) 255-6100
Contact: Richard R. Johnson

HY JAMES - THE AUDIO PROFESSIONALS
SD, AC, SES, EI
24166 Haggerty Rd., Farmington Hills, MI 48024
(313) 471-0027
Contact: Henry J. Root/Tom Greenberg
Services offered, credits, specialization: Audio equipment for the professional—everything from tape stock on up through the Otari MTR-90 24-track recorders and consoles from Amek, Neotek, Soundcraft, Ramsa and Tascam are found in the Hy James demo rooms. BTX synchronizing equipment and the Otari MTR-10 or 12 mastering recorders make audio-for-video easily explained in a hands-on demo. Large monitor speakers can be auditioned with your program material in our own I.E.C. Listening Room. A full line of microphones are available including the Calrec Soundfield, Crown PZM and the B&K's. Hy James is Michigan's only full-line Tascam dealer. We offer leasing from people who understand the business, and we have full service, design, and consultation available for the audio professional. Hy James - The Audio Professionals

ICB AUDIO CO.
SES, EI
1349 E. McMillan St., Cincinnati, OH 45206
(513) 281-5535
Contact: Ian C. Budd

IRC AUDIO INC.
SES, EI
8112 Castleway Ct. West, Indianapolis, IN 46250
(317) 849-6887
Contact: Kevin Meeks
Services offered, credits, specialization: IRC Audio Talks Tascam! The complete Tascam line, Series 20, 30, 40, 50 and 85-16B, is in stock and on display in our demo control room. We specialize in cost effective turn-key studio packages for recording, audio-for-video, broadcast, corporate A/V, and mobile recording from 2 to 16 tracks using Tascam tape machines and mixing consoles and support equipment from: JBL, UREI, dbx, Crown, Tan-

noy, Ramsa, Shore, EAW, Aphex, Echoplate, EV, Ashly, Lexicon, Delta-Lab, Yamaha, Biamp, Ampex, Klark, Teknik and many more. We also offer custom designed sound reinforcement systems for any application.

KAVCO, INC.
SD, SES, EI
3931 Image Drive, Dayton, OH 45414
(513) 898-2003
Contact: Russell Johnson

KAYRON, INC.
SES
641 Madison, Oak Park, IL 60302
(312) 386-0464
Contact: Hal Kaitchuck

KC MUSIC & PRO AUDIO
Sound Works Division
SD, AC, SES, EI
6924 W. 79th St., Overland Park, Kansas City, KS 66204
(913) 381-5206
Contact: Mick Warnock

KHS/OTM SOUND COMPANY
SD, AC
108 Birch, Park Forest, IL 60466
By written appointment only
Contact: Klaus H. Seliger, President

C.V. LLOYDE SOUND SYSTEM
SES
102 S. Neil St., Champaign, IL 61820
(217) 352-7031
Contact: C.V. Lloyde

MIDWEST SOUND & LIGHTING
SD, AC, SES, EI
2324 "O" St., Lincoln, NE 68510
(402) 474-4918
Contact: John Knoth

MIDWEST
Sound & Lighting

MIDWEST SOUND & LIGHTING
Omaha, NE

MIDWEST SOUND & LIGHTING
SD, AC, SES, EI
308 S. 72nd St., Omaha, NE 68114
Contact: Pete Franks

MILAM AUDIO
SD, AC, SES, EI
1470 Valle Vista Blvd., Pekin, IL 61554
(309) 346-3161
Contact: Jerry Milam

AL NALLI ANNEX
SES, EI
312 S. Ashley, Ann Arbor, MI 48104
(313) 665-7008
Contact: Rob Nalli

PI KEYBOARDS & AUDIO, INC.
SES, EI
13329 Pearl Rd., Cleveland, OH 44136
(216) 238-0644
Contact: David Yost

Services offered, credits, specialization: Specialization in studio/pro-audio equipment supply and repair for the Midwest. Fully stocked operational showroom of OTARI, TASCAM, FOSTEX, TRIDENT, SOUNDCRAFT, RAMSA, LINN, JBL, UREI, LEXICON, EVENTIDE, ROLAND, URSA MAJOR, ADA, SYMETRIX, APHEX, DBX, FURMAN, & MORE. Repair services on premise. Warranty repair station for all major brands. Hours: 12-9 Mon-Thurs., 12-6 Friday, 11-4 Saturday

PI KEYBOARDS & AUDIO, INC.
Cleveland, OH

Pi KEYBOARDS & AUDIO

PRECISION AUDIO, INC.
SES
18582 U.S. 20, Bristol, IN 46507
(219) 295-7493
Contact: Sanford Swartzendruber

PYRAMID AUDIO INC.
SD, AC, SES, EI
450 W. Taft Dr., South Holland, IL 60473
(312) 339-8014
Contact: Rob Vukelich

GEORGE RONDINELLI MUSIC
SES
1101 Main, Dubuque, IA 52001
(319) 583-8271 or 583-8272
Contact: George Rondinelli

SOUND SOLUTIONS, INC.
SES, EI
5701 Canton Center Rd., Canton, MI 48187
(313) 455-5557
Contact: Dave Hill

SOUND SYSTEMS SPECIALIST
EI
2220 Yale, Springfield, IL 62703
(217) 789-7078
Contact: Chuck McCarrel

SOUND WORLD
SES, EI
1808 SE 3rd Ave., Rochester, MN 55901
(507) 288-8326
Contact: Nick Alexakis, Ray Hylland

SOUNDZ MUSIC RENTALS & SALES
SES, EI
516 N. Milwaukee Ave., Wheeling, IL 60090
(312) 537-8211
Contact: C. Etian

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SOUTH WESTERN COMMUNICATIONS, INC.
SD, SES, EI
PO Box 5288, Evansville, IN 47715
(812) 477-6495
Contact: James R. "Randy" Miller, Pres

SUN SOUND SYSTEMS, INC.
SES, EI
4846 Main St., Skokie, IL 60077
(312) 679-1150
Contact: Ron Bressler, Tom Christenson

SUPERIOR SOUND, INC.
SD, AC, SES, EI
625 E. Pawnee, Wichita, KS 67211
(316) 263-4444
Contact: Jim Pearce

SWALLEN'S
SES
3700 Red Bank Rd., Cincinnati, OH 45227
(513) 527-6825
Contact: Paul Niehaus

SYNDER SYSTEMS
SES
16638-40 Warren, Detroit, MI 48224
(313) 881-5167
Contact: Kenny or Moon

THOMPSON ELECTRONICS COMPANY
AC, SES, EI
3522 W. Harmon Highway, Peoria, IL 61604
(800) 323-3300 (Illinois Only) or (309) 637-2277
Contact: Craig Thompson, Bill Harlan

NORTHEAST

ACES USA
SD, AC, SES, EI
244 Lyell Ave., Rochester, NY 14608
(716) 458-5610
Contact: Mr. Boyd Mc Coy

ACOUSTIC DESIGN/CONSTRUCTION
SD, AC, EI
5 Donaldson Pl., Roslyn, NY 11577
(516) 484-6622
Contact: John Julien

ACOUSTILOG, INC.
SD, AC, SES, EI
19 Mercer St., New York, NY 10013
(212) 925-1365
Contact: Alan Fierstein

A.F. ASSOCIATES INC.
EI
100 Stonehurst Ct., Northvale, NJ 07647
(201) 767-1000
Contact: Bill Ebeil

ALTEI SOUND OF CT INC.
SD, SES, EI
2392 Main St., Bridgeport, CT 06606
(203) 374-0162
Contact: D. Cantalini, M. D'Amore

ANALOGIQUE PROFESSIONAL SYSTEMS
SD, AC, EI
17 W. 17th St., New York, NY 10011
(212) 989-4240
Contact: Jean Pierre Mulot/George Reisz
Services offered, credits, specialization: Analogique Professional Systems is a world class acoustical and engineering design company specializing in recording studios and control rooms, mastering studios, and audio for video. With over 17 years in acoustic design and engineering, Francis Milano, senior design engineer, is now based in New York. Currently in development is the first true digital designed control room and recording studio. Just outside Atlantic City, this studio complex is designed and built from the ground up and will set the standard for digital design and digital acoustical concepts. Among completed projects this year, Sonic Recording Studio, Freeport, New York, had their Studio A control room completely redesigned utilizing the Milano Concept© This control room was featured on the May cover of Mix and has generated great interest in the New York area. For RockAmerica, the leading national music video distribution pool, Mr. Milano designed an in-house post production audio-for-video remastering facility. All projects are considered on an individual basis. Past projects include Vogue and Philips recording complexes, Gang Studio, Translab Mastering, Delphine Studio, Radio Monte Carlo Nova Broadcast and Production Studio, and a state-of-the-art motion picture projection and sound studio for Philip Sarde (Quest for Fire)

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

NORTHEAST

ANALOGIQUE PROFESSIONAL SYSTEMS
New York, NY

ANDOL AUDIO PRODUCTS INC.
SES
4212 14th Ave., Brooklyn, NY 11219
1 (800) 221-6578
Contact: Anthony Maniere

ANDREWS AUDIO CONSULTANTS
SD, AC, SES, EI
347 West 39th St., New York, NY 10018
(212) 736-9570
Contact: David M. Andrews

AST SOUND
SES, EI
250 West Broadway, New York, NY 10013
(212) 226-7785
Contact: Mike Kramer

A/T SCHARFF RENTALS
SES, EI
1619 Broadway, New York, NY 10019
(212) 582-7360
Contact: Peter Scharff, Josh Weisberg

AUDIO ARTISTRY
AC
PO Box 56, Kensington, MD 20895
(301) 493-8323
Contact: Farrel M. Becker
Services offered, credits, specialization: Control room design. Acoustical and electronic measurements. TEF (Time, Energy, Frequency) measurements using Tecron TEF System 10 analyzer. TEF measurements include time delay spectrometry (TDS), energy time curves (control room acoustics), and anechoic measurements of monitor loudspeakers (frequency and phase responses). Energy time curve measurements may be used to "tune" acoustics of control rooms during construction or to retrofit existing rooms. Making measurements is one thing, but it is knowing how to interpret them that counts. We have six years experience with TEF measurement systems. TEF measurement equipment available for rental with or without operator.

AUDIOFORCE
SES-Rental Only
147 W. 24th St., New York, NY 10011
(212) 741-0919/(800) 847-4123
Contact: Sid Zimet

AUDIO INTERFACE
EI
38 Woodcrest Rd., Whippany, NJ 07981
(201) 884-1542
Contact: Jim Stephen

AUDIOTECHNIQUES, INC.
Studio Sales Department
SD, AC, SES, EI
1619 Broadway, 4th Fl., New York, NY 10019
(800) 223-2486, (212) 586-5989
Contact: Gene Perry
Services offered, credits, specialization: Audiotechniques, Inc. offers a complete turnkey studio capability from mono to twin 24 track. After 12 years of experience serving record companies, independent recording studios, radio and TV stations, home recording facilities, and a variety of other users of professional recording equipment, Audiotechniques is recognized as one of the most capable recording studio suppliers in the world. Audiotechniques maintains offices and technical facilities in both New York City and Stamford, CT, with satellite sales/service centers in Boston and Washington DC. Audiotechniques studio design and equipment specialists will be pleased to give you a quote.

AUDIOTEK
Hollis, NY

AUDIOTEK
SD, AC, SES, EI
182-35 Jamaica Ave., Hollis, NY 11423
(212) 526-1456
Contact: Herb Horton
Services offered, credits, specialization: Audiotek is a full-service company providing everything from A to Z with regard to studio consultation, studio design, installation, modification, custom manufacturing, as well as equipment installation for all broadcast transmission equipment, broadcast audio and video, professional recording equipment, etc. Services also include 24-hour supply and sales of all pro audio, video, and broadcast equipment available on the market, including full maintenance and service of this equipment. Audiotek has been in business 16 years providing expert consultation and conscientious servicing of all your needs, with full financing available for all projects. We provide anything and everything your heart desires with no limitations in completing your project.

AUTERI ASSOCIATES
EI
9 Henearly Dr., Miller Place, NY 11764
(516) 331-5022
Contact: Bob Auteri

BOYNTON STUDIO, INC.
SES
Melody Pines Farm, Morris, NY 13808
(607) 263-5695
Contact: Fred Hohman, Bob Boynton

BOGEN DIVISION, LEAR SIEGLER, INC.
SES
PO Box 500, Paramus, NJ 07653
(201) 343-5700
Contact: E.B. Sobin, Manager, Public Relations

WG BROWN SOUND EQUIPMENT CORPORATION
AC, SES, EI
701 Erie Blvd., East, Syracuse, NY 13210-1088
(315) 475-5161
Contact: James C. Messinger

CALF AUDIO INC.
SC, AC, SES, EI
207 S Tioga St., Ithaca, NY 14850
(607) 272-8964
Contact: H. Barnum Cole

CAPE COD AUDIO/CHARLIE'S MUSIC
AC, SES, EI
80 Enterprise Rd., Hyannis, MA 02601
(617) 775-1710
Contact: C. Davis

CARUSO MUSIC, INC.
AC, SES, EI
20 Bank St., New London, CT 06320
(203) 442-9600
Contact: Larry or Richard Caruso

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

NORTHEAST

COMMUNICATION CONTRACTORS CO.
EI
956 Wyoming St., Allentown, PA
(215) 439-4063
Contact: Jim Landis

CONNECTRONICS CORPORATION
SES
652 Glenbrook Rd., Stamford, CT 06906
(203) 324-2889
Contact: Richard Chilvers

CRAMER AUDIO & VIDEO SYSTEMS
SD, AC, SES, EI
120 Hampton Ave., Needham, MA 02194
(617) 449-2100 or (800) 343-5800
Contact: Mark Parsons

CSE AUDIO
SD, AC, SES, EI
173 Old Well Rd., Rochester, NY 14626
(716) 227-7763
Contact: Craig Fennessy

DADDY'S JUNKY MUSIC STORES, INC.
SES, EI
361 South Broadway, Salem, NH 03079
(603) 893-4420
Contact: Mark Rogers

DANBURY ELECTRONIC MUSIC CENTER
SES
84 Federal Rd., Danbury, CT 06810
(203) 792-5543
Contact: Gary Schwartz

DJM PRO AUDIO SYSTEMS
EI
361 S. Broadway, Salem, NH 03079
(603) 893-4057
Contact: Thom Stolar or David Tourville

EAR CRAFT
AC, SES, EI
14 4th St., Dover, NH 03820
(603) 749-3138
Contact: Brian Fischer

EAST COAST SOUND
SD, AC, SES, EI
40 Main St., Danbury CT 06810
(203) 748-2799
Contact: Ed Roman

ELECTRON MECHANICS
EI
Lower River Road, South Hadley, MA 01075
(413) 533-9134
Contact: Bruce Seifried

VIN GIZZI
New York, NY

VIN GIZZI
SD, AC
425 East 63rd Street, New York, NY 10021
(212) 758-3691
Contact: Vin Gizzi
Services offered, credits, specialization: Vin Gizzi is a consultant and designer of technical facilities for the recording industry and the communications media. Drawing on his extensive background in the music, audio and television fields, he has designed digital audio recording suites, audio-for-video mix rooms, recording studios and control rooms, shooting stages, screening rooms and other media installations. His projects have ranged from small radio production rooms to New York's premier video mix room (Editel). He offers a broad scale of services—from architectural and acoustic design, equipment selection and installation to hourly consulting—according to clients needs. His client list includes RCA Records, Editel NY, Sigma Sound Studios in New York and Philadelphia, Century III Teleproductions, The Metropolitan Opera, Power Play Studios, Doppler Studios, Nexus Video Productions, Donald Fagen, Major League Baseball Productions, Empire Stages, and Corelli Jacobs Film Music.

HARVEY PROFESSIONAL AUDIO/VIDEO
New York, NY

HARVEY PROFESSIONAL AUDIO/VIDEO
SD, AC, SES, EI
25 W. 45th St., New York, NY 10036
(212) 921-5920
Contact: Peter Hoagland

LAKE SYSTEMS CORP
SES, EI
55 Chapel St., Newton, MA 02160
(617) 244-6881
Contact: Bill Ford, Mr. Pamboukjian
Services offered, credits, specialization: Lake stocks over 100 lines of pro audio and video equipment. Top studio designers, consultants, and architects consistently specify Lake systems for system design, equipment requirements, and their knowledgeable time efficient installation and service team. Lake has been in business for over 30 years, and can handle any size job from a small production studio or nightclub, to fully blown multi track recording studios, TV and radio stations, casinos and stadiums. We are in the forefront of the digital audio movement, and leaders in interactive video technology. We are committed to our clients.

LANDY ASSOCIATES, INC.
SES, EI
1890 E. Marlton Pike, Cherry Hill, NJ 08003
(609) 424-4660
Contact: Jim Landy, Dave Newborn
also:
1605 Trapelo Road, Waltham, MA 02154
(617) 890-6325
Contact: Brad Beec, Mike Landy
Services offered, credits, specialization: Systems design and installation of Audiotronics, Quantum, Neotek, Tweed and Ramsa audio consoles, AKG, Crown, Electro Voice, Sennheiser, Shure and Telex microphones, Ampex, Otari and Studer tape machines; JBL speakers, Crown, dbx, Dataek, Orban, Thomson-CSF, RTS Systems, Telex Intercom, Clear Com, etc.

MANGO MUSIC
SD, AC, SES, EI
899 Troy Ave., Brooklyn, NY 11203
Contact: Brooks Junior

MANNY'S MUSIC
SES
156 W. 48th St., New York, NY 10036
(212) 819-0576
Contact: Stuart Manny, Ian Manny or Doug Cook

MARTIN AUDIO VIDEO CORPORATION
SES
423 W. 55th St., New York, NY 10019
(212) 541-5900

MICROPHONICS
SES
P.O. Box 37, Brooklyn, NY 11204
(212) 438-6400
Contact: Leon Sterbam

THE MIXINGBOARD
SES, EI
124 Intervale Ave., Burlington, VT 05401
(802) 658-4793
Contact: Steven Hirsch

NEW YORK TECHNICAL SUPPORT, LTD.
SD, EI
1440 Midland Ave., Suite 1-D, Bronxville, NY 10708
(914) 776-2112
Contact: Greg Hanks, Rosemarie Lapresti
Services offered, credits, specialization: New York Technical Support, Ltd. is a full service maintenance firm that caters to the technical needs of the recording, film, and broadcast industries. We provide design, consultation, installation and repair services. Our specialties include: field service, power and ground distribution analysis and fault finding, tape machine optimization, EMT tuning, modification and refurbishment, custom design and manufacturing, installation and wiring services, contract maintenance service. We are factory trained to service Ampex, 3M, MCI, Neve, Scully, and Trident equipment. Our work is guaranteed.

PEIRCE-PHELPS, INC.
Philadelphia, PA

PEIRCE-PHELPS, INC.-AUDIO SYSTEMS DIVISION
SD, AC, SES, EI
2000 N. 59th St., Philadelphia, PA 19131
(215) 879-7236
Contact: Charlie Moore, Doug Wilkens

PROFESSIONAL AUDIO VIDEO CORPORATION
SES
384 Grand St., Paterson, NJ 07505
(201) 523-3333
Contact: Paul DiSavino

PROFESSIONAL MUSIC AUDIO ENGINEERING
SES, EI
2600 Commercial Drive, N. Providence, RI 02904
(401) 353-6221
Contact: Peter M. Archambault

PROFESSIONAL RECORDING AND SOUND, PRS
SD, AC, SES, EI
1616 Soldiers Field Rd., Boston, MA 02135
(617) 254-2110 or (800) 343-3001
Contact: Peter Engel
Services offered, credits, specialization: PRS supplies, designs, installs and services New England's largest and smallest recording studios. PRS offers consultation services which can provide symbiotic relationships between acoustics, layout, and equipment. As part of the Group Four Companies, PRS maintains an extensive service, installation and design department capable of providing complex system interfacing as well as provide technical know-how to maximize equipment performance. PRS carries over 100 product lines and can recommend and supply the most cost effective solutions for any audio need. Simply stated PRS is New England's audio knowledge source.

RCI (RECORDING CONSULTANTS, INC.)
SES, EI
8550 Second Ave., Silver Spring, MD 20902
(301) 587-1800
Contact: Sales Dept.

STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

NORTHEAST

ROSNER CUSTOM SOUND, INC.
SES, EI
11-38 31st Ave., Long Island City, NY 11106
(212) 726-5600
Contact: Alex Rosner

TED ROTHSTEIN
SD, AC
55 Sloane Ave., Staten Island, NY 10306
(212) 979-5396
Contact: Ted Rothstein

RPG DIFFUSOR SYSTEMS, INC.

RPG DIFFUSOR SYSTEMS, INC
Largo, MD

RPG DIFFUSOR SYSTEMS, INC.
SD, AC, SES
12003 Wimbleton St , Largo, MD 20772
(301) 249-5647
Contact: Peter D'Antonio
Services offered, credits, specialization: RPG Diffusor Systems offers the first commercial reflection phase grating acoustical diffusor which provides wide-angle coverage over a broad frequency bandwidth. The QRD and PRD models can increase the apparent size and ambience of small voiceover rooms, drum booths, and mobile studios, provide the necessary diffusion and stereo perspective in recording, broadcast, disc mastering and film mix control rooms, create a spacious diffuse sound with the sweetening of a concert hall in recording studios, and significantly improve the acoustics of performing arts facilities for both the performer as a shell which provides a greater sense of ensemble playing and intonation, and the audience by increasing the ratio of early lateral to total energy which increases the stereophonic perception of music. RPG Diffusor Systems offers acoustical consulting services and both stock and custom designed diffusor systems to enhance the acoustics of all of the critical listening environments mentioned above.

S+C ENGINEERING, R&D
SD, AC, EI
8 Summit Ave., Sharon, MA 02067
(617) 784-6996
Contact: Skip Sweeney

SCHARFF COMMUNICATIONS
SES, EI
1600 Broadway, New York, NY 10019
(914) 747-0333
Contact: Peter Scharff, Josh Weisberg

SILVER & HORLAND INC.
SD, AC, SES
170 West 48th St., New York, NY 10036
(212) 869-3870
Contact: Pat Chupko

SOUND SYSTEMS SERVICE
AC, SES, EI
72 W. Sylvania Ave., Neptune City, NJ 07753
(201) 775-7007
Contact: Joe Belmonte

STAR SYSTEMS
SES, EI
462 Merrimack St., Methuen, MA 01844
Contact: Ed Byrnes
Services offered, credits, specialization: Star Systems is a professional audio and video supplier for the broadcast, industrial, and recording studio market. Services include instrument and recording equipment rentals for in house and remote use, pro audio, lighting and recording equipment sales in addition to a complete stock of audio and video in various formats. Delivery service available. Projected opening August 1, 1984. Write for catalog.

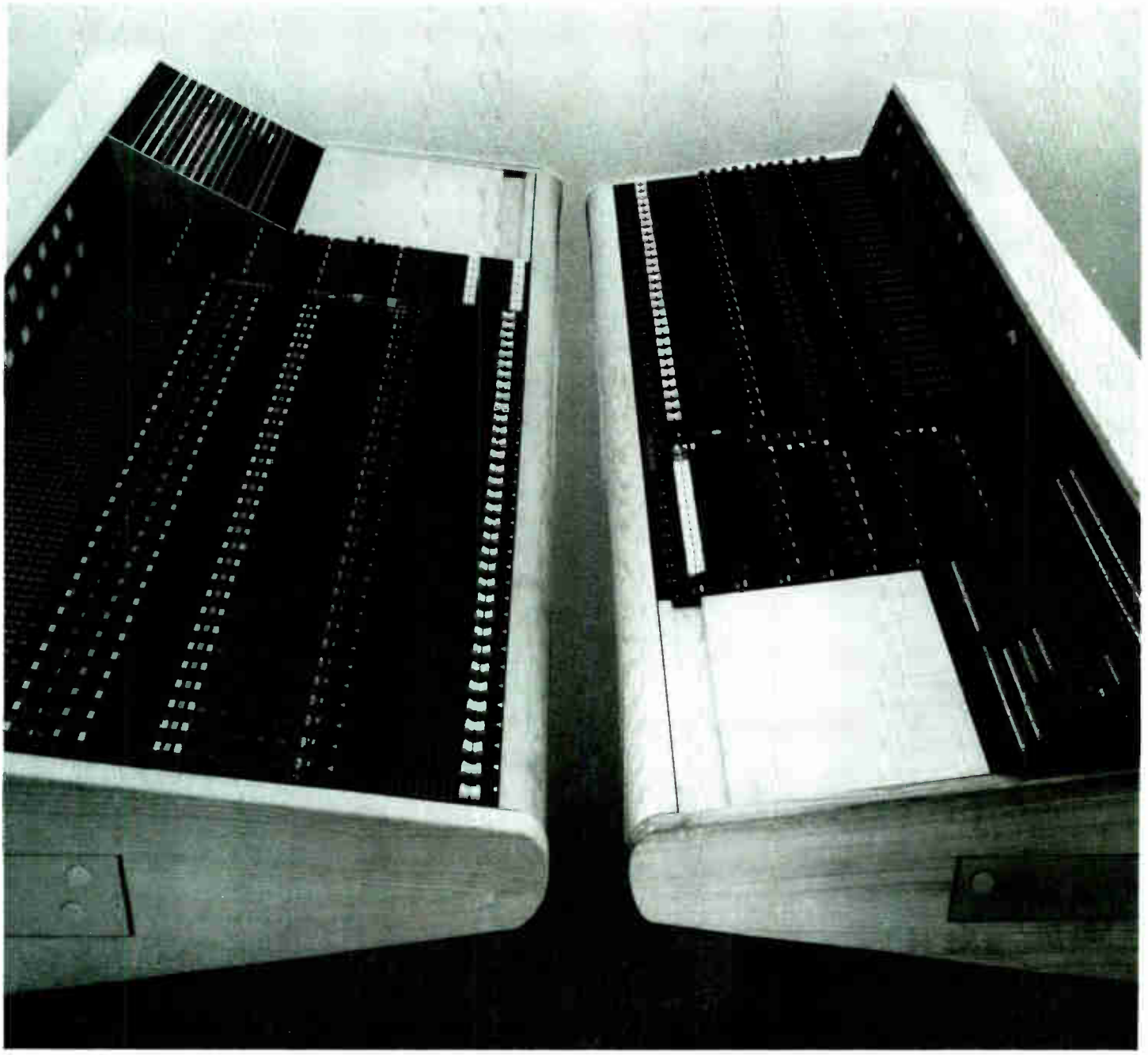
STEREO DISTRIBUTORS/EPA AUDIO
EI
844 Park Ave., "Heaven In Hoboken® " NJ 07030
(201) 792-3604
Contact: E. Hausen/P. Maneri

JOHN M. STORYK ASSOCIATES
New York, NY

JOHN M. STORYK ASSOCIATES
SD, AC
31 Union Square West, New York, NY 10003
(212) 675-1166
Contact: John Storyk, Alex Major
Services offered, credits, specialization: John M. Storyk Associates is one of the nation's leading architectural and acoustical design firms offering design and consulting services in the video and audio fields. The firm specializes in the design of studios, control rooms, theaters, and interformat media facilities. Formerly known as Sugarloaf View, the firm has been responsible for the design of over 300 audio and video studios throughout the U.S., Europe, Africa, and South America. John Storyk is a principal and co-founder of Metropolis Studios in New York City. Metropolis will be an electronic cinematography studio complex for video, audio, television and film production and post-production. It will contain two VARMS (Video/Audio Recording and Mixing Stages) designed by Storyk. The VARMS will be one of the first studios designed specifically for the simultaneous recording of broadcast video and digital audio essential for the recording of high quality video disks and video cassettes, among other things.

STUDIO ELECTRONICS & ACOUSTICS
SD, AC, SES, EI
87 W. Palisade Ave., Englewood, NJ 07631
(201) 894-1014
Contact: Manos

.....tried, trusted, TRIDENT



AFP Sound Systems
Michigan
313/476-2293

Audio Techniques
New York City
212/586-5989

Bridgewater Custom Sound
Illinois
312/596-0309

Comcast Engineering
Indiana
317/849-7050

Cramer Prof. Audio/Video
New England
617/449-2100

Everything Audio
So. California
213/995-4175

Southwest Pro Audio
Texas
512/443-4567

Trackside Engineering
Southeast
404/436-3024

The Series 80B is a 32 input, 24 group/monitor console, and the Series 70 is a 28 input, 16 group 24 monitor console. Both desks are fitted with a fully professional patchbay, 4 echo returns with EQ, and have the facility to use the monitor section as further inputs on remix.

Your limit isn't 32 inputs, Trident's engineers will design you an individual 56 input console at a price which will impress your bank manager.

So don't mince words – say Trident.

TRIDENT

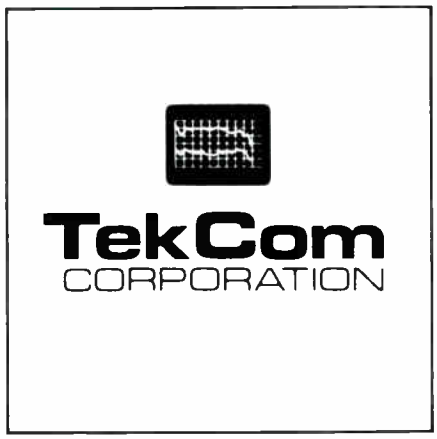
TRIDENT U.S.A. INC.

280 Mill Street Ext, Lancaster, Mass 01523 U.S.A.
Tel: (617) 365-2130/(617) 368-0508 Telex: 951546

TRIDENT

Circle #080 on Reader Service Card

TOY SPECIALISTS
SES - Rentals Only
147 W. 24th St., New York, NY 10011
(212) 741-0919 or (800) 847-4123
Contact: Rita Tessar



TEKCOM CORPORATION
Philadelphia, PA

TEKCOM CORPORATION
AC, SES, EI
408 Vine St., Philadelphia, PA 19106
(215) 627-6700
Contact: Lou Maresca

UNISTAGE, INC.
SES
330 Genesee St., Buffalo, NY 14204
(716) 853-6500
Contact: Bob Lovejoy

VICTOR'S AUDIO
235 Franklin Ave., Ridgewood, NJ 07450
(201) 652-5802
Contact: Jim Hovey

WASHINGTON MUSIC CENTER
SD, AC, SES, EI
11151 Viers Mill Rd., Wheaton, MD 20902
(301) 946-8808
Contact: Robert Levin or Carl Culos

WESTEC AUDIO/VIDEO
SD, AC, SES, EI
1841 Broadway, New York, NY 10026
(212) 586-1662
Contact: Dan Mazur, VP Sales & Marketing
Services offered, credits, specialization: Quietly serving the broadcast and post-production industry for over 15 years, Westec is offering a wider range of audio and video equipment than ever before. Long specializing in communication, wireless and SMPTE editing products, Westec's system design flexibility is now enhanced with a complete line of premium routing switchers and distribution amplifiers. A factory authorized service center for most major wireless microphone manufacturers, Westec also maintains a large inventory of hard-to-find Ampro/Scully parts. Our Emmy award winning staff can also help your sound effects problems. Westec supplies a fine selection of acoustic materials and pre-fab isolation booths to meet your studio needs.

HUBERT WILKE, INC.
SD, AC
260 Madison Ave., 19th Floor, New York, NY 10016
(212) 578-4646

WOLFF ASSOCIATES
EI
1378 Northgate Square, Reston, VA 22090
(703) 689-0448
Contact: Paul Wolff

ZALMO SOUNDS
SES
PO Box 681, Brooklyn, NY 11230-0681
(212) 633-4166
Contact: Sherman Schreiber

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

SOUTHEAST

ACE MUSIC CENTER, INC.
SD, AC, SES, EI
13630 W. Dixie Highway, N. Miami, FL 33161
(305) 891-6201
Contact: Neil Richarde

RICHARD ADLER ENGINEERING SERVICES
AC, EI
P.O. Box 21272, Nashville, TN 37221
(615) 646-4900
Contact: Richard Adler

ALL PRO SOUND
SD, AC, SES, EI
P.O. Box 6306, Pensacola, FL 32503
(904) 432-5780
Contact: Richard Couture

ALPHA AUDIO
SD, AC, SES, EI
2049 West Broad St., Richmond, VA 23220
(804) 358-3852
Contact: Eric Johnson
Services offered, credits, specialization: Alpha Audio is the exclusive nationwide distributor of SONEX Acoustical Foam for professional audio applications. SONEX has now been widely approved and acclaimed as a highly cost effective method of sophisticated sound control, and meshes nicely with the professional equipment division which distributes over 60 major lines of pro audio equipment. Alpha Audio also provides installation, maintenance, design and consulting services, as well as manufacturing specialized computer-assisted control systems.

AUDIO ARCHITECTS INC.
SES, EI
823 19th Ave. S., Nashville, TN 37203
(615) 320-0463
Contact: Allen Rumbaugh
Services offered, credits, specialization: Our focus has always been to unite the fields of musical expression and progressive studio technology. Let our considerable experience work for you as you plan your studio. We are authorized in Nashville as Tascam and Soundcraft full line with the most respected names in pro audio support equipment as well. Our customer list includes the biggest names in the Nashville music industry. We won't list them here. You know who they are. We pride ourselves on the commitment to provide every customer with the same standard of excellence that we would expect if finishing the project for ourselves.

AUDIO, LIGHT & MUSICAL
SES
3301 N. Military Hwy., Norfolk, VA 23518
(804) 853-2424
Contact: Bill Ricketts

AUDIO UNLIMITED OF NORTH AMERICA, INC.
SD, AC, SES, EI
11 Battleground Court, PO Box 9225,
Greensboro, NC 27408
(919) 274-4682
Contact: Chip Moose

BACKSTAGE INC.
AC, SES, EI
310 W. Broad St., Richmond, VA 23220
(804) 644-1433
Contact: Cameron Grainger

BUSSETRONICS
SD, AC
1235 Pine Island Road, Merritt Island, FL 32953
(305) 452-2910
Contact: Steve Bussey

DIGITAL ASSOCIATES' AUDIO RENTAL
PO Box 422, Spring Hill, TN 37174
(615) 256-4487
Contact: Rick Horton, Mike Poston
Services offered, credits, specialization: Equipment, Mitsubishi X-800 digital multitrack recorder with 32 channels available for audio recording, 2 tracks for console automation data, 2 analog cue tracks, 1 SMPTE track with internal generator, and comprehensive remote/auto-locator system. Mitsubishi X-80 2 channel digital recorder in road case, open reel format with razor blade editing, separate SMPTE track. Rates: X-800, descending rate scale beginning at $600 per day. X-80, descending rate scale beginning at $240 per day. 10 percent discount available for cash payment. Call or write for complete price schedule. Digital ..Hear the Music. ..Not the Tape!

