Vol. 5 No. 8 THE RECORDING INDUSTRY DIRECTORY $1.50

Mix

STUDIO DESIGN SPECIAL ISSUE

Studio Acoustics
Building Materials
The Monitor Field
Future Control Rooms
Listings of Designers and Suppliers

Free yourself from the confines of "semi-pro."

Semi-pro gear limits your possibilities. While it is useful and fun in the beginning, you soon outgrow it. Then it begins to hold you back.

The TAC 16/8/2 is not "semi" anything. It's a professional standard low impedance board offering important features previously found only on all-out 24 track consoles.

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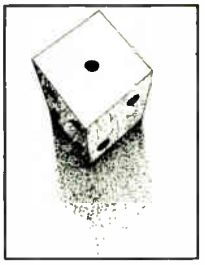
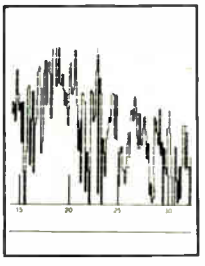
Mix

Cover:
San Rafael, California's Tres Virgos Studio, a four track studio in 1976, evolves into a full service 24 track operation with Live End-Dead End™ acoustical design by Chips Davis and Ed Bannon. Photo by Bob Morris.

VOL. 5, NO. 8 **AUGUST 1981**

DEPARTMENTS





FEATURES

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Display advertising rates, specs and closing dates are available upon request.

INSIDE

The art and science of studio design has quickly evolved, in parallel with the development of commercial multi-track tape recording. In just a few years we have witnessed the emergence of the studio designer. Part architect, part engineer, part musician, the studio designer has assumed the job of relating the young science of acoustics to the demands of the musical art, by way of the economic and esthetic realities of construction.

Scott Putnam, one of the design group's young veterans, has teamed with Tom Lubin in this issue to present a detailed piece on dealing with the complex and frustrating building codes. This is the kind of story that should be kept in a medicine cabinet with the rest of your headache remedies.

An economical approach to construction materials is the subject of the article presented by Lakeside's Steve Fouce and Carl Yanchar, former Sierra Audio designers who have been putting together some major rooms for music recording.

Specializing in the newly popular Live-End, Dead-End™ acoustical design techniques, Chips Davis and Ed Bannon have contributed information of value in all studio situations regarding the techniques of achieving a quiet control room environment. Well known international designer Francis Milano has also submitted a general perspective piece that considers the acoustical criteria generated by multi-track.

Don Davis and Ed Long are men that have been associated with acoustical theory and technological development for a great portion of this young industry. We are pleased to present Don's latest thoughts on the future of the control room and Ed's observations on the control room's monitor field.

• • •

We hope you enjoy reading this issue as much as we enjoyed putting it together. ■

TRACKS

CURRENT

Mitsubishi/AEG-Telefunken Digital Agreement

Mitsubishi Electric Corporation in Japan and AEG-Telefunken in West Germany have recently reached an agreement in the field of professional digital audio recording whereby AEG-Telefunken will join the Mitsubishi PCM format for professional PCM stereo and multi-channel audio recorders on an exclusive OEM basis.

By this exclusive OEM agreement, the Mitsubishi PCM format will be introduced under the AEG-Telefunken brand throughout Europe, except for Sweden.

Jim Guthrie Named National Sales Manager For Sony Professional Audio Division

New York—Jim Guthrie has been named National Sales Manager for Sony Professional Audio, it was announced today by Nick Morris, General Manager of the division.

In his new position, Mr. Guthrie, who has served as technical field sales manager for the division for the past two years, will be responsible for implementing marketing strategy through Sony Professional Audio's network of reps and dealers.

A native of Carmel, California, he currently resides in Norwalk, Connecticut and works out of Sony's New York City offices.

Syn-Aud-Con Back On Tour

After a two year absence from the Midwest and East Coast caused by Syn-Aud-Con's construction of their West Coast Seminar Center, they will again offer nationwide classes in the following cities during the Fall of 1981: Denver Area, Sept 1-3; Cleveland Area, Oct. 6-8; Atlanta Area, Nov. 9-11; St. Louis Area, Sept 16-18; Washington, D.C. Area, Oct. 20-22; Orlando Area, Nov 18-20; Chicago Area, Sept. 28-30; New York Area, Oct. 27-29; Dallas Area, Dec. 1-3.

Syn-Aud-Con will have a series of classes and special workshops at their West Coast Seminar Center during the Winter/Spring of 1982.

For further information write or call Syn-Aud-Con, PO Box 669, San Juan Capistrano, CA 92693. Phone 800-854-6201 In California call 714-496-9599.

Pete Horsman To Phase Linear

Pete Horsman has been appointed to the newly-created position of National Sales Manager, Professional Products, for the Phase Linear Corporation. Making the announcement was company President Ed Hart.

"Pete Horsman's appointment to this key position represents a major step forward in our plans to dramatically expand Phase Linear's professional market penetration," stated Hart. "Pete is an industry veteran with solid experience in many levels of pro sales and marketing. I'm very pleased that he has joined the Phase Linear team."

In his new post, under the direction of Sales Vice President Bruce Lowry, Horsman will work to establish a broad-based national network of pro audio dealers and representatives.

3M Names Corporate Scientist

3M has appointed Robert J. Youngquist to the position of corporate scientist in its Professional Audio/Video Equipment Project.

Youngquist is responsible for further advancement of digital audio and high density digital recording technologies. He was research manager of the former Mincom Division, where he spearheaded development of the first commercially-available digital multi-track recorder, working closely with the BBC.

He is currently involved in the study of digital audio standards as secretary for one of the working groups of the International Electro-Technical Commission.

notes...

Lakeside Associates get the contract for **Kenny Roger's** renovation of **Concorde** (formerly Scott Sunstorm) Studios in Hollywood... The next AES convention will be in New York from Oct. 30 to Nov 2 and AES will then skip the usual May event, by a board of governors ruling, in favor of an L. A. show in the fall of 1982... The CES show in Chicago this June drew a crowd of 61,000 with earth stations, once again, being the big attraction... **Express Sound,** Costa Mesa, CA, studio builder and supplier has closed its doors... **Feliciano Audio Services,** formerly **Filmways Audio Services,** has recently added the talents of **Ike Benoun and Gary Stines** to their Hollywood operation. **Jerry Shirar** has assumed the post of President of **IAM Studios** in Irvine, CA, following **Skip Konte's** resignation... **Bob Carr** has been elected president of the Atlanta Recording Academy... **Westlake Audio** has moved from 6311 Wilshire Blvd to 7265 Santa Monica Blvd. in Los Angeles... New York studio vets **Don Berman, Steve Bramberg, Jeffrey Kawalek, Bob Ludwig and Ron Bretone** have purchased and reopened Foghat's 130 year old Victorian mansion/studio in Long Island and renamed it **Boogie Hotel**...

Beyer Appoints Bensen

Paul Murphy, General Manager, Beyer Dynamic, Inc., has announced the appointment of Tom Bensen as National Sales Manager for Consumer and Professional Products.

Bensen has varied background in the electronics industry which includes 2½ years as Audio Products Division Manager for Eumig and extensive experience on the retail level selling professional and esoteric component products. He was also Technical Director for TDK before joining Eumig and was announcer/engineer for Beck-Ross Communications Inc. (WGLI Radio) for 2 years.

MSMA Elections

President Jimmy Johnson of the Muscle Shoals Music Association announced today that the Board of Directors of MSMA has just re-elected the following officers to serve for the 1981-1982 year. Elected as president was Jimmy Johnson, vice president David Johnson and secretary-treasurer Barbara Wyrick

Cline Promoted By King Instrument

William E. Cline has been promoted to the position of Senior Vice President, Marketing, of the King Instrument Corporation, a manufacturer and international distributor of tape winding machines for loading audio and video cassettes

In his nine years with King Instrument, Cline has most recently served as Vice President, Sales. In addition to continuing his sales responsibilities, he is now responsible for customer service and replacement parts, order handling and processing, future product and feature planning, scheduling of shipments, approval of product changes, and the appointment and supervision of sales representative and service technical organizations world-wide.

The announcement was made by William H. Anderson, president of King Instrument Corporation.

Staff Appointed At Third Coast

Third Coast Records managing partner Frank Seater has announced the appointment of the label's national marketing and promotion staff. The new Chicago-based label is presently preparing for the July release of its first product, and will utilize the independent distribution network.

Heading up the label's marketing department is David Webb, Third Coast's vice president/sales and marketing. Working directly under Webb is Dennis Price, Third Coast's national sales director.

GO AHEAD. STOMP YOUR FEET!

You've got an ATM Instrument Microphone System.

You're on stage to make music, not noise. But most microphones will respond to everything that hits them. Including noise coming through the mike stand. Except these new ATM microphone systems. Because each of these specially-designed instrument mikes includes a *very* effective shock mount and a windscreen.

Even if you're on a "bouncy" stage, you needn't tiptoe when an ATM microphone system is at work. Distracting noises are reduced... not amplified. Including floor resonances from speakers nearby. Or the clunks when you raise or lower the mike. All the audience hears is your chops.

But a great microphone system is not just a shock mount or a piece of foam. At the heart of our systems are three superb studio-quality microphones: a unidirectional dynamic, a unidirectional condenser and an omni condenser. Road tough? Of course. But with response specially tailored with uncanny accuracy for instrument reproduction.

With these ATM microphones a trumpet is bright, not strident. Trombone is dark but not murky. Reeds are full but not thick. And drums are crisp and clean, not fuzzy or thumpy. For two important reasons.

First, frequency response is smooth and peak-free and extends well beyond the limits of your instrument. So the balance between overtones and fundamental isn't distorted. And one part of your range isn't favored over another.

Second, and equally important is our wide dynamic range... designed to capture and amplify all of yours. It's almost impossible to overblow our ATM dynamic, for instance. And our electrets will handle up to 130 dB with ease. So your *fff* crescendo won't come out just *ff*.

Great sound and no distractions. The best possible way to start your sound system working *for* you. ATM Instrument Microphone Systems are waiting for you at leading pro music dealers everywhere. Kick up your heels!

AUDIO-TECHNICA U.S., INC., 1221 Commerce Drive, Dept. 81MX Stow, Ohio 44224. In Canada: Audio Specialists, Inc., Montreal, P.Q.

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Condenser

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Unidirectional
Fixed-Charge
Condenser

Model ATM21SM
Unidirectional
Moving Coil
Dynamic

All systems include microphone, stand mount, shock mount, foam windscreen, and carrying case.

NORTHEAST

Coco and the Lonesome Road Band has just completed the recording and mixing of their first album at **Mountain Recording Studio** in Northfield, Vermont. The group received national attention with their single, ***"New England Song"*** which was a pick hit in both **Billboard** and **Record World**. The song earned Coco the Songwriter of the Year award in the 1976 State of Maine Country Music Awards. The album is being engineered by **Crow Levine** who serves as one of the regular engineers at Mountainside. The album will be released by Green Mountain Records.

Recent activity at **Kajem Studio** in Gladwynne, PA includes; **Vince Montana** producing his daughter **Denice Montana, Mitch Goldfarb** engineering and **Grover Washington, Jr.** is in the process of recording new ideas for **Ramsey Lewis; Mitch Goldfarb** engineering.

The Slack Brothers are currently recording tracks at **Sound Heights Studios** in Brooklyn, N.Y., for Benedict Productions, **Tim Benedict** producing and engineering.

Current projects at **Sorcerer Sound** in New York City, include: Salsoul Records artists **Inner Life** and **Log, Larry Levan** recording and mixing. The **Del Byzanteens** have just finished recording and mixing their forthcoming album, and producer **Bill Curtis** is mixing the **Fatback Band**.

In New York City, **Right Track's** 48th St. Studio has **Jerry Wexler** producing the new **Linda Ronstadt** album for Elektra/Asylum Records. The album is recorded/mixed by **Jim Boyer** assisted by Right Track's **Julian Shapiro**. Musicians involved with this special material project include: **George Mraz, Walter Bolden, Tal Farlow, Ira Sullivan, Al Cohn** and **Tommy Flangan**.

SOUTHEAST

News from **Muscle Shoals Sound Studios** includes; **Barry Beckett** cut sides on **Cindy Richardson** for MSS Productions, all songs written by **Cindy** and **Ava Aldridge...Gregg Hamm** engineering **Mary Beth McLemore** assisting. Barry has also completed co-production with **Barry Seidel** on **Billy Burnett** for CBS... Billy and Ava co-wrote one song for the forthcoming album, which is scheduled for release in August. Engineering was handled by **Gregg** and **Mary Beth**, with **Pete Greene** assisting.

Grammy-winning producer **Larry Butler** was at **Sound Emporium** in Nashville, Tennessee to produce an album on **Steve Woods and the Slingshot Band**, a new California-based Polygram act consisting of five member—**Steve Hill**, lead guitar; **Leo McClatchy**, bass; **Bill Bartley**, keyboards; **Mary Wacker**, drums; and **Steve Ahmad Jamal** just completed a new LP, recorded live at **Bubba's** in Fort Lauderdale by **Criteria Recording Studio's** remote vehicle. The album was mixed to digital using an MCI JH220 format. **Mike Fuller** mastered the LP, for Gemcon Records, from the digital format.

Current studio activity at **Music City Music Hall** includes: Rocker **Leon Russell** in the studio cutting a double album's worth of country standards. Veteran studio pickers on those sessions include **Harold Bradley, Jerry Reed, Billy Byrd, Curly Chalker,** and **Buddy Spicher. Bill Harris** engineering with assistance from **David Debusk**.

Jimmy Rivers was at **Triiad Recording** in Ft. Lauderdale, Fla., for vocal overdubs and mixing on his 45, recorded in Nashville. **Vincent Oliveri** handled the engineering and **Robert Corti** assisted.

NORTH CENTRAL

Currently at **A&R Recoding Studio** in Ames, Iowa, **Dean Davis** has completed a single for **T and S Express** of Colorado. **Colt 45** recently completed their latest album while **Ian Allen/Carlson Productions** is currently in production on their latest LP.

At **Multi-Trac Recording Studios** in Redford, Mich; Four string players from the Detroit Symphony Orchestra added their touch to the new **Dale Hicks Band** single ***"You never thought you could love me"*** written, arranged and produced by **Nick Canzano**. Detroit's hottest rock band **"Mariner"** mixing their upcoming LP "Sweet Horizon"; "Tight" mixing their EP "High Tech Tea". "Valentine" (currently on tour in Japan) mixing their EP—all produced and engineered by **Jeff Jones** for Tidal Wave Records.

Two more digital sessions lit up the boards at Chicago's **Universal Recording Corporation**. The latest to utilize **Murray Allen's** expert staff and 3M machine were Renaissance Productions for the **International Harvester Company**, and John Tatgenhorst for Battelle Products. Renaissance composer **Rich Manners** worked closely with Universal engineer **Bill Bradley** on the International Harvester tracks.

At **Hedden West Studios**, Schaumburg, Ill., **Mal Davis** has completed the following albums. The "Russ Daughtry" album produced by **Russ Daughtry**; and "Changes" produced by **Steve Shafer**. All recorded and mixed in Studio B. Both are contemporary Christian album projects.

SOUTHWEST

KLOL Radio of Houston, Texas is doing an album project at **Indian Creek Recording** in Uvalde, Texas. The album, "Talent in Texas", is being co-produced by **Steve Moore** and **Eddie Fair** and engineered by **John Rollo**. Bands include: **Kyote, Trout Fishing in America, Automatic, True Heart, Barbara Pennington, Dr. Rockit, Sirens, Michaelmas, Messiah** and **The Ducks.**

Omega Audio has been involved in a variety of projects lately. The 24-track truck, based in Dallas, was recently booked to record a television special for **Delbert McClinton**. The show was part of Dallas Symphony Orchestra's summer outdoor festival "Star Fest". Omega was called upon to record the show 24-track with SMPTE Time Code and to post the audio portion of the program with their new BTX Interlock Systems. Engineering was done by **Paul Christensen** and **Russell L. Hearn**. The show was shot by Richard Kidd Productions of Dallas. Producer was **Richard Kidd**. Video facilities were provided by Video Production Services of Kansas City and Dallas.

NORTHWEST

At **Mobius Music Recording Studio** in San Francisco, CA., recent projects include the **Finders** new single ***"So Insane"*** backed with ***"Which Way"***. **John and Hilary Stench** have recently completed their new single with **Oliver DiCicco** engineering. The **Golden Gate Jumpers** are presently working on their new release with **Steve Ashman** producing and **Oliver DiCicco** engineering.

At **Fane Productions Studio**, Santa Cruz, CA., **Ray Bolger** wrapping up his narrative version of Peter and the Wolf with the Santa Cruz Chamber Orchestra, **Pete Carlson** engineering; **The Garcia Brothers** laying tracks for their new LP, **Tom Anderson** producing and engineering; and **Interface** putting the final touches on their latest single for Bluebeat Records, **Fane Opperman** at the console.

Action at **The Automatt** in San Francisco, CA includes: Huey Lewis recording a new LP for Chrysalis Records with Huey Lewis producing, **Jim Gaines** engineering, and **Maureen Droney** assisting and **Meg Christian** mixing new LP for Olivia Records with **Betty Rowland** producing, **Leslie Ann Jones** engineering, and **Susan Gottlieb** assisting.

Studiomixer II

Now You Can Get What You Want

The next time you walk into your local audio store and listen to the salesman try to tell you what you want, turn the tables on him. *You* tell *him* what *you* want, instead.

Explain to the salesman that you have a studio and you need a mixing console with the finest components and specifications available to give trouble free performance and produce high quality tapes. Mention that your band also works gigs, and that your new mixer must have equalized, balanced sends for stage amps, too.

Next, convince him that you need some basic features like individual input channel patching, phantom power, input attenuation and padding, two effects sends, and overload indicator lights. Remind him that you would like at least a four-way, independent mix for headphones in the studio or for monitors on stage. Tell him that you would like the mixer's submasters to be an independent mix from that of the masters, so that a tape can be made of a live gig without disturbing the P.A. mix.

Don't forget to tell the salesman that you must have a full parts and labor warranty for at least two years . . . one which enables you to deal directly with the factory if you like when your band is not near a local dealer.

Then demand more features. Tell him that you would like the board to have a built-in pink noise generator, a lineup oscillator, VU meters for all output functions, and cueing buttons for just about everything you can think of. And, of course, tell him that you expect all this for an unbelievably low price!

But, most importantly, put the final icing on the cake by saying that you need a 10X2 mixer today, but that your needs may dictate as large as a 35X8X4X2 console for your expanded facility, tomorrow.

By this time, if your local audio dealer is prepared for someone with needs as complex and sophisticated as yours, he will be directing you to the Studiomixer display in his store. If he's not prepared, then maybe you had better find a dealer who is.

If you need help finding a dealer, or just plain want some more information, please write to us, **Amerimex Co., Inc., 10700 Katella Ave., Anaheim, California, 92804.**

SOUTHERN CALIFORNIA

From Van Nuys, CA., **Tim Pinch Recording's** 24 track remote truck and recording staff has been very busy lately. **Tom Johnston** recorded at Wolf & Rissmillers Country Club in Reseda California for a video production. **Alabama, T.G. Sheppard, Merle Haggard, Roseanne Cash** and **The Gatlin Borthers** at the Rosebowl in Pasadena California for the "A Day In The Country" video production. These productions were engineered by **Tim Pinch** and **Rex Olson.**

At **Soundcastle** in Los Angeles, **David Malloy,** Eddie Rabbit's producer, has been in the studio the last 3 weeks mixing the new Eddie Rabbitt album and single for Elektra Records. **Peter Granet** engineering, assisted by **Mitch Gibson.**

The **Houston Recording** remote truck was in Las Vegas, Nevada on June 17 recording a live 24 track videotaping at the Aladdin Theater featuring **Kool and The Gang, Jonathan Winters** and **Waylon and Madame.** Engineers were **Fred Tator, Rich Houston** and **Steve Hawk.** Video Productions of Nevada supplied the video trucks and A-1 Audio provided sound reinforcement.

Current action at **The Pasha Music House** in Hollywood, CA., producer **Spencer Proffer** and engineer **Larry Brown** completing **Billy Thorpe's** first LP for the Pasha/CBS label. **Proffer** also producing sides on Florida artist **Keith L'Neire** with **Larry Brown** and **Duane Baron** engineering for KII Management.

At **Digital Sound Recording** in Los Angeles a hot, but as of yet unsigned new band called **"The Names"** have just completed five very promising musical offerings. The boys produced themselves while being recorded by **engineer Stewart Schonwetter** with assistance from **Jim Bauerlein.**

From **Gingerbread Studios** in Santa Monica, CA., **Bob Dorough** has been in and out of the studio cutting himself and a surprise artist; Also, a group that's touring called **"The Lienkes"** stopped in to lay some tracks, with **Terry Ayres** and **Kimbo** producing. **Sharon Taylor,** a former Miss Black America, is cutting tracks with **Larry Farrow** producing and **Bob Wolstein** engineering.

Studio News

Circle Sound Studios, San Diego, is pleased to announce the opening of their Synthesizer Studio offering an elaborate Roland 700 System Synthesizer with an MC-8 MicroComposer computer enabling this modular studio system complete control from the most common application to the most sophisticated orchestral film score without alleviating the emotional subtleties of the composer. Programmer, Robin Graham, worked with Roland in Japan seven years developing this system.

Angel Voice Recording in San Jose, California, celebrated the opening of their new 24-track facility with an Open House July 9-11, 1981.

At **Celebration Recording Studios** in New York City, **Morris Mamorsky** announced the appointment of V.P., **Jack Zimmermann** to Studio Manager. **Piers Plaskitt,** the previous manager moves to Bullet Recording in Nashville, Tennessee.

Unicorn Studio in Nevada City, CA., has selected the Studer A800 24-track for master recording chores at this new Northern California studio. Unicorn, owned by **Roger Hodgson** of the rock group Supertramp, is scheduled to open in mid-summer.

Kewall Productions Recording Studio in Bay Shore, New York reports that they have upgraded their studio with a complete new dbx noise reduction system, and have added all new special effects into the studio. Engineers Keith & Walter Gutschwager have just completed an all new ceiling design for the studio.

