

JANUARY 1983
\$2.00

THE RECORDING INDUSTRY MAGAZINE



INTERVIEW:
NARADA MICHAEL
WALDEN

Mix

Listings:
Northwest Studios
Forum:
Multitrack Analog
Tape Recorders

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World Radio History

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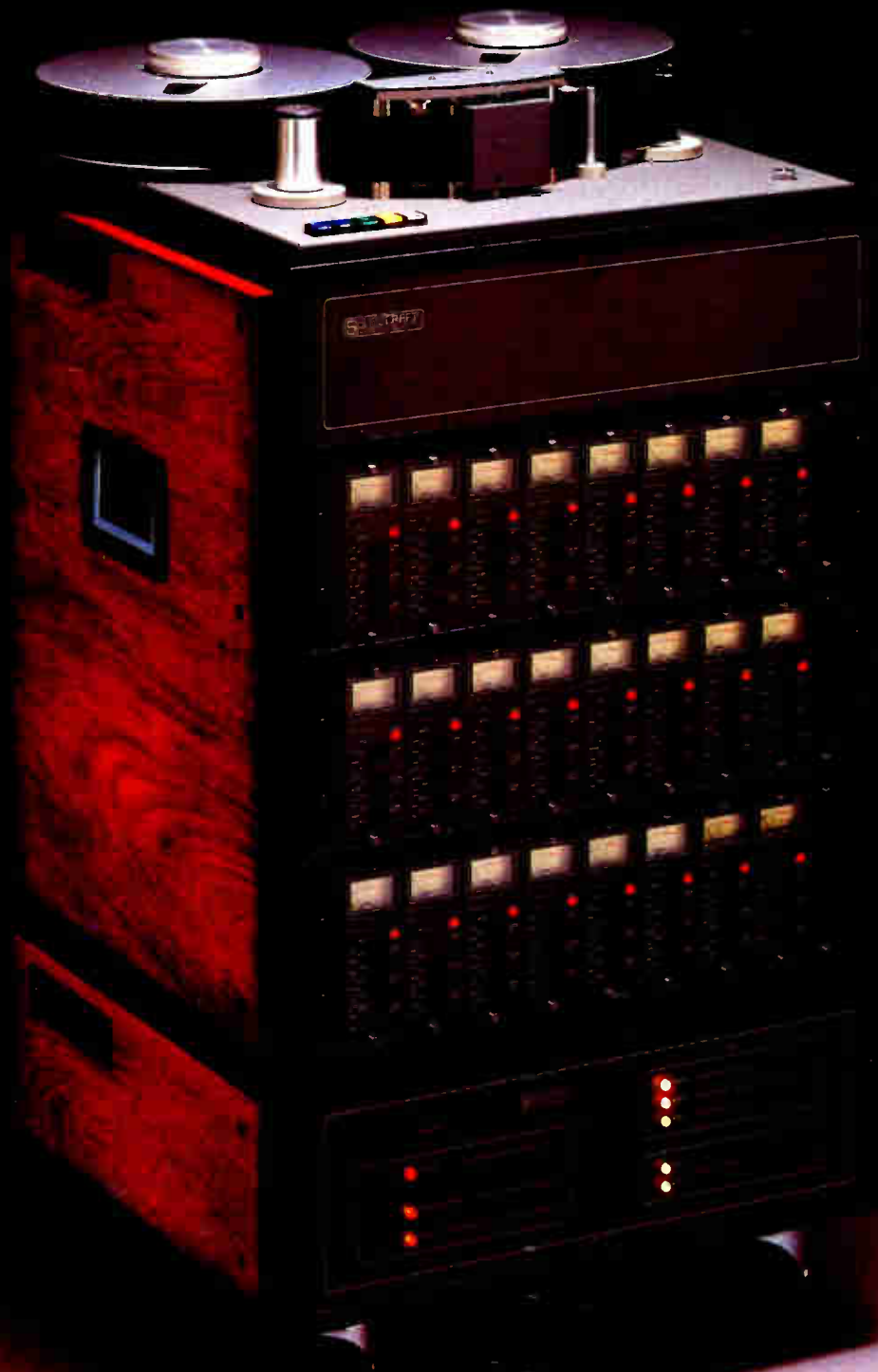
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Cover:
Studio A at Steve Lawson Productions, in Seattle, designed by Jeff Cooper, specializes in commercial audio and audio for video.

Photo by:
Craig Ingle

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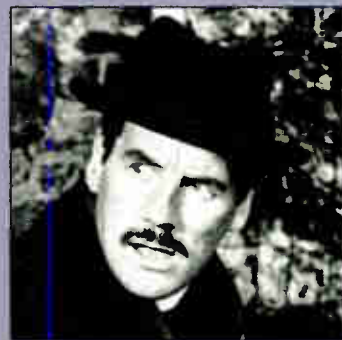
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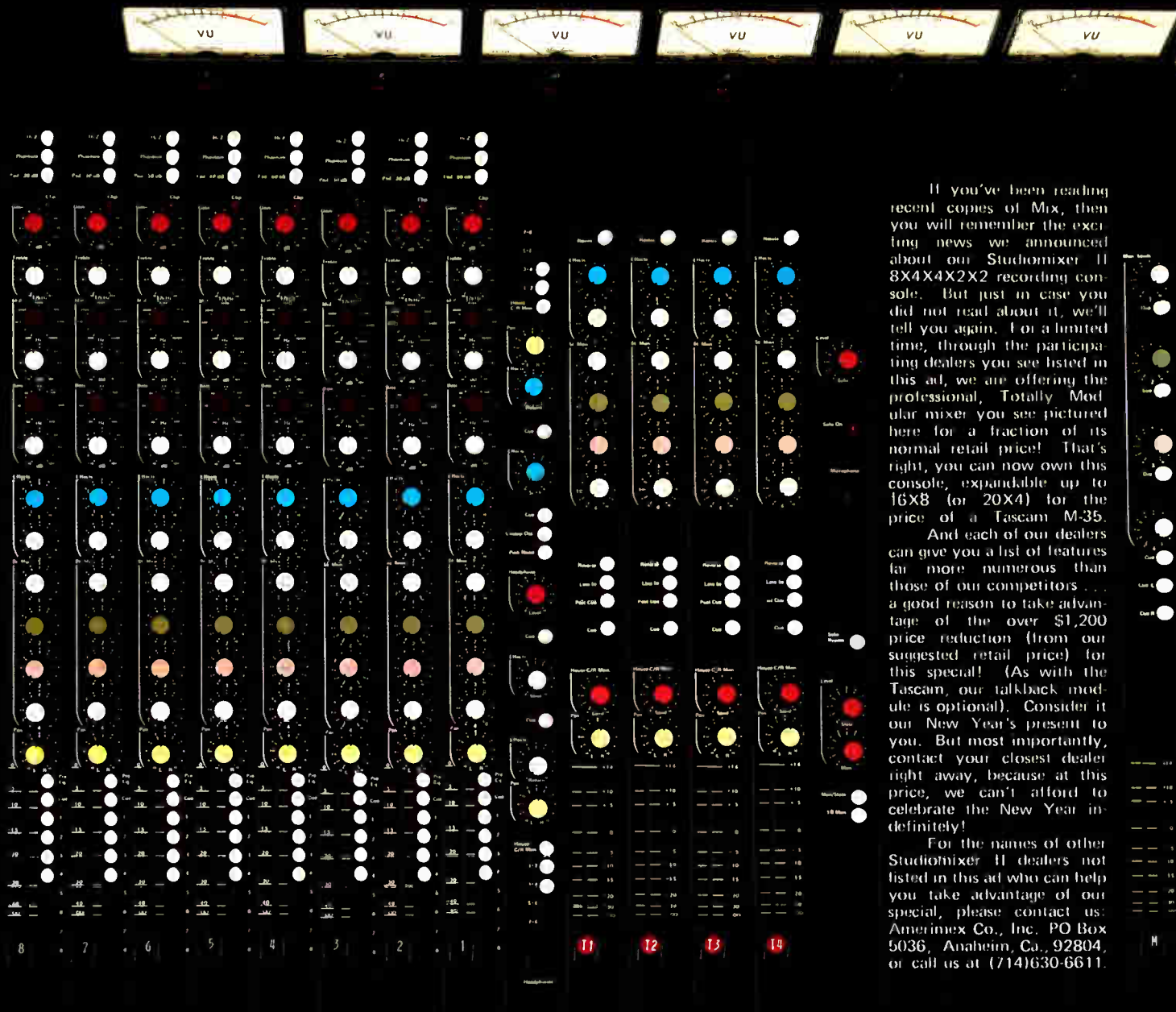
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(Roger or Scott)

Stagesound
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Long Beach, Ca. 90808
(213)420-9006 (Rob or
(714)527-0330 Tony)



If you've been reading recent copies of Mix, then you will remember the exciting news we announced about our Studiomixer II 8X4X4X2X2 recording console. But just in case you did not read about it, we'll tell you again. For a limited time, through the participating dealers you see listed in this ad, we are offering the professional, Totally Modular mixer you see pictured here for a fraction of its normal retail price! That's right, you can now own this console, expandable up to 16X8 (or 20X4) for the price of a Tascam M-35.

And each of our dealers can give you a list of features far more numerous than those of our competitors... a good reason to take advantage of the over \$1,200 price reduction (from our suggested retail price) for this special! (As with the Tascam, our talkback module is optional). Consider it our New Year's present to you. But most importantly, contact your closest dealer right away, because at this price, we can't afford to celebrate the New Year indefinitely!

For the names of other Studiomixer II dealers not listed in this ad who can help you take advantage of our special, please contact us: Amerimex Co., Inc. PO Box 5036, Anaheim, Ca. 92804, or call us at (714)630-6611.

Studiomixer II (Now for the price of an import)



Dear Mix,

Good morning . . .

Every once in a while somebody does something right and you always intend to let them know about it. However, the best intentions aren't always followed through. Right? Right!

I have intended to drop you a line for many moons to let you know that you have my vote on what you are doing with Mix. So today I said the heck with my regular chores and this note came first.

Of all the publications that come to our studio, Mix is probably the most avidly read by musicians, techs, engineers and others who spend time in our hallowed halls. Copies disappear like magic. We do manage to retain one copy with a notification that it will self-destruct if it leaves the building.

Keep up the good work!

Sincerely,

Paul T. Hayes

Hayes Recording Studio

Tampa, FL

Dear Mix,

It's regrettable that in his letter responding to Barry Fox's article about historical recording, Oliver Berliner also made historically incorrect statements.

The contention that "he created the world's second-most-famous trademark" should be challenged. The original painting of "His Master's Voice" by the English artist Francis Barraud was not painted for any record company. In fact, Nipper was depicted listening to an Edison cylinder phonograph. For approximately six years, the canvas apparently was not sold. In 1899, Berliner's agent in the U.K. William Barry Owen saw the work, and commissioned the artist to paint over the Edison machine with a Berliner Gramophone. It is scarcely known that the original painting was a poignant statement, depicting the artist's dead brother's dog listening to his deceased master's voice. The original painting clearly showed the dog and phonograph situated on top of a coffin. At that time, since cylinder phonographs were commonly used to make home recordings, such cylinders as there were available were played at wakes and funerals.

The statement that "Edison went to his death refusing to acknowledge . . ." the liabilities of his system is melodramatic, non-academic, and I doubt documentable. Further, I'd like to know to

what "distortions" Mr. Berliner is referring. Edison's acoustically recorded, vertically cut "Diamond Discs," which were issued in early 1913, are generally much less noisy and have far less severe harmonic resonances than do their lateral cut counterparts. When played electronically with suitable styli and equalization, they sound surprisingly good for recordings made at that time. So, in fact, do the Edison celluloid cylinders of the same period.

Mr. Berliner is certainly right in contending that his grandfather played a significant role in the evolution of sound recording and reproduction. He is equally correct that Mr. Fox's articles contain errors. Certainly, the magnetic experiments of Elias Rein should have been mentioned. And what about the precocious optical film systems by Rein, Eugene Lauste and Ernst Ruhmer? These were not merely 'experiments in the lab.' Films made by the latter two were theatrically exhibited in the U.S. and Europe prior to the 1920s.

Also, Jack Mullin's article contains errors. The speed of 33 $\frac{1}{3}$ rpm was not initiated in 1926. Bell Labs has in their collection at Murray Hill New Jersey, electrically recorded, 33 $\frac{1}{3}$ rpm synchronous discs cut in October, 1924. The West Street Laboratories of Western Electric (which became Bell Labs on January 1, 1925) had been working on disc and film recording way before the commercialization of "Vitaphone" and the other E.R.P.I. systems.

On the subject of RCA's "Program Transcriptions," the project was most definitely not abandoned after a few months. The Victor record catalog for 1936 lists them as "long playing records." Not all of the pressings were "plastic." I have two shellac samples. Also, it should be noted that the General Electric System known as the Brunswick "Light Ray Recording" process was previously used to record variable area tracks on 35 mm film. Known as the "Pallophotophone" it was used to pre-record programming on WGY as early as December, 1922! When the recording horn-tied-to-the-mirror was replaced by a condenser microphone, input amplifier and string galvanometer, the system became known as RCA Photophone. This was done as a result of G.E., RCA, and AT&T being members of a "patents pool" which was eventually dissolved in an anti-trust litigation. Brunswick 78s recorded with that system clearly sound inferior to their Orthophonic and Viv-tonal counterparts.

Finally, I'd like to point out that the BBC was not the only user of the Marconi-Stille Steel *Band* (not tape!) system as might be inferred from the caption on page 22. The Swedish Radio Company used three of these daily from their initial shipment in the 1930s until they were replaced by post-war tape recorders. Their engineering department recently cannibalized the three into one operative unit. It has been used to transfer steel bands in their extensive audio archives. The bands ran at 1.5 meters per second and the sonic results (subjectively) sound surprisingly good. Samples of this and other unusual old recordings can be heard at the fabulous Ampex Museum of Magnetic Recording in Redwood City, California.

Sincerely,

Art Shifrin

N.E. Regional Manager

Thomson-CSF Broadcast, Inc.

New York, NY

Dear Mix,

My name is Dan Mitzimberg. Earlier this year I became fortunate enough to get the capital together to purchase most of my own equipment and start recording. Although I had gone to school in Nashville and had worked in many studios in the northwest, it was my turn to start working for myself.

It may sound easy, but I had to start doing things that machines were doing for me before. If it hadn't been for Mix Magazine and some other publications on specific techniques, I would still be at peg one. To keep a long story short, thanks for the info.

Thank you,

Dan Mitzimberg

Fulhouse Studios

Dear Mix,

I would like to ask you to correct an error that appears in your December 1982 article on Specialty Records Corporation. In that article the operations chief Joe Helminski said, "Sheffield Labs (*sic*)—which is now a part of Warners . . ."

This unfortunate misstatement keeps cropping up in the industry and we would be grateful if you would point out that Sheffield *Lab*, the original audiophile record company and direct disc pioneer, is owned fully, exclusively, and solely by Doug Sax and Lincoln Mayorga who founded the company 15 years ago. (Doug and Lincoln also own The Mastering Lab in Hollywood.)

Mr. Helminski's comment was in reference to a sale made two years ago by Messrs. Sax and Mayorga of a plating/matrix facility to Warners. Warners was granted the right to use the name Sheffield Matrix in association with that enterprise. However, the parent company, Sheffield Lab Direct Disc Recording is very much independent of Warners.

Thank you very much,

Andrew Teton

Marketing Director

Sheffield Lab

Santa Barbara, California

CURRENT

JBL Agrees to Acquire UREI

Harman International Industries, Incorporated of Northridge, CA, parent company of JBL Incorporated, has signed a Letter of Intent to purchase United Recording Corporation. URC is the parent company of UREI, a leading manufacturer of professional recording and broadcast equipment.

The acquisition is subject to approval by

the Harman International board, and acceptance of a tender offer by URC stockholders.

Harman International Industries is a diversified manufacturer and worldwide marketer of audio products. It has manufacturing plants in California and Indiana and owns full-line distribution companies in Germany, France, Great Britain, Australia and Japan.

NMA "Entertainment Expo 82"

The Nashville Music Association put on an exposition that is probably the first of its kind anywhere. For three days, November 12-14, the exposition sight was filled with music and information. There were some 160 exhibitors at the exposition. These ranged across a broad spectrum of the industry and included record companies, publishers, film, video and record production companies, studios, equipment suppliers, photographers, publicity and promotion artists, hotels, customers, financial aid concerns, schools, and trade organizations. The exposition allowed those in the entertainment business to meet, talk, and make new contacts. It also allowed the public a glimpse at the behind the scenes working of the industry. All the while, some of Nashville's best talent were showing off before crowds of music lovers. The shows demonstrated that Nashville has more than country and western talent to offer.

For more information on the NMA, write to: 14 Music Circle East, Nashville, TN 37203; or call (615) 242-9NMA.

—Chris Haseleu

NAMM Show January 21-23

As of December 1st, 305 exhibiting firms had registered for nearly 135,000 square feet of exhibit space at the Anaheim Convention Center for the January 21-23 Winter Market of the National Association of Music Merchants. Also highlighting the event will be several educational sessions presented by the Creative Audio and Music Electronics Organization (CAMEO) in-

cluding "Microprocessor Effects Devices for the Performing Musician," "Microphone Techniques and Selection for Sound Reinforcement" and "The Use of Reverberation to Enhance Live Performances and Recordings."

More information on the convention is available by contacting the NAMM office: (312) 527-3200.

notes

Etsuro Nakamichi, Founder and Chairman of the Board of the *Nakamichi Corporation*, died on November 10, 1982. According to Niro Nakamichi, President and Chief Executive Officer, "In his final months he established the E. Nakamichi Foundation, a non-profit organization dedicated to music and its enjoyment. It was his wish to encourage and support young musicians so that they may grow to enrich the lives of future audiences." . . . *Hans D. Batschelet* has been appointed President of *Studer Revox America*. The announcement was made by the outgoing President, *Bruno Hockstrasser*, who has returned to the Studer factory in Switzerland to assume the position of Product Manager for Professional Recording Systems. . . . *Robert D. MacCormack* has been elected President and Chief Executive Officer of *BTX Corporation*. He succeeds *David Krumholtz*, a founder and director, who becomes Manager of Product Development. . . . The first *Alexander M. Poniatoff Gold Medal for Technical Excellence* was presented to *Dr. Ray Dolby* by the *Society of*

Motion Picture and Television Engineers (SMPTE) at its conference in New York City on November 8. The annual award is sponsored by *Ampex Corporation* in honor of its founder. . . . The *Professional Entertainment Production Society* (PEPS) will be holding its Third Annual Convention January 14-16 at the Sheraton La Reina in Los Angeles. This year's show will provide an opportunity for attendees to evaluate products via questionnaires supplied by the manufacturers. Call (213) 760-8857 for more information. . . . *Morris-Tait Associates* of North Hollywood, California, has been selected as the sales representative firm in the Southern Pacific region for *Klipsch and Associates*. . . . *Terry M. DeRouin* has been appointed to the newly created position of domestic marketing administrator at *Ursa Major, Inc.* . . . *Nortronics* has appointed *Optex Corporation*, of Toronto, for Canadian sales and distribution and *William Menezes and Associates* of Kansas City, Kansas, as representative for Kansas, Iowa, Nebraska, Missouri and southern Illinois. . . . *Will Sharpe* has been appointed worldwide sales manager for *Showco* sound systems and the new-

ly developed *Vari-lite*. . . . *Family Light* will present their Music Camp, 3½ days of workshops, lessons, playing music and performing, February 18-21 in Healdsburg, California. Call (415) 459-2862 for details. . . . *3M's Magnetic Audio/Video Products Division* has appointed *John Boylan, Del' Eilers, Jimmy Johnson, Tom Jung, George Massenberg* and *Jim McCullaugh* to the Scotty Award Board of Governors. . . . *Sonic Landscapes*, studio designers, has moved to 24 Belvedere St., Suite H, San Rafael, CA, (415) 459-1675. . . . *AST Sound* has relocated at 250 West Broadway, New York City, (212) 226-7781. . . . *Mitsubishi's Digital Audio Division* has moved their Illinois office to 799 North Bierman Circle, Mount Prospect, 10013, IL 60056, (800) 323-4216. . . . *Robert H. Millice* has been appointed Western sales manager at *Sound Technology*. . . . *Shure Brothers Inc.* has appointed *R.M. Associates Ltd.* as regional sales representatives for Kansas, Illinois, Iowa, Missouri and parts of Nebraska. . . . New appointments at *Cetec-Gauss* include *Jim Williams*, Executive Vice President; *Fred Mulh*, V.P. Operations; and *Mike Geszaro*, V.P. Finance.

First we proved it. Then we improved it.



Over the past four years we've installed over 500 Studer A800 multi-track recorders in studios all around the world. We've proven this machine on all counts—reliability, sonic performance, production versatility, and total client satisfaction. No other recorder has earned such widespread admiration among recording professionals.

And now, with the introduction of the A800 MKIII, we've improved on the proven standard. We've removed all transformers from the record and reproduce paths. We've added interfaces for Solid State Logic and

Neve/Necam automation, and for all SMPTE/EBU synchronizing and editing systems. We've also updated the software for the microprocessor controls to meet the most demanding industry requirements.

Improving the A800 was not an easy assignment, but at Studer the pursuit of perfection has become an ingrained habit. Discover the difference yourself. Call your Studer representative and ask for details on our new A800 MKIII...now, more than ever, the proven standard for impeccable performance.

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NORTHEAST

At *Kingdom Sound Studios*, Syosset, Long Island, *Richie Corell* and *Glen Kolotkin* producing the new *Ramones* album for Sire Records. *Ron Cote* engineering... The *19 Recording Studio* of S. Glastonbury, CT, recently completed three cuts from Capitol EMI's release "Project Future - Revelation 13." Engineering by the 19's *Ron Scalise*. Writing and production provided by *Rahni Harris*. . . Session happenings at *Celestial Sounds*, New York City: Capitol Records' *Morrie Brown* is producing *Ellen Shipley*. *Steve Goldman* engineering, *Dennis O'Donnell*, *Larry DeCarmine* and *Don Peterkofsky* assisting. . . Recent guests at *Boogie Hotel Studios*, Port Jefferson, NY, include: *Foghat* and producer/engineer *Nick Jameson* recording a new album for Bearsville records, assisted by *Chris Isca* and *Jim Sparling*. . . Recent activity at *The Barge Sound Studio*, Wayne, NJ, includes: *Jeff Harman* continuing work on his forthcoming album. . . At *Blank Tapes Recording Studios*, New York City, *Butch Jones* engineering mixes for *The Go-Go's* and *The English Beat* for I.R.S. Records. *Chris Stein* mixing a *Blondie* Concert for an HBO Special. *Joe Arlotta* engineering. . . At *Greene Street Recording*, New York City, *John Jansen* and *Jim Steinman* are producing *Bonnie Tyler's* new album for CBS International. . . At *Frankford/Wayne Mastering Labs* of New York City, recent projects include the *Paul McCartney* single "Tug of War," *Chuck Mangione's* single "Steppin' Out" and the *Ramsey Lewis* LP, all mastered by *Joe Gastwirt*.

SOUTHEAST

At *Reflection Sound Studios*, Charlotte, NC, *Howard McCrary* producing *Tammy Faye Baker's* "Hyme Time" LP for PTL Records, *Steve Haigler* engineering. . . In Orlando, FL, *Bee Jay Recording Studios* recently finished recording *Molly Hatchet's* new album for Epic Records. *Tom Werman* was the producer and *Gary Ladinsky* engineered with *Bill Vermillion* assisting. . . *The Jets* recorded at *Prisma* studios, Ft. Lauderdale, FL, for their upcoming television appearance on Selkirk's channel 30 rock show. Produced by *Neil Brody* of Southern Nights Agency, engineered by *Arthur Gabe*. . . *Full Sail Recorders*, Altamonde, FL, recently recorded the *National Gospel Choir* when they appeared at the Thomas A. Dorsey National Convention of Choirs and Choruses in Orlando, FL. The masters are now being mixed and completed by *Milton Biggnam* of Savoy Records, a subsidiary of Arista. Release is scheduled for early

1983. . . At *Stargem*, in Nashville, TN, *Barry Dale* was in completing his new single for Stargem Records, *Wayne Hodge* producing. . . At *Soundshine Productions*, Ft. Lauderdale, FL, *Tom Staley*, formerly of NRBQ, has been working on some new songs for release. . . "Nothing But the Truth" by *Mac McAnally*, the first album mixed on digital by a Muscle Shoals' Alabama studio, was recently completed at the *Wishbone Studio* for Geffen Records, produced by *Terry Woodford* and *Clayton Ivey*.

NORTH CENTRAL

Recent recording activity at *Studio A*, Dearborn Heights, MI, includes: *Mel Davis* working on self-produced tracks for upcoming release. *Eric Morgeson* producing pop singer/songwriter, *Larry O.*. . . *Solid Sound, Inc.* in Ann Arbor, MI, reports country singer *Lisa Mari* has just completed her second album. Also working on an album this month, the band *Cybitron*, with producer *Billy Talbert*. . . In Detroit, at *Tantus Studio*, the *Original Dittlies* are working on their soon to be released single entitled, "I Don't Understand," written and arranged by *David Daniele* and produced by lead vocalist *Larry Conn*. Engineering this single is *David Schreiner*. . . At *RMJ Studios*, Detroit, MI, *R.J.'s Latest Arrival* laying tracks for their forthcoming release, R.J. producing; *Jimmy Ruffin* is mixing tracks of all new material.

SOUTHWEST

Midcom Inc's 24 track "Audio for Video" remote truck, Arlington, TX, teamed up with the Dallas based *Warner/Amex Cube Cable* video production facility, to provide a SMPTE time code mix and multi-track recording of musician *Mark O'Conner* of the Dixie Dregs, at Dallas' Eastside club. . . *David Edney* of *CookSound* in Houston, TX, recently completed an album project for *The Eric Hood Group* with Hood producing and Edney co-producing and engineering. . . *Crystal Clear Sound* in Dallas recently finished a project for *Mark Brymer* and *Jensen Publishing*. *John Mayfield* and *John Carey* engineered. . . At *Skyrocket Studios* in Houston, TX, *Walkee Talkee* has completed tracks for their Christmas record. The sessions were engineered by *Keith Lancaster* and produced by *Rick Richards*, *Danny Kristensen* and *Bruce Moody*. . . Recent recording activity at *Lone Star Recording Studios* in Austin, TX, includes the *Leroi Brothers* with *Vince McGarry* engineering their rockabilly LP; *Macumba Love* (Joe Ely Band members) recording an EP with *Joe Gracey* engineering. . .