DISCOUNT MUSIC CENTER
SE, EI
456 N. Orange Ave., Orlando, FL 32801
(305) 843-2025
Contact: Patti Mellick

BOB DIX, INC.
SES, EI
P.O. Box 31, Marion, VA 24354
(703) 783-2001
Contact: Bob Dix

STEVEN DURR & ASSOCIATES INC.
SD, AC
6216 Bresslyn Rd., Nashville, TN 37205
(615) 352-0218
Contact: Steven Durr

GATOR TRACKS
SES, EI
800 Grand Caillou Rd., Suite #106, Houma, LA 70363
(504) 851-4602
Contact: Chuck Positerry

GORDON LIGHT & SOUND
Greenville, SC

GORDON LIGHT & SOUND
AC, SES, EI
922 Poinsetti Hwy., Greenville, SC 29609
(803) 242-5140
Contact: James Floyd

GRAY COMMUNICATIONS CONSULTANTS, INC.
SD, AC, SES, EI
P.O. Box 3229, 404 Sands Drive, Albany, GA 31708
(912) 883-2121
Contact: Perley E. Eppley, Sr.
also:
5401 Southern Comfort Blvd., Tampa, FL 33614
(813) 885-1411
948 Carlyle South, Apartment 538, Mobile, AL 36609
(205) 460-2824
Contact: Phillip Smith

5301 McLanahan Drive, Suite D-5, Northeast Business Center, North Little Rock, AR 72116
(501) 758-3234
Contact: Harold Cole
100 Greenbriar Drive, Knoxville, TN 37919
(615) 523-3107
Contact: Tom Owens
1605 S. Bumby, Orlando, FL 37806
(305) 896-7414
5441 Pepsi Street, New Orleans, LA 70123
(504) 733-7265
115 Spence Lane, Nashville, TN 37210
(615) 883-9175
1657 N W 79th Avenue, Miami, FL 33126
(305) 591-3637
1031 Northwest 91st Terrace, Gainseville, FL 32601
(904) 376-2435
Contact: Jerome Hoffman
209 Oxmoor Circle, Suite 708, Birmingham, AL 35209
(205) 942-2824
3684 Clearview Avenue, Doraville, GA 30340
(404) 455-3121

HART SOUND & LIGHTING
SES
1725 S.E. 8th St., Ft. Lauderdale, FL 33316
(305) 463-4655
Contact: S. Barret

IDEAL ACOUSTICS
SD, AC, SES, EI
110 Willow Rd., Starkville, MS 39759
(601) 324-1020
Contact: Dr. W.S. Shepard

J.C. SOUND & LIGHTING
SD, AC, SES, EI
1131 E. Commercial Blvd., Ft. Lauderdale, FL 33334
(305) 776-4916
Contact: John Clark
also:
1625 Camerbur Dr., Orlando, FL 32805
Contact: Mark Butler

CHRIS JONES DESIGNS
SD, AC
115 Waverly Hall Close, Roswell, GA 30075
(404) 993-2366
Contact: Chris Jones

PAUL A. KADAIR, INC.
SD, AC, SES, EI
11420 Airline Highway, Baton Rouge, LA 70816
(504) 292-5105
Contact: Paul A. Kadair

KILLER SOUND
SES, EI
604 N. Semoran Blvd., #3, Winter Park, FL 32792
(305) 677-7639
Contact: Charles Rigsby

JACK LINK & ASSOCIATES
AC, SES, EI
1729 Cogswell St., Rockledge, FL 32955
(305) 636-7231
Contact: Greg Sexton
also:
1255 Laquinta, Bldg. A, Ste. 118, Orlando, FL 32809
(305) 851-1427
Contact: Des Byrne or Brian Gergeson

MACK & DAVES
SD, AC, SES, EI
3712 Mac Corkle Avenue, Charleston, WV 25304
(304) 924-6679
Contact: Mark Fortwer

MODERN MUSIC INC.
SES, EI
320 E. Oakland Park Blvd., Fort Lauderdale, FL 33334
(305) 565-1671
Contact: Paul Crosta

MODULAR PERFECTION
SD, AC
14205 N.E. 18th Ave., Miami, FL 33182
(305) 944-6731
Contact: Seth Snyder
Services offered, credits, specialization: Modular Perfection

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STUDIO DESIGNERS & SUPPLIERS

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

SOUTHEAST

manufactures pre-fabricated room wall sections for recording studios and control rooms. Each modular section is available in varying degrees of acoustical brightness or absorption. Credits: Middle Ear Studios (Bee Gees' private studio), Right Track Recording, New York, NY, Coconuts Recording Studio, Miami, International Sound Studio, Miami, Discos Sonotec; DB Recording Studio, Miami, Starke Lake Studio, Orlando, FL, Sony Corp. of America, NAB Convention, Las Vegas, NV

MODULAR PERFECTION
Miami, FL

MUSIC MART, INC.
SES, EI
700 Park Ave., Lake Park, FL 33403
(305) 845-2626
Contact: Jeff Curtis, Sonny Smith

NATIONAL AUDIO TECHNOLOGY & ELECTRONICS
SD, EI
1271 Dal Maso Drive, Daytona Beach, FL 32017
(904) 255-2240
Contact: Nate Mudge

J.H. NYGAARD & ASSOCIATES, INC.
SD, AC
11155 N.E. 12th Ave., Miami, FL 33161
(305) 893-8187
Contact: James Nygaard

PARAGON MUSIC CENTER INC.
SES, EI, EM, ES
2139 W. Hillsborough Ave., Tampa, FL 33603
(813) 876-3459
Contact: Dick Rumore

PRO AUDIO GENERAL STORE, INC.
AC, SES, EI
2480 S.E. 52nd St., Ocala, FL 32671
(904) 622-9058
Contact: Bill Shute
also:
746 Cypress Lane, Carol Stream, IL 60188
(312) 231-7120

Contact: David and Kerry Kerstin
1805 Kimberly Drive, Marietta, GA 30060
(404) 425-0630
Contact: Kandy Shute

PRO-AUDIO INC.
SES, EI
0-1640 Lake Michigan Dr., N.W., Grand Rapids, MI 49504
(616) 677-5973
Contact: Ken Reinecke

PROFESSIONAL SOUND
SD, AC, SES, EI
2737 Door Ave., Fairfax, VA 20031
(703) 698-8888
Contact: Bill Peterson

QUALITY SOUND & VIDEO, INC.
SD, AC, SES, EI
833 Bragg Blvd., Fayetteville, NC 28301
(919) 483-1212
Contact: Mark Lynch

RADICAL ELECTRONICS
Falls Church, VA

RADICAL ELECTRONICS
2872 Hartland Rd., Falls Church, VA 22043
(703) 573-6910
Contact: David Elzroth
Services offered, credits, specialization: Manufacturer of media press boxes, high quality audio distribution amplifiers, turntables, tape, microphone and film pre-amplifiers.

RECORDING STUDIO EQUIPMENT COMPANY
North Miami, FL

RECORDING STUDIO EQUIPMENT COMPANY
SD, AC, SES, EI
14205 N.E. 18th Ave., North Miami, FL 33181
(305) 945-9774
Contact: Seth Snyder
Services offered, credits, specialization: Our professional audio products and services include: Mixing consoles, 8-56 channels; tape recorders, analog 1-24 channels, digital 2-24 channels; signal processing equipment, monitoring speakers and amplifiers; microphones, MCI/div. of Sony brand of pro audio equipment; prefabricated studio acoustics by Modular Perfection, Inc.; system design; studio acoustical design, complete turn key design & installation services; consultation. We have designed and installed multi-track recording studios for such clients as the Bee Gees, KC & the Sunshine Band, Bob Marley and the Wailers.

RELIABLE MUSIC
Charlotte, NC

RELIABLE MUSIC
SD, AC, SES, EI
1001 S. Independence Blvd., Charlotte, NC 28202
(704) 375-8662
Contact: John Saviano, David Bustle

JOHN LYNN SANFORD/CONSULTING ENGINEER
SD, AC
P.O. Box 120975, Nashville, TN 37212
(615) 256-3805 or 254-5925
Contact: John Sanford

S.C.M.S. - PRO AUDIO WHEREHOUSE
SD, AC, SES, EI
800 N. Polk St., Pineville (Charlotte), NC 28134
(704) 889-4508 or (800) 438-6040
Contact: Cal Walker
Services offered, credits, specialization: S.C.M.S. specializes in turn-key production facilities and broadcast studio packages. We are authorized dealers for most major lines of recording and broadcast equipment, and have on-call, one of the foremost acoustic consultants in the U.S. Our experience comes from years (20), in the broadcast, and production fields, and also current hands on work in our own commercial production facility. Check out our ad in this issue, and give us a call!

SOUND & COMMUNICATIONS, INC.
SD, AC, SES, EI
5466 N. State St., Jackson, MI 39206
(601) 982-2080
Contact: Algie Broome

SOUND CITY
Lafayette, LA

SOUND CITY
SES, EI
101 Camellia Blvd., Lafayette, LA 70503
(318) 984-5840

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LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

SOUTHEAST

—PAGE 117

Contact: Vincent Sauro
Services offered, credits, specialization: Sound City offers a wide range of musical instruments, sound reinforcement, and multitrack recording gear. They have helped establish a growing market for both personal and professional multitrack recording in Lafayette. Specializing in Fostex recorders, Ramsa, and Studiomaster mixers, EXR, MXR, dbx and Roland signal processors, Sound City also boasts complete sound reinforcement products and musical instruments from such companies as Peavey, Electro-Voice, Synergy, Seil, Acoustic, Gibson, Fender, Ludwig, Tama, and Pearl. A full-time technical staff and creative financing help round out this full service, full line music store. Musical instrument rentals are also available at very reasonable rates for short term engagements

SOUND ENGINEERING CO., INC
SES, EI
2709 E. 24th Street, Chattanooga, TN 37407
(615) 624-3505
Contact: C G Coggin

SOUTHWIND ENTERTAINMENT CORP.
SD, AC, SES, EI
106 W. Amelia, Orlando, FL 32801
(305) 422-0300
Contact: Michael Orlando

SPECTRUM SOUND, INC.
SES, EI, EM, ES
429 Space Park North, Goodlettsville, TN 37072
(615) 859-4381
Contact: Ken Porter

STADLER MUSIC
SES, EI
924 S. Scales St., Reidsville, NC 27320
(919) 349-6554
Contact: Leonard Stadler

STAGE SOUND INC.
SD, AC, SES, EI
1013 Campbell Ave., S.E., Roanoke, VA 24013
(703) 342-2040
Contact: Reed Henion

STEREO SALES, INC.
SD, AC, SES, EI
637 W. Tennessee St., Tallahassee, FL 32301
(904) 224-2635
Contact: W T Menasco, AES

STUDIO SUPPLY CO. OF MIAMI, INC.
SD, SES
11155 N.E. 12th Ave., Miami, FL 33161
(305) 893-8187
Contact: David Carr

STUDIO SUPPLY COMPANY

STUDIO SUPPLY CO., INC.
Nashville, TN

STUDIO SUPPLY CO., INC.
SD, AC, SES, EI
1717 Elmhill Pike, Suite B-9, Nashville, TN 37210
(615) 366-1890
Contact: Tom Irby

STUDIOWORKS
SD, AC, SES, EI
1018 Central Ave., Charlotte, NC 28204
(800) 438-5921, (704) 375-1053, 375-1053
Contact: Wayne Jernigan

SYNERGETIC SERVICES, INC.
AC, EI
18903 NE 5th Ave., Miami, FL 33179
(305) 652-8066
Contact: Ross Alexander

Technical Audio Systems

TECHNICAL AUDIO SYSTEMS
Atlanta, GA

TECHNICAL AUDIO SYSTEMS
SD, AC, SES, EI
4301 Pleasantdale Rd., Suite E, Atlanta, GA 30340
(404) 447-9211
Contact: Ron Montgomery, Dave Cardinali, Steve Starnes
Services offered, credits, specialization: Recording studio equipment, broadcast audio equipment, ENG/EFP equipment, noise control, design/consultation, most major lines, leasing available, production experienced staff

THOROUGHBRED MUSIC INC.
2204 E. Hillsborough, Tampa, FL 33610
(813) 238-7085
Contact: Fred Grunewald, Bill Gillespie
also:
3160 Bee Ridge Rd., Sarasota, FL 33579
(813) 921-5714
Contact: Nick Ferlicchi

TM SOUND & LIGHTING
SD, AC, SES, EI
1226 N.E. 4th Ave., Fort Lauderdale, FL 33334
(305) 776-4915

What could sound better than a $500 note?

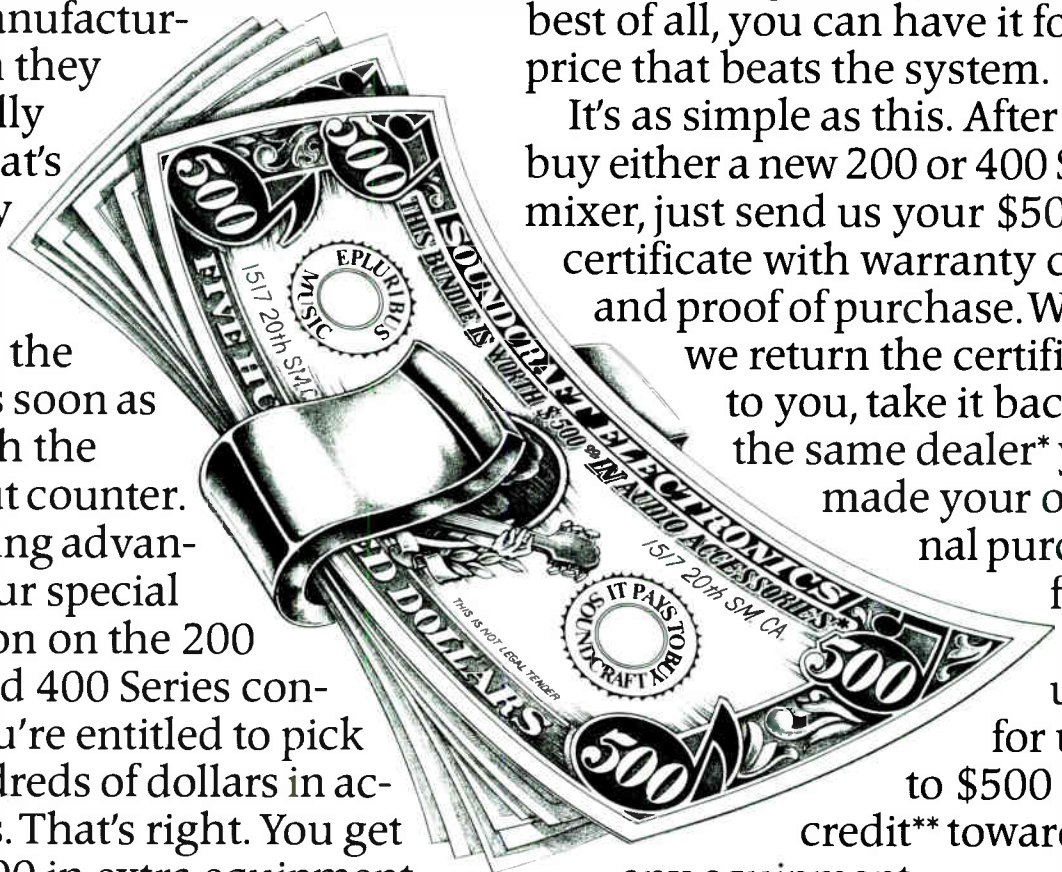
At Soundcraft, we know it's not enough to build the finest mixing consoles in the world. After all, other manufacturers claim they are equally good. That's why only Soundcraft counters the claims as soon as you reach the check out counter.

By taking advantage of our special promotion on the 200 Series and 400 Series consoles, you're entitled to pick out hundreds of dollars in accessories. That's right. You get up to $500 in extra equipment without spending anything extra.

Things like amps, mics, signal processors, speakers, digital delays, cables or cassettes. You make the choice. We make the payment. Which means you can now use your Soundcraft console the way it was meant to be used. In a professionally integrated system. And best of all, you can have it for a price that beats the system.

It's as simple as this. After you buy either a new 200 or 400 Series mixer, just send us your $500 certificate with warranty card and proof of purchase. When we return the certificate to you, take it back to the same dealer* you made your original purchase from and use it for up to $500 in credit** toward any equipment.

It's our way of extending a note of thanks to those who appreciate Soundcraft's commitment to Appropriate Technology.



Soundcraft

Soundcraft Electronics
1517 20th Street, Santa Monica, CA 90404
Tel.: (213) 453-4591 Telex: 664-923

*Authorized participating Soundcraft dealers only.
**Actual amount of credit varies with model purchased.
Offer effective 6/1/84 and expires 8/31/84; void where prohibited by law.
Valid only in the continental U.S.

TRACKSIDE ENGINEERING
SD, AC, SES, EI
2670 South Cobb Drive, Smyrna (Atlanta) GA 30080
(404) 436-3024
Contact: Les Duncan
Services offered, credits, specialization: Recent design credits Crawford Post Productions, Signal Sound, IBS Studios, 2560 Studios, Protestant Radio and Television Center. Complete turn key services offered including video-audio interface and synchronizing, and custom electronic equipment design and fabrication. Equipment sales for Trident-USA, dbx digital and professional, Lexicon, Ampex, BTX and most other professional lines. Service performed by factory trained personnel.

VALLEY AUDIO
Nashville, TN

VALLEY AUDIO
SD, AC, SES, EI
2821 Erica Place, P.O. Box 40743,
Nashville, TN 37204-3111
(615) 383-4732
Contact: Bob Todrank
Services offered, credits, specialization: The latest in design theories and practices, including the new rear wall diffusor system (designed by Peter D'Antonio of RPG Diffusor Systems, Inc.) Valley Audio's acoustical designer and consultant-Bob Todrank. Equipment: Tecron TDS Computer Room Analyzer. Dealers for Amek, Harrison, Neotek, and Sound Workshop mixing consoles. Otari's full line of multitrack tape recorders, as well as dbx 700 Digital Audio Processor. Monitors by JBL, UREI and Fostex. Amplifiers by Bryston, Hafler, and UREI. Valley Audio offers complete equipment installation, maintenance, and servicing of all professional audio equipment. Valley Audio is a complete "turnkey" facility.

VICKERS MUSIC
SES
537 S. Peterson Ave., Douglas, GA 31533
(912) 384-0949
Contact: Gary J. Vickers

WILLCUTT SOUND SYSTEMS
SES, EI
419 Rosemont Garden, Lexington, KY 40503
(606) 276-2713
Contact: Bob Willcutt

WILSON AUDIO SALES
SES, EI
6602 Hwy. 100, Suite 205, Nashville, TN 37205
(615) 356-0372
Contact: Wally Wilson

WILSON AUDIO SALES
SES, EI
115 Waverly Hall, Roswell, GA 30075
(404) 993-2366
Contact: Chris Jones

WOLFF ASSOCIATES
SE, AC, SES, EI
1378 Northgate Square, Reston, VA 22090
(703) 689-0448
Contact: Paul Wolff
Services offered, credits, specialization: API authorized dealer, Datatronix Audio products, console refurbishing, repair, customization and also dealing with grounding and other studio related technical problems. Major references available.

LEGEND: SD: Studio Designer; AC: Acoustical Consulting; SES: Studio Equipment Supply; EI: Equipment Installation/Maintenance/Servicing

SOUTHWEST

ABADON/SUN, INC.
SD, AC, SES, EI
P.O. Box 6520, San Antonio, TX 78209
(512) 824-8781
Contact: Woody Smith
Services offered, credits, specialization: Specializing in cost effective multi-track systems, including pre-wired packages from Soundcraft, Tascam and Fostex. Acoustic consultation available at reduced rates, to full turn key design and installation.

ARNOLD & MORGAN MUSIC CO.
SES, EI
510 S. Garland Road, Garland, TX 75040
(214) 494-1378
Contact: Larry O'Neill

ASSOCIATED PRODUCTIONS OF TEXAS
SD, AC, SES, EI
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LUNCHING WITH BONZAI

DANNY 'KOOTCH' KORTCHMAR

by Mr. Bonzai

A FISTFUL OF GUITAR

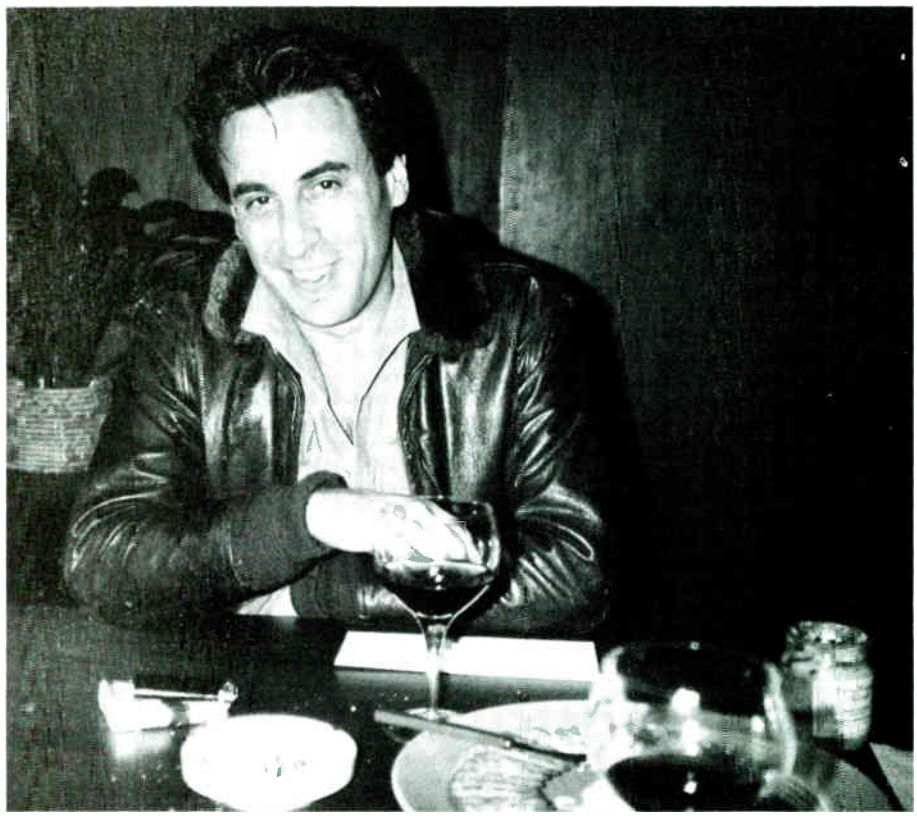


PHOTO MR BONZAI

The aroma of ripening Camembert mingled with the bouquet of a breathing '82 Beaujolais Jadot. My tape recorder and camera were loaded for Big Game; my overloaded list of questions for Danny Kortchmar was ready —but there was something missing. Ah! I had it. I blew up my new Whoopee Cushion and secreted it under "Kootch's" prospective seat. Good food, good wine, and bad jokes can bring out the best in folks.

Danny arrived and paused briefly in my photo gallery of previous Lunching guests. He lingered on a shot of Michael O'Donoghue, the friend who had suggested our meeting. Danny appeared to be in a state of flex more than relaxation. He wore a leather jacket, had slicked-back hair and reminded me of Robert DeNiro. He strode in, checked out the scene, sat down, and a loud Bronx cheer filled the room.

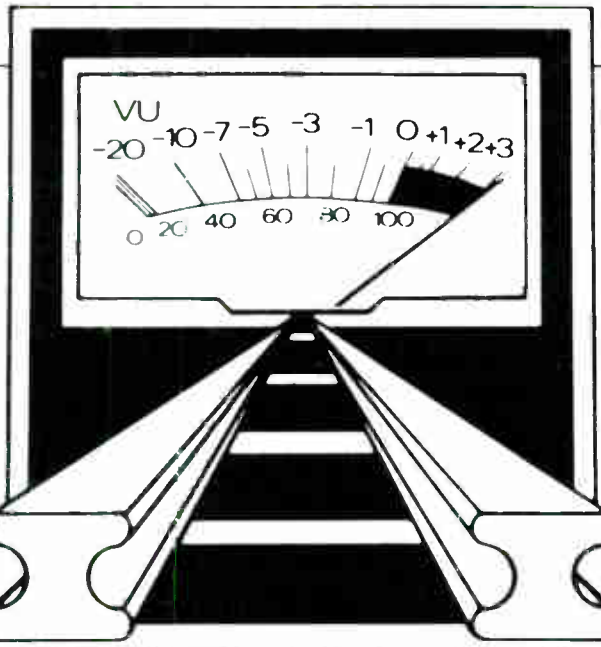
"What the?" He pulled out the rubber bladder and looked at the vintage '30s graphics and Whoopee logo. "I haven't seen one of these in years!" We were off to a good start.

Danny began his career in a soul band called The Kingbees. "We played a lot of dumps around New York," he told me. "Then James Taylor and I started the Flying Machine, a folk-rock kind of thing."

The Flying Machine lasted about a year and Danny then joined the infamous Ed Sanders in The Fugs. Their material included "Coca Cola Douche," "River of Shit" and Danny's personal favorite, "Slum Goddess From the Lower East Side."

Next came a psychedelic band called Clear Light and the emigration to Los Angeles. In LA he joined Carole King in a band called The City, and later formed Jo Mama with some of the Flying Machine members. Session work included King's phenomenally successful ***Tapestry*** and when James Taylor hit big, Kortchmar became a touring and recording identity in his own right.

New recognition led him to work with Jackson Browne, several tours with Crosby & Nash, and the formation of the heavily respected group, The Section, with Russ Kunkel and Lee



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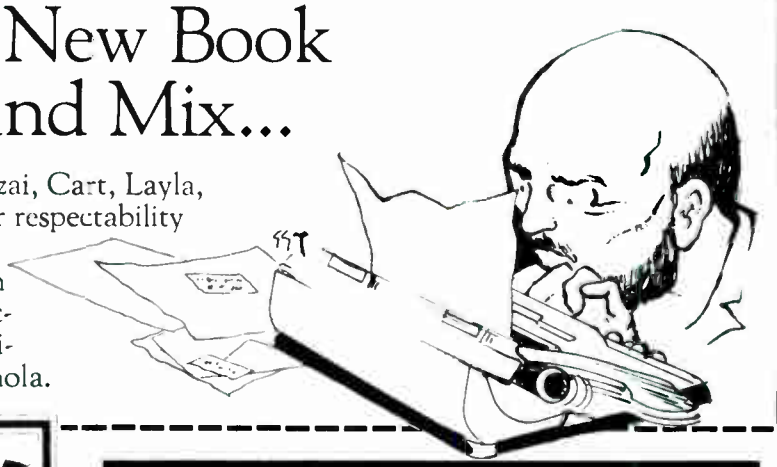

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Sklar. "It was basically James' touring band," Danny said, "a jazz-fusion kind of trip."

The restless Kortchmar collected his laurels with The Section, but wasn't satisfied. "I realized that I really had to start playing rock. I was starved from playing singer-songwriter music, not to take away from that, but I wanted to play something more aggressive, that featured more guitar. I made a solo album, which didn't do very well, but it started me in the right direction."

Danny produced two albums for Louise Goffin, worked with Linda Ronstadt, and then began working with Don Henley, as co-writer and co-producer with Greg Ladanyi and Don on *I Can't Stand Still,* Henley's debut solo album. They are in the studio now, working on the sequel.

Bonzai: What can the guitar do that no other instrument can?
Kootch: The guitar is really a combination of a lot of instruments. It can be a rhythm instrument; it can play soaring lines—it can provide so many elements and always have that human sensitivity. The electric guitar is the first heavily processed musical instrument—the first synthesizer. And it still responds to the touch and has a fluidity that no other electronic instrument has.

Bonzai: What is the next stage in the evolution of the guitar?
Kootch: I've been playing with the Roland guitar synthesizer, the next step in applying guitar to the ultimate in processed sounds. You can MIDI interface with any synthesizer, which is the wave of the future.

Bonzai: Of all the sessions, of all your recordings, which performance shows your true character as an artist most clearly—where has your identity come through the clearest?
Kootch: It's difficult to say. There are parts of performances that demonstrate exactly what the essence of my style is. For instance, my playing on Linda Ronstadt's "Hurt So Bad" is a good example of my playing. On Don Henley's "Dirty Laundry" I play a rhythm part that has my personal brand. I really liked what I did on Warren Zevon's "Ain't That Pretty?"

Bonzai: How did you get the nickname Kootch?
Kootch: When I was about 13, people found it difficult to pronounce Kortchmar. In summer camp somebody called me Kootchmar, and then they called me Kootch, and it stuck.

Bonzai: How is Henley's second album coming along?
Kootch: It's an extension of the first album, but it's rowdier. It's different because Henley's been growing as a solo artist, and since The Eagles, his style is becoming more defined. He and I are growing as a writing team. We make a good team and we're developing a more definable sound for Don, writing-wise and production-wise.

Bonzai: Where do you record?
Kootch: At Record One, which I think is the best studio in Los Angeles. It's a beautiful studio, but it's also the most efficient, for my money. They used the dimensions of the Sound Factory to build the room and then really buffed it out. Val Garay is a real stickler for quality control on every level. It's a studio where everything works. Someone pointed out that the electronics are happy there.

Bonzai: Which record has made you the most money?
Kootch: I've received the most money for my writing. I co-wrote "Somebody's Baby" with Jackson Browne, and co-wrote Henley's album and "Dirty Laundry," which was a huge hit.

Bonzai: Which record was the most enjoyable to work on?
Kootch: I love working on Henley's stuff. It's the most enjoyable because I've co-written the songs, so it's my music, and I feel more involved than I ever have before. I'm the happiest when I'm heavily involved in a creative way.

Bonzai: Of all the artists you've worked with, which one would you single out as being a transcendent genius and generally amazing human being?
Kootch: —transcendent genius is pretty intense. I never jammed with Einstein—good lyrics, but he didn't sing very well. I would have to say that Linda Ronstadt, Jackson Browne, James Taylor and Don Henley are all br people.

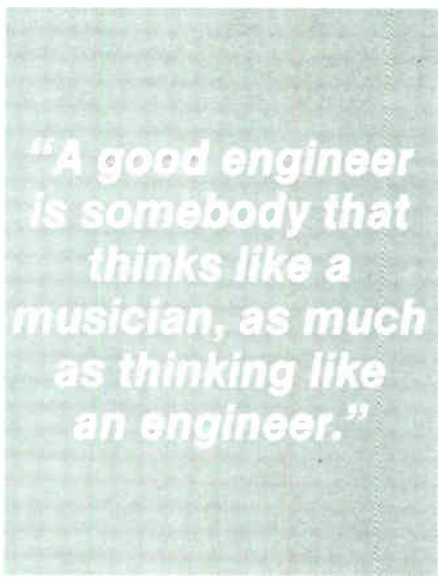
Bonzai: In your childhood, what . cian had the most profound effect you?
Kootch: I don't think I could single one musician. There were The Beat Miles Davis, John Coltrane, Steve Cropper, Curtis Mayfield's little intrc to the tunes on The Impressions' records; Jimmy Nolen from the James Brown Band. There were blues artists that affected me: Lightnin' Hopkins, Muddy Waters, Robert Johnson.

Bonzai: Who is the Salvador Dali of the guitar world?
Kootch: Jimi Hendrix.

Bonzai: Who is the Atilla the Hun of the guitar?
Kootch: Meaning somebody that's just the conqueror, the destroyer? Then I would say Steve Lukather. He's Mr. Everything. He will run you around; he can hurt you in so many ways—he's like a prize fighter. He's got so much going for him as a musician, along with a soul and an integrity and a real joy in his playing.

Bonzai: Who is the Picasso of the guitar—someone who can move through many styles and push every style to the limit?
Kootch: By that definition, Steve Lukather is also the Picasso of guitar. But I'm sure he would prefer to be called the Attila the Hun of guitar, believe me.

Bonzai: We'll call him "Picasso the Hun"...
Kootch: There are other guitarists worth mentioning. Waddy Wachtel has wonderful soul and a great approach and always plays the right thing. Ricky Vito is an amazingly soulful, brilliant blues guitar player. But Steve Lukather encompasses so many styles and has pursued all of them. He can play amazing bebop, he can play flamenco, classical, and he can play amazing heavy metal, great blues—just so many styles and all of them great.



Bonzai: How would you describe yourself to a visitor from outer space?
Kootch: Urban junebug, World Class.

Bonzai: Who's your favorite politician, living or dead?
Kootch: I'd have to say Harry Truman, because he had the nerve to make a hard decision in a hard time, and without looking back, he made it.

Bonzai: Who's your favorite doctor?
Kootch: Doctor No.

Bonzai: Who's your best friend?
Kootch: My girlfriend, Louise. We live together and understand each other real well. I have a lot of friends that I love very dearly, and there's no way I could say who is my best friend.

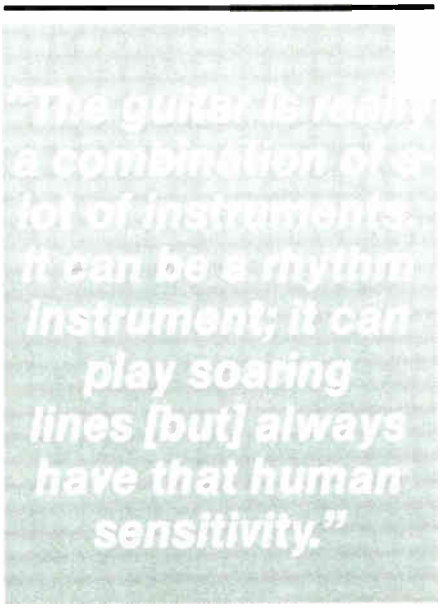
Bonzai: Why do people have pets?
Kootch: Because you can train a pet to love you.

Bonzai: How did you discover puberty?
Kootch: It was probably at one of the James Bond movies. It may have been *Dr. No*, with Ursula Andress.

Bonzai: This awakened you to a new fun world?
Kootch: Yes, like Mel Brooks said as the 2000 Year Old Man, "Hey, there's ladies here!"

Bonzai: What do you appreciate in an engineer?
Kootch: A good engineer is somebody that thinks like a musician, as much as thinking like an engineer. Everything he does is designed to help the song and to help the total situation, which is the way musicians think when they're recording a tune. Another element would be speed, along with efficiency.

Bonzai: What makes a great producer?
Kootch: A lot of things. Some people would say that a great producer stays out of the way. When Lou Adler was producing Carole King's records, he knew how to stay out of the way and to let the tune evolve, and then he knew when to say just a few things to some of the musicians. That's one class example of great producing. Another aspect is sheer genius at arranging. Production is a combination of picking the right sound for things. Every producer functions differently. Some producers, like Jimmy Iovine, came up from engineering, as Don Gheman and Greg Ladanyi did. Some come from arranging, like Quincy Jones, Michael Omartian, or David Foster. The list of great producers who came from being musicians is not so long.



Bonzai: Interesting—you fall into this category, right?
Kootch: I don't know if I fall into the category of great producers quite yet.

Bonzai: Why is there a problem for musicians becoming producers?

Kootch: I've never thought about it before. I think the problem is that musicians tend to think about the playing more than they think about the song. The focus in making a record has to be on the song and the performance. When I started doing sessions, I just listened to my own playing. That would be an improper attitude. The proper attitude is the whole picture, the message, the vision, the skull of the thing.

Bonzai: Do you remember your first recording session?
Kootch: Yes, I was 18 or 19. We scrounged up some money and got some time in a two track studio on 42nd Street in New York. We recorded some tunes and listened to them and I immediately said, "Yeah—wow—records." The whole idea of making records, of recording something and having it on wax and being able to put it out and get three minutes of this groove, this thing—I still love it.

Bonzai: Why are you a legend?
Kootch: I'm not a legend.

Bonzai: Well, a lot of people seem to know your name, although they have trouble pigeonholing you...

Kootch: I'm a catalyst. My guitar is rooted entirely in providing a framework and a structure for a song. What I do is not easily defined. I'm not a brilliant guitar player like Eric Clapton or Eddie Van Halen. What I do is very ephemeral. It's not based on any one skill. It's based on giving a lot to what I do and helping the entire situation.

Bonzai: Why are you a survivor?
Kootch: Because I never think about quitting. It just never occurs to me. I love music. I don't think of myself as being in the music industry. I think of myself as a rocker—somebody that just will always be a diehard rocker, that just loves the whole idea of the backbeat—turn up the amps and let's knock the shit out of it.

Bonzai: What is the theme of your life?
Kootch: Well, again, I'll quote Mel Brooks, as Fabiola, the young rock and roll star. He says, "My life? my purpose? I don't know my life or my purpose. That's why I'm loved."

Bonzai: If you could be any female, in the sense that it would transport your consciousness and psyche, who would bring out something enlightening?
Kootch: Katherine Hepburn. Maybe Drew Barrymore.

Bonzai: Do you have a fantasy lover?
Kootch: So many that the list would cover the walls of this apartment. Louise Brooks would be at the top of the list—a movie actress of the '20s. And Marilyn Monroe—who I actually met when I was seven years old.

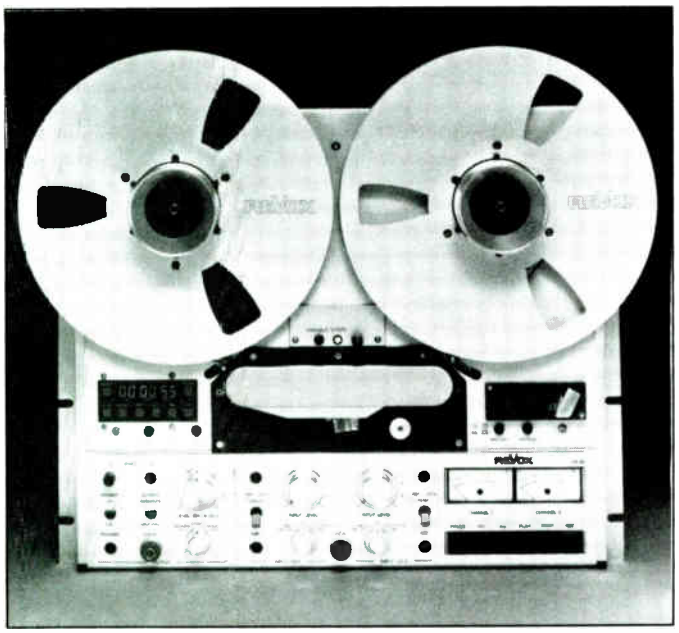
Bonzai: Maybe it was a premonition of puberty...
Kootch: You know, I would say so.

Bonzai: A little kid knows there's something coming up that he doesn't understand...
Kootch: Yes. We went out to dinner. My little seven year old friend's father was a friend of Arthur Miller. We all went out for Chinese food and I sat across from Marilyn, and she said I was cute, too. She absolutely glowed. She was literally luminescent as I remember her, and how much awareness can you have at seven?

Bonzai: Of all the stories, which would you most like to score?
Kootch: ***The Competition II.*** No, I don't think I could score my favorite books and stories.

Bonzai: Oh, c'mon—we're not going to end on a humble note, are we?
Kootch: No—if they re-make ***Peter Gunn,*** I would like to score that. ■

PREVIEW



Revox PR99 MKII Two Track

Revox has enhanced the production capabilities of their PR99 professional open reel recorder by adding several important new features. This updated model, the PR99 MKII, incorporates an LED real time tape counter and built-in vari-speed control, along with zero locate, address locate, and auto repeat functions.

The address locator feature automatically searches the tape in fast wind mode for a pre-selected address point which may be entered from the keyboard or transferred from a tape counter reading. The repeat mode automatically plays and rewinds the tape between the two pre-selected memory locate points. The vari-speed control adjusts the nominal tape speed with a − 33 percent to + 50 percent range (± ½ octave). The PR99 MKII retains all the design and construction features of its predecessor, including die-cast aluminum chassis and headblock, balanced + 4 inputs and outputs, self-sync, input mode switching, and front panel mike inputs. The suggested list price is $2,250.