Sorcerer Sound in New York City, has taken delivery on a new rebuilt Steinway B grand piano and has enlarged the studio with the addition of a vocal/keyboard room with a 13 foot ceiling. 24 tracks of dbx has been added to the 24 track Dolby noise reduction mainframe, and the 2 and 24 track Studer A-80's have been converted to transformerless operation by **Acoustilog, Inc.**

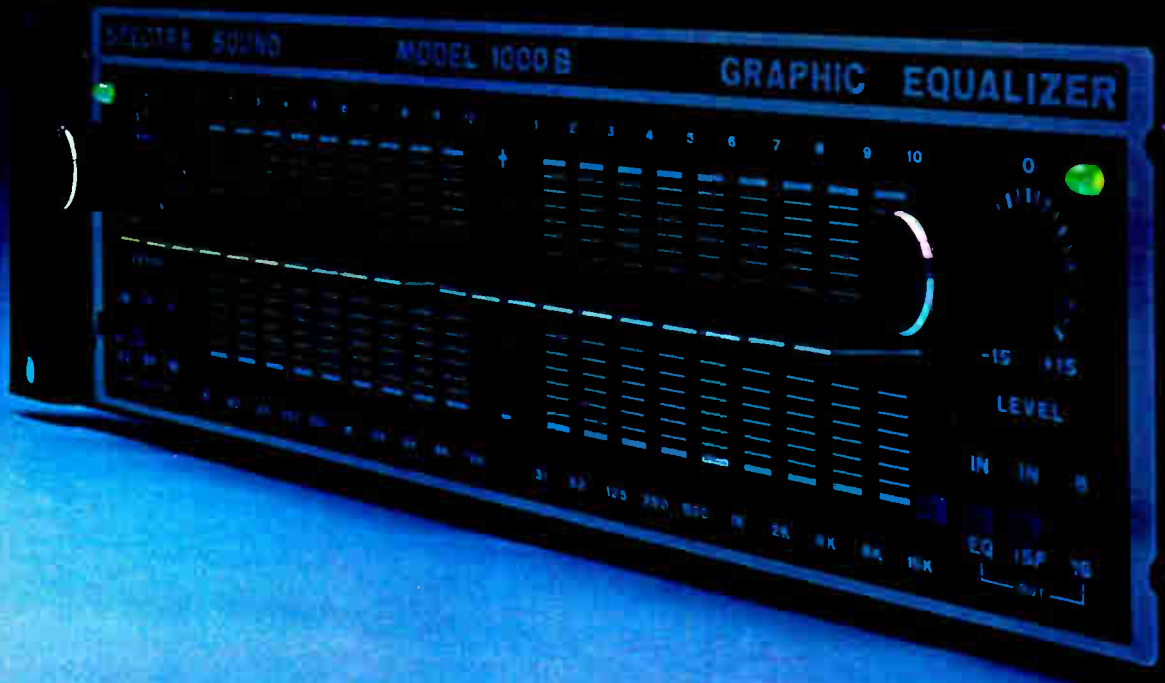
Criteria Recording Studios of Miami, Florida has just opened its ultra-modern new East Wing, a 7,500-square-foot addition to the existing complex of four studios, a mastering room, offices and recreation suites. The first session in the John Storyk-designed superstudio was booked by John Cougar & The Zone, recording an LP for Riva Records. Revolutionary in design, the studio is asymetrical with a soaring wood-beamed ceiling that rises to a height of 27 feet, then stairsteps down to eight. The nine-sided control room is equipped with a custom MCI 556/48 console, completely automated and transformerless.

Sound Smith Studios in Portland, Oregon is happy to announce the addition of **Mr. Ira Leslie** to its staff as recording engineer. Mr. Leslie hails from Hollywood, California where he worked for the past ten years with such studios as Filmways/Heider Recording, Group IV Recording and Cherokee Recording.

The Spectra Sound 1000B, a new industry standard in graphic equalizer performance, reliability, and versatility.

To be an audio industry standard requires unequaled performance, reliability and versatility. The Spectra Sound 1000B 10 band graphic equalizer excels in these realms with improvements not previously available to the professional audio industry. The unmeasurable distortion and extremely low noise of the 1000B did not happen by accident, but are the result of design and manufacturing techniques developed over the years.

In recording, broadcast, and sound reinforcement, the audio professional relies upon the equalizer to maximize sonic performance. The 1000B can ease equalization problems while insuring years of trouble free operation.



Specifications

T.H.D.	.0018% (Test Equipment Residual)
I.M.	.0018% (Test Equipment Residual)
*Signal/Noise Ratio	104 dB below +4dBv
Frequency Response	20 Hz to 20kHz, ± .5dB, +18dBv
Input Impedance	Balanced, 10k ohms, Unbalanced, 100k ohms
Output Impedance	Less than 1 ohm, typically .3 ohm

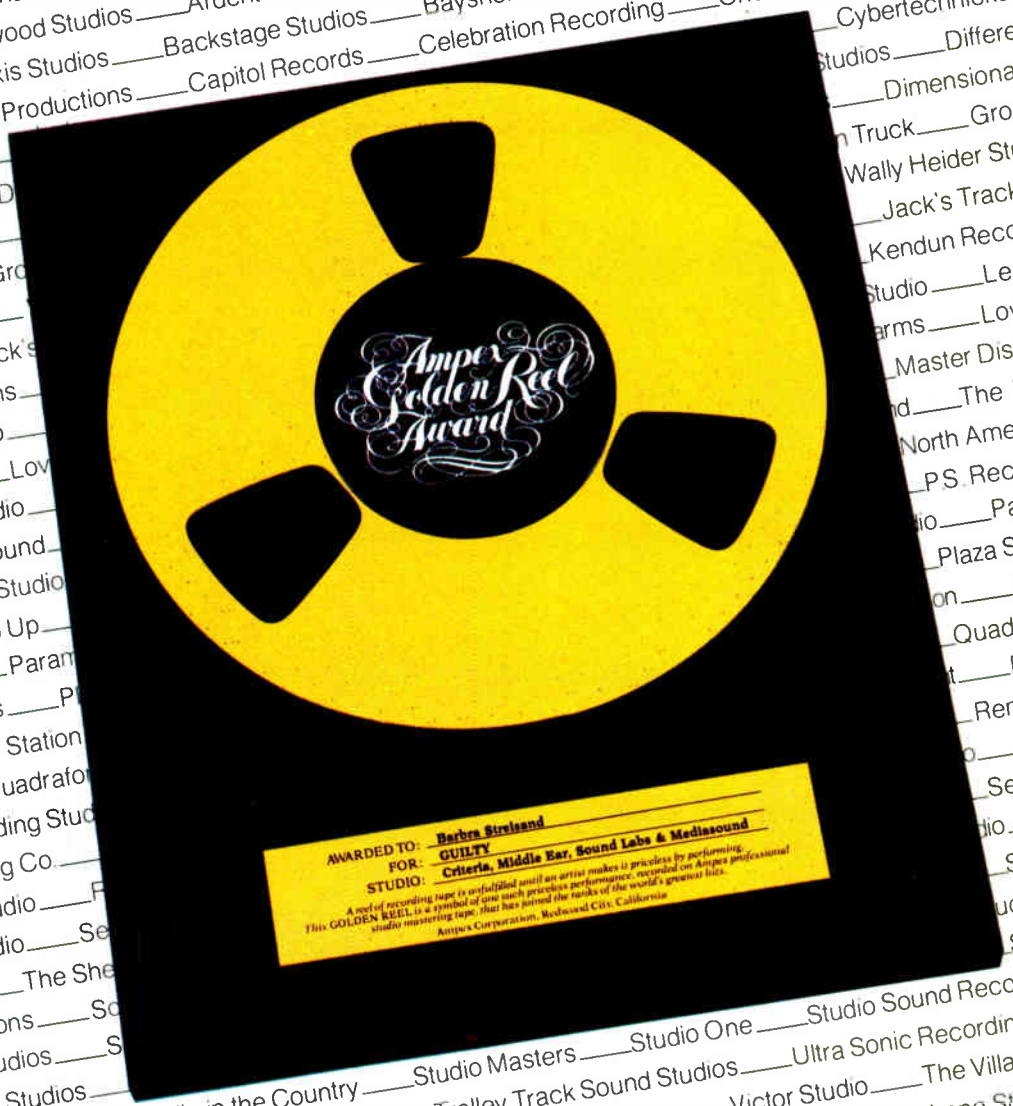
*Specification unweighted, 20 Hz to 20kHz.

For further information contact:

Spectra Sound

3750 Airport Road
Ogden, Utah 84403
(801) 392-7531

Spectra Sound is a wholly owned subsidiary of Spectra Sonics.



MASTERS OF THE STUDIO.

There's as much magic in the mixing board as there is in the keyboard.

That's why, when we award the Ampex Golden Reel, it goes to both the recording artist *and* the recording studio. Together they provide the magic that turns a reel of recording tape into an outstanding creative achievement.

The Ampex Golden Reel Award honors those achievements that were mastered on Ampex professional recording tape. They've earned a place in the ranks of the world's most successful recorded albums and singles*.

Along with the Award, we also present $1,000 to a charitable organization. Since we started the Golden Reel Awards three years ago, there have been over 200 recipients, and more than $200,000 donated on their behalf.

Congratulations to all of them. The masters on both sides of the microphone.

AMPEX

Ampex Corporation, Magnetic Tape Division, 401 Broadway, Redwood City, California 94063, (415) 367-3889.

 Golden Reel Winners as of 1/81

*RIAA Certified Gold

PROGRESSIONS

SUPERANALOG

by Larry Blakely

One of the main advantages of professional digital tape recorders has been their exceptional dynamic range, a 20 to 30 dB advantage over analog recorders.

Now, in the wake of the excitement generated by digital, there has come a new challenge from the analog camps: two tracks on ½ inch tape.

There is a principle in analog magnetic recording theory that if the track width of a tape track is doubled, the signal to noise ratio will be increased by 3 dB. In 1971, recognizing this opportunity for increased quality, CBS-Sony in Tokyo asked Studer to custom build them special tape recorders with two tracks on one-half inch tape, allowing increased signal to noise. They also required that some be built with "preview heads" for disk mastering purposes. According to a source at Studer, companies such as Phonogram and EMI have been using this tape recording format for some 15 years.

In 1979, Ampex introduced a special model of the ATR-100 tape recorder series that featured 2 tracks on ½" tape. It was also possible to purchase a 'two track on half inch' conversion kit that could be utilized with a standard ATR-100 tape recorder.

For those who desire this machine for disk mastering with these wider track "stereo tapes", Ampex markets their ADD-1 digital delay mastering unit as they make no ATR-100 machine with an advance play head.

MCI introduced a half-inch, two track recorder as a part of their JH-110 series in 1980. They showed both a standard machine of this type and a mastering version (with a preview head) at the 1980 November AES Convention.

Studer currently is delivering a standard catalog A-80 RC-2-½" featuring the half-inch two track format.

According to all three manufacturers, this special two track format has gained a great deal of recent interest. It seems that many studios are interested in making higher quality "stereo" master tapes, figuring that for the moment, 'better analog' seems a better bet than digital. The format is standardized and tapes are interchangeable on any of these three manufacturer's machines.

These wide track recorders can provide a 75 dB signal-to-noise ratio at 30 ips, in reference to 1020 nano-Webers, utilizing Scotch 250 or Ampex 456 Grand Master.

It is also interesting to note that at least one manufacturer claims the "wow and flutter" of a half-inch machine to be better than that of a quarter-inch type, due to the increased mass of the tape. The suggested resale price of these machines varies from $7,500 to $9,800 depending upon model and manufacturer.

The Sound Emporium in Nashville had a digital "shoot out" which many of you may have read about. Here all of the commercially available digital machines, and some of the analog types, including a Studer two track, half-inch model, were compared for differences in their audible qualities. According to John Abbot of Sound Emporium, "It (the Studer) was the very best of the analog machines, the best I have ever heard. It's not as good as a digital machine, but very, very, close".

It will be interesting to watch for "new" developments in analog technology in the near future as an attempt is mounted to preserve the life of analog recording. A number of larger studios who had held off on purchasing large multi-track machines in the anticipation of purchasing digital recorders, are now purchasing large multi-track analog machines; still not willing to risk a six figure investment for a digital multi-track recorder without an established standard recording format.

Who will survive the battle? There is no question in my mind that digital will, and analog will very likely become better because of it. ■

Do It Yourself PUBLICITY

by Dennis Buss and Chris Haseleu

Not unlike other service oriented businesses, a recording studio's track record is the key to building clientele. A Michael Johnson cut or a Hall and Oates credit can double studio bookings. For a studio in the commercial/jingle market, one major advertising agency client can get the ball rolling.

So, how does the studio owner let the marketplace know of it's business' activities and changes, without spending a lot of money on advertising? In-house publicity, if done properly, could be the answer.

The primary difference between advertising and publicity is that the latter is free. The results of publicity efforts are often hard to identify and control, and the owner should keep this in mind when developing the firm's publicity program. He or she should also keep in mind the two basic, interrelated purposes of a publicity campaign: visibility and image development. We now come to the three steps to an effective publicity program.

Step #1: **WHO**...The most critical step is to develop an effective CONTACTS LIST: a grouping of industry contacts designated to receive press information from the studio. Most recording studios will find two types of contact categories appropriate: trade publications, and selected individuals in the industry.

In identifying which publications to send press information to, the studio owner must keep in mind not only the purpose of the information (visibility, image), but also who he wants to target. Creativity is the key here! If the studio owner is targeting a specific type of client (i.e. advertising agencies, local musicians for demos, etc.,) selected cutlets might be effective: local advertising associations newsletters, the entertainment section of a city's newspaper, the newsletter sent out to musicians that belong to a local chapter of the A.F. of M.

Key people in the industry are good contacts. If the studio is interested in promoting production work for radio programs or jingles, press information to area radio station General Managers would be a good idea. Or, if an advertising agency is producing a series of commercials at a studio, the owner might find it profitable to let other advertising agency heads know about the sessions. Whatever the purpose of the contact, the studio owner should handle the contact list delicately and efficiently.

Step #2: **HOW**...The most common and often most appropriate vehicle to send to the contact list is the simple press release. This takes the form of a letter (maybe with an enclosed picture) to trade publications/journals announcing a single event: "West Coast Sound Upgrades to 24-track," "Jerry Evans Named Manager at Bullet Studios," or "Recording Associates Begins Fifth Year of Engineering Instruction." The copy should be short and to the point. Separate announcements should be released separately.

Another publicity method is the feature article. If a studio event is newsworthy—a $3 million dollar expansion underway, the studio has just added a new service that is unique to the area, etc.—the owner can release the information in the form of a well-written article. Occasionally the trades will print the release as submitted, or with some revision. Pictures included with the release are helpful. For the best reaction, time should be spent on creative writing and attractive production (not just photo-copying) for the best chances of avoiding the "round file."

Step #3: **HOW OFTEN**...No matter which publicity vehicles are used, the secret to an effective publicity program is **regular releases.** A press release once every other month does not work. A constant, organized campaign is critical. It's usually helpful to develop a schedule and set aside a regular time slot to work on publicity.

• • •

Do-it-yourself studio publicity could be a lot easier and less expensive than you might have thought. By the same token, the results could be greater than you might expect. Give it a try. ■

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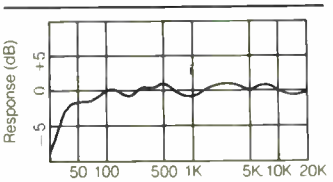

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PRODUCERS DESK

FREDDIE PIRO

by James Riordan

Freddie Piro is a classic example of a truely independent record producer. His success with Ambrosia and other acts and the success of his studio (Mama Jo's in North Hollywood) has left him in an autonomous position. Freddy doesn't produce anyone that he doesn't like and that's the way he wants to keep it.

"I find it really hard to work with anybody that I don't like as a person. They can be incredibly talented, but if we don't get along, it's hard to be with them in that room. You really kind of give away your life for whatever period of time you're recording. You're giving them everything you've got and you've got to feel good about it. I get off on artists who feel good about themselves and making records."

In the studio Piro sees himself as an extension of the artist and his job as getting that special performance down on tape. "I try to help the artists get what they want to get. I try to get an atmosphere where creative people can be real loose and not feel stifled at all. I'm a big believer in trying to find something better than what just automatically comes up. In the studio it's good to be willing to make a mistake if there is a chance of it coming out better. I look for those things that are special as opposed to just getting a solid track. It's the people who are never willing to take a chance who miss those special performances."

Piro also believes that a producer has to make records with his own tastes in mind. "You can't make records *for* anybody else. You can just make things that you really like and you have to go with what you think is right. The majority of producers I know produce the music they really like as well as they can and hope that the consumer agrees with their taste."

Introduced to the world of making records when he accompanied some friends to a studio for a demo session, Freddy was hooked when the "demo" wound up being a Top Ten hit. "I decided right then that making records was what I wanted to do. So I found some kids I thought sounded good and took them into the studio and cut a record when I was about fifteen years old. I kept at it and met a guy over at Capital who let me come in and watch them record. I learned a lot there. One of the best experiences I had at the beginning of my career was when I had a little four-track studio and I was doing most of April-Blackwood's demos on the West Coast. It gave me the opportunity to see all kinds of people record and I would analyze what they were doing and in my own mind decide if I would do it differently. I began to get a definite idea of what I would change or what I thought could be done better. This was when I really got serious about making records."

Although Piro has made some great records he would spend years away from the studio rather than go in with an act that didn't totally knock him out. "I never could find very much that I liked so I wouldn't produce that many things. The first real successful project I had was in the early seventies with a thing called "Love Song" which was the number one gospel album in the nation for a very long time.

"I started building the studio in '72 and, when the engineer was wiring it, some kids came over and played some tapes for me. I thought they were really good and started working with them. They became Ambrosia and I did a few albums with them. Sometimes I'll be out of the studio for a long time and I'll hear something come over the radio that just gives me an incredible urge to get back into the studio. It's like I've got to make records right *now*. It's that thing that turns me on inside."

Experimentation is an important part of both the producer's and the studio's function, according to Piro. "A studio is no more than a big magnifying glass. A band can put something down and refine it because they can hear it properly. They may have spent twenty hours on the tune in rehearsal, but all of a sudden they really 'hear it'. That's the marriage of the studio to the artist and I don't think you can catch that outside of the studio unless you're real, real, good. You can spend a lot of time trying to get a sound without totally knowing what an artist is looking for until he says, "That's it, that's it." The only thing that matters is the end result. The public doesn't know if you did twenty tunes or eight tunes or how many takes you do of each one. I mean, how many times does Steely Dan do tracks over? Having great players and a huge budget really allows for true experimentation, but most people don't have that available to them."

Because he is such a firm believer in experimentation and development Freddie has just completed building another studio which he intends to use for developing new acts.

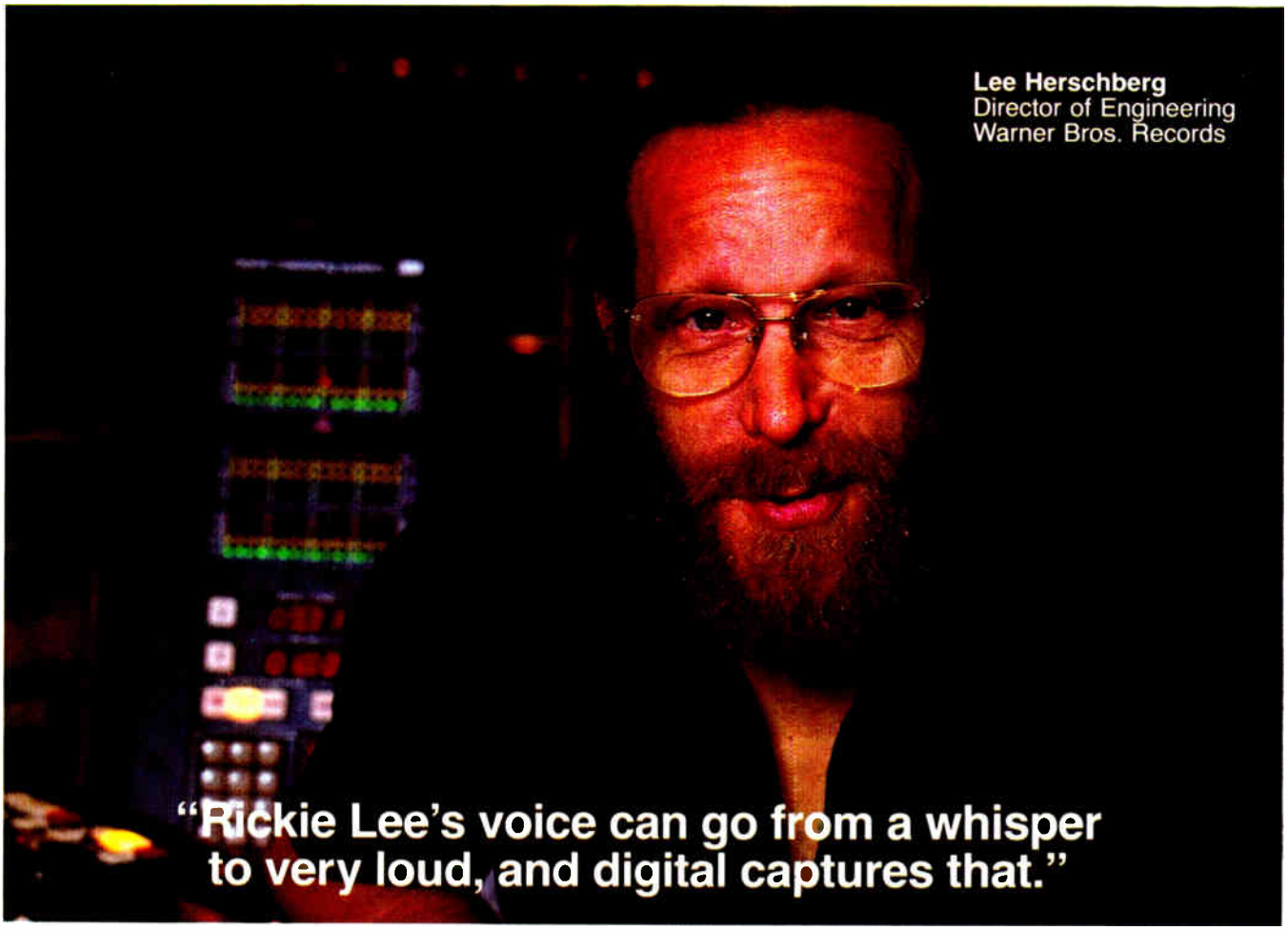
"With the economy the way it is and the effect it has on record companies, it's become really hard to experiment. It's hard to record a new artist and compete with an established one who may have a phenomenal budget to work with. You can't go out of business trying to develop an act. It makes a lot more financial sense to produce acts that are already signed, but the future of the music business has always been the new talent. We have to discover and develop new talent if we are to survive. I feel this is almost the perfect time to start a studio for developing new acts because there are a lot of good people that can't get deals now. The chart is only so big."