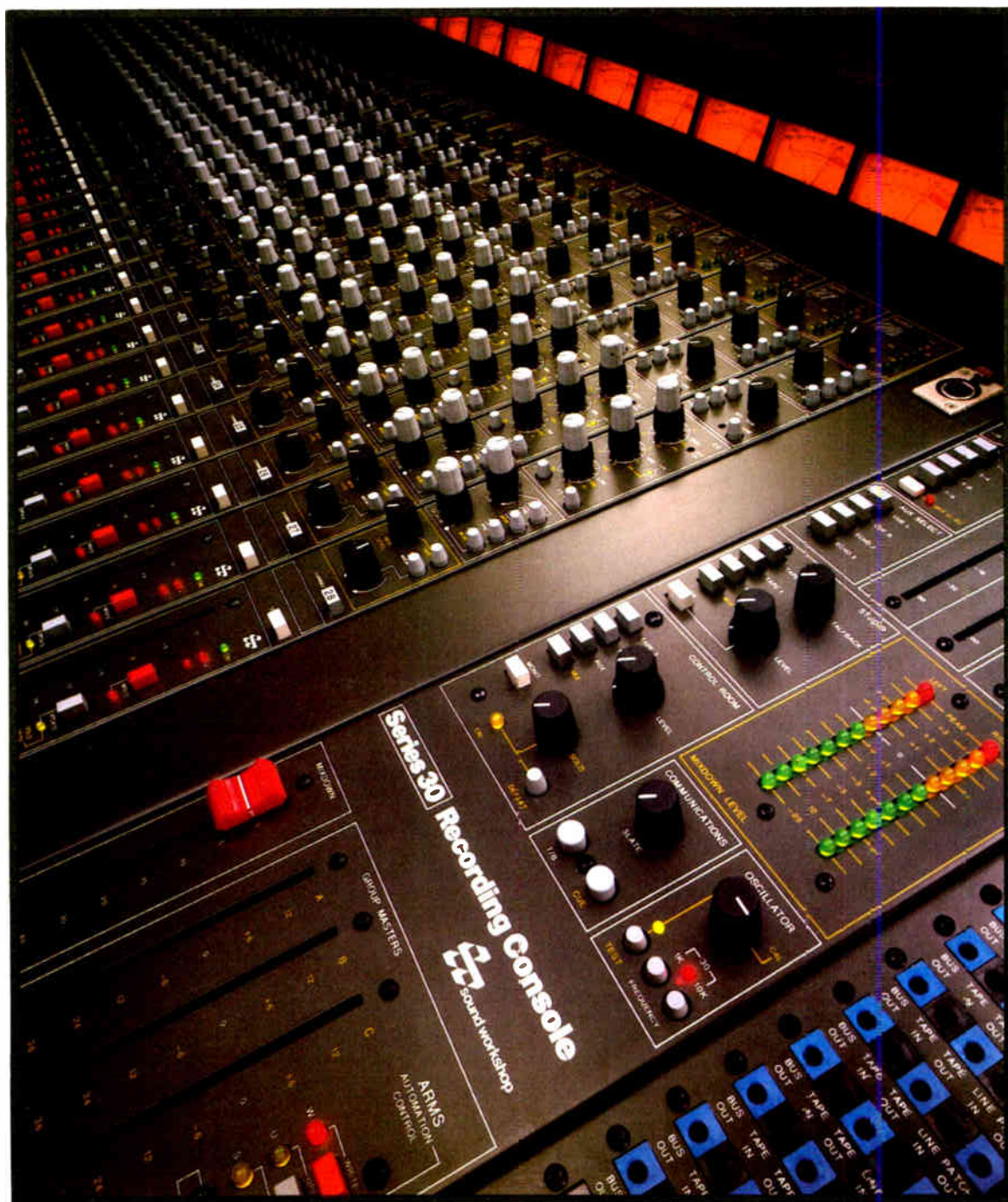
Gladys Knight was recently at *Commercial Sound Studios*, Las Vegas, NV, overdubbing for her new album on Columbia Records. *Bob Brown* and *Mark Harman*, first engineers, and *Don Whitbeck* as second engineer. *Leon Sylvers III* and *Gladys Knight* producing for Silverspoon Productions. . . In Studio A, *Sumet-Bernet Sound Studios*, Dallas, TX, *John Mayfield* engineered a vocal session for the new Johnny High Country Music Review album with *Marc Jaco* and a string session for Crescendo Records' new *June Hunt* album with *Charlie Brown* producing.

SOUTHERN CALIFORNIA

Recent live studio projects at *Kendun Recorders* in Burbank, CA include *Jefferson Starship* with producer/engineer *Kevin Beamish* supervising overdubs and mixes for RCA/Grunt Records in Studio D. *Tom Cummings* assisted at the console. . . Composer *J.A.C. Redford* is at *Evergreen Recording Studios*, Burbank, CA, scoring episodes of MTM Production's new series, "St. Elsewhere." *Rick Riccio* is the engineer, assisting is *Mike Hatcher* and *Gary Luchs*. . . At *54 East Sound Recorders*, in Pasadena, CA, *The Womacks*, Bobby, Cecil, and Linda are completing overdubs for their latest offerings for "The Womacks," with *Tyronne Williams* and *Ceasar* at the helm. . . The *Complex's* video stage, West Los Angeles, was recently the site for a *Linda Ronstadt* 35 mm film produced by *Robert Lombard* for *Lombard Entertainment*. The film was directed by *Richard Namm* and choreographed by *Tony Basil* with lighting and camera work supplied by *David Lewis*. . . *Westwood One's* new \$500,000 hi-tech mobile recording studio, Los Angeles, CA, has recently recorded *Evelyn King* at the Roxy, *Biff Dawes* engineering, produced by Westwood One, and *Fleetwood Mac* at the Forum, Biff Dawes engineering, produced by *Ken Caillat*. . . At *Paramount Recording Studios* in Los Angeles, producer *Kathy Kurasch* is in doing new jingles for KNX-FM with such featured artists as Jeff Baxter, Abbie Rubin, Lauren Wood, Jimmy Spheeris, Cindy Huisken, and Leonard Allen. *Patrick Von Weigandt* and *Dennis Moody* at the board. . . The production staff of Fiction label Inc. had a mixing session at *Digital Sound Recorders* in Highland Park, CA. *Armando Sidon* and *Don Fefie* engineered for Fiction and *George Sanger* of the studio engineered the tracks. . . *Magnolia Sound* in North Hollywood, CA, hosted *J.J. Cale* as he began work on his new album with Cale producing, *Stuart Taylor* engineering and *Alan Vachon* assisting.

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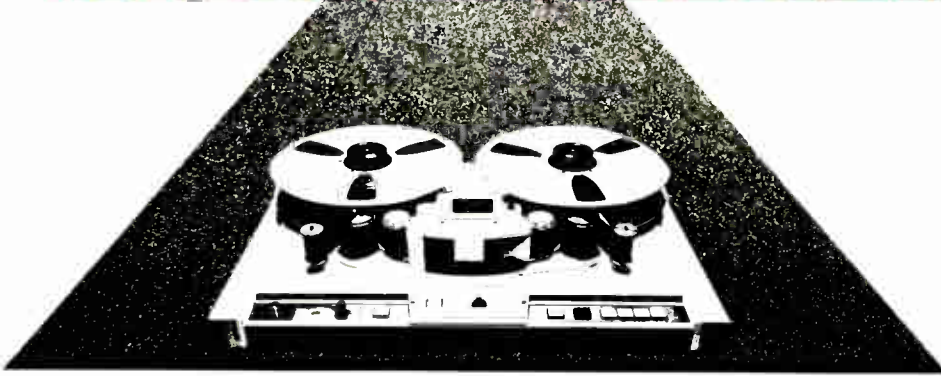
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ANALOG

THE LAST GENERATION?



Multitrack Forum

by George Petersen

Digital versus Analog. Analog versus Digital. Much has been said on both sides of the issue. In a way, this issue is quite similar to the film vs. video debate. Film can do things video cannot do and the reverse is true. When the first broadcast-quality video recorders were introduced, it was obvious that much improvement was needed in terms of reliability, standardization, and cost. Video did not replace film—they coexisted fairly peacefully, and occasionally came together in hybrid productions (film transferred to video for post production; computer generated effects transferred to film, etc.). While digital can do everything analog recording can do, it is obvious that digital audio still has a long way to go in terms of improving reliability, standardization, and cost. Analog and digital audio technology now coexist peacefully, and hybrid productions (analog multitrack mixed to digital 2 track; digital recordings released on LP disks, etc.) are common. At the same time when digital recorders make headlines with each new step, analog machines have been making steady progress in a quieter fashion.

Analog 16 and 24 track recorders have undergone an enormous evolution since their introduction during the late 1960's. Of course, the most dramatic and most important of these changes was the improvement of the sound quality itself. Today's analog multitracks far surpass their earlier cousins in terms of wider frequency response, improved signal to noise ratios, and in reduced wow & flutter,

crosstalk, and other distortion characteristics.

Advancements in transport design have also been welcomed into the multitrack field. Bulky, interference-producing drive motors and troublesome relays have all but disappeared, now having been replaced by servo-controlled DC motors, microprocessor logic circuits, VSO's (variable speed oscillators), and crystal controlled speed locking. While most recorders on the market utilize the combination pinch roller/capstan drive system, a variety of other systems are employed today. Stephens Electronics uses the unique capstanless, non-pinch roller system they introduced in 1971. Otari's drive system eliminates the pinch roller entirely, via a large diameter capstan wheel.

Ever since MCI introduced their AutoLocator at the 1972 AES Convention, other manufacturers have incorporated locator systems into their own recorder lines. Today such systems (with or without remote controller) are produced by all major multitrack manufacturers, as either standard or optional equipment.

Since the electronics, drive, and control systems of modern analog recorders have reached a plateau in terms of excellence, multitrack designers have turned to other goals over the past few years. All the manufacturers we talked to have placed the utmost emphasis on improvements in the reliability and serviceability of their machines.

At this stage in the evolution of analog multitrack recorders, the only design improvement one could imagine would be either a built-in espresso machine or a small, obscure switch tucked away in some corner which would convert the recorder from analog to digital operation. Barring this eventuality, we are left with *the* question: Have we reached the last genera-

tion in analog recording? We talked to representatives from several manufacturers about this subject, and also about their current top-of-the-market model.

Don Haight, Ampex ATR-124

HAVE WE REACHED THE LAST GENERATION IN ANALOG MULTITRACK?

"The 124 is the end. The last. The most sophisticated machine in the evolution of analog multitrack. For us to develop a totally new machine from scratch at this point would be unlikely. People who buy 124's now will have them for a long time. This is the end of this stage, but analog will be with us for a long time. Most houses (recorder manufacturers) are preparing digital programs, and we are ongoing in this process. We have to follow the marketplace.

"The 124's keyboard control and membrane switchpanel bothered some people at first. They expected the new machine to be something like the (Ampex) 1200. People have adjusted to it well, and other manufacturers are incorporating these types of controls more and more. Over time, small improvements will be made. But there



Ampex ATR-124

won't be any more giant milestones in analog technology.

"The customer base is becoming very sophisticated in what they expect to see and in what timeframe. Most of the current R & D activity in the industry is aimed 3-5 years ahead. That's when we will see a large push for digital. We're at the point of diminishing marginal utility in analog. The longer term digital R & D dollar will give you more bang for the buck."

(continued on page 15)

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international broadcast standards, the incomparable ATR-100 1/4" and 1/2" mastering recorder, the rugged MM-1200 multi-track, and the advanced ATR-124 multi-track analog recorder. For details about any

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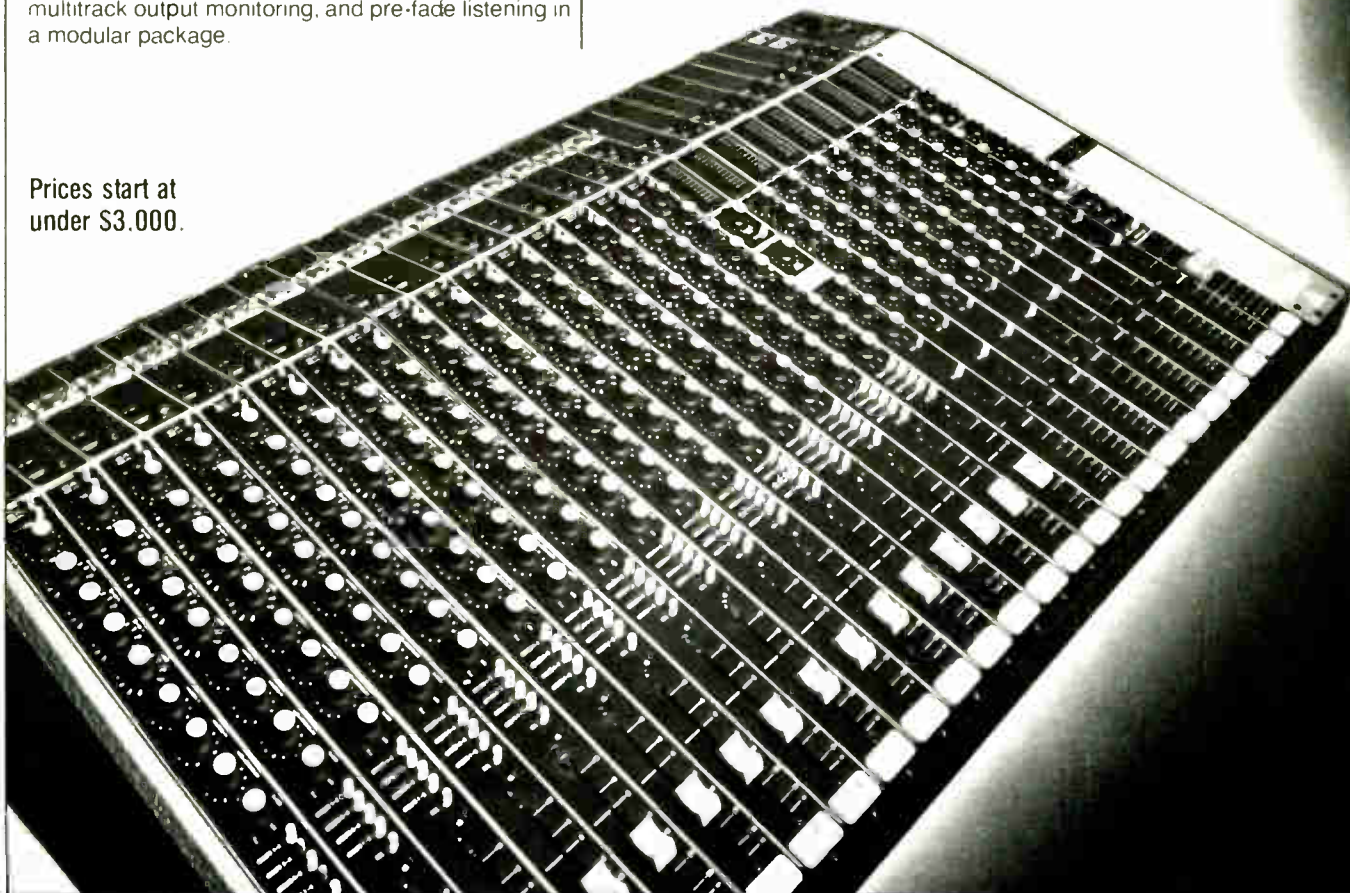
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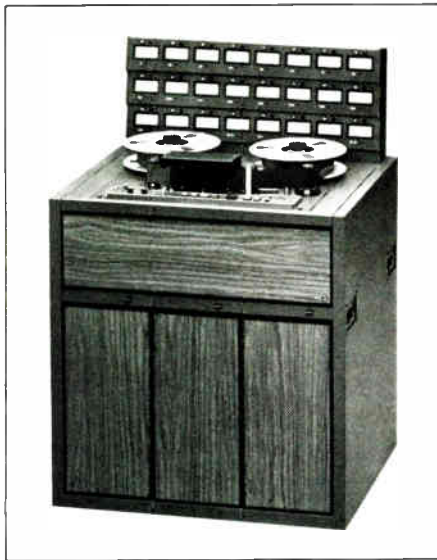
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(continued from page 12)



MCI JH-24-24

**David Moore,
MCI JH-24-24**

HAVE WE REACHED THE LAST GENERATION IN ANALOG MULTITRACK?

"The analog process still has a lot of life left in it. Digital will be moving in slowly, but eventually, since the advantages of digital cannot be duplicated with analog technology. What Jeep said [Jeep Harned, August MIX] is true: we will see a lot of hybrid analog/digital studios before digital completely takes over.

"Electronically, it's a sophisticated clean-up race in performance, head improvements, etc. It's a feature contest. There will be improvements, but at this stage, advancements in tape will be more important. BASF, for exam-

ple, is coming out with a 2" chrome tape. The main drawback to using chrome tapes is they are difficult to erase. While this is not much of a problem in consumer applications, if a multi-track cannot erase an insert completely, you're going to have problems. So you need a better erasing system. Most improvements in analog will follow the newer tape formulations.

"In terms of reliability and serviceability, other manufacturers have been trying to catch up with MCI. MCI owners have always been very technically and engineering-oriented, and we designed our machines to be easier to service than other recorders. Electronic components in general have always been under a lot of pressure concerning increased reliability. We in the audio industry have always had the luxury of riding on the back of technological advances fostered by other industries. We share technology with other branches of the electronics and computer industries. Some of the results of this are the availability of PC boards in short runs, and the OP amp.

"One significant thing we've noticed is more and more artists buying 24 track equipment for their homes: to check studio takes, for recording direct synthesizer tracks, etc. Someone who can relate to a Portastudio can figure out a 636 (MCI console) and a JH-24. The reliability of the gear doesn't get in the way any more. You don't need a maintenance tech standing by 24 hours a day.

"Two or three years from now, everything will be recorded with SMPTE time code, just as engineers now routinely record 1 kHz and 10 kHz tones on tapes. Since code generators are less complex than time code readers, manufacturers may someday build

a generator card into all their machines."



Otari MTR 90 II

**David Roudebush,
Otari MTR-90 II**

HAVE WE REACHED THE LAST GENERATION IN ANALOG MULTITRACK?

"There is room for improvement in both analog and digital. Each new improvement reveals little things we hadn't noticed before. Digital has made many advancements, but it's not at the end of the road. It's like the early transistor amplifiers which had better specs than the tube amps. But the tube amplifiers sounded better, and it took a while before the transistor amps evolved to an acceptable sound.

"We're moving towards a homogeneous information net where video and audio are following the computers. Our MTR-90 is a software-controlled machine. The software makes
(continued on page 17)

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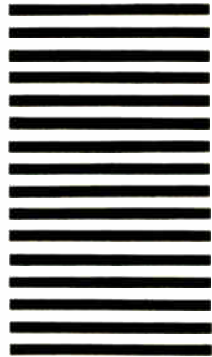


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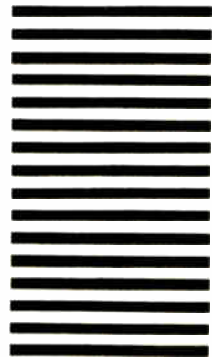


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(continued from page 15)

the machine compatible with the real world. It gives the machine greater flexibility. It's like the difference between a Seiko and a Rolex watch. We are using software and electronics to accomplish what other recorder manufacturers are doing with machining. It's more cost effective and reliable in the long run.

"Are we at the last generation in analog? The V-8 small block Chevy evolved 20 years ago as the last generation. We're like the car makers. As far as sound goes, we've mostly exceeded what was needed. The MTR-90 is far ahead of the ultimate software the consumer gets, whether cassette tape, vinyl disk, or whatever. And yet we continue to look for ways in which to improve."

**Wayne Freeman,
Soundcraft SCM 762**

HAVE WE REACHED THE LAST GENERATION IN ANALOG MULTITRACK?

"We've approached the boundaries of technology. Signal flow and reproduction can't really be improved. Microprocessor-based control will become standard. We've reached the max in terms of features needed for most applications.

"As a London-based manufacturer, we noticed that the Americans have been skeptical about buying an English mechanical product. The English electronics have always been superior. With continual engineering updates, and the dollar to pound exchange rate, we're giving people who would otherwise buy a used machine an alternative in terms of state-of-the-art, new warranted equipment.

"Digital is totally economy-based. While there are those studios that have to have the ultimate at any cost, we don't see digital moving in for

at least 5 years. If a digital 24 track were available today for \$30,000, then analog would become passe."



Soundcraft SCM 762

**John Stephens,
Stephens 821B-104A
24 track**

HAVE WE REACHED THE LAST GENERATION IN ANALOG MULTITRACK?

"The question is: How far can audio go? Our machines have been the state of the art for a number of years now, and audio has just begun to catch up. We introduced our transformerless system in 1968, and we have yet to find a machine to match its excellence in terms of reproduction. The bandwidth of our 24 track goes down to 30 Hz, ± 1 dB at 30 ips.

"Until the digital folks change

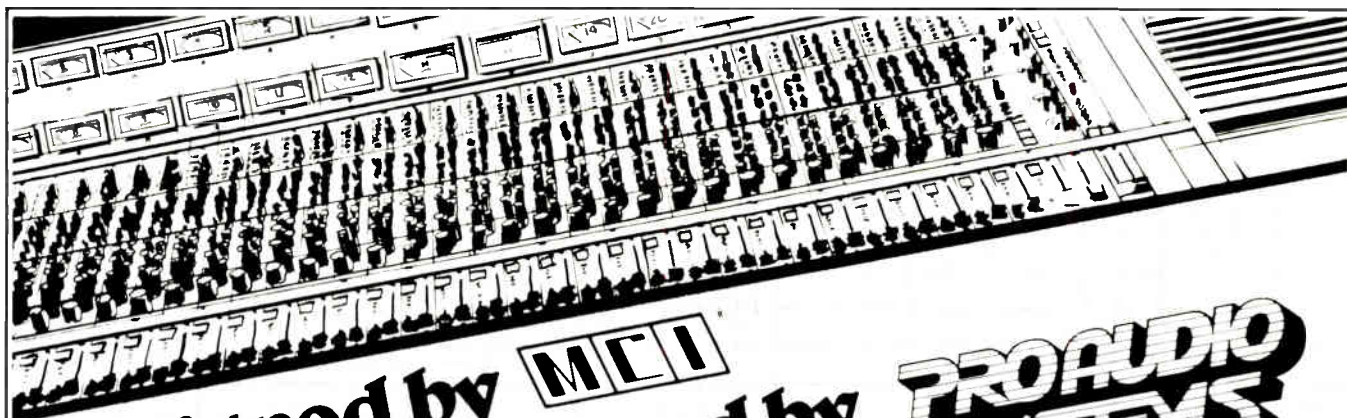


Stephens 821B-104A

their standards, analog will be around. Digital is a matter of tradeoffs at this time. They have a packing density problem. The sampling frequency is roughly 50,000 Hz. I don't know anyone who would buy a pro analog machine using a 50,000 Hz bias. I can hear the difference in the top end. I think a lot of other people can too. The high sampling rate of the dbx digital system could be a breakthrough. It sounds feasible.

"About 1968 or 1969, when chrome tape came out, I experimented with a 1" Dupont formulation and I was impressed with it. Although difficult to erase, it was as quiet as the later stuff. Even with its thin coating, we found a 3-4 dB improvement, but the manufacturers wouldn't produce it in the 2" format. Tapes today have shown much improvement: less print-through, easier to

(continued on page 19)



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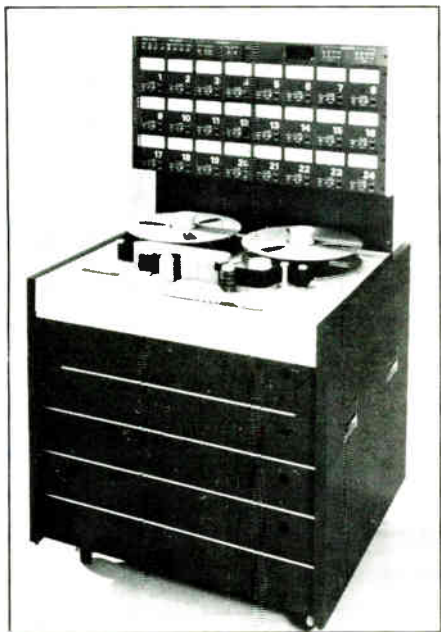
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(continued from page 17)

erase, and better signal to noise ratios.

"When digital first came out, I expected it in 5-7 years. Now I'm not so sure. A lot of it is P.F. It's like the producer who asks for more top end, and the engineer turns a knob that isn't attached to anything, and the producer says, 'It sounds better now.'"



Studer A-800

**Sam Borgerson,
Studer A-800**

HAVE WE REACHED THE LAST GENERATION IN ANALOG MULTITRACK?

"The sound quality of analog can only improve in better tape formulations and wider track width, as in our A80 two track, 1/2" mastering decks. Other improvements will come in terms

of control systems for audio/ video sweetening. Our A800 MKIII 24 track machine includes interfaces for Solid State Logic, and Neve automated mixing systems, as well as EECO, BTX, Audio Kinetics, and other synchronizers.

"Reliability and operator usability can always be improved. Our new A810 is a two track designed primarily for broadcast work. It incorporates digital microprocessor control of the audio electronics, so instead of trim pots you align with a digital pad network. This system might well come into multitrack if it is needed.

"An A800 transformerless 24 track with an A80 two track can give such superb reproduction that there's very little room for improvement. It's very close to digital. The primary advantage in most digital applications is the non-degradation of sound dubs, rather than sound quality."

**David Oren,
Tascam 85-16B**

HAVE WE REACHED THE LAST GENERATION IN ANALOG MULTITRACK?

"Analog will be with us for a considerable period. More standardization of the digital format is needed, not only in sampling rates, but in the number of digital tracks per audio channel. It's a rare case today when an album is completed at only one studio, so equipment interchangeability is an important factor. Price is another major consideration. So until these differences are resolved, analog will remain strong.

"Based on the changing market, today's analog machines are designed for use in both audio and video recording studios. The 85-16B is set up for full SMPTE compatibility with synchronizers and video editing systems. The recorder's three servo-con-



trolled motor system provides excellent high speed shuttling in sync. This is a must in a video facility where time is money.

"TEAC has been involved with digital audio for a long time. We showed a PCM (digital) audio disk at the 1977 AES show. We later developed and exhibited a draw disk with record/playback capability. But the broad-based use of digital multitacks in the world class studios is at least five years away, unless there is some major breakthrough. Advances in analog will be dependent on the quality of tape. Competition between tape manufacturers has benefitted the industry, although the greater market and profit margin has shifted from audio tapes to videotape." ■

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Guidelines for Second Engineers

by Tom Lubin

In last month's column Chris wrote about finding an engineering job in a studio—what to expect and how to prepare for it. This time I want to deal a little more specifically with the responsibilities of the second engineer. In my experience, I have found the following information to be of great (and essential) service to the operation of a top notch studio.

One of the second engineer's responsibilities is the stocking and maintenance of certain items necessary for good recording practice. The following supplies should be in each control room at the beginning of every session. This list was designed for sixteen or twenty-four track studios, but can be modified for smaller operations.