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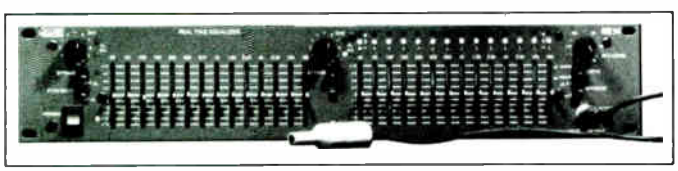

Rane Dual 14 Band Equalizer/Analyzer

The Rane Model RE 14 is a complete ⅔ octave equalizer/analyzer combination containing two ⅔ octave state variable graphic equalizers, a single ⅔ octave color-coded realtime analyzer, built-in pink noise generator and a flat-response condenser microphone with 40 foot cable and case.

The equalizer sections feature constant-Q filters on ⅔ octave ISO centers from 40 Hz to 16 kHz with 45 mm sliders, separate level controls, hard-wire bypass and automatic balanced/unbalanced/floating active inputs and outputs. The analyzer utilizes a colored LED array with switchable ± 1 dB/ ± 3 dB window, selectable house curve, calibrated RTA sensitivity control and adjustable pink noise output. Suggested list price for the entire system is $699.

Circle #094 on Reader Service Card

Astatic Talkback Microphone

The Astatic 827, a miniature electret cardioid permanently attached to a low profile 13-inch or 17-inch gooseneck is perfect for talk back, paging, and lectern applications. Phantom-powered only, the mike includes a windscreen and is priced at $68.50.

Circle #095 on Reader Service Card

Noise Lock® Quadraseal Door

The Quadraseal door made by the Industrial Acoustics Company features an STC rating of 63 and was designed to provide high transmission loss characteristics in a two-part door that swings as a single unit. The informally labeled "piggyback" door consists of two 2½-inch-thick leaves with vibration-isolator brackets adhering the inner leaf to the outer. A 5½-inch air space separates the leaves with the outer leaf hung from two cam-lift hinges. The action of these hinges lowers the all-steel door as it closes forming a tight floor seal without a door sill to prevent sound leaking from underneath the door. This eliminates a potential trip-over hazard for personnel and a hindrance to movement of equipment.

By combining function and acoustical performance in a one-unit design, the Quadraseal Door neutralizes the expense and inconvenience of double-door, opposing-swing designs. Total assembly (which includes factory-installed acoustical seals) of each door prior to shipment erases uncertainty about its in-use acoustical performance, a factor in doubt when seals are attached at a job site.

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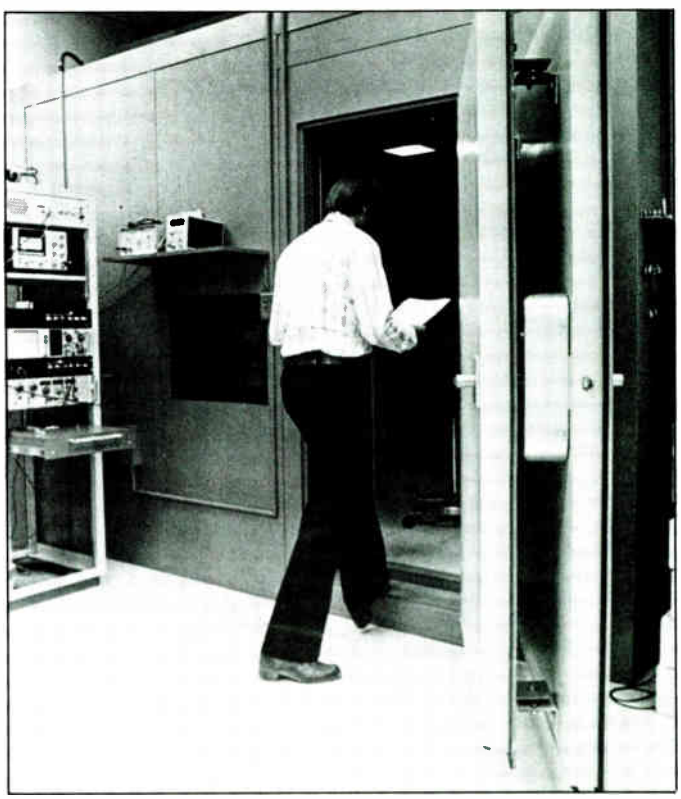

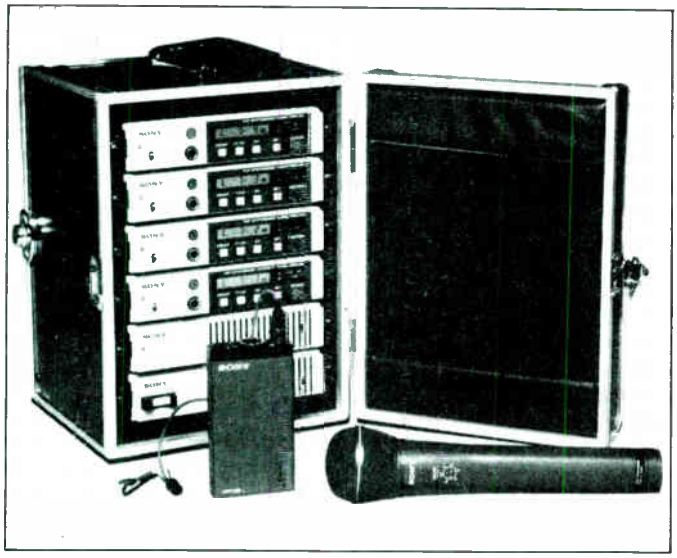

Sony VHF Synthesis Wireless Microphone System

The major components of the Sony VHF wireless system are the WRT-210 handheld microphone transmitter, the WRT-220 bodypack transmitter (with supplied lavalier microphone), and the WRR-210 and WRR-220 receivers. The frequency range of each transmitter covers two adjacent television channels of 48 individual transmitting frequencies. Thus only four transmitters are needed to cover the entire range between 174 and 216 MHz. A pushbutton system with LCD readout allows easy tuning to desired frequencies, and retuning if interference is encountered.

In addition to featuring miniaturized frequency synthesis circuitry, the system also utilizes a linear compander resulting in 96 dB dynamic range. Frequency response is 100-15,000 Hz with a signal-to-noise ratio greater than 60 dB. The optimal effective operating distance between transmitter and antenna exceeds 200 meters. The Sony VHF system transmitters have a suggested list price of $995. VHF system receivers are priced at $1,195 and $1,995 (diversity). Available accessories include a wide range of antennas, a rackmount adapter, carrying case, and an AC/DC power supply.

Circle #097 on Reader Service Card

Korg SDD-1000 Digital Delay

In addition to offering over two seconds (2048 ms) of delay with a dynamic range of 90 dB, the Korg SDD-1000 features a number of musically useful and interesting effects such as record cancel, sequencing, sampling and trigger overdubs. Delay time and hold time can be set remotely; the unit can be synced to drum machines and sequencers; and sounds can be sampled and triggered by a footswitch or other trigger source. The Korg SDD-1000, priced at $395, also offers complete front panel controls for standard delay functions such as regeneration, modulation, delay time, input/output mixing, effect bypass, and infinite hold.

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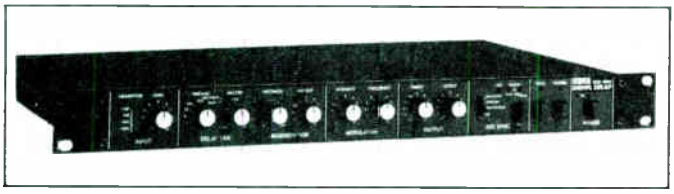

Gauss 200 Watt Coaxial Speaker

Cetec Gauss has introduced their first coaxial speaker, model 3588, which features a conservative power rating of 200 watts RMS, and has been manufacturer tested to continuous program levels of 750 watts delivering clean sound. Metric sensitivity is 95 dB for the low frequency and 109 dB for the high frequency section. Because of proprietary design parameters, both drivers are virtually in the same acoustic plane, thus eliminating the need for time compensation networks. The speaker is designed to work with any standard professional quality crossover.

A new computer-aided time spectrometry program was developed by Walter Dick, Cetec transducer engineering director, which was used to design the unique cosh horn for the coaxial. This design provides an extremely stable image, reduced second harmonic distortion, and virtually no mid range shadowing.

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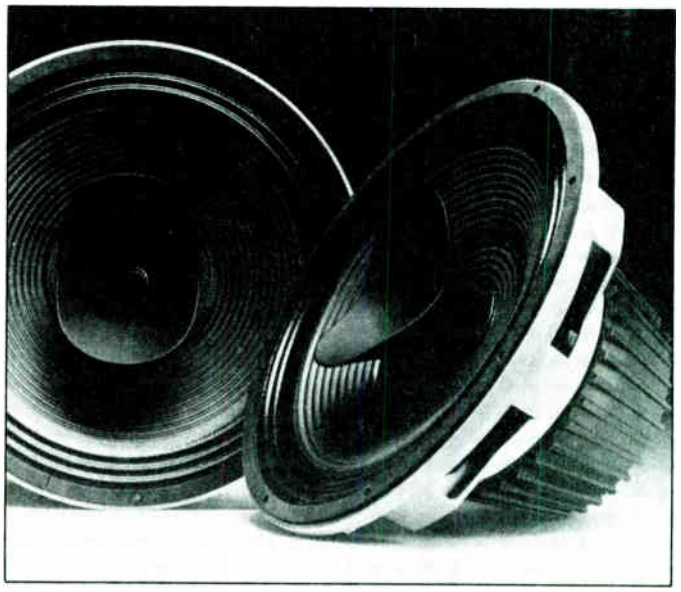

Peavey DECA/600 Power Amps

Peavey announced the second range of products developed at its recently completed AMR research facility; the new Digital Energy Conversion Amplification (DECA) power amps. Company president, Hartley Peavey, has expressed the view that the DECA technology will totally revolutionize audio amplification. The amplifier operates in a manner which largely eliminates the need for heat sinks, bulky power supplies and other parts traditionally associated with high power amplifiers.

After the initial introduction of DECA technology with the DECA-600 (300 watts per channel), the company plans to announce several higher powered versions. According to Peavey, one of the best things about the new DECA technology is that it not only increases the efficiency and performance but does so in a very cost effective manner. The initial DECA-600 lists for $699.50 in the United States.

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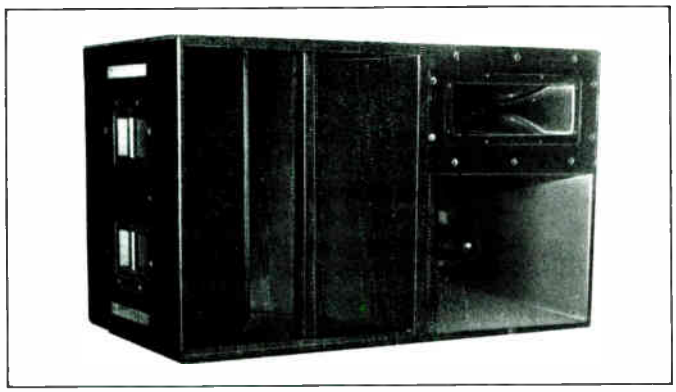


EAW KF-500 Loudspeaker System

The Forsythe Series KF-550 from Eastern Acoustic Works is a high definition, three-way sound reinforcement speaker system. Its "one box" design insures optimum driver alignment and integration for even phase response. The system's low end is handled by two RCF 15-inch woofers; an RCF 12-inch speaker handles frequencies from 250 to 1500 Hz; and a user-supplied JBL 2445 or TAD 4001 driver bolts onto the unit's HF horn to provide the highs. The three horns integral to the KF-550 were developed by Kenton Forsythe and conform precisely to the mathematical models by using a proprietary, polyurethane foam, reinforced hardwood construction technique.

The KF-550 comes with Cannon EP-8-14 male and female connectors, as well as banana plug test points, and an EAW flying strip on each side enables the unit to be hung at eight different angles with two straps.

Options include casters which can be attached to the speaker's slant back and a protective transportation cover.

Circle #101 on Reader Service Card

B&K Applications Notes Available

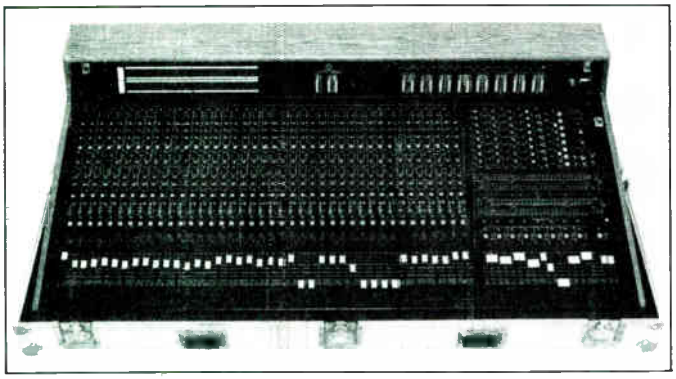
Bruel & Kjaer has just published "Microphones for Modern Recording," on the use of their 4000 series omni microphones. The booklet contains many useful suggestions on mike positioning and introduces some different possibilities on getting the most from omnidirectional B&K mics. The following applications are included: vocals, acoustic piano, percussion, strings, wind instruments, guitars, and drums. Written by recording engineer David Rideau, the booklet is available free of charge by circling the reader service number indicated below.

Circle #102 on Reader Service Card

Sunn Alignment Delay System

The Sunn ADS 4000 digital signal delay device is designed for the critical time alignment of multiple loudspeaker system arrays. The unit features up to five independently delayed outputs ranging from 0 to 9.99 milliseconds, adjustable in 10 micro-second steps; a reference (zero delay) output; a digital display of the delay for each output; balanced and unbalanced interconnects; battery powered memory backup; tamper-proof "adjust lock"; and a digital expansion port. Additional delay outputs (up to 5 total) can be field installed as needed.

Circle #103 on Reader Service Card



New Jim Gamble Sound Reinforcement Consoles

Jim Gamble Associates, of Tahoe City, California have introduced a new line of stage and house consoles which offer full parametric EQ with constant Q (peak boost, infinite cut), 19 three color LED meters with 46 dB of range, a thirty band digital filter spectrum analyzer, digital pink noise generator, 52-pair AMP Quick-Latch connectors, a 288 point bantam patch bay system, and nine programmable busses.

The house consoles, priced at $73,000, feature 40 inputs into eight stereo submasters or 16 mono submasters, two thirty-band graphic equalizers, eight effect sends and returns, and a stereo cue system. The stage consoles are priced at $64,000 and include 32 inputs into 16 outputs with a 16x16 switch matrix, built-in mike splitting, scrambling, and an on-stage sub-snake system.

Circle #104 on Reader Service Card

TOA Powered Mixer with Cassette

The TOA MCX-106 is a compact, self-powered mixing system with a microprocessor-controlled stereo cassette deck. It can record live tapes, playback pre-recorded audio, record sound-on-sound with an external tape source, and simultaneously perform as a 6-channel powered 300 watt sound system and 6-channel independent monitor mixer.

Each input channel features a balanced XLR connector, an unbalanced phone jack, 3-band EQ, pre-EQ foldback send, post-EQ recording level and pan controls, post reverb/effects send, plus an input trim control (with peak indicator LED). The unit also offers a nine-band graphic EQ, and an accessible, front panel patch bay with TOA's exclusive Buss-Link™ capability, and a pro-quality spring-type reverb unit with two-band dedicated EQ.

Circle #105 on Reader Service Card

Fostex Test Generator and Mixer/Compressor

The Fostex Corporation of America recently unveiled two new products, the TT-15, a battery operated five frequency tone generator; and MN-15 compact mixer/compressor. The TT-15 generates 40, 400, 1000, 10k, and 15k Hz tones, and three output levels (−30, −10, and 0 dB) are selectable. The output connector is an RCA pin jack type.

The MN-15 is a mono, battery operated mixer with four line inputs and a switchable line/mike input. All five inputs can be routed through a compressor with a variable release time. An AC adapter is optional.

The TT-15 Tone Generator is priced at $45. The MN-15 mixer lists at $55.

Circle #106 on Reader Service Card

Modular Soldering Station

The Ersa/Caig Modular Soldering Station MS8000/MS6000 incorporates a modular design, so the individual components (transformer, control units, iron, holder) can be used individually or in combination to tailor to specific applications. The high power reserve of the PTC heating element and transformer insure a constant soldering temperature even during fast soldering sequences.

Other features include an above average efficiency, compact module system, easily interchangeable soldering bit (even when hot), short heating time, extremely long life of heating elements, suitable for right or left handed users and short distance between soldering bit and handle.

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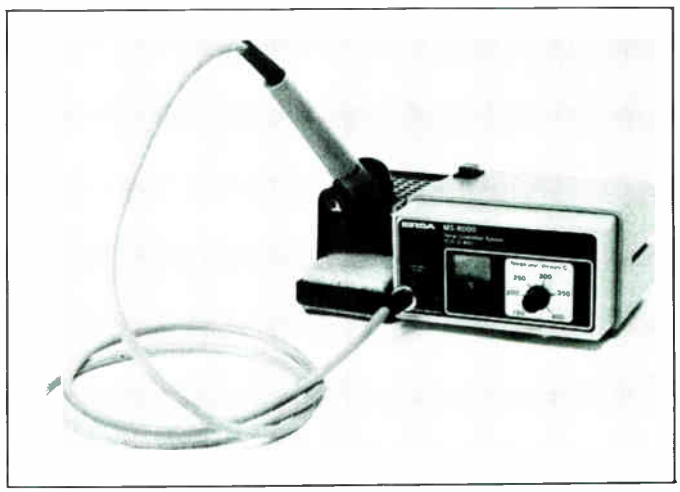
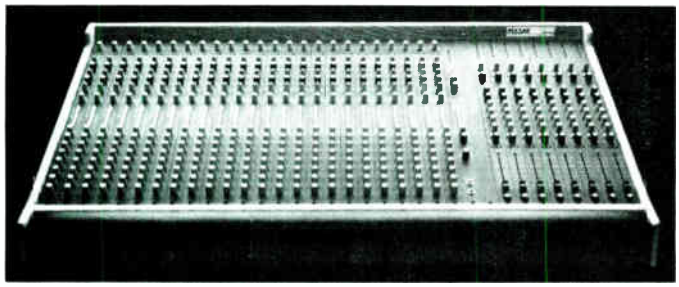


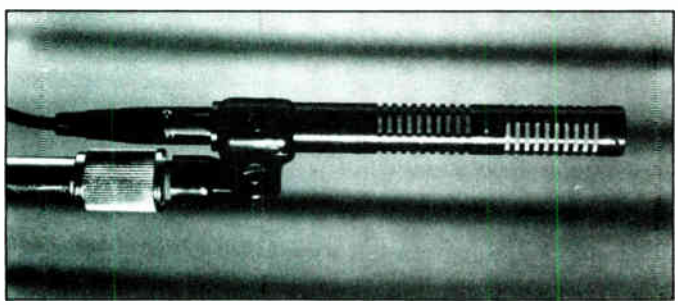


Pulsar Monitor Console

Pulsar Labs, Inc. has introduced their M8 Series of professional monitor mixing consoles. Main frame sizes range from a 16 input by 8 output, to a 48 input by 16 output. The M8 Series includes features such as: total modularity including back panel, three band sweep EQ, phase reverse switch, mute switch, priority cue system, 48 volt phantom power, LED metering on all gain stages, two talkbacks (house & stage), extensive headphone monitoring at the console of the cue and aux. mixes.

The outputs also have sweepable high and low pass filters, mute and cue. Pulsar also designed into the consoles an additional four send matrix on the inputs. These four sends per channel are sent to the four auxiliary receives on the outputs and allow subgrouping of several channels together. The M8 Series consoles are capable of accepting on-board signal processing such as comp-limiters, additional EQ, etc.

Circle #108 on Reader Service Card



Speiden SF-12 Stereo Ribbon Mike

Speiden & Associates, of Plainfield, New Jersey have unveiled their SF-12 Coincident Stereo Ribbon Microphone, offering excellent stereo separation and imaging, wideband response and negligible off-axis coloration. The microphone employs two 1.5 micron aluminum ribbons, each weighing in at one-quarter milligram. Polar patterns are symmetrical "figure-of-eight," positioned at mutually right angles for classic Blumlein stereo pickup, and the mike's small physical size causes a minimum disturbance of the sound field, with few undesirable diffraction effects. The SF-12 comes with an 18-foot cable terminating in two XLR connectors, and a stand adapter is included.

Circle #109 on Reader Service Card

W.B.I. Plate Reverb

Introduced at the Los Angeles AES Conference, the W.B I. Plate Reverb is a portable, (70 pound) unit which features a 75 dB signal to noise ratio, balanced input and stereo outputs, and a full, bright sound with an estimated delay time of 3.5 seconds. The W.B.I. Plate Reverb, built with a precision stainless steel plate, solid oak sides and top (with built-in handles), is priced at $749. **Circle #110 on Reader Service Card**

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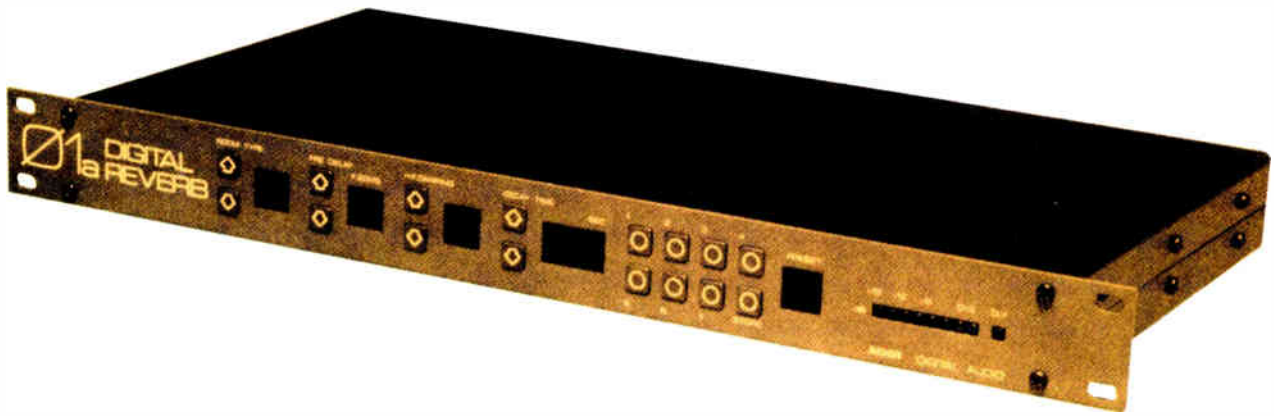


MXR 01
DIGITAL REVERB

Specifications

AC Mains	115V @ 25W / 230V @ 25W
AC Protection	Transformer internally thermal limited
Input	Mono, active balanced, 20k Ohms, +6 dB Max
Outputs (2)	Stereo, unbalanced, 100 Ohmsm +6 dB Max
Connections:	
Input	¼-inch TRS paralleled to barrier strip
Outputs (2)	¼-inch T/S paralleled to barrier strip
Infinite Hold	¼-inch T/S (accepts momentary contact, normally open switch)
Reverb Cut	¼-inch T/S (accepts momentary contact, normally open switch)
User Memory	7 memory stores
Reverb Time	Adjustable from 0.1s -24.0s
Frequency Response	150 Hz - 10 kHz
Dynamic Range	75 dB
Distortion	0.05 percent @ 1 kHz
Dimensions	1¾-inch x 19-inch x 9-inch

by Robert L. Missbach

There's a curious irony in the world of studio recording that we studio-types have joked about for years. The fact is that most studios spend thousands of dollars removing the natural ambience and reverberation from a recording room, and then spend thousands of dollars more putting artificial ambience and reverb back onto those meticulously dry tracks.

Originally, these artificial "spaces" were created by live chambers or electro-acoustic devices such as springs and plates. The disadvantages are numerous: chambers are, of course, rather non-portable, although they can be tuned or shaped for different responses. Springs and plates, though much less permanent installations, suffer from a variety of limitations, from acoustic feedback to lack of adjustability.

The advent of digital audio technology has opened a new realm for "spaciousness." First we had digital delay, which has now matured to a new height of complexity in digital reverberation.

MXR Innovations has now joined the studio digital reverb race with the Zero-One digital reverberator, a very affordable, user friendly, extremely flexible unit, bringing some real competition to the heavy-hitters at Lexicon, AMS, and other high-dollar marques.

The Zero-One packs nine basic programs into a single rack space, with up to five user-alterable parameters per program. In addition, these nine programs may be configured from a non-user adjustable factory preset memory, which will give the unfamiliar operator at least a reasonable program audition. Programs 1 and 2 are plate programs, very dense and diffuse, and good for drums and percussion. Programs 3 and 4 are chamber sounds, less diffuse, more explosive, and suited for vocals and sustaining instruments. Programs 5 and 6 are larger hall domains, with many early reflections and long, clear decays, great for strings, flutes, pipe organs, and choirs (how many times have you tried to make three voices sound like the Mormon Tabernacle Choir?). Programs seven through nine are based on programs four through six with an interesting new feature: dynamic decay.

The author wishes to thank Leo's Professional Audio of Oakland, CA for supplying the unit used in this test.

The latter trick has previously been available only on higher-priced units—the user may choose a reasonably short decay time for continuous program input, and a longer value for when the input ceases. Admittedly, this is an aberration of reality, but then so is much of modern music mixing, anyway. Simply, this dynamic decay allows the mixer to keep the densest portion of the mix "clear" with short decay time, and still allow the reverb to "open up" to a longer decay when the program source pauses or stops. MXR has opted to go in one direction with this feature: these decay rates cannot presently be reversed, i.e. longer running time, shorter stopping time.

For this, however, the Zero-One provides two useful external control jacks. One is a reverb stop control (you'll need a momentary contact, normally open switch/pedal) which will, upon closure, reduce the currently displayed decay time to the minimum for that program (as little as 0.1 second). This feature operates in any of the programs, is easier than signal gates, and gives your feet something to do while you're mixing. The second external control may be unique to MXR: an infinite hold command. Using the same type of momentary contact switch, this feature does just what you'd expect: sustain! Use of this control takes some practice, and it's better-suited for 1 or 2 input sources; trying to sustain an entire mix produces some strange and dramatic effects. But then ...

The controls for the Zero-One are simply laid-out. There are LED displays and increase/decrease buttons for program number, predelay, damping, and decay time. Seven number keys and a "store" key access the seven memories, and another LED window displays the current memory address. For programs seven through nine, the "store" key doubles as a "page 2" key, to allow adjustment and display of the running decay time in the "decay time" window, and a reverb mix control, displayed in the "predelay" window, varies the amount of reverb mixed back into the initial sound, allowing for modified density.

The adjustable parameters have a broad range, and are active in all programs except the factory presets. Predelay ranges from 0 to 90 ms in 10 ms steps. Damping, or high frequency roll-off in the reverberant field (analogous to hanging drapes in a chamber), is an arbitrary zero through nine; the higher numbers introduce increased damping. Decay times increment by 0.1 second steps in the lower values from 0.1s to 5.0s, increasing to 0.5s steps from 5 to 10 seconds, and 1.0s steps between 10 and 24 seconds (max.).

Inside the unit, the program software is contained in a single 28 pin DIP PROM mounted in a quick-change socket. Current models of the Zero-One are supplied with Version 1.1 software, and MXR obviously intends later programming updates to be a simple PROM swap. The two PC boards are cleanly modular with ribbon cable and molex connections for easy servicing. Two nicad batteries provide short-term memory retention, and a ten-year lithium battery allows for long-term algorithm and preset retention.

The Zero-One is essentially a unity-gain device with no external gain controls, but the unit does have a front panel LED input gain display. Some level-match experimenting with console send and return gains should yield desired results from either the "semi-pro" −10 dB or the "pro" +4 dB systems.

On a subjective note, I found the Zero-One to be very easy to operate and adjustable enough to dial-in a desired effect with precision. As with any such device, one must choose the proper program for a given input source: use it wrong and you won't be happy. But I've used the cheapest springs, standard studio plates, and expensive talk-to-me remote-ables, and the Zero-One definitely has a lot to offer, especially considering its $1,600 list price. Small studios can rely on it for a single-source reverb, while large operations could use a couple for special purpose applications. All in all, a pleasant product for your final frontier, S P A C E. ■

PHOTO: SANDRA RUSSELL CLARK

NEW·ORLEANS

J·A·Z·Z and HERITAGE FESTIVAL

by Phil Tripp

Over the past fifteen years, the New Orleans Jazz & Heritage Festival has evolved from a small stage in Congo Park, where the musicians outnumbered the audience the first year, to a ten-stage daytime outdoor bash with night shows in several other venues including the Saenger Theatre, the Riverboat President, Prout's Club Alhambra, and the Performing Arts Center.

Over 200,000 people pack into the day and night shows to see over 3,000 musicians in more than 300 performances during the ten-day festival. It's a musical joyride, but a technical and logistical nightmare to bring all the productions to fruition in what is arguably the largest and most complex music festival in the United States.

Held in late April and early May over two consecutive weekends, the outdoor Heritage Festival comprises five days of performances on the ten stages—two major stages for the heavy acts, three tents containing gospel, traditional and mainstream jazz performance areas, with the other smaller stages scattered precisely around Gentilly Street Racetrack Fairgrounds.

Over the years, the producers have learned from their mistakes, the problems created by crowd control, and the cruelty of New Orleans' somewhat unpredictable spring weather. Sound bleed has always been a recurrent problem that has been worked on every year, and the mammoth task of electrical distribution to not only the stages but also to over 50 food vendors with their electrical appliances and assorted other power requirements from the facility and other production areas led to a continuously changing and unique power grid system.

Associate producer Joanne Schmidt explains the refinements with both the power and sound reinforcement systems: "There seems to have been a new change every year and this year we've had incredible modifications to our large power grid system. The racetrack had new light poles installed throughout the fields with 440 power. We were able to draw some voltage from those poles for a somewhat easier power distribution. Since it was untested, we had to make sure that not even an extra electric frying pan in a food booth came on so that a stage's power wouldn't be blown off. Previously we had run power overhead and in some situations underground, but the new cables for the power poles and an underground drainage system for the field caused untold problems in trying to locate runs for cables that would be safe for the audience as well as optimum for our distribution.

"The changes in placement of stages and the technology that we've evolved with our sound systems has been most interesting, though. We've always encountered some bleed problems between the hotter stages, numbers one and four at each end of the field, and the corresponding tents and smaller stages, and from individual stages to each other within the field, depending on the strength of the artist and how hard they

Dewey Balfa, Mark Savoy and the Cajun Allstars bring everyone to their feet at the Festival.

hit. We've relocated the stages so that there is less bleed. Plus, we're using narrow radial horns, as opposed to the wider angled ones, elevated higher and pointed down severely toward the audience.

"Also, our technical director Kelly Sullivan has cleverly placed bleachers, trucks that suppliers use—like semis or other trucks—some of the individual stands for food service, etc. between the stages to block the sound most effectively. And this year has been our best ever in terms of isolating the sounds from individual stages."

There is no shortage of entertainment for the audience. The gospel tent can accomodate over 1,000 people and the stage may be filled one hour with 48 ladies from a Baptist church, followed by a smaller five-piece gospel choir of prisoners from the local parish jail.

The festival tent alternates between mainstream jazz groups, folk artists such as Odetta, Mose Allison, and smaller ensembles, with the same basic capacity as the gospel tent.

The third large tent, Economy Hall, concentrates more on Dixieland jazz groups and even has a linoleum dance floor on the side of the stage where people can whip themselves into a foot-stomping frenzy.

Both the Economy Hall and Festival Tent use sound equipment supplied by Koehn Electronics and the Sunn Musical Equipment Company, while the gospel tent is operated by P.D.A. Audio. The two main stages use massive sound systems supplied by Rock n' Roll Systems. Stage One is handled by Pace Sound & Lighting with Glenn Himmaugh as engineer, while Stage Four uses RAM Sound, with owner Robert A. McTyeire as engineer.

Stages One and Four handle the hardest acts, which this year included Jerry Lee Lewis, Fats Domino, Grand Master Flash, the Neville Brothers, Steel Pulse, Rita Coolidge, Al Green, Bobby Blue Bland, Clarence Gatemouth Brown, and other local groups.

Timing is critical. In many cases, changeovers between acts are only 15 to 30 minutes and all stages must operate on a strict time schedule in order to enhance the flow of festival goers from stage to stage and also to clear the festival grounds progressively at the end of the performances.

200,000 people pack in to see over 3,000 musicians in more than 300 performances during the ten day festival: it's a technical and logistical nightmare...

Over 30 stage crew members and 25 sound crew people are responsible for the operation of the ten stages under the direction of the technical production supervisors known as the Special Forces Team. Headed by Kelly Sullivan, technical director, and Laura Loughlin, program director, the crews use a unique telephone communication system specially installed for the festival.

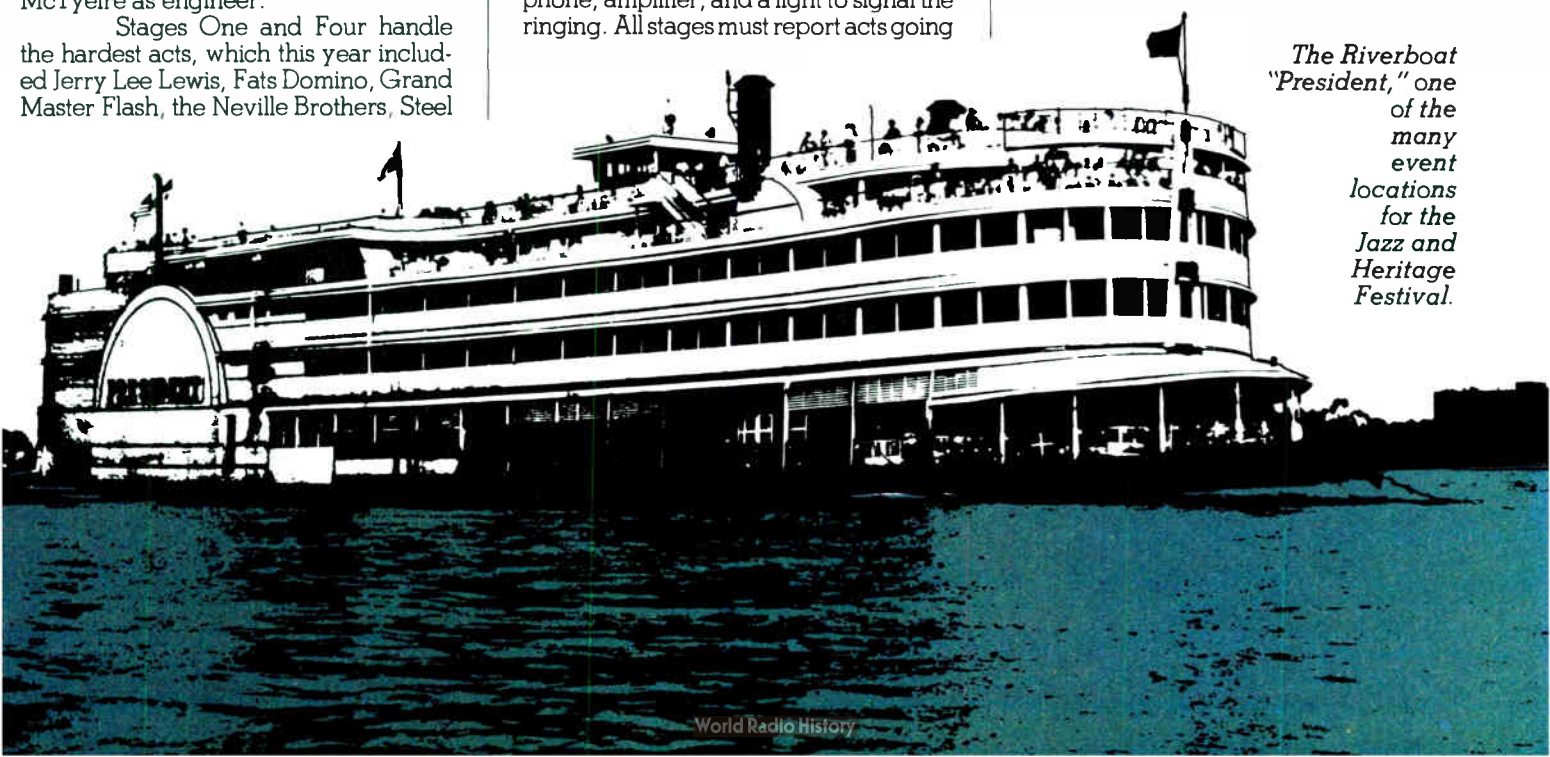
Each stage has a modified telephone with noise cancelling microphone, amplifier, and a light to signal the ringing. All stages must report acts going on and off and any problems which can delay the appearances of the artists.

John Phillips and Tom Spicer are in charge of routing rental equipment from stage to stage in order to minimize the amount of equipment used by artists and cut down on changeover times on each stage.