The enigma that most successful record producers get into is that they build a studio to work in and then find it costs them more to use their own studio than someone else's. The reason is that to compete with the state-of-the-art studios in both technical quality and design requires so much capitol that the only way it is successful is to rent it out at state-of-the-art prices. Piro has gotten around this by converting a house into a very comfortable 24 track studio.

"The most important thing about any studio is its monitors. If you're hearing what you're doing correctly then you're safe. The important thing is getting the music right. If it's musical, it sounds good, and it evokes an emotion, it doesn't matter if you recorded it on the cliffs of Dover or in Hollywood. As long as it's technically clean and musically right, you've got it."

Piro's advice is to develop the qualities of persistance and determination to succeed in the music business. "Ten people can all want to do something and whoever is the most persistant and determined will achieve it. This is true for any career. How you get into making records does not matter as much as how hard you work at it. There is no set way. Sometimes we become almost too knowledgable and then we become aware of what we can't do. You can get caught up in producing, engineering, or anything to the point where all of a sudden you don't know what's different or exceptional because it's all in and out. That's why it's important to stay a little bit outside of it.

"It's real easy to stay busy. If you've had a couple of chart records the record companies will keep you going but the key is the talent you choose to work with. You show me a great producer and I'll show you a great artist that they produced. It's the marriage. Val Garay and Kim Carnes were great casting and so were Bob Ezrin and Pink Floyd. You keep learning when you're making records. You keep expanding your knowledge about what works and what may work better. It takes patience and a lot of effort and you have to keep your objectivity. I have a good time doing it as well." ■



Lee began his engineering career with Decca in 1956, moved to Warner Bros. in 1966, and became Warner's Director of Engineering in 1969. His experience spans the recording of such artists as Frank Sinatra, James Taylor, and most recently, Rickie Lee Jones. Herschberg is a true believer in digital recording, and agreed to tell us why.

Q. You've probably had as much experience with the 3M Digital System as anyone.

A. Yes, probably. I've been working with it for two years and had one of the first systems. We've been through the ups and downs and it's been well worth it. At this point, the 3M digital machine works as well as most analog machines.

Q. How do you justify the extra expense of digital recording?

A. Well, I think from any studio point of view, you've got to have the equipment that will bring in the artists. And if digital recording is truly the state-of-the-art, you've got to consider the clients you'll attract, and their needs.

Q. You've obviously done a lot of projects digitally. Why?

A. To me, digital recording is almost like the tape machine is nonexistent. You don't have any of the inherent problems you have with analog. I think everybody is aware of the major benefits of digital recording. No wow or flutter, lack of tape noise and no need for noise reduction. And digital allows you to do things you couldn't do with analog. Like compiling 3 or 4 tracks onto one. There's no degradation of quality.

Having 32 tracks has helped, and so has the addition of a digital editor.

Q. What do you say to an artist who's considering a digital project?

A. I'd say, yes, if it's up to me, go ahead and do it with digital.

Sometimes, on an analog session when the digital is available, I'll record the first couple of tracks on both machines. Then, on the first couple of playbacks, we'll listen to them side by side. That usually does it right there. There's no comparison.

There's nothing wrong with analog recording. And never has been. It's just that, with digital, you're hearing on playback what you just did in the studio. And you begin to hear all the shortcomings of analog machines — the things you've come to accept. And suddenly, those things are no longer acceptable.

Q. What musical formats are suited to digital?

A. Any format, really. It's particularly good for music with a lot of dynamic range. Like Rickie Lee.

Q. What would you say to other engineers and producers considering digital?

A. Well, digital isn't for everybody. And I'm not trying to say it is. There will always be people who prefer analog, and a lot of great records are made that way. It's just that, to my ears, digital is far superior, and it's the next logical step.

Lee Herschberg recently recorded Rickie Lee Jones on the 3M Digital System. The album, Pirates, is available from Warner Bros. Records.

3M Hears You . . .

3M

Artist Studios

RAY PARKER'S AMERAYCAN STUDIO

Ray Parker at Ameraycan Studios.

by David Goggin

Ray Parker, Jr. enters his Ameraycan Studio for our interview wearing a dark blue jogging suit, looking a lot like Lando Calrissien stepping into the bridge of a Star Wars cruiser.

The studio was built to his specs, and he was on hand during every day of its construction. Built into a small building in North Hollywood, the studio makes maximum use of limited space in it's functional and comfortable design.

Ray Parker, Jr. has been recording for eleven years. He started at the age of 15 in Detroit and began his L.A. session career in 1973. Prior to his west coast exodus he toured as guitarist with Gladys Knight, The Temptations, The Spinners, and Stevie Wonder (recording on the "Talking Book" and "Innervisions" albums.) As a much sought after session player he worked in most of the major L.A. studios and his compositions began to be covered by major artists like LaBelle, Seals & Crofts, and Herbie Hancock.

As Ray began to concentrate more on his future as a performer and writer, he put together the group Raydio, built a modest studio in his home, and produced, sang, played, composed, arranged, and engineered his impressive debut album with Arista. The album was a success, and with his solid recording contract the time came to build Ameraycan Studio. His experience in many studio settings, and the practical knowledge gained from his home studio provided the background necessary for a well planned and executed construction.

Working with Ray on the studio was his co-engineer and tech-wizard Steve Hallquist. Steve had worked for ten years with Audio Industries, the west coast MCI distributor, and provided expertise which resulted in many features of the studio.

The studio proper has a high ceiling, lots of oak on the wall, and an oak parquet floor. Custom gobos with fabric on one side and mirror on the other make the room flexible for everything from tight rhythm tracking to string dates.

In conserving space, the choice was made to combine the control room window with the doorway to the control room. Two sets of heavy duty sliding glass doors, fitted with special gaskets, and spaced two feet apart, serve to isolate the studio from the control room and provide a highly reflective booth for isolated recording. Clear visibility to the entire studio is provided.

Ameraycan has quite a large control room, since Ray

does much of his overdubbing there.

The room has total walk-around space surrounding the board, an automated MCI JH-636 console, with oak "wing" producer desks added to either side. The racks are mounted in the back wall and tilt out for easy servicing. The power amps are concealed, and built on rollers for easy access. There are convenient connectors for direct overdubbing, and jacks for cassettes to make quick reference mixes. The room is a maintenance man's dream.

Equipment includes an MCI JH-114 24-track with autolocator, transformerless JH-110-B 2-track, an older JH-110-A for slap and duplication, Lexicon 224 and AKG BX-10 reverb, Lexicon Prime Time, Eventide Harmonizer, Orban De-esser, Roland SPH-323 dual phaser, dbx limiter/compressors, and an old but dependable Rhythm King. The rooms, the furnishings, and the equipment at Ameraycan comprise a highly streamlined yet eminently state-of-the-art recording studio. *(Cont'd on page 20)*

Ray Parker's one man band, Raydio, set up for tracking at Ameraycan Studios.

DESIGN BY SCOTT PUTNAM

by Tom Lubin

The building Ray picked up was a good real estate buy (for North Hollywood) but was not quite the ideal spot for a recording studio. Besides being narrow and not having too high a ceiling, it was situated directly in the Burbank Airport flight path. If that wasn't enough of a challenge, the front of the building was separated from Lankershim Blvd. (eight lanes wide) by only a six foot sidewalk! But, it was a good buy.

To solve the Herculean portion of the tasks Ray called upon Scott Putnam, a veteran designer/builder of studios for United/Western, Ocean Way West, Ocean Way and Burbank Editorial Services, all in the L.A. area; Kay Smith Studios, in Seattle; Santa Barbara Sound; and White Rabbit, in Sausalito. Scott has been working on studios since he was a teenager, helping out at his father's studio, United/Western, in Los Angeles. He credits father Bill Putnam and Jack Edwards for much of his design background: Bill for the acoustics (and making Scott do his homework) and Jack for his ideas on the architectural use of space.

Scott considers the economics of a studio, "When I have a client like Ray I know that he'll be able to generate enough business from his own projects to keep it going. Someone who just wants to build a studio because they like the idea, I worry about because the clients don't just flock in anymore. Competition has caused rates to go down and the cost of operating a studio has gone up. A few years ago a lot of large studios went in but that trend has reversed. Many owners came to the conclusion that a large room won't generally be able to earn anymore income than a small one. At the same time the large one costs more to maintain.

"I tried making Ray's place efficient and versatile," says Scott, "and use every inch of building shell. We also had a limited amount of space to work in. I wanted to give Ray as large a control room as possible since that's where he is most of the time. At the same time he needed as large a studio as we could get and it had to feel bigger than it actually was. The original plan had a piano booth, and used conventional base traps, but as the design progressed the nooks and crannies were eliminated. A room this size just can't afford to have specialized areas since in most cases it's wasted space. I've seen many drum booths and built a few of them myself, and when they're completed the drummers never use them. They set up in the middle of the room. In a very large studio, a design can afford to have a small portion of the space delegated to a specialized area, but a small room cannot."

Scott tried to save as much of the existing building as possible. He had hoped the walls and ceilings could be left, but as walls were removed it became apparent the wall on the right side would have to be removed and reconstructed along with a new roof. The new fourteen foot high side wall was built two feet taller than the remaining original wall, and it was extended the full length of the building. (see orginal outline).

The top of the new roof was sheet rocked with one layer of 5/8" drywall before the ½" plywood sheathing was laid down. Attached on top of the plywood was a standard roof covering. The bottom of the joists were then rocked with two layers of ½" drywall. This afforded Scott with an additional 12" of isolated air space between the joists.

Below the joists an isolated 1" rock ceiling was suspended, the acoustic ceiling was than hung under that. The voids between the various layers of sheetrock were also filled with a layer of fiberglass. (Though the ceiling is parallel to the roof it is not parallel to the floor because of the angleing of the joists from the higher wall to the lower one.

The original bass traps in the design were replaced with a combination of diaphramatic panels and Owens Corning 703 fiberglass. This allowed very good absorption from a 6" depth. For higher frequency absorption some of the panels were covered with carpet.

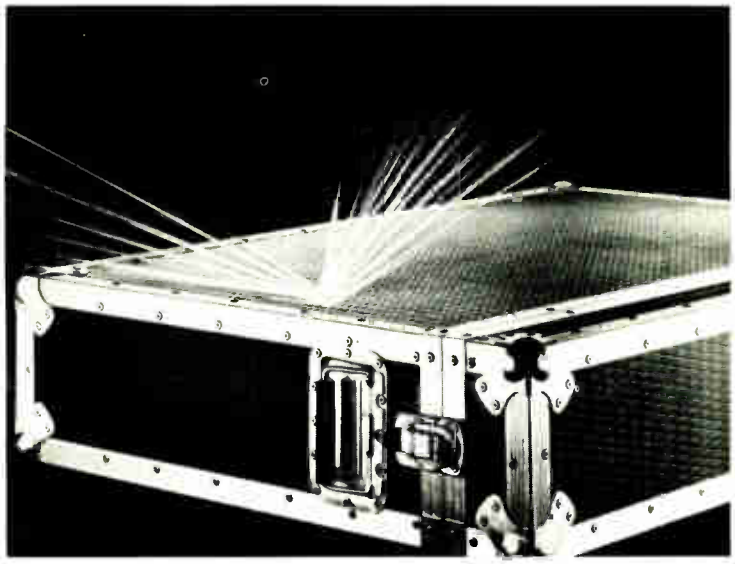
To get more floor space the walls are sloped from the floor slightly inward. At the ceiling the wedge shaped space between the inside and outside walls provide room for the air conditioning case. Rather than prefabing a plenum, the air conditioners that are situated behind the building are connected to a long, very large diameter flex ducting that gently snakes through the wall cavity.

ISOLATION AND DECOUPLING

The new roof & double wall construction supplied enough sound isolation to eliminate the problem of landing jets. To provide for decoupling between the studio floor and Lankershim Boulevard, some 35 feet from the outer wall, the building's concrete slab was cut between the control room and the studio. The control room floor was decoupled from the slab with a sandwich of moisture barrier, celotex, 2x4's on edge, more celotex and one inch particle board. The cavity between the 2x4's was filled with fiberglass, and also provided the space for all of the wire channeling.

The two sliding glass doors provide adequate studio-to-control room isolation. The monitor speakers are at ear level, and to both sides of the control room glass. Their cavities are cantileavered off the control room wall. There are storage cabinets below the speakers as well as under all of the seats in the lobby and the producers desk.

The studio's environment feels very open and belies it's actual width. As Scott pointed out, "We have a good volume for the square footage, and all the square footage is usable for any setup. ■



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(Cont'd from page 18) • • •

Was it a major decision for you to build that first studio in your home?

Yes, because I didn't have a record deal at the time and I had to spend a lot of money with no clear way of getting it back.

Would you consider that first studio a rough draft for this one?

Very rough...a console in the bedroom. But I did learn a lot about the equipment, and the hardware and design. This studio was less of a risk because I was selling records. At least I knew that what I recorded would be released.

How did having your own studio affect your work?

Well, I could spend as much time as I wanted to get it right.

Was there a marked change in your final product?

I began putting down the Rhythm King and overdubbing all of the instruments one at a time instead of paying for studio time and having to get everybody there to cut things as fast as possible.

That's the big difference?

I think so...with all my hits I've always played all of the instruments myself.

Was there anything special you had in mind when you planned this studio?

The look was important. I wanted something comfortable, that I wouldn't get tired of looking at. The designer, Scott Putnam, did that right. I also couldn't work in big rooms, because the rhythm tracks got too loose. This room is small enough to get the sound I want, but big enough to do strings.

And there are other nice features...we have inputs here under the console so things plug right in and go fast. We have a lot of little gadgets that make life easier.

Did you work closely with Scott on the Studio?

I was here every day..."raise that doorknob up...make that line an inch lower..."

What was your biggest hassle?

The city regulations.

Has it been a good investment?

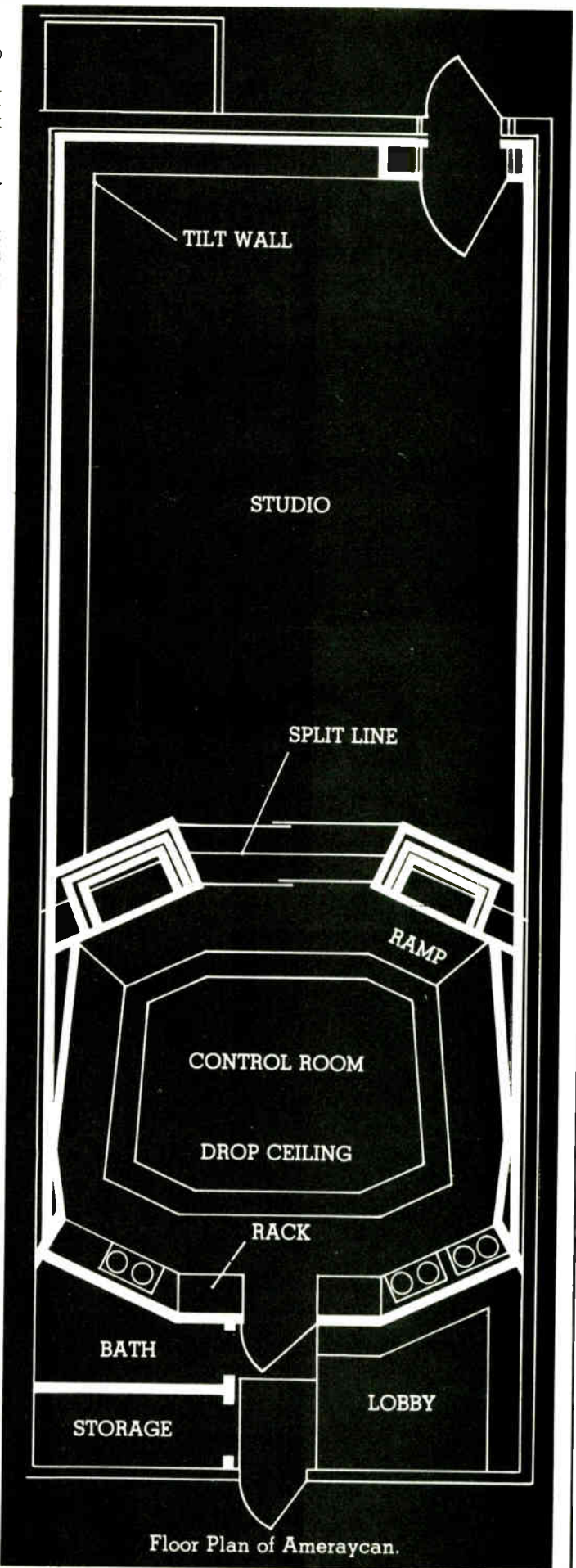
Oh, yeah, it's been a very good move. It should pay for itself very shortly from my records and the other artists I produce, as well as outside clients that we're bringing in.

Would you advise other artists to do the same?

Financially, it's a much more reasonable thing to do than booking time. People spend 75 to a hundred thousand dollars in studio time on an album. Even if you bought the land and building over a five year period the note wouldn't come to that much. As long as you have an album budget you should be able to afford a studio.

And the faith that you will be recording for a few years...

Anybody with nominal success should be able to do it. I'm not saying you have to sell gold or platinum records, just nominal success and an album budget for the next few years. Even if you can't afford to buy a building, you should be able to lease one and some equipment. It would still come out cheaper in the long run, and you have time to do other projects, cut other records, hustle up some business and make it come out to your advantage. ■



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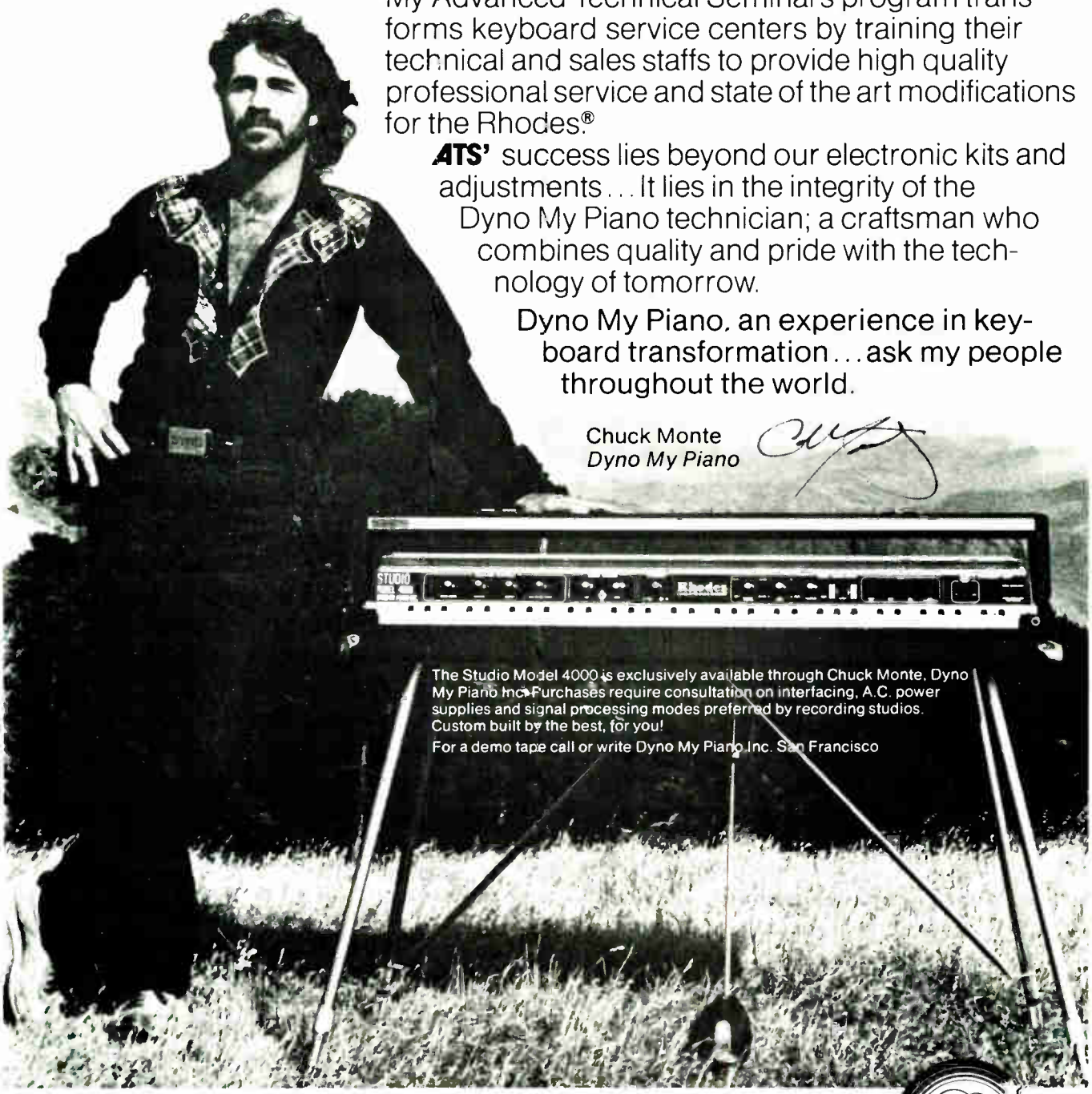

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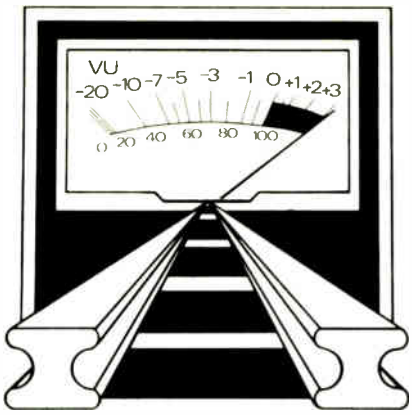

Other Side of the Tracks

episode #23

a TERRIFIC session

by Mr. Bonzai

When Ryan Recording made the cover of Mix magazine we knew we were headed for Fat City. The years of hard work had finally paid off. I arrived early at the studio, confident that we would be booked solid for years to come.

"Layla, any calls yet?" I asked our receptionist cockily.

"Tons, Mr. Bonzai!"

"Great...run them by me." I took out my notepad to start figuring out our expanded income.

"Well, let's see," she began, "Johnny Terrific wants to get back in the studio to finish up his latest album. Oxxon Tape wants us to sign a 25K a year purchase order. The Mortician's Union would like us to donate some time for their annual glee club album...Omega Labs wants to show us their new digital fuzz generator, and Orange Grove Junior College wants us to hire one of their students for free."