- 1) Leader tape (1/4", 1", 2")
- 2) Grease pencils (white and black)
- 3) Splicing tape (1/4", 1/2", 1")
- 4) Adhesive tape (red, blue, masking, gaffer)
- 5) Head, puck and capstan cleaner
- 6) Spare reels (2-1/4", 1-2")
- 7) Alignment screwdriver(s)
- 8) Pencils, felt tip and ball point pens
- 9) Track, trouble, and job sheets
- 10) Editing block(s) (1/4", 1", 2")
- 11) Demagnetized Razor Blades
- 12) Cotton swabs (Q-Tips)
- 13) Matches
- 14) Paper towels
- 15) Contact cleaner
- 16) Wastebasket liners
- 17) Head demagnetizer
- 18) Oscillator
- 19) Lighter fluid and air freshener
- 20) Studio and control room ashtrays

The following should be done by the Second Engineer before the session. In general it is assumed that the Second will usually arrive an hour before the session (depending on the session's requirements).

(order of importance might vary slightly)

Turn on the air-conditioning, lights, and any machinery that might

need heating up.

If for some reason there are dirty ash-trays and full wastebaskets, they should be emptied and cleaned with new liners put in the baskets. The room might also need air freshener, as might the studio.

Make sure the board is "zeroed" and that the cue, echo, and monitor sends are down before starting machine alignments.

Align the machine per normal procedures using studio "standard" test tones for the initial session of any project. Tones should then be placed at the head of the "Master" reel, and all subsequent sessions should use these tones for playback level adjustments. (It never hurts to put up the "Standard" to make a comparison with the "Master" tones.)

Verify through the console that all the tracks are working. Listen to each in record, with and without tone. Make sure each track is quiet, and that there is sufficient erase current.

Verify that the echo system is working and exactly which sends are connected to what chambers, and how the returns are hooked up.

Hopefully you will know how the engineer wants the session set up, and what microphones will be required. If not, find out as soon as he or she arrives. (Likewise outboard gear, additional tape machines, guitar amps, keyboards, etc.)

Be sure all cables are dressed so no one can trip on them when the studio lights are dimmed. Make sure ear phone distribution boxes, external power supplies and direct boxes cannot be kicked. Have all the earphones set up over music stands rather than on the floor or a mike stand. Make sure there is sufficient cord for musician movement.

Everything should be ready to go before the scheduled time.

If there are any technical or non-technical problems, please avoid moaning or worried looks. If there is time, fix the problem or call maintenance. Maintenance should respond quickly, discreetly and with a minimum of hoopla. The decision to swap components or actually fix a problem should be decided by the most expedient method.

If a significant problem exists, inform the engineer of the situation

and agree on a solution to go circumvent the problem. *Do Not* carry on this conversation in front of the client or anyone else in the session. If the client suspects a problem, be diplomatic and let the engineer handle the reply. Don't be disparaging about anything in front of a client. Don't offer opinions and, when asked, choose your words wisely. Do not allow your words to come between you and the client, and never take sides in artistic disputes in the studio.

Be ever-present, anticipating but not over-reacting, unassuming, patient (no matter whose fault something might be) and chameleon in temperament. Make sure to inform the engineer of any recent equipment modifications or changes, and what echo devices or chambers are currently connected to the board and which are available. Find out if anyone in the session has other people arriving at a later time, and whether phone calls should be held.

During the session

Best judgment should be used as to when a client should be informed of a phone call. Further, the front desk should make every effort to get the name of the caller and who the call is for. The person in the control room should make every effort to discreetly let the person receiving the call know who the caller is and what line they are on.

The Second should make sure none of the microphones, earphones, or assorted hardware and cable are in harm's way; stepped on, rolled over, struck, toppled, etc.

The Second should prepare a trouble report immediately after a problem is discovered. The trouble report should include the name of the item, the nature of the problem, when it occurred, and under what conditions. At the end of the session it should be turned in to maintenance so it can be fixed. If the problem is significant, a note should be left for anyone using the studio before the repairs can be undertaken. Outboard equipment that is not operating correctly should not be left in the studio, and neither the console nor the machines should have any indication of modules that are not working correctly. There should be a log kept of board and recorder problems that

the engineer can check before each session. It's simply bad P.R. for the client to see that any part of the board or recorder is defective. The mike closet might also be a good place for this information.

If some sort of temporary problem solving measure was used, be sure that the trouble report explains what was done. (This is particularly true of AC fuses, and the light fuses used in most of the speaker systems.) What size they are supposed to be and what size was temporarily installed should be clearly communicated, and if replacement was made with the last "correct" fuse, then a note should also be made that more should be purchased. The trouble report should also indicate if any of the console or tape machine modules were swapped. If so which modules were involved, where did they come from and where did they go.

Where appropriate the Second on a session should be responsible for take sheets, the accuracy of the track sheet, pulling the selected takes to the "Master" reel, putting up the desired selection, and keeping track of the various reels of tape, including paperwork and similar procedures for the two-track.

Toward the end of the session let the front office know what time the session will be ending, so that any additional charges can be computed. Also, any down time should be taken into consideration. Neither the Second nor the "house independent" should get into any discussion with the client about the bill. Defer all "misunderstandings" about the total to the management (particularly with a regular client). *Never* be the bad guy to the client; you have to create with them. Let the front office grind out the billing and collecting.

After Session

Before the client leaves, confirm the arrangements for their following session.

Zero the board, and begin shut-down procedures for each of the studios. (Each console will have different requirements. Generally, amplitude controls are turned to off as are all the switches. EQ selects should be sent to their center position and turned off. Any lighted switches should be off, and any switches which control relays should be set so that the relays are in a "relaxed" position.)

Clean all the grease pencil and any other marks off the board and the machinery. If there are wastebaskets with food, or full ashtrays, they should be emptied, and an air-freshener spray used.

All of the equipment and

microphones should be put away. A microphone body count before and after the session is a must. The set-up should never be left up unless by a previous arrangement with the management and all concerned. A session which goes deep into the early morning hours may arrange to let the morning Second break down *providing* there is no morning session in that studio.

Place all the stands in their designated place in the studio. Any other things that were moved specifically for the session should be returned to their "normal" placement.

(Normal: that spot which is mutually agreed to by all interested parties.)

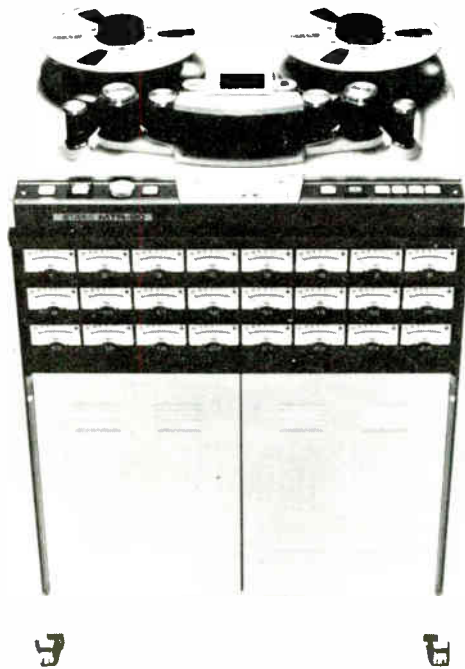
The client's tapes should be returned to the vault with the track sheet for each tune in the box that contains that selection.

If a set-up is left up, as much as possible get as many cables, ear-phones, etc., off the floor so that the studio can be cleaned.

Turn off lights and air-conditioning! (Unless either room could use the air change.)

Turn in any paper work, or other information that the front office will need the next day. ■

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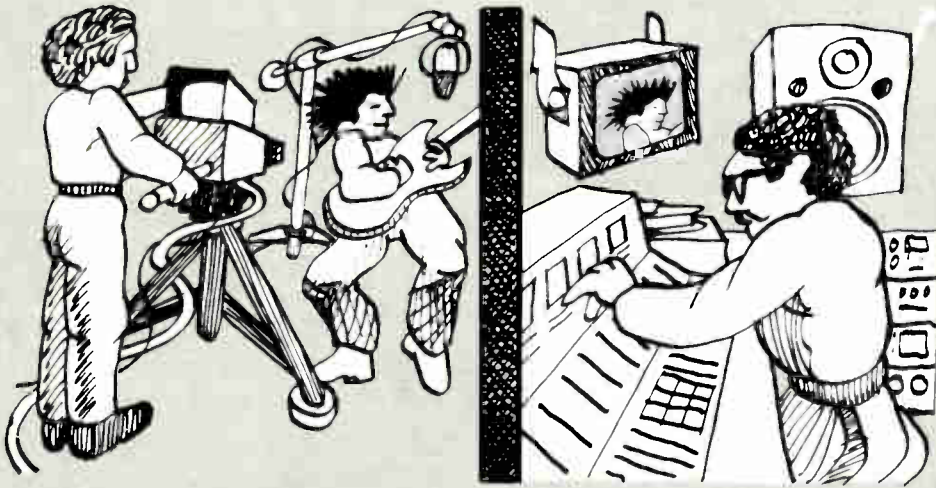
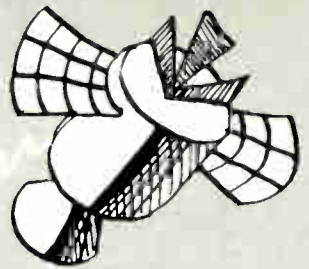
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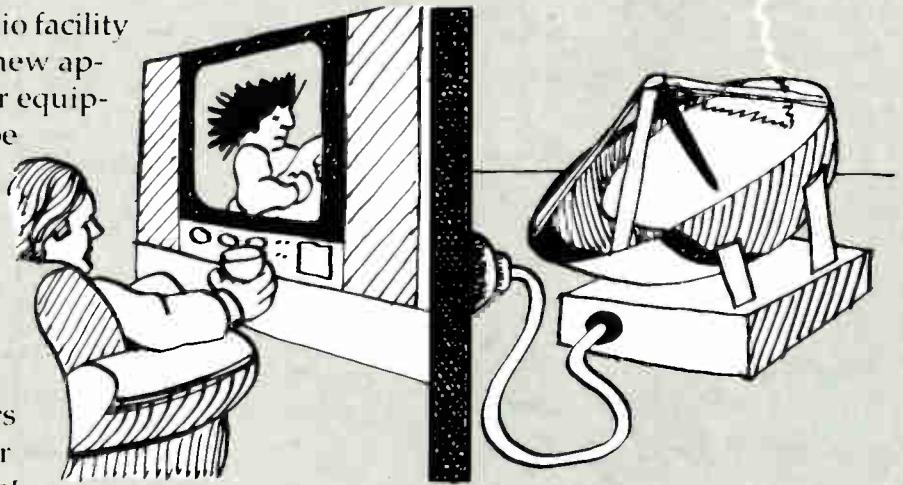
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No Studio Is An Island



Audio for Video, Video for Audio, SMPTE Sequencing, Electronic Story-boarding, Digital Editing and Processing. In the last few years, the lines between a number of diverse technologies and industries have begun to blur; and sometimes it all seems pretty confusing.

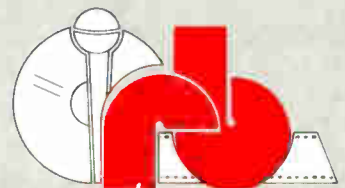
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EUREKA

TELEPRODUCTION

CENTER

by Pat Maloney

Ken Cox initially became involved with the industry when he worked as a musician in Los Angeles in the mid '60s. He gradually moved into engineering and relocated to San Francisco where he later went to work for McCune Sound as an audio technician and engineer. In 1978 he met

needed" it is. A brief description of each room, and its contents should serve to illustrate the thoughtful and

Videc editing suite; CMX editor on left, audio control in center, Grass Valley switcher on right



creative planning that went into the project.

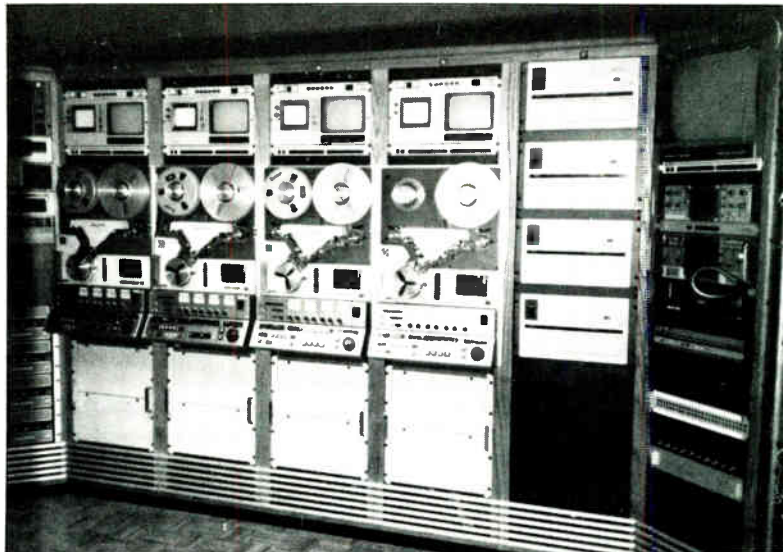
MAIN STUDIO/THEATRE

The main studio is large enough to seat 225 people and has a 25 foot ceiling. A driveable "Tiger" pneumatic scissor lift is available to aid in focusing and moving the overhead lighting instruments. In addition to the complete video lighting system, a full complement of theatrical lighting including two followspots has been installed to provide the appropriate illumination for events such as corporate presentations, theatrical plays, concert, industrial shows, etc. Both systems are independent of each other yet controllable from a single computerized lighting board.

The three foot high proscenium stage occupies one entire end of the studio and comes complete with curtains, border lights, and a permanently curved rear cyclorama. Three MSL UltraMonitors are recessed into the oak stage floor, a design feature much appreciated by dancing performers and videc directors. Also recessed and covered with protective

another Ken, Mr. Kenneth L. Kidwell, President and chairman of the board of Eureka Federal Savings. Mr. Kidwell had an eye on the future and discussed with Ken his vision of a state-of-the-art combination audio and video teleproduction center. Shortly thereafter Ken left McCune to put together the Eureka Teleproduction Center in San Carlos, California, and proceeded to secure the services of some of the top studio design and construction people in the business.

The result is a vast media center that is impressive not just because of the amount of equipment inside, but by how well "human engi-



Video master control with Sony 1" machines

metal panels are the stage mike boxes. Portable UltraMonitors can also be plugged into several wall mounted connector places located around the studio. Forty-eight mike lines are available at various panels throughout the room.

A glassed-in stage manager's position doubles as an offstage monitor mix position complete with built-in mike splitters. Storage areas underneath the stage contain rolling carts that can be loaded with grip equipment such as extra lighting instruments and cables. Separate loud-

speaker zones located within the studio/theatre area can all be individually adjusted with White equalizers. A complement of 8" JBL full range loudspeakers are mounted in sealed ceiling enclosures and are intended principally for voice reproduction or low level music reinforcement. Heavier PA requirements are handled by 6 MSLI UPA loudspeakers and 2 MSLI R-2 subwoofers that are mounted in three separate groups above the proscenium arch. Additionally, 2 UPAs are located high up in the rear corners of the studio for those

rear fill and surround sound applications. Amplification is by BGW and Crest.

A floor to ceiling soft cyclorama can be drawn across the control room windows opposite the stage to allow shooting from the front of the studio to the rear - handy for more traditional visual environments that don't include a stage as part of the set.

A remote truck would have a very easy time of it here logistically. A driveway beneath the theatre can serve as a parking space and all cables get routed up a stairway and then pulled through specifically designed access holes in the walls of the studio itself. Although the studio is located on the second floor of the building, a street level elevator is conveniently located for easy movement of equipment into the room.

A multitude of isolation baffles are available in various sizes, with or without windows. They can be used as free standing units or combined to form 'walls' to turn the studio entrance and exit areas into very effective isolation booths. These short hallways vary in size and have all been acoustically treated to provide optional recording environments for everything from the studio's Steinway concert grand to an acoustic guitar or drum set.

Located in a rear corner of the studio is a food service area with sinks and refrigerator to accommodate late evening snacks - or perhaps cocktails for that more formal session.

Two fully equipped dressing rooms are located above the stage and are accessible from the offstage left area. Located next to the dressing rooms is the Video Camera Control room which contains all the camera color matching and shading equipment. For on-location work a remote truck is available that utilizes Ikegami cameras, Sony 1" and 3/4" video tape machines and Nagra audio recorders.

PRODUCTION AUDIO CONTROL ROOM

Located in the rear of the studio, the audio control room is behind a sliding glass window that opens to the theatre/studio - necessary for live PA work using the proscenium speakers. For recording purposes, the window is closed to provide the necessary isolation for recording onto MCI multitrack machines. Utilizing ACD/John Meyer Studio monitor speakers, a live mix and a multitrack recording can be done simultaneously! yet totally independent of one another, due in part to extensive modifications to the 48 input Harrison audio console. Forty-eight channels of ADR 'Scamp' module positions, one for each console input, are available for signal processing.



Mr. Randy Goodrum—
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Randy Goodrum

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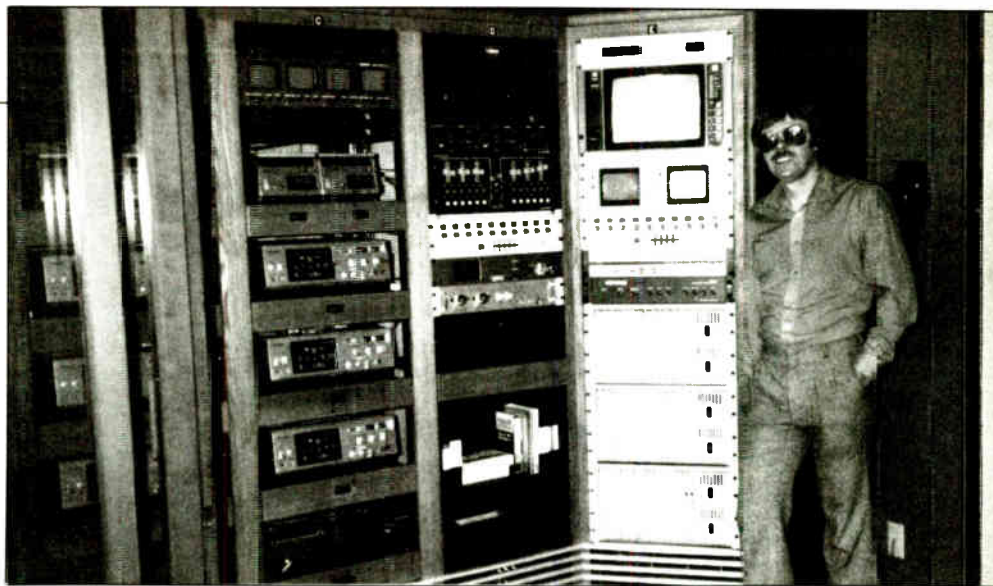
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LIGHT AND PROJECTION BOOTH

Located next to the audio booth in the rear of the room is the light and projection booth. One hundred twenty eight dimmers are individually controlled by either a manual board or computerized equipment built by Berkey/Colortran. A color video monitor is located to the right of the computer board so the operator can immediately see the results of lighting adjustments from the camera's viewpoint. Also within easy reach is a variety of items such as a disco type special effect light controller and a small group of audio controls and tape deck remotes for use during small meetings and multimedia shows. Twelve slide projectors for these shows are set up in three groups of four projectors. These are flanked by a Phillips professional 16 mm projector. The slide projectors are under the control of a Spindler/Saupe multi-image dissolve unit and the 16 mm is remotely controllable from the lighting desk.

VIDEO MASTER CONTROL

Moving upstairs to the third floor, we come upon an apparent room within a room – the heart of video operations, Master Control. The room measures about 10' x 15' and the walls are actually not walls at all, but rather custom designed equipment racks faced with oak that house video equipment from floor to ceiling. The equipment in this room includes an MCI audio recorder as well as two Sony 3/4" video cassette machines for transferring programs via a video noise reducer, color corrector and time base corrector to one or more of the four Sony BVH1100A 1" color VTR's. All machines have Dolby 'A' type noise reduction on the audio channels. Additionally, this room contains four Sony BVT2000 digital time base correctors (one for each of the four 1" machines); a CMX computerized video editing system which controls the four Sony 1" machines as well as the MCI audio recorder; electronics for the Grass Valley switcher in the Editing Suite; Quantel Digital Video Effects electronics; master sync generators; Grey Engineering SMPTE time-code and character generators; the main switching station for the RTS 2 channel intercom which runs throughout the facility; and finally, two racks of audio and video patch panels running from floor to ceiling which



contain tie lines from everything here in master control to all the other rooms in the center.

VIDEO EDITING SUITE

Two thick smoked glass doors lead to the control center of the video department – the Editing Suite. Precisely outlined by overhead spotlights in the semi-darkened room (no lighting glare on these video moni-

tors!) are several control panels dedicated to specific video post-productions operations. A remote keyboard for a Chyron color graphics computer allows last minute adjustments or changes to graphics during actual post-production work. The CMS computer editing console controls the operations of the four Sony 1" machines as well as the MCI audio deck. A Grass Valley switcher

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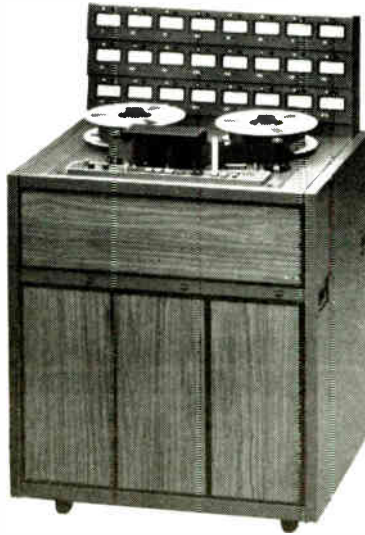
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JH-24

The New JH-24, latest in the world's most accepted series of multitrack recorders offers unmatched performance coupled with work and time-saving features. Available in 24, 16, or 8 track formats, this recorder easily accommodates format changes, and a machine purchased in a lower track format (8 or 16) can be field upgraded to 24 track. A full function remote control is included, with time saving automatic input switching to simplify overdubs.



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has an effects memory system on each of its three effects banks that enables it to put together a sequence of different effects that can be changed, updated, and repeated.

The custom audio panel in this room is notable for its absence of traditional faders. Instead, touch sensitive strips control audio levels to and from the various mixdown machines and playback decks. The entire studio center is designed for stereo audio recording throughout the video chain and so the acoustics and monitoring equipment in this room are compatible with those in the audio control rooms. Monitoring options include built-in ACD/John Meyer Studio Monitors, a pair of JBL speakers, and Auratones, all switchable from the audio console.

VIDEO GRAPHICS ROOM

A few steps down the hall from Master Control is the Video Graphics room, and its primary occupant is the Chyron IV Graphics Generator. The Chyron contains a 'font compose' feature that allows on-screen lettering and graphics in various type style or 'fonts.' Graphics material can also be placed under a high resolution black and white camera which sends the image to a computer to be colorized, manipulated, and displayed in any combination of 64 different colors on a video screen.

VIDEO DUBBING ROOM

The Video Dubbing Room, located next to the video graphics room, is capable of producing video tape dupes in 3/4", VHS, or Beta formats. Recorders include Panasonic 8200 VHS machines with two channel audio, Panasonic consumer VHS unit with a single audio channel, Sony VO-2800 3/4" and Beta recorders. Each deck is connected to its own video and audio monitors as well. Of course, all the machines can be programmed to record from the same source at the same time, whether the signal originates from anywhere within the building, from local TV programming, or from the satellite dish on the roof. An electronic matrix performs all the necessary video and stereo audio patching.

An image enhancer and a digital time base corrector are available to clean up and improve the quality of the dupes to where they can often look better than the original. An AD/R stereo ParaGraphic equalizer and a Compex Limiter are available for enhancement of the stereo audio tracks as well. The final handfinished oak 'rack' contains a 13" Conrac color monitor, vector scope, waveform monitor, and RTS intercom station.

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Audio remote control panel; MCI transport remotes, BTX Shadow Synchronizer, data entry terminal

AKG, Beyer, Calrec, E-V, Shure and Sony. Headphone cueing is via Westlake Audio headphone boxes that provide for individual control of channel switching and level setting.

• • •

A design feature that I especially appreciate is apparent



Left pullout drawer: computer controlled routing and assignment switcher. Right drawer: Cibola's multi-function remote controller

AUDIO MIXDOWN ROOM

The mixdown room contains another Harrison console, with 32 inputs. Tape recorders available in the room include an MCI 24 track, an MCI JH110 1/2" 4 track, an MCI 1/4" 2 track (convertible to 1/2" 4 track), two Otari 5050B series machines (a 2 and a 4 track, mainly used for dubbing and slide show productions), four Technics RSM-95 cassette decks (for high quality real-time cassette duping), and an Otari high speed duper for making cassette copies of lectures and speeches.

Audio and video machine synchronization is provided by BTX.

Control room monitoring is via ACD/John Meyer Studio Monitors complete with MSLI subwoofers, and Auratones. Located in front of the console is the producer's music scoring area which looks through a large glass window into Studio B. The scoring area contains a 64 voice Synclavier synthesizer and a Linn drum machine which are interfaced to the computer for precise control of the various sounds needed on a particular video project or audio production.

throughout the center: namely, even though you can accomplish the most complicated patching, routing and recording setups imaginable, there is also the provision to do things the easy way if that is all that is required.

A remote control panel in Studio B is a typical example of what I'm talking about. Housed in a hand-crafted oak cabinet (which doubles as a telephone stand) is a custom designed control panel that dims the lights, opens and closes the shades in front of the control room window, and remotely controls audio and video playback machines for screening purposes. Every room in the center has a similar panel to control functions pertinent to its specific locations.

And should you desire a break from your production work at the Eureka Teleproduction Center, (or simply need to rest after a tour of this extensive facility!) you can relax in the comfortable client lounge which contains a wet bar, color TV, couch, and even an imported Italian espresso machine. ■

STUDIO B

Designed primarily as a narration voice-over and overdub studio, this room contains its own set of the ubiquitous ACD/John Meyer Studio Monitors (complete with subwoofers!) so the artist doesn't have to go next door for playback in order to hear the quality of the performance. When used in conjunction with a Mitsubishi large screen video projector, these superior quality time and phase corrected loudspeakers transform the studio into a very impressive screening room.