Mike Guthrie is the electronics engineer who keeps all walkie-talkies, telephone systems, and equipment working at top performance. Guthrie's responsibilities include testing any amplifiers or electrical equipment being brought into the area to ascertain proper grounding and operation. Each stage has a ground fault interrupt testing device which must be applied to any equipment to be used. If any amplifiers or other stage equipment are shown to be defective, a replacement amp is used, or Guthrie may even repair the problem on the premises.

An unexpected problem which cropped up this year was the walkie-talkie system. Unfortunately, the festival walkie-talkies were stolen from the truck of a service company a few days before the festival. A whole new system of walkie-talkies which had to operate on two separate frequencies were out to use for the roving festival production personnel. Though it was an inconvenience, the system worked and allowed for a smooth running production team.

The key to this mass of production is certainly pre-planning. This year the festival used a Kaypro 10 computer, programmed by Alan Langhof, owner of the Dream Palace nightclub, who knows the production business problem areas. As Joanne Schmidt states, "It was easier than going to a straight business-



The Riverboat "President," one of the many event locations for the Jazz and Heritage Festival.

man. Langhof knows his stuff. And our computer is programmed with all contract information—monies, deposits, notes on productions, needs, i.e. instruments, catering, chairs, even music stands. The computer will also print our contracts—both union and non-union —and all artists are alphabetized and payment reference numbers with cheque information available for display on a daily basis.

The use of rental equipment eases many problems of transporting gear into the fairgrounds area during the day. A major source of gear is Festival Productions, Inc., the New York executive production company for the festival, and the rest is rented from local suppliers with Is Music as the main contractor. Gary Edwards of Is Music has three people at the fairgrounds at all times servicing the equipment with spare amplifier heads, cymbals and accessory items.

Since all shows are held during the daytime, no lighting systems are needed and it would prove to be an added drain on the already overextended power system. The godfather of power for the festival is Eddie Lambert who has handled the power requirements for the growing festival for 14 years. Having to comply with strict local regulations and unrelenting inspectors, Eddie's amazing acumen at interfacing stage and food booth requirements is nothing short of a miracle. Far from being a rock and roll roadie, the 60-year-old Lambert possesses a technical skill and raw determination that has surmounted even the most impossible situations and has averted potential disasters almost every year.

While the daytime program may appear to resemble a highly technical military maneuver rather than a series of staggered stage performances, night shows require less crisis intervention and manic energy.

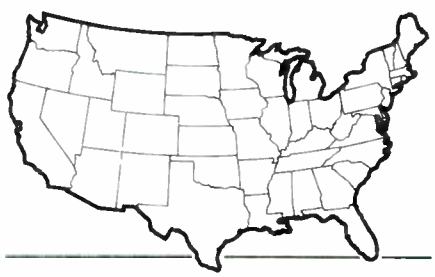
The most interesting shows are held on the Riverboat President which generates its own power as the ship cruises up and down the Mississippi River. Three to four bands a night perform to rabid audiences of 2,000. With onboard food and liquor facilities, the crowd is well lubricated to enjoy enervating performances from a wide variety of local stars and international performers. This year's shows included the original Meters with their special guests Dr. John, Steel Pulse, Roy Orbison, Johnny Rivers, Sonny Rollins, Herbie Mann; a blues cruise with Taj Mahal, James Cotton, the Fabulous Thunderbirds, Etta James and others; Fusion Night with Stanley Clarke and George Duke; and a Jazz Festival Anniversary party featuring Fats Domino and Dr. John.

The Riverboat shows use Pyramid Audio Productions directed by Don Drucker, who also handle programs in other venues in the city, including Prout's Club Alhambra with late night jazz jams, the Saenger Theatre where Ray Charles and Al Green appeared together, and the Performing Arts Center.

As Drucker says, "It's so easy now. Jazz people have fewer requirements than the rock and rollers we're used to catering to; and you can even enjoy the music while you work, as opposed to the heavy metal heroes that we often have to tolerate. There's a love of music which has come out that courses through the audience and is fed back by the performers. It's a very special, magic event, and we're happy to be such an integral part of it." ■

LISTINGS UPDATE

REMOTE RECORDING & SOUND REINFORCEMENT



The following is a list of remote recording and sound reinforcement companies which were inadvertently omitted from our June listings.

SOUTHWEST

ARIZONA REMOTE RECORDERS
REMOTE RECORDING
833 W. Main St., Mesa, AZ 85202
(602) 834 9511
Contact: Earl Ricker

GABRIEL SOUND
SOUND REINFORCEMENT
833 W. Main, Mesa, AZ 85202
(602) 969-8663
Contact: Brent Gabrielsen

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

LOST PERSON STUDIOS
SOUND REINFORCEMENT & REMOTE RECORDING
200 Timbercreek #115, Richwood, TX 77531
(409) 265-2166
Contact: Gregory R. Leach

METRO AUDIO
SOUND REINFORCEMENT & REMOTE RECORDING
512 Southwest Dr., Southgate Plaza, AZ 72401
(501) 972-0321
Contact: Jimmy Bolin

ROH'S ELECTRONIC DESIGN
SOUND REINFORCEMENT
4553 E. Broadway, Tucson, AZ 85711
(602) 795-8573
Contact: William D. Roh

SOUND AND INTERCOM SYSTEMS
SOUND REINFORCEMENT
3146 W. Clarendon, Phoenix, AZ 85017
(602) 279-0551
Contact: Paul Allison, Art Smith

SHOWCO, INC.
SOUND REINFORCEMENT
9011 Governors Row, Dallas, TX 75247
(214) 630-1188
Contact: Jack, Rusty, Robin

SOUTHEAST

A.C. COMMUNICATIONS
SOUND REINFORCEMENT
P.O. Box 8795, Mobile, AL 36608
(205) 470-9243
Contact: Alan W. Carter

W. STEPHEN BUSSEY, P.E.
SOUND REINFORCEMENT
1235 Pine Island Rd., Merritt Island, FL 32953
(305) 452-2910
Contact: W. Stephen Bussey

CONSOLIDATED ELECTRONIC SYSTEMS, CO.
SOUND REINFORCEMENT
6529 Clinton Highway, Knoxville, TN 37912
(615) 938-2088
Contact: Ralph C. Miller

COTTRELL ELECTRONICS CORPORATION
SOUND REINFORCEMENT
One So. Fifth St., Richmond, VA 23219
(804) 648-8338
Contact: Walker C. Cottrell

MUSICO
SOUND REINFORCEMENT
P.O. Box 2654, Mobile, AL 36601
(205) 438-5828
Contact: E.B. Cosper

NORTHEAST

LE MOBILE
REMOTE RECORDING
211 W. 56th St., New York, NY 10019
(212) 265-1979
Contact: Abe Hoch or Meryl Yelman

SHOWTINE SOUND SERVICES
SOUND REINFORCEMENT
P.O. Box L-473, New Bedford, MA 02745
(617) 636-6040
Contact: Lloyd Jacobsen

NORTH CENTRAL

SGA SYSTEMS
SOUND REINFORCEMENT
410 East Grand River Ave., Lansing, MI 48906
(517) 372-5278
Contact: Mark Reed

THE VOX BOX
SOUND REINFORCEMENT & REMOTE RECORDING
350 Apache Drive, Marshall, MO 65340
(816) 886-6935
Contact: Alan or Paul

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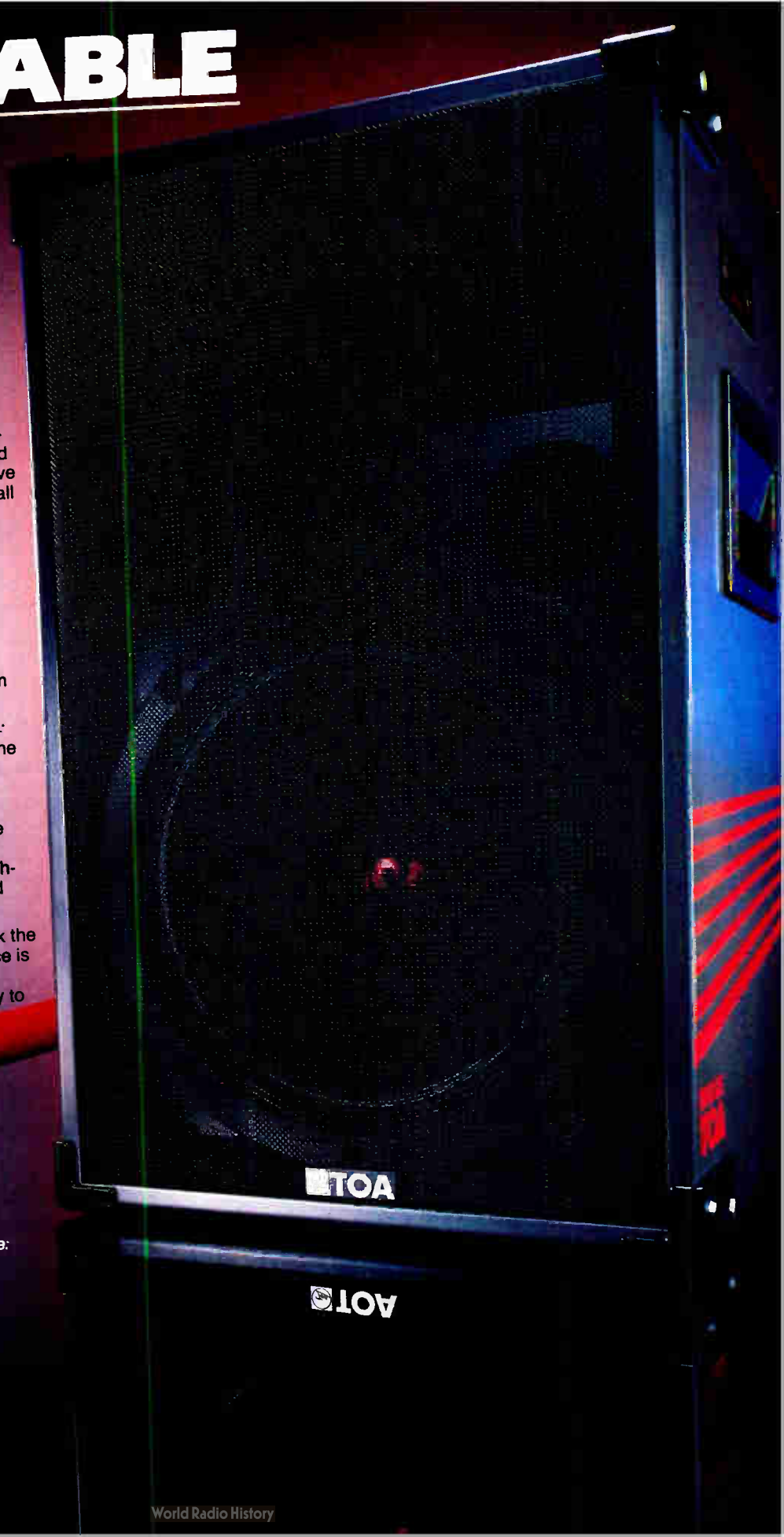
be SYNTHABLE



The software wizards stuck a 9-foot concert grand onto a tiny silicon chip . . . **a world-class speaker is the way to hear it.** Because a system designed only for "traditional" sounds can't live up to the powerful levels and complex timbres of electronically-created music.

That's why we created the 380SE.

Total Transparency—and Psychoacoustic Satisfaction, too.

The 380SE is a clean and powerful three-way speaker system. Electronic reeds and strings, flutey and brassy tones, percussive accents, special effects . . .all sounds at all levels come through with exacting sonic accuracy. The 380SE illuminates subtle variations in pitch and level, whether handling one note at a time or a full synthesized chorus.

Attention to Detail

The digital wizards must master every detail of their technology. A speaker designed for electronic music gives them the freedom to concentrate on sound creation rather than sound reproduction.

So we paid attention to every detail of the sound system. That's why the 380SE is constructed entirely from our own high-quality components. With continuous power handling of 360 watts. Full range inputs. Bi-amp and tri-amp connectors. Four bridging connectors. Mid- and high-frequency level controls, flush-mounted where you can get right to them.

And as you can see, we didn't overlook the visual details. The 380SE's appearance is visual confirmation of its class. The 380SE's performance proves its ability to handle electronic music.

That's what being synthable is all about.

For complete technical data, call or write:

TOA Sound & Communications

TOA Electronics, Inc.
480 Carlton Court
So. San Francisco, CA 94080
(415) 588-2538
In Canada: TOA Electronics, Inc.
10712-181 Street
Edmonton, Alberta T5S 1K8
(403) 489-5511

MX1688 Recording Console

16 × 8 × 2 with control room mixing

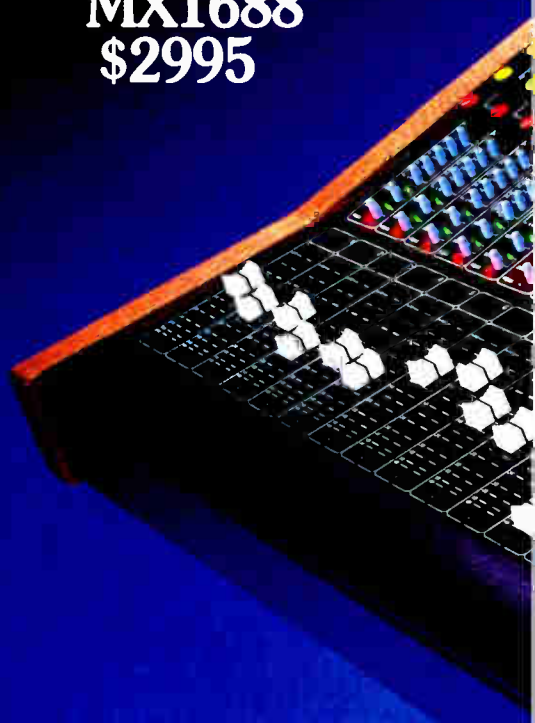
The CARVIN MX1688 is a full function recording mixer designed to serve as the control center for eight-track recording studios. Recording basic tracks, overdubbing sessions, and final mixdown are all handled with ease by the MX1688; signals are automatically routed to the appropriate sections of the console for each recording operation. You will rarely (if ever!) need to reconnect any signal cables with the MX1688. One of the key features provided by the MX1688 but rarely found on PA "recording" mixers is an independent control room monitor mixer with buss/tape source selection. Working groups will find this mixer perfect for the double duty requirements of recording and live sound mixing.

The input channels of the MX1688 include sweepable three-band parametric equalization with defeat switch, four auxiliary mixing busses with pre/post switching and solo/mute functions. Quiet performance starts with an ultra low noise differential mic preamp and is preserved throughout the mixer by careful attention to gain structure and use of the finest low-noise integrated circuits.

Construction of the MX1688 is all modular with individual circuit cards for each channel and master strip. High quality connectors and ribbon cable permit easy field servicing. The same professional quality components as used in $100K consoles are featured in the MX1688 such as Switchcraft™ connectors, ITT Schadow™ switches, and controls that are optimally damped for smooth operation and made for years of service.

Efficient manufacturing, and direct marketing allow us to load the MX1688 with all the features required for multitrack recording and still offer a price that represents real value. Try it on the job for 10 days and if not convinced that it's better than consoles selling for twice the price, we'll refund your money! Send for your FREE CARVIN 84 pg catalog today or include $2 for 1st Class mail, $5 Foreign. For an extensive overview of the MX1688 or MX1644, send $7 ea for their 32 pg Operating/Service manuals. Refundable with purchase.

MX1688
$2995



MX1644 Recording/Live Sound Mixer

16 × 4 × 2 with control room mixing

The MX1644 shares many of the advanced features and construction of the MX1688 but in a less expensive 4 out configuration. The 16 input channels of the MX1644 feature four band equalization, two monitor busses, two effects busses, 4 sub assign plus L & R assign, and a host of other features. The 4 main sub-outs can utilize the optional ($200) nine band graphic equalizers (4) which can also be patched into the channels. The MX1644 comes with a studio quality Hammond reverb system. Compare the quality and price of the MX1644 and discover its value!

MX1644
$1695

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MX1644 Manuals $7

MX-58

Product Information
TOLL FREE 800-854-2235
Calif. 800-542-6070

CARVIN
Dept MX-58, 1155 Industrial Ave.,
Escondido, CA 92025

MX1688

Recording Features

- Eight Track Studio Control Center
- Input/Output Channel Organization
- Independent 8 Into 2 Monitor Mixer
- Four Auxiliary Busses w/ Pre/Post
- Three Band Parametric EQ w/ Defeat Switch
- Mute and Solo on all Input and Output Channels
- Two Effects Returns w/ Pan and Solo
- Talkback w/ Built-in Mic and Monitor Dimming
- Peak Warning Indicators w/ Peak Stretching
- Patch Points on all Channels
- Microphone Phantom Power
- Cue and Effects Sends from Output Channels
- Alternate Metering of Cue and Two-Track
- Quick Tape Playback Through Monitors
- Independent Mic and Line Preamps
- Studio Feed w/ Source Selection
- Totally Modular Internal Construction
- Input Noise of -127 dBv
- 20 dB headroom at All Stages
- +4 dB or -10 dB Operating Level
- T.H.D. less than .05%

P.A. Features

- Eight Sub-Groups w/ Solo and Mute
- Four Independent Monitor Mixes Available
- Headphone Monitoring of Main or Monitor
- Talkback to Monitors
- 11 Step Gain Controls for Easy Set-Up
- Channels Assignable to L & R Stereo Output

"The flexibility of the effects and clean layout of the MX1688 allows creative control, usually found only in desks selling at over twice the price I'm very impressed!"

— Peter Mclan, Producer for Men at Work

Circle #114 on Reader Service Card

CHARLEX DRIVES THE CARS INTO THE NEXT GENERATION

by Lou CasaBianca

Anybody who has watched a few hours of MTV can tell you what's wrong with music videos. After an initial period of almost euphoric instant gratification, the tedium of more and more sex-smoke-and-violence gives way to the unmistakeable daze of video heavy metal poisoning. By definition, all film and video music pieces are interpretive. Even the most verite' documentary is as much the projection of the filmmaker's translation of the reality of the moment, as it is a representation of the actual event. There are so many options, so many ways to go in the conceptualization and scripting, in casting and wardrobe, why is there so little creativity and imagination? Why is there such a pathological preoccupation with the degredation of women and blatant racism? It's too easy to write it off as catering to adolescent prurient interest and teenage fantasies. The artists, producers and record companies must bear the responsibility. Recently, though, a crop of thoughtfully scripted, creatively designed and well directed upbeat films have appeared on the music video scene, welcome indicators pointing in the direction of innovation and married with high technology and good taste.

The Alan Parsons Project's "Don't Answer Me," Steve Perry's "Oh, Sherrie," and Thomas Dolby's "Hyperactive" are all outstanding and innovative recent works. But probably the best example of a music video that represents a new look combined with a great song and a really humorous well-written script is The Cars' "You Might Think."

Recently we spoke with Charlie Levi of Charlex, a New York-based special effects and commercial production company. The company has created commercials for ABC's ***Nightline,*** Atari, Exxon, Ford, Jell-O, Kodak and the ***National Enquirer.*** It was the off-the-wall, tongue-in-cheek sense of humor of the ***Enquirer*** spots that attracted The Cars to Charlex. Charlie Levi and Alex Weil are Charlex and the co-producers and directors of The Car's video. In this case, the term "video" may be taken literally, as the entire production was shot on video, not on film, like 95 percent of the "videos" we see.

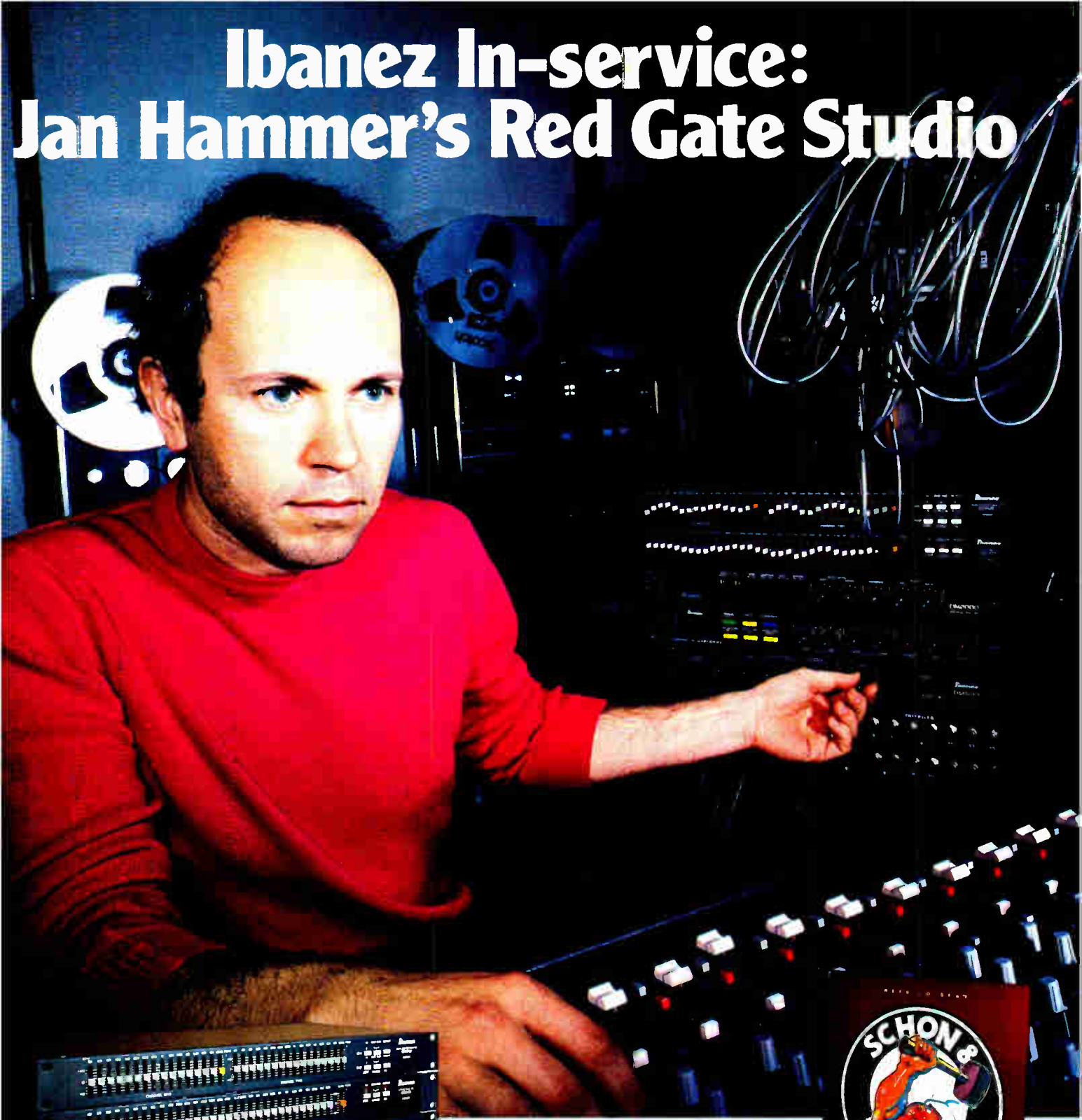
Charlex has moved special effects in music video to the next level of the artform in their zany production of "You Might Think." The production is a masterpiece of high-tech orchestration using ADO (the Ampex Digital Optics system to move images in x-y-z axes simulated 2-dimentionality), the Paint Box (MCI-Quantel computer designed to create artwork directly onto video frames), and Ultimatte (Electronic "blue screen" rear projection providing digital control of backgrounds).

As in most cases, "it's not what you got, but how you use it." All the hardware in the world in lesser hands could not have generated a project of this creative complexity. The key to the success of the piece is the script concept developed by Levi and Weil, working with co-director Jeff Stein and writer-art director Bob Ryzner. As important was Charlex's unique commitment to video production is having ADO, Paint Box, and CMX editing linked to a shooting stage permitting live action video and special effects to go on tape simultaneously.

The storyboards were so pre-

(Above) The Cars "You Might Think"
Left to right: Susan Gallagher, Ric Ocasek Clock

Ibanez In-service: Jan Hammer's Red Gate Studio



Jan Hammer - long recognized as a pioneer of the electric keyboard - also pioneered the use of advanced signal processing techniques in his medium. Jan learned early on the value of quality signal processing in the creation of his unique musical voicings. In his Red Gate Studio Jan has chosen Ibanez digital processors and graphic equalizers. For Jan has learned what more musicians, producers, engineers and soundmen are learning everyday: Ibanez delivers!

Ibanez

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(209) 255-1685
Contact: Jeff Long

SOUTHERN CALIFORNIA

ACCU SOUND AND VIDEO STUDIOS
SOUND REINFORCEMENT & REMOTE RECORDING
4274½ El Cajon Blvd., San Diego, CA
281-6693
4276 El Cajon Blvd., San Diego, CA
280-6098
Contact: Brian Cantarini

AUDIO SOURCE INTERNATIONAL
SOUND REINFORCEMENT
231 E. Imperial Hwy., Suite #250, Fullerton, CA 92635
(714) 680-3975
Contact: Tony Bernatowicz

THE ENACTRON TRUCK
REMOTE RECORDING
5102 Vineland Ave., North Hollywood, CA 91601
(213) 761-0511
Contact: Stuart Taylor

FOSTER ELECTRIC INC.
SOUND REINFORCEMENT
15000 Calvert St., Van Nuys, CA 91411
(213) 994-0686
Contact: James P. DeMarco

K-T ELECTRONICS
SOUND REINFORCEMENT
3306 Lime Ave., Long Beach, CA 90807
(213) 424-0979
Contact: Wayne E. Gingerich, gen. mgr

RECORD PLANT RECORDING
REMOTE RECORDING
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8456 West 3rd St., Los Angeles, CA 90048
(213) 653-0240
Contact: Irene Simmons
Equipment: Consoles designed by Record Plant and built by API. 44 inputs, each w/API 550A EQ and four echo sends. 32 multi track outputs, sophisticated simultaneous 2 track, 4 track, and mono facilities can accommodate the most demanding video and radio productions. A solo system that doesn't interrupt critical video and radio mixes. Independent playback mixing section (with cue and echo sends) for nondisrupted instantaneous playback. Voltage controlled group faders, assignable to program or monitor/remix faders, for flexible sub-mixers. Extremely extensive patch bay and signal route switching provides unequalled functional possibilities. Outputs for headphone mixes, stage talkback, stage foldback, PA mixes, stage monitors. Monitors: RCD John Meyer and JBL 4320s monitoring system. Recorders: 3M 79 Series 24 track, 4 track, 2 track, and cassette recorders (dbx and Dolby optional). Limiters: UREI, Teletronix, dbx. Mikes: AKG, Neumann, Shure, E-V, Sony, Beyer, Sennheiser

SHOWCO WEST
451 N. Orchird, Burbank, CA 91506
Contact: Wil Sharpe

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(818) 786-2500 and
816 E. 25th St., Kearney, NE 68847
(308) 237-2207
Contact: B.J. Alexander

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P.O. Box 3084, Ontario, CA 91761
(714) 947-3709
Contact: Dan Olhla

WEBBER SOUND
SOUND REINFORCEMENT
1095 N. Main, Suite I, Orange, CA 92667
(714) 953-5082
Contact: Bob Estrin

cise that there were virtually no out-takes on the special effect sequences. "There is no shot that is more than three maybe four generations," Levi says. "We had a lot of machines rolling and did a lot of organization in front to avoid generation loss. Quality was our main concern. The budget had nothing to do with reality. This was our first video and we were anxious to do it. If it was budgeted out as if it was a job for an advertising agency, I would say it was about 25 percent of what the cost should have been. We could have simplified the production and no one would have complained. As a matter of fact, when it had to be on-air, the ending on the piece had Ric smiling and it was at our insistence that we go back and do another 20 hours of work to get the ending as it is now. We were the ones who made it as hard for ourselves as it became and it's paid off in creative satisfaction.

"We hope to shoot more music videos," he continues. "We've turned down a couple of major groups, because we're only interested in doing these for groups that we like and who would suit our style. It takes such a tremendous amount of work and commitment on our part that we only want to get involved with groups we enjoy."

The production required six days of shooting and six days of postproduction. The Paint Box artwork was executed by Patti Belluci and Henry Baker. The Cars' Ric Ocasek's unattainable female co-star was Susan Gallagher, whose casting and performance is another key element in this music video ***tour de force.*** Charlex has created what has to be considered one of the most innovative music videos ever produced.

A video clip that is as creative in it's own right. "O Sherrie," by Steve Perry, directed by Steve Cole and produced by Paul Flattery. It is photographically outstanding and right on the mark in its movie-within-a-movie satire of the rock video starmaking machine. Singer/songwriter Steve Perry (of Journey fame) is cast as a rock "tenor" in distress about being cast in yet another smoke bomb and period costume video scenario. He refuses to go along with the program, exits the set and starts his ode to Sherrie acapella in what becomes a play on a Shakespearean balcony scene. Blessed with a powerful song and performance, Cole and Flattery successfully weave comedy and dramatic dialogue with what is surely one of Perry's strongest vocal performances to date.

While technology and execution play a major role in the creation of innovative and entertaining productions, what is clear in the pieces pointed out is that the script concept and preproduction planning are equally important. Let's hope we can look forward to more of the same.

POLICY FOR MUSIC VIDEO

Music videos with audiophile stereo quality will serve as a catalyst in bringing long form music video programming of age. Fair financial compensation for the artists, producers, directors, and other craftsmen is essential and must be in place before music video programming can be considered to have grown out of its infancy as an industry. Advertising agencies are beginning to see the numbers (ratings, shares, and cost per thousand) they need to make this kind of programming "viable" for their sponsors. Sales of video 45s, video LPs on ½-inch video tape and laserdisc should begin to support a budding and profitable software marketplace. Eventually, the programmers and the producers will agree on the fees for specific limited rights for home video, cable and broadcast. Hopefully included in these agreements will be a commitment to not only compensate program producers fairly but to also ensure recognition for the directors, lighting designers, and sound mixers behind your current favorite video. Typically, only the recording artist and the record company are credited at the end of a music video clip programs or on MTV.

Audio has traditionally been treated as a "necessary evil" by TV people. From microphone selection and technique through sound stage acoustics, most video production and postproduction facilities can be rated "anemic" when it comes to audio recording and mixing power. Some of the record companies themselves contribute to music video "noise floor" by releasing ¾-inch video dubs to programmers with obnoxiously poor audio. Tapes out of stereo phase, with no dynamic range, no low end, no high end, and lots of hiss have, alas, become common.

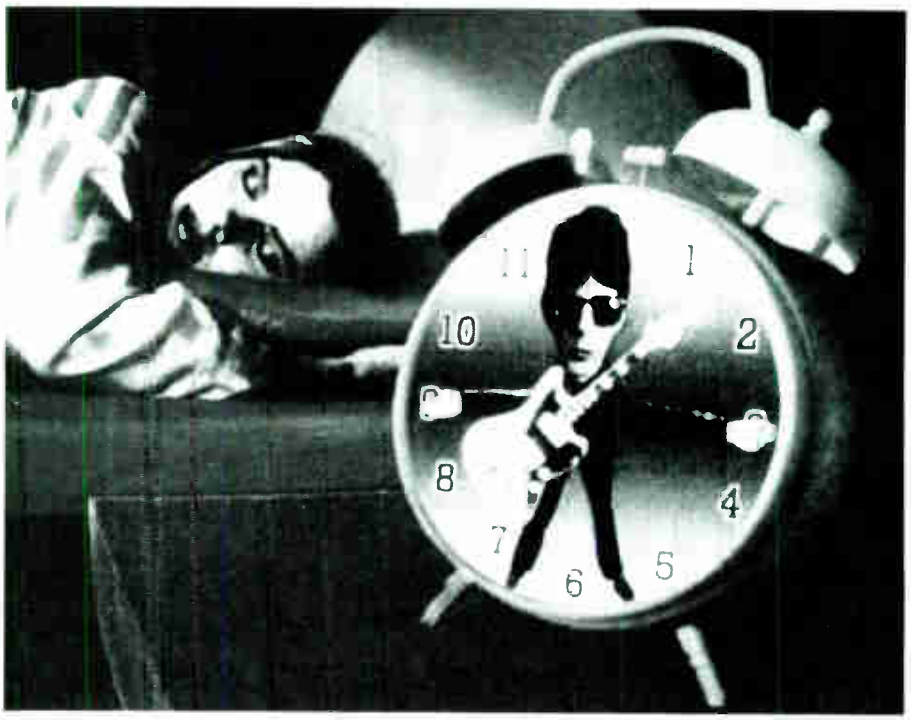
The arrival of the CD digital audio disc, Beta and VHS HiFi make stereo mastering in the audio and the video postproduction environment the new standard. The ***Tonight Show, Friday Night Videos*** and most network sports programming will be produced and broadcast in stereo within the next year. Rapid-fire commercials and network IDs will now include stereo audio stingers. Last March 29th, the FCC issued its second report on the "Use of Subcarrier Frequency in the Aural Baseband of TV Transmitters," placing its seal of approval on a new era of production and programming.

Quality in audio for film and video is now, more than ever, a must. The convergence of the recording studio, the video or film postproduction facility, and radio and TV broadcasters in the music video arena is forcing the level of audio production quality to rise to the level of the professional recording

studio. The fact is that video and computer interfaces in both consoles and tape machines will become a key factor in the success of new devices—analog or digital. Rare just a few years ago, tape machines with microprocessor control, search, and multiple and external machine control. The evolution of this technology will permit microprocessors to communicate with outboard computers which will then have access to all signals within the tape machine. Two track tape recorders with center track time code are becoming a standard. Synchronizers are now being incorporated into consoles.

One manufacturer has incorporated a keyboard into the console permitting the synchronous control of up to five tape machines, automatically switching time code, tach pulse, direction sense, transport controls, and tallies. Multitrack postproduction capabilities have been enhanced by the use of digital display and the transmission of multichannel audio signals over fiberoptic cable, passing through AD/DA conversion equipment. Stereo TV consoles are now available for broadcasters along with video switcher interfaces for audio follow video needs.

Other advancements include a serial console interface, which will allow a console to be controlled from an RS-232 port driven by a video editor or outboard computer. Another manufacturer will be introducing a floppy disk-based computer controlled mixing unit, which will fit most consoles without modification, and is available with retrofit packages including VCA faders. Whether the developments have come about because of interest from video people in higher audio quality, or from a natural evolution, it is clear that the industry is finally rising to meet consumer demand for high quality stereo video programming.



The Cars "You Might Think" Susan Gallagher, (Ric Ocasek Clock)

It's a Family Affair

By Quint Randle

The record business isn't exactly known for the typical, middle-American family lifestyle. We have yet to see the wife of a rock star named "Mother of the Year." And most music dads spend much more time cutting records than they do cutting and edging the front lawn. Pop means "popular," not father.

While a parent's climb up the corporate ladder in any business has been known to tear families apart, there are a growing number of people defying the general rule that families and businesses just don't mix. The fact that the "studio family" is a thriving entity is just one indication of this modern fact of life.

Some of these husband, wife, and sometimes son or daughter teams operate their studios out of the basement or some other room connected to their home. In addition to all the regular worries, these studios must make sure other little things don't go wrong—like clients parking in front of the mail box or the neighbor's driveway.

Running the business out of the home is not the norm, though. Many family-run studios shy away from the "home effect" and go for a more detached atmosphere. Some have a non-relative business partner or two in addition to family members of the studio corporation.

But whether at home or away from home, running the studio as a family has its unique benefits along with its particular challenges. *Mix* talked to a number of families, and here's what a few of them had to say about combining the roles of recording studio and family.

JERRY AND ANNETTE FULLER
Footprint Studios—
Sherman Oaks, California

A while back, Jerry and Annette Fuller's 15-year-old son Adam asked them what instrument was easiest to learn to play. Up until that point neither he or his 13-year-old sister Anna had expressed much interest in the music business.

Mom thinks he figured out that "there are girls who like guys that are into music."

The Fullers, married for 18 years, have had a studio for more than eight of those years. Typical of many "family operations," Footprint Sound Studios started as a facility for Dad's songwriting and production work.

The studio, located in a separate building at the Fuller's home, has enjoyed the patronage of such "names" as Glen Campbell, Tanya Tucker, Bobby Goldsboro, Al Wilson and other major artists. Still, Jerry explains, 60 to 70 percent of his regulars hold day jobs and are working in the wee hours of the night for that big break.

"When I leave, I'm gone," Jerry says of the short walk from the studio back to the house. He knows the studio is right there if he needs to go back and get something, but it "doesn't interfere with the house.

"I had more problems when my office was in Hollywood," he continues.

While Jerry does most of the engineering with the help of a few others, Annette acts as studio manager, booking time, etc. The office, which is an extra room in the house, has a separate outside entrance. "We close up at 5:30 p.m.," Jerry says—just like any normal business.

Working at home is great because "I'm right here" if there are any problems or family emergencies, he says. But Annette says, "There are times when we don't really see each other all day so it's just like he's at work."

Sometimes work calls at four in the morning when there's a problem with the machine in an all-night session. "If something goes wrong I have to go out and make sure everything is cool," he says.

While Jerry can be torn away from his sleep by the studio, Annette often gets taken away from her office work during the day: "Visits from friends that are more personal than business, will take me away when it's a little difficult."

Both think "there is more on the plus side than the minus side," and Jerry swears they've "never had an argument in 18 years."