It wasn't the jackpot I had expected, but at least we would be working again. Johnny Terrific had been recording his latest album since Woodstock and no one knew if it would ever be completed, but his old song "Call Me Collect" was this year's phone company jingle, so we knew he could pay his bill.

"When does Terrific want to start recording?" I asked.

"Noon."

"Noon! OK, get Eddie out of the sack and tell him to tweak the multi-track for elevated levels...call Keith, the tape supplier, and order us a case of pancakes. (Terrific always likes to do about twenty mixes per tune and then listen to them in his mobile sauna.) Tell Cart to cancel his fishing trip and get the U-87's out of the shop. (Terrific likes to have at least nine Neumann's on the drums.) And let's give Orange Grove College a call and try out that free student."

The college sent over their top student just in time to get set up for our big session.

"Hi, I'm Garfield...I've got a 3.8 grade point in Electronics."

"That's great, Garf," I complimented him. "Why don't you start by washing the control room window?" We'd keep him busy in the background until he got the hang of high pressure session work.

Garf had the window cleaned, the carpet vacuumed, and our car stereos repaired by the time Terrific and his crew arrived four hours late. They began to haul in their truckload of gear as I made introductions.

"Johnny Terrific!...what a thrill," Garf gushed. "I thought you O.D.'d when I was in the sixth grade."

"No, kid," he responded, "I was just re-mixing."

Cart and Eddie began setting drum levels and hooking up the bank of Terrific synthesizers while I put up Johnny's master tape to check his levels. The tape backing began to peel off before I could stop the machine. I switched it off, closed the doors on the machine, and slowly rushed into the drum booth for a conference.

"Eddie," I pleaded hoarsely, "I need some help. The master is falling apart."

"Hmmm," he said, "that happened to the Zeppelin once when they left their tape in an open convertible for a few weeks. The only thing we can do is ride the pinch roller with some Q-tips and head cleaner and hope it holds up 'til we finish the session."

I strolled back to the control room and put Garf on pinch roller duties as Layla burst in with exciting news.

"Mr. Bonzai, Kent Kornkooper just called! He saw our studio on the cover of the Mix and wants to come by to check out our sound."

"Who's Kent Kornkooper?" inquired Garf.

"Kent Kornkooper is the president of Expressly Everything. He is the most influential studio designer in the world. He built The Buffalo Ranch up at Lake Narrowhead, he designed "Le Tape" for Andre Peneur in Canada, and he just completed Air Loom Studios in Bora Bora for The Bingoes."

"Oh," said Garf, stopping to take notes.

Six hours later we were reasonably rolling. Kent Kornkooper walked in just as Terrific was laying down some flashy synthesizer riffs. We were looking good and my hope was that Kornkooper would pass the word along to some industry heavyweights. I invited him to have a seat on our sofa and listen to the session.

Our control room had been built at gigantic expense by The Modzilla Sound Company. We had an incredibly good sound, with no external E.Q. The time analysis sheets looked like a mass murderer's E.E.G., but we had the sound that people like Johnny Terrific responded to.

"**Very** nice sound, Mr. Bonzai," Kornkooper remarked. "I especially like the inner-tube clouds you've suspended over the relective area above the console. How is the internal wall structure composed?"

"Oh, the usual sandwich layering with a little improvising here and there," I informed him. I really didn't know exactly what Modzilla had put in the walls, since they had kept it a secret.

"Hey, it really stinks in here," yelled Garf. "Look—there's smoke

coming out of the ducts!"

I tried to hide my panic. "Just keep recording, Johnny...no problem...must have blown a fuse."

"Sure, man...I don't want to stop now. I'll be cookin' soon."

Cookin' was right. If the air conditioner failed, the studio would hit 150 degrees in minutes. I put Garf in charge of running the tape machine and grabbed Eddie and Cart for rooftop reconnaissance.

Up on top of the studio, we found fan belts flapping and screaming, the motor bouncing on its grommets, and smoke pouring into the sky. We yanked the filter panel off and found a black, caked mess of dirt, dust, dead bugs, and solidified fiberglass. We began beating the filter panels and immediately looked like three stooges in blackface.

When we got back to the control room, Kornkooper and Terrific were semi-comatose with Garf fanning them with a record jacket. I heard the sound of sirens outside as a troop of firemen marched in with axes and huge hoses.

"OK, men, hit the walls, the ceiling, this electronic stuff," the Chief ordered. "Hold it...stop...it's OK," I screamed. "No water!"

"Alright, but this smoking wall has to be opened up."

Before I could put myself between the firemen and the wall, the axes were flying. The smoke subsided just as they tore down a 9x12 foot section.

"Interesting," commented the bleary-eyed Kornkooper. "I never thought of using that type of slate."

As the walls crumbled before us, out tumbled slabs of school blackboards. Next came a layer of sawn-up surfboards, a pile of crushed styrofoam cups and egg cartons, a few sheets of astroturf, and several mohair sofa cushions.

"That's just amazing...you learn something every day," Kornkooper raved. "I'm gonna mention this in my report at the next EAS convention. I like the idea of the small studio improvising when they pack their walls."

Johnny Terrific revived and started to leave with his band.

"Wait, Johnny," I called. "Every studio has a little down time..."

"Hey, man," he said, "no problem. We'll just go grab a bite to eat. If Kornkooper says this is a happening studio, that's good enough for me."

"Thanks, Johnny...could you give us about an hour to put the wall back?" ■

The situations and characterizations in this column are purely fictional and do not reflect anything relating even vaguely to reality, living or dead.

DEALERS FORUM

Financing Studio Expansion

Craig G. Ingle
President
Pro Audio Systems
Seattle, Washington

Pro Audio Systems has been building studios for about five years. During the past two, we have seen the recording studio market go through a painful growing-up period.

Back in the seventies, the "creative" element was everything and the business side got very little attention. It was easy to get started. People were opening studios for a lot of the wrong reasons. In many cases, their only qualifications were they liked music and could scrape together the money for the hardware.

Today the studios that are making it are the ones willing to take a serious look at the "dollars and cents" aspect of their business without letting go of the "creative" element.

For example, Pro Audio Systems recently worked with Jim Bredouw and Sunny BlueSkyes to put together The L.A. Studios. This was at a time when interest rates were skyrocketing and banks were cutting back on loans.

Today The L.A. Studios is booked solid with commerical work. Of course, the fact that Jim and Sunny have enormous amounts of talent is what brings the customers in. However, I feel one reason it's so profitable is that everyone involved sat down and looked at total project costs—not just hardware.

These included cost of money, cost of time, cost of construction, installation, over runs, long term maintenance and the human element of team effort. The fact that The Studio made money in its first hour of operation is just as important as the fact that 90 million people heard the product.

Claude Hill
President
Audicon Design Group
Nashville, Tennessee

The two greatest factors in cost efficient design and construction in the contemporary multi-track recording studio are proper project planning and the selection of building materials.

Proper planning includes the services of an experienced design team, which includes qualified architects, from the outset of the project to assure that in all areas from site planning to interior design the most functional and cost effective decisions are made. The 'fix it in the mix' approach to studio design and construction is certainly the most wasteful and costly.

Claude Hill

There is a wide range of materials available to the designer and client, not all will fulfill the basic acoustic needs and allow the primary criteria for studio design to be adequately met. It is the designer's role to guide the client in selecting cost effective materials which provide proper acoustic performance within the established budget.

In today's economic climate, sources of financing for 'start-up' studio operations are difficult, if not impossible to find. While established studio operations have only to commit to pay high interest rates, new studios cannot find financing.

One approach which has worked recently is the use of investor capital to purchase the required real estate for the project and to use the value of the real estate as leverage in obtaining the required construction and equipment financing.

Bob Todrank
Executive Vice President
Valley People, Inc.
Nashville, Tennessee

"Creative financing" has always been necessary for studio construction and equipment, partly because gray-flannel-banker-types often don't speak the same language we do. Now the communication problem has worsened, with the economic slow-down, record label cutbacks, and a rash of studio bankruptcies. That's why our first recommendation to our clients is to hire a financial planner and/or accountant—someone who can speak the language of investors, on your behalf. If you're lucky, you'll find a financial planner/accountant who'll want to get involved as a limited partner. If not, pay for the services outright. The fees you pay will save you countless headaches all along the way.

Next, you need a thoroughly prepared and documented business proposal. It should contain as much important information as possible: projected P&L statements for at least four years; your background and brief personal history; a firm statement of your objectives and goals; commitments from artists and companies who intend to use your facility; artist's sketches and architectural drawings of your proposed facility; and, a believable repayment plan.

This proposal will be necessary, whether you obtain conventional funding (i.e., banks, savings and loans, leasing companies), or capital investment (i.e., outside investors, limited partnerships, tax shelters, etc.). For new businesses, investor support is a better likelihood, while established businesses with proven profitability will fare better with conventional financing.

Ask your accountant about limited partnership tax shelters as a source of funding. Then put together a group of interested parties who can each contribute a fair share. (We've had reasonably good success using this approach.)

You'll want to make your proposal presentation to as many sources of funding as you can (with the participation of your accountant.) Educate yourself well enough so that your prospective financiers don't ask any questions you can't answer.

The area of financing is where a lot of creative, talented, experienced people lose their dream of studio ownership...because they don't back up the dream with thorough preparation and perseverance.

Cost efficiency is one of my pet subjects, but I only have room here for a few points:

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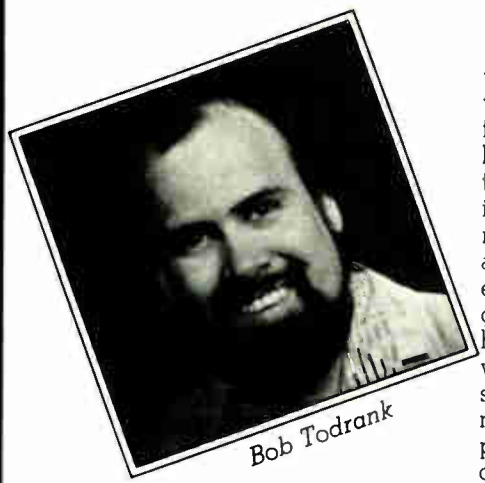

Bob Todrank

In building an acoustical space, your first and foremost expense is isolation. Isolation from outside noises, and from you to your neighbors. Isolation is both material and labor-intensive, thus the high cost. Here again, pre-planning is extremely important. I stress the necessity of enlisting qualified assistance in the early "thinking" stages; or educate yourself to the ramifications of good and bad acoustic isolation and how to get it right. If you are dealing with a building from the ground up, be sure to include the majority of necessary isolation in the structural support part of the building. This procedure negates the necessity of building costly additional isolation inside. If you don't have the luxury of building from the ground up, choose your site carefully with your eye always on isolation. The less you need, the more inexpensively you can build. Also, be wary of expensive, so-called "acoustical" finish materials. There are multitudes of inexpensive, quite functional, and attractive materials available to the astute planner.

One final note about our current economic times: Don't overbuild! Build only what you need for your business and your customers. "Keeping up with the Joneses" may satisfy your ego, but do nothing for your wallet.

Courtney Spencer
Vice President, General Manager
Martin Audio Video Corp.
New York, New York

An appropriate and cost efficient studio equipment package must account for actual operational requirements and, in many cases, the marketability of at least the principal items (i.e. console, multi-track, monitors) to the studio's projected clientele. The "name game" is a significant factor for many studios, especially major record-oriented facilities, and in some cases can virtually make or break an operation. Above all, one must take a hard look at what is actually needed, and what your projected income can support.

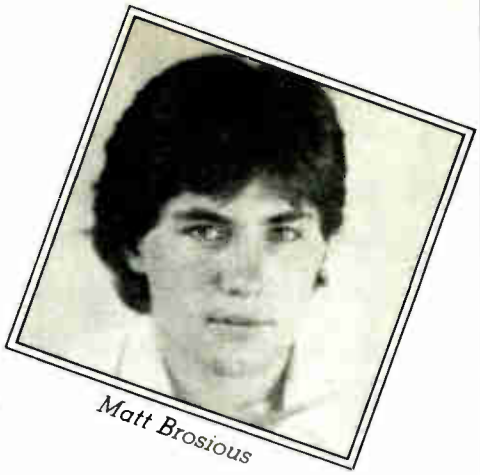
In regard to the actual financial arrangement, the best advice I can give is to retain the services of a good accountant. He can analyze the various options available to you and help you make the right choices. In my experience, at least, the most popular form of capital equipment financing is the so-called "finance lease". In most respects, this is not a true lease, except for the fact that the lease company retains title to the


Courtney Spencer

equipment until all the payments have been made and the nominal purchase option completed. Bank financing is a viable alternative for equipment aquisition and the clear choice for construction and capital improvement.

A "finance lease" and bank financing share common characteristics in that both allow you to take the normal tax investment credit, deduct the interest from your taxes and own the equipment upon completion of payment. A "true" lease can usually be treated as a fully deductible operating expense, but typically involves a purchase option at the end at "fair market value" which may be a substantial figure, given the normally high value of quality used equipment.

The essence of success in financing and building a new studio is careful research and planning, understanding your marketplace, and providing sufficient operating funds to get through the typically lean early months of operation.



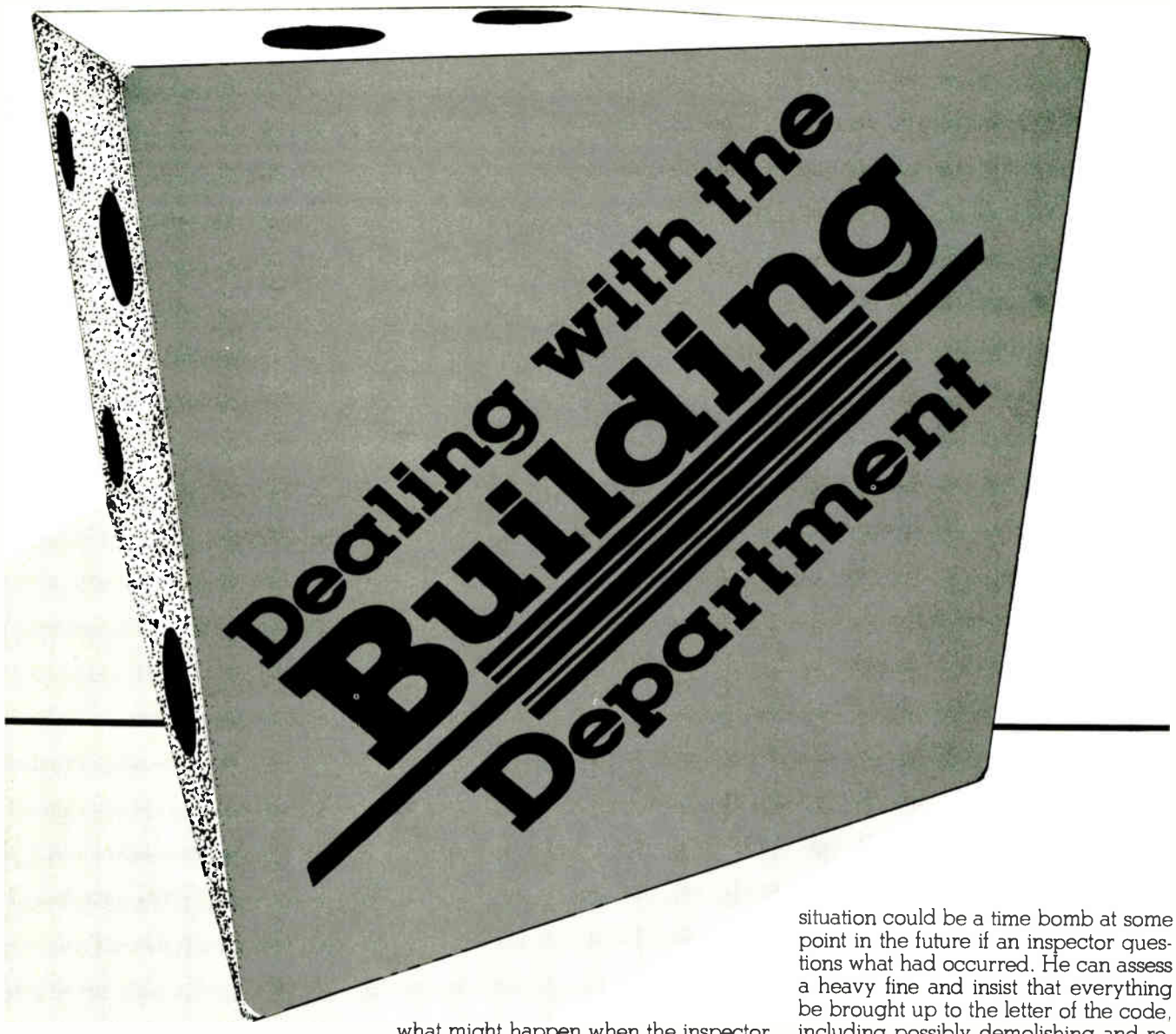
Matt Brosious

Matt Brosious
General Manager
Audiotechniques Equipment Exchange
New York, NY

When I put together an equipment package, I stress the importance of consultation and long range planning. It is always an excellent idea to determine your equipment/construction budgets and what effect these budgets will have on your business, well in advance of any purchases. Purchases must not only be justified—but must be absolutely necessary!

For example, let's say a particular area doesn't have a recording studio with more than 16 tracks. An enterprising studio owner may think, "Hey! If I put in a big-buck 24 track room, everybody in town will record (and mix) at my place, right?" Wrong! In many cases if an area doesn't have a big-buck 24 track studio, it's probably because the business cannot support such an operation. There is an advantage to having the latest, most sophisticated equipment but that advantage can be nearly wiped out by the cash flow strain that purchasing the equipment and financing the purchases causes.

I am not saying that studios shouldn't expand, but suggesting that because of keen competition and the capital intensive nature of the recording studio business, more than usual cleverness is required for any degree of success. Recently I have put together several equipment packages designed around used gear. My clients have realized an initial savings of up to 50%. The equipment I supplied was top quality, well maintained studio gear, that was either being liquidated for financial reasons or being traded-in on the latest model. Used recording equipment offers several other advantages besides low cost, including a well-known track record, parts availability and familiarity among the technical ranks. I also recommend that thorough testing be performed on any piece of used gear you're thinking of buying. It is the only way to be sure of what you're buying. ■



by Scott Putnam and Tom Lubin

When someone decides to build a studio or extensively modify an existing facility, the most formidable part of the construction may not be the design or financing, or dealing with workman. What has been known to strike terror in the hearts, and what is likely to be discussed in low whispers and only behind closed doors...is the building department, and it's on-site inspectors. By their decisions, which may often seem no more than personal whims, months of design planning can become null and void in a fell swoop with that most feared phrase, "This doesn't pass code."

Many a studio owner has spent restless nights filled with bad dreams of what might happen when the inspector shows up. Would there be an unanticipated necessity to hire big saws, jack hammers, cranes, expensive consultants; and what would have to be torn out or re-done? Not only would this cause budget overruns and frayed nerves, but projected completion dates would become meaningless as the building department knows no deadlines.

On the other hand, many studios have done extensive construction projects without a permit out of fear of what acquiescing to the "code" might mean. Not "pulling" a permit, however, can have equally catastrophic consequences. More than once an inspector has appeared at an un-permitted project, having gotten wind somehow that something was going on. With his discovery, owners have faced fines and penalties, as well as the necessity to back-track and obtain a permit before the project could go forward.

Even after the work has been completed, if a permit was not obtained, the situation could be a time bomb at some point in the future if an inspector questions what had occurred. He can assess a heavy fine and insist that everything be brought up to the letter of the code, including possibly demolishing and rebuilding what had been done.

The problem tends to compound itself since once work has been done without a permit, there is quite a lot of hesitation to get a permit for a subsequent project, for fear the previous work will be questioned. Further, work that is done without a permit and proper inspection may make the studio's building insurance policy null and void.

THE BUILDING DEPT... IT'S PURPOSE

The building department and the building code were established to provide minimum standards to safequard life and limb, health, property values, and public welfare by regulating and controlling the design and construction of a building, and the quality of materials that are used.

The code tries to break building requirements into categories such as single family dwellings, commercial, high rise, etc., but in many cases the

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uses merge together. Where a recording studio (or home music room) falls is somewhere between the cracks. Though local codes do vary from city to city (or county to county), they all pretty much follow the National Council of Building Inspector's Uniform Building Code. There are specific code books for building, electrical, plumbing, heating and air conditioning. A copy of the various Uniform Building Code books can be obtained at larger libraries or book stores (but be sure the copy is current since changes in specifications and procedures, locally and nationally, occur yearly.)

Fire codes probably vary the most, and are stricter in many of the larger cities. Probably the most severe restrictions are in Los Angeles and New York, where they also have more stringent electrical specifications.

Other agencies that can affect the speedy construction of a studio might be the zoning department, the health department, the fire inspector, the barrier committee (who deals with the needs of the handicapped,) and the architectural review board (who looks at the aesthetics of a building as it relates to community standards for the area.)

If the building is being built from scratch, there will be additional visits to the city structural engineer, possibly the energy conservation bureau, and, depending on the site, the grading and engineering inspection department. Further, if the studio is being built from the ground up, an entirely different and stricter set of rules will apply. If the studio is being built on a vacant lot there is no way of avoiding these stricter rules, but if there is any kind of an existing building that is going to be demolished, it might be wise to retain as much of the original building as possible so that the studio will be considered a re-do or, if possible, a simple remodel. You may only need to leave one wall standing for the rest of the construction to be considered a re-do, since the rule is broadly interpreted. Usually the preferred wall to leave standing is the one facing the street, since a new wall may need to comply with current easement requirements that call for its placement further back from the street than the original wall's position.

WHO DOES WHAT?

Basically, the building department runs interference for all the other departments, besides evaluating the structural integrity of the construction. If someone there decides you have to go to another department before approval is granted, then that's what you'll do.

The electrical department, besides handling all the power requirements, will also check fire alarm and smoke detector installations on new constructions and re-dos. The heating and air-conditioning department deals with air ducting, the various blowers and heating exchange systems. The plumbing department supervises sewer, gas and water pipes. Sometimes authority overlaps and dual approvals are required. The electrical, plumbing, heating and air-conditioning, and building departments all watch dog the various city, state and federal energy conservation and/anti-pollution codes.

If the requirements don't seem to apply in your particular case, you may go before the committee (somewhat like a court hearing) and possibly get a variance.