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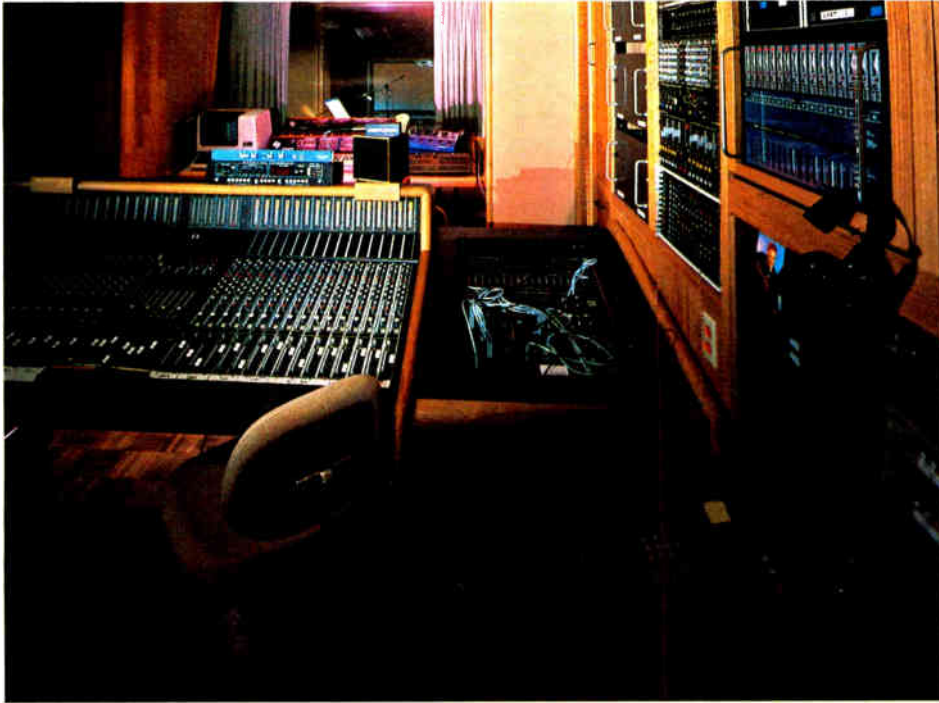
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World Radio History

VARIETY & Diversification

by **George Petersen**

1982: The year of the record industry slump. An economy in deep recession. Unemployment reaches an all-time high. To cope with lower sales, A & R executives at major labels are more cautious than ever, with few acts

being signed. The major acts are in fierce competition for slots on tight radio playlists. And yet, in the northwest area and nationwide, new studios are being built, others are upgrading and remodeling, and pro-audio dealers report strong sales. The key in this paradox lies in significant market changes, both in studio diversification and record distribution.

Augie Blume, of Augie Blume

and Associates, a San Francisco-area consultant in record promotion, distribution and artist publicity, has noted an increase in local recording activity: "More and more, bands are distributing their own product, particularly due to the reluctance of regional distributors in handling artist-produced records. One local band, 'Merlin,' has sold over 9000 albums through off-stage sales, mail order, and their fan club. That's quite good for a locally produced album."

Mountain Ears began eight years ago as a 4 track studio, and is now Boulder, Colorado's only 24 track facility. Through constant upgrading (they recently acquired additional EMT plates, outboard gear, and microphones from a defunct St. Louis studio), they have built up a large base of steady customers. Owner John Aldridge says, "We don't feel the L.A. or San Francisco pinch. We reduced our rate for night recording to \$65, and we've been doing real well." (During the month of November, they reported 100% bookings.)

Next Coast Productions of Boulder, Colorado has christened its drive to develop a record market in the Rocky Mountain region with the completion of the company's first two album projects.

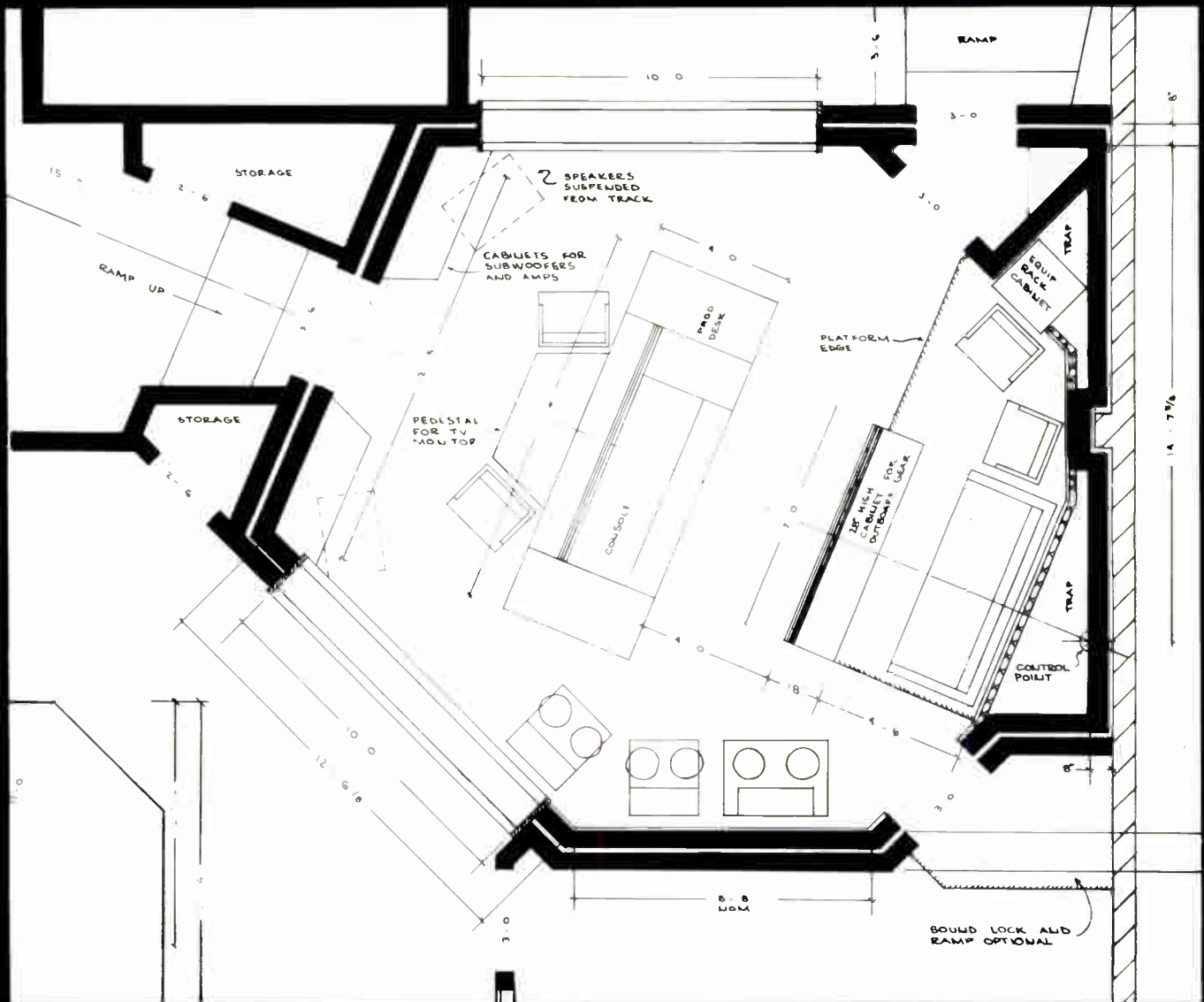
In association with Austin-based Free Flow Productions, Next Coast has produced albums for reggae artist John Bayley and pop-rock band The Joxx. Both disks will be issued on Free Flow's Breaker Records label as part of a six-album financial package arranged between the two companies earlier this year. Included in the deal are album distribution and artist promotion guarantees, as well as other financial incentives.

Sound Techniques, in Madera, CA (Fresno area), recently upgraded their Otari MTR-90 Series I recorder to 24 track. "Barry Ross did the conversion. The nice thing about Otari is that everything went so smoothly," said owner Ken Carlton. "We also added a Sound Workshop Series 30 console with ARMS automation, a vocal stres-

Mountain Ears Studio

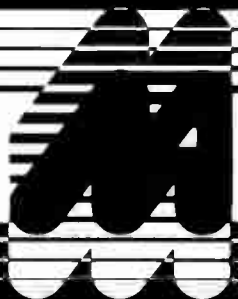


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Northwest Recording Update

Triad Studios, Redmond

son, and a Harmonizer. Business has been great over the past year. I'm basically a rock and roller, but last year I produced two country albums and two contemporary Christian albums."

Eric Seaberg, manager of Triad Recorders (Fresno, CA) reports their new, George Augspurger-designed, three room facility will open in February. The two large main rooms will feature Studer recorders and Quad/Eight consoles, while the third room (7' x 7') is laid out for radio/voiceover production. The two main control rooms were designed to be identical in sound so producers could easily use either room based on availability. The studio will also allow SMPTE sync to either 3/4 or 1" video for sweetening projects.

One of the more popular attractions at the November AES show was the unveiling of the first episode of MIX video magazine. This lively and informative thirty minute tape was directed by Lou Casabianca, of Speed of Light Video Productions, of San Francisco, and was written by MIX editor David Schwartz, general manager Penny Jacob, and noted screen author David Goggin. Following the familiar MIX magazine format, the video featured a Producer's Desk interview with David Rubinson, owner of San Francisco's The Automatt studios; an inside look at computer animation by Denver's Computer Image Corp.; and a portion of a NARAS instructional seminar with veteran producer Fred Catero explaining drum miking.

R.O. Studios, (Concord, CA) underwent a total renovation from 8 to 24 tracks, and opened their doors last month. Jeff Cooper assisted with the designs, and the facility is now equipped with an Otari MTR 90 II recorder and a Sound Workshop Series 40 (28 x 24) console from Sound Genesis. Ralph Henry, R.O. owner, explained the studio now fits his concept of a "house-studio," since Chris Ostrander wired every room in the house for recording. Randy Stadtman's "dial a mix" system was also installed so four separate mixes are available to each set of headphones.

Bodacious Audio, Inc., formerly of San Mateo, CA, has moved their headquarters to Sausalito, in the Harbor Sound Complex. They now offer full production services, 24 track remotes, video production, and 1/2" Ampex two track machine and head rentals. Harbor sound will continue to



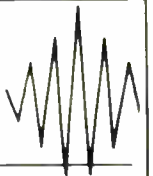
offer 24 track fully-automated recording and mixdown, and 1/2" and digital mastering.

Tres Virgos Studios in San Rafael, California celebrated their first

year of business last November in their new Chips Davis LEDE™ Designs 24 track room and owner/engineer Robin Yeager reports that business has been growing tremendously. Projects com-

rms sound

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Circle #023 on Reader Service Card

DNA OPENS IN SEATTLE

by George Petersen

DNA Productions, of Seattle, Washington, unveiled their new, world class facility with a grand opening party November 28. The studio design, by acoustician/designer Jeff Cooper, consists of a round building where the angular, prism-shaped control room juts into the circular layout, forming a crescent-shaped main studio. Large stained glass windows along the back wall are in stark contrast to the room's black velvet wall panels and plum carpeting. According to David Thompson III, DNA owner,

"The design is totally unique. There's no other studio like this anywhere. Jeff did a fine job. A lot of the people who come in here say the studio looks like a spaceship. Actually, the black wall panels do give the impression that the room reaches out into infinity."

DNA engineer Pat Hewitt was "... surprised at the high quality of construction. All the rooms are floating. It's all first class. Not a dime was spared anywhere." The recording gear is also of high calibre. The control room is equipped with an Otari MTR 90-II 24 track, Otari 1/2" and 1/4" two track machines, and a Sound

Workshop Series 40 36 x 32 transformerless, fully automated console from RMS Sound. JBL 4435 BiRadials were selected as control room monitors.

"We designed the studio to cater to major artist album projects and audio sweetening for TV commercials and video," Thompson explained. "We've noticed a growing need for this type of facility, and we're anticipating the market by getting in on the ground floor." The DNA studio is equipped with a BTX Shadow synchronizer and a JVC video recorder for such projects. ■

pleted by the end of the year included mixing on Van Morrison's new Warner release, tracking and mixing for "Children as Teachers of Peace" by Verlin Chalmers, a project for Big Sisters, audio for a video by the band Merlin for a CBS pilot entitled "Battle of the

Best," and a number of radio commercials for Tamarin Productions, an in-house production company affiliated with Tres Virgos.

Jack Leahy, of Russian Hill Recording, San Francisco, has kept his studio busy by turning to jingles, com-

mercials and video work. Having completed audio work for a Garfield special with Lou Rawls, and Norton Buffalo's "Double Down," they are now doing audio post-production for Carol Ballard's (director of "The Black Stallion") new film "Never Cry Wolf." This Amarok Production film is slated for Disney release. Jack has also started a "graveyard shift" night rate of \$35/hr to expose the studio to new clients, and to keep his second engineers busy.

Album activity remains heavy at The Automatt, in San Francisco, where recent projects include Carlos Santana working on a self-produced solo LP for Columbia with Ken Kessie engineering and Maureen Droney assisting. Angela Bofill is working on an Arista Records LP with Narada Michael Walden producing one half of the project with Dave Frazer engineering and Angela Bofill producing the other half, with Leslie Ann Jones engineering. And Tamy Comstock's new project is in the works for U.S. Records with Elliot Mazer producing and Fred Catero engineering.

Pro Media, of San Francisco, has just completed the installation of a large corporate audiovisual facility for IBM, in San Jose. The company's rental department has just gone nationwide and have added Revox and Trident to their lines. Some of their more popular tradeshow rental items are the GE PJ-5050 video projector, and the reliable combination of AB Systems amplifiers paired with Meyer MSL-3 speakers.

At Mobius Music Recording in San Francisco, Jules Broussard has recently completed his album. Currently at Mobius, Larry Vuckovich is recording a new album with Gaylord

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Birch on drums and Kenneth Nash playing percussion for Palo Alto Jazz Records. The above sessions were engineered by Oliver DiCicco and assisted by Annette Olesen.

The latest news from Starlight Sound Studio in Richmond, California, includes Parallax recording their debut album for Tongue in Groove Records. Andy Kulberg is producing with Norman Kerner engineering and Tim Song Jones assisting.

In Oakland, Bob Ulius of Leo's Pro Audio reports they have remodeled the store and have added better quality products to fit the need of the increasing recording market. Now the exclusive Soundcraft dealer for Northern California, Bob finds the Soundcraft 16 x 4 boards under \$5500 to be a popular item. The DeltaLab Effectron is also selling quite well.

In addition to their usual clients, Sound Genesis in San Francisco has done two unique installations recently. One is a telemarketing system (up to 18 locations) for Tarden Computer Corp., and the other is a complete 24 track facility built for Chuck E. Cheese Pizza Time Theatres, incorporating an automated Sound Workshop console and an Otari MTR-90.

John Sugnet, from Recording & Broadcast Supply (San Rafael, CA), feels the recording studio market has stabilized somewhat, and they have made up the difference through serving the growing corporate AV field. They are now working on an installation for California Image Associates, a new, state-of-the-art, 5-6 million dollar Sacramento video facility. Some recording products which have been selling well are the Orban 421 gated compressor/limiter/expander, the DeltaLab Effectron.

Northwest Recording Update

R.O. Studios



tron, and the Sony C-48 large diaphragm, switchable pattern mike, which John feels is comparable to Neumann and AKG, while at a lower price.

Sonic Landscapes of Sausalito, CA has completed a complete sound system design/installation for the El Dorado Saloon, Sacramento's million dollar showcase club. The system features Meyer Sound Labs components for both the house and stage monitor speaker systems. The club also features a Soundcraft Series 800 console, BGW power amps, White equalizers, a Lexicon Super Prime Time, and a White real-time analyzer to round out the system.

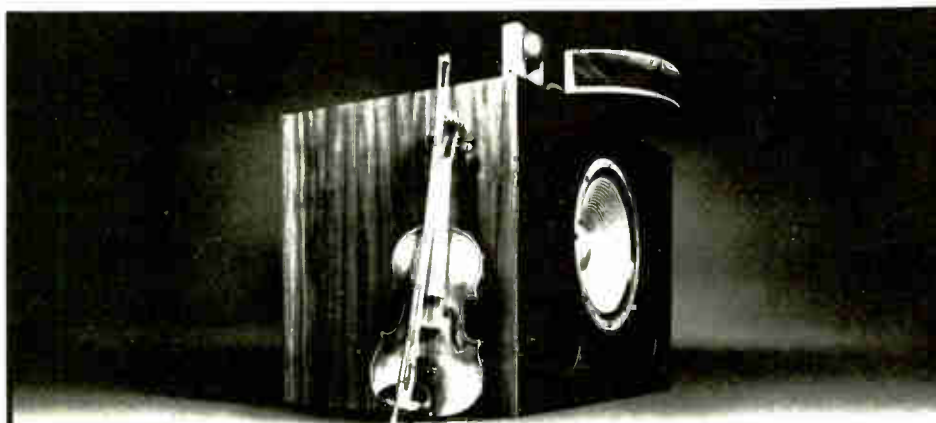
According to Roy Segal, Executive Vice President at Fantasy, (Berkeley, CA) they have completed the complete remodeling of Studio "A". The new room, designed by George Augspurger, now features a Neve console, with Studer and Mitsubishi recorders. Studio "A" was designed to be compatible to their popular room "D", which is usually booked solid.

Spectrum Studios, of Portland, Oregon, joined the ranks of the top ten percent of recording studios in 1982. Michael Carter, President, indicates, "Our business is up over 18%... the half-million net sales figure we achieved has been our goal for years. Most studios doing that amount of business are in L.A., New York, Nashville, Dallas or Chicago." Spectrum has recently moved into the audiovisual sales and design/installation field. They have also completed total AV systems for corporate conferencing and sales rooms.

Web Staunton, at Mountain Mobile Recording, has completed the outfitting of a 1961 Silver Eagle bus for remote recording. The unit now houses a 24 track Otari MTR-90 recorder with autolocator, and a Neotek Series II console. Home based thirty miles south of Klamath, near the California border, Web intends to mainly serve the Seattle to Reno area, but will go anywhere up or down the coast.

Action at Soundsmith Studios in Portland, Oregon, centers around their progress to become a full service audiovideo production center. Besides the recent addition of a 32 input custom built mixing console, the studio has recently added a BTX shadow system for video sweetening and is scheduling a January opening for their 3/4" post production video facility.

Triad Studios, in Redmond,



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Washington, have continued their on-going process of upgrading, according to Dan Foster, studio manager. "We finished the acoustical work on our live end," he explained. "It's great for strings, and we now have the largest string floor in our market. We also added about \$30,000 in equipment, including a Lexicon 224x, a Harmonizer, a Klark RTA, and a Linn drum machine."

Greg Paisley, of RMS Sound in Seattle, reports excellent business. In addition to providing the gear for the new DNA studio, Greg believes the "Pacific Northwest has great potential."

We just opened our new store/showroom in Portland and things are really picking up." RMS also completed a large installation for the Community Chapel Bible College, going from 8 to 24 tracks with an Otari recorder, Sound Workshop Series 40 automated 32 x 32 console, a Lexicon 224, and JBL Biradial monitors. Community Chapel has a complete media center, printing plant, and their own record label.

Dave Dewey, from Seattle's Pro Audio Systems, also indicates burgeoning business over the past year. "Most of the people up here have been building their businesses slowly, with their own money, and tend to be cautious," he explains. "We've seen a lot of upgrading, with a number of studios going to 16 track or to 24 track. Many broadcast facilities are also getting into multitrack, and the new MCI JH 800 broadcast console has generated a lot of interest." He also says that 16 track machines are selling well to composers, and recently sold 16 track gear to Surreal Studios in Anchorage, Alaska.

Current activity at Brant Productions Recording Studios in Seattle includes writer/artist John Soltero from L.A. area recording musical education series tapes with Michael Radford producing and Bob Ensley engineering; solo artist John Candelario recording original selections for possible single release, Bob Ensley engineer; and tracks for the "Santa Fe Cruisers" band, Bob Ensley engineer.

Throughout the year, NARAS (National Academy of Recording Arts and Sciences) has been very active in the Northwest area. Studio tours and luncheons were held in California's central valley, the San Francisco Bay Area, and in Portland, Seattle and Vancouver. NARAS also sponsored instructional seminars on jingle singing, a singers workshop, and recording, manufacturing, promoting, and distributing records.

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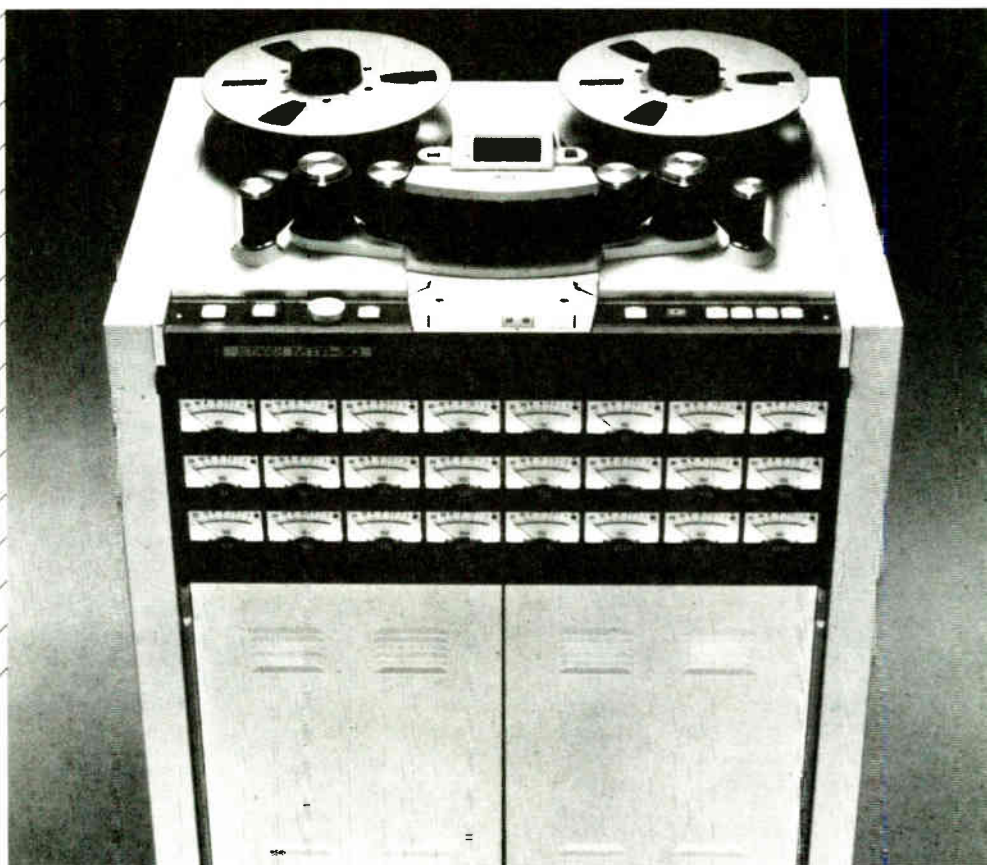
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 Studio Manager: Jim Van Wazer

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 3651 East Marginal Way South, Seattle, WA 98134
 (206) 587-0112
 Owner: Steve Springer
 Studio Manager: Steve Springer

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 Honolulu, HI 96814
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 Studio Manager: Les Edwards

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 Studio Manager: Les Edwards

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 (415) 834-6912
 Owner: Walter
 Studio Manager: Walter

• **THIRD EAR SOUND CO**
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 (415) 233-2920
 Owner: Jim Hirschman
 Studio Manager: Jim Hirschman

• **3-B PRODUCTIONS**
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 701-16B Kings Row, San Jose, CA 95112
 (408) 298-1323
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 Studio Manager: Kevin

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 (415) 777-0494
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 Studio Manager: Tom

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 Studio Manager: Al Vedro

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 Studio Manager: Tom

• **ARTICHOKE PRODUCTIONS**
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 Studio Manager: Fred Kuttan

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 (415) 892-5911
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 Studio Manager: Mel Martin

• **CHONK MOONHUNTER**
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 2721 Bellaire Place, Oakland, CA 94601
 (415) 436-6978
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 Studio Manager: Carl

• **FRED FOXX MUSIC CO /STUDIO IV**
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 Studio Manager: Fred

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 Studio Manager: Tom

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 (415) 533-6070
 Owner: Jim
 Studio Manager: Jim

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 (206) 597-8700
 Owner: Tom
 Studio Manager: Tom

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 Studio Manager: Lew

• **PFS RECORDING**
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 Owner: The J.F. Shaw
 Studio Manager: Max

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 Studio Manager: Fred

• **PINE APPLE STUDIOS**
also REMOTE RECORDING
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 Owner: Tom
 Studio Manager: Tom

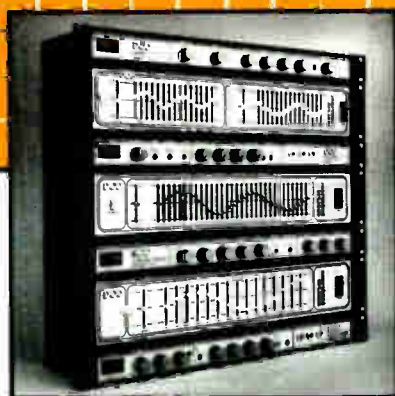
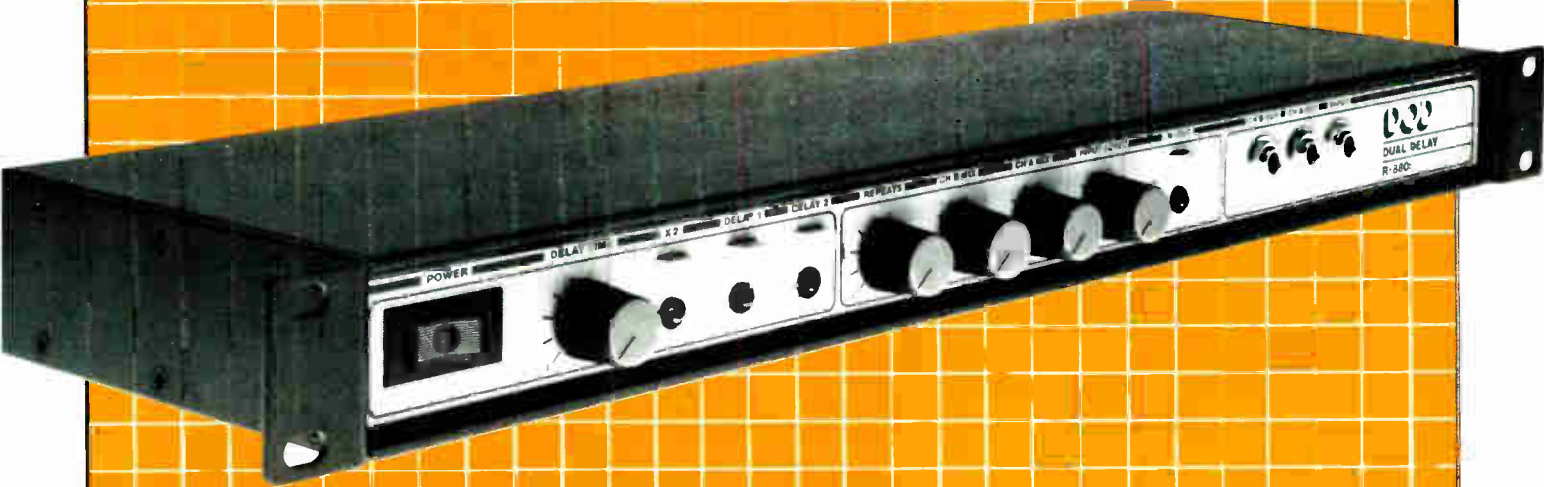
• **RECORDING ETC**
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 (415) 327-9344
 Owner: Tom
 Studio Manager: Tom

• **SILVER LABEL RECORDING**
also REMOTE RECORDING
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 (415) 321-5776
 Owner: Tom
 Studio Manager: Tom

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Description

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Special noise reduction techniques make the R-880 quiet enough for even the highest gain preamps, and it incorporates some features only available in digital systems.