And by the way, Adam is now taking bass lessons.

DAVID AND CATHY CORREIA
Celebration Sounds—
Pawtucket, Rhode Island

"A feeling of caring" is the way David and Cathy Correia describe the effect their relationship has had on their studio, Celebration Sounds. The eight track studio has been in business for about three years.

Like some other family-run studios, the Correias have a non-relative business partner, Dan Moretti, of whom David says, "I have as much trust in Dan as I do in myself." This, of course, is a must for any business relationship.

Dan enjoys the benefits of being in business with a husband and wife team though. The studio has built a solid foundation because of the Correias' nurturing of "their baby," he says. "People know we're here to stay and not in it for a fast buck."

Cathy, who acts as studio manager and accountant, says no real problems have occurred. "If there are any problems then the three of us will work it out pretty well."

David echoes Cathy's sentiment:

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Dan Moretti (left) and David Correia of Celebration Sounds.

"There are absolutely no problems or barriers with communication. We get along so well." David feels this is one of the big plusses of running the studio with his wife.

Cathy says that when clients come in, they really feel like Celebration cares. "I guess the two of us caring about the studio and about each other kind of makes that happen," she says.

Dan, who has known the Correias for some time, agrees with Cathy. She has more of an insight into how the studio affects Dave when he's away from the business. And thus Dave is a better partner because of it, he says.

Dave explains that the toughest part of running the studio as a family, like many other husband and wife teams will say, is being able to divorce yourself from the studio when you're at home. Having a cup of coffee on the back porch usually turns into a discussion about the studio, he says.

"But it's still a new business and we're excited about it," says Cathy. This is the first time Cathy has worked in a self-employed atmosphere, and she "enjoys the decision-making."

Married last August, the Correias have no children yet, and Dave jokes with Cathy about maternity leave when and if any kids do come. "If we have children then you can't be studio manager anymore," he teases.

Cathy was unavailable for comment.

TOM, LAUREL AND JIM MORRIS
Morrisound Recording— Tampa, Florida

Morrisound Recording, located in Tampa, Florida, has been around for about two-and-a-half years. The 24-track studio is owned by a family corporation in which Tom and Laurel Morris and Tom's brother Jim are the main stockholders.

"You can certainly trust the people you work with," Jim, chief engineer, says pointing out one thing he enjoys about the family business. "You don't have to worry about them running off to Venezuela with your MTR 90 or something."

But on the other hand, he says that it seems like every family party is almost a business meeting. Relationships can become a bit strained at times.

While some family-owned studios are located at or connected to a house, Jim says doing that brings in "an entirely different kind of clientele." In doing a lot of video post-production work, he has found that "it's a lot harder to get those type of clients, if they have to drive into a residential section of town. Plus, it's very rare that you can find or afford a house large enough to do everything you want to do."

PETER AND MARY BUFFET
Independent Sound— San Francisco, California

At one time Independent Sound was literally in the house. "You walked by it every time you went to the kitchen," says Peter Buffet. But now, Peter and Mary go to work every day down in the basement of their 100-year-old Victorian home.

"Being able to go down there when the time is right is wonderful," Peter says, "instead of driving across town and working for someone else. It's great to be working for ourselves, having it right here."

Entering the 24 track studio from the outside is a must for everybody, even the Buffets can't get to the studio from inside the house. "We have to walk out the back door first."

As the Buffets built the studio from its four track beginnings, they realized that the studio itself was as important as the equipment in it. They then set out to create an environment that was totally different from the house. So people were surprised when they came in. "As far as I can tell, we've succeeded pretty well at it," Peter says.

But having the studio at the house is a two-edged sword in other areas besides reputation and image. "The fact that it's here—you think you should be working all the time. There's no one telling you 'go home,' " Peter says. On the weekends it gets real tough not to go down there.

Mary explains that it's important to set up some ground rules if you are going to integrate the family and business. They know they have to get up at 7 a.m. and take their twin daughters to school. So all-night sessions are avoided.

Having kids and a solid family life, Peter continues, has helped them to know exactly how much they have to make to live on. "We know what we have to take home." So Peter running off to buy some new gadget for the studio without his wife's permission is not a problem.

The music industry is not exactly known for its upstanding people, and this is one of Mary's concerns: "Some people you run into don't have the greatest values or integrity—you really try to just keep them away from your family.

"We don't just welcome someone

Cereus Recording's (L-R) Allen Moore, Diane Moore, D.R. Wilke and Peggy Murphy Wilke.

into the studio; then they're in our lives. That's what you really have to learn how to keep separate. "Your clients are your clients and your life is your life."

ALAN AND DIANE MOORE
D.R. AND PEGGY WILKE
Cereus Recording—
Scottsdale, Arizona

"The reason we started the studio in the first place was to help my brother's band," says Diane Moore, studio manager at Cereus Recording, a 16-track facility. "And," she continues, "because his band has gotten a lot of equipment, we've become a very well-equipped studio."

Diane and her husband Alan, along with her brother D.R. and his wife Peggy, have been running the studio for more than four years. Two other non-relatives are part-owners also.

"We all know where we want to go and how we want to get there," Diane says. "I find it's a lot easier to communicate because we know each other so well." This is not necessarily the case with typical business associates.

This obvious benefit does have its drawbacks: "We don't have much of a personal life anymore," Diane continues. And each is so familiar with the others that it's hard to be business-like.

But the family atmosphere does rub off on the customers. "I think everybody feels more at home when they get in the studio," she says.

Almost all of the money Cereus brings in is put back into the studio, in hopes it will eventually be able to support all of them. Both Alan and Diane hold down other jobs. Alan installs and repairs digital organs, and Diane has a double dose of family-run businesses due to the word processing service she runs out of the house.

The studio is a quick ten minute drive from the Moore's home. When Diane gets tired of the phone ringing she simply "changes it to the answering service."

The hardest part, she says, is "trying to separate our personal lives from our business lives."

The Moore's have a 14-year-old daughter, and a 17-year-old son who enjoys helping out in the studio dubbing cassettes, etc. "He wants to major in electronics," she says with a laugh. ■

MUSICIANS, ARRANGERS, & PRODUCERS

by Carol Kaye

I recently saw a remarkable live performance at the Paramount Theatre in Denver. It was a nostalgia-type show which employed a big local orchestra conducted by Nelson Riddle. Frankie Avalon and Leslie Gore were the lead vocalists. My heart really went out to Nelson as I saw how contemporary he is (he arranged much of Linda Rondstadt's latest material,) and as I thought back on all the wonderful sessions we'd done together. He was a great boss—a no-nonsense and straight business boss. His thick Jersey voice carried a sharp wit, and he could nail me with just the flicker of an eyebrow. Nelson's great song arrangements are used a lot by Frank Sinatra—Nelson started the use of rhythmic big band jazz styles to back singers. I thoroughly enjoyed watching this concert—seeing how good Nelson looked and sounded, and remembering his great appreciation of fine young musicians.

Closing my eyes and swaying to the music, I thought of other arrangers we worked with in the '60s. Ernie Freeman brought a strong influence to Hollywood for many years. Ernie became quite successful, with a string of hits for Frank Sinatra, Dean Martin and Sammy Davis Jr. Few even remember that he played sax on the old hit "Raunchy." He was a strong and demanding arranger who wouldn't allow us to improvise without trying his chart first, or without his permission. He would mentally clobber us if we disobeyed. A man of action, Ernie was able to gain our immediate attention. Never a time waster, he had a slot for everything, but always had the time to let us know of a job well-done. His brother, Art, an easier going personality, also built a reputation in Hollywood as a talented and influential arranger/producer. Both personable and well-liked, the Freeman Bros. set some early standards for Hollywood pop hit arranging.

Bob Thompson was "the" jingle arranger—with clients like Goodyear, Revlon, Clark-Teaberry, Buick, Chevrolet, Falstaff...you name it. He was another one of those arrangers with a sharp sense of humor who could have me doubled up in hysterics, and then flailing to grab my instrument after his surprisingly quick count-off. His stopwatch was like a part of his body, yet he was the gentleman of gentlemen—always concerned about people.

Sid Feller is another favorite whose subtlety with strings was absolutely beautiful. He usually spent a long time writing and, like Ernie, would get upset if we changed any of his notes. We couldn't put anything past him, although Ray Charles could get away with it. I can hear Ray's voice now: "Nah, nah, nah, darlings. Horns, this is what you to play!" And he would proceed to sing every horn player his part—his ears knew!

And how could I leave out Dan Costa and his earth-shattering arrangements. He put some fantastic big band stuff behind Robert Goulet and Paul Anka, and we had a lot of fun doing sessions at United "A" and Mike Curb's (MGM) studio. Or David Cavenaugh, the producer at Capitol Records who sent beautiful Christmas cards each year. Dave was also a musician with real sensitivity... and was the guiding force behind Nancy Wilson, Mel Torme, Cannonball Adderly, and The Lettermen.

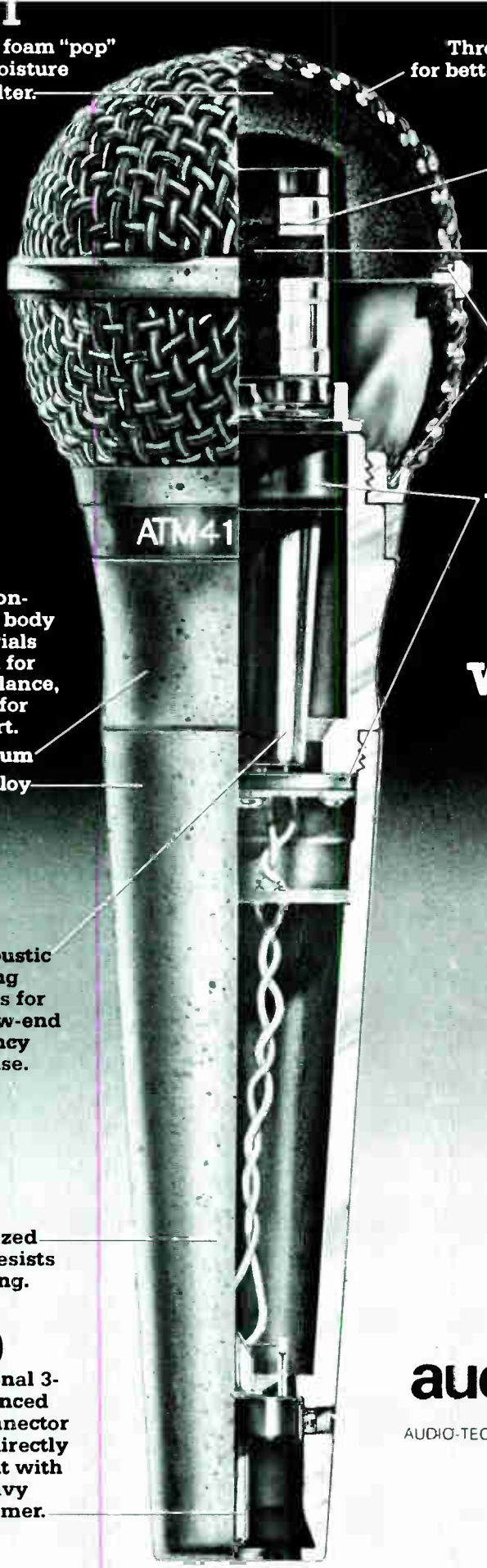
Capitol Records was the scene of a lot of goings on. Studio "A" especially was hot for people like Nancy Wilson and Mel Torne. It's been great, and the studios are well known for their echo chambers buried deep in the parking lot. We cut "Wichita Lineman" there, with the rhythm section using a demo by Jimmy Webb as a guide for chords and style. Al De Lory was producing. Glen was the guitarist, I played bass, Larry Knechtal was on piano, and Jimmy Gordon on drums.

Columbia "A" was another hot room at the time. We cut "Homeward Bound" (Simon & Garfunkel), "Indian Reservation" (Paul Revere & The Raiders), Pattie Page, Doris Day, Don Ellis and Kim Fowley dates. Columbia "D" was a smaller studio where we cut many songs with Andy Williams, and O.C. Smith's "Little Green Apples." Al Casey, Tommy Tedesco, Lou Morell, John Morell, Dennis Budimer, Mike Anthony, Al Viscovo, James Burton, and Glen Campbell were some of the regular guitarists on those Columbia dates.

People are still surprised to hear how many Motown sessions were done in LA. Frank Wilson was the producer on most of those Motown hits from the early '60s (garage studios) to the live Temptations/Supremes hits (at RCA). Frank was able to extract amazing sounds from some very boxy-sounding studios. A lot of big records for the Four Tops, the Miracles, Martha & the Vandellas and the Supremes were done in places like Armin Steiner's garage and later his International Sound Studios on Yucca and Argyle streets, Bob Ross's "Harmony House" recording studio (really just an old house,) and Sunset Sound.

RCA Studio 1 was the early home of The Monkees, who weren't even a group when guitarist Tommy Tedesco and I did their music in the studio. The group was formed around the good stuff that we session players cut. But this wasn't uncommon in the '60s. We were also the Marquetts ("Batman Theme," "Alka-Seltzer" commercial.)

Well, as the final applause tapered off at Nelson's performance I got a little misty thinking about how well all of my old cronies are doing. I miss you guys! ■



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COMPUTERIZED MUSIC

A Look Ahead

by Joe West

With the advent of MIDI and other computer-related products for musicians, a revolution is taking place in music technology. Having been involved in the computer industry for some time and having seen the effect of computers on other applications (graphics, accounting, word processing, games, etc.), I feel confident in predicting that the next two or three years are going to be interesting.

Systems with the power of the present versions of the Synclavier and Fairlight will be much less expensive in the relatively near future (one or two years), and the sound of these new machines will be superior by a large degree to what we are used to hearing. Some time in the next year or so at least one hit record will feature the computer on vocals.

Guitarists will finally be able to play synthesizers. I played Roland's new GR-700 into a Yamaha DX-7 just a week before I wrote this article. It works and it works well! I had velocity sensing and pitch bend controlling the Yamaha's sounds, and I had a great time.

One very important thing to understand is that computers are a natural for musical applications. Almost every aspect of music can be explained in mathematical terms, and computers ***love*** numbers. It is also becoming increasingly evident that musicians are natural programmers, due to the logical nature of arrangements and orchestrations.

How is this quantum leap in technology going to take place in such a short period of time? For one thing, there ***is*** no quantum leap to be taken: The technology already exists. The introduction of Apple's Macintosh and the IBM PC (the PCjr is inadequate for serious musical applications) will eliminate memory and processor-seed problems; I know of five major corporations which are deeply committed to producing a state-of-the-art music processor, and they understand the art of programming very well.

What will the musicians of the future have at their disposal, and what will it cost them? They will spend between three and five thousand dollars for their new music processors, which will be awesome by today's standards.

A typical music computer's opening display might look like this:

Select One: Play
Compose
Edit
Record
Create a New Instrument.

If ***Compose*** is selected the display might look like this:

Name of this composition _____
Part # (1) _____
Assign beginning values for each:
Instrument name (Piano) _____
Key 8 (C) _____
Volume (127) _____
Spatial Location (C) _____
Tempo (120) _____
Signature (Cmaj) _____
Scale (Equal) _____

The items in parentheses are ***default*** values, which the computer assigns to each variable. Unless you specify otherwise, these will be the parameters for the composition.

The program would then ask if you want to enter notes in real time or use the traditional staff for step entry. The program would automatically number the bars and allow repeats, transposition, accelerando, etc. to be programmed in. You could play or print out the work at any point in the process.

There will be a light wand (like a bar code reader) that you can pass over sheet music and have it entered into the computer for editing, voice assignment and playback.

Editing will parallel most of the features of an advanced word processing program. Search and replace, block moves, insert and delete, automatic backup of files, pause, merge, etc.—and the full classical and

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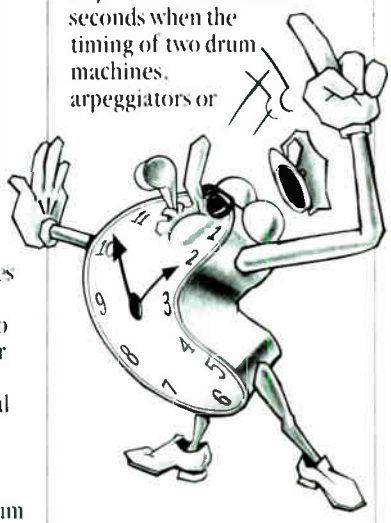

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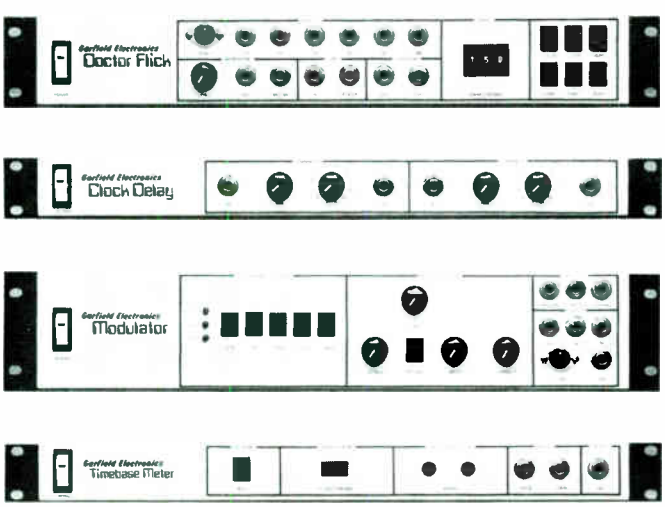

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modern arranging graphic notation set will be available. The more advanced software systems will allow "zooming in" on a note to define its characteristics even more exactly. For example, you could display a half note on the screen and insert commands to make the note begin with a traditional cello sound and then smoothly evolve into a baritone sax, with an echo tacked on at the end.

A configuration file will store commands to make a disk automatically load a series of compositions and instruments. The keyboard will have the instruments you selected live and ready to go.

Creating and modifying voices will be limited virtually only by our imaginations. Some of the features that will be available are additive synthesis combined with wave interpolation (going from one waveform to another, with the "crossfade" time being programmable); every method of modulation possible under software control, and special effects from superflangers to real echo; and a full library of natural sounds. (While most of the sampling will be done in the large studios with the equipment and conditions necessary for a quality sample, a sampling option will probably be available on new computer synths since they're relatively easy to implement.)

Digital recording (from external sources such as tape recorders) on these new machines is still a long way off. The memory requirements for straight digital recording are at least ten times what's needed for our new synthesizers. Still, I would not be surprised to see a breakthrough in this technology using the artificial intelligence and data compression techniques that the Kurzweil and E-mu have used with exceptional results.

Most of the foregoing predictions are pretty conservative. Being a musician myself, I've never been all that conservative—so I shall now venture forth with some more adventurous forecasts.

One very interesting phenomenon that will probably present itself in the relatively near future is Just tuning. It's a piece of cake on a computer, and when you hear Just tuning you will immediately recognize its "rightness" compared to the traditional equal-tempered scale we are now used to. The effect it will have on acoustic instruments could cause a great deal of controversy; as our ears become accustomed to Just tuning, anything else will begin to sound "wrong." This could become very political.

Another interesting byproduct of all this new technology will be a new breed of musician with the ability to compose and play without having to go through the discipline we've all had to go through in the past has played a large role in the type of music we play and compose, the removal of these constraints will produce a new type of music that should prove quite interesting.

So what should today's musician do? Don't wait! Get into MIDI now and try to understand it. If you are planning to buy a computer, get one that can grow. The Apple II series, the Macintosh, and the IBM PC will all be around for some time, and all are expandable (The Commodore 64 has a closed architecture and has proven to be too unreliable for even semi-professional applications).

Probably the most unpredictable of all is what kind of music all this will bring. It will be new; it will cause controversy; and record, video, and other producers are going to have one hell of a time. I, for one, am going to enjoy every minute of it.

Joe West is the owner of Computers & Music, a San Francisco Bay Area retail store devoted to computer applications in music. West is also a synthesist and occasional guitar player.

Thomas Dolby

Science with Soul

by David Gans

As the music industry becomes more and more attuned to video and less dependent on song quality to sell product, the criteria for success are changing—and not necessarily for the better. Artists whose first albums satisfy—let alone promise followups of any quality—are few and far between. With so many hammy fists fondling the software between inspiration and release, how can a songwriter or performer reach the public with his own vision intact?

This situation might give rise to a new kind of artist at the same time as it's finishing off the old-fashioned aural portraitist whose audience did its own seeing. One promising practitioner is Thomas Dolby, who successfully integrates a very literary and cinematic song sense with sophisticated sound techniques and engaging melodies, creating a style that satisfies the shallow criteria of commerciality without abandoning depth and substance.

He broke into the American Top Ten with "She Blinded Me With Science," a danceable, modern-sounding track that offered a brand of humor that's been all too rare on the scene of late (and which people like Rockwell have since tried in vain to replicate). It had a great video, too, simultaneously creating and satirizing a mad-scientist image and thereby giving Dolby both a marketable hook and a perfect escape route from the trap of narrowness.

"Hyperactive!", the first single from his second LP, ***The Flat Earth,*** was as different from "Science" as a song could be while retaining all the charm, sonic excellence and humor of Dolby's character. He is now established not only as a commercial force but as a musician's musician thanks to his use of a wide range of musical and verbal elements without prejudice—as evidenced by the well-integrated guitar sounds on the new album.

Dolby's live show is equally well-balanced. He plays his Fairlight but doesn't hide behind it, choosing instead to attend to his audience while another band member operates the computer. Overhead video screens are used intermittently, underscoring rather than overpowering what transpires on stage. The music is the star of the show, and the technology and musicianship—and Dolby's own personality—coalesce behind it.

Dolby is neither a techno-geek hiding behind his science nor a techno-flake blinding us with fakery. His songwriting gives the impression of a novelist's soul in a performer's shoes, and that's how the offstage Dolby comes off, too.

He comes by his worldliness honestly, having been born in Cairo and grown up in various places with his archaeologist father between stays at "cheap boarding schools." A self-taught pianist and guitarist, he played "bad jazz" (according to his bio) in bars and busked in the subways of Paris and London before his interests in electronics and music merged into synthesizers and home recording.

After doing some touring behind artists including Camera Club and Lene Lovich (for whom he wrote "New Toy"), Dolby put his mind to solo work and recorded "Urges" and "Leipzig," which were released in England on the independent Armageddon label. That attracted offers for session and production work, and Dolby paid some more dues on a higher stratum with Foreigner (including the hits "Urgent" and "Waiting for a Girl Like You"), Joan Armatrading (***Walk Under Ladders***), and others.

He released a single, "Europa and the Pirate Twins," on his own Venice

PHOTO: DAVID GANS

in Peril label, and shortly thereafter put out his first LP, ***The Golden Age of Wireless.*** American success began with an EP, ***Blinded by Science,*** which included "Science," "Submarines" and three songs from the debut LP. He was not yet 25 years old.

Mix: Most pop music is collective, dealing with common experiences—falling in love, for example. Much of your work is unique and very specific. "Mulu the Rain Forest" is an excellent example: It's just not the kind of song a whole lot of people would think of.
Dolby: This is true, but I don't see why pop music has to be restricted to any particular guidelines. I agree with you that some of the best pop is very much a common experience, but I didn't grow up on a street corner, and that's the traditional standpoint that the rock performer comes from. He's a Bruce Springsteen from Jolsey, or a Bob Marley from Trenchtown, or a Grandmaster Flash from the Bronx, or Madness from the East End of London. They grew up in a certain time and they had their heroes, and that is the spur that gets them to start making music.

Mix: What was your motivation?
Dolby: I suppose, really, that I'm an observer and narrator. I look at the world and I want to reflect it in my own way. I've always had a very powerful imagination and a very thin line between the real world and a kind of fantasy world of my own. For that reason, a minute real-life experience is all the impetus I need to add in a touch of fiction and make it into something that excites me.

I've never been in a submarine; I've never met a dissident writer. I have the same approach to those things as the public I'm singing to. It's on the fringe of my experience, something that in a way has been conjured up better for me by novels and classical music and dance than by the television and movies that are the staple diet for a lot of people.

I tend to take a writer's approach to it—but then, my favorite writers are people like Joseph Conrad, and my favorite directors are people like Werner Herzog. It's all very escapist.

Mix: But didn't Conrad go to the places he wrote about?
Dolby: Yes, and that's why I can never be like him. But my appreciation of what he's writing about—or what Graham Greene is writing about—is very much ***because*** it's outside of my experience.

Mix: You've done a lot more traveling than most of the people you're performing for.
Dolby: I've done more traveling, but I've probably done less falling in love. (laughs) So maybe in a way that's what I'm more qualified to sing about.

Mix: It certainly gives you a niche of your own in pop music. The "less falling in love" part—is that at least partly a function of being on the move all the time?
Dolby: Yeah, I suppose.

Mix: And now you're traveling again. Is this an okay part of the job?
Dolby: It's not something I would want to do nine months of the year, with three months "off" to make the next album. That's not a rut I would ever wish upon myself. It's really nice to meet some real fans, instead of just record company executives and media people who inevitably tell you you're wonderful.

Mix: Don't your fans tell you you're wonderful?
Dolby: Oh, yeah, but they could be across town telling John Denver that he's wonderful. That's the difference. They could be at home watching ***General Hospital,*** and they chose to come and see me. It's not a job of theirs.

Mix: Since your music is springing from your imagination, it would seem you could find inspiration wherever you are. Do you do much writing on the road?
Dolby: Not really. On the road, I tend to see hotel rooms, airports and backstage. Also, I don't find America that inspiring a place, really.

Mix: What about Americans?
Dolby: I like Americans, but I find them uncharismatic compared to Europeans. They are more open, more friendly; I would say they're less inhibited on an instant level, but more inhibited on a profound level. With the average European, once you find the key to unlock the door there's a lot of depth. Americans can function very comfortably on a day-to-day, gregarious level, but it's hard to get much deeper.

I don't mean to be condescending. American audiences are great for what I do, but there are different levels to my music. There's a kind of wacky, slapstick thing that everybody can appreciate—hence the success of "She Blinded Me With Science." But there is also a little bit more emotional content, or a bit more imaginative content to it than some of the other things on the charts.

I don't want to insult the intelligence of Americans by saying, "You're not very deep."

Mix: But whether or not you want to articulate that, in a certain kind of person it could inspire a kind of contempt for the audience.
Dolby: I don't have contempt for the au-

diences at all. In fact, having come here and toured, my opinion is much higher. When somebody says, "Hey, you just went up 12 places in the *Billboard* chart and we've just notched up 400,000 units," it's hard to relate that to real people. Okay, so in Cleveland last Saturday afternoon, three-and-a-half thousand people went to the record shop and bought one of my records. But who are they? What are their names? Where were they on their way from and to? What are they escaping from this Saturday afternoon? What horrors have they been going through during the week at their office or their factory? It's just very hard to feel gratified by that, especially when the lifestyle is so alien to me.

Mix: Well, speaking of alien lifestyles, where did you get the idea for "Mulu the Rain Forest?"

Dolby: At the time I wrote the song, I just had the title in my brain. I didn't know where it was from, and I found out later there is a book called ***Mulu the Rain Forest***—which, as it turned out, was written by the father of a girl who is the secretary at the mastering room I use in London. Just another coincidence. I'd probably seen the book advertised in a magazine or something, and the cover has a very striking photograph of the rain forest.

Mix: And so from that phrase and that one picture, you got the idea to do that song.

Dolby: I just have a very visual imagination. I tend to paint little pictures with the sounds that I choose. So rather than just settle for a conventional lineup of bass and drums and guitars or whatever, I take a much more literal approach and find something that actually helps the concept of the song along.

I originally worked the song out on the piano. As a song played on the piano, it's not really that unconventional. The chords and the song structure aren't that weird. But I chose to be very, very specific with the sound so that every element came from the kind of context I was singing about: a rain forest in Borneo, and the strange kind of primal religion that the natives have there, which is related to dream time and alternative reality and deifying the jungle.

Mix: Where did you get your information?

Dolby: I knew a little bit about the aborigines' belief in dream time. Not an expert's opinion, but I suppose a kind of mad scientist's view of it. One thing I did know about rain forests is that the overgrowth there is so incredibly thick that you get all these nocturnal life forms that don't live anywhere else. So this string of images came out, and as I started to work on ways of presenting the song I leaned more and more towards natural sounds.

The first thing I did was record a bunch of crickets down in the south of England on a summer night. You don't get that constant chorus of them like you do in the south of the States, but you do get them a little bit in the summer. I recorded them on a Nagra and made a loop of it on the Fairlight so they would play in 4/4, the way a hi-hat would play.

Then, at about the beginning of every second or fourth bar I wanted a sort of crashing sound, like trees falling over in the jungle—a very strong sort of image. I used a recording of tribal dancing from the isles of Gilbert and Ellice, in the Pacific. One of these particular dances ended up with a line of people all stamping their feet. With the right kind of echo, it gave the effect of trees falling over. That was basically my rhythm part. When I started playing piano along with that, it finalized the song structure for me and I knew what I wanted where.

I made the bass a very reptilian kind of string-bass sound. It was actually an electric fretless, but with pickups all over the neck. The sound you hear is of the strings hitting the fingerboard instead of the sound of the string resonating.

Then I added in a few touches over the top. I created a kind of pan pipe sound by blowing over the rim of a milk bottle—we have quite fat milk bottles in England—and sampling that. And I used a vocoder to make all sorts of grunting noises which sounded to me kind of like tribal chanting.

It's all very un-authentic, you know, a white, middle-class European's idea of the rain forest. It's a little piece of colonialism, I suppose, but not at the expense of any down-and-out Indonesian musicians. I don't really approve of that—going off to South Africa or Jamaica or wherever and hiring a bunch of out-of-work musicians, getting them to play you their repertoire and then rewriting the songs and putting your own name to it.

Mix: You've been hired by others on occasion. How did you feel about doing things for Foreigner? Their approach would seem to be the inverse of yours in many ways.

Dolby: There were two things I really gained from that experience. One, I got off my backside in the Paris Metro and got back to playing a bit of music that was actually going to do something for my career and enable me to sing to a wide audience instead of just to German tourists in Paris restaurants. It also gave me enough money to make my first solo record without the help of a record company and get it released by an independent label—which aroused enough interest for me to get a major deal.

The other thing it gave me was expe-

rience. When I'd been in the studio before, it'd be, "Okay, I've got 500 pounds saved up. That'll give me ten hours on the 16 track." Now here I was in the studio for as many hours as I wanted. It took me five weeks to do the work on (***Foreigner 4***), which is about what it took me to make my first album, start to finish. And there's not that much evidence of keyboards on (***"4"***), you know.

The Foreigner sessions also taught me to focus in on perfection—not that perfection in the studio is something I've always gone for since, but it gave me a yardstick by which to judge things. Foreigner hold what they're doing very much at arm's length, whereas I'd always been very passionate about what I did. They taught me how to switch off for a minute and listen as an outsider to what I do.

On my first album, I had to have a complete set of songs well recorded in order to get a record deal in the first place, plus I'd had four or five years of not doing very much—a lot of free time, a lot of sitting around trying to invent myself as a performer. Looking back on it, my first album was a little bit academic, partly due to the self-conciousness of being an ex-sideman now a solo artist.

After I made the first album I suddenly got very, very busy with this round of hotel rooms and interviews. I thought to myself, "I can either go away somewhere quiet and wait until I've got a whole new set of songs, or I can get into the studio and try and come up with the best ideas there." I wanted to save the creative spark for the studio, which is something I'd done in the past only when I was working for others. When I produced or co-wrote or was a sideman for other people, I'd just show up at the studio with a keyboard under my arm, listen to what they played me, and within five minutes come up with a part. Some of my best ideas happened that way.

A lot of my songs are based on concepts I'd had in my head for some months, and what I did in the studio was a lot of exploring. For example, I'd been wanting to write a song about dissidents, because I could see a parallel with the kind of subversion of a guy with a big US hit making music that was not that accessible—going against the grain rather than following the formula. I knew that it should be moody and slightly Eastern Bloc sounding, and I wanted it to have a slight irrational feel to it, like an angry writer speaking his mind.

I had a handful of chords and a few lyrics when I got in the studio and started hammering it out. I got the drummer playing the beat I wanted, and I suggested chords to the guitarist and bass player, how many bars they would do before a chord change. Then I'd wander around the room humming to myself, trying to get the melody worked out. Sometimes words would form in my mouth, and they were usually related because my mind was focused. It would be "over the border" or "in the palm of history," things like that. I'd jot down a bit of lyrics and just build like that until I felt I'd hit on the spark of what I'd been looking for.

Mix: You're trusting your instincts to come through while the tape is rolling.
Dolby: Yeah. Sometimes you have to back off for a minute and think it out methodically: "I've got a chorus and a half of a verse. I've got these four lines; the next four are going to have to scan the same, so what rhymes with this?" So you fill it in like a crossword. Sometimes you have to apply yourself more methodically if it's not working the other way.

What was great about having the core of a band around me this time was that they got me more passionate about what I was doing. (Bassist) Matthew Seligan and (guitarist) Kevin Armstrong taught me that no amount of technical perfection compensates for a lack of emotional commitment. That was very valuable to me.

Mix: So you find yourself watching for responses—
Dolby: Yeah, and just trying to feel juices

flowing. I could have made a very technical record—taken the formula of "Science" and "One of Our Submarines" and repeated that, but I needed to be excited about something.

We went to Brussels, which is a good place but not an awe-inspiring place. It wasn't like going to New York and going to night clubs til six in the morning every night, and it wasn't like going to Nassau and spending the days on the beach and working at night. We lived in an old art deco apartment, slept in the same room and walked together to the studio every day, very much living the same life.

Mix: Where did that foreign-speaking voice in "Dissidents" come from?
Dolby: It came from Moscow Radio; it's some sort of play. There's a guy who lives opposite me who's a ham radio operator. He has an enormous antenna in his back garden, and every time I go out there he's up on a ladder attaching another coathanger to it.

One day I just wandered in and said I was interested in what he was doing. He said, "Shhhh! I'm talking to Moscow!" I fetched my Nagra and recorded some of it, then sampled words that I liked the sound of into the Fairlight. I gave myself six different voices in different parts of the keyboard, and I messed around with the timing and pitching of them.

Mix: So there's no literal sense in the words any more?
Dolby: I don't know. Somebody told me that's some heavy stuff about the Devil and Heaven and Earth. I made up my own translation of it for the video. I had a Russian dissident lipsynching the words. He was actually Polish, but he could do it phonetically, and he vaguely knew what they were talking about.

I put English subtitles in. They're sitting around a table and he leans forward and says, "I remember the night they came for my father and mother. It was in the days when grain was plentiful. We sat on the steps eating a simple meal of barley gruel. I never saw them again. Ever again."

Mix: And for all you know it means, "Wash the dishes."
Dolby: Or "Decadent rock and roll music of the Western world is destroying people's minds." (laughter).

Because I've got those samples (in the Fairlight) I can use them live, which is great.

Mix: Is that how you get so close to the recorded sounds on songs like "One of Our Submarines?"
Dolby: The Fairlight is just wonderful for that, because you can just sample bits of the multitrack. A lot of the effects on the tape are combinations of synth sound and maybe an echo effect. When I sample it, I get it complete with the echo so it's very much the same effect and the same perspective.

PHOTO: DAVID GANS

Dolby on stage at San Francisco's Warfield Theatre.

Mix: What is the configuration of your live show?
Dolby: I just play the Fairlight and the grand piano, and sing. I've got six musicians—a flexible lineup. There's bass, drums and guitar, but the bassist and the guitarist also play keyboards at different points.

There's a main keyboard player who does the bulk of the synth parts, which I don't want to play. His name's Lyndon Connah, although he's become a woman on this tour so he's now called Lynda Neon.

Mix: Just for the duration of the tour?
Dolby: I don't really know. It started out because I was advertising for a female singer. He was a big fan of mine, so he came down in drag. He got the job not as the female singer but as the keyboard player, 'cause I had decided I didn't want to play too much. We were talking about touring, and he said he objected to the role-playing—"the boys in the band" and all that sort of stuff.

Mix: He didn't want to feel obligated to chase girls?
Dolby: Yeah. So I said, "Why don't you just stay a woman?" He took me seriously, so I gave him a bit of a budget to have a dress made and get some makeup lessons. He just became a woman. (Note: During the course of the tour, Lynda Neon acquired a "sister" named Nina Neon when another of the male musicians donned female garb.)

Matthew Seligman, an old friend of mine who's really my sounding board on everything I do, is the bassist. I don't know why I didn't credit him as co-producer. He doesn't twiddle knobs, but he was always there for the mixes. He'd say, "Nah, that's not happening," and "That sounds great," whatever.

The drummer is Justin Hildreth, who played on both albums—although there's very little real drumming on this album.

The guitarist is an unknown named Chucho Merchan, from Bogota, Colombia. A lot of the parts were written already by Kevin (Armstrong), but Chucho has added in a lot of nice stuff on his own.

Then there are two backing vocalists. Lesley Fairbairn has sung on both albums; I've known her for ten or twelve years, and she kind of keeps me in step. She's the voice of my conscience. She says, "You can go just this far, but don't go any further because I know you."

Mix: In what ways? On stage?
Dolby: No, no. The way I am on stage is the sum total of the impressions of me by my band and audience, because I'm impressionable in that way. You know, the way you highlight aspects of your personality with your various friends and the people you've dated.