ZONING

The building department's zoning laws for recording studios contain many gray areas. If the building is a commercial property, the situation is straight forward. On the other hand, if the studio is going into someone's house (which is frequently the case,) it should be described to the building department as a private listening room that will not be used for "commercial" purposes, or as a workshop—just like a painter, or sculptor.

If the studio is going to be a commercial operation and is being built from scratch, it might be necessary to not only satisfy the zoning requirements, but provide a number of parking spots based on the size and use of the building and it's anticipated occupancy.

If the building does not satisfy zoning, it might be possible to get a variance that would allow the installation, providing specified conditions were met. How hard it is to get a change of zoning depends almost entirely on the location of the property. If the location is not in the correct zone for a studio but borders on an area that is, it is possible the zoning can be changed. In some cases, the neighborhood will have to be polled, and an environmental impact report commissioned that would include everything from surveys on the added auto traffic, to water, sewer, and soil use evaluations. For property along the ocean in California and some other coastal states, a coastal commission will have to pass judgement.

At all costs, avoid problems wherever possible. You may have all the best of intentions and not be able to see how anyone would object to what you want to do, but find there is opposition. If you do challenge your opposition, it is not at all unlikely that they will try wearing you down with a decision on your project taking a year or longer, and costing thousands of dollars in reports and hold-ups in construction. Needless to say, there is no guarantee that the outcome will be in your favor.

Realizing how difficult the environmental road can be, many have been tempted to—and succumbed to ignoring the whole matter with the hope that no one will notice. In many cases no one has, but in more than one situation a studio owner has been confronted and told that the studio must cease operation because it is in violation of zoning and land use requirements.

AND IN CALIFORNIA...

California also has one other collection of rules having to do with earthquake requirements. A new building must meet some rather strict standards regarding the walls and ceiling, but this can be handled fairly straight ahead when building from the ground up. Where a studio is being built in an existing shell, what appears to be a perfect building for a studio might turn into a nightmare and require extensive structural re-enforcement. There is also a building materials inspector who must approve any material or device that has not been previously inspected or approved by the Department of Exotic Materials or custom electrical or mechanical devices can suddenly hold up the entire final inspection of the building, the proper hook-ups and possibly occupancy. And a U.L. approval will not necessarily mean an automatic city approval.

PULLING A PERMIT

The best possible situation is to avoid as many different departments and divisions as you can. Do everything **Over the Counter** and avoid **Plan Check. Over The Counter** means that you take the plans to the various departments and get approval from an inspector at the front desk. If you submit to **Plan Check** it will take at least a couple of weeks, and quite possibly will be much more extensive. Here are some hints on how to do it as painlessly as possible.

1. Keep the drawings simple
2. When talking to the inspector, stay to the point and volunteer nothing.
3. If there is a detail missing that he wants to see, sketch it on the drawings you have and get him to approve the sketch. If you draw incorrectly he will correct it.
4. If you do any work on bathrooms, or change the basic use of the building, the various handicapped codes will come into effect, and ramps and elevators may be required.

DRAWINGS

Most inspectors, if they are presented with a roll of drawings with hundreds of intricate details, will glance at them and say, "This will have to go through plan check."

The style of the plans should be drawn simply, for getting through the various building departments as painlessly as possible. The drawings should show all the dimensions, and the general placement, rafter and header details and such. A good floor plan with structural details is much more likely to get over-the-counter approval.

Remember that the Building Department's main concern is safety, and each type of building has codes that are appropriate. If you have a set of drawings prepared by a studio designer, a good percentage of the detail sheets have little to do with the structural integrity of the construction. It's best to leave all these details in the truck, and not confuse the issue.

When going back to the counter for approval, it is usually best to go back to the same inspector, who is familiar with what you are doing and has already approved what you've done so far.

Most of the time, the building department and the inspector won't care that the drawings are identical to the physical reality as long as the work is done correctly.

When there is a questionable structural detail, it is good insurance to have a structural engineer review the question.

When talking to the inspector, play down the drawings. For example, instead of calling them "double walls," refer to them as "non-load bearing" partitions.

WHAT DO THEY WANT

The building department wants to see a floor plan, some elevations, and basic structural details. All of the materials and measurements should be called out so the inspector doesn't have trouble reading how the walls and ceilings are being held up, and what sort of footings are necessary under the floor, posts or walls. They're generally not too interested in the acoustic design and construction of the interior.

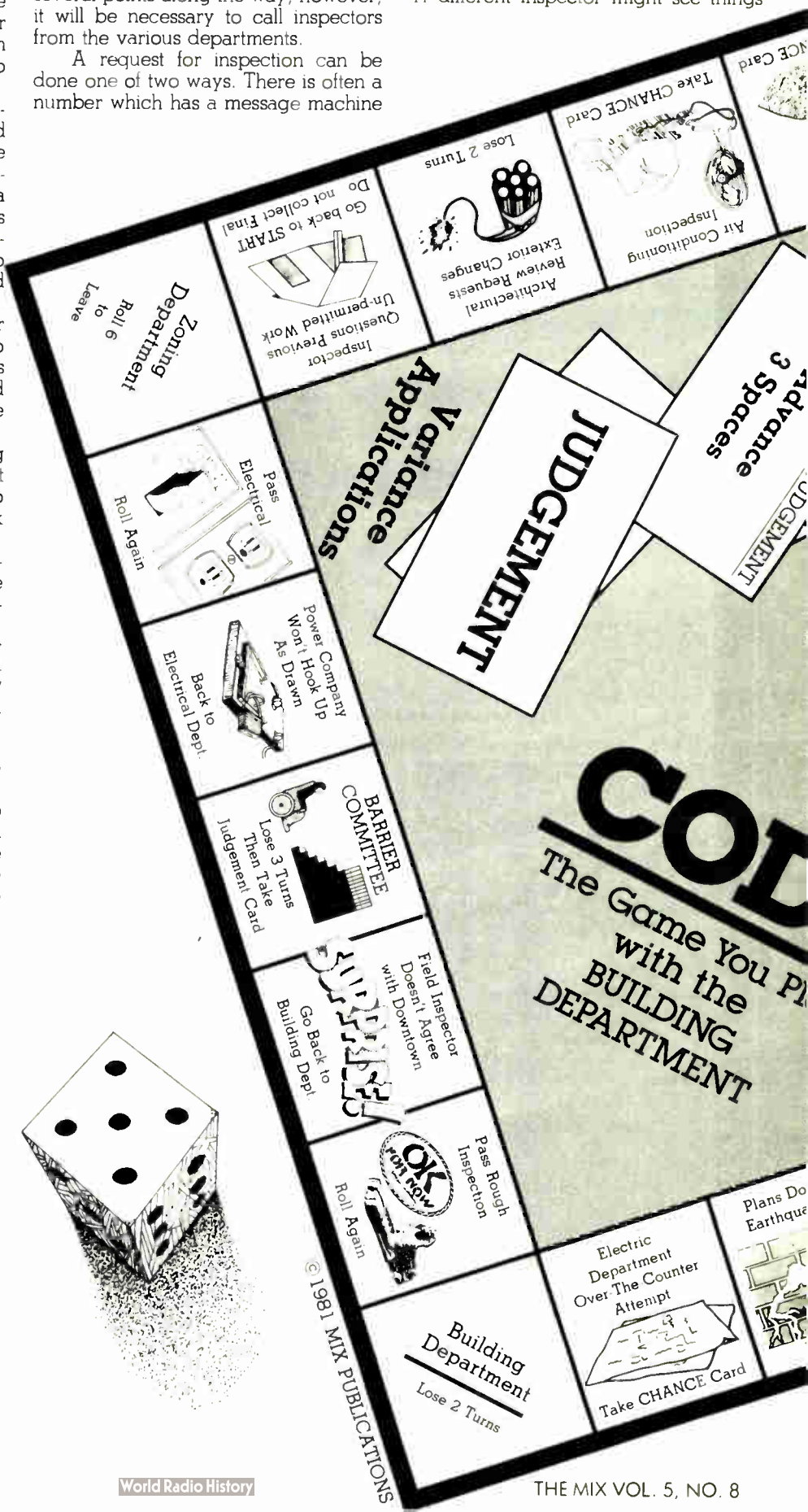
The electrical department wants to have a simple floor plan layout of where the distribution box, receptacles, and switches will go. They also want to know the number of breakers that will be used and where they will go electrically and physically, and the gauge of all the wiring. They also want a load schedule that shows the maximum amount of steady state as well as surge current that each breaker is going to handle and the total amount of power for the entire system.

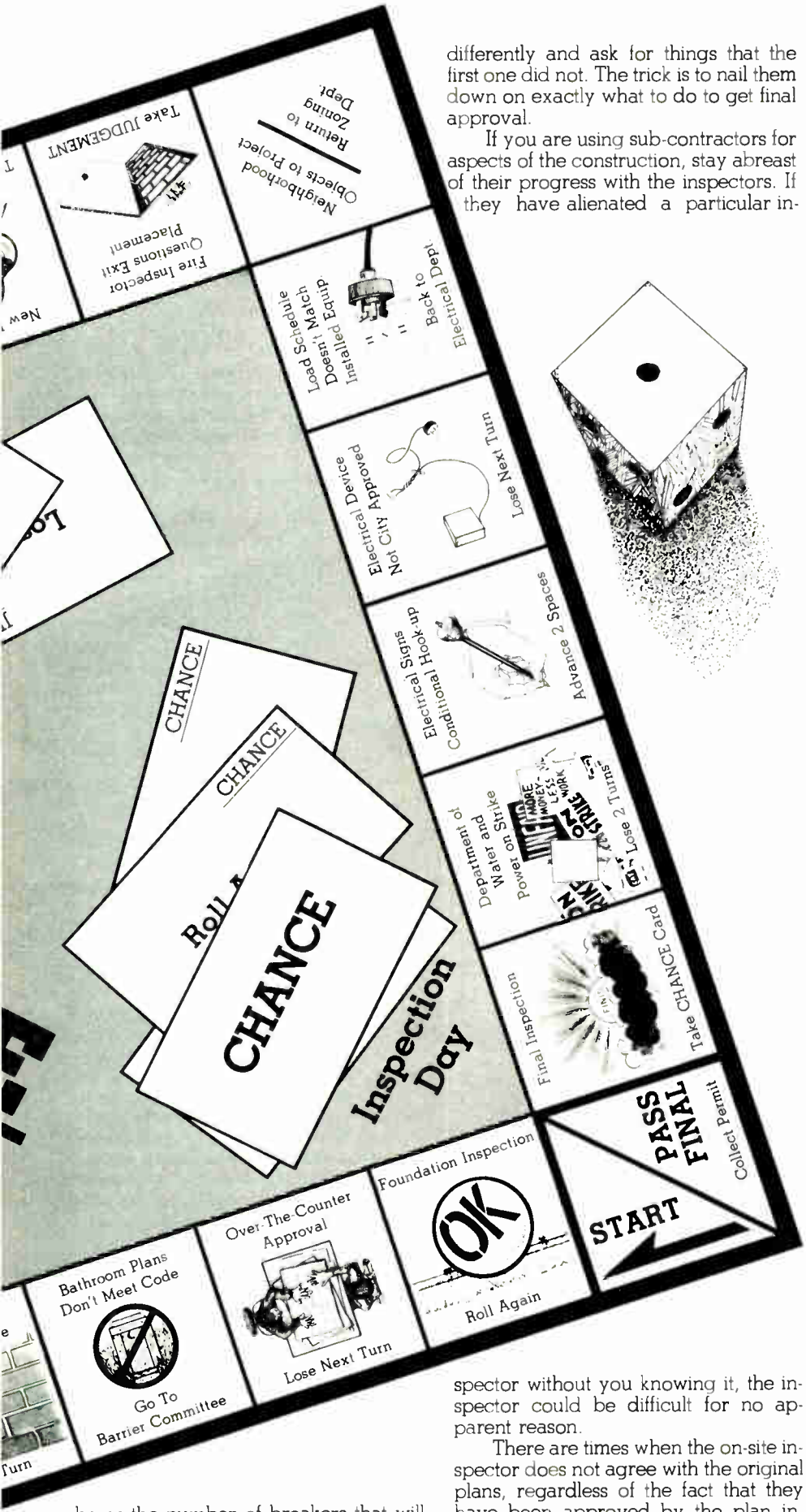
The air and heating department will require similar information, including the efficiency specifications and air volume figures for the studio's duct work, compressors, heaters and blowers.

ON SITE INSPECTION

Once the plans have been approved, construction can begin. At several points along the way, however, it will be necessary to call inspectors from the various departments.

A request for inspection can be done one of two ways. There is often a number which has a message machine so that builders can request a particular inspection for the next day. What is preferable is to directly call the inspector who has previously been to the site. A different inspector might see things





know the number of breakers that will be used and where they will go electrically and physically, and the gauge of all the wiring. They also want a load

differently and ask for things that the first one did not. The trick is to nail them down on exactly what to do to get final approval.

If you are using sub-contractors for aspects of the construction, stay abreast of their progress with the inspectors. If they have alienated a particular inspector without you knowing it, the inspector could be difficult for no apparent reason.

There are times when the on-site inspector does not agree with the original plans, regardless of the fact that they have been approved by the plan inspector. It's hard to say what exactly to do in such a case. You could go back to the original plans inspector and explain the problem and see if the field inspector and he could get together.

TIMING

The sequence of inspections is as follows: If the design calls for any foundation work or concrete walls (block or poured,) the inspector has to approve the steel re-enforcement and the forms before the concrete is poured. The next inspection comes after the framing is completed and before the sheet rock goes up. Both the electrical and the building inspectors are called in at that time; the electrical, for a rough inspection of the wiring and conduit size and installation. Once the sheet rock is in place they are not able to inspect the inside of the walls.

Depending on the design, it might also be necessary to call in the air conditioning inspector so that any of the ducting that will be concealed in the walls can be approved. He'll be checking for proper supports, and duct size.

All of the inspectors will return for a final inspection, and possibly one time between the first and the last. If they point out problems that need changing, the number of times they visit will increase. It might also be necessary to have a few extra inspections if the sequence of construction requires it. What is important is that all of the work that will eventually be buried in concrete, behind walls or in ceilings, is checked before it is enclosed.

When the inspector shows up and takes a look at what he's supposed to see, he'll leave a pink slip which indicates his decisions. If it is not approved, there will be a note as to what is still required.

OTHER BLESSINGS

Often the building department's approval of the electrical and gas hook up is conditional on the approval of the gas and/or electrical company. The meter has to be placed where they can get to it easily, and they have to approve the point where you want to make your hook-up. It might be convenient for the bulding but not convenient for the power company, in which case it has to be moved. When additional power is being installed, the new service is not granted until both the city and the department of power inspectors have approved the system. They will also ask for all of the Load schedule information.

A significant problem can also arise if the city has not given final approval but you need to get the new gas or electrical service connected. If the city has not signed off completely, it is difficult to get the service companies to make the hook up, even though the hold up on the final approval may be over something that has nothing to do with

the integrity of the system. In the mean time, you're jumping power from the old service to the new one, and chances are the existing service isn't quite adequate, nor is the inter-connection all that secure. Sometimes under these conditions you can call the city inspector, and if he agrees that hooking up the power or gas would not cause an unsafe condition, he can authorize the power and gas company to install the service.

THE BIG RED TRUCK

Because of the amount of sheet rock that is commonly used in studio construction, it is pretty easy to meet structural fire codes as long as the building has been designed with proper exits.

The interior materials are another story and to avoid taking down or spraying the cloth and wood with fire retardant at some future date it is suggested that before they are installed they be made fire proof.

COSTS OF PERMITS

Separate permit fees will be necessary for each of the different departments and, if the various aspects of the construction are being done by different sub-contractors, each will take out their own permit. If the work being done is not part of the original permit, the inspector will require you to take out a supplementary permit to cover the additional work.

A different contractor's license is needed for each of the permits. For example, a general building contractor might not have a heating and air conditioning, or electrical contractor's license. It is almost essential that the permit be pulled by a licensed contractor. If you are doing much or all of the work yourself, try to find a contractor who, for a fee, will supervise the work that is done.

The building department wants to be assured that the work is being done by someone who is qualified to do it. If there is a construction failure, they want to be able to have someone they can hold responsible. The building department also wants to be assured that any worker on the job will be covered by some form of workman's compensation.

The cost of the permits is figured differently depending on whether the project is considered a commercial project or a home addition, and what type of a permit it is on.

For a commercial building permit, the fee is based on the estimated cost of construction. As long as you're reasonable, they'll go along with it. Generally, what you think is a low estimate for studio construction is average-to-high compared to normal frame construction, so fairly low in regard to a studio will usually suffice.

For a homeowner, a room addition is calculated on the square footage.

The cost of the electrical permit is based on the number of receptacles and hook-ups.

The air conditioning and heating is also based on the extent of the construction.

THE FINAL

On completion of the various aspects of the project, each of the different inspectors will come in and write off the permits. The last inspection, the final Final is done by the building inspector after all the work is done. Frequently the finals happen some time after the studio is in operation. Usually there will be some small detail to hang-up the sign-off, such as a timer for the air conditioner, a lighted exit sign, etc. It's best to get these details cleaned up as soon as possible because inspectors have been known to go through their files and check up on those projects that were never finaled. If they show up and find a great deal more un-permitted construction you could have real trouble.

There are times when it might be preferable to hold off on the final Final inspection for as long as possbile, since on completion the tax assessor will be informed of the improvements and it is likely the taxes for the building will go up. Something like this might be all right for a little while, but to avoid unannounced inspections, it's best to get the project completely signed off.

Further, if the previous owner had done this very thing you could be in for quite a surprise. One day an inspector might show up wondering about a permit for something that you know nothing about. Hopefully the construction that they're asking about isn't buried behind the wall that you've built. Always check if there are any outstanding permits on the building before you begin your construction, and get them cleared up so you can start with a clean slate.

AND FINALLY...

And then the day comes when that last inspector says everything looks alright and signs off the permit. Finally, more important matters will prevail, such as getting the first paid bookings, and making the mortgage and lease payments on a facility that was to be opened months before.

One thing is sure. As you say thanks to the last inspector and goodbye to the bureaucracy, the tenacity and true grit you have exhibited by going through the rules and regulations will have put you in good stead for surviving as a recording studio entrepreneur. ■

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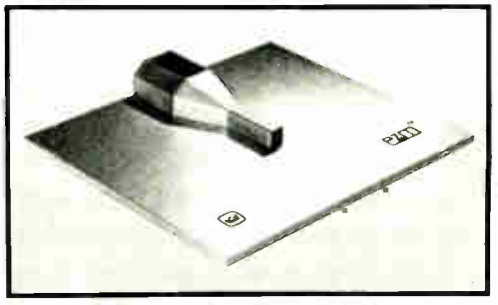

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ACOUSTICAL CONSIDERATIONS FOR MULTI-TRACK

by Francis Milano

The last ten years have seen great growth in acoustic design, especially since the advent of the multi-track analogue tape recorder. The methods for working with multi-track were fundamentally different from those employed with simpler, earlier machines. During the time of those earlier machines, the acoustics of recording studios represented the extensions of a basic application of Sabine's formulae and other's extensions of his work. The problem was that Sabine's ideas reflected the realities of the acoustics in concert halls and did not take into account the problems of closed studio recording. The flexibility to record in fragments, brought about by analogue multi-track recorders, completely changed the thinking of recording engineers. The transition occured not suddenly, but slowly—by empirical discovery. And acoustic designers followed slowly behind.

We can state now that so called acoustic design for studios is less a true scientifically derived standard than it is an accident of the somewhat haphazard evolution of the recording industry.

There is in fact no single basic standard of acoustic design. Current design techniques are not so much empirical in terms of calculation and measurement, but in their overall aims—and tend to follow an individual designer's interpretation of psychoacoustics.

From my background as a musician and classical organ manufacturer; and from my extensive experience in acoustics, which includes the design of more than 24 studios, control rooms and cutting rooms, I have followed the evolution of American studios as they developed in the early 70's on the west coast.

ZONING

The state of the art is now regarded as different zoning. Each zone has sound pressure level that must be isolated for the microphones, but must allow musicians free communication. Each zone should be designed to enhance the timbre of each instrument or group of instruments. Many studios I have seen have been typically adorned with a rich profusion of finishing materials which tend to make the studios look more like a cozy bourgeois parlor of a French bank president, satisfying aesthetics at the expense of acoustics.

But what, in fact, is the reality? Far too many important acoustic parameters are swept under the rug— such as noise floor, coincidence resonance frequency and parasitic aborption due to light construction, especially when large amounts of low frequency energy are present. Other important factors involve air conditioning noise, air flow movement at infrasonic frequencies creating intermodulation across static mike capsules, and inaccurate trapping due to the casual duplication of sub standard trap designs (including the failure to tune the trap once it is in place.)

To deal with these problems and to anticipate the arrival of the age of digital multi-track recording, we must improve the dynamic range of each area dedicated to each specific instrument, and to reject the maximum amount of parasitic resonance between zones. This is easy when you understand the relationship between the directional characteristics of a given instrument and the reflective properties of various finishing materials.

In the studio, who are we accommodating: the microphone, the sound engineer, or the musicians? It is assumed that since musicians wear a headset most of the time they are immune to the surrounding acoustics. But when musicians attempt to get their own personal 'sound' they are working in a direct field. If the acoustics are right this will have a strong influence on the final result. This psychoacoustic ***mise en condition*** is imperative if the musicians are to give their best.

The other area of concern is the control room, or "reference room", the nerve center of the studio. All work done, in or out, must transit through it. Unfortunately, control room designers are usually far too concerned with technical details and insufficiently aware of psychoacoustic problems. The first of these problems is the non-linearity of the ear/ brain interface at different sound pressure levels. The second is masking effect—where the harmonics of one instrument are cancelled out by fundamentals of another when those fundamentals are higher frequency and greater amplitude. The third problem occurs with high-level listening, as fatigue and the self limiting properties of hearing tend to obscure gain variations and mask high frequency distortion. The fourth problem is the tendency of the ear/brain to synthesize frequencies from "memory" even when they are missing from reality, often creating problems that may not be noticed until the final mix-down. The final problem is the "symmetry effect" where phantom sounds created within the acoustics of the studio confuse the engineer. All these parameters must be taken into account if the sound in the control room is to be as neutral as possible. The more natural the sound is there, the fewer problems there will be later. In order to satisfy these basic psychoacoustic needs, the control room must be a primary square or rectangle with inactive walls. Internally, the room must be shaped as a distorted polygon, the shape depending on the placement of the traps. The room must be quartered and the traps placed symmetrically, and the same for the finishing materials.