All this, combined with the DOD reputation for quality and service makes the R-880 an excellent choice for medium to long audio delay applications.

The Dual Delay uses both companding and emphasis to achieve its remarkably quiet operation.

Delay times of 12 ms through 500 ms are easily obtained by adjustment of the simple, straight forward controls. The front panel is divided into three sections: the delay controls; the signal controls; and the signal jacks.

The DELAY 1 and DELAY 2 switches engage each of the delay lines; therefore, at least one must be "in" to produce a delayed signal. The INPUT jack goes directly to the input level pot, so there is no input stage to overload. The CLIP indicator begins to light at about one-half of the actual clip point to allow for more headroom in the program material. The A MIX and B MIX controls are two identical mix circuits that go to separate output jacks. When using two amplifiers, the mix controls may be set differently for greater presence.

Specifications

Frequency Response:
 Dry 20Hz to 20KHz \pm 1db.
 Delay 40Hz to 6KHz \pm 1db.
 X2: 40Hz to 3KHz \pm 1db.
 Signal to Noise Ratio:
 Dry 95 db un-weighted.
 Delay 90 db un-weighted.

Input:
 100K ohm unbalanced.
 Outputs:
 Channels A and B are separate and identical. Output impedance is 600 ohms each channel unbalanced.
 Indicators:
 All switches have LED lamps to indicate when they are in. The power switch is illuminated when on and the clip lamp lights when a signal over 5 volts PP is present.
 Delay Range:
 Delay 1: 12 ms to 125 ms.
 Delay 2: 25 ms to 250 ms.
 Delay 1 \times 2: 25 ms to 250 ms.
 Delay 2 \times 2: 50 ms to 500 ms.
 Size:
 Standard 1 3/4" \times 6" \times 19" rack.
 Weight:
 6 lb. 7 oz. (3 kg.)



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8 TRACK

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3327 Mt. Diablo Blvd., Lafayette, CA 94549
(415) 283-4094
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Engineers: John Rowe, Peter Rowe, Duncan Rowe
Dimensions of Studios: 15 x 20
Dimensions of Control Rooms: 12 x 14
Tape Recorders: Scully 8-track, Scully 240 2-track, Pioneer
CTF 900 cassette
Mixing Consoles: Smith Workbench Series 805 16 in x 20 in
Monitor Amplifiers: Crown DC 300A Symetrix HA 10
Monitor Speakers: UREI Tricore Model 811A
Echo, Reverb, and Delay Systems: Master-Bloom XL 805 Fair
child preamp, Debut 401 MXR comb filter
Other Outboard Equipment: UREI 1144 limiters, Furman para
metric EQ, Yamaha 2201 power amp, UREI 1176 limiters,
Symetrix noise gate, and many others on request
Microphones: Neumann U87, EV RE 20 DS-5, Shure SM 57
42, 545, AKG 451 E, RCA DX 77, Sony C12, C7A, C55
Instruments Available: Wurlitzer baby grand, best guitars
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Rates: \$100/hr for block time rates
Extras: Nice quiet, relaxed atmosphere for the artist to exercise
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Direction: Set-up opening in June 1981, we have recorded such
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track studios around the Bay Area, but when you record with the
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Studio Manager: Rick Farlee

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(415) 865-2040
Owner: Michael Coonan
Studio Manager: Michael Coonan
Engineers: Michael Coonan
Dimensions of Studios: 12 x 14
Dimensions of Control Rooms: 10 x 11
Tape Recorders: Ampex M41000 8-track, Ampex AG 450 2
-track, Sony 854 45 4-track
Mixing Consoles: Custom built
Monitor Amplifiers: M. In-sh Model 80
Monitor Speakers: JBL 4-1
Echo, Reverb, and Delay Systems: MIC MIX Super 11
Other Outboard Equipment: dfx 1800 compressor, SAF graph
ic Microtech graphic
Microphones: Neumann 180s, AKG D224E, C451E, Beyr
M460, EV RE 18, et
Instruments Available: Grand piano
Rates: \$50/hr plus tape and studio 1000 Hz from your tape
and artwork for \$2,500.00 (includes color cover, everything 1000
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(415) 479-2124
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Studio Manager: Robert Brown
Engineers: Henry Vincent, Lester Bushlow, John Liverio
Dimensions of Studios: 20 x 24, 29, 20 x 24, 15,
20 x 50 (10), 20 x 40 x 50
Dimensions of Control Rooms: 12 x 5
Tape Recorders: Otari MX 505, MX 508 track, TEAC 444 4
track, Sony 4-track 4-track
Mixing Consoles: Tascam 1642 16 in x 2 out, Tascam custom
ized 1642 16 in x 2 out, Yamaha 16 in x 2 out
Monitor Amplifiers: McIntosh TR1, Linnson Pyra 70
Monitor Speakers: JBL A and B, A and B
Echo, Reverb, and Delay Systems: Space station, SST 182,
Ibanez AD 280, MXR Electric tube, E-muplex, Mood Player
Space 150
Other Outboard Equipment: SAF 701 graphic EQ, UREI lim
iter, Bi Amp graphic EQ, IVP pre-amp, box noise reduction
Microphones: Neumann 400, 421, 441, AKG Sony EV,
Shure
Instruments Available: Piano, synthesizer, drum, and other on
request
Rates: \$40/hr in 4 hr. block time available

•• ACCESS AUDIO
also REMOTE RECORDING
71 Langton, San Francisco, CA 94103
(415) 864-4656
Owner: Perry Lunsister
Studio Manager: Perry Lunsister

•• ACE TUNEL SOUND CO
also REMOTE RECORDING
9944 S.W. 37th Ave., Portland, OR 97219
(503) 246-5046
Owner: Zack Zaccaria, Laura Zaccaria
Studio Manager: Zack Zaccaria

•• ALEGRIA PRODUCTIONS
P.O. Box 1339, San Juan Bautista, CA 95045
(408) 623-4902
Owner: Alegria Productions
Studio Manager: Diana Sletten

•• AMERICAN MUSIC RECORDING STUDIO
also REMOTE RECORDING
4450 Fremont Ave. N., Seattle, WA 98103
(206) 633-1776
Owner: Andy Altrich and Bruce Mann
Studio Manager: Andy Altrich and Bruce Mann

•• AN TOMAR STUDIOS
Oakland, CA
(415) 482-0839
Owner: Anthony Paizanos
Studio Manager: Tony Paizanos

•• APPLEWOOD RECORDING STUDIOS
4542 49th S.W., Seattle, WA 98116
(206) 932-6348
Owner: Harlan Michael
Studio Manager: Harlan Michael

•• ARCAL PRODUCTIONS
2732 Bay Road, Redwood City, CA 94063
(415) 369-7348
Owner: ARCAL, Inc.
Studio Manager: Sal Vich

•• ARMY STREET STUDIOS/B.S.U. PRODUCTIONS
also REMOTE RECORDING
P.O. Box 31425, San Francisco, CA 94131
(415) 821-6962
Owner: JAK Enterprises
Studio Manager: Victor Gao

•• ASTRAL SOUNDS RECORDING
482 Reynolds Circle, San Jose, CA 95112
(408) 294-5153
Owner: Jeff Tracy
Studio Manager: Jeff Tracy

•• THE ATTIC
2747 Hillegass Ave., Berkeley, CA 94705
(415) 843-2049
Owner: Dr. A. John Mallinckrodt
Studio Manager: Dr. A. John Mallinckrodt

•• AUDIO PRODUCTION STUDIO
7404 Sand Lake Rd., Anchorage, AK 99502
(907) 243-4115
Owner: Creative Productions, Inc.
Studio Manager: Brian Graham, Chad Engesser
Engineers: Brian Graham
Dimensions of Studios: 19 x 24
Dimensions of Control Rooms: 11 x 14
Tape Recorders: Otari MX 505 8-track, Otari MX 505 16
2-track, Baxx A 77 mono, Baxx Tascam Technics Sony
binoculars, Sony TC 854 4-track
Mixing Consoles: Sound Workbench 1, 800 B, 12 in. x 8 out
Monitor Speakers: JBL A and B, A and B
Echo, Reverb, and Delay Systems: Otari 1118 reverb, MXR
1101, MXR flanger/doubler
Other Outboard Equipment: 8 x Type 1 noise reduction, 8 x
10 x 10 cm noise limiter, UREI 1144, SA Kopex, Gen. Trans, Or
ton, B. J. parametric EQ, On an 800 EQ, mobility controller,
MXR pitch transposer, SAF stereo graphic EQ
Microphones: (2) Senn C 7E, AKG 414, 2, Beyer M 50
and assembly Sony, Shure EV and home
Instruments Available: bass guitar, Yamaha CP 70, most other
instrument, available on request at reasonable rates
Rates: 8-track: \$50/hr, 2-track: \$45/hr

•• **BAYSHORE STUDIOS**
871 "F" Industrial Rd., San Carlos, CA 94070
(415) 591-3503
Owner: Keith Hutschok, D.K. Bannett, Tapir Smith, Khadija
Studio Manager: Peter H. Fox

•• **BEAR CREEK RECORDING STUDIO**
20711 Bear Creek Rd., Los Gatos, CA 95030
(408) 354-2351
Owner: Justin Meyer, Donny Meyer
Studio Manager: Justin Meyer
Engineers: Justin Meyer, Bruce Rind, Rick Wake
Dimensions of Studios: 12 x 13
Dimensions of Control Rooms: 11 x 15
Tape Recorders: Teac 8088 track TEAC A-800SX 2 track
2 track TEAC C-1X 2 track cassette
Mixing Consoles: American 2 track mixer II 10 in x 8 in TEAC
Model 10 in x 2 out
Monitor Amplifiers: B & W
Monitor Speakers: JBL 4011 Auratone
Echo, Reverb, and Delay Systems: Custom Hatz power
custom Si-rino reverb, Eworth-Harmanizer, Dolidak D-22
Other Outboard Equipment: 20 in x 10 in compressor limiters
TEAC 1008 in x 2 out limiter
Microphones: F.V. AKG Sennheiser Sony Shure
Instruments Available: Custom Clavinets, M. DeLeonard
mellotron with volume pedal, double bass, tuba, oboe, bassoon,
pipe organ, clarinet, saxophone, trumpet, trombone, French horn,
tuba, clarinet, Euphonium, harp, guitar, Celeste, Baroque organ,
Hammered keyboard, timpani, trap, xylophone, saxophone, French
bassoon, piano, guitar, electric guitar, electric guitar, keyboard,
amp
Rates: \$ 5/hr. 100 hrs. available

•• **BENT NAIL STUDIOS**
2375 Cory Avenue, San Jose, CA 95128
(408) 244-0766
Owner: Dave Meier
Studio Manager: Dave Meiers

•• **BERKELEY MUSIC GROUP**
1442A Walnut, Suite 176, Berkeley, CA 94709
(415) 524-5188
Owner: Robert Marini, M. Leo, Joseph, Gary M. Flew
Studio Manager: Robert Marini
Engineers: Robert Marini, M. Leo, Joseph, Gary M. Flew
Dimensions of Studios: 15 x 17 x 9.5, 2 also 10 x 10, 5 x 7
Dimensions of Control Rooms: 14 x 10 x 11
Tape Recorders: Otari 5050 ME 111 9 track Otari 5050 B 2
track, Sony 1011 cassette, Teac TEAC 1011 2 track, 144
4 track
Mixing Consoles: Ramco 8900 10 in x 4 in
Monitor Amplifiers: MCI 4011 Auratone
Monitor Speakers: JBL 4011 JBL 433 Auratone
Echo, Reverb, and Delay Systems: MCI 4011 MCI 4011
reverb, Teac 1011 D-11
Other Outboard Equipment: Valco 10 in x 10 in MCI 4011
limiter, limiters, FXR exciter, MCI 4011
Microphones: AKG 414 Sennheiser F. V. ZM 58 F. V.
BE 10 Sony ECM 50 F. AKG 410 D1120 mic
Instruments Available: (B.D.) Whammy, Harmonic Flauto, Sax
Bance Los Polaris, guitar, saxophone
Rates: \$ 5/hr. and engineer, 100 hrs. time slots available
Direction: RMF as a former recording artist, studio operator and
post production aspects of your recording project. Our library of
industry of these services includes: available for a
scripted based on writer and performer. We can consult and
arrange for print, photo, video, production, post production
placement and marketing your material.

•• **SKIP BESSONETTE RECORDING STUDIO**
also *REMOTE RECORDING*
235 S. Oakdale #101, Medford, OR 97501
(503) 772-9748
Owner: Skip Bessonette
Studio Manager: Skip Bessonette

•• **BIG AND FAMOUS STUDIOS**
625 W. McGraw, Seattle, WA 98119
(206) 282-7110
Owner: Paul Walter, Greg Hawahfeldt
Studio Manager: Paul Walter

•• **BIRD PERCUSSION STUDIO**
P.O. Box 112, 1716 Ocean Ave., San Francisco, CA 94112
(415) 871-2410
Owner: "Bird"
Studio Manager: Bird



Bird Percussion Studio
San Francisco, CA

•• **BRANT PRODUCTIONS RECORDING STUDIOS**
2701 38th Ave. S.W., Seattle, WA 98126
(206) 937-7025
Owner: Brant Productions Company
Studio Manager: K.F. Embley
Engineers: Bob Embley, Independent, Computer Engineers
M. Leo, Bannett, independent
Tape Recorders: TEAC 8088 track w/box, TEAC A-800SX 2 track
w/box, TEAC C-1X cassette w/box and Dolby, Technomic metal
tape, 4 track tapes
Mixing Consoles: TEAC 10 in x 10 in Model 10 main board, TEAC
10 in x 2 out, 10 in x 2 out, 10 in x 2 out
Monitor Amplifiers: Crown, Kawai
Monitor Speakers: JBL Auratone, 10 in x 10 in, 10 in x 10 in, 10 in x 10 in
Echo, Reverb, and Delay Systems: Sound Workshop, Lexicon
Other Outboard Equipment: 4 x Compressor, Limiter, Brant
Poly-D, Harmonix Type 1 and 2, chorus, reverb, tremolo, unity
link, 10 x 10
Microphones: Sony Shure Sennheiser
Instruments Available: Electric guitar, assorted musical instru-
ment amplifiers and equipment
Rates: \$20/hr. (base), special project rates upon request. Tape
costs additional.
Extras: Master quality tapes, custom in-boards. Special interest
offerings, featured artist, with special rates available. Available
featured arranger, musician, writer and a comfortable, pro-
fessional, price.

•• **CAPITOL CITY STUDIOS**
also *REMOTE RECORDING*
911 East Fourth Avenue, Olympia, WA 98506
(206) 352-9097
Owner: Allen P. Gile
Studio Manager: Allen P. Gile

•• **CARACAS AUDIO VIDEO PRODUCTIONS**
also *REMOTE RECORDING*
(415) 595-3742
Owner: Henry B. Gile
Studio Manager: Christopher G. Gile

•• **CATRACS STUDIOS**
(formerly Ram Recording)
also *REMOTE RECORDING*
727 Caliente Ave., Livermore, CA 94550
(415) 443-2205
Owner: Ram Bessonette
Studio Manager: David B. Walla

•• **CENTER FOR CONTEMPORARY MUSIC**
Mills College, Seminary and MacArthur Blvd., Oakland,
CA 94613
(415) 430-2191
Owner: Center for Contemporary Music
Studio Manager: Jay Clويد

•• **RICK CHAISSE PRODUCTIONS**
also *REMOTE RECORDING*
19 Locke Way, Scotts Valley, CA 95066
(408) 438-2331
Owner: Rick Chaisse
Studio Manager: Rick Chaisse

•• **CHAPELWOOD PRODUCTIONS**
6440 W. 111 Ave., Broomfield, CO 80020
(303) 466-3619
Owner: Kenneth H. Rott
Studio Manager: Jeanne M. Rott

•• **CHRISTIAN MUSIC INDUSTRIES (C-M-I)**
Box 74, Renton, WA 98057
(206) 271-4554
Owner: Tom Thrasher
Studio Manager: Tom Thrasher

•• **CORY SOUND**
1255 Howard, San Francisco, CA 94107
(415) 861-4004
Owner: Phil Markinson
Studio Manager: Doug Wade

•• **CREATIVE SOUND STUDIO**
602 Cree Dr., San Jose, CA 95123
(408) 224-1777
Owner: Dick Dias
Studio Manager: Dick Dias



Dangerous Rhythm Recording
Berkeley, CA

•• **DANGEROUS RHYTHM RECORDING STUDIOS**
3579 Adeline, Berkeley, CA
(415) 284-2771
Owner: Matt Wallaro
Studio Manager: Matt Wallaro

•• **JAMES DANIELS PRODUCTION**
138 Byron Ave., Palo Alto, CA 94301
(415) 325-8574
Owner: James Daniels
Studio Manager: Brian Zimmerman

•• **DEMO LAB**
298 Arlington, San Francisco, CA 94131
(415) 641-1094
Owner: Jim Johnson
Studio Manager: Chantal Vachet Johnson

•• **DENTEN PRODUCTIONS**
P.O. Box 1709, Alameda, CA 94501
(415) 521-0321
Owner: Michael Denten
Studio Manager: Michael Denten

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•• DOME STUDIOS
S.R. Box 40510, Fairbanks, AK 99701
(907) 456-1993, 456-2604
Owner: Jerry Halton
Studio Manager: Bill Halton
Engineers: Jerry Halton, Bill Halton
Dimensions of Studios: 47' x 30' (recording room)
Dimensions of Control Rooms: 125 sq. ft.
Tape Recorders: TEAC 2400 SX 4 track, TEAC 2440 S 4 track, Technic RS 1500 DS 2 track, Pioneer RT 1050 2 track, 12 Reelwood cassette, Pioneer cartridge 8 track
Mixing Consoles: Beyer M124 24 channel, Tascam Model 18 8 channel, 12 Shure sum mixers, 4 channel
Monitor Speakers: B14-1
Other Outboard Equipment: 8 channel, 48x
Microphones: Boyer Shure, Eddy Crown, P2M, Neumann U47 tube, AIAI, Technicon 4717, 1730, others on request
Instruments Available: Piano, Etc., analog and electronic, guitars
Rates: 1/2 price
Direction: Mellow west by storm here, out of town with a nice view of the Alaskan and 5000 ft. mountain range. Sitka spruce flooring throughout. Materials available. We have all services in music to help you out. Our orientation is toward jazz and we have a great talent and outside area to get a new perspective. Studio is available on rental basis or just purchase the gear. All materials.

•• EL DORADO RECORDING
642 El Dorado, Oakland, CA 94611
(415) 655-3497
Owner: El Dorado Recording
Studio Manager: Roger Keller, Michael Ewers
Engineers: Frank Griffith, Roger Keller, Richard DeGottino
Dimensions of Studios: 7 x 5 x 10
Dimensions of Control Rooms: 5 x 15 x 10
Tape Recorders: Tascam 8 track 4 track, TEAC 3440 4 track, TEAC 2440 SX 4 track, Orion, MY 5050, Fwix 2 track
Mixing Consoles: Bump 16/2, 16/1, 16/2, Neptun 800/8x, Yamaha PS 4, 400 series, Mix, etc.
Monitor Amplifiers: Dynaco ST 150, Dynaco ST 20, Crown DC4A
Monitor Speakers: JBL 4811PWX, Airline 6050
Echo, Reverb, and Delay Systems: 16 channel 16 Time Align, 16 channel 16 Time Align, 16 channel 16 Time Align, 16 channel 16 Time Align
Other Outboard Equipment: UREI LA 4, LA-4A, A my stereo parametric, Intonation MVP, Synthesizer, 48x, 48x, 48x, 48x
Microphones: Neumann KM 84, 129, Sennheiser MD421, 20, ME 4, SM58, SM57, AKG C501, 502, D1100B, D1007, FV BE-20, BE-15, BE-17, BE-7, BE-9, Boyer M90 2, M90, 4, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
Instruments Available: Yamaha CP77, electric grand Korg 77 synthesizer, percussion instruments, guitar and bass amps on request, Octaplex, CFXA
Rates: Lowest possible. Available on request
Extras: 1/2 price available on many bass, keyboard, drums, percussion.

•• FOCUSED PRODUCTIONS, INC.
30 Berry St., San Francisco, CA 94107
(415) 777-3108
Owner: Jeff Roth
Extras: 1/2 price available on many SM/TE, time sync, 1/2 price available on many SM/TE, time sync, 1/2 price available on many SM/TE, time sync
Direction: Top level of music, mostly 4 and 8 track, 2400 SX 4 track, Orion, MY 5050, Fwix 2 track, Orion, MY 5050, Fwix 2 track, Orion, MY 5050, Fwix 2 track, Orion, MY 5050, Fwix 2 track
Other Outboard Equipment: UREI LA 4, LA-4A, A my stereo parametric, Intonation MVP, Synthesizer, 48x, 48x, 48x, 48x
Microphones: Neumann KM 84, 129, Sennheiser MD421, 20, ME 4, SM58, SM57, AKG C501, 502, D1100B, D1007, FV BE-20, BE-15, BE-17, BE-7, BE-9, Boyer M90 2, M90, 4, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
Instruments Available: Yamaha CP77, electric grand Korg 77 synthesizer, percussion instruments, guitar and bass amps on request, Octaplex, CFXA
Rates: Lowest possible. Available on request
Extras: 1/2 price available on many bass, keyboard, drums, percussion.

•• FOREST RECORDING STUDIO/PRODUCTION
17505 Orchard Ave., Guerneville, CA 95446
(707) 869-3458
Owner: Handy Vance
Studio Manager: Handy Vance

•• FOTO SOUND PRODUCTIONS
2600 15th St., North Bend, OR 97459
(503) 756-2187
Owner: Dave Knapp
Studio Manager: Fred Sell

•• FULHOUSE STUDIOS
also REMOTE RECORDING
P.O. Box 1413, Pendleton, OR 97801-0320
(503) 276-5454
Owner: Ian Mizumberg
Engineers: Dan Mizumberg, Mark Royal
Tape Recorders: Tascam 3H 8 track, TEAC 3440 4 track, Sony stereo, (cassette), Sanyo cassette (dual)
Mixing Consoles: Tascam 40 8x4x2, TEAC Model 2 6x4x4x2, Bose Extramix 6x4x1, Peavey 16x2x2x1
Monitor Amplifiers: Sony 1800 receiver, Crown D150A, Kenwood 6440 4 channel receiver
Monitor Speakers: API, Dynamic, JBL, Studio 19, Bose 501 II
Microphones: AKG D12, AKG C15, WCE1 Cardioid Phantom EQ modified Shure 57s, Shure 54, E.V. Allen, many others available upon request
Instruments Available: Hammond M3 Leslie 145, ARP strings, Hamam synthesizer, piano, acoustic and electric guitars (Gibson, Fender, Ibanez), Hooper drums, other equipment available upon request

•• GENERATION ORGANIZATION
also REMOTE RECORDING
3745 Potter, Eugene, OR 97405
(503) 484-9087
Owner: Lew Thorne
Studio Manager: Lew Thorne

•• GRASS ROOTS RECORDING STUDIO
also REMOTE RECORDING
2737 N.E. 25th St., Portland, OR 97212
(503) 281-5108
Owner: Michael O'Rourke
Studio Manager: Michael O'Rourke

•• HIGH PLAINS AUDIO RECORDING STUDIOS
1108 E. 17th Ave., Denver, CO 80218
(303) 832-3999
Owner: Hi-Terrain Associates of North America Corp.
Studio Manager: Pete Dockendorf

•• (H.A.R.C.) HORIZON AUDIO RECORDING CO.
10297 Bethel Burley Rd. S.E., Port Orchard, WA 98366
(206) 876-4972
Owner: Kerry I. Pillina
Studio Manager: Kerry I. Pillina

•• HORODKO SOUNDTRAX
also REMOTE RECORDING
111 Vallejo St., San Francisco, CA 94111
(415) 956-8729
Owner: Horodko Soundtrax Inc.
Studio Manager: Ed Horodko
Extras: A full service audio studio with exotic peripherals like TimeSpace enhancement and 4 video interlock. Specializing in making commercials with extraordinary creativity. Near the Broadway off ramp in San Francisco, convenient to most advertisers. 3000sq. ft. Original mix, music and angles. Computerized synthesizer. Computer assisted sound effects library. Many production music libraries. Remote recording. Full production including talent, desired A/V and industrial video. Over eighteen years experience in making excellent commercials. More than a recording studio.

•• NEIL JANKLOW STUDIO PRODUCTIONS
Please phone for appointment
(415) 858-0132
Owner: Neil Janklow
Studio Manager: Neil Janklow

•• STEPHEN JARVIS/AKASHIC RECORDS
also REMOTE RECORDING
3622 C. Mt. Diablo Blvd., Lafayette, CA 94549
(415) 837-7959
Owner: Stephen Jarvis

•• JUDE PRODUCTIONS
P.O. Box 90, Dutch Flat, CA 95714
(916) 389-2326
Owner: Russell Brian Brooker
Studio Manager: Russell Brian Brooker

•• KEYBOARD STUDIO
also REMOTE RECORDING
Pacifica, CA
(415) 355-6617

Owner: Grant Ewald
Extras: TEAC 83 8 track w/pitch control. What we're offering is a good way of recording your songs or projects with the musical assistance of a capable arranger. C's piano, Grand and Rhodes, bass, vocals, synthesizer and strings. We can mix it for a song. Your demonstration cassette tape or reel, mixed with a special professional sound—and at reasonable rates.

•• KEZR STUDIOS
777 North First Street, Seventh Floor, San Jose, CA 95112
(408) 287-5775

Owner: All Broadbasting Inc.
Studio Manager: Michael McGark

•• KING PRODUCTIONS
300 Broadway, San Francisco, CA 94133
(415) 391-5464

Owner: King Broadbasting
Studio Manager: Gary Dominique

•• LITTLE BIRD PRODUCTIONS
also REMOTE RECORDING
4416 S.E. Hwy 101, Lincoln City, OR 97367
(503) 996-2575

Owner: Herbinger, Northwest
Studio Manager: Leon Forrester Caulkins
Extras: 4 minute walk to bus. 4 1/2 rent platform. HV hook in and spare. 100% lush green. State-of-the-art facility. Entertainment, Hollywood and on 9. Little Bird produced albums.
Direction: We're moving more and more toward the real thing. Our own productions and records, video, profiles, etc. Plus we specialize in doing full production for songwriter artists who don't have a band—but we're still available to anyone wanting a small, efficient, aesthetically pleasing studio to work in.
— FLY ON, LITTLE BIRD!