Mix: And you acquire traits from them, too.
Dolby: Right. You've acquired little traits, and they've brought different traits of your personality to the front. That's the way I am on stage: opposite ends of the scale.

The other singer is Debra Barsha, who's almost like a cabaret singer, from New York. To her, I'm this extraordinary, polite Englishman whose sexuality is entirely suppressed. She goes, "Oh, my God! Isn't he cute?"

Mix: "Sexuality is suppressed"—is that on purpose?
Dolby: No, it's just the English formality.

Mix: Behaving yourself is respected in many circles, you know.
Dolby: Yeah, I know. It's respected, but it means you don't get laid very often (laughs). The type of people I tend to attract generally are fascinated by my personality, and if there's anything physical about it it's swept under the carpet. It tends to be, "I'm so fascinated by your childhood, your romantic lifestyle, and the traveling you've done." If at that stage you're thinking, "It's 3:00 in the morning and I'm quite tired. I'm going to be gone and never see you again, so let's get ourselves sorted out," it's a little bit difficult when the girl in question is obviously so wrapped up in your old-worldliness...

Mix: You could say, "Let me show you something I learned in Cairo last year"—
Dolby: I never thought of that! ■

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—FROM PAGE 68, GARAGE STUDIO

tical tiles are cemented to each wall in a 6 x 5 array. This totals 60 square feet. Carpet covers the floor and the ceiling is drywall. The two resonators plus some 350 square feet of gypsum board compensate for the low frequency deficiencies of the tile and carpet, but not completely. This brings the reverberation time of the control room to about 0.34 second, rising to about 0.46 second below 250 Hz. With all the compromises involved there seems to be little justification for further acoustical adjustment.

OUTSIDE NOISE TO INSIDE

No matter how high the average and peak levels of music are in the studio, there are those soft, sweet and sentimental passages for contrast. The barking of a neighbor's dog heard on the vocal track during such a passage is guaranteed to raise the emotional level even higher than the vocalist could hope for. Therefore, concrete walls 6 feet thick are longed for at such times, but they are just too expensive. However, statistics are on the side of the amateur or low budget recording job. How often do soft passages occur? How often do screaming motorcycles or other interfering noises occur? The permutations and combinations are such that redoing a very occasional ruined take is usually the answer for this type of studio. However, it is quite a different story if it costs $5,000 in studio time and for talent to redo the passage.

The conversion of this garage to a studio is fraught with compromises. The result will be something like midway between the living room and a first class studio.

Very square neighbors have been known to identify that beautiful stuff being layed down in multitrack within the studio as noise. The difference in point of view can bring the police. In some communities the noise ordinance is as broad and general as this one:

"It shall be unlawful for any person to make, cause or permit to be made, any loud or unusual noise which directly causes an unreasonable interference with the use, enjoyment and/or possession of any real property owned or occupied by any other person."

In an increasing number of communities a certain maximum allowable noise level is set for the boundary of the property on which the studio rests. In brief, the sounds escaping from the studio may give far more trouble than exterior sounds spoiling takes.

Multitrack recording techniques require studios quite different from the traditional kind. Numerous books have been written on the multitrack subject as well as many articles in the technical press. The reader is referred to these for information on the host of pertinent points which cannot be covered in this limited space.

Note: This article is an excerpt from F. Alton Everest's ***How to Build a Small Budget Recording Studio from Scratch ...with 12 Tested Designs,*** and is reprinted with the kind permission of TAB Books. This and a selection of other books on studio design are available through Mix Bookshelf. See page 156.

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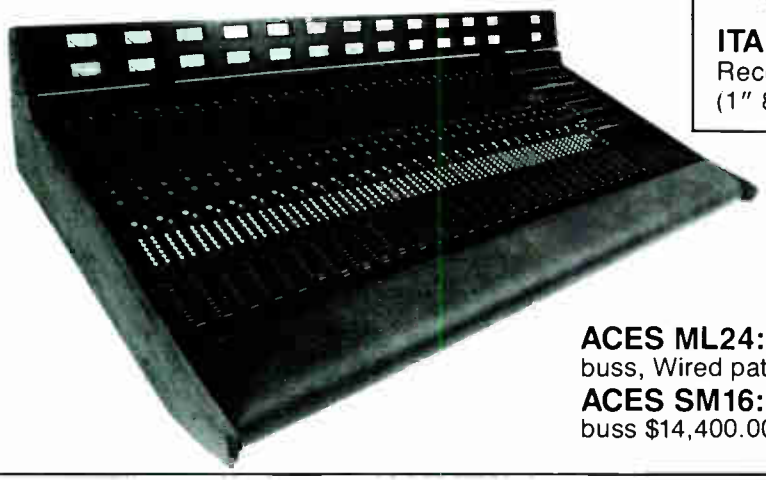

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R.E.M. Hits Its Stride

Sometimes, you just get lucky. It so happens that about four years ago, I found myself in Atlanta for one night with nothing spectacular to do. Told that whatever action to be found would be at the brand new 688 Club near the Georgia Tech campus, I hied myself thither.

Heading the bill at the pleasantly cavernous "new wave" joint that night was a barely five month-old band from nearby Athens, home of Tech's arch-rivals, the Georgia Bulldogs. A couple of dozen locals had turned out, and were casually quaffing pre-show beers while studying a set list painted in aggressive letters all along the stage's left wall—an apparent remnant of a recent visit by Iggy Pop.

On came the band, to minimal fanfare; and while the crowd didn't really even dance, much less lose its collective head over them, there was some offhand interest.

Interesting they were, too—four ordinary-looking, rather scruffy guys on guitar, bass, vocals and drums, knocking out urgent Byrds-and-British-Invasion-tinged originals with a few cool covers thrown in (like the Swingin' Blue Jeans' "Hippy Hippy Shake.") They looked more than slightly uncomfortable in the limelight, except their lead singer, who despite his seeming shyness exuded that elusive quality we call presence.

Gotta remember these guys, I thought...

These days, you'd be hard pressed to find a rock critic that doesn't salivate on cue at the mention of R.E.M. Ever since their early single, "Radio Free Europe/Sitting Still" on Georgia indie Hib-Tone Records caught the fancy of New York's rockcrit establishment in 1981, this Peach State quartet—vocalist Michael Stipe, guitarist Pete Buck, bassist Mike Mills, drummer Bill Berry—which redefined the word "unassuming" has also set new standards for the phrase "critical darlings."

A brief recap: following the general acclaim for "Radio Free Europe," R.E.M. signed to IRS Records in summer 1982 (a smart move by a smart company), and released a mini-gem called "Chronic Town" that fall which kept the critics intrigued.

Favor became flat-out fandom across the board with last year's ***Murmur,*** R.E.M.'s first full-blown LP. ***Rolling Stone*** critics dubbed ***Murmur*** album of the year and R.E.M. best new artists of the year; ***Record*** magazine bestowed laurels for debut album of the year upon it; and the prestigious ***Village Voice*** 1983 Pazz & Jop Poll voters found ***Murmur*** second only to ***Thriller*** in the album of the year category. (R.E.M. has yet to make a significant dent in the charts, but even that may not be too far off, given the quirks of the record-buying public.)

Why all the fuss? Simply put, R.E.M. forges radical rock and roll with the most basic of instrumentation in a way that grabs your viscera and says "***This*** is what God made turntables for." Not to mention the fact that their live show, no longer tentative, verges on the incandescent.

And now along comes ***Murmur***'s followup, ***Reckoning,*** and far from falling victim to reviewers hungry to sink their fangs into another example of "sophomore, jinx," the new waxing seems to be following in ***Murmur***'s hallowed critical footsteps.

Was R.E.M. even just a skosh nervous about putting out album number two in the wake of album number one's raves? "We've never let any kind of pressure bother us," guitarist/spokesman Pete Buck says decisively. "We don't believe in it. When we go into the studio to record or when we're writing songs, we know we're capable—we're not gonna blow it."

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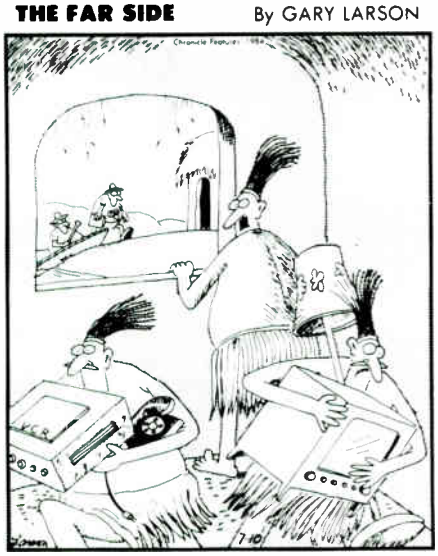
PHOTO © LINDA MATLOW/PIX INTL.

Michael Stipe (left) and Peter Buck of R.E.M.

THE FAR SIDE By GARY LARSON



"Anthropologists! Anthropologists!"

Sequential Circuits Model 400 Drumtraks

Before I even got into what this machine was capable of doing, I was impressed by the digitally stored sounds. There are 13 separate sounds on six different channels, and even the crash cymbal, a weakness on most other drum machines, is very nice.

Here is the breakdown of channels and instruments:

Channel 1: Bass drum; Channel 2: snare drum, rim of snare; Channel 3: tom 1, tom 2; Channel 4: crash cymbal, ride cymbal; Channel 5: closed hi-hat, open hi-hat; Channel 6: claps, tambourine, cowbell, cabasa.

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The Bangles: Not Just a Girl Group Any More

PHOTO NEIL ZLOZOWER

The Bangles (L to R) Vicki Peterson, Debbie Peterson, Susanna Hoffs, Michael Steele.

This may come as a shock, but men are different than women. Even when a female breaks through all the barriers and makes it past fan/secretary/singer and all the way to musician, there's still a difference.

Take the Bangles, four women valiantly attempting to be perceived as a rock band, not a Girl Group. They play their own instruments, they write their own songs, they made an independent single and then a Faulty Products EP, and now they have an album out on Columbia. They tour, they make videos, they do all that stuff that rock groups do, but the first thing everyone points out about them is that they're ***girls***. And then they immediately compare the Bangles to either the Runaways or the Go-Gos, with whom they share nothing but gender. It's like lumping Black Sabbath in with the Bay City Rollers—after all, they're both ***boy*** groups.

"I think women get into music for different reasons than men do," says drummer Debbie Peterson. "The motiva-

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The Teddy Boys

"I want 'em to really know and love me. I want people who are really behind me totally before I sign any contract," Ted Aldine insists. His group, Houston's Teddy Boys, has already turned down "three or four offers," he said, because they weren't substantial enough "to make records"—or at least, the kind of records Aldine wants to make.

Ideally, those records would capture some of the intensity of a Teddy Boys gig. There would be a piano as audacious and thrilling as Jerry Lee Lewis's once was. There would be quick, tasteful guitar filigrees everywhere, a fast shuffle beat and plenty of room for Aldine to vamp round songs like "Brand New Cadillac" (done Clash-style) and "Hound Dog" (done like B.B. King might do it and then reprised a la Elvis, only at double speed).

Not that the Teddy Boys' current release—***Drive This,*** a self-produced effort on the independent Ricky Dog label—is bad. It's quite good, in fact, and just won "Best Texas Album," in a reader's poll in Texas' ***Buddy*** magazine, which annually gives out Buddy Awards at a big bash. The group performed in front of several of the Lone Star State's legendary musical figures including Stevie Ray Vaughan and two-thirds of ZZ Top.

"Yeah, that made me real proud,"

Ted Aldine of the Teddy Boys.

Aldine said from the front porch of his purple house on five acres outside Houston. "You know, pride comes before the pocketbook, and to play for the people in that crowd, well, it was an honor. And even if we don't have a record deal, we're in a real comfortable spot. All the guys have wives or girlfriends, and they're all living their lives when we're not playing.

"We all put down roots before we got into music. I worked in the construction business for seven or eight years and got some of the essentials before I got serious with my music. And this band started by accident when this hairdresser friend of mine heard a tape of us and played it for this New York guy who loved it and started booking us like mad. I finally had to quit my job, we were working so much," Aldine said

Later, he'd add another band, the techno-pop Finz, which he founded with his current pal and piano pounder Walter Shannon and some other "very talented, very artistic" people. But at the time the Finz were happening, says Aldine, "you had to be punk or R&B to get work, so it didn't work out."

And he certainly doesn't feel trapped by the rockabilly label: "We're trying to change that, and we're not gonna be stuck in rockabilly. We're just working up to rock and roll. We're just trying to play music in general—and we're Southerners, all from Texas. We've all got roots in the music from around here.

"Our guitar player (Kevin Rath) played in an old rockabilly band, and his father is a porch picker with a fantastic record collection. So we've heard just about all the old, cool records there are. That's where we got 'Brand New Cadillac'—not from The Clash, even though we do it sort of like the way they do it."

Aldine's attention has turned to video—one result of constant touring for

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—FROM PAGE 167, TEDDY BOYS

the past year or so. So the Teds will soon commit themselves to videotape, and there will also be another record—probably a double-sided 12-inch single this time.

The search for a deal will go on, but at a dignified, Texas-style pace. The Teddy Boys will save their frenzy for the Carl Perkins and Buddy Holly and Johnny Burnette stuff.

—Laurice Niemtus

Ernie Watts: Saxmaster

Saxophonist Ernie Watts is one of the best known players of the instrument. A Grammy Award winning jazz artist who has toured with the Rolling Stones, he is in constant demand as a session player. Many people don't know that Ernie is also a permanent member of the Tonight Show Band. He was also one of the last players to join the staff orchestra of NBC before that institution was discontinued. This came about shortly after his moving to LA.

"I came to LA when I left Buddy Rich's band and found out more people knew about me than I had thought," he recalls. "I started subbing for various players on TV shows and record dates. I subbed for Bill Green over at NBC on staff and one of the guys that was on the staff moved back to Hawaii, and I was asked to replace him. I had the pleasure of being on staff at NBC for the last two or three years that it existed. While I was on staff I was doing the *Andy Williams Show* and other shows, and the *Tonight Show* would come out to LA a few times a year for two or three weeks at a time and because I was on staff, I would play with them sometimes. When the show moved to LA, Doc Severinson asked for me, and I've been playing with them ever since. It's real nice because it's regular, and I can send a sub when I need to. I have a list of guys that have already been approved by Doc to take my place when I have to do a record or film date."

Playing with the *Tonight Show* is interesting work and provides Watts with a degree of regularity that is rare in the usually unscheduled life of a musician.

"Their normal procedure now is that they have re-runs on Monday, and Tuesday through Friday they tape the show the day that it is shown. The rehearsal is from about 3:15 till about 4:30 and then the show is taped from 5:30 till 6:30 and they have a 15 minute audience warm-up before that. It's really on schedule all the time; they hardly ever stop

Ernie Watts

the tape. So for other jobs, that's good because I can do a record date in the morning, go do the *Tonight Show* and then I know that I'll be out to make a seven o'clock date at night too."

Watts won the coveted "Most Valuable Player Award" from the LA Chapter of NARAS for his session work in 1982. The key to his success is his ability to meet the needs of the producer and to be able to get along with a variety of people and situations.

"Some people are easy to work with; they have a definite thing they want when I go in," he explains. "They may give me a specific line and we'll work on that for a while. Some even record one note at a time. It's amazing, they'll just pick and pick until all the music is gone out of it. The notes are perfect, but the music is cold. When you try to make something totally perfect what you end up with is something that is totally sterile. Some producers are like that. They just work at something till it just drives everybody crazy. And then, other people I've gone in and recorded and I've had to ask them if it's okay for me to do an extra take, because everything I did they liked. So it seems to depend on the individual."

Watts loves to play live and tries to have a regular live gig going whenever it is feasible, but the demands on his time and the jadedness of the LA music scene often make it difficult.

"LA's a real strange place for live music. People only seem to come out on the weekends. It's hard for me to play

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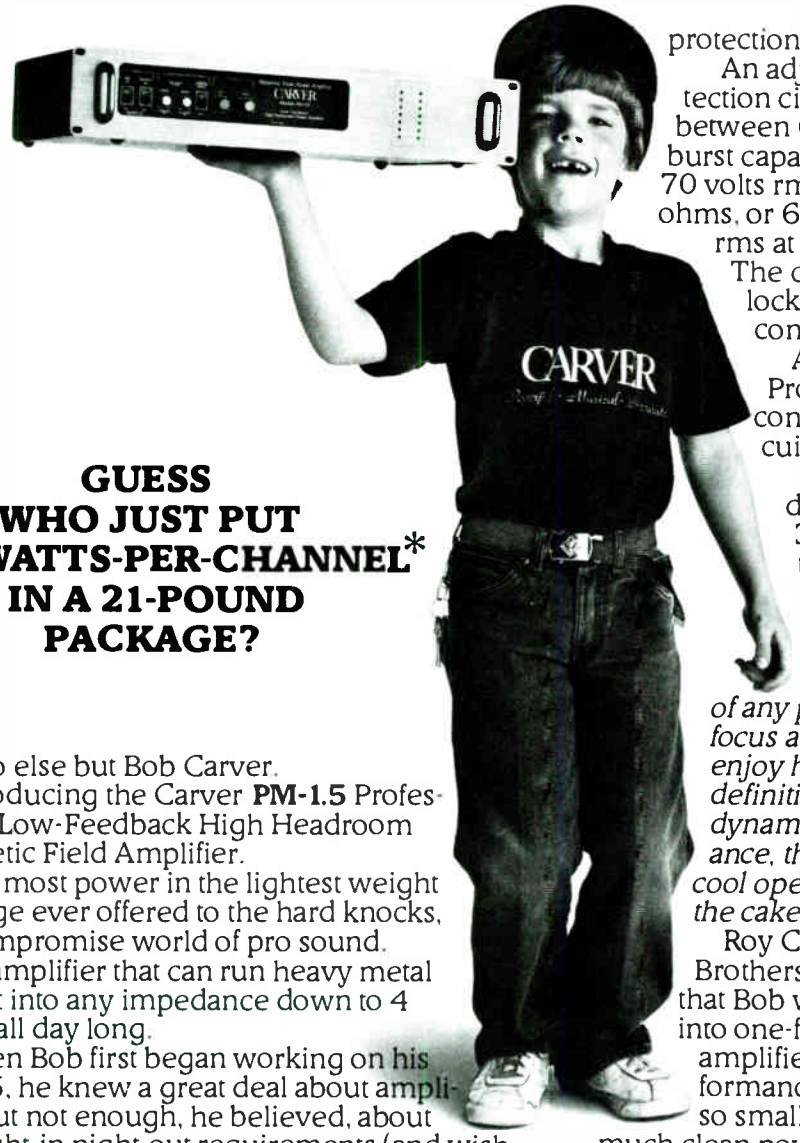

GUESS WHO JUST PUT 450 WATTS-PER-CHANNEL* IN A 21-POUND PACKAGE?

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Introducing the Carver **PM-1.5** Professional Low-Feedback High Headroom Magnetic Field Amplifier.

The most power in the lightest weight package ever offered to the hard knocks, no-compromise world of pro sound.

An amplifier that can run heavy metal flat-out into any impedance down to 4 ohms all day long.

When Bob first began working on his PM-1.5, he knew a great deal about amplifiers but not enough, he believed, about the night-in night-out requirements (and wish dreams) of the pro sound world. And so he spent much time consulting with a large number of sound reinforcement professionals, including the "pros' pro," Clair Brothers.

Clair Brothers asked for lower input ac line current, greater transformer thermal capacity, dual modes of precision balanced inputs with 1% resistors, back-to-front cooling with a fully proportional fan system that can just tick over at idle or blast 1000 ft/min. to keep output transistor temperatures constant. They wanted greater noise immunity and unbelievable long-term, high-power operation, as well as a 3/16" front panel with deep-recessed controls.

Others wanted rear rack-mounts, adjustable protection circuit thresholds, front panel selectable clipping eliminator, and even a sequential, soft-start power-up mode.

Now that the PM-1.5 has undergone thousands of lab test hours and seven months of hard road testing, Clair Brothers, Bob, and you get all that and more.

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An adjustable Short-Term Speaker Protection circuit adjusts dynamic headroom between 60 and 77 volts with a short term burst capability of 70 volts rms at 8 ohms, or 60 volts rms at 4 ohms. The circuit locks-in to the control setting after 0.5 seconds.

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An adjustable Long-Term Speaker Protection circuit matches the time constant of the output shutdown circuit to your PA or monitor system.

Finally, the Clipping Eliminator detects clipping lasting longer than 30 milliseconds and attenuates the input signal just enough to pull the PM-1.5 out of clipping.

As for sound quality, consider this quote from **The Audio Critic Magazine,** *"...the equal of any power amplifier in transparency, focus and smoothness. We especially enjoy hearing spatial detail, instrumental definition and completely natural dynamics. At this level of sonic performance, the astoundingly small size and cool operation become icing on the cake..."*

Roy Clair and Ron Borthwick of Clair Brothers said it this way, "We are amazed that Bob was able to put the same wattage into one-fourth the volume of conventional amplifiers without sacrificing audio performance. It's hard to believe that an amp so small and lightweight can put out so much clean power. But it does!"

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—FROM PAGE 166, R.E.M.

"They can go in the studio and play the songs perfectly in one take," confirms longtime R.E.M. associate and co-producer Mitch Easter.

Reckoning's ten songs were recorded in eleven days at Reflection Sound Studios in Charlotte, North Carolina with Easter and sometime partner Don Dixon at the helm. (***Murmur*** had taken 16 days to record at the same facility, positively indulgent by R.E.M.'s standards.) According to Buck, "***Murmur*** was kind of a mood record in a way. We didn't spend a whole lot of time doing the initial tracks, but we did a fair amount of overdubbing. There's overdubbing on ***Reckoning,*** but it's a lot less apparent. There's not as much percussion and weird piano parts and stuff. We just went in and bashed it out.

"We wanted ***Murmur*** to run together, to create a feeling, to be a kind of seamless thing in which you really couldn't tell what was going on," Buck says. "On ***Reckoning,*** we wanted to make the album stand on its own as a collection of songs. It's a different side of us, and a fairly big change from the last album."

A typical R.E.M. recording session, Buck explains, "is supposed to start at noon, but we usually end up getting there about 12:30 or 1:00. We just piddle around for about 20 minutes and then usually cut three or four basic tracks right away. We did all the basic tracks for ***Reckoning*** in the first four days.

"The first three days in the studio we did seven songs, complete with all the overdubs. Then in the next five days we did the other three songs. We spent six days of actual recording and overdubbing, then seven days of mixing."

Input from co-producers Easter and Dixon (credited as "machinists" on the album jacket) "usually didn't come until it was time for overdubs," Buck remarks. "I'd suggest certain guitar parts in a certain place, and they might suggest something else. If the two of them really had a strong opinion about something, it'd tend to sway us in that direction," Buck adds. "They've been around and they ***know.***"

Almost perversely non-technically-minded himself, Buck recalls that Easter and Dixon "would pretend that ***they*** weren't. They'd walk around and say 'Hmmm, let's get this mike, it looks like it'd look good over ***here***'—they'd do a mike placement based on the way it looked, how 'groovy' it was. In fact, they were really good about trying interesting placements, and using ambient mikes."

Easter's signature touch with throwback garage-pop artists (his own band Let's Active, The Individuals, half The Bongos, and Athens upstarts Oh OK

among others) makes him a natural for the peculiar hybrid that is R.E.M., though as he modestly acknowledges, "A lot of people seem to forget that the band makes the sound. A lot of record producers go in and change everything about a band when they start to record, which is crazy.

"There is a lot you have to do to make something work on tape," Easter concedes, "because a lot of the power of a live show comes from sheer volume. So you have to give psychological clues that make you feel the power of the group."

As opposed to ***Murmur,*** most of which was recorded directly into the console, ***Reckoning*** was all done with microphones, says Easter.

"We hadn't gotten a very good bass sound on ***Murmur,***" he notes, "so we wanted to rethink the process. We recorded the bass with the same amp Mike Mills uses on stage, and just added a whole lot of compression. The fact that he uses round wound strings and a trebly tone and hits the strings real hard, and that the amp is distorting a bit, gives it more of an edgy guitar sound than a 'duh-duh' Stax/Volt bass."

Buck obligingly gives capsule reviews of some of his favorite tracks on ***Reckoning,*** when asked. He says he's fond of the LP's first single "So. Central Rain," and the six-minute ballad "Camera," which he declares "sounds like Booker T & the MG's on drugs or something." And then there's "(Don't Go Back To) Rockville," which Buck says is "pretty much of a straight country narrative song with words upfront. You can understand everything Michael sings. ***That'll*** make people freak out."

On the whole, Buck describes ***Reckoning***'s songs as "just a little more open emotionally and less obscure lyrically. "Not, that we're ever intentionally obscure. Although we'll never be a straight narrative-type band, there are a few things you can pick up a little more easily this time around."

With characteristic self-effacement, Buck thinks that R.E.M.'s many laurels up till now (and many more in the offing, no doubt) simply add up to the fact that "we've just been lucky enough to have 'our time,' or whatever.

"There are regional bands all over—like the dB's, and The Neats from Boston, and The Replacements in Minneapolis, who do what they do without a lot of self-congratulatory hoopla about how they're changing barriers and breaking down walls and stuff," Buck says, disdainfully referring to some of their more sloganeering brethren across the pond.

"We don't worry too much about any hype or salesman job we have to do," Pete Buck says in no uncertain terms. "We just do what we do and get on with it."

—Moira McCormick

MIDI for your Steinway?

Forte Music has introduced their MIDI Adapter System, which provides a MIDI output jack to trigger MIDI-compatible synthesizers, sequencers, and accessories from most electric and acoustic pianos. In addition to sensing keyboard information (including dynamics), the system also detects when the piano's sustain pedal is pressed, and sustains the synthesizer notes accordingly. Two other useful features (footswitch controlled) are: an instant transposition of the output notes by any interval, and a keyboard range selection function, that defines an "active range" beyond which no note data is sent to the synth, for

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—FROM PAGE 171, MIDI

doubling bass or lead lines.

Forte's MIDI Adapter is just the thing for using your Steinway to trigger your DX-1, and the manufacturer states the device does not affect the normal operation of the piano in any way. The modification, priced at $1295, installed, is available for the Yamaha CP-70, CP-80; Kawai Electric Grand; Rhodes 73, 88; and most acoustic pianos. For more information, contact Forte Music, Box 6322, San Jose, California 95150, (408) 262-8866.

—FROM PAGE 166, DRUMTRAX

Each channel has a separate output jack. You cannot play more than one instrument or sound from the same channel simultaneously.

Tuning possibilities of each sound make any one of 15 different tones available for each. You can, in effect, loosen the snares on the snare drum. The two tom toms can be raised and lowered from the highest-pitched roto-tom to the lowest floor tom—almost the sound of a kettle drum. The crash cymbal can be set as a 6-inch splash or a 30-inch gong. The handclaps can be brittle or thunderous. The kick drum can sound like an 18-inch jazz bass drum or Alex Van Halen's 26-inch model. And the good thing about the digital LED readouts is when you find the sound you like all you have to do is remember the numbers, and you always know you'll get that sound again.

Knowing how good the machine sounds, it's time to learn how to work the thing. Don't expect to buy Drumtraks and figure it out in one sitting. Be patient and don't rush yourself. If you learn it right, learn the shortcuts at first, you'll be a lot better off.

Drumtraks has two primary modes: pattern and song. Songs are made by chaining together patterns. Your patterns can be in whatever time signature you want, however many measures you wish, and at whatever tempo you desire (anywhere from 40 beats-per-minute to 250).

Editing features allow you to add parts to existing songs, cut parts out, repeat parts. It's pretty well thought out, so it shouldn't be too long before you've got the steps memorized.

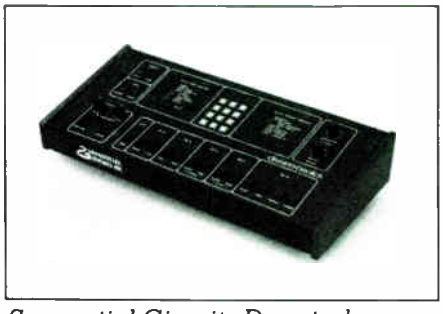
The "Error Correct" feature maintains perfect timing on the patterns you program. It is set to correct to 16th notes, but can be set to correct to 1/96th, to provide 96 recording points in the measure. Not that we use 96th notes that much these days, but it's nice to have 'em.

They also thought of a way to make Drumtraks not play so precisely —it's called "Swing Time." You can actually make your machine sound like a drummer who's had a few too many drinks. That's probably not the effect you're after, but loosening up a tight funk beat just a little gives it a human sound and keeps it from sounding too rigid and computerish. You can also program swing and shuffle feelings using the "Swing Time" effect.

In addition to being able to program the tuning of each instrument individually, so too can you program individual volume and accents. The possibilities are mind-opening to drummers as well as non-drummers.

Bassist Andy West, known for his work with The Dregs, demonstrated the Drumtraks machine at the NAMM show in January and again in June. "You realize how much more there is to consider about percussion than just beating on drums," he says. "From a standpoint of composition, and trying to articulate what you want a drummer to try and do, it becomes easier once you realize what potential there is on the instrument. Drumtraks has helped me a lot in that way."

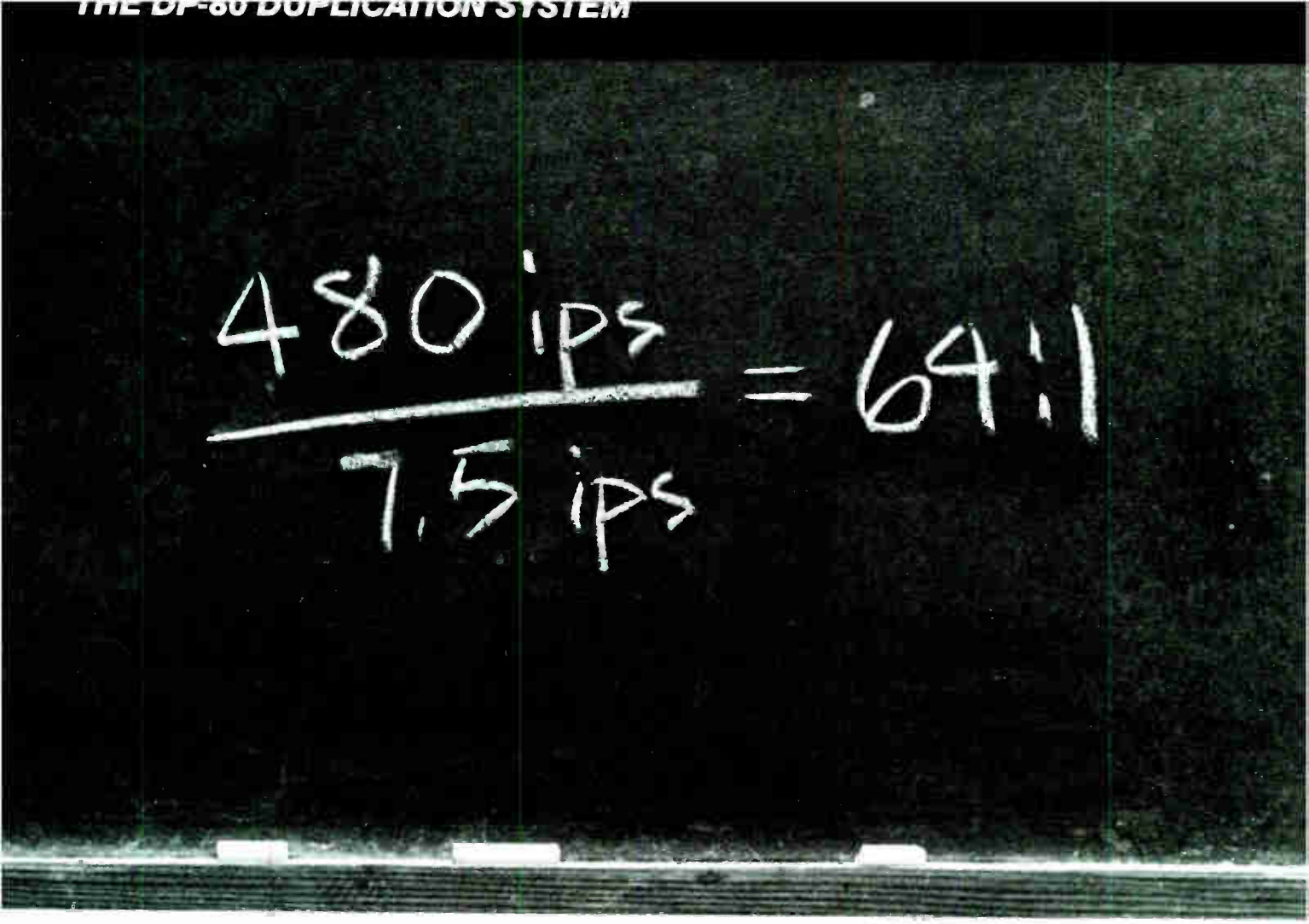
Drumtraks is equipped with two built-in interface systems. There is a selectable 24, 48 or 96 pulse-per-quarter-note clock input, and a 24 or 48 pulse clock output for older sequencers or rhythm units. For operation with computer-controlled sequencers, the new MINI interface is also included. Drumtraks can therefore synchronize to SCI's Model 610 Six-Trak multi-timbral synthesizer/sequencer, or any other MINI-equipped instrument. Drumtraks can be played with full velocity control from the velocity-sensitive keyboard of the Prophet T-8.



Sequential Circuits Drumtraks.

"I've used it with a T-8 and it's amazing," says West. "If you're making a pass through while recording, you can actually play the keys with the touch sensitivity. And so, it gets ridiculous it's so neat. The harder you beat on the keys the louder the sound, which is really the only way to use the programmable dynamics. It's so much easier than increasing the volume beat by beat."

—Robin Tolleson



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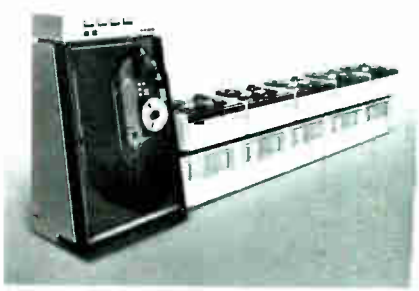

The DP-80 Master Reproducer and Slave Recorders.

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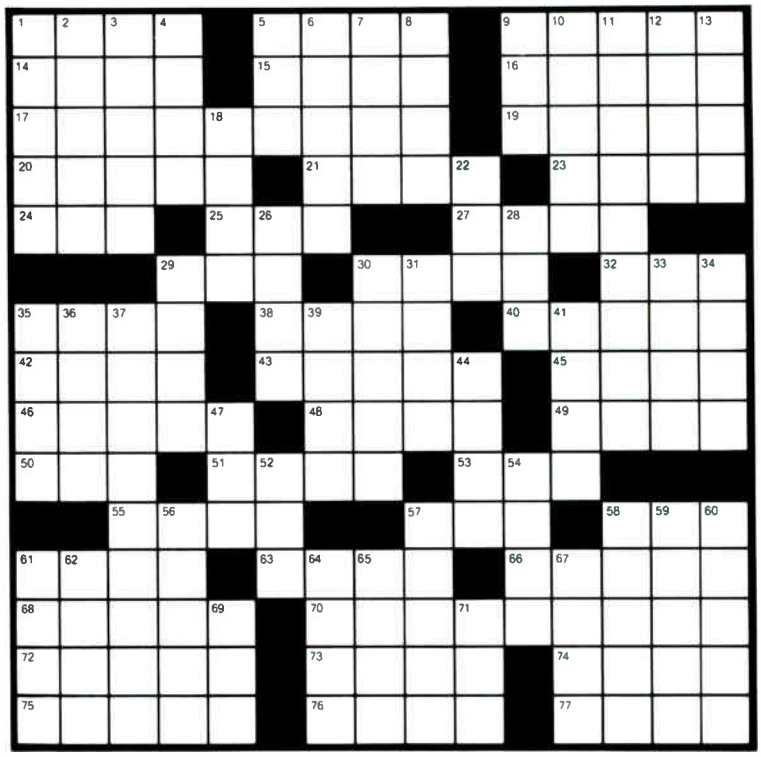
MIX WORDS



"STARSHIP AUDIO"

ACROSS
1. Quarter bushel
5. "_____ _____, said the Mama Bear"
9. Cicatrices
14. Table spread
15. Norse god
16. Constellation
17. Studio action
19. Short and sweet
20. _____ Berliner, recording pioneer
21. Understands
23. Arthur of the court
24. Opthamologist's abbr.
25. N.Y.C. time
27. Compress (with "down")
29. The Champ
30. Prefix denoting a number of possibilities
32. Signal booster
35. Half a mob
38. Cut
40. French prep school
42. Fitzgerald
43. Glory and renown
45. Lampreys
46. Fauna's friend
48. Controversial abbr. in studio design
49. Regarding
50. _____ Paulo, Brazil
51. Type of shirt or game
53. Biological audio receiver
55. Lab animals
57. Media solicitations
58. _____ Gabriel mts.
61. Cried
63. Jump-jet
66. Silverheels role
68. Dole out
70. A must for multi-tracking
72. The love of your life
73. Audio effect
74. Resting
75. Edgy or nervous
76. Cross-corner, for short
77. Early tribesman of the U.K.