TOMMOROW

As we advance into the 80's, studios will become more and more specialized. One type may concentrate on audio research and sound effects, both analogue and digital. Others may be heavily involved with video and cinema, as the sound tracks of both become more and more elaborate, and will be required to produce sound equal to that of the pure audio studios. For the designer, it will mean new zoning techniques, monitoring in stereo with mono center and far greater complexity in general.

Acoustics, as it is a human related environmental technology, will always change. As our perception develops, our taste evolves. Acousticians will have to keep pace with the incredible growth of technology. At this moment the quality of equipment used in the average studio outstrips the quality of its acoustic design. If we are to catch up with the present and equal the future it will require a real *tour de force.* ■

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Selecting Building

by Steve Fouce and Carl Yanchar

Advanced recording techniques and technology, as well as the recent emphasis on economy, demand obtaining the maximum results for the least cost. Studio construction is no exception. Brute force and shotgun approaches no longer can be used. But with careful design and planning, basic construction materials can provide per-

TABLE 1—Wall Constructions

STC	Construction	Avg. Cost/SF
32	2x4, 16" O.C., ½" sheet rock both sides	$2.20
34	2x4, 16" O.C., 5/8" sheet rock both sides	2.53
38	4" non-reinforced concrete block	3.30
39	2x4, 16" O.C., ½" sheet rock, 2 layers both sides	3.08
41	4" concrete	3.03
41	2x4, 16" O.C., 5/8" sheet rock, 2 layers both sides	3.52
43	6" non-reinforced concrete block	3.80
43	2x4, O.C., staggered on 2x6 plate, 5/8" sheet rock, 1 layer both sides with 3½" fiberglass insulation (**Fig. 1**)	3.85
44	2x4, 16" O.C., ½" sheet rock, 1 layer nailed 1 side, 1 layer on resilient channel second side (**Fig. 2**)	2.97
45	4" concrete block, 1x2 furring with 1"fiberglass in cavity, 1 lb. sheet lead, ¼" plywood (**Fig. 3**)	6.10
46	6" concrete	3.44
46	2x4, 16" O.C., 5/8" sheet rock over ½" sound board both sides (**Fig. 4**)	3.63
46	2x4, 24" O.C., ½" sheet rock on ½" sound board both sides	2.82
47	2x4, 16" O.C., on staggered 2x6 plate, 5/8" sheet rock, 2 layers both sides	4.18
47	2x4, 16" O.C., staggered on 2x6 plate, ½" sheet rock on ½" sound board both sides	3.02
48	8" non-reinforced concrete block	3.95
48	2x4, 16" O.C., 5/8" sheet rock, 2 layers one side, 1 layer on resilient channel second side	3.41
49	2x4, 24" O.C., ½" sheet rock on ½" sound board both sides	3.00
49	4" concrete block, 2x2 furring with 1 lb. sheet lead, ¼" plywood	6.20
50	2x4, 24" O.C., staggered on 2x6 plate, ½" sheet rock on ½" sound board both sides	2.94
50	2x4, 16" O.C., 5/8" sheet rock one side, 5/8" sheet rock on resilient channel on second side, 3½" fiberglass in cavity	3.30
51	2x4, 16" O.C., ½" sheet rock on ½" sound board on ½" sheet rock both sides, 3½" fiberglass in cavity	3.74
51	8" concrete	3.85
53	12" non-reinforced concrete block	4.54
56	12" concrete	4.66
57	2x4, 24" O.C., 2 walls with 1" airspace, 2 layers of ½" sheet rock one side, 1 layer of ½" sheet rock on second side	5.56

Note: Dollar figures have been used for ease of comparison. Actual costs may vary due to local conditions.

Materials

formance which parallels the electronic state of the art.

Before considering the actual materials, there are several related factors which significantly affect the overall cost of construction. The first is the acoustic specifications. If you contemplate digital recording, testing the limits of the signal to noise ratio the various systems offer, then the isolation system of your studio must be commensurate. The most obvious solution is **mass**—a brute force technique. However, carefully determining your isolation requirements and investigating the various methods to attain the desired results can be one of the most significant factors in reducing overall construction cost. However, a word of caution. It will cost much more to add isolation at a later date if what is built is insufficient. Reconstruction will mean that all of the finish details and even some of the isolation walls may have to be rebuilt.

The selection of a site is the initial step in defining the isolation requirements. Obviously, locating a studio in

TABLE 2
Modifications to Basic Wall Construction

Mod	STC improvment	Avg. Cost/SF
Fill cavity of concrete blocks	+3	1.04
½" plaster over concrete block		
1 side	+2	.89
2 sides	+4	1.98
½" gypsum board on concrete block		
1 side	+7	.66
2 sides	+10	1.38
½" gypsum board on 1x2 furring on concrete block		
1 side	+12	.70
2 sides	+15	1.40
Fiberglass insulation in wood wall cavity		
3½"	+2 to + 5	.60
6"	+4 to +10	.90
9"	+6 to +15	1.26

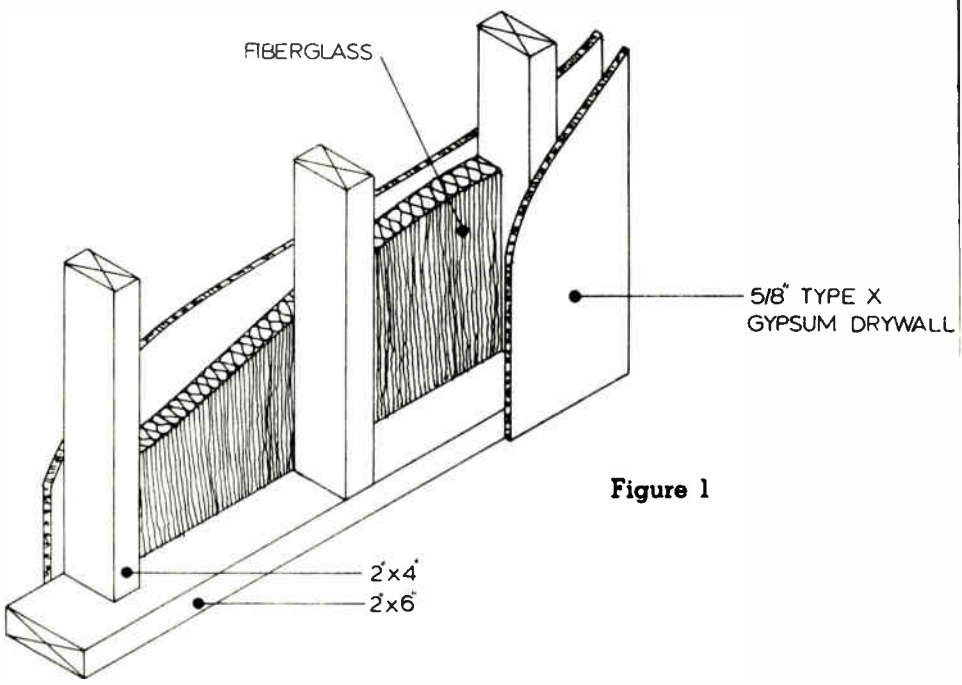


Figure 1

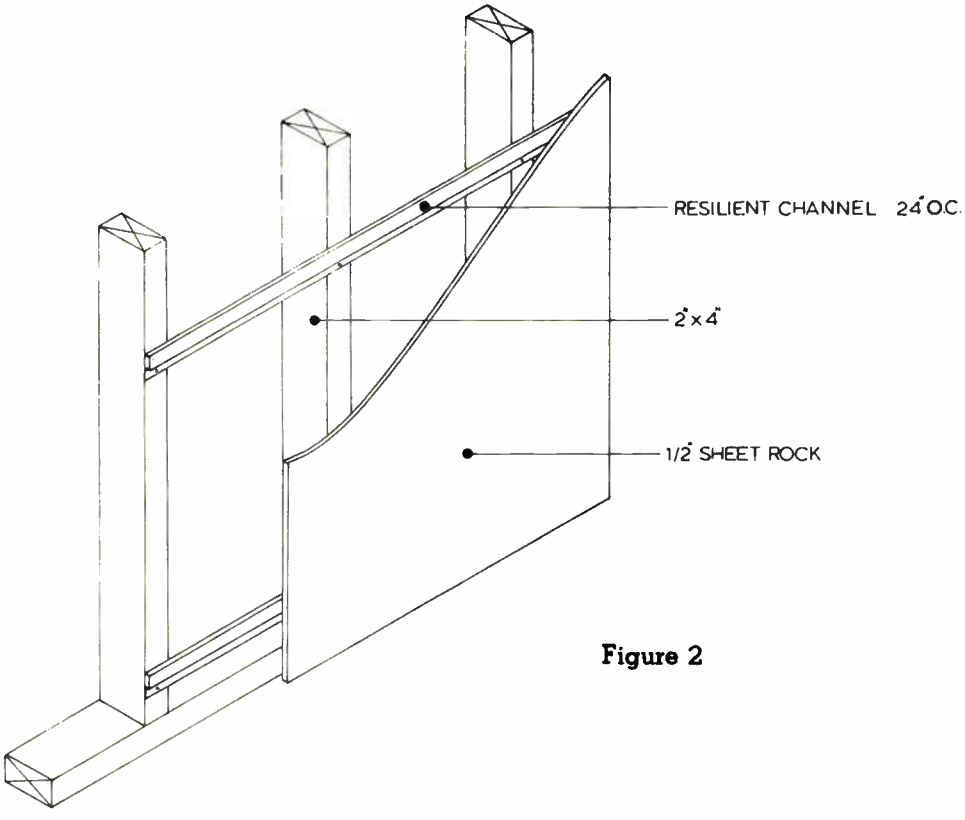


Figure 2

the country far away from trucks, trains, boats and airplanes will substantially reduce isolation requirements, for today. But things change. Be informed about the future development plans for the area. If you are less fortunate and have to locate in the city, the same cautions apply.

If constructing from the ground up, you have the opportunity to optimize the total building design to suit your needs. In an existing building, its present construction will dictate the additional amount of isolation necessary. A wood frame building, for example, will have less intrinsic isolation than a structure of concrete block.

Once the site is selected and the specifications are finalized, the actual design will determine the cost of both material and labor. A good design will attain the desired results at a sensible cost. A consultant experienced in studio design and construction will normally save his fee many times over by the time the project has reached its conclusion.

There are many types of construction that minimize the materials used, but require special techniques of installation and need more labor than alternative methods which obtain the same results. Many textbook wall constructions for a specific STC (sound transmission class) are degraded by 5dB or more in practice due to the realities of actual construction.

Even some of the best carpenters do not realize the importance of sealing all cracks and overlapping joints.

The materials used in studio construction can be divided into two basic categories: the isolation system, which provides the specific transmission loss; and the finish materials, which determine the reverberation times, diffusion characteristics and aesthetics of the studio. The effectiveness of the isolation system can be quantified by its STC, which is a single number representing the weighted sound transmission loss at several different frequencies. **Table 1** shows some of the most common isolation wall constructions used in studios along with their estimated STC and installed cost per square foot.

Although there is a vague overall trend to increasing cost with increasing STC, some very definite observations can be made. Construction using sound board (also known as sound deadening board) are particularly effective as well as easy to build. The use of resilient channels also affords better than average performance.

Table 2 shows some modifications to the basic constructions and their effect both on STC and cost. Some very simple and relatively inexpensive additions can increase STC impressively. The importance of filling a wood wall with fiberglass is perhaps the most apparent. The STC improvement in this case is derived chiefly by reducing resonances within the cavity.

One important point should be made about the use of STC figures. Although they allow easy comparison of alternatives, the transmission loss of constructions with the same STC can vary considerably at the same frequency. In situations with severe external noise conditions, especially at low frequencies, professional advice will prevent costly miscalculations.

With labor costs lower than the construction industry averages used in compiling the cost figures, significant savings can be gained as long as workmanship does not suffer. Concrete block and solid concrete construction, for example, will always require skilled labor.

The finish materials are the other primary material cost factor. Here costs do not correlate at all with the acoustic results obtained. Decisions affecting the cost of finish materials are more a matter of taste and budget than acoustic performance. The carpet you choose can cost from under $10 a square yard to over $50 a square yard. Marble can run from about $4.50 to over $45 a square foot for the material alone. Hardwood, drapes, and fabrics will also vary greatly in cost for non-acoustic reasons. One of the keys to selecting finish materials that are economical is to find products that meet the requirements of acoustic considerations and aesthetics at the lowest cost over their useful life. Carpets and other areas subject to heavy wear will more than likely have to be replaced in a few years no matter how expensive they are.

Surfaces which can be changed from reflective to absorptive can cost more than double since effectively you are covering them twice. But the added versatility is very desirable.

One final caveat. A studio requires far more attention to detail than normal construction. A bid could easily be doubled if a contractor is not clear on what is expected from him. Select your contractors carefully and give them all the information you can. Only then will there be no surprises for anyone. It only costs you in the end, either by additional costs or corners cut. ■

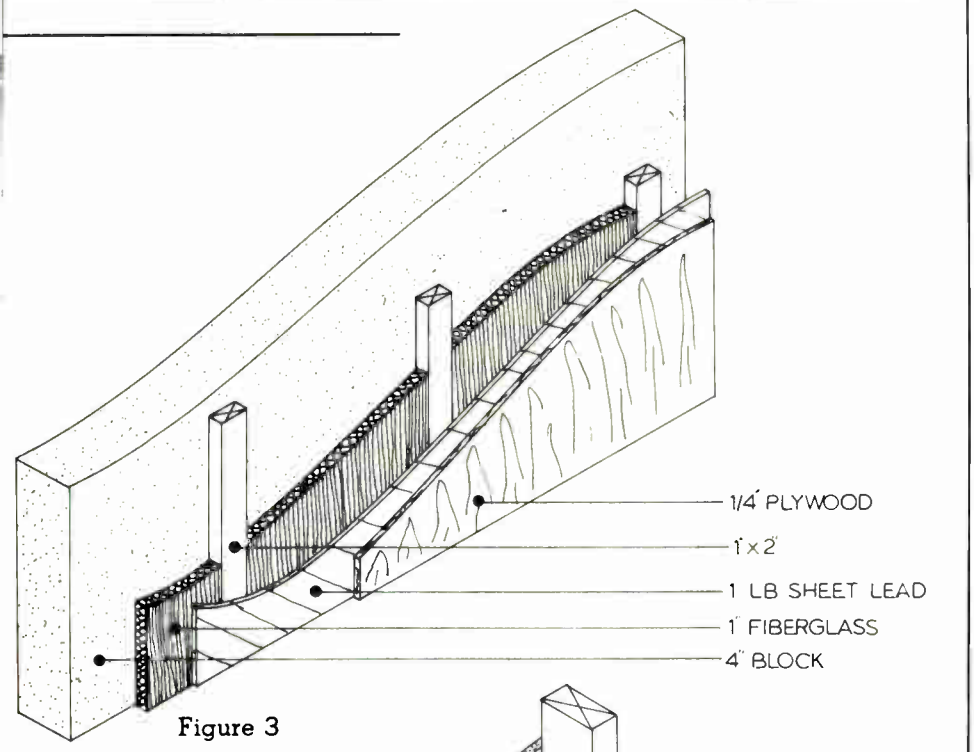


Figure 3

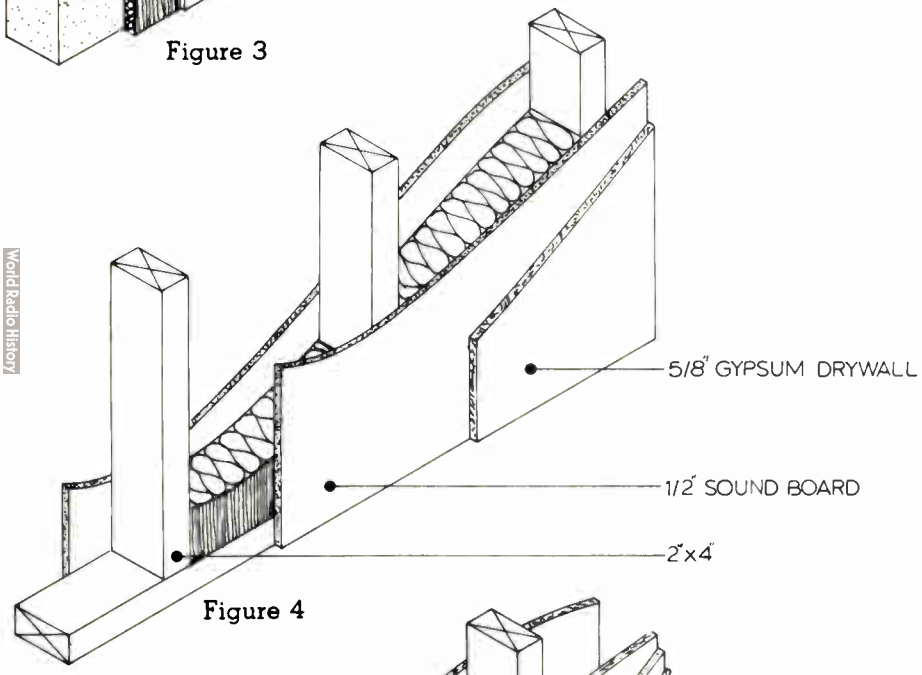


Figure 4

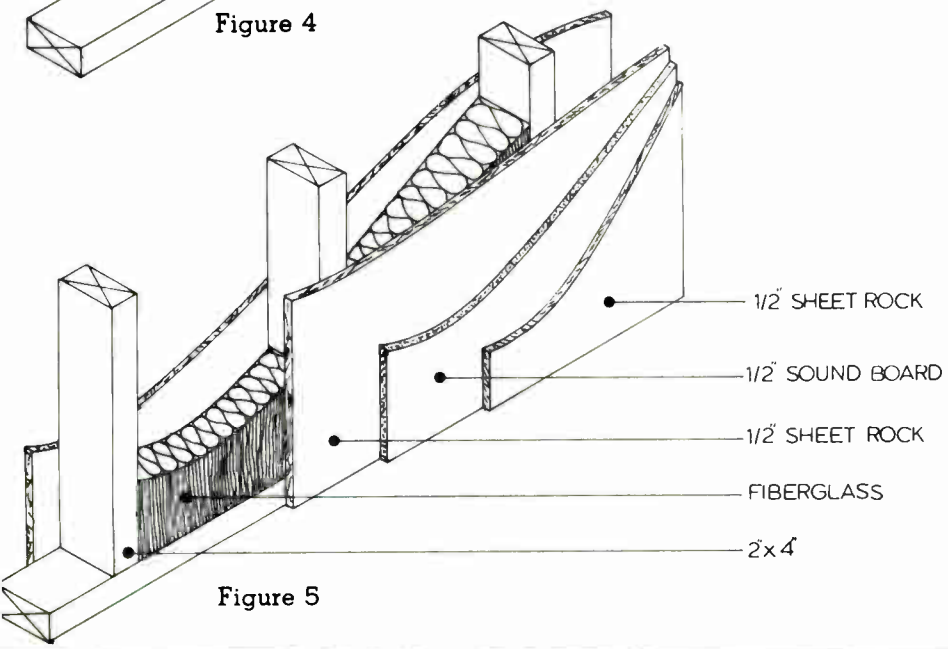


Figure 5

THE MONITOR FIELD

by Edward M. Long

The idea of being cost effective about anything implies that we already know what it is that we are trying to do, but it might be a good idea to define our goal anyway. The word monitor is derived from the latin word "moneo": to warn or advise. When we monitor something we need something that will warn us when things are not as they should be. A monitor loudspeaker should allow us to hear exactly what is happening; it should never cover up or make things sound better than they really are. If the source being monitored is unpleasant, if it has distortions, extraneous noise, or defects of any kind, these should be heard. In this way, the monitor is doing its job properly. It is warning us, as it should, so that we may take corrective action. As professionals involved in making original recordings or broadcasts, we are in a position to see that the final audio product, be it disk, tape or broadcast, is as good as we can make it.

A consumer doesn't have this same ability to take corrective action. A consumer type loudspeaker doesn't necessarily have to be accurate in the same sense as a professional monitor and most of the commercially successful ones have not been. They are designed to reproduce a wide range of program material, both good and bad, with subjectively pleasing results. One of the most difficult problems a professional has when selecting a monitor loudspeaker, is separating the professionally oriented desire for accuracy from the consumer oriented desire for a pleasant sound.

There is one more problem to be faced before we can even select a professional monitor. The effect of the environment upon the total sound, in most cases, is a major factor. It is not only important in the results achieved in the final monitoring situation, but it can be a major factor in the choice of a monitor before you purchase it. Another factor to be considered when selecting a monitor is to make certain that the absolute polarity of the program material is correct and that it is the same for each of the loudspeakers which you are auditioning. If you are able to hear through the "noise" of the environment, the program material and even the sales presentation, you have a better chance of selecting a truly accurate monitor. Of course, this isn't easy but it can be done. Once the monitor is in the final monitoring environment, there are things which can be done to reduce the effect of this environment upon the perceived sound. It should be understood that, just as we don't want the monitor enhancing or masking the sound, we don't want the environment doing this either. The environment should be neutralized as much as possible so that the sound from the monitors represents the sound of the program only. Perhaps the first stage of any cost effective approach to monitoring is represented by the choice of an accurate monitor loudspeaker and a neutral environment, since many hours can be wasted trying to "fix" things that aren't even in the program material.

One way to achieve cost effective monitoring is to monitor in the near field of the loudspeaker. Of course, the loudspeaker must be designed to allow this. It must produce a coherent plane wave radiation as close to the baffle as possible. As one of the first proponents of this technique, I designed a monitor specifically intended for NEAR-FIELD-MONITORING™. The MDM-4 Mix-Down-Monitor has been available publically since 1975 and a little longer privately. These monitors are usually placed about 3 feet apart and 3 feet from the listener. The MDM-4 is 19"x13"x9¾", weighs 25 lbs., and costs $680 per pair. Figure 1. shows the MDM-4 in a typical arrangement on a recording console. Since the sound reflected from the console can cause an effect upon the sound, mainly in the bass range, the MDM-4 was designed so the listener can momentarily move right up to within 6 or 8 inches from the center of one monitor to check the balance of the sound in this range. NEAR-FIELD-MONITORING™ also achieves a higher sound pressure level (SPL) at the listener's ears for a given acoustic power from the loudspeaker. This means that the cost of a monitor designed to be used in the near field for the same acoustical output. Another advantage of monitoring in the near field of the loudspeaker is the fact that the sound reflecting and absorbing surfaces of the environment have less effect upon the perceived sound than they do upon the sound of monitors placed in the far field. This also means that the expense of adjusting and treating walls, ceiling and other reflecting surfaces can be minimized.