•• MADMAN STUDIOS
3268 Adeline St., Berkeley, CA 94703
(415) 654-1564

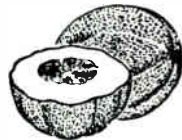
Owner: Paul Sandoval, Bill Thompson
Studio Manager: Bill Thompson

•• McCUNE SOUND STUDIOS
951 Howard, San Francisco, CA 94103
(415) 777-2700

Owner: Harry McCune
Studio Manager: Terry Swanson

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Melon Studio
San Francisco, CA

•• MELON STUDIO
P.O. Box 22504, San Francisco, CA 94122
(415) 665-6566

Owner: Robin Woodland
Studio Manager: Robin Woodland
Engineers: Robin Woodland, Assistant engineers: Charlotte Seekamp, Steve Rosen, Carrie Garkink
Dimensions of Studios: 20 x 20 x 8
Dimensions of Control Rooms: 8 x 8
Tape Recorders: TEAC 83 8 track, TEAC 44 4 track, TEAC 434S 4 track, Bvox A77 2 track, TEAC 1230 4 track stereo, (10) Pioneer CT6H stereo cassettes.
Mixing Consoles: Hill B Series 14x8x2, TEAC Model 38x4
Monitor Amplifiers: G. NAD 8020, Dynaco SCA 80Q
Monitor Speakers: Dynaco A5X1's, Auratone
Echo, Reverb, and Delay Systems: Hammond system stereo reverb, tape delay, MXR stereo reverb
Other Outboard Equipment: dbx noise reduction (Type I, II)



manuels Type II 100 channel, mix 400 compressor, auto 4 channel, Auto 4 track, 100 channel, Pioneer PL 220 II turntable, Kari electric, mixer.

Microphones: Sennheiser 421's, Shure SM 57's and 58's, AKG SE 55's, EV RE 55, direct boxes.

Instruments Available: Kawai or Fender grand piano, excellent stereo piano, Fender Telecaster, Fender Telecaster Deluxe amp, percussion.

Rates: 8 track \$200/hr., 4 track \$150/hr. (book rates for 50 hrs. or more). Production Consultation \$10/hr. Hands On Recording Workshops \$185 for 80 hour course. Call for our special real-time cassette duplication rates.

Extras: Free lessons in production and engineering are available. Bonus 100% off on all studio instruments. Great discount prices on tape, tape, and more. Great discount prices on tape, tape, and more.

Direction: Melon Studios now has 8 track and features other new equipment, but it takes more than equipment to make great recordings—it takes talent, skill and commitment. Since 1971 people have turned to our studio for work and friendly support. We have a staff of a relaxed and competent staff. Our specialty is producing and recording bands with 8 track and tapes. We also offer the best quality real-time cassette duplication, now with even lower prices and faster service, and the unique Hands On Workshops. Come see and hear for yourself! Call for an appointment, inspection facilities and plan your course.

•• MIX MASTER RECORDING
also REMOTE RECORDING
4096 North Branam, Merced, CA 95340
(209) 383-1718
Owner: Jim Schriber
Studio Manager: Beth Andren

•• NORTHWEST SOUNDTRACK RECORDING STUDIO
P.O. Box 7822, Eugene, Oregon 97401
(503) 683-8663
Owner: Cindy McManus
Studio Manager: Cindy McManus

•• NOVA RECORDING SERVICES
also REMOTE RECORDING
1001 4th Ave., Suite 3618, Seattle, WA 98154
(206) 447-1696

Owner: The Nova Music Group
Studio Manager: Paul Speer
Engineers: Paul Speer, David Lanz, and independents
Dimensions of Studios: 2 x 20
Dimensions of Control Rooms: 12 x 15
Tape Recorders: MCI JH 1100 8 track, Ampex AG 500 2 track, Sony TC D5M cassette, Sony TC 153SD cassette.
Mixing Consoles: Tascam 3 (modified), 8 in x 8 out; Fostex 2050 10 in x 2 out.
Monitor Amplifiers: Crown D 150A
Monitor Speakers: JBL 120 Auratone
Echo, Reverb, and Delay Systems: AKG BX 10, Tapco 4400
Other Outboard Equipment: SMPT Time Clock by BTX (Shadow System) for locking to video, Symetrix parametric EQ, Ashby compressors, custom Tru-z Amp mike pre-amp system, Orban signal-to-noise controller.
Microphones: Neumann U87, AKG 414, Sony C-37, EV RE 10, Sennheiser 421, 441, Shure Beyers (matched pair H&K and AKG C 24 also available by special arrangement).
Instruments Available: 3 voice Oberheim synthesizer, Fender Rhodes, Roland drum machine.
Rates: \$45/hr. (audio production), \$65/hr. (synchronized video sweetening).

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6510 216th SW,
Mountlake Terrace, WA 98043
(206) 774-7309

•• OCEAN BREEZE RECORDING
2021 Bluebell Dr., Santa Rosa, CA 95401
(707) 527-8131
Owner: Bob Williams, Ben Rothenberg
Studio Manager: Bob Williams, Ben Rothenberg

•• PARALANDRA PRODUCTIONS
also REMOTE RECORDING
840 E. 3925 S. Greenbank, WA 98253
(206) 321-6697
Owner: Michael Bade
Studio Manager: Michael Bade

•• PEARL'S PLACE
Fremont, CA 94538
(415) 651-7187
Studio Manager: Joey Horten, Vickie Horten
Engineers: Dave Humrick

•• PEEKABOO MOUNTAIN STUDIOS
117 Palmyra St., Auburn, CA 95603
(916) 885-1708
Owner: Jeffrey R. Hester, S. Charles Hester
Studio Manager: Jeffrey R. Hester

•• PUGET SOUND
8924 Ravenna Ave., N.E., Seattle, WA 98115
(206) 523-9933
Owner: Image Records
Studio Manager: Pat Hewitt

•• QUARTER MOON RECORDING
130-D Hamilton Drive, P.O. Box 1421, Novato, CA 94948
(415) 883-4757
Owner: Michael Ransom
Studio Manager: Michael Ransom

•• RADIANT STAR
also REMOTE RECORDING
204 East 4th St., Loveland, CO 80537
(303) 669-5912
Owner: Bruce Brunson
Studio Manager: Bruce Brunson

•• BILL RASE PRODUCTIONS, INC.
also REMOTE RECORDING
955 Venture Ct., Sacramento, CA 95825
(916) 929-9181
Owner: Bill Rase
Studio Manager: Bill Rase

•• RECORD WEST
1424 Wikiup Dr., Santa Rosa, CA 95401
(707) 526-7361
Owner: Dave Jorgensen
Studio Manager: Elvin Duncan

•• ROCKY MOUNTAIN PRODUCTIONS
also REMOTE RECORDING
P.O. Box 1233, Provo, UT 84603
(801) 489-7850
Owner: Walt C. Jones and Carl Fritch
Studio Manager: Walt C. Jones

•• RUBBER PARK PRODUCTIONS
also REMOTE RECORDING
P.O. Box 120, Tahoma, CA 95733 (Lake Tahoe)
(916) 525-6554
Owner: Steve Teshara
Studio Manager: Steve Teshara

•• S.B. PRODUCTIONS
also REMOTE RECORDING
43 William Ct., Danville, CA 94526
(415) 820-2070
Owner: Scott C. Boorey
Studio Manager: Scott C. Boorey

•• RANDALL SCHILLER PRODUCTIONS
also REMOTE RECORDING
1207 Fifth Ave., San Francisco, CA 94122
(415) 661-7553
Owner: Randall Schiller
Studio Manager: Randall Schiller

Engineers: Randall Schiller, Cathy Cohn
Dimensions of Studio: 12' x 15', Drum Room 9' x 9'
Dimensions of Control Rooms: 12' x 15'
Tape Recorders: TEAC/Tascam 808 B track, Otari 5050R 2 track, Sony TC-854-4S 4 track, Sony TC-850-2T 2 track, Pioneer



RT 707 2 track, Sony TC-854-4S 4 track.
Mixing Consoles: TEAC/Tascam 808 B track, TEAC/Tascam M-35EX, 12 in x 4 out, TEAC/Tascam Model 18 in x 2 out, TAP CO Panjo 7416 18 in x 2 out

Monitor Amplifiers: SAF 2001, 24001, BGV Model 100-01
Monitor Speakers: JBL 4011B, Auratone 501, Altec A7-500 (modified & bi-amplified), and Pioneer CS-88

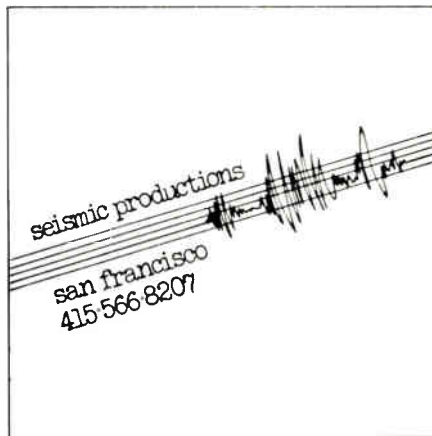
Echo, Reverb, and Delay Systems: Debalal DE-2 Acoustic computer stereo digital delay, Sound Workshop 242 stereo reverb unit, Eventide 910 Harmonizer

Other Outboard Equipment: URFI 5271 Octave graphic EQs, MXR dual 15 band graphic equalizer, 4 x 154 dual linear noise reduction, URFI 1178 stereo compressor/limiter, dbx 161 compressor/limiter, Crown VFX-2A dual channel electronic crossover filter, SAF 5000 amp limiter/restoration unit, Orban 62 parametric EQ and compressor, 1174 stereo security support equipment

Microphones: EV RE-5, 504A, Sennheiser SM 57, SM 58, SM 5B, SM 7B, Sony ECM-90, ECM-91, and Sennheiser MC 421 s and MD 421 s

Instruments Available: Steinway/Clark grand piano
Rates: Studio rental 18 track \$2000, 4 track \$200, 2 track \$200/hr. Location rental and production charges included.
Extras: Kitchen facilities

Direction: We are a multi-faceted company providing facilities and services in the areas of audio, video, film and theatre. We are dedicated to providing the highest quality in a relaxed but professional environment. Immediate expansion plans call for complete sixteen track facilities. In addition to recording studio services, we provide sound reinforcement for venues ranging from small clubs to large outdoor concerts, audio design and installation, film and video production and lighting services.



Seismic Productions
San Francisco, CA

•• SEISMIC PRODUCTIONS
also REMOTE RECORDING
San Francisco, CA
(415) 566-8207

Owner: Mike Joseph
Direction: Specialties: Producers, Independent Filmmakers, and Location Recording. Where production and live performance are in any format (stereo, 4 track, live, live wire, respel to advert, indie projects). We even do our own direct marketing. Seismic has an extensive track record from the Lowry-Lowry Discant anthology to numerous corporate live all-time from radio spots to over 75 Bay Area bands in the past 5 years. Call us. We're just and friendly. We're pros. and we've got around 1000 to show you how to save money and avoid mistakes.

•• SHOWCASE SOUND
3090 S. Bascom Ave., San Jose, CA 95124
(408) 377-5864 (message)
Owner: Jim Bruno
Studio Manager: Randy Wideman
Engineers: Randy Wideman, Chae Tom Carlson, Jan Lynch

Showcase Sound

Showcase Sound
San Jose, CA

Dimensions of Studios: 17' x 19' x 10'
Dimensions of Control Rooms: 12' x 9' x 8'
Tape Recorders: TEAC/Tascam 808 B track, TEAC/Tascam 3300SX 2 track, TEAC/Tascam A 500 cassette
Mixing Consoles: TEAC/Tascam Model 15, 24 in x 8 out
Monitor Amplifiers: GMI 1000S Dyna 100
Monitor Speakers: JBL 4011 Auratone 5W

Echo, Reverb, and Delay Systems: Tapco 4400 reverb, Korg stereo echo, Lexicon Phase Line, MXR limiter/doubler

Other Outboard Equipment: 4 x 1178 compressors, Et Amp graphic EQ, Mocho CI 1001 parametric EQ, Symetrix compressor, 154 noise reduction, MXR limiter/compressor, dbx noise reduction

Microphones: AE 100, 4-488, Sennheiser 421a, EV RE-20, RE-20, Sennheiser M52, Sennheiser X1Ns, Sony ECM 401, Sennheiser SM57, Sennheiser 401

Instruments Available: Upright piano, studio drum kit, various other instruments. E-mail: showcase@comcast.net
Rates: Please call for rates

•• SHYNE SOUND
also REMOTE RECORDING
40 Woodland, San Rafael, CA 94901
(415) 469-2833

Owner: Leroy Shyne
Studio Manager: Leroy Shyne
Engineers: Leroy Shyne
Dimensions of Studios: 50' x 90'
Dimensions of Control Rooms: 20' x 15'
Tape Recorders: TEAC 9080 track 9, Pioneer 4022 4 track, MC1 1 track

Mixing Consoles: Altec 8-Header 1, 2, 12 in x 12 out
Monitor Amplifiers: BGW 750 Series C
Monitor Speakers: Shure S150
Echo, Reverb, and Delay Systems: Orban dual limiters, Debalal DE-2, echo, URFI & MXP Plus

Other Outboard Equipment: 4 x 1178 comp limiters
Microphones: Sennheiser M52, EV RE-20, Sennheiser 421, Crown ECM

Instruments Available: Upright piano, drums, Fender electric bass, Gibson guitar, assorted pre-CBS Fender amps
Rates: \$30/hr. or \$250 for 4 hours

•• THE SOUND BOARD
also REMOTE RECORDING
Redwood City, CA
(415) 364 3484
Owner: Steven Lawson

•• SOUNDCAPSULE STUDIOS
also REMOTE RECORDING
P.O. Box 6363, Tahoe City, CA 95730
(916) 583-1836
Owner: Michael J. Loomis
Studio Manager: Michael J. Loomis

•• SOUND CONSCIOUSNESS STUDIO
also REMOTE RECORDING
725 Loma Verde, Palo Alto, CA 94303
(415) 493-1365
Owner: Phillip Grook
Studio Manager: Phillip Grook

•• SOUNDMARK, LTD.
also REMOTE RECORDING
4950 Nome-C, Denver, CO 80239
(303) 371-3076
Owner: Corporation
Studio Manager: David H. Wirt

•• STAR MOUNTAIN STUDIOS
also REMOTE RECORDING
P.O. Box 114, Bodega Bay, CA 94923
(707) 875-9925
Owner: Moses Moon
Studio Manager: Elm Korner

•• STARTRAX RECORDING STUDIO
also REMOTE RECORDING
6156 Carl Ave., Las Vegas, NV 89108
(702) 648-6146

Owner: Larry Read, Jeannette Read
Studio Manager: Bruce Duff Burney
Engineers: Larry Read, Duff Burney
Dimensions of Studios: 15 x 20 main, 5 x 4 drum
Dimensions of Control Rooms: 6 x 10
Tape Recorders: Tascam 80 RW VSO & rem 2 track, Tascam 35 2B w VSO & remote 2 track, Technics 1500 2 track, Kenwood KX 2060 2 track

Mixing Consoles: Tascam 15 modified 24x16x8
Monitor Amplifiers: 4 Yamaha Professional Series 2050s
Monitor Speakers: EV Sentry 100s, EV Sentry 5s, and Auratone

Echo, Reverb, and Delay Systems: MXH System II, multi delay w expandable range, Tapsco stereo F 2 reverb

Other Outboard Equipment: 4 point patch Bay, UREI LA4 compressor/limiters, ADX 24 band EQ's, Gold Line Real Time analyzer, DX 8 dbx noise reduction for 8 track and 2 track Dolby, VSK variable speed for 80 Hz quartz metronome, MXH Blender
Microphones: Sennheiser 441, 421's, Shure SM 58, 57, 56's, Tascam 1B 1, 2's, PE, 40's, EV HF 20's, Shure SM 81, Sennheiser a 100 direct boxes

Instruments Available: Tympani drums, Remo 1B 8000 programmable drum synthesizer, cable Nelson upright piano, Ovation custom legend guitar, Ovation classical too, Yamaha BB1000 bass, Yamaha amps, Handall bass amp

Video Equipment & Services: Sony Trinitron 13" color camera, Sony special effects generator and switcher, Sony 1" portable beta VTR and JVC editing VHS, 1" VTR, Weiman tape sync at this time only

Rates: \$25/hr 8 track and mixed own time, \$40/hr video production time, 1/2 hr free setup time, Free use of all studio instruments at no extra charge

•• STARTSONG
3218 E. LaSalle, Colorado Springs, CO 80909
(303) 634-2045
Owner: Tom Greger

•• STEELHEAD PRODUCTIONS
also REMOTE RECORDING
Box 366, Blackfoot, ID 83221 (By Appointment Only)
(208) 785-7298
Owner: Jon Lykseth
Studio Manager: Jon Lykseth

•• STOTZ'S SOUND
also REMOTE RECORDING
576 Cypress St., Monterey, CA 93940
(408) 375-9718
Owner: self
Studio Manager: self

•• STUDIO N
10115 South DeAnza, Cupertino, CA 95014
(408) 996-2055
Owner: Brian Job
Studio Manager: Dave Noditt

•• STUDIO ONE
235 East 3rd Avenue, San Mateo, CA 94401
(415) 347-4811
Owner: Gary Duoss
Studio Manager: Chris Craig
Engineers: Bruce Cooley, Gary Duoss
Dimensions of Studios: 12 x 20
Dimensions of Control Rooms: 12 x 11
Tape Recorders: Ampex A644, 8 track, 1 Stereo 350 2 track, IFAI 440 4 track, 4 Sony TC 601's cassette remote, Otari 5050 MKIII 8 track
Mixing Consoles: Tascam 15 16 in x 8 out
Monitor Amplifiers: Crown DC 800, Kenwood
Monitor Speakers: Alvo Model 9 Auratone
Echo, Reverb, and Delay Systems: Orbis reverb, Deltalab digital delay, stereo tape echo
Other Outboard Equipment: 2 UREI LA4N limiter/compressors, Orbis stereo compressor, Orbis parametric EQ, Allison Keflex Guitman Countryman preamp filter
Microphones: Teletunkon, and Neumann U47's and U47's Sennheiser 421's, AKG C 451, EV Shure etc
Instruments Available: Baldwin piano, Lawton drums, Zildjian cymbal, percussion amps, guitar, music stand, effects
Video Equipment & Services: 1" time base, 1" and 1/2" AF 2 projects
Rates: Call for quote, studio 1/2 block time



Extras: Music libraries, Network Southern Super Real Time and high speed digital, including pulse (A/V) programs, excellent video, lowest air.

Direction: We are a full service production studio serving the commercial music and video industries. Our studio is fully equipped with the latest professional equipment. Full-time Hartman Audio and Film Magazine operates A/V and music and video music groups. We have writers, arrangers, producers, and photographers and can develop your entire album package. Contact Andre Masala, Sales.

•• SUNSHINE RECORDING
327 Del Sur, Vallejo, CA 94590
(707) 552-5210
Owner: Lyman White
Studio Manager: Lyman White
Engineers: Lyman White, graduate of the Recording Institute of America, member of the Audio Engineering Society
Dimensions of Studios: 20 x 21
Dimensions of Control Rooms: 6 x 6
Tape Recorders: Tascam 80 RW 8 track, Tascam 35 2 track, with 2 track 2 track, TEAC 2400S 2 track, Technics BS MB cassette, Technics BS M6 5 cassette, Pioneer H 899 8 track, 4 track, JVC KD 345 cassette
Mixing Console: Sound Workshop 1280 B 12 in x 8 out
Monitor Amplifiers: Yamaha TA 100, McIntosh MC 50, Level 1

Monitor Speakers: JBL 441 studio, JBL Decade 16 control room
Echo, Reverb, and Delay Systems: Ureia Major Space Station multi track delay, Pioneer SH 102W reverb, Univox FC 80 reverb
Other Outboard Equipment: dx 162 stereo compressor limiter, UREI stereo parametric EQ, Sennheiser and Trouper Series direct boxes, Orbis Model 526A dynamic balance controller
Microphones: AKG C 414FB, Sennheiser MU 421 U 5, Hoyer M 200, M 101, Sony ECM 24F, Teledyne EC 340's, Shure 55B, J 5885A
Instruments Available: A\$ 100 per session, Fender Malibu acoustic, Fender Valleria acoustic, 12 string, Gibson Les Paul, Wurliater grand piano, Power 400 amp, Roland SH 202 string ensemble, C# Octave synthesizer
Rates: Recording and mixing \$25/hr editing \$12/hr

TECHNICAL SOUNDS, INC./FAST TRACK STUDIOS
also REMOTE RECORDING
1906 E. 115th Pl., Northglenn, CO 80233
(303) 457-0730
Owner: Terry McMurtry
Studio Manager: Wayne Gerbrin II

•• TRULLION STUDIO
P.O. Box 23051, Sacramento, CA 95823
(916) 391-9691
Owner: Kurt & Nancy Bischoff
Studio Manager: Furt Bischoff

•• TWILIGHT STUDIO
642 Palm Ave., Watsonville, CA 95076
(408) 722-7819 or (408) 728-1294
Owner: Steve Loveless
Studio Manager: Steve Loveless

•• ULTRA SOUND STUDIOS
1751-B Villa Stone Dr., San Jose, CA 95125
Mail P.O. Box 1346, Campbell, CA 95009
(408) 286-3721
Owner: Derek Jones
Studio Manager: Vickie Jones
Engineers: Derek Jones, Chief Engineer, Independents
Dimensions of Studios: 12 x 44 w/18' ceiling, isolation

Circle #032 on Reader Service Card



RECORD

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Larksong

10 Scott Pl, Pt. Arena, CA 95468

Circle #033 on Reader Service Card



Ultra Sound Studios

Ultra Sound Studios
Orinda, CA

Booth Built in make inputs and line outputs for easy access.
Dimensions of Control Rooms: 12 x 16 with 8' window.
Tape Recorders: Otari MX 5050s Mark III 8-track (w/VSO Real Time counter, full function remote and dbx 150s on all channels) Ampex AG 440 2-track w/ 80 ips capability Sony TC K77R cassette w/ remote Sanyo SC-80 cassette M-15 45/2 cassette.
Mixing Consoles: T1w in 5b w/ 5EX expansion rack monitor solo 20x4x2 with meter output for all channels Sony MX 16 6x4x2 Fostex 2050 tape machine 4X.
Monitor Amplifiers: Sennheiser AU 717 MCS 8500 100 amp.
Monitor Speakers: M/S tweeter, Ayrton.
Echo, Reverb, and Delay Systems: Orban 1118 11x1 reverb Digital Effects, AEM 1124 multi-tap delay, two 16000 Hz sections for reverb tail, band width.
Other Outboard Equipment: Sennheiser SF 7 analog EQ, dbx 130X limiter, Sanyo SR 808 Q amp, Sanyo cassette 1200 port patchbay.
Microphones: Sennheiser EV 18 20s Sennheiser 4, 4s, Sennheiser SM 7, Sennheiser, others. Closest Sound Co., superior direct mono, S.V.A., 4M 11 amp, Pioneer Supply.
Instruments Available: Various instruments upon request.
Rates: Block rates available. For a complete list of rates visit our website.
Extras: Complete professional studio available sound tracks and voice-overs for film, video, or other. On-site location, refreshments, microwave refrigerator, library in receptionist area, clubs and restaurant nearby, versatile monitoring available.
Direction: QUALITY. At Ultra Sound Studios our aim is to provide our clients with the finest professional recordings of the highest quality utilizing professional equipment unmatched by other systems in the 8-track field. When the opportunity and the budget allow Ultra Sound Studios will have a more alternative. Come see and hear. We're located at The Alameda Expressway and San Jose Avenue, Suite 104. Make that turn to the right and Dave Rubin's recording studio is on the left. Dave Rubin, Frank, and Hal Rubin's company is the Central Point Band. The session was recorded at Ultra Sound Studios. Am I the only one who says...

•• THE UNREGULATED RECORDING STUDIO
P.O. Box 81485, Fairbanks, AK 99708
(907) 456-3419

Owner: The Unregulated Recording Studio
Studio Manager: Melissa Stone
Direction: We are about to expand to full Duetrak 2 men capability. The goal at Unregulated is to provide a unique experience in capturing the sound, atmosphere and spirit of Alaska's last frontier. If you want music that is inspired, then we're the only place above all positive we can help you. Fairbanks, Alaska and Unregulated Recording Studio. We are now seeking musicians, producers, and session musicians in the Fairbanks area. We are currently looking for the next great recording artist.



Versatile Video
Sunnyvale, CA

•• VERSATILE VIDEO INC
151 Gibraltar Court, Sunnyvale, CA 94806
(408) 734-5550
Studio Manager: Bill Atwood

•• WESTMONT RECORDING COMPANY
6034 Shawn Ave. S.W., Olympia, WA 98502
(206) 943-6328
Owner: Robert H. Cook
Studio Manager: Robert H. Cook



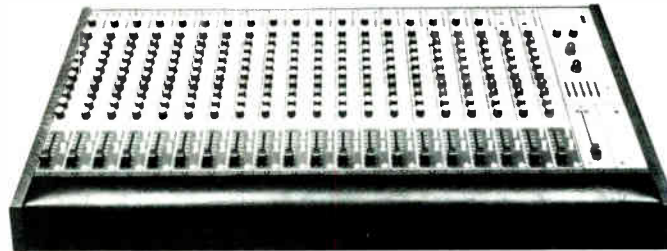
Xandor Recording Studios
Orinda, CA

•• XANDOR RECORDING STUDIOS
also REMOTE RECORDING
407 Camino Sobrante, Orinda, CA 94563
(415) 254-9077
Owner: Bill Mitchell, Lee-Patricia Jim Woyewoeth
Studio Manager: Jim Woyewoeth

Be a Mix Distributor

Call Mary Holland
415/843-7901

We Put It Together



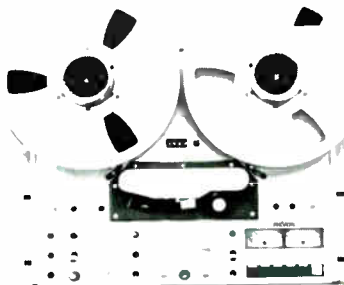
LOGEX
BY Sound Workshop



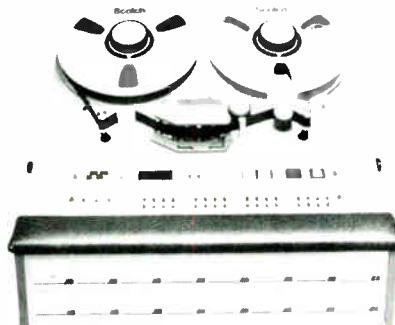
MICMIX XL-305 REVERB



DeltaLab Effectron



REVOX PR 99
2 track Recorder



TASCAM 85-16



JBL Bi-Radial
Monitors

Whatever your audio equipment needs - recording studio, production house, broadcast facility, or home multi-track—**Suntronics** is your convenient one-stop source. 2 to 16 track recorders, small and large mixers, speakers, mikes, signal processors—you name it, **Suntronics** has it readily available at four easy-to-find Southern California locations. Let us help *you* put it together.