DOWN
1. Read seriously
2. Varnish and perfume ingredient
3. De Mille
4. Certain jazz festival
5. Land east of Eden
6. Poet
7. Rhodes tone generator
8. Norse girl's name
9. Drunk
10. Something to skim
11. Cubic studio considerations
12. _____ Hashanah
13. Snicker _____
18. Tape holder
22. Orchestral section (abbr.)
26. _____-drive
28. Feel poorly
29. Not near
30. Medium to which studios are adjusting
31. Footless
33. Patty _____
34. Dinero (sing.)
35. Umps
36. Spirit of the Kaaba
37. Layout of the studio
39. _____ and void
41. One mil in millennea
44. Germ
47. Fitting
52. WWII intelligence group
54. Movie dog
56. Teensy little items
57. Maui greeting
58. Insinuating
59. Coral island
60. Musical group
61. Float on the air
62. She, in Paree
64. Even
65. Prefix meaning to swing (back and forth)
67. Of the ear
69. Certain pipe fitting
71. Record events

Solution to July Mix Words

—FROM PAGE 167, BANGLES

tions have to be stronger. You don't get the same feedback, the same approval."

"Men are out for the old 'sex, drugs and rock and roll,' " says guitarist/vocalist Vicki Peterson, Debbi's sister and band co-founder. "Not that we don't like to get laid occasionally...

"We were all very small Beatlemaniacs," she continues, "but instead of saying 'Oh, Paul's so cute,' we were saying 'Yeah, I'm going to be that, too. I want to get up there and play.' "

The Bangles play melodic, harmony-laden tunes with lots of bright, ringing guitar. Sort of all Mamas and no Papas. They chose David Kahne (Translator, Romeo Void) to produce the new album, ***All Over The Place,*** because they like what he did for the guitar sound on Rank & File's ***Sundown.*** The material the band writes, though, reveals a few more differences between your basic male person and your basic female person. There's not a lot of "I'm gonna get you" "I'm gonna make you mine" and "oooh, baby, it's gonna feel so good." But there is a lot of relationship stuff—what it ***feels*** like, especially when it goes bad.

"But they're not 'I'm going to sit at home and cry and wait for the phone to ring' songs," says Susanna Hoffs, vocalist/guitarist.

"It's not weepy female stuff," says Vicki Peterson. "But, at the same time, when you are hurt by somebody, it hurts very deeply, and that's easily and wonderfully expressed in song.

"When men write songs about it, it's not so much 'it hurt ***me,*** I am hurting.' It's '***you*** bitch, ***you*** did it, ***she's*** a maneater, look out for ***her.***' It's different."

" 'You're breaking my heart, you're tearing it apart, so fuck you!', " smiles Steele, quoting the refrain of Harry Nilsson's now infamous lament.

Where all this introspection leaves the Bangles is at the same place they were before they thought about it. Regardless of the Freudian reasons for the songs they write, they're going to keep writing pretty much the same kind of songs. Whether those songs will be successful is another story.

"What is mainstream?" cries Vicki Peterson, doing her best Pontius Pilate impression. "Do you have to homogenize your music, or when you sell enough records does the mainstream come to you?"

"You just have to keep doing what you do best," says Hoffs.

"One thing I know," says Vicki Peterson, "Is that we get lots of letters from kids, girls who are picking up guitars and who want to do this. There's no reason why there should be a gender barrier in rock and roll."

What ***do*** women want, Herr Doktor Freud? A top 10 album would be nice, thank you.

—Ethlie Ann Vare

Tips on Arranging for Synthesizers

The first point to consider in synthesizer arranging is you not only choose the notes to be played, but you can design the instruments that will play them as well. You should first become very familiar with your synthesizer, and start selecting patches you like to work with. Many times, just experimenting with different timbres will spark compositional ideas for your arrangements.

While you are exploring, think in terms of timbral combinations. By combining two patches, you can arrive at timbres that are not possible with one synthesizer. For example; if you come up with a nice patch to which you would like to add a little extra something, be it another harmonic, a different sort of attack, or whatever, but find that you can't make any changes without significantly altering its basic quality, then go with a combination. Work up another patch with components you want to add, and play them together. This is easy if your machine has multi-timbral capability, if not, plan on overdubs, or best of all, use two different synthesizers. The MIDI interface is great for this.

While combinations are a good way to get interesting sounds, do not plan on overdubbing layer upon layer of the same part. This may be some people's idea of full sound, but it is often unnecessary, and it completely destroys the character of the patches you worked so hard to create. Use this technique judiciously.

I also want to caution you about using patches in which the oscillators are not phase-locked or synched. Although detuning can produce some beautiful timbres, it may also create problems. The phase shift that occurs in these patches may result in a fuzzy pitch center when combined. This will give the music an unpleasant wobbly effect which will be difficult to sing over (if you plan to add vocals). Avoid using more than one such patch at a time, and never in the bass.

A good first step in arranging is to draw a graphic score. Take several sheets of blank (or graph) paper and sketch out a visual representation of the tune. Draw a scale along the bottom to mark off the form. Indicate points of high and low density with peaks and valleys on the paper, using different colored

—PAGE 176

—FROM PAGE 175, SYNTHESIZERS

pencils to diagram the various orchestral colors you wish to achieve. Write in the patches which you have selected by drawing horizontal lines, (each signifying a patch), labelling each line. Clearly mark the entrances and exits so that you can see how they will overlap.

Now that you have put your ideas into a tangible form, they are easily translated into notes. Think about how you want to fill the harmonic range. I like to think of patches as sections of an orchestra: strings, brass, woodwinds, and percussion. Of course, synthesizers can get some pretty severe variations on these basic families, but this concept is still a good point of departure.

Break down the arrangement into its component parts, and analyze each in terms of its function. Most arrangements have a bass line to serve as an anchor (and often to keep the time), a few harmonic pads (sustaining chords in the low and middle registers), rhythmic punches, melodies, counterlines, ostinato figures (arpeggiating patterns, usually done with a sequencer or arpeggiator), a high string line, and several special effects. Decide which of these components you will use and begin writing them into your score. Consult your graphic score often as you make your decisions. Remember, every part should sound good and complete within itself. This is a traditional orchestration rule which I have found to be useful for this situation. Adherence to this rule will make your arrangement more coherent, and your mixdown much easier.

The key word is support. Build your arrangement from the bottom, starting with the bass. Ordinarily, you should restrict the range of your bass synthesizer to about the same limitations as the bass guitar. You could extend the lower limit down as low as C (three octaves below middle C) but a bass line that goes much lower will lack definition. Avoid bass doubling or writing anything in the same range as the bass. Clarity here is essential.

A harmonic pad will usually be above the bass. The lower limit for a close position chord is approximately C (below middle C), anything much lower may sound muddy. If you are stacking several pads to fill the low and middle registers, it is a good idea to use a technique called "constant coupling." In this technique the top voice of the lowest pad will be doubled by the bottom voice of the pad above. This is a good method to insure textural consistency.

Rhythmic punches usually occur in the middle register. Always support them with corresponding or com-

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—FROM PAGE 168, WATTS

at night because I usually have a record date and the *Tonight Show* to do. Then I have to run home, eat, load up the car, go to the club, unload the car, and set up the stand—it's a lot of work, it takes a lot of time. I'll get home at about 3:00 a.m., then I'll have to get up at 7:00 a.m. for a 9:00 movie call. Playing for just a few people makes a person like me feel rejected and sometimes it's not worth the hassle."

He is probably best known for his Grammy Award winning *Chariots of Fire* album produced by Quincy Jones. The record won the Best Pop Instrumental Award at the 1983 Grammy Awards.

"That was recorded while I was working with the Stones," Watts says. "We had three days off in San Francisco, and Quincy called me and said he had some ideas. So I came down to LA, and we recorded "Chariots" in two or three days. All the playing on that is live. First take—play it! I was very pleased to win the Grammy, but things have become so commercialized that the awards that aren't covered on television are not taken so seriously. Still, I'm happy that they recognized my work."

Many rock fans became aware of Watts' phenomenal ability from his tour with the Rolling Stones. The film *Let's Spend The Night Together* captured many of his performances and indeed featured Watts on the screen almost as much as the members of the group themselves.

"That came about through Quincy Jones. The Stones were out in this area and Mick called Quincy because they needed a sax player, and he recommended me. Mick sent me some records to play along with, but the first time I played with the band live was in San Diego, in front of 80,000 people. I did the rest of the tour with them; it was really interesting. It was also *really* crazy. Those guys know how to have a good time."

While touring with The Stones requires a degree of personal discipline to keep from overdoing the partying, Watts enjoyed working with the group musically as well as liking them as people.

"One thing I really liked about playing with them was that each night was different. The tunes are of a different duration each night, the solos are different which makes it like playing an improvisational group. There's a lot of spontaneity to it. They get better and better every concert. Keith is the musical drive and Mick is the creative force behind the show, and it works—they're interdependent."

Currently, Watts is preparing another album and enjoying playing his instrument in so many different situations. He seems to enjoy his art without being chained to it.

"My nature isn't to try to make it in the 'big time'. I'm not that kind of person. My basic goal is to be as good a musician and person as I can possibly be, and to help other people with their music. That's the way I look at what I do. When I go into a session to do a solo overdub—or even a small horn part—I feel I'm there to make the producer's and engineer's jobs as easy as possible by giving them what they want. I'm there to help. I don't really have a career goal, except to keep on doing what I'm doing now. I'd like to do some more recording, in a way that I have more control over it. I would like to do some jazz albums, because that's the most creative music. I'm working on putting together another record project and I'm doing a lot of sessions. I like doing that. I enjoy the variety that I have in my work. It makes life *very* interesting."

—James Riordan

Out of One Squeeze and Into Another

The first wave of the British new wave got a pretty rotten deal in America. Not only did the bands have a total lack of commercial success, they also had a ton of critical acclaim. This means that the survivors who are attempting to continue their careers have to contend both with never having been heard before ***and*** the fact that the people who never heard them were told these guys were great.

Such is the plight of Chris Difford and Glenn Tilbrook, the former Squeeze frontmen who had the misfortune of being called the "Lennon & McCartney of the '80s."

"That was flattering for an initial period," says Tilbrook, 26, lead vocalist and composer. "But the record company echoed those comments far more than they should have. There's never going to be a new Lennon & McCartney, or a new Dylan, or a new Picasso, for matter."

Tilbrook is semi-sprawled over a couch, dressed in a clean ragpicker's outfit and sporting hair growing wildly past his collar. The record company, never one to give up, says he is going through his "Live Peace in Toronto" period.

Lyricist Difford, 29, is more comfortable writing words than speaking them, preferring to let his partner do the talking and the singing. He is painfully shy and dresses like a runaway banker from Nassau. But it was he who incited the partnership in 1973 by posting a sign in a shop window advertising for a collaborator (for a fictitious band on a fictitious label).

Their tunes have since been covered by artists as diverse as Joe Cocker, Tim Curry and Grandmaster Flash. The legendary Everly Brothers have requested a Difford-Tilbrook song for their upcoming reunion LP. They obliged, but Tilbrook says they haven't yet heard whether the track will be used. "It's up to Dave Edmunds, who's producing the record," adds Difford.

Squeeze toured the States 15 times, but only their farewell appearances (including a shot on ***Saturday Night Live***) attracted much attention. Still, the pair have found steady demand for their work. Their play, ***Labelled with Love,*** had a successful run in London, and they have written three songs for Julian Temple's upcoming film, ***Absolute Beginners.*** And now A&M Records is hoping the pair can re-establish themselves on vinyl with their solo—uh, duo—debut, ***Difford & Tilbrook.***

Glenn Tilbrook (L) and Chris Difford, late of Squeeze.

Squeeze, says Tilbrook, "had passed its peak, for no particular reason. It was a kettle off the boil, and had been for about a year before we finally decided to break up. We know Squeeze was on the verge of becoming very successful, but we were finding increasingly fewer areas where all our tastes would meet.

"I think the new album sounds quite different from Squeeze," he continues, "although some of the differences may be more obvious to me than to most listeners. They're still Chris' and my songs, and we're still singing them and arranging them, so there are many similarities."

Difford's singular lyrics in songs like Squeeze classics "Tempted" and "Black Coffee in Bed" have driven Tilbrook into uncharted and unpredictable melodic realms. Asked about the new album, they naturally close ranks like a mutual admiration society, each naming "Hope Fell Down" as his favorite cut. "I think the chord progressions are fairly stunning," says Difford, "more mature than we've ever dealt with on record."

"I thought it was a tremendous lyric when I got it from Chris," adds Tilbrook.

The pair will assemble a band and tour this summer, but there are also other tempting projects at hand. Both express interest in doing more work for the stage, taking into account the recent glut of rock-accented movies. "I think there's quite a yawning gap between the presentation of a teenage film like ***Footloose*** and the theatrical presentation of contemporary music like ***Cats***," Tilbrook notes. "A younger theatrical musical could bring a whole new audience to the theater."

Are Difford & Tilbrook, then, not Lennon & McCartney after all? Are they instead a new Gilbert & Sullivan, Rodgers & Hart or Webber & Rice? They won't countenance any such comparisons, but they are happy to emulate their predecessors' two-headed synergism.

"I think the best thing a partnership has to offer is a sense of balance," says Tilbrook. "I know I've had some very wacky ideas for songs that I've been strongheaded about. In retrospect, I'm glad there's been someone there to restrain me."

—Ethlie Ann Vare

—FROM PAGE 176, SYNTHESIZERS

plementary figures in the bass and drums (or drum machine). Use patches that are sharp and forceful.

Although cliche', arpeggiating figures are useful in a number of ways. They provide additional harmonic and rhythmic support, they can produce a variety of textures, and if used correctly, can give the whole arrangement a lift. It is up to you to use these devices creatively. Arpeggiating figures work well in any register, but it is important to keep them (or any other active part) out of the range of the melody, especially if you are to be using a vocalist.

Your high string line will perform essentially the same function as a real string line. Write simply and melodically, but writing string-like articulations, such as a gliss or fall, can sound very corny. If you want a different articulation, experiment with portamento or your envelope generator.

Plan ahead, ***before*** you head for the studio. Don't leave important creative decisions until the last minute during a recording session. Determine how many tracks you need, what signal processing is available, and how much time you will have to work with. Make adjustments in your score to compensate for any limitations. Also, have all your patches stored in memory, and backed-up on tape.

The first thing to do at your session is to tune your instruments. A digital frequency counter is the best way to tune synthesizers—its a small price to pay for perfect intonation. If your synthesizer has VCOs, then tune often throughout the session.

Despite the fact that these are electronic instruments, you should strive for a "live" sound in your recording. This can be accomplished through the illusion of room ambience and the simulation of how acoustic instruments would be recorded. One way to record a synthesized string section is to record your violin, viola, and cello parts onto separate tracks, using a different patch for each. Adjust the balance within the section and bounce to one track, adding a slight amount of delay. Double this track by bouncing again and pan the two finished tracks left and right. By adding an appropriate amount of reverb, you will have the effect of a live string section recorded with a stereo pair.

One trick to attain room ambience is to combine the direct signal with a miked signal. This can be done while initially laying the track, or afterwards by bouncing. Place your speaker in a live room (a bathroom is good), and mike it from a distance. This technique works well with brass-like patches. Plate reverb is also a very good way to obtain a live room ambience. It's nice and bright and it adds a glowing texture to most synthesizer sounds.

If you are looking for fullness, use a digital delay to achieve a doubling effect. This is usually superior to doubling with overdubs.

Once you begin mixdown, you should consult your graphic score again. Use it as a guide for dynamics and density. Also, use it to evaluate your success—have you accomplished what you set out to do?

Always remember, it's not the equipment, but how you use it effectively and creatively that will make the difference.

—Stephen Quinzi

Oberheim OB-8 Patch Hunt

Oberheim Electronics is now sponsoring an OB-8 synthesizer "Patch Hunt," to encourage creative programming of new sounds on the instrument, and increase communications between the synthesist and the manufacturer.

The submitted patches will be judged by a select group of Los Angeles based musicians and synthesists. The best patches will then be compiled by the Oberheim staff and made available on data cassette to all participants and other interested OB-8 owners. Creators of the selected patches will receive credit for their efforts in a Patchbook which will describe the front panel settings used in creation of the sounds.

Due to numerous requests, the Oberheim International OB-8 Patch Hunt entry deadline has been extended until October 31, 1984. Interested parties may contact Oberheim or its authorized dealers for entry forms and guidelines. ■

"Electronics and studios are interesting in the way you can use them to play with the time experience."

PHOTO JOSEF WOODARD

Daniel Lentz and the New 'Maximalism'

DANIEL LENTZ
On the Leopard Altar
Icon

Produced by Yale Evlev; engineered by Daniel Protheroe; recorded at Santa Barbara Sound; mixed at Record Plant, Los Angeles and Santa Barbara Sound; direct metal mastered in Germany.

Daniel Lentz's musical mazes are equal parts conceptual ingenuity and emotional hypnosis. They've earned him a comfortable niche in the New Music world over the past decade, with NEA grants, commissions from German radio, gigs in Europe and at the New Music America festivals. With the release of his new album, ***On the Leopard Altar,*** Lentz might well elbow his way into the pop market.

Lentz poses no threat to Boy George, mind you, but this album is a striking set of relatively short pieces, fascinatingly and laboriously orchestrated for interweaving keyboards, voices, and —on one cut—wine glasses. The tonal vocabulary is pleasing to the ear and familiar to those who've heard Philip Glass (and who hasn't, by now?). Yet beneath Lentz's music are cleverly constructed tests that will keep semantic puzzle-solvers enthralled.

One way to gauge the effect of ***On the Leopard Altar*** is to literally road-test it. Take it out into the fast lane of the nearest Interstate at a palpable volume and see if the overlapping synthesizer lines and crisp vocal syllables of "Is It Love" don't put you right there in the essence of traffic—separate, driving energies darting and thrusting toward unseen destinations. This record is a study of sonic polish and forward motion.

For Lentz, the most intriguing aspect of music is not the means of travel as much as the ***process*** of traveling. "There are no new sounds, I don't think," he comments. "And even if there are, the ones I've heard aren't very interesting. The prettiest sounds are still the human voice or a nice piano. Electronics and studios are interesting in the way you can use them to play with the time experience. I've always been interested in how you can shift the time sense around; all my pieces are process-like things that play with that concept."

On the Leopard Altar, meticulously scored mostly for Memory Moog (the composer's pet) and from one to four voices, was tracked in one week earlier this year at Santa Barbara Sound. It uses the compositional devices Lentz has mastered—the repetition of a musical or lyrical phrase that slowly changes shape before our ears—but in miniature. Immediate impressions will put the album, particularly "Wolf Is Dead" and the cyclical, Gamelan-like eighth-note march step of "Is It Love," in with the minimalists. Lentz recognizes his affinity with that school, of

which Philip Glass is currently the most noted practitioner, but points out that his own work in this style began in 1970 and 1971, "long before I had heard of Phil Glass and minimalism." He prefers to call his work "Maximalism," anyway. "I know how much damned work it takes," he says. "There's nothing minimal about it—hours upon hours putting this stuff together."

More seriously, Lentz points out that when the classic Minimalists—Glass, Terry Riley, Steve Reich, et al.—use human voices, they're applied as instruments. "They're not used to express sentiments with words." And when these composers deal with text, "they do it pretty much in a left-to-right manner, and it seems to me just sort of added on after the fact."

Consider, then, some of the verbal themes of ***On the Leopard Altar***. "Aztec Lover" is a mysterious tune which could almost pass for a stripped-down pop ballad. Here, he equates Hollywood's version of love with the human sacrificial rites of the Aztecs with such lines as "You hurt me when you come in me" and "You tear my heart out." "Wolf Is Dead" is an energetic tribute to an artist friend who died in a car crash; vocal lines dovetail over a pumping rhythm bed of exotic synths. A typical lyric is "A human life can be sad/be sad/beside death though it's real fine." "I've been accused of having a light-hearted view of death," Lentz notes, "but Wolf had that view. He was German, and the piece opens with 'Hey man, too bad you died' because 'hey man' was an American colloquialism he liked to use.

"It's not a traditional requiem," Lentz grins.

And Lentz is not a traditional musician. His penchant for twisting things into new shapes began when he found a Bell & Howell tape recorder under the Christmas tree when he was 14. "I found out quickly what you could do with speed changes," he recalls. "Then when I found my first capstan-driven recorder I learned that you could make things go backwards, which is another modulation device."

He dabbled with electronic music and jazz through a stint studying composition at Brandeis University and later in Stockholm. Eventually he landed a teaching post at the University of California at Santa Barbara. Things started to go awry there: Lentz was always at odds with the system, gleefully staging musical mutinies. "I didn't behave," he recalls, "so they fired me."

One of his more controversial compositions was a 1969 piano sonata whose first movement, "Love and Conception," called for a speaker inside the piano to broadcast reviews of the concert in progress while the page turner lured the pianist into a carnal embrace inside the instrument—a classical satire of groupie sex. The second movement, "Birth and Life," called for the piano to give birth to a baby piano. The score for the third movement, "Death Music," required that the piano be wired to the theater's electrical system—"which can be nine or ten thousand volts," Lentz notes. The performer was to wear a steel armband "so if he hit a wrong note he'd be fried on the spot." Understandably, this one never reached the performance stage.

Lentz has tamed his more rabid urges since those tumultuous late '60s/ early '70s, as ***Leopard Altar*** and other recent compositions demonstrate. "Aztec Lover" has an eerie delicacy to it. "We made a change during the recording that Jessica (Lowe) had to adjust to spontaneously," Lentz recalls. "I had her lighten her voice to a whisper, and we put the microphone practically inside her mouth. You can hear all the lip sounds, which I grew to like. I wanted it to be pretty, like a pop love song, so people would listen to what's happening textually. After she recorded it, Jessica was really upset and wouldn't even listen to it until a few days later. Then she really liked it—the magic of the studio, you know."

Engineer Daniel Protheroe was Lentz's able assistant in the making of ***On the Leopard Altar***. He first encountered Lentz as a greenhorn in Ojai, California, trying to come to grips with a Lentz piece that employed disjointed voices in Latin as well as coordinated wine-glass rubbing. "I've worked with Daniel a lot," says Protheroe wryly, "and I wouldn't wish it on anybody." However, Protheroe has grown accustomed to Lentz's often difficult concepts; keeping an eye on the score is the key.

The wine glasses appear again in "Lascaux," on the new album. Here, Lentz had several musicians rub glasses of varying pitches continually for the duration of the piece; others malleted held glasses when cued by the composer. Close-miked for added depth (the lowest notes achieved by VSO-ing), the glasses were "played" by Lentz at the mixing board, where the faders were marked with pitch values. The final effect is of soaring, haunting notes rich in overtones, making the Glass Harmonica sound like a toy. Thus does purely acoustic sound invade the jurisdiction of the synthesizer—another Lentzian turn of the conceptual screw.

If the recording end of the project came off fairly smoothly, the mixdown threw in a wrench. Producer Yale Evelev, considering the complexity of

the sound, decided to take the tapes to a studio with an automated console in Los Angeles. "That was a really strange experience," says Lentz. "We spent two days on two of the pieces. We dubbed it off on cassette and I heard it in my car—which is the ultimate judge—and it sounded like it was mixed underwater.

"We brought it back to Protheroe in Santa Barbara. His whole principle is that there are no electronics in the signal path except the gain stuff and some EQ. The transparency you get is so important to this music because there's so much going on."

Protheroe had recorded the tracks with a mind to avoiding fix-it-in-the-mix angst. "This music is so intricate—we recorded a lot of it eight bars at a time—that you can't leave decisions for the mix," he suggests. "There's no easy reference, no chorus to cue into. So you either put it down just as intended or you go spontaneous and mix it like a reggae dub. That would be cool—you've got so many tracks, I'm sure you'd come up with something." He flashes a smile. "But when we got to the mixing, all the levels were pretty much straight across, because we had foresight in the planning stages. We had to."

On the Leopard Altar is the most accessible Lentz music to date, a perfect primer to his musically seductive wordplay. A touring group will include Lowe, doubling her vocal capacity with an Emulator stocked with Lentz's diced phonemes; two keyboardists will handle instruments such as Synclavier and the elaborate new Yamaha QX1 sequencer (if Lentz gets one in time). Lentz will serve as helmsman and sundry keyboardist. "We could go up to the size of several orchestras if we wanted. I hate to get dependent on technology, but there doesn't seem to be any other way," he says in token protest.

At present, though, Lentz is waiting to see if *Leopard Altar* will bring him new visibility. Well, it's not exactly waiting: "Between pieces, you don't think you're doing anything, but it's working on a very subconcious level. Then it just pops out. If somebody says, 'Here's the deadline,' that's where the creative person comes out. I'm certainly no different: I respond to deadlines. If RCA came to me and said, 'You've got to do an album by next week,' by God..." He trails off, leaving well enough alone.

—Josef Woodard

[**Ed. Note:** Another Lentz album is due in October or November on the San Francisco-based New Albion label. Produced by Lentz and Foster Reed, it will contain pieces from 1973, 1976, 1978 and 1982.]

VIDEO NEWS

by Mia Amato

"HERE'S...JOHNNY" —IN STEREO

NBC promises stereo broadcasts of both ***The Johnny Carson Show*** and ***Friday Night Videos*** by mid-1985, according to the network's report to its affiliates and confirmed by ***Michael Sherlock,*** executive VP of operations and technical services. The Carson show has been recorded in stereo for several years but broadcasting of multichannel sound was held up pending a standards decision by the Federal Communications Commission.

An NBC series, cop show ***Miami Vice*** may air in stereo this fall via simulcast. The show is slated to air Fridays from 10 to 11 p.m., and "music plays a strong part in the action," explained NBC president ***Brandon Tartikoff.*** "This could be the first primetime series to be broadcast in stereo."

KNBC in Los Angeles, WNBC in New York and WRC-TV in Washington were named as the first NBC stations to telecast stereo. In the meantime, NBC's parent company, RCA Corp., unveiled 18 new TV set models with built-in stereo capability. The Colortrak 2000 line is priced $1100 to $1500 and will be available in most dealerships for Christmas orders.

The earliest use of multichannel sound may be for bilingual telecasts from another network, ABC. Spanish-language sports and news for Los Angeles station KABC may arrive by fall. A spokesman for ***CBS*** says that network is still studying multichannel applications and no dates have been set for stereo there. Converting existing equipment for stereo at network owned stations is estimated to have cost each broadcasting company upwards of $10 million in new gear.

COLE GETS CONTRACT

Jack Cole, of the promo team Flattery/Halperin/Cole, has been signed to a one-year contract with EMI Music's ***Picture Music International,*** becoming the first video clip director to sign an "exclusive" deal with a major label. Under the agreement, Cole is guaranteed a certain number of music video projects, which will include clips and TV commercials. Cole has since moved to New York City. F/H/C buddy ***Paul Flattery*** will act as producer for all of Cole's projects for PMI.

Video People: ***Don Wershba*** joins VCA/Teletronics (NY) as audio engineer, hailing from Media Sound Studios, where his album credits include work for ***Aretha Franklin*** and ***Soft Cell.*** At Unitel Video (NY) ***Cece Lazarescu*** moves up to sales account executive. ***Steve Garfinkle*** moves to Movielab Video from a post at Showtime. ***Roy Moore*** and ***Ron Sheppard*** have moved from Eureka Teleproductions Center, and are now at Versatile Video in Sunnyvale, CA.

Garry Marshall (TV director known for his work with ***Mork, Laverne*** and ***The Fonz***) has completed the first English-language video for teen heartbreakers ***Menudo.*** Like Japan's "pop idols," the Latino band members are replaced when they reach 16. "They asked me if I was replaced every few years," said Marshall, "I said I didn't know yet." "Like a Cannonball" aptly visualizes two band members trapped inside a giant pinball machine. ***Jeff Abelson*** produced, for client RCA.

More Names Behind the Clips: ***Philip Davey*** of Keefco directed the clip for ***Flying Pickets'*** single, "When You're Young and in Love." The video is based on a real children's hospital threatened with closure by the British government. ***Peter Allen*** produced and ***Bill Parker*** directed "Dancing in the Sheets" for Paramount's "Footloose" soundtrack album song by ***Shalamar.***

Russell Mulcahey is the man behind ***Duran Duran's*** concert video, "The Reflex." ***David Mallett,*** who introduced us to ***Queen's*** new look in the futuristic "Radio GaGa," pushes things a little further by putting the band in drag for the beautifully lit clip, "I Want to Break Free." ***Millaney, Grant, Mallet & Mulcahy,*** collectively known as MGMM, recently moved their operations from London to a Manhattan townhouse on the Upper East Side.

THOMAS DOLBY'S VIDEO TOUR

A summer innovation jointly achieved by ***Sony Software, Capitol Records,*** and ***Thorne-EMI*** to promote ***Thomas Dolby's*** "Hyperactive" album, video album and video single is music-video cooperation extraordinaire. The three mega-companies are sponsoring a club run of the "Hyperactive" video album, interspersed with taped commentary by Dolby; roughly two weeks after club screenings in each market are scheduled concert appearances by Dolby, live.

Bruce Kirkland of the video promotion firm ***Second Vision,*** put the package together which includes giveaways of screening tickets through radio and retail in each market, album giveaways, and dance contests. There's also a contest awarding a Sony Beta HiFi deck and TV to the record retailer who mounts the display cross-promoting the video and album versions of "Hyperactive."

"The video tour will determine if a pre-taped program shown in clubs can be a profit making enterprise," Kirkland said. Dolby is using a lot of video playback on this particular concert run, stage monitors and big screens, and examples of his earlier experiments with the

Haggard's "Live" Videos

"It's like taking a show home in your pocket," says Merle Haggard, explaining the concept of his latest enterprise, Hag Video Masters.

By completing an envelope order blank distributed at Haggard's concerts and enclosing a check or money order for $49.95, fans can receive a copy of the night's live performance, "Uncut," just as the HVM logo advertises. Orders for either Beta or VHS format are filled within four to six weeks.

"This thing we're doing is unique," says Haggard. "It's putting spontaneity on film. "There's no plan—no format. Think of it—it's never been done before —even in motion pictures."

Steven Van Strelen, director of video for HVM, says that they usually hire local union cameramen to film the shows in selected cities. They use two JVC KY310 cameras, and the sound is recorded separately in their remote studio via a Soundcraft (Series 800) 24-track board. According to Van Strelen, Merle and Fuzzy Owen later mix the sound and then it is matched to the video.

Haggard's band, the Strangers, are extremely supportive of the idea. They make more money due to an ingenious royalty profit-sharing system that Haggard had set up allowing "all the people who appear on the tape to get a share."

Plans for marketing and distribution of the video-cassettes, in addition to direct sales at concerts, includes airing special concerts through available satellite slots. Haggard also plans to have monitors set up in the lobby of the halls where he performs and to show tapes of previous shows so that the fans can see a sample of what may be ordered.

Taping of the live concerts, however, is just the beginning of Haggard's focus on video. "We're going to make an entire live concert album as a movie," he reveals. "We're even making an 80-acre ranch into a movie lot.

"I really don't know why we didn't think of doing this before now," says Haggard enthusiastically. "I guess the market just wasn't right."

Haggard, with his usual candor, says he watches a lot of television, but is not too impressed with what he is seeing in the way of music video or the news shows which feature music segments.

"Anybody can do anything well if they're going to be doing the same thing every time," Haggard reasons. "We are surrounded by a lot of talented people and we're letting them go to see what they can come up with."

—Rose Clayton

medium appear on both his Sony "Video 45" releases and on the long-form work distributed through Thorne-EMI.

Baker Street Studios says come on up and take a tour of their studios in Watertown, MA, which offers video production in 3/4-inch format and complete audio services in 16 track and 8 track. The site has SMPTE synching for post work, a 20-foot x 40-foot studio with 10-foot x 20-foot hard cyc for shooting.

Positive Video has acquired Eureka Teleproduction Center (ETC) in San Carlos, CA. The ultra-plush panelled and parqueted 65-foot x 75-foot studio, equipped with computerized Berkey-Colortran lighting grid and teleconference facilities, used to belong to a bank's corporate TV division, and provides Positive with the one thing the popular music-video post house lacked: a studio. Audio fax includes 24 track Harrison 32-input console, BTX "Shadow" synchronizers, Dolby "A" noise reduction and even a Synclavier 64-voice synthesizer.

Unitel Video (NY) has added a seventh edit suite, with Grass Valley Switcher, CMX editing, ADO, DVE, and Quantel effects boxes. A third studio, 33-foot x 42-foot, opened in June.

A "video press release" for artist ***Johnny Winter*** was completed and distributed by ***Eye & Ear Teleproductions*** (Chicago). The five-minute tape, which has aired on cable and broadcast, is of the guitarist discussing his career, his blues influence, and his elaborate body tattoos. ***Tom Hilbe*** directed for client ***Alligator Records.*** Cost for the shoot was under $5,000.

Johnny Winter

"It's a good alternative for a record label that doesn't want to spend $40,000 on a music clip, but still wants to expose the talent and get some attention," Hilbe said.

Explained Alligator's ***Mindy Giles:*** "Johnny had been out of the public eye for a while and we needed a vehicle for up-to-date news. The record ***(Guitar Slinger)*** is selling great...we got many calls after the MTV airing."

Elsewhere: ***Television Matrix*** (Miami) used its Betacams to tape a ***Culture Club*** interview for ***Entertainment Tonight.*** The ***Bar Kay's*** "Freak Show on the Dance Floor" video was produced and directed at ***Ardent*** (Memphis) by ***Marius Penczner,*** shooting on 35mm film. DP was ***Rick Dupree.***

ELECTRONIC FUN

Another Good Idea: the M-18 press box from ***Radical Electronics,*** a press conference in a case. Actually a two-input, 18-output router in an industrial aluminum suitcase to use when the electronic media is clamoring at your door. Host them in style with the option of mike or line level on either standard XLR or 1/4-inch phone jacks and you can do away with a clutter of microphones blocking the interviewee's face during TV and radio press events. For more information, contact the distributor at 2872 Hartland Road, Falls Church, VA. (703) 573-6948. ■

Bobby Gosh Finds Heaven in the Country

by Radcliffe A. Joe

An increasing desire for greater creative, technical and financial control over recordings of the music they write and play is prompting a growing number of recording artists to design and build their own recording studios.

Up until now, hampered by inadequate funding, and many of the other variables that keep creative and technical control of the recording business beyond the reach of all but the most determined, many artists have restricted their efforts in this area to simple eight track facilities used largely for demos and commercial jingles. However, the advent of digital technologies, and the awareness that larger, more sophisticated facilities are likely to be more cost-effective over the long run, are changing this and encouraging more artists to venture into the high-tech world of state-of-the-art recording.

Pictured above: Bobby Gosh (R) and engineer Dexter Brown and Bygosh Music's Audicarts console.

One such artist is Bobby Gosh who, in 1973, composed and recorded the song "A Little Bit More." The tune was later covered by the popular rock group Dr. Hook, and went on to sell an estimated 3.5 million copies worldwide. Gosh moved to Vermont in the 1970s "to escape the increasing pressures of living in New York City," however, his recording career continued to flourish. To meet his career obligations he would have to travel back to New York, or fly to such far off places as Nashville and Los Angeles to record his songs and a growing number of commercial jingles for such companies as Burger King, Pepsi Cola and Arby's.

The solution to his problem seemed to rest in building his own recording studio, "but the cost of the state-of-the-art facility I had in mind seemed prohibitive," says Gosh. Nonetheless, a few years ago when he decided to expand the size of his Vermont

Gosh and Brown with MCI 16 track recorder.

home, Gosh added more space than he actually needed in the hope that his dream of having his own recording studio would one day materialize.

The dream moved closer to reality when Gosh teamed up with recording engineer Dexter Brown. Together they not only talked about the dream studio, but actually sat down and began designing such a facility.

It was not without trepidation that Gosh and Brown took their blueprints to Hamilton Brosious of Audiotechniques in New York. Says Gosh, "Ham was of invaluable assistance in helping us streamline our design, and making the right recommendations that would help us create the type of studio we had in mind, at a price we could live with." He adds, "Without Brown and Brosius the dream of the studio would never have materialized.

Also playing an important role in the design and equipment modifications for the room which would later be named Bygosh Music Corp., was David Baldwin of New England Digital Corp., manufacturers of the Synclavier II. According to Gosh, a Synclavier II is interfaced with the rest of the studio equipment when needed for such special projects as Gosh's recently-concluded Gruen watch commercial for television.

Equipment used at Bygosh Music includes an MCI model JH-16 16 track recorder with Auto Locator III, an Audioarts model 28 x 8 console, Sony PCM-F1 digital audio processor, an MCI model JH-110B two track, Roland model CPE 800 Compu Editor with SMPTE Code, Roland model 106 synthesizer, and Roland sequencer, Lexicon model 200 digital reverb, and Lexicon model PCM 42 digital delay, Valley People Dynamites, monitors by Westlake and Auratone, Korg Poly 800, microphones from Neumann, Sennheiser and Shure, Accoustat amplifier, and a LinnDrum machine. A Synclavier II synthesizer is planned as the next major investment for the studio.