Of course, most control rooms also usually allow for far field playback of program material as well, so such treat-

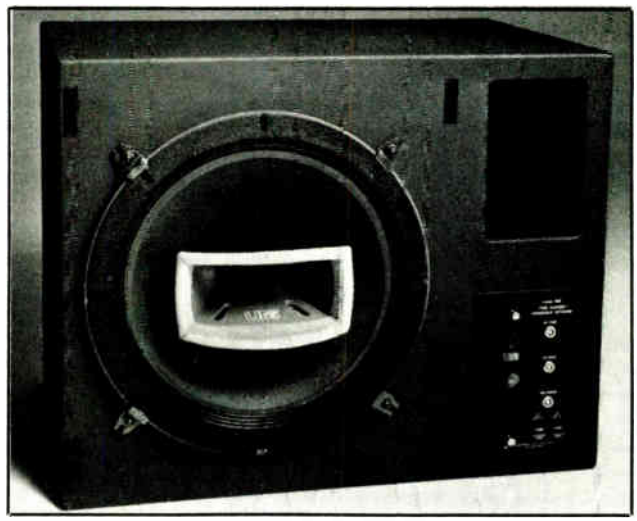
MDM-4 Near Field Monitors.

ment measures are usually necessary and desirable in most cases, but this playback is usually not as important as the monitoring done while the original program is being recorded or broadcast. The MDM-4 was designed originally to allow a uniform method of monitoring in a wide variety of environments, some of which were truly atrocious. One of the most widely used applications of the MDM-4 has been its use by producers and free-lance engineers who use it in a number of different studios to achieve a consistant result.

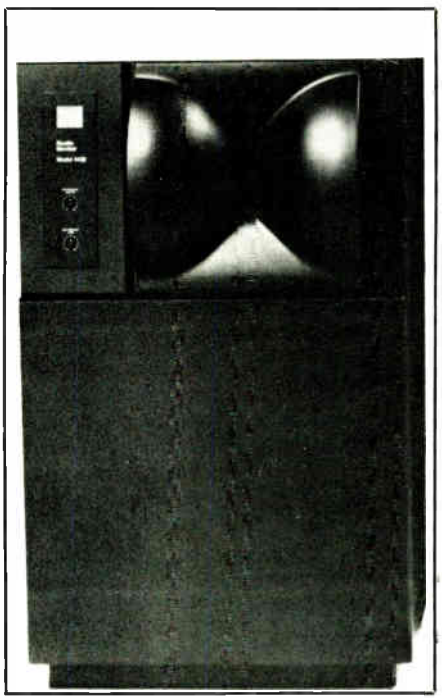
For playback of program material, it is usually desirable to have monitors in the far field. This allows more people to hear the results simultaneously. Since acoustical reflecting will play a signficant role in the perceived sound, treatment of the reflecting surfaces is worthwhile. There is a way to minimize these effects before treating the surfaces of the environment. If the monitor is designed so that the direct sound reaching the listener is coherent, and lacking time smear, two things are achieved. The articulation, clarity as well as the sound localization are improved. The time smear in the reflections is also reduced. When the direct sound and the reflections are coherent, the listener's ability to hear detail is improved. Even when the environment has highly reflective surfaces, the ability to hear more accurately with less strain means that more effective results can be achieved in less time. It allows a person to work for longer periods with less strain and therefore means that less mistakes will be made. Certainly, this qualifies as cost effectiveness.

In the past few years, the time smear in monitors has been reduced considerably. The TIME—ALIGN® monitors introduced by UREI beginning in 1977 have set the pace. There are now 3 TIME-ALIGN® models available. The UREI 828, which is the smallest, is shown in Figure 2. It measures roughly 21"x26½"x19", weighs 110 lbs and costs $2552 per pair. The 828 has a sensitivity of 87dB/volt/meter, which is quite high.

Tannoy is another company which has been working to produce monitors with reduced time offset between the bass and treble. They have an interesting electronic crossover which features a time delay to correct for the usual time offset. I haven't tried this unit yet, but I hope to do so soon. Producing high SPL with good articulation and clarity is the forte of Meyer Sound Labs. John Meyer was an early proponent of loudspeaker design with low group delay or time smear. His monitors are not inexpensive but they can certainly be considered cost effective. A state-of-the-art application which demonstrates the amazing clarity and realism of John's designs when producing high sound levels is the Meyer Sound Labs system in the Oakland Coliseum. Another system which shows great promise was recently introduced by JBL at the 1981 A.E.S. Convention in Los Angeles. The design of the JBL Model 4430 indicates that attention was paid to the blending of the bass and treble sections in both the amplitude and time domains. The JBL 4430, shown in Figure 3, is about 35¾"x22"x19", weighs 35 lbs., and costs $980 per pair. It has a sensitivity of 82dB/volt/meter. It is a compact full range system which is only 3dB down at 42 Hz when mounted against or flushed into a wall.



UREI's 828 TIME-ALIGN™ Monitor.



JBL's 4430 Studio Monitor.

When considering acoustical treatment in a monitoring environment, treating the surfaces closest to the monitors first is the most cost effective. Absorbing the strongest first order reflections does the most to clean up the time smear, since later reflections contribute less to obscuring detail. Simple absorbing panels can be constructed using light frames, R-703 material, and a cloth covering. Placing these panels on reflecting surfaces near the monitors, can clean up a lot of problems in a hurry. They can be put in place and removed easily for clients who are not ready for articulate sound without time smear. This can also be very cost effective.

• • •

To recap, my recommendations for cost effective monitoring are: (1) Monitor in the near field whenever possible; (2) Select monitors with the least amount of time smear; (3) Monitor at moderate levels between 70 to 85 dB SPL; (4) Use acoustical absorbing materials on the reflecting surfaces nearest the monitors first. If you can do all of the above, you will find that your results can be excellent, consistant, and certainly provide the best use for that rare commodity—money. ■

Designing for a QUIET Control Room

by Chips Davis and Ed Bannon

The successful design of any recording studio depends to a great extent on the ability of the designer to measure, analyze, predict and control virtually all sound in the listening environment.

Controlling a sound field means designing to encourage the propagation of wanted sound (Audio) and to discourage the propagation of unwanted sound (Noise).

While not specifically a conventional noise measurement technique, we've found some interesting aspects of the side effects of noise by using TEF™ (Time, Energy, Frequency) measurements to analyze wide-band sound energy density. TEF™, was developed by Richard Heiser, the J.P.L. in Pasadena. TEG™, LEDE™ are trademarks of and are licensed by Synergetic Audio Concepts.

It was the development of TEF and it's associated science TDS (Time Delay Spectrometry) which led us to the first actualization of a true LEDE design in our own studio, Las Vegas Recording. We'd like to share with you some standard techniques and some of our own developments for designing a noise free environment.

Aside from being annoying, distracting and tiring, we've found that certain types of noise, common in most control rooms, can cause side effects which include severe time smearing in the low end frequency spectrum of the room.

Noise comes in three basic flavors: Airpath Noise, Diaphramatic Noise and Impact Noise.

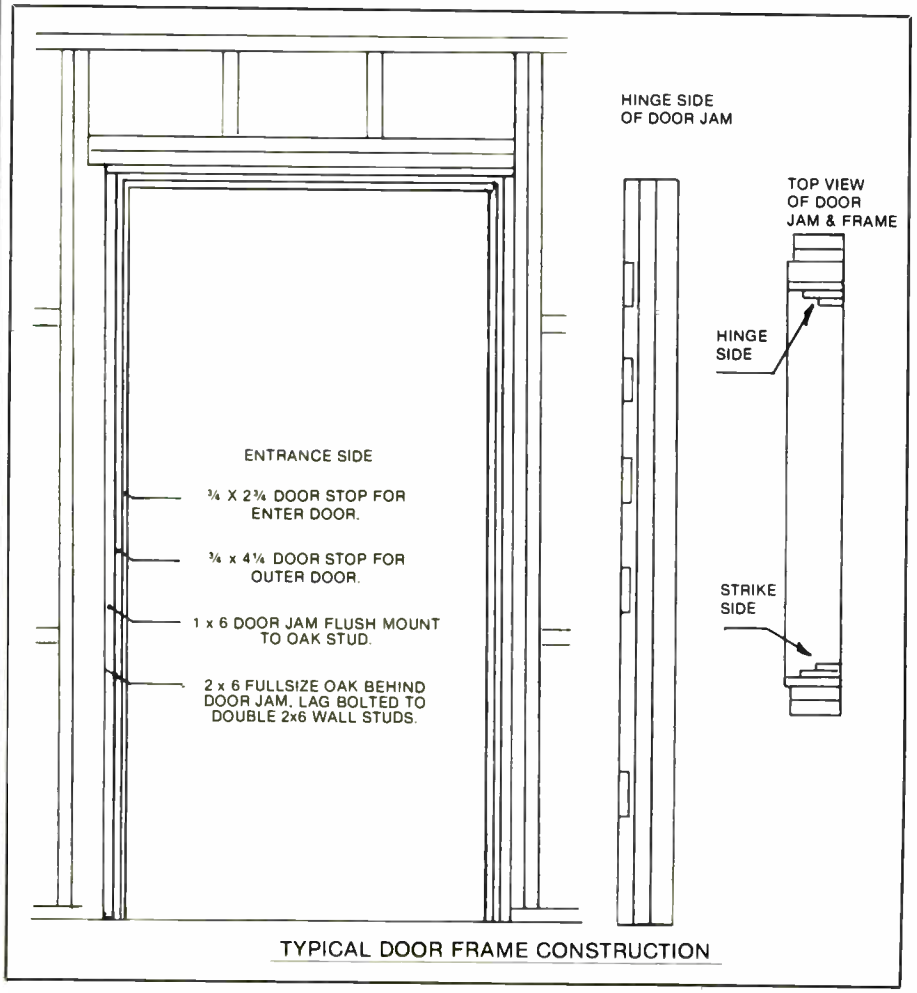
AIRPATH NOISE is any sound originated in air, any air. Conduits, air ducts, telephone and electrical outlets, elevator shafts, construction cavities, loose door and structural seals and sloppy construction are all conductors of Airpath Noise.

DIAPHRAMATIC NOISE is that sound which is generated by diaphramatic action of a sound wave hitting a wall, floor, ceiling or partition. The wave impulses cause the wall to vibrate in sympathy, thus passing a portion of the wave to the other wall side. If a wall section is rigid and massive, the less diaphramatic action, thus less sound passing through the wall. diaphramatic action can be used to attenuate noise. Diaphramatic action can be used to absorb Low Frequency sound energy, an example of this effect is a membrane absorber or well isolated boundry wall. In these cases, the impulse is dissipated by kinetic and thermal energy expended in trying to vibrate the wall. Rigidity and mass are the key words since a rigid surface vibrates as a plane.

IMPACT NOISE is by far the most difficult of all noise to contain. Impact Noise is caused by direct mechanical action. Heavy transportation, a loading dock, trains, freeways, plumbing, door slams, mechanical system and musical vibrations can all cause Impact Noise.

The best time to fight noise is before construction starts. An accurate site analysis is essential if you are to do any better than guess at what construction techniques and materials are needed for a project. The cost range of a site analysis is between $500 and $5,000; quite a healthy spread that is dependant on where you live (travel time) and how much of what kind of analysis you need. The noisier the location, the higher the cost, (but you already knew that.)

Figure 1

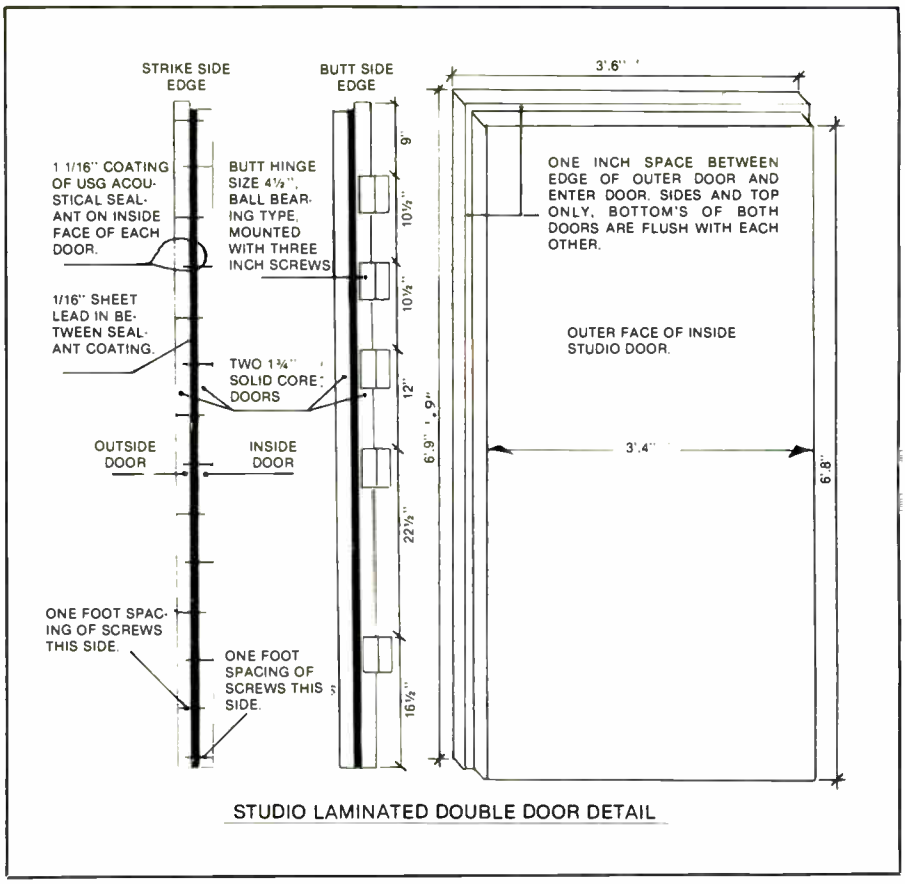


TYPICAL DOOR FRAME CONSTRUCTION

A simple SPL Meter and spectrum analyzer just don't do the job, particularly when you are looking at low frequency sounds and vibrations. If your site is under a freeway, near a subway or in a tall building with noisy elevators, opt for the full site analysis. Include velocity measurements over a reasonable length (18-35Hrs) of time. The money and time you'll save in knowing just how much to build will be worth the investment.

Since sound is transmitted in solids much faster than in a gas, (1130 ft/sec or 344.4 meters/sec in air and 22,309.7 ft/sec or 5,050 meters/sec in Gypsum board,) you can easily see why controlling structural noise is our first concern. There's no sense in tossing thousands of dollars against the walls in damping and attenuating materials if the building itself is causing your problem.

Starting from the ground up, the first subject is floors. The ideal treatment of floors is to float them. A continuous pour of concrete (3½ min.) floating floor systems along with decoupling of each acoustic area is by far the most effective floor iso system. In particularly vibration prone locations, floors are actually supported on spring isolators offering a deflection of up to ¾". If you can't float the whole slab, go for the



STUDIO LAMINATED DOUBLE DOOR DETAIL

Figure 2

control room and drum booths first. You might wish to provide for a retro-float studio floor at some later date. A well constructed floating floor should be effective down to a minimum of 15Hz.

A less expensive, and less effective, method of floating a floor involves building an eggcrate, crossbraced grid, one foot on center with your floor joists. At the underside intersection of each grid, isolate from the sub-floor with a piece of ¼" thick rubber with a Derometer (compression) rating of between 45 and 50. The idea is to provide the absolute minimum contact between the grid and sub-floor. Fill the grid with fibreglass and cover with at least two layers of particle board.

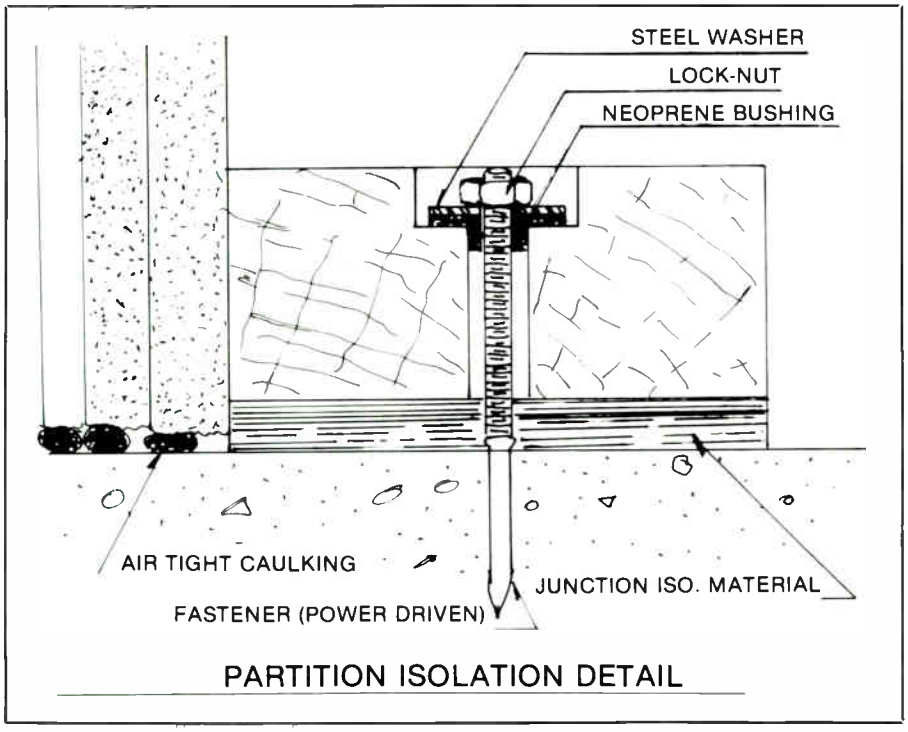
All of these floor systems work and provide an isolated foundation on which to build your walls. The old method of laying a sheet of neoprene across a whole floor and then pouring concrete does not isolate the lower frequencies due to the large surface contact between the continuous rubber base and the concrete floor above.

Some careful consideration should be given to both material selection and utilization. When we specify particle board we are referring to High Density, Industrial Grade Particle Board with a weight of over 100 pounds per 4' x 8' x ¼" sheet. All lumber should be kiln dryed, clear grade, and should be left on-site for at least 10 days before use to avoid warpage which causes squeaks, creaks and leaks.

All fasteners are Grabber (brand) screws. These come in one to four inch lengths and are faster and more efficient than nails once you get the hang of using a screw gun. Not only should all construction be screwed but also glued using USG (Brand) acoustical sealant as a glue. Where screws are not practical, lag screws and machine bolts should be used. (Figs. 1 and 2)

The only time nails are used is in setting studs and plates to concrete and then only the power driven (Ramset) nails are used. (Fig. 3)

Studios are places where serious SPL's take place, over 130 dB impulse SPL in our LEDE control rooms and rising as new amplifier and speaker technology comes on stream. These high impulse levels are necessary if you are to take advantage of the full dynamic range capabilities of today's equipment. This kind of impact noise (sound vibration) can literally shake a poorly built room apart! Resonances which occur due to faulty construction often occur at sub-audible frequencies so that their effect becomes psycho-acoustic as well as perceptual. Tight construction is a must.



PARTITION ISOLATION DETAIL

Figure 3

For boundry or outer wall systems, we like to specify 6" (min) hollow core concrete block, filled with concrete to code and covered with a scratch coat as a sealer on each wall side, to achieve maximum transmission loss. This system is rigid and heavy and requires a substantial foundation to bear it's weight.The more rigid and massive the structure, the greater attenuation at lower frequencies.

Another boundry wall system, which we developed for Tres Virgos Studio in San Rafael, CA, involves a sandwich of R-19 filled 2 x 6's covered with Celotex (Brand particle board and 1 inch of concrete per side. The entire system floats on Peabody Kinetics (Brand) isolation material and is attached to the building structure with ½ inch machine bolts on custom manufactured "motor mounts." As you can see in Figs. 3 and 5, although walls and floors form an air tight seal, the actual area of direct mechanical contact is quite small. This system is not only efficient but very cost effective.

Once the boundry structural systems are in place, an inner or secondary room must be built within the outer shell. This room, too, must be isolated from direct contact with the rest of the structure. We generally specify R-19 filled 2 x 6's covered in two layers of particle board and one layer of 5/8" sheet rock. If more mass is required we add sheetrock, carefully caulking and sealing all seams in all construction.

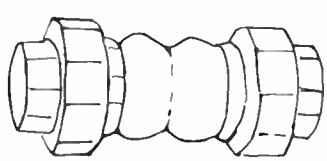
Air tight seals are essential to prevent both Airpath transmission and flanking around walls, floors, ceilings and in construction cavities. This air tight requirement goes for all structural components as well as any openings around conduit, piping, duct work, bracing, electrical switches and outlets. To insure the integrity of seals use a non-bleeding, non-drying, non-hardening caulking compound such as Dow Silicone Sealer (Brand) or USG Acoustical Sealant (Brand). All openings of over ¼ inch should be sealed using Johns Manville Duxseal (Brand). All conduit, duct work, etc., should be decoupled along each run with a neoprene sleeve gasket or similar system (Fig. 4) to control vibration transmission as well as airpath noise. All conduit should be wrapped and sealed when running through walls, floors and ceilings (Fig. 5.)

How important is an air seal? Well, let's take a 10-inch opening with a noise level of 60dB. Reduce the opening by a factor of 100 to .1 inch and you only reduce the noise 20dB. Obviously with air path noise, little openings cause big problems. Air tight, air tight, air tight!

The two plates (Figs 1 and 2) show a recommended door jamb and door construction detail.