7560 Garden Grove Blvd.,
Westminster, CA 92683, (714)
898-6368; 898-9036

7760 Balboa Blvd., Van Nuys,
CA 91406, (213) 781-2537;
781-2604

1620 West Foothill Blvd.,
Upland, CA 91786, (714)
985-0701; 985-5307

11151 Pierce St., Riverside,
CA 92515, (714) 359-5102;
359-6058

Circle #034 on Reader Service Card

••• BEGGARS BANQUET RECORDING STUDIOS

also REMOTE RECORDING
7736 Elphick Rd., Sebastopol, CA 95472
(707) 823-7185

Owner: Warren Dennis
Studio Manager: Warren Dennis
Engineers: Warren Dennis
Dimensions of Studios: 6'00 sq ft
Dimensions of Control Rooms: 15'00 sq ft
Tape Recorders: Tascam 85 16 w dbx 16 track Tascam 40-4 w/dbx 4 track, Technics 1500U (isolated loop) 2 track Tascam 25 2 w dbx 2 track, (2) Aiwa 6550 cassettes, Sony TCK 75 cassette
Mixing Consoles: Sound Workshop (w super EQ 20 inputs) 24 in x 16 out
Monitor Amplifiers: Nikko Alpha I 350 watts channel Symetrix HA 10 headphone amplifier Accuphase C 200 pre amp Sony direct drive turntable w Stanton cartridge
Monitor Speakers: JBL 1112 L100 Auratones (12) AKG 140 earphones (6) Sony headphones (4) Sennheiser headphones
Echo, Reverb, and Delay Systems: Eventide H949 Harmonizer/digital delay MasterTroom SI (4) reverb number Koru stereo echo Multi-tape delay (4)

Other Outboard Equipment: URFI 1A 4 comp/pressor limiter, dbx 162 stereo compressor/limiter Eventide limiter Ashley parametric EQ Roland Dr Rhythm programmable drum machine Peterson strobe tuner Hi Amp graphic EQ, (2) Countryman direct boxes (2) Symetrix direct boxes MXR phaser
Microphones: (2) AKG 414 (2) AKG 451 AKG D 224F (2) AKG D 200E, (2) Sony ECM 241 Sennheiser 441 (4) Shure SM 57, P2M microphones
Instruments Available: Yamaha C 4 conservatory grand piano Slingerland Ludwig Zildjian Paiste drum kit Gibson Les Paul guitar, Gibson Ripper I 50 bass guitar Fender Rhodes piano full array percussion instruments Glesman Pentaphonic digital synthesizer (extra charge/day) Yamaha G50 amplifier
Rates: \$28/hr (incl engineer) Special bulk and spiritual non profit music rates Call for quotes
Extras: Beautiful country environment fully air conditioned Would you believe indoor basketball? Good coffee! Included in the rate is Warren Dennis as engineer and as a musician at no extra charge
Direction: Warren Dennis (owner/engineer) has over 15 years music experience as a performer, publisher, songwriter, Screen Gems FMI instructor at Sonoma State University and over 200 projects to his production credit His philosophy is based on honesty, professionalism, and attention to detail from pre production to final pressing Beggars Banquet delivers a great sounding product in a clean and relaxed environment and for the most reasonable rate possible Call and arrange a casual appointment to look things over and hear some of the quality work this studio is putting out!

••• ROBERT BERKE RECORDING

San Francisco, CA
(415) 661-6316
Owner: Robert Burke
Studio Manager: Mark Esler

••• BRANDT'S RECORDING STUDIOS

1030 48th St., Sacramento, CA 95819
(916) 451-3400
Owner: Charles M. & Eina M. Brandt
Studio Manager: C.M. Brandt Chief Engineer: Irvan L. Bertin Asst. Engineer

••• BROWN BAG PRODUCTIONS

482 S. Jasmine, Denver, CO 80224
(303) 388-9245
Owner: Michael Lee, Robert Lee
Studio Manager: Robert Lee



Corasound Recording
San Rafael, CA



••• CORASOUND RECORDING

122 Paul Dr., San Rafael, CA 94903
(415) 472-3745
Owner: Stephen Hart J.D. Sharp
Studio Manager: Patty Matthews
Engineers: Michael Baskovsky, Stephen Hart, J.D. Sharp, Warren Harris, Scott Church
Dimensions of Studios: 26 x 16
Dimensions of Control Rooms: 9 x 12
Tape Recorders: Otari MTR 90 16 track Otari MX5050 MKIII 8 track Otari MX5050H 2 track TEAC A3340S 4 track, Aiwa 800 cassette
Mixing Consoles: Neotek Series 2 20 in x 16 out
Monitor Amplifiers: Phase Linear Crown, SAE
Monitor Speakers: Eastern Acoustic Works JBL 4311, Auratones
Echo, Reverb, and Delay Systems: Ursula Major Space Station digital reverb Deltalab DL 4 Ibanez AD230 Sound Workshop 262 stereo reverb Roland Space Echo
Other Outboard Equipment: ADH stereo comp/limiter, dbx compressors Ashley parametrics, EXR exciter dbx noise reduction, 1/2 octave room EQ Symetrix signal gates, Countryman direct boxes
Microphones: AKG, Beyer, F.V. Neumann, Shure Schoeps, Sennheiser
Instruments Available: Drum set, Yamaha U-3 upright grand piano, string synthesizer, percussion instruments Hohner clavinet
Rates: 16 track \$50/hr 8 track \$42/hr, block rates 16 track, 50 hrs or more 10% discount 8 track 10 hrs or more 10% discount, 10% discount is available if any rate is full payment in advance
Extras: Good sounding room, experienced engineers
Direction: For seven years Corasound has been recording LPs and singles for radio, TV and film soundtracks We also offer complete production services from arrangement to pressing Corasound products receive national airplay and recent product is being distributed internationally

••• DESITREK STUDIOS

3415 S.E. Hawthorne Blvd., Portland, OR 97214
(503) 232-8606
Owner: Joe A. Perez, David B. Harrison, Michael Demmers Douglas Durran
Studio Manager: Michael Demmers

••• EASTERN WASHINGTON UNIVERSITY STUDIOS

also REMOTE RECORDING
Fine Arts Complex, EWU, Cheney, WA 99004
(509) 359-6390



Phil Edwards Recording
San Francisco, CA

••• PHIL EDWARDS RECORDING

also REMOTE RECORDING
1338 Mission St., San Francisco, CA 94103

(415) 861-4439

Owner: Phil Edwards
Studio Manager: Cecily Gardner
Engineers: Studio and Remotes: Phil Edwards, Phil DeLance, Steve Evans Remotes only: Ron Davis, Bill Steele, Dennis Staats, Jim Hilson
Dimensions of Control Rooms: Mixdown A 13 x 14 x 7, Mixdown B 12 x 10 x 7, Remote track 21 x 8 x 7
Tape Recorders: (2) 3M 79 16 track, 3M 70 8 track, (3) MCI JH 110B 2 track, Ampex 440C servo 2 track, (2) Ampex/Inovonics 300/355 2 track
Mixing Consoles: Mixdown A API 1604, 16 in x 4 out, Mixdown B Langevin custom, 10 in x 4 out, Remote track DiMetric (API) 2416, 24 in x 16 out
Monitor Amplifiers: Mixdown A Crown DC 300A, Mixdown B McIntosh MC 250, Remote track McIntosh 2100
Monitor Speakers: Mixdown A Altec 9845A, Auratone 5C, Mixdown B JBL 4315, Remote track Altec 604-8G, Auratone 5C
Echo, Reverb, and Delay Systems: EMT 140ST stereo plate, AKG BX-10 reverb
Other Outboard Equipment: UREI limiters 1176LN, 1A-3A, Orban 621B parametric EQ, Orban 516EC D'Esser, Dolby M16 noise reduction, 301 noise reduction (16 channels), ITC cart machine, three deck, assorted 1/4 track cassette and elcaset machines
Microphones: Neumann U-87, U-47, KM-84, AKG 414, 451, Sennheiser 421, Shure SM-85, SM-58, SM56, SM-53, E.V. RE-15, 1751, RCA 77-DX
Rates: 16 track mix: \$75/hr, 8 track mix \$60/hr, all other work (4 track, 2 track, etc.) \$40/hr Please call for remote rates
Direction: PER is experienced in providing complete on-location audio services and facilities for all types of projects For example Live recording Woody Herman, Dave Brubeck, Stan Getz, Cal Tjader, Carla Bley, etc.; Live broadcast: SF International KJAZ Festival (live telecast in Japan via satellite), Jefferson Starship (KMEI), Opera in the Park (KQED), Video production Home Box Office, KPIX, Video Tunes: Radio production Monterey and Concord Jazz Festivals for National Public Radio, Film soundtracks Willie Nelson at the Cow Palace for Baytide Films, "Partners" for Hurricane Gulch Productions Complete packages for simultaneous recording and broadcast are available, as are our fine multi-track mixdown and post production facilities

••• FEATHERSTONE RECORDING

also REMOTE RECORDING
8996 Fruitridge Rd., Sacramento, CA 95826
(916) 381-5243
Owner: Featherstone Recording Studios, Inc.
Studio Manager: Tom Conrad

••• FREEWAY RECORDING INC.

also REMOTE RECORDING
2248 E. 14th St., Oakland, CA 94606
(415) 532-3700
Owner: Freeway Recording Inc., Bernie Rivera, President
Studio Manager: Beecher Buntel III, Hooking John Haller
Engineers: Beecher Buntel III, Jan Walina, David Hartzheim, John Haller
Dimensions of Studios: Studio A 16 track w/isolation booth 46 x 37 x 12, Studio B 4 track 20 x 30 x 16, Studio C, Rehearsal & 4 Track 22 x 32 x 16
Dimensions of Control Rooms: Control Room A 24 x 15 x 10, Control Room B 14 x 17 x 12
Tape Recorders: 3M M 56 16 track, 3M M-64 2 track, TEAC 3440S 4 track, Pioneer CTE 900 cassette
Mixing Consoles: BCA 8900, 24 in x 16 out, Carvin 1608, 16 in x 8 out, Yamaha PM 760, 12 in x 4 out
Monitor Amplifiers: McIntosh 2300S, 2100S, BGW 750B and 100B Crown DC 300, D150, D40, McIntosh 60, PSA 2
Monitor Speakers: Studio A custom tri-amp Gauss and JBL Altec 604E Studio B ESS and custom JBL Altec custom Dual JBL 15
Echo, Reverb, and Delay Systems: Orban Springs, Lexicon Prime Time others available by special request
Other Outboard Equipment: dbx noise reduction (16 channel), Vocal Stressor, dbx 162 and 260 compressors, UREI 1176LN stereo limiters UREI digital metronome, Technics turntable w Audio Technica cartridge
Microphones: Neumann U 87, U 47, E.V. RE 20, Sennheiser 414, 421, 441, Sony C-37A assorted Shure, F.V. AKG dynamics
Instruments Available: Baldwin 5'6" grand piano, Hammond B 3 organs Fender Rhodes pianos, amps, drums, guitars (music store in front), PA systems available from small clubs to the Coliseum Call for details Rehearsal and instrument rental available
Video Equipment & Services: Upon request sound/video stage available 11/83
Rates: Call for quote Discount for block bookings

••• HOLDEN HAMILTON & ROBERTS INC.

also REMOTE RECORDING
2227 N. 56th Ave., Seattle, WA 98103
(206) 632-8300
Studio Manager: Herb Hamilton Jr

••• HOT TRACKS RECORDING
 also REMOTE RECORDING
 2217A The Alameda, Santa Clara, CA 95050
 (408) 554-1117
 Owner Phil Lumson and Don Hanson
 Studio Manager Phil Lumson
 Engineers Don Hanson, Phil Lumson, Mary Weir, Bob
 Lumbo, Mark Rosen
 Dimensions of Studios 44' x 11'
 Dimensions of Control Rooms 20' x 11' (studio only),
 20'00" x 11'
 Tape Recorders Tascam 850 4-track Analog, Tascam 680 2-track
 Tascam 80 8-track Analog, Tascam 302 4-track Digital,
 224 4-track
 Mixing Consoles Two Tascam 4400 (studio), Mack 5 (office)
 Monitor Amplifiers Yamaha CL2, T-80W 100
 Monitor Speakers JBL 4411S, JBL 4411S, and Auratone
 Echo, Reverb, and Delay Systems Digital ADAM 024 4-track
 Eberlein Mischu, Line Modulator, Loft 440 delay unit, and
 MICMIX Digitalizer AK 18X10 reverb
 Other Outboard Equipment 2000 4-track compressor, EMI
 6228 dual parameter F2, Ashly S909 A dual parameter F2,
 Tapes C201 and MXB dual graphic equalizer
 Microphones Neumann U87, AKG 414, AK 145, E-V
 RE 20S, Sennheiser MD421S, Shure SM57, and 58S
 Instruments Available Hamilton 5 note grand piano, Fender
 Rhodes Twin reed, Precision bass, Gibson Les Paul
 Rates Call or write

••• INDEPENDENT SOUND
 2032 Scott St., San Francisco, CA 94115
 (415) 929-8085
 Owner Peter Rubin, Marc Rubin
 Studio Manager Marc Rubin
 Engineers Peter Rubin, Marc Rubin
 Dimensions of Control Rooms 15' x 7.5'
 Tape Recorders TEAC 85 16-track, Otari 5050B 2-track,
 TEAC X-2 4-track, Sony TCD-P10 8-track
 Mixing Consoles Sony W-7000, Sony 600 VCA, 100 x
 100 x 100
 Monitor Amplifiers B+W 250
 Monitor Speakers JBL 4411S, MDM 47, Auratone, Yamaha
 NS10
 Echo, Reverb, and Delay Systems Lexicon 4 multi-parameter
 Lexicon Prime-Time digital delay, Event 10949 Harmonizer
 Other Outboard Equipment Sempco dual channel compressor
 series limiter, expansion rate parameter F2, and an out parameter
 unit in Orban paraphraph F2
 Microphones Neumann U87
 Instruments Available Linn drum machine, mixers, 10 of 10
 Yamaha CS80 CE 70 synthesizer and ARI 1000 Pro Cop
 for Rhodes V keyboard
 Video Equipment & Services Experience with all types within
 and production of video, audio, and MTV and network video
 Rates from \$50/hr. on up in full or part sessions. Production
 package available
 Extras Unlimited tapes, the more used, extend by 25%
 on average. There are other new tape formats and **fast**
 Direction The studio was built for times in mind. The big
 drums and multiple array of speakers, along with the ability
 to move the front of the rear main floor. We take great pride
 in it. It was our own and it was part of the last four years. We
 consist of 10 more. Project and a Sweeney Barry Isaac, N
 Sisters, Hair Attack, Andy Lindley, of Eve, Ernie, M, and
 Bob of L. MTV and more



*Ironwood Studio
 Alderwood Manor, WA*

••• IRONWOOD STUDIO
 20816 23rd Ave. W., Alderwood Manor, WA 98036
 (206) 775-7905
 Owner Paul Seales, Susan Achew
 Studio Manager Paul Seales
 Engineers Paul Seales, Gene Durbin



Dimensions of Studios 17' x 11' (studio), two 15' x 10' room
 Dimensions of Control Rooms 17' x 11'
 Tape Recorders Studer A80 4-track, Otari 5050 4-track, Otari
 5050 2-track, Akai GX 4-track, Sanyo STD-9000 cassette
 Mixing Consoles Sound Worktop Sanyo 240 x 120 x 120
 Monitor Amplifiers Magnatone
 Monitor Speakers JBL 4411S, Auratone
 Echo, Reverb, and Delay Systems Mischu, digital reverb,
 Digital 111, 909, digital delay
 Other Outboard Equipment Symetrix compressor, 20
 Symetrix, and digital delay unit, 1000 series, vocoder, A-100
 parameter, FJ Neptun, digital delay, 1000 series, digital
 reverb, Symetrix reverb, compressor, Bode Line analyzer
 parameter, Symetrix parameter, EMI 6228, digital
 B Line, Lumson, D, and a compressor
 Microphones Neumann U87, U47, RM 84, Beyer 500, E-V
 RE 20, and D11, Shure SM 88, SM 57, SM 58, AK 145, Nu
 meta CM 300S
 Instruments Available Grand piano, Hammond M, W, Leo
 Fender Rhodes, 5 note grand piano, Harmonizer, digital
 drum, Guild guitar, and a variety of Music Man amp, Tele
 strum, MOOG synthesizer
 Rates \$45/hr. for 2-track, up to \$120/hr. for 4-track,
 for 16-track, 1000 tape extra



*Isolation Studios
 Pleasant Hill, CA*

••• ISOLATION STUDIOS
 24 Genola Court, Pleasant Hill, CA 94523
 (415) 937-6552
 Owner David Deary
 Studio Manager David Deary
 Engineers David Deary, F. Coen, David
 Dimensions of Studios 15' x 20'
 Dimensions of Control Rooms 10' x 15' (studio), 4' x 4'
 10' x 10'
 Tape Recorders Ampex MM 800 4-track, Tascam 808 w/
 dual track, TEAC 8 track, TEAC 4 track, Sony KM meta 8
 800, Nakamichi 800 cassette
 Mixing Consoles Sound Worktop Sanyo EQ 14 24 x 24
 Monitor Amplifiers Rotwood 951 Q80 150
 Monitor Speakers JBL 4411S, Auratone, Intony 400, Two
 Davis
 Echo, Reverb, and Delay Systems Digital 1000 digital
 delay, 20 Steiner jobs reverb, B Line, digital delay
 Other Outboard Equipment Sempco mono reverb, 1000
 series, 1000 parameter, Ashly compressor, 1000 comp
 parameter, B Line, digital parameter, Ashly parameter, and
 Steiner jobs
 Microphones Sanyo Sennheiser, Shure, AKG, and more, avail
 able by appointment
 Instruments Available Yamaha grand piano, 15' x 4' har
 monium, B Line, synthesizer, digital drum machine
 Rates \$5.50/hr.

••• JUNIPER STUDIOS
 P O Box 1405, Evergreen, CO 80439
 (303) 333-8326 or 838-5526
 Owner Tom and John May
 Studio Manager Tom May



*Rob Kingdom Mobile Recording
 Sunnyvale, CA*

••• ROB KINGDOM MOBILE RECORDING
 ONLY REMOTE RECORDING
 120 Remington #415, Sunnyvale, CA 94087
 (408) 732-5305
 Owner Bob Kingdom
 Studio Manager Bob Kingdom
 Engineers Bob Kingdom, Don H. pp III
 Dimensions of Studios The Western World
 Dimensions of Control Rooms 27' x 11' (studio), in a separate
 Tape Recorders Tascam 85 4-track, Otari 5050B 2-track,
 Otari 5050 4-track
 Mixing Consoles Steinmeyer 20' x 4' 20' x 20' (office)
 Monitor Amplifiers Univesa 100 500, Bode 200
 Monitor Speakers JBL 1000, Auratone
 Echo, Reverb, and Delay Systems Lexicon Prime-Time 99
 Lexicon 92 DDL, Auratone SBS
 Other Outboard Equipment FAX External 4 x 1000 comp
 reverb, Digi Group (10 band EQ), symetrix serial rate custom im
 plementer
 Microphones Neumann U87, RM 84, Beyer 500, E-V
 RE 20, Bode 200, Shure SM 57, Sanyo ECM 91, Sennheiser
 421, K 111, instrument monitors
 Instruments Available MOOG, many more, many others
 Rates 16-track \$5/hr. over 16-track \$18/hr.
 16-track \$30/hr. 18-track mile travel, over 15 miles
 Extras Various rates available
 Direction Demos, clients in most of the United States, The Euro
 Wayne Sklar, Chatter, Mercury, Vanilla, Deep Six, Eastern
 W, and the Santa Clara County, and other. All in
 other, includes Tim Allen, Michael Silverstein, Joe Ferrara,
 Larry Van der, The Corporation, Video clients include Tim Al
 len, and the Santa Clara County, and other. We specialize
 in remote location, in most of the country.

••• THE LAST RECORDING STUDIO
 2539 Pearl, Boulder, CO 80302
 (303) 442-1158
 Owner Mark Burnett
 Studio Manager Dick Linka

••• LIKewise PRODUCTIONS
 P O Box 5447, Berkeley, CA 94705
 (415) 654-3112
 Owner Likewise Productions
 Studio Manager Betty O'Holt
 Engineers Betty O'Holt, Markley, Gray, James, plu
 in person
 Dimensions of Studios A 16' x 4' B 11' x 20' C 11' x 11'
 Dimensions of Control Rooms 10' x 14' (studio), 10' x 10'
 Tape Recorders Tascam 85 4-track, 2-track w/ digital control
 TEAC 8 track, 400 SX 4-track, Otari 5050 2-track w/ digital
 control
 Mixing Consoles Sound Worktop Sanyo 240 x 120 x 120
 Monitor Amplifiers Sanyo BA 3000
 Monitor Speakers Tascam SHM 1, Bode 200, E-V
 Echo, Reverb, and Delay Systems Lexicon Prime-Time digital
 delay, Mischu, digital reverb, digital reverb, Lexicon 92
 digital delay
 Other Outboard Equipment 2000HEA 4 channel compressor,
 C, 1000 series, 1000 series, digital delay, 1000 series, 1000
 series, 1000 series, Cry Baby, Dyna Comp, Bode, LSI, Kern
 and other. Limit power, and other
 Microphones Neumann U87, Sanyo ECM 91, Sennheiser

The Answer Is Always Ampex

When customers ask us which tape they should master on we have only one answer. AMPEX.

Why? Because Ampex two inch Grand Master™ 456 is tested end-to-end and edge-to-edge. That means you won't find out half way through a session that you've got a bad reel of tape. Each roll of two inch 456 comes with a strip chart of the test results; proof beyond a doubt that there will be virtually no tape-induced level variations from one reel of 456 to the next, or within a single reel. No other brand of tape offers you that sort of consistency. So we recommend no other.

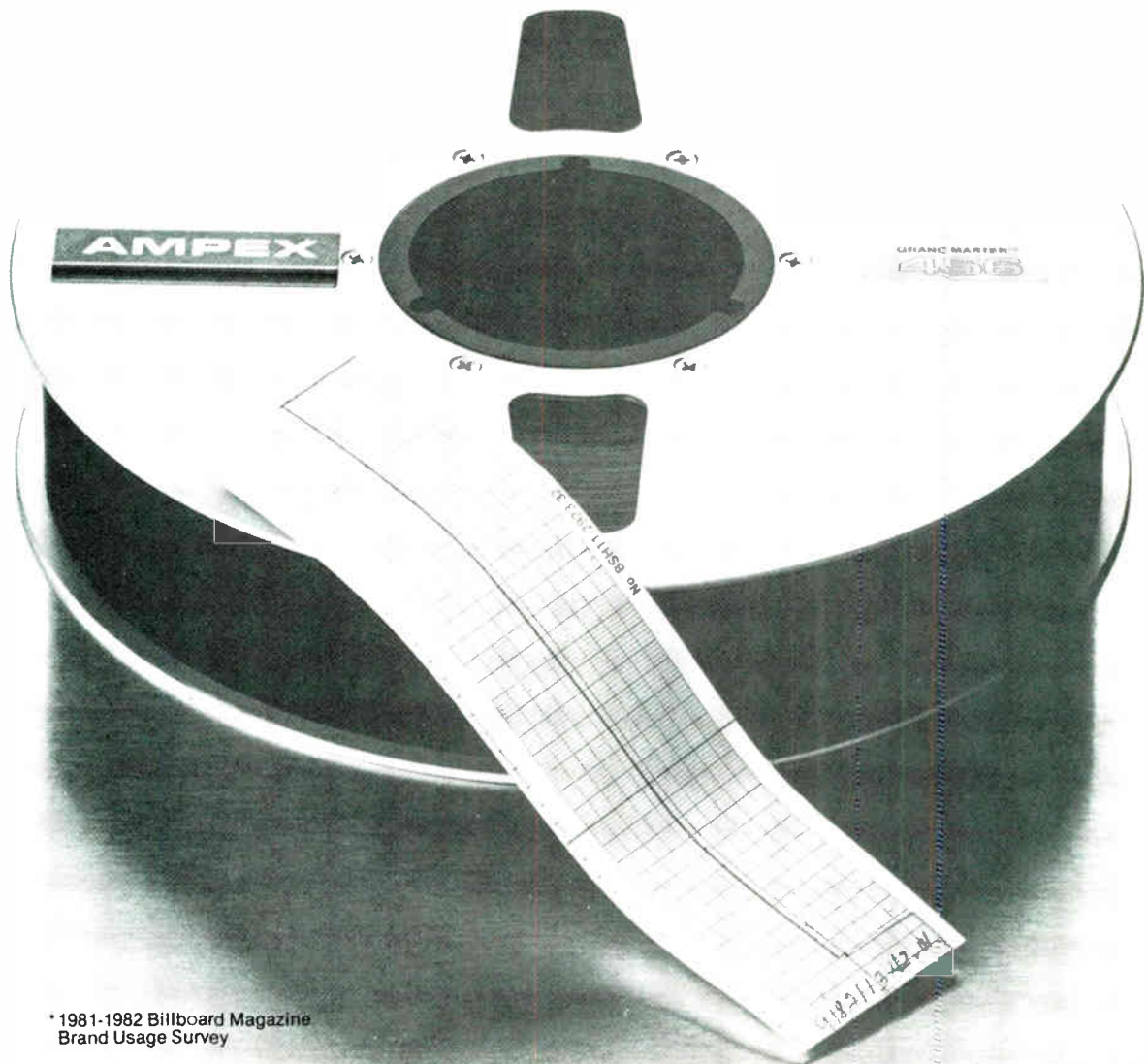
When you're recording, the last thing you want to worry about is the tape. Maybe

that's why four out of five professionals master on Ampex*, then again maybe it's just because it sounds so good.

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802 Fourth Street, San Rafael, CA 94901
(415) 457-7600



* 1981-1982 Billboard Magazine
Brand Usage Survey

World Radio History

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Microphones: We have a full selection of condensers, dynamics and ribbon mikes including Neumann, Sennheiser, AKG, Beyerdynamic, Shure, ARI, etc.

Instruments Available: Kawai grand piano, Octave synthesizer, Gallien Krueger 11.5C (boogie type amp), Fender pro CBS bandmaster (vintage), timbales and various percussion, custom Gibson Les Paul Jr., Gibson ES 335, Martin D18 (vintage), Fender Rhodes.

Rates: Call for current rates. Our rates are competitive. We offer block rates, discounts and special project prices.

Extras: Production assistance available, conveniently located in San Francisco, but away from the downtown madness. Studio musicians. Comfortable lounge and plenty of parking.

Direction: We are experienced in all types and phases of recording, specializing in album projects, singles and demos. Oasis provides a comfortable, low keyed, but professional atmosphere. We have continued to expand and improve our facilities to meet your demands; we believe our reputation speaks for itself. Please don't hesitate to see Oasis and hear our work; we're proud of it! Call for an appointment.