Bygosh Music Studio was opened in October of 1983, and has since been fully booked with Gosh's own projects. However, at some point Gosh hopes to be able to make the facility available to other artists and producers. Gosh has composed, sung and produced an estimated 200 network TV commercials in the studio. He is also producing, on a continuing basis, the background music used in Circus Playhouse, a national chain of fast food restaurants that used computerized, animatronic robot entertainment. He has also written the music for ***Happily Ever After,*** a CBS TV movie-of-the-week.

Spurred by the success of the new studio, Gosh has formed a studio production group comprised of chief engineer Dexter Brown, who also plays guitar, David Tortolano, assistant engineer and guitarist; Brian Bull, synthesizers and guitars; and Gosh on Keyboards. The group, which calls itself Contents Under Pressure, also composes and sings, has completed three pop records, and according to Gosh, has already attracted the attention of a major record label.

Gosh notes that the advent of digital technology in the recording business has broadened the creative scope of artists like himself. He says, "I can now do almost anything in my studio from film scores, to pop records to commercial jingles with only my engineer and a LinnDrum machine as my assistants.

Gosh feels that financially and creatively the establishment of Bygosh Music studios "was one of the best moves I ever made." However, he does not recommend it for every artist. He feels that no artist should even attempt to start his own studio unless he has at least a working knowledge of state-of-the-art studio equipment, and access to a good engineer.

He feels too that one of the critical decisions will be whether an artist should consider a professional or semi-pro facility. However, he admits that financial capabilities will be the deciding factor here. Gosh continues, "However, if money is not a pressing factor, the artist should go for the professional facility. In the long run it would be the best decision he could ever make."

Gosh also points out that the artist with a professional studio can bypass the costly and time-consuming exercise of first doing a demo and then doing a professional recording. He says, "By investing in professional equipment from the outset, every hour spent in the studio can be recorded in a professional format.

One of the major advantages of Gosh's studio is that it affords him the luxury of working at a leisurely pace on his pop music records, while earning his keep through the multitude of commercial projects with which he is kept busy. "This is the way I wanted it," he says. "I want to have a speculation LP going at all times. My one great dream is to create a hit record right in my own studio."

Adding to the creative appeal of Bygosh Music studios is its location. The studio is nestled in the Vermont hills away from the big city. The control room measures 15 feet by 10 feet, with the two studio rooms measuring 16 x 16, and 26 x 17 x 12 respectively. The rooms feature 12-inch thick walls with Cel-Bar insulation. Twelve-inch thick cement slabs are used under the control room.

Adding to the many advantages of Gosh's studio is the fact that he also own's Victoria's, a nearby 100-seat restaurant and discotheque. Gosh says, "This facility allows us to jack our master tapes directly into a live audience environment for immediate feedback. In this way we can correct any flaws in the tape before presenting it to a major record label for appraisal." Victoria's is also used for entertaining Bygosh's clients. ■

Radcliffe A. Joe is a New York-based writer and former editor of Billboard Magazine.

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Origins of Videotape Recording:

An Interview with Charles Ginsburg

Part II

By Peter Hammar

3M AND OTHER TAPE MAKERS: A WHOLE NEW MARKET

Mix: You can't have a magnetic recorder without tape. What was the role of 3M in St. Paul and their engineers like Bill Wetzel and Vic Mohrlant?
Ginsburg: Well, Minnesota Mining & Manufacturing were making magnetic tape for recorders. They got involved with us, providing us with experimental video tape. They had excellent facilities, excellent laboratories, were able to turn around very fast for experimental material, and consequently they were still rushing new experimental batches of tape to us daily.

When we were in Chicago in the days just preceding the 1956 NARTB convention, we had one of those experimental rolls of 3M tape that was good enough to satisfy them with the signal to noise level we were getting. Now, we did get cooperation and good tape from other tape manufacturers. We weren't only dealing with 3M. We were dealing with Audio Devices and we got lots of experimental tape from Reeves Soundcraft. But the 3M was what we ended up using the most of.

THE FIRST VIDEOTAPE MARKET STUDY

Mix: When Ampex management realized your VTR experiments were going to be successful, how did they see the future market of the videotape recorder, worldwide?
Ginsburg: When our results began to look good, management set up a VTR committee, a group consisting of George Long, president of the company, Alex Poniatoff, and a few other managers. They were supposed to make the big decisions on VTRs, whether to continue or not continue, or whether to put up more money.

The VTR committee report in February 1956 contained all of the marketing information we had at that time. The report was written for the Ampex Board of Directors, who were going to be drawn to

Charles Ginsburg

the subject of VTRs, since we intended approximately six or seven weeks from that time to make that big showing in Chicago. The market studies showed that if the machines could do color as well as black-and-white and if they sold for no more than $30,000, and if ABC acquired the DuMont network, then the total market between 1956 and 1960 for VTRs would be 26 units.

Mix: Predicted sales of 26 VTRs, worldwide, in four years?!
Ginsburg: Yes. Now, as it turned out, we were shipping 30 units a month by the spring of '58. We shipped the very first machines, the VRX-1000, by October of 1956. The first VTRs went on the air at CBS in Hollywood on November 30th, 1956. Before the end of that year, we had shipped two machines to CBS, then a couple of machines to NBC. As we got into 1957 we were shipping a few machines per month and by the spring of 1958 we were shipping machines by the rate of 30 a month.

Mix: Why do you think Ampex Marketing so grossly underestimated the demand for the videotape recorder?
Ginsburg: I think simply because they assumed that the machines would only be used for program delay, primarily and initially to take care of the time zone differences. There was no conception that capabilities and facilities would be developed to permit people to use videotape recorders in editing and for post-production work.

EARLY VTR POST-PRODUCTION AND EDITING

Mix: Post-production is one of the most important functions of the videotape recorder today. When did you realize that your team's invention would be useful for actually producing programs, rather than just for use in time-delaying live programs?
Ginsburg: The use of VTRs for what might be called post-production editing even then far surpassed any anticipation any of us at Ampex had. One of the most extravagant examples of this was in 1957, when CBS put out, I believe, a 90-minute production called ***The Red Mill,*** which had something like 167 edits in it, and when you consider that each edit consisted of cutting the tape with a razor blade and applying a piece of editing tape, perhaps a half-mil thick, over the back of it, and to do that 167 times in one reel of tape was fantastic. But the fact that the production people wanted so badly to use the video recorders for program production led to the really quite rapid development of editing tools and techniques.

Mix: About mid-1956, right after the show, did you just assume that you would be limited to mechanical editing, or was there any idea about electronic editing?
Ginsburg: No, we didn't discuss electronic editing in the period just following the 1956 introduction. We had so many things to do that just had to be done before we could start delivering the first machine. There simply was no time for it. A lot of the ideas for editing came from customers, and in general it was customers talking with the engineers, as the lab engineers became field engineers, or went into the field, because it took a long time to build up a real force of field engineers. The interplay between the cus-

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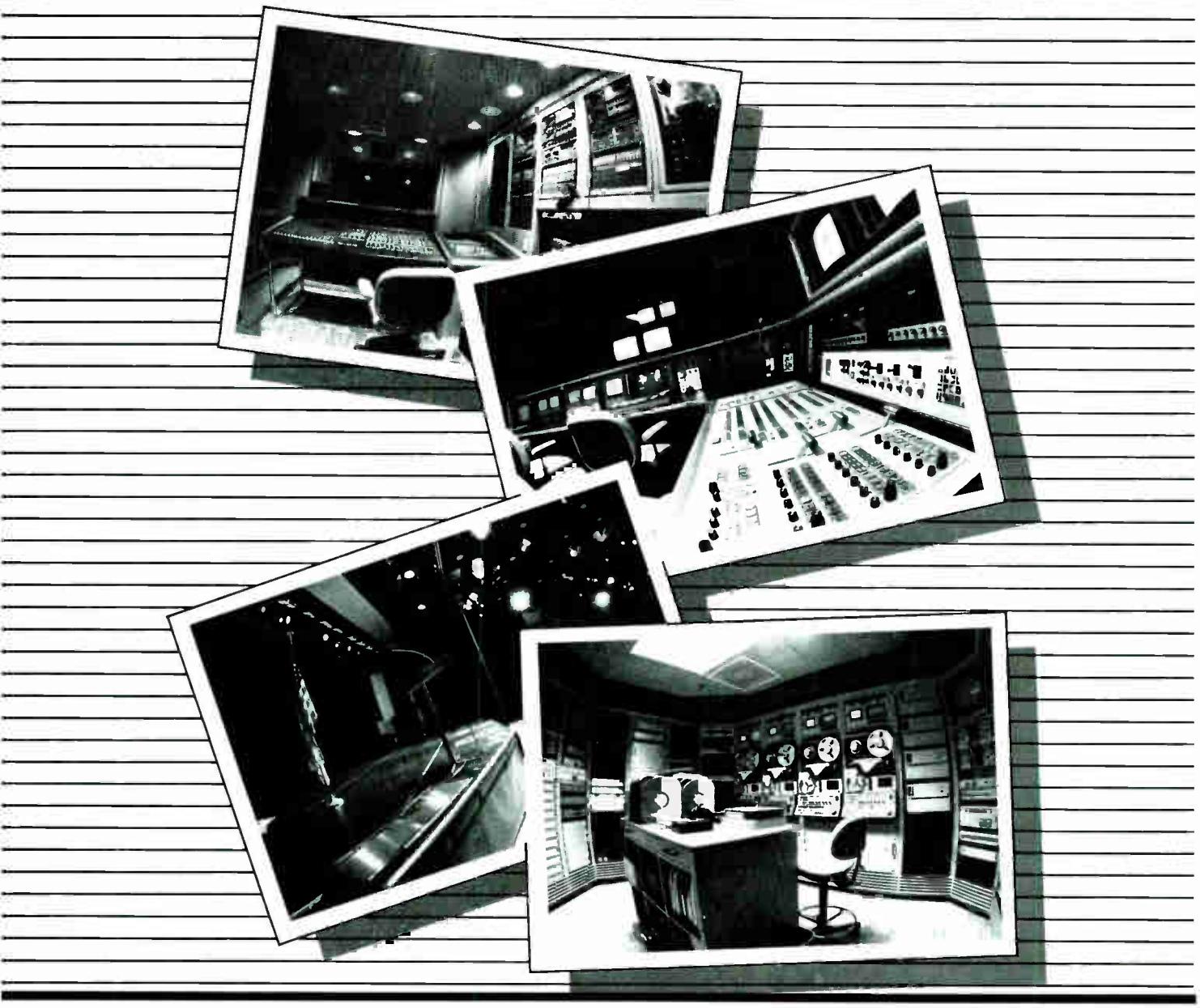

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tomers and the engineers was what led to the developments in the field of editing.

THE GREAT 1957 AMPEX-RCA TECHNOLOGY SWAP

Mix: In the early 1950s, RCA had been Ampex's rival in the great Crosby-RCA-Ampex VTR race. After Ampex's successful introduction of its recorder, RCA and Crosby dumped their VTR projects. Yet, the Ampex VTR was monochrome only and RCA had the color technology. How did Ampex get color from RCA?
Ginsburg: We started our work on color in 1956. We had Stanford Research Institute working with our people and equipment at SRI. In the fall of 1957 RCA made an approach to Ampex to exchange their color know-how for our VTR know-how, and out of that came the early color recorders. It wasn't a matter of a straight exchange of secrets, it was a matter of the exchange of know-how. RCA had the David O. Sarnoff Research Center in New Jersey pursuing one approach, and the RCA people in Camden N.J. were pursuing the problem from a slightly different approach.

To a large extent, Chuck Anderson and I acted as intermediaries between the two parties at RCA, and we would tell Princeton what Camden was doing and Camden what Princeton was doing. It was a very unusual situation and a very rare opportunity because we got to rub elbows with the biggest names in television history.

Mix: What was your first feeling watching TV when you saw video tape being used on a network show?
Ginsburg: Well, the first pictures that I saw on the air from tape were in a studio, and subsequently whenever something was going to be taped, we knew it, so we would watch where we were, at home or in the lab. So the sudden marvelous improvement in pictures as a result of the use of videotape didn't come suddenly, it came gradually for those of us who were involved.

THE FIRST "COMPACT" VTR AND EARLY PROBLEMS

Mix: All of the pictures from Chicago in '56 show the VRX style cabinet, the Mark IV, and evidently all the electronics are inside—no external equipment racks. Yet the first production VTRs made, the VRX-1000 and the subsequent VR-1000, all have two or three external racks of equipment. What happened to the all-in-one cabinet concept of the Mark IV prototype?
Ginsburg: Following our initial showing at the NARTB convention at Chicago in 1956, Audio Division manager Phil Gundy decided that it would be a very good thing to offer two configurations of the machine. So he gave the customers a choice of one cabinet completely enclosing all of the electronics, or a smaller cabinet and two racks of equipment for the electronics.

Gundy's decision was not based on any conference with the engineers, and the option of an all-in-one cabinet finally bit the dust about nine months later, so we never did deliver one monstrous cabinet with all the electronics. In addition there was the problem of getting the cabinet through a standard doorway. The Mark IV prototype, the one we brought to Chicago, would not fit through a standard doorway. It was too wide. From the standpoint of fire regulations if nothing else this would have been a severe obstacle, so we had to make the cabinets for subsequent machines smaller, narrower.

"It's clear that analog video technology is mature enough now to make a decision to make a complete change in the television systems of the world today."

Mix: What were some of the technical problems you encountered in those first VTRs like the VRX-1000 here in the Ampex Museum?
Ginsburg: When we went to Chicago in 1956, we knew that the machine was incomplete. We knew we had to have some kind of processing amplifier or "proc amp" on the output end of the machine to shape the sync-pulses so that clamps along the line in the television station or in the telephone company's transmission circuits wouldn't operate erroneously on the basis of false information generated by our VTRs.

We didn't know just what to do, so when we were in Chicago we got together with the people from the CBS Central Engineering Department and discussed the whole matter with them. Following that, Ray Dolby came back to Redwood City and designed a complete processing amplifier, and it was fine. Now that's one very specific thing, it was no surprise to us, we knew we had to have something.

We had many problems which had to be solved before delivering the first machines after the prototypes. Heads, video heads, were probably our number one headache. We just didn't really know how to make them. The heads which we had made up to that time, late 1956, were primarily experimental, but they worked well enough to be demonstrated. We couldn't count on manufacturing them, so tremendous amounts of work had to be done there. The work included not just the design of the video transducers themselves, but the tooling to make them, and the tooling to be able to adjust them into position before they were shipped out of the factory.

Much of our video head development was concerned with interchangeability, that is, being able to record a tape on one machine and being able to play it back on another, which we could not do when the prototype machines were shipped. It wasn't until 1957 that we made head and head assemblies which we said were interchangeable.

THE VTR TEAM AFTER THE SUCCESS IN CHICAGO

Mix: Just after the successful unveiling of the machine at the Chicago show, that summer and fall of '56, what changes in engineering roles occured in the group?
Ginsburg: Between Chicago in 1956 and the end of the year we worked as hard as we had the preceding year. Maybe harder, because the pressure on us to deliver machines was so great. Memos that exist from those times show that promises on delivery were made greatly in excess of what engineering said they could do. We had a lot of people brought into the lab, technicians, manufacturing personnel. We actually had a project engineer in charge of each machine to be shipped, and there was a lot of resentment about all of this pressure. But as it turned out, if the pressure hadn't been exerted, we wouldn't have done it as well or as fast, and the payoff wouldn't have been what it finally amounted to.

Mix: The team was six people in 1956. I've got a picture up here in the Ampex Museum that shows about 15 people; what about the swelling of the ranks?
Ginsburg: There were six of us on the project until April 1955, approximately a month after the demonstration for the Ampex Board of Directors. Then we started to grow not at a rapid rate but at a fairly steady rate, so that by May 1956 there were perhaps 15 people altogether on the project. Just following that, with a big backlog of orders, people started to just pour into the laboratory. Fortunately, we had a fairly empty, barn-like building.

We did have the room to expand, but by December of 1956 we probably had 30 people working on the project. This included manufacturing personnel and technicians, as well as the engineers.

Mix: After your team's tremendous success in Chicago, what projects did you do at Ampex?

Ginsburg: After the basic VTR development work was completed, I went into an advanced development capacity in which I was working on projects aimed at the television industry as well as government instrumentation applications. Following that I was in charge of the entire rotary head video and instrumentation development.

Organizational changes separated one of the groups, and then I went back to the advanced development role. More recently in fact, during the last ten years, I've been involved mostly with matters relating to digital television.

SOME THOUGHTS ON THE FUTURE OF TELEVISION AND VIDEO RECORDING

Mix: We've come a long way since 1956, and here we are today talking about digital video.

Ginsburg: It's clear that analog video technology is mature enough now to make a decision to make a complete change in the television systems of the world today. The advantages would be in the form of much better pictures. The argument that people have made since the time you could look at green faces all over your television receiver in a Hollywood bar is that you have to show them what to look for, you have to say "This is a lousy picture and this is why it's lousy."

All these "artifacts" in the video image that derive from the NTSC, from the PAL system, from the Secam system, ***can*** be eliminated. People will appreciate it once they are taught what to look for. I mean, even a good NTSC signal, even in a studio, which is much better than anybody has ever seen at home, still looks lousy if you point out the artifacts, and those artifacts can be eliminated. But to do it will require a change in the TV systems of the world, so whether this comes in the form of a complete transition to digital, or the introduction on a broad scale of high-definition TV, or even just the widespread adaptation of component analog signals, the changes can come about. But the time of decision is very close at hand.

Mix: Would you say that the development of technologies, the process of the development of most technologies, is basically pretty similar to what you and your team went through from 1952 to 1956, or are we looking at a whole different type of R&D technique here?

Ginsburg: Well, at the time that we went to work on the videotape recorder, the television systems of the world were in place, they were fixed, there weren't variables. Color came along, it sort of existed about the time we started, although it wasn't an economic force in the world at that time, say, in '52. When color television really started to mature and ***demanded*** a videotape recorder to accommodate it, we made some of the biggest breakthroughs that were ever made in videotape recording.

OK, time passes. Here is the world teetering on the brink of a decision about what to do: Should we go high-definition television, should we go digital, should we go digital components, should we go analog components? Whatever decision is made on the television systems of the world can be accommodated by the technology in videotape recording, because it's come so far, but I couldn't have said that 20 years ago. So, probably a whole new generation of videotape recorders will come to exist, once the decision is made what to do about the television systems of the world.

Mix: It sounds as if the videotape recording is driving the overall television technology. If we need digital VTRs or high-definition component VTRs, that could affect what goes on in television stations as far as the transmission of television signals.

Ginsburg: I don't think the TV technology is driven by the VTR technology. But the VTR technology does not need to be hampered by decisions to go to new television systems. When I say new TV systems, I mean dump NTSC, dump PAL, dump Secam, to obtain better pictures, to obtain pictures which don't have the artifacts, that means defects, attendant to NTSC, PAL and Secam. One system isn't noticeably better, I might even say detectedly better than another system. They've all got the defects in them, but the most clever schemes for being able to generate and transmit color television were derived in the '50s. These schemes were for compatible color TV systems, and that's the key. They no longer need to be used. We've out-grown them, technologically.

Mix: We have millions of television sets in the world with PAL and NTSC standards. What do you do about that?

Ginsburg: The problem of what to do about obsolete television receivers is a good question. I think the way it'll come about is that, for a long period of time, there'll be a cross-over as more and more people get sets which will operate on a new, parallel standard, a new television system. Gradually the old ones will become obsolete. That sort of thing can be done, it was done in Britian over a long period of time when they went from 405 to 625 lines. ■

VIDEO INTERFACE

by Neal Weinstock

STRANGER THAN FICTION

Okay, Video Interface is a lousy liar. Thousands of readers have written in to let us know they're on to the fact that two months-back's column on Al Weiss was unadulterated fiction. Sorry, Alfie, not to have provided you with a little adultery in your too brief life. However, sometimes truth can be stranger than either adultery or Alfie...

And so, we continue to explore the wacky world of art-music-video.

Nothing but the facts, ma'am. The lady who lives downstairs of VI's newly occupied garret likes to belt out showtunes and light opera in off-key Brooklynese. A murder is getting to be more deserved every day. One fine evening around Miller Time, while savoring a particularly pellucid sunset o'er the bay, VI's reveries about a new portable recorder were ever-more-consciously comingled with a petruscent rendering of "The Street Where You Live." As the skies darkened, so did VI's fantasies. The East River glistened, awaiting the long-suffering column's neighbor.

As the skies darkened, yellow-lit lives became visible behind the city's windows. VI's attention was drawn to one bright red opening to the soul of a little brownstone across the street. A grand piano, a pair of hands, red walls, nothing more. In fluid counterpoint to the voice of hell that wafted up through VI's floorboards, these hands were playing something complex, restful, and symmetrical. All VI could hear was excremental, but suddenly a vision of musical beauty had appeared. VI squinted, stared, and realized: it must be Bach!

This disembodied visual correlative of music promised relief from ***My Fair Lady.*** VI knew a 20:1 zoom lens was in his momentary posession for product testing. Never mind the manufacturer or the ethics. He stumbled to the laboratory, then back again with the zoom on a 35mm camera. Forgive not, dear public, merely understand. It was Goldberg! There was no mistaking that 20th variation. Thoroughly engrossed in the movement of the hands, VI became deaf to the noise from below. Now, that's music video.

Morning, and hungover VI awoke sweaty from a dream of 30 grand pianos all playing noiselessly in harmony. He almost forgot the dream under a cold shower, then through the bathroom window saw the Bach house again. Always at peak genius in the morning, VI immediately remembered that he had once been in that house.

Two years before, in a Hollywood far, far away, a friend of video had enlisted the man who in another life would become VI, to write notes on the underground for a would-be arty vid journal. The kind you used to read while still in school. It folded before it ever began, but not before the writers had thrown in lotsa work. (The friend paid for the work anyway. Such niceness rarely goes unpunished in the unpublishing industry, and the pal now edits a professional journal about contamination in germ-free environments.) One small lot of that work was the story of Wendy Chambers.

VI called her up. What was she up to now?

"I've really been getting into Bach lately," she told me, but not at once. "I think you're talking top of the line when you're talking Bach."

She is also getting into a piece for thirty harps to be performed at the Cathedral of St. John the Divine in September, getting back into her local ***Videoville*** TV show, and working on a video accompaniment to the "Star Spangled Banner" for station sign-offs. The anthem will be played on her car horn organ.

The car horn organ, as invented by Ted Sledzinski, spans a few octaves from oogles to beeps to honks. It is Die-Hard battery-operated.

When the man who would be VI last visited Art Music, Inc. (for so Wendy is also known) it was preparing OneWorld Percussion: an alternating circle of fifty percussionists of all sorts, all day, World Trade Center Plaza, with video and digital audio. Perhaps Chambers' most famous piece was her "water music" for choreographed rowboats in the Central Park lagoon. Of fame: "I really like it when the stuff is on the news," she says. "It's almost like beaming it out there. You remember *Close Encounters* ... where the mountain's on TV, so most people are running away from the area —but the people who have their little image of the mountain charge over instead of leaving. The number of people who watch the news; it's going to hit those people with the same idea."

Art Music, Inc. admits that, "the concept is the really strong part about my work. People really respond to that. But I try to make the music better and better, so it will survive. The music's what makes the work unique."

Wendy keeps cockatoos, rabbits, piano, car horn organ and assorted video and audio gear, keeps getting commissions and keeps getting grants. Strong and simple concepts and a sense of humor have brought her notice, in an often unnoticeable walk of art. Even so, even with a mastery of the art of non-profit incorporation, of the art of the grant of non-profit incorporation, of the art of the grant and state jobs like resident artist in high schools, it's a tenuous existence.

Many is the art/music/video type who often thinks of chucking it all for the lure of more commercial music. Wendy Chambers not only does not have to, but her work is fun enough, and open enough, to bridge the gap. To influence the commercial folks, perhaps, but more importantly to gain a worthy audience for herself. Visiting Wendy in-between a few very commercial scripting jobs himself, VI couldn't help but think that pop music has as much to learn from her as a Japanese receiver maker does from an original researcher in psycho-acoustics.

Videoville is a TV show that

Wendy "curates," on local WNYC. Thus she knows quite a lot about other independent video-makers' works and predicaments. "It's really hard to find good stuff for a half-hour show sometimes," she says. "There's just not enough money to support this stuff. People keep hoping that MTV will open up to art video every so often." She says there is a "real debate about whether MTV is making things better or worse. I was on a panel at the Museum of Broadcasting recently, about art video on broadcast TV. Originally when MTV began, I thought it was good. At least it was closer to art video than ***Three's Company***. I thought this may possibly open up an art video slot as the next step. Then John Giancola, he's head of the New York State Council for the Arts," (the NYSCA is a clearing house for grants to many independent film and videomakers) "said, 'Is that necessarily so? What is MTV? What are people looking at? In some ways it looks like art video, but it's really not. And it's going to pull people farther away from it. MTV is an art video substitute,' he said. If you look at all these special effects on MTV, they started as art, but now they're being used in a real commercial way. So John says art video is just not going to make it."

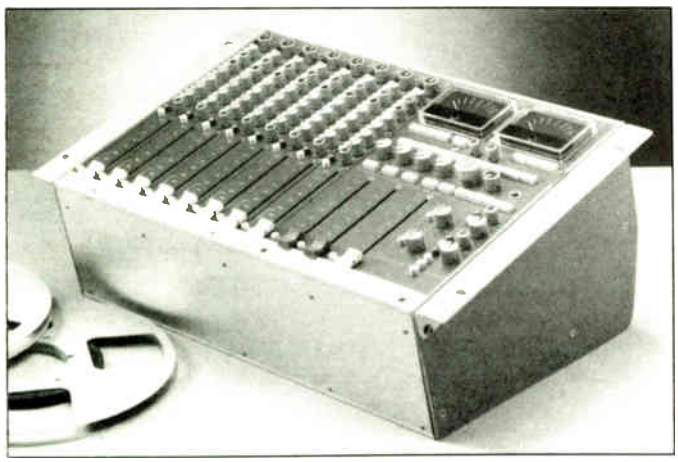
Wendy is a little more optimistic; she thinks the place for art video is definitely not commercial TV, but that the commercial stuff on MTV may just help prepare the average viewer for a more experimental sort of TV.

Feel a little odd being criticized as too mainstream, oh ye music videomakers? It might salve that wound to know that currently several art vid types are furiously attempting to get all the commercial music video work they can. Low budget for music videos—oh, say $15,000—is a year's wage for even the best jockeys of the grant races. In a recent series of showings and talks at Donnell Library in New York—an institution that has long supported independents—such downtown stars as Julia Heyward, Paul Dougherty, Beth B, and Joan Logue showed their stuff. All fairly original members of the crew at the Kitchen, that bastion of freaky video images, they are all now speaking in the tongues of MTV. Beth B's making a Dominatrix tape, Dougherty's done "Rap Machine" for Whodini, Heyward's "Dragging the Bottom" won highest votes from the judges of MTV's Basement Tapes contest and lowest votes from the folks at home, and Logue just did a Paul Simon tape.

"Doing video is like being a junkie," said Heyward. Video costs, and the more you do, the more you want. It's just another sign that West Broadway ain't all that far from Madison Avenue and Hollywood. Cross pollination may not do anybody any harm.

Persevere, Wendy, persevere. Please. ■

HARDWARE | SOFTWARE



Calrec M Series Minimixers

Audio + Design/Calrec, Inc. have introduced their M Series of compact 8-16 channel mixing boards for broadcast and small studio applications. Each input module features line/mike switching, phase reverse, three band EQ, four pre/post fader auxiliary sends, PFL, AFL, 48 Volt phantom power, and a full throw Penny & Giles 3000 series fader. The master output section includes: either PPM or VU meters, meter select switching; a switchable, variable frequency oscillator section; aux outputs and monitor controls; playback inputs; and both stereo and mono output faders.

The Calrec M Series Minimixers can be powered by either 120/240 VAC or via an external 16 Volt source. Five different basic models are available, ranging from a rack mount version to a table top design, and a variety of options can be ordered: twin compressor/limiters with stereo link switch; external controls for tape machine remotes; and several output configurations.

Circle #159 on Reader Service Card

Studer TLS 4000 Synchronizer

Designed to accept and convert a full range of video and film synchronizing standards, Studer's new TLS 4000 SMPTE synchronizer system may be used for a variety of audio/audio, audio/video, and audio/film lockup applications. Two different control panels, offering two levels of control possibilities, are available: one to satisfy the basic needs in synchronization, the other to give the experienced operator a powerful tool with extended possibilities.

The TLS 4000 interfaces to all sorts of transports via an intelligent interface. For reference, it accepts time code, frequency signals between 20 Hz and 20 kHz, video composite signals as well as biphase signals.

The basic TLS 4000 can be operated as a stand-alone unit via the local control unit, or in large systems under SMPTE/EBU bus control. By utilizing the serial control port (RS 232 or RS 422), a large number of synchronizers can be linked by a control computer, thus allowing synchronizer systems to be tailored to size according to specific facility requirements. Some features of the TLS 4000 include: the ability to fully synchronize time codes with different standards, e.g. 24 fps code with 29.97 fps code; a resolver mode with selectable reference of standard time code; a slew mode for expanding or compressing time; and programmable display and cueing.

The basic system (synchronizer module and local control unit) fits in two 1-unit 19-inch rack spaces. It mounts easily in the Studer A810 recorder console. A basic TLS 4000 system with synchronizer, interface, and local control unit has a list price of $5190.

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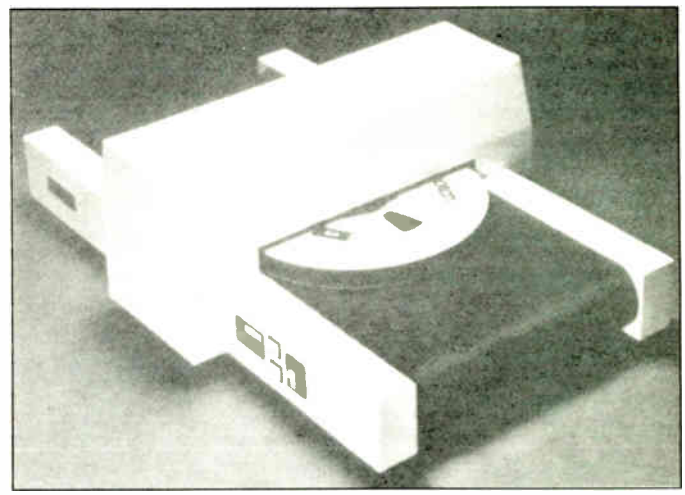

Garner 1200 High-Energy Tape Eraser

The new Garner 1200 videotape eraser, which replaces their model 1100A, offers a depth of erasure of −90 dB, even on a heavily saturated high-coercivity tape. The unit handles one inch tape on reels up to 10½-inches in diameter and the total erasure time is less than 16 seconds. A similar model, the 1400, which accepts 14-inch reels is also available.

Circle #161 on Reader Service Card

Nortronics Head Cleaning Software and Diskettes

The first software diskette with head cleaning instructions for Apple's Macintosh computer as well as cleaning diskettes in the 3½-inch format have been introduced by Nortronics. The Macintosh Software Diskette, CMP-412, assists the user in cleaning computer heads to prevent error or data loss caused by smoke, dirt and oxide buildup on the heads. The Macintosh head cleaning software guides the user through the head cleaning process with simple instructions that appear on the computer screen. The software automatically steps the read/write head to a fresh cleaning band on the cleaning diskette, spins the disk and automatically shuts the drive off 30 seconds later—after all debris is safely removed.

The software is sold separately or with replaceable cleaning diskettes that fit into reusable 3½-inch jackets.

Developed and manufactured exclusively by Nortronics, the jacket and cleaning diskettes work with the Hewlett-Packard's HP-150 as well as Apple's Macintosh. The Macintosh software diskette comes packaged as part of the Nortonics diskette head cleaning kit (CMP-153), priced at $39.95. The kit includes two cleaning diskettes, a reusable diskette jacket, head cleaning spray, and the software. Sold separately, the software diskette is $29.95.

Circle #162 on Reader Service Card

dbx Video Sound Processors

Three low-cost video sound processors have been introduced by dbx which restore the dynamic range, sonic impact and bass performance to video sound from any video sound source. The dbx SX-10 Video Sound Dynamics Enhancer is a dynamic-range expander designed for the audio portion of any video program. The dbx SX-20 Video Sound Impact Restorer is engineered to restore the sonic impact of a live performance—the attack dynamics lost in the recording of the program material. The dbx SX-30 Video Bass Enhancer offers dynamic boosting of low frequencies. The dbx video sound processors are priced at $149 each.

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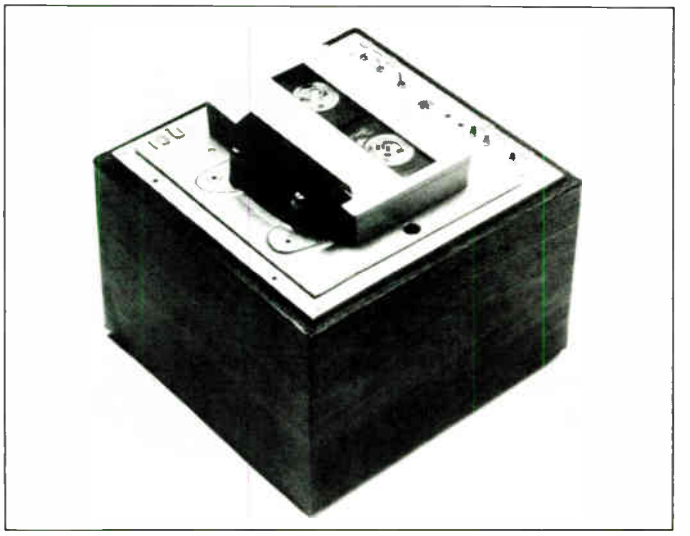

Videocassette Rewinder

The 619 Video Cassette Rewinder by Audico, Inc. of Elk Grove, Illinois, features plug-in modules that allow users to rapidly interchange between U-matic, VHS and Beta cassettes. Faster than other available means, 60-minute U-matic cassettes are rewound in less than two minutes. The operation is also performed under safe, cooler conditions, and recorders are freed for more productive uses.

Circle #164 on Reader Service Card

Synthonic Sound Music Library

The Disco Co., a Decatur, Georgia (Atlanta area) production music house, has announced the release of Series I of their Synthonic Sound Music Library. The library focuses upon contemporary popular styles, including pop, funk, disco, reggae and MOR formats and is structured for diverse broadcast, film and A/V applications.

The music library can be licensed on an annual, per production, or single theme basis, and a demonstration tape of Series I is now available.

Circle #165 on Reader Service Card

Sony's MSC-70G Genlocker™

The Sony SMC-70G Genlocker, a $2,400 microcomputer with genlock gives producers the ability to create computer graphics and video text with extreme flexibility and resourcefulness. Users can easily and precisely synchronize the graphics material with external video signals through the genlock function incorporated in the system.

The external video program can come from the composite output of a camera, from a VTR, a videodisc player or a black burst signal. The genlock lock-in range is very wide, 15.734 kHz, plus or minus 120 Hz minimum, so that a separate time base corrector is not needed. Selectable plug-in superimposer modules configure the output for either NTSC or RGB signals. The NTSC output can be fed to a monitor and recorded on any VTR. The RGB output can be monitored but not recorded.

The user can create and control the graphics and character displays through keyboard settings, or the software can control the operation independently. The software input can come from single or dual optional 3.5-inch micro floppy disk drives, which can be mounted directly in the assembly. The internal RAM is 64K bytes for graphics, characters, attributes and programmable character generation. Additional software is also available in ROM's that plug directly into the system. Each ROM supplies 32K bytes, for system monitoring, Sony BASIC command language and additional character fonts. A large variety of selectable software programs add to the system's flexibility and creativity.

Circle #166 on Reader Service Card

Fuji High Performance ½-inch Cassettes

Fuji Photo Film U.S.A., has unveiled their highest-grade, highest-density half-inch videocassette in both VHS and Beta formats. Called Super XG H451 in the VHS format, the tape features a +6 dB performance in video S/N, effectively doubling the signal-to-noise ratio, as well as +5 dB in color S/N and +3 dB in audio S/N, when compared to the Fuji reference tape. The higher-density Super XG has a concentration of particles amounting to a density almost 14 times greater than that of standard video tape, resulting in a dramatic decrease in modulation noise. Fuji Super XG H351 in the Beta format exhibits similar superior performance characteristics.

The new formulations are designed for any situation that requires a high quality ½-inch videocassette, such as on-location work, dubbing, editing, and long term storage applications.

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1981 October, North Central Listings. Digital Reverberation Survey. Chicago Music History.

1981 November, 1982 New Products. Studio Monitor Report. Synthesized Drums. Larry Carlton. Al Kooper.

1981 December, Tape to Disk Listings. Lee Ritenour. Tape Ops. Sony Compact Disc. High Speed Duplication.

1982 January, Northwest Listings. Mixing Consoles. Grateful Dead's Studio. Lindsey Buckingham.

1982 February, Southeast Listings. Digital Synthesizers. Dave Edmunds. John Meyer.

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1983 June, Sound Reinforcement/Remote Recording. Shows by Frank Zappa. Mixing Console Forum II. Papa John Creach.

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1984 April, Video Production & Post-Production. Video Production Supplement. Time Code Special. Jeff Baxter and Brian Setzer.

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