Now, here's an interesting effect

Figure 4



NEOPRENE PIPE COUPLING ¾"

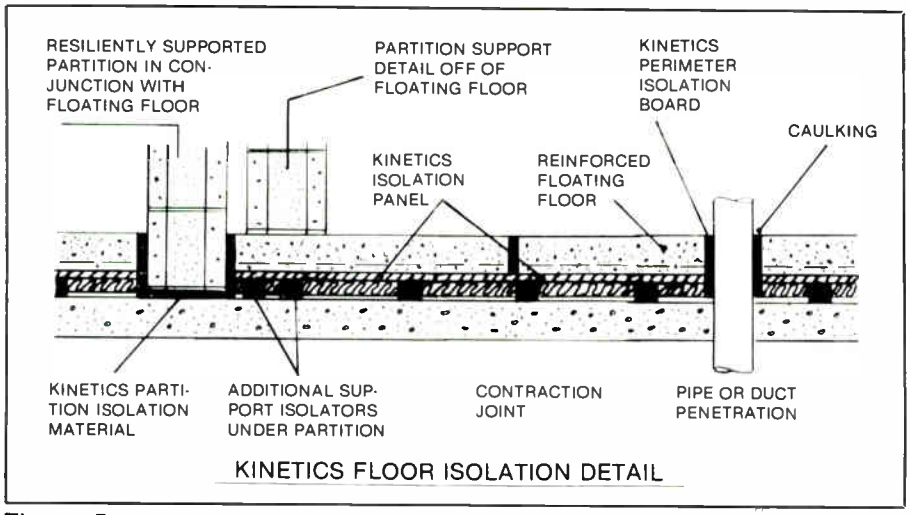


Figure 5

that occurs in nearly every control room. It's called EES (Early, Early Sound). Through our own research, using TEF, we have developed a more effective method of measuring structural born noise and low frequency energy density. Here's some of what we've found. We know that sound travels faster in a solid than in air, therefore when some of our TEF plots showed an impulse arriving at the mixing position considerably before the direct air path wave from the speaker diaphragms, we had cause to believe that we were dealing with a structurally transmitted effect.

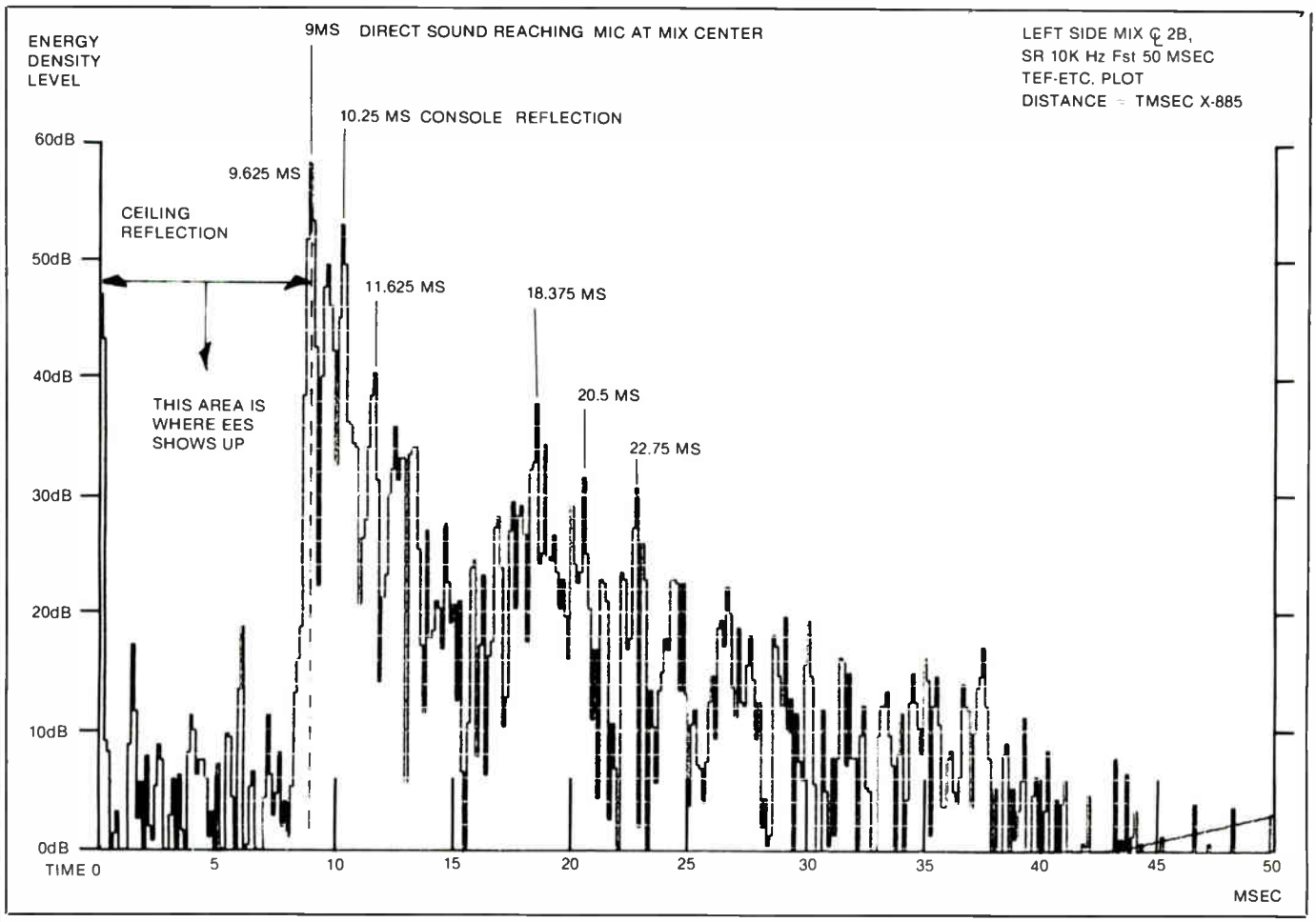
The very act of direct coupling a loudspeaker to a control room structure causes a mechanical transmission of the direct vibrations of the speaker components to arrive at the mixing position considerably ahead, in time, of the airborn sound impulse. In one control room we found EES arriving 2.58 milisecond before the the direct wave! This causes a low frequency time smear that interferes with mixing perspectives. This EES effect can be heard as a roomy or mushy bass sound. This may be one of a number of reasons that so many studios mix on mini-monitors mounted on the console. Perhaps the speakers mounted in the wall are causing EES. EES doesn't show on conventional measurement devices. (Fig. 6) Want to get rid of EES? Try a simple decoupling of your loudspeakers. In the absence of standing waves or electronic chain problems, even a little isolation will show an improvement in most situations. (Fig. 7) Decoupling of loudspeakers is one of the basic criteria for our Energy Density© LEDE designs...

We've also found that many bass problems develop in the inability of the average electronic chain to pass a low frequency square wave.

Of course we've only scratched the surface of noise control. However, there are any number of excellent reference works on the subject. Local industrial acoustic treatment suppliers are also sometimes helpful.

Among other things, TEF has given us the ability to do free-field amplitude, phase and directivity measurements, transient response and time alignment of speaker systems; as well as show us what might best be called a 3 dimensional (amplitude, frequency, time) "picture" of the real-time events in a given sound field.

Figure 6



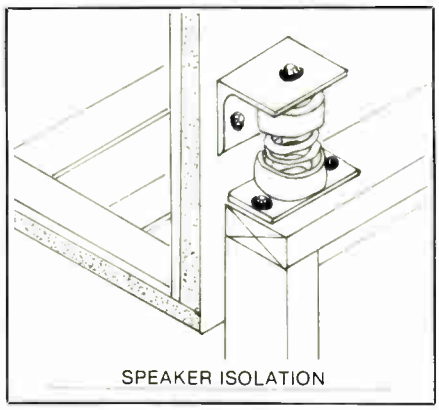


Figure 7

We're hopeful that TEF will become more available with the introduction by Crown, later this year, of a dedicated TEF Computer. This tool will give us the ability to do with one instrument what now takes an interface of many devices to accomplish.

With these powerful new tools easily available, we believe that we are entering a period of rapid advances in the science and art of acoustic design.

Good luck with your new studio, here's hoping the only noise you hear is the guiet rustling of hundred dollar bills resting in your jeans. ■

CONTROL ROOM DESIGN

The Future

by Don Davis

The advent of meaningful, relevant acoustic measurements, soon to be followed (hopefully early in 1982) by reasonably priced, readily accessible test equipment will, in our opinion, rapidly change the present approach to the design of control rooms

What kind of training will the future successful designer need in addition to the good esthetic judgment necessary to the harmonious visual use of "engineering" materials?

1. The designer will have to ***understand*** why a loudspeaker ***does not*** have a low frequency response in a small room but rather it is the room's modal response that is of fundamental interest.
2. The designer will have to discover that the popular words "reverberation time" have no meaning whatsoever in small, "acoustically dead" control rooms because there is no ***reverberant sound field*** present with levels equal to or above the ambient noise level present in the room. If there is no reverberant sound field present, then its decay time can't be measured, which brings up the interesting question of what is the instrument measuring?
3. The designer must become aware of the dynamics of the air molecules and how barriers, absorption, transmission and reflection of the ***energy*** carried via these particles are modeled at high frequencies as a beam and at low frequencies as a wave.
4. The designer should know the difference between polarity and phase and be able to easily calculate the relative phase between a direct sound level and an early reflection as a simple geometry problem.
5. The designer should be able to calculate the acoustic level of any signal, including a reflection, and be able to account for the inverse square law losses over the path, the absorption, the transmission, and other similar variables that affect signal levels.
6. A designer should, with ease, be able to correctly identify which acoustic parameter is represented by:

$$M^{-} \bullet KG \bullet S^{-\prime} = ?$$

|A|e should not pose problems and the designer would be well advised to be familiar with Bode plots, polar plots and other accepted techniques for analyzing phase. The designer should, with ease, convert ***any*** frequency interval into either octaves or decades. We would expect the designer to have complete familiarity with both linear and logarithmic scaling schemes and understand how to convert from one to the other efficiently.

7. The designer cannot ***intelligently*** manipulate the design parameters of a control room without a full working understanding of the Haas effect, the inital time delay gap, the ratio of direct-to early reflected sound, the Kuttruff effect, what audible form comb filters take (the Rodger's effect) and similar totally basic, absolutely fundamental psychoacoustic phenomena.

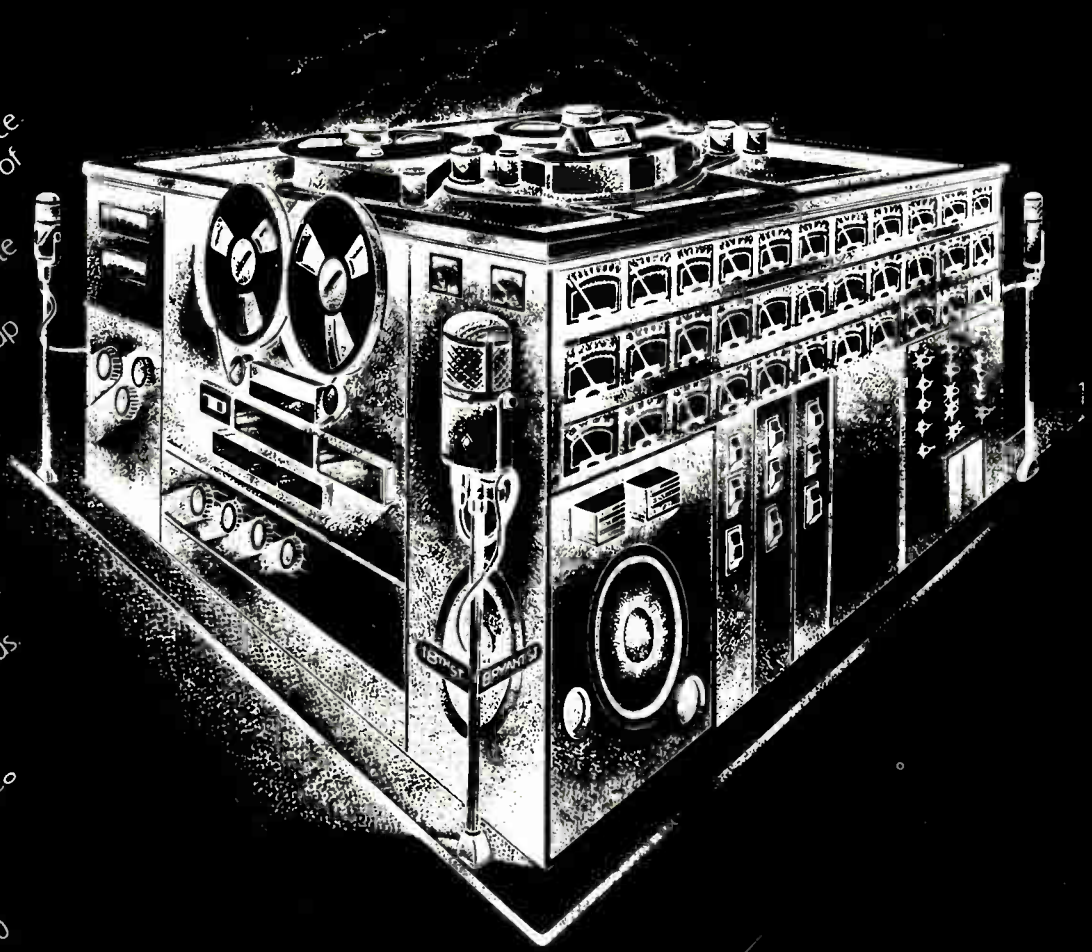
Another desirable discipline for the designer to be aware of is the ***proper*** use of the decibel (99.99% of the "engineers" in recording have not achieved this so we'll not insist on it but they all would function much more effectively if they did learn what a decibel really is).

The decibel, for example, is never, ever:

A. A voltage ratio
B. A current ratio
C. A sound pressure ratio

The designer without a good conceptual "feel" for complex impedances truly handicaps himself when judging monitor loudspeakers. Knowledge of the difference between constant voltage and constant current circuits is very useful (especially in measurement work). A basic understanding of the difference between energy, work, and power must be achieved prior to using the new generation of Time, Energy, Frequency (TEF™) measuring equipment developed by Richard Heyser and soon to be manufactured by Crown International. ■

We have it all under one roof.



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STUDIO
Designers & Suppliers

The following listings are composed of many of the major domestic suppliers of equipment and expertise for the recording studio. We urge interested readers to verify the accuracy of this information as changes are frequent in this dynamic industry.

ACI/FAS Audio Services
attn: Ike Benoun.
7138 Santa Monica Blvd.
Hollywood, CA 90046
213/851-7172
Studio Design,
Equipment Supply & Service.

Accurate Sound Co.
attn: Ron Newdoll.
Redwood City, CA 94063
415/365-2843
Equipment Supply.

Acoustilog Inc.
attn: Alan Fierstein.
19 Mercer St., New York, NY 10013
212/925-1365
Studio Design,
Acoustical Consulting.

Alangrove Builders, Ltd.
attn: Mike Thorpe
947 North La Cienega Blvd., Suite L
Los Angeles, CA 90069
213/506-4962
Studio Design,
Acoustical Consulting.

Analogique Systems
attn: Jean-Peirre Mulot
17 West 17th St., New York, NY 10011
212/989-4240
Studio Design,
Acoustical Consulting.

Antech Labs
attn: Bill Schuermann.
8144 Big Bend Blvd., St. Louis, MO 63119
314/962-5656
Equipment Supply & Service.

ASI
attn: Woody Smith.
P.O. Box 6520, San Antonio, TX 78209
512/824-8781
Studio Design,
Equipment Supply & Service.

Audicon Design Group
attn: Claude Hill.
1200 Beechwood Ave., Nashville, TN 37212
615/256-6900
Studio Design,
Equipment Supply,
Acoustical Consulting.

Audio Image
attn: Rob Henion.
3685 N. Federal Hwy.
Pompano Beach, FL 33064
305/943-5590
Equipment Supply & Service,
Studio Design,
Acoustical Consulting.

Audio Industries Corp.
attn: Hal Michaels.
1419 N. LaBrea Ave., Hollywood, CA 90028
213/851-4111
attn: Ron Timmons.

185 Berry St., San Francisco CA 94107
415/777-5525
Equipment Supply,
Studio Design.

Audio Systems
attn: Allan Burris
205 22nd Ave. N., Nashville, TN 37203
615/320-1606
Equipment Supply.

Audiotechniques
attn: Ham Brosious.
652 Glenbrook Rd., Stamford, CT 06906
203/359-2312
attn: Matt Brosions.
1619 Broadway, 4th floor
New York, NY 10019
800/223-2486
Equipment Supply & Service.

Audio Video Resources
attn: Jeff Mestler.
60 Broadway, San Francisco, CA 94111
415/781-2603
Equipment Supply & Service.

Auracoustic Research & Engineering
attn: Dr. Richie Moore.
540 Canal, San Rafael, CA 94901
415/459-1783
Acoustical Design.

Bananas at Large
attn: J.D. Sharp
804 4th St., San Rafael, CA 94901
415/457-7600
Equipment Supply.

Blakeley Pro Audio
attn: Doug Blakeley
3103 Central N.E.
Albuquerque, NM 87106
505/266-0296
Equipment Supply.

Rudi Breuer
attn: Rudi Breuer
805/273-3792
Studio Design,
Acoustical Consulting.

Coast Recording Equipment Supply
attn: Jerry Cubbage.
6114 Santa Monica Blvd.
Hollywood, CA 90038
213/462-6058
Equipment Supply.

Jeff Cooper and Associates
attn: Jeff Cooper
22627 Cavalier St., Woodland Hills, CA 91364
213/887-9100
Studio Design,
Acoustical Consulting.

Chips Davis/Ed Bannon LEDE™ Design
attn: Chips Davis or Ed Bannon.
3364 Clandara Ave., Las Vegas, NV 89121
702/731-1917
Studio Design,
Acoustical Consulting.

EAR Pro Audio
attn: Ed Vogt.
947 S. 48th St., Tempe, AZ 85281
602/968-8675
Equipment Supply & Service.

STUDIO DESIGN

East Coast Sound Specialties
attn: Ed Roman
242 Main St., Danbury, CT 06810
203/748-2799
Equipment Supply.

Electro-Media Systems
attn: Dan Gwynne.
8257 Beverly Blvd., Los Angeles, CA 90048
213/653-4931
Studio Design,
Equipment Supply & Service,
Acoustical Consulting.

Empirical Audio
attn: Winn Schwartau.
Opening in San Diego, CA on September 1, 1981.
914/762-3089
Acoustical Consulting,
Equipment Supply.

F. Alton Everest
6275 S. Roundhill Dr., Whittier, CA 90601
213/698-8831
Acoustical Consulting.

Flanner's Pro Audio
attn: John Loeper.
Mayfair Mall, 2500 N. Mayfair Rd., PO Box 26005, Milwaukee, WI 53226
414/259-9665
Equipment Supply & Service.

Everything Audio
attn: Brian Cornfield.
16055 Ventura Blvd., Suite 1001
Encino, CA 91436
213/995-4175
Studio Design,
Equipment Supply & Service,
Acoustical Consulting.

FAS Audio Services
attn: Larry Metz.
5540 Cleon Ave., N. Hollywood, CA 91601
213/877-9711
Equipment Supply.

Ken Fauss
1887 Tipperary Ln., Newberry Park, CA 91320
805/498-4006
Acoustical Consulting.

insert Flanner's.

Ford Audio
attn: Steve Simmons.
4800 W. I-4, Oklahoma City, OK 73108
and 4715 E. 41st St., Tulsa, OK 74135
405/946-9966
Equipment Supply & Service.

The Gotham Organization
attn: Russ Hamm.
741 Washington St., New York, N.Y. 10014
212/741-7411
Equipment Supply & Service.

Harvey Professional Division
attn: Gene Perry.
25 West 45th St., New York, N.Y. 10036
800/223-2642
Equipment Supply & Service,
Studio Design,
Acoustical Consultants.

HUN Sound
attn: Bobby Blackmore.
647 Irwin St., San Rafael, CA 94901
415/454-2911
Equipment Supply.

Hy James
attn: Henry Root.
2839 Boardwalk, Ann Arbor, MI 48104
313/994-0934
Equipment Supply.

T.P.S.
attn: Joseph Julien.
63 Center Park Road, Greenlawn, N.Y. 11740
516/261-5924
Studio Design.

Lakeside Associates
attn: Stephen Fouce.
306 West Third St., Suite 300
Los Angeles, CA 90013
213/843-6916
Studio Design,
Acoustical Consulting.

E.M. Long Associates
attn: Ed Long.
4107 Oakmore Rd., Oakland, CA 94602
415/531-8725
Acoustical Consulting.

Martin Audio Video Corp.
attn: Courtney Spencer.
423 W. 55th St., New York, N.Y. 10019
212/541-5900
Studio Design,
Equipment Supply & Service.

Milam Audio
attn: Jerry Milam.
1504 N. 8th St., Pekin, IL 61554
309/346-3161
Studio Design,
Equipment Supply & Service.

Sye Mitchell Sound Co.
attn: Sye Mitchell.
22301 Cass Ave., Woodland Hills, CA 91364
213/348-4977
Equipment Supply.

Neotek West
attn: Steve Ditto.
4007 6th St., Los Angeles, CA 90020
213/387-7999
Equipment Supply.

Paoletti, Lewitz & Assoc.
attn: Dennis Paoletti.
40 Gold St., San Francisco, CA 94133
415/391-7610
Acoustical Consulting.

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feedback

Dear Mix:

The May, 1981 issue of Mix page 42 first paragraph listed this person and address to contact about a newsletter for women in audio. As you can see from the enclosed envelope she's moved 3 times since and didn't even leave a forwarding address for the 4th time. I think we would all appreciate you finding out what happened and let us know in the next issue.

Now that we know about women who have managed to get into audio why not take it one step further and let the rest of us in on the secret I've gone to school, attended several workshops, studied on my own, and done volunteer work, but can't get a paid job. I hear everything from "you're just a dumb blonde" to "you're only in it for the sex." Both statements are very chauvinistic and false, and in fact the guys I have had a chance to work with were impressed with my abilities, after the initial shock of finding out I really did know something wore off. I've always wanted to work with sound equipment and have always been rebuffed because I'm just "a stupid female." I refuse to settle for anymore "pink collar" jobs. Somewhere, somehow, I'm determined to get into audio!!

Nancy Dykstra
1617 Forham Dr. St.
Grand Rapids, MI 49506

Dear Nancy:

Our apologies for the runaround. We spoke with Nyya and she has informed us that an error at the post office has been misdirecting her forwarded mail. She regrets the inconvenience and has asked us to run her new address:

Nyya Lark
840 Larrabee St., Building 2-108
Los Angeles, CA 90069

Dear Mix:

Mix is to be commended for its recent coverage of women in the recording industry. However, we would like to point out a plaguing problem that is, while not limited to the recording/audio field, quite prevalent within that industry; SEXIST LANGUAGE.

Unfortunately the pages of Mix and other industry periodicals are constantly written for and from the male perspective. This type of non-inclusive language not only limits opportunities for women but also inherently limits the options in thinking for men.

In 1974, the National Council of Teachers of English published a guideline for nonsexist use of language. (Copies are free by sending a self addressed stamped envelope to: National Council of Teachers of English, 1111 Kenyon Road, Urbana, Ill. 61801).

Yours very truly,

Jasun Martz-Neoteric Music-Los Angeles, Ca.

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