••• OUTBACK STUDIOS
489 1/2 Cavour St., N. Oakland, CA 94618
(415) 655-2110
Owner: Wilson Dyer
Studio Manager: Nancy Dyer
Engineers: Wilson Dyer
Dimensions of Studios: 23 x 20 x 12
Dimensions of Control Rooms: 13 x 10 x 12
Tape Recorders: Ampex MM 1000 16 track, Otari MX5050 2 track, Pioneer HI 701 1 track, 100 TEAC CX 210 Real Time (as sets) duplicate system
Mixing Consoles: Sound Workshop Series 4020 in by 16 out
Monitor Amplifiers: BGW 250K Bi Amp TC 60, TEAC Model 3 headphone amp etc.
Monitor Speakers: JBL 4411 440, Auratone vintage home hi fi speaker
Echo, Reverb, and Delay Systems: Lexicon Prime Time DDL Master Room XI 405, Furman RV 1, MXB flanger doubler, Yamaha F 1010 delay
Other Outboard Equipment: AHP equalizer, 1/2 in x limiter, noise reduction, Symetrix signal gates, Furman parameter, Bi Amp graphics
Microphones: AKG 414 EB, D11, 190, 160, 1000, Boyer M 500, Neumann KM 85, U 87, Sennheiser 44, 421, Shure SM 57, 58, Stryker 2A (44), ECM 47, 50, 12, 19, Dyanco Jensen System three boxes
Instruments Available: 1948 Kramich & Bach baby grand, Gibson ES 335 145, Fender Strat, Deluxe amps, Gibson frame w/ Yamaha wood, unare, Froehner 5, Rhodes w/ Dyno my EC, Music VI line
Rates: Block rates of 1 hr. \$ 40 hr. w/eng. Call for Real Time our rates dip for 1st price.

••• PARADISE STUDIOS
also REMOTE RECORDING
46-003 Alaloe St., Kaneohe, HI 96734
(808) 235-5931
Owner: Sound Connections, Inc.
Studio Manager: Ken Matinday

••• PARVIN STUDIOS
P.O. Box 16191, San Francisco, CA 94116
(415) 359-1853
Owner: M.B. Parvin
Engineers: Leo Parvin and Henry Parvin
Dimensions of Studios: 22 x 10
Dimensions of Control Rooms: 11 x 11
Tape Recorders: Ampex MM 1000 16 track, Ampex 440 B 9 track, Ampex 440 B 42 track, Ampex AG 500 1 track, Akai GX 600 stereo 14 track, Akai 650 B stereo cassette
Mixing Consoles: Audiotronics 50, 20, 18 in x 16 out
Monitor Amplifiers: Marantz 15 Crown DC 300
Monitor Speakers: Altec 604 GK, UREI Time Alti in Auratone SC's JBL 4311
Echo, Reverb, and Delay Systems: Master Room Stereo C Series reverb, AKG Wien Stereo
Other Outboard Equipment: UREI Modco 112, 1N, 1N2, UREI Modco 1A4, 1A4 amp resser, limiters, Orbis Para 0 and

parametric UREI 540 equalizer, dbx noise reduction, Eventide Harmonizer, EITech take-limiter
Microphones: Neumann U 87, U 47, KM 85, KMS 85, Sennheiser 421, 441, AKG 1000, Shure SM 81, AKG D 200, Shure SM 58, MB 301 ribbon, Shure 540, Electro Voice BE 20
Instruments Available: Emerson baby grand piano, Hammond B 3 organ, Fender Rhodes piano
Rates: Call for rates

••• PRUNE PRODUCTION & RECORDING
12 Locust Ave., Mill Valley, CA 94941
(415) 383-0230
Owner: Alan T. Rappoport
Studio Manager: Chris Merrin
Engineers: Bob Ollisson, Chris Morris, Jerry Martinez
Dimensions of Studios: Main room 300 sq ft includes 160 booth
Dimensions of Control Rooms: 250 sq ft
Tape Recorders: TEAC RS 16 16 track, Ampex ATR100 2 track, Otari 5050 2 track, TEAC A 440 S 4 track, Avar cassette decks
Mixing Consoles: 2 Sound Workshop 1280's in/out, 1.4 in x 16 out
Monitor Amplifiers: Phase Linear 1000, BGW 250, BGW 100, Randall 250
Monitor Speakers: JBL 1112's, JBL 4411's, Auratone
Echo, Reverb, and Delay Systems: Lexicon 224 digital reverb (completely adjustable), MICMIX Spring reverb, Digital DDL, plus tape delay
Other Outboard Equipment: Lexicon Prime Time, Marshall time Modulator, Eventide Harmonizer, Scamp rack with 4 in compressor, sweep EQ, stereo pan mon, autolimiter, LA 2 limiter, stereo LA 4 limiters, Orbis Para graphic EQ, Furman parameter EQ, 2 UREI 540 in/out in the room EQ's
Microphones: Neumann U 87s, 86s, 84s, Beyerdynamic M 88s, U 1, AKG 452, 414s, E V BE 15, Shure 55s, 57s, Sennheiser 421, 441
Instruments Available: Yamaha upright piano, Ludwig S 200 and 1 Rogers drums, percussion equipment and anything pertaining to guitar via Prune Music
Rates: 1.5 hr with engineer, \$15 hr for tape copying



Rainbow Sound
Hayward, CA

••• RAINBOW SOUND STUDIOS
also REMOTE RECORDING (by advance arrangement only)
24289 Mission Blvd., Hayward, CA 94544
(415) 582-9980 or 886-6048
Owner: T. Malcolm Rowland
Studio Manager: T. Malcolm Rowland
Engineers: Malcolm Rowland, Mike Horst, Ron Massey, David Turner, and Jeff Allen, Live & Remote, Louis Nourano (live & remote), other arrangements by Curtin from Sennheiser
Dimensions of Studios: Main room 18 x 12, 12 x 12, 12 x 9, 12 x 9
Dimensions of Control Rooms: 11.5 x 12 x 8
Tape Recorders: Otari Ampex MM 1000 with continuously variable tape speed, 16 track TEAC T1500 Hi-Fi w/EF, 16 track Otari Ampex TEA TA440 4 track, 2 in and 1/2 inch Otari Ampex A 600 4 track master tape deck, TEAC Sony & Marantz cassette recorders
Mixing Consoles: Otari Custom M 100 w/ GM 20 expansion, 16 in x 16 in, 16 in x 16 in, 16 in x 16 in, Yamaha PM 500, 16 in x 16 in
Monitor Amplifiers: Phase Linear PL 100 stereo, 2 McIntosh MC 100, master reverb multi ramp, stereo SAE 250 C 2 pre amp, stereo
Monitor Speakers: 2 JBL 4411, 2 Auratone 50's, 2 Beyer 112 in 8 4X, 2 Sennheiser 44 and 2 Beyer phones
Echo, Reverb, and Delay Systems: GBS stereo Spring reverb system, Digital DDL 2, stereo digital delay, custom Echoplex tape delay unit, etc.
Other Outboard Equipment: Modco Par 1 parameter EQ, 2 Furman EQ's, AHP 2900 parameter EQ, stereo 1/2 in x 160 compression limiter, Fender instrument amplifiers, more

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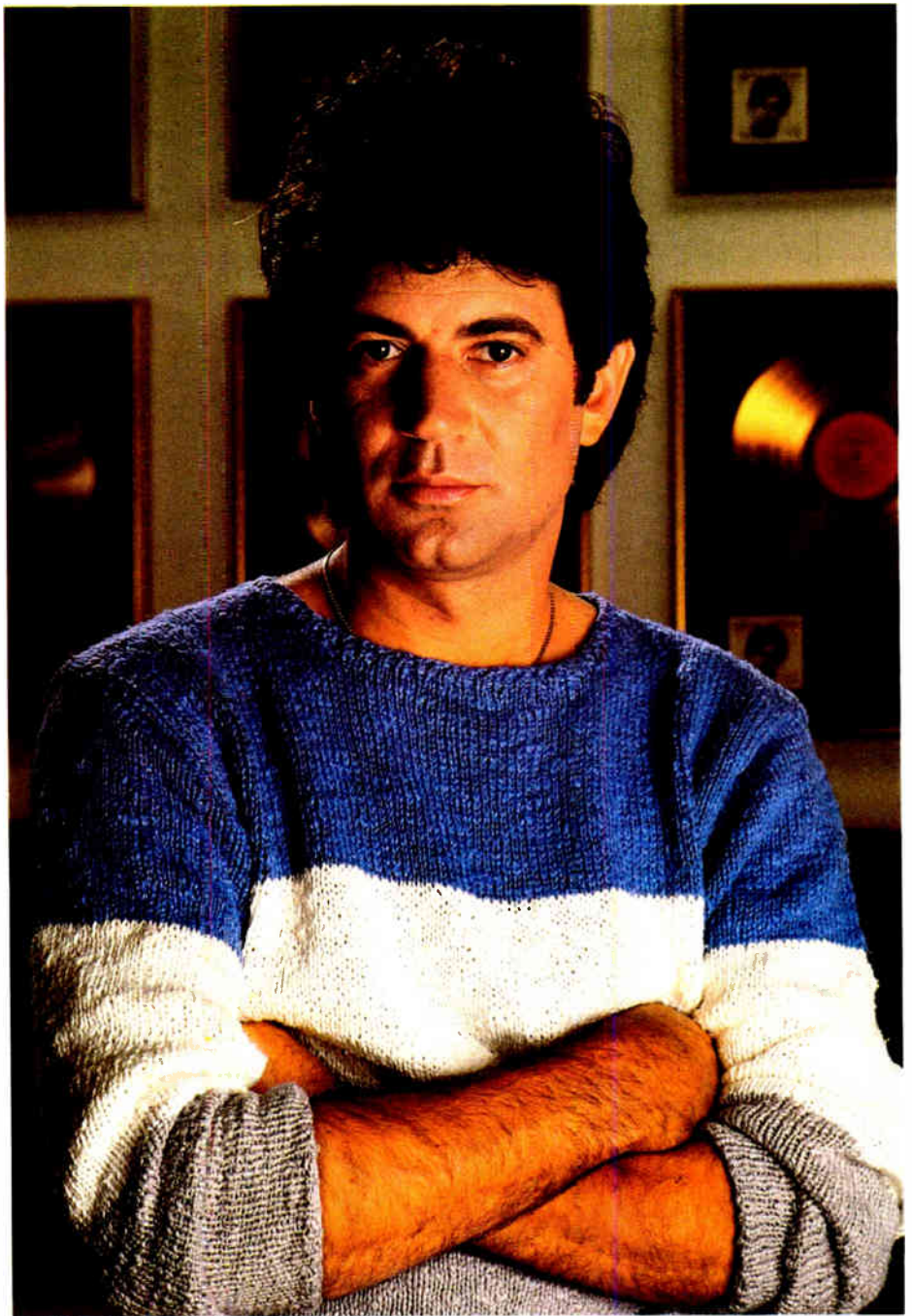
Summit Audio

P.O. Box 1678 Los Gatos, Ca. 95031
408/395-2448

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Grammy
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For
"Record Of
The Year"
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(Kim Carnes).
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Engineer.
Studio Owner
(Record One).
Producer.
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Manager.



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Mr. Garay accepts no compensation for his endorsement.

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Extras Since the owner is a studio player and producer, these services can be used to whatever level desired. The rates are now over those of a musician and not simply a technician.

Direction This isn't a commercial studio in the classic sense of the word. It's privately owned and has been opened to those outside projects serious about quality demos or records. The rates will remain comparatively very low in the hopes of attracting those who want the sound to be right and not simply a substitute.

••• **SOUND RECORDING COMPANY**
also **REMOTE RECORDING**
503 W. Indiana Ave., Spokane, WA 99205
(509) 326-0222
Owner: Corp
Studio Manager: Irene Carter

••• **THE SOUND SERVICE**
860 Second St., San Francisco, CA 94107
(415) 433-3674

Direction For over a decade we have been providing producers with a full range of audio services for visual media. With the installation of our Audio Kinetics 5.1 Q Lock we can now provide full blown audio editing, mixing and sweetening for video. With our in-house libraries of original in-use live and studio composer and sound designer and extensive sound effects, we believe we offer the most comprehensive facility for sound track production of all forms of visual media: video film, audio visual in the Bay Area. We're efficient, creative, competent, friendly and offer a great cup of coffee. Drop by.



Soundtek Studios
Campbell, CA

••• **SOUNDTEK STUDIOS**
also **REMOTE RECORDING**
85 South Second St., Campbell, CA 95008
(408) 370-3313

Owner: Bob Berry
Studio Manager: Greg Noga
Engineers: Bob Berry, John Erickson, Greg Noga
Dimensions of Studios: Main room: 21 x 24, live room: 9 x 20
Dimensions of Control Rooms: Studios: 14 x 17
Tape Recorders: Ampex MM1200 (6) wired for 24 track, Ampex ATR102 (2) track, (2) TEAC V-4HX cassettes, TEAC X7R (2) track
Mixing Consoles: Neotec Series III (2) 6 in x 24 out, Quantum (remote) QMB w/expander (1) 6 in x 8 out
Monitor Amplifiers: Crown PS400, Crown PS200, Crown D75 phones
Monitor Speakers: UREI H14A, Auratones, Art Audio, Audio Spectrum

Echo, Reverb, and Delay Systems: EMT 240, AKG BX5 live chamber 30 x 4, Eventide Harmonizer, Lexicon Prime Time
Other Outboard Equipment: dbx 900 Series limiters, noise gates, UREI LA-4 limiters, Roland stereo flanger chorus
Microphones: Neumann AKG, Sony, Sennheiser, Shure, Countryman, E-V
Instruments Available: Horuqal 6'6" grand piano, Fender Rhodes Mini Moog, clavinet, Hammond B3, vibes, ARP Omni complete Ludwig drum set, various snare drums, Marshall 100 watt Fender Princeton
Rates: \$50/hr

Extras: Kitchen facilities, 10 minutes from lodging and the San Jose Airport, 1 block from various entertainment nightclubs, restaurants, shops and music stores. Soundtek Studios is next door to a complete video production and editing facility.

Direction: Soundtek Studios is a complete audio production facility. Projects include album production, audio/video interface, commercial production, jingles and sound reinforcement. We have a complete staff of writers and musicians. Classes in recording techniques are offered in conjunction with San Jose State University. At Soundtek Studios, we are dedicated to a complete creative environment.



Spectrum Studios Inc
Portland, OR

••• **SPECTRUM STUDIOS, INC**
905 S.W. Alder St., Portland, OR 97205
(503) 248-0248

Owner: Michael Carter, Lindsey McGill
Studio Manager: Michael Carter
Engineers: Michael Carter, Lindsey McGill, Chris Douthitt, Dave Mathew, Mark Tortwig
Dimensions of Studios: A: 19 x 14, B: 18 x 14, C: 14 x 10
Dimensions of Control Rooms: A: 22 x 15, B: 7 x 15, C: 12 x 10
Tape Recorders: Ampex MM1200 (1) 24 track, (2) Scully 280 B 4 track, (5) Scully 280 B-2 2 track, (8) Scully 280 B mono, Nagara 2 4 2 mono, Magnasync 5 Series 2000 (1 each in 16mm interlock system)

Mixing Consoles: Custom (manufactured in house) Spectrum 1616 (1) 6 in x 15 out, (2) custom Spectrum 1608 (1) 6 in x 8 out
Monitor Amplifiers: McIntosh, Crown
Monitor Speakers: E-V, Sentry II, Auratone, UREI H13
Echo, Reverb, and Delay Systems: EMT 140s, AKG BX 20E, Eventide Harmonizer
Other Outboard Equipment: Dolby A noise reduction, dbx limiters and 187 noise reduction, Harmonizer, Eventide flanger, UREI 11 octave EQs, UREI notch filter, Orban D-Easer, Allison Kefex, Gain brains, Roger Mayer gates, Jensen direct box, Countryman FEET direct boxes, Eiki interlock projector, Magnasync interlock distributor, AVI Eagle computerized programmer, AVI Doves
Microphones: Neumann U 87, U 47, FET, E-V, CS 15, RE 16, RE 50, AKG C451E, D1900E, D190, D200, Shure SM 54, Sennheiser 415, Sony ECM 50
Instruments Available: Yamaha G3 6' grand piano, drum set
Rates: \$55/hr for all formats

••• **STAR SOUND AUDIO INC.**
also **REMOTE RECORDING**
2679 Oddie Blvd., Reno, NV 89512
(702) 331-1010

Owner: Scott Berastrom
Studio Manager: Mark Ishikawa
Engineers: Scott Berastrom, Mark Ishikawa, Lee Taggar
Dimensions of Studios: 35 x 30, 3 solo rooms: 8 x 14, 7 x 10, 8 x 10
Dimensions of Control Rooms: 15 x 25
Tape Recorders: Tascam 85, 16, 16 track, Tascam 45, 2B, 2 track, Tascam 122, 2 track, TEAC 222, 2 track, TEAC A 800, 2 track
Mixing Consoles: Tascam M 15, 24 in, Roland/Studio 545, 800 Compu Editor
Monitor Amplifiers: Crown PSA 2D, BGW 100s
Monitor Speakers: JBL 4333, 4312, 4411, Auratones, Altec 604s

Echo, Reverb, and Delay Systems: MasterRoom Super "C" reverb, Prime Time, DeltaLab, Roland, and Advanced Audio delays
Other Outboard Equipment: dbx available for all channels, dbx de-esser, compressors, noise gates, parametrics, DeltaLab DL-5,

MXR in Eventide, 40 Harmonizers, Roland Studio phase shifter, stereo flanger, Dimension D, TEA, parametric, Ashly noise gate

Microphones: Sennheiser 44 s, 42 s, 4 y, 409, 402, 2, E-V PL 20s, RE 15, RE 20, AK 54, 4, 460, 340, 320, Shure SM 56, 57s, 4, A1, 21, 1, 8, 8 s, PZMs, Countryman, 01

Instruments Available: Steinway upright, Gulbransen grand, Prophet 5, TR, Moog, Moog, Steeman, Pentatonic, Rhodes, Chroma, and many more

Video Equipment & Services: Simple VCR, Aviatone
Rates: \$154/hr (dependent on time and number of tracks)

Extras: Over 2,000 instruments available for Studio 1, A11, Suzanne, later complex. Almost any vinyl gear. Repair and customization facilities, concert sound and live multi-track available
Direction: Project Success stressed. Facility is set up to do very cost effective. No charge set up, efficient engineering, computer assist mixdown, and \$1 million in instruments and outboard available

••• **TELEMATION PRODUCTIONS/AUDIO**
1200 Stewart St., Seattle, WA 98101
(206) 623-5934

Owner: Telemation
Studio Manager: Butler Crawford
Engineers: Peter B. Lewis, Susan McArthur, Jonathan Trevelyan, Wayne
Dimensions of Studios: A: 28 x 38 x 15, B: 4 x 4 x 8
Dimensions of Control Rooms: A: 4 x 6, B: 5 x 15
Tape Recorders: Studer A800 (6) track, MCI H1114 track, Ampex Invision (5) 4, 2, & mono
Mixing Consoles: Neve 516, 24 x 12 + 8, Neve 5432, 11 x 2 + 2

Monitor Amplifiers: BGW
Monitor Speakers: Altec, JBL, Auratone
Echo, Reverb, and Delay Systems: EMT 900, Orban Major Space Station (level 500)

Other Outboard Equipment: ADR Vxx, Stresser, Neve compressor/limiter, 2 Ashly SC 40, Orban parametric EQ, UREI LA 4A, 2, UREI graphic EQs

Microphones: 2 AK 14, 4 EB, 2, RCA 770X, reverb chamber, E-V RE 20, RE 5, 2, Crown P2M, Sennheiser 44, Microphone and vocal mikes available for rent

Instruments Available: Limited percussion, Lexon synthesizer for rent. No piano for rent

Video Equipment & Services: VCR, 4, VCR, 2, Q Lock, 3, Synchromizer, Sony 25" color monitors, CR & studio, total sweetening incl. 16 x 45 mm film
Rates: Studio A: sweetener \$125/hr, 16 track record mix \$100/hr, Studio B: 4 track, 2 track or mono \$60/hr, music/tech search \$40/hr

••• **THUNDER OAK AUDIO**
also **REMOTE RECORDING**
23717 Bothell Way S.E., Bothell, WA 98011
(206) 483-1333

Owner: Thunder Oak Audio, Inc
Studio Manager: V. Coupez

••• **TIOGA RECORDING STUDIO**
P.O. Box 205, Allegany, OR 97407
(503) 267-2330

Owner: Jim Hanagan
Studio Manager: Jim Hanagan
Engineers: Jim Hanagan
Dimensions of Studios: 25 x 23 with drum stage and isolation booth

Dimensions of Control Rooms: 13 x 17
Tape Recorders: Ampex MM 1200 16 track, Ampex AG 440 4 & 2 track, Magnacord (2) 2 track, TEAC 2400 4 track, Nakamichi 500 cassette
Mixing Consoles: MCI H 42R (8 in x 18 out)
Monitor Amplifiers: Crown DC 300A, D 150 (2) D 60s
Monitor Speakers: Altec 604E in Bio Reds with Mastering Lab crossovers, JBL's and Auratones

Echo, Reverb, and Delay Systems: AKG BX 20E, Eventide Harmonizer digital delay
Other Outboard Equipment: 18 channels dbx, Orban 2 channel parametric EQ, Orban 4 channel noise gate, UREI 117s LN compressors

Microphones: Neumann, Sennheiser, Sony, Shure, E-V
Instruments Available: Knabe baby grand piano, Hammond B3 organ with Leslie, Provey guitar, amp, Hickenlocher bass guitar, Fender Telecaster, guitar, stand up double bass
Rates: \$25/hr

Extras: Band house available for rent \$20 per night per band (1 mile from studio)
Direction: We are located 20 miles east of Coos Bay, Oregon, up in the coastal hills of Oregon. It's peaceful with the Millicoma River you can fish or swim in. If you look at our price you'll see we are making recording your song(s) affordable but not giving up quality

••• **T & B LABS**
3018 22nd St., San Francisco, CA 94110
(415) 821-3065

Owner: M. Kelley, J. Schlesinger
Studio Manager: Gully Anderson
Engineers: Randy Beaubeaux, Gregory Jones, Mark Ellinger

Dimensions of Studios 500 sq ft
 Tape Recorders Ampex 4400 1-track Sony ICD5M cassette
 MCI 1540 4-track TEAC 2540S 4-track Revox A22 2-track
 Mixing Consoles Neveok Series P 24 mix 40 out
 Monitor Amplifiers Meltr 1 Vandal
 Monitor Speakers JBL and Superlux SEM
 Synthesizer rack Philips JBL 4
 Echo, Reverb and Delay Systems MasterReverb 3050 Delay
 Unit Pyle Line
 Other Outboard Equipment TEF 1/2 and 1/4 inch limiters, Trans-
 tronix I.E. 1/2 inch type limiter, custom delay track generator, and
 EQ processor
 Microphones Telefunken 24 1/2 inch type Neumann 281 AK
 Countryman Sennheiser EV Sauer
 Instruments Available Spector mandolin, guitar, bass, piano,
 Fender electric and acoustic guitars, synthesizer, rhythm ma-
 chine, synthesizer, Roland 808 rhythm machine
 Video Equipment & Services U.S. production and worldwide
 service
 Rates Available upon request

••• WARTHOG STUDIO
 also REMOTE RECORDING
 P.O. Box 620 Enumclaw WA 98022
 Owner: Barbara Vetter & Sammie Longoria
 Studio Manager: Sammie Longoria

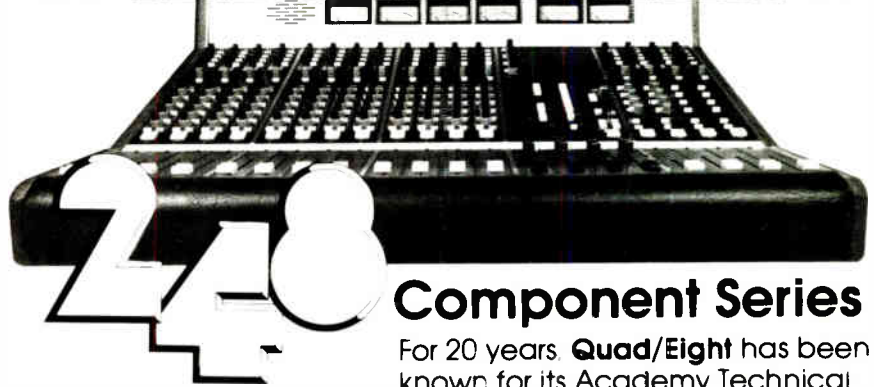
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(213) 478-8222
Eastern U.S.
(212) 605-0296



Circle #041 on Reader Service Card

24 TRACK

THE NORTHWEST



Ange, Voice Recording
San Jose, CA

(415) 331-2899

Owner: Gene Turner
Studio Manager: David Turner
Engineers: Wally Park, E. M. M...
Dimensions of Control Rooms: 6 x 10 control room, 12 track
Tape Recorders: 2 MCI, 1 B...
Mixing Consoles: M...
Monitor Amplifiers: M...
Monitor Speakers: J...
Echo, Reverb and Delay Systems: A...
Other Outboard Equipment: F...
Microphones: Ne...
Instruments Available: B...
Video Equipment & Services: A...
Rates: 1...
Extras: 1...
Direction: 1...



The Automatt
San Francisco, CA

•••• THE AUTOMATT
 829 Folsom St. San Francisco CA 94107
 (415) 777-4111
Owner: Dan...
Studio Manager: M...
Engineers: M...
 Dan... Wayne...
 Paul...
 Michael...

•••• ANGEL VOICE RECORDING CO
 2460 Senter Rd. San Jose CA 95111
 (408) 292-1155
Owner: J...
Studio Manager: David...
Engineers: Vincent...
Dimensions of Studios: 40 x 50...
Dimensions of Control Rooms: 14 x 20
Tape Recorders: Ampex...
Mixing Consoles: S...
Monitor Amplifiers: Crown...
Monitor Speakers: J...
Echo, Reverb and Delay Systems: A...
Other Outboard Equipment: UREI...
Microphones: EV...
Instruments Available: Grand piano...
Rates: 1...
 (discount for block booking and domestic)

•••• APPLEWOOD STUDIOS
 also REMOTE RECORDING
 680 Indiana St. Golden CO 80401
 (303) 279-2500
Owner: Applewood Studios, Inc.
Studio Manager: John Bergeron

•••• AUTHENTIC SOUND
 ONI Y REMOTE RECORDING
 30 Princess Ct. Sausalito CA 94965

Dimensions of Studios: A 1700 sq ft, B 500 sq ft, C 250 sq ft, D 200 sq ft
Dimensions of Control Rooms: A 20 sq ft, B 15 sq ft, C 10 sq ft, D 8 sq ft
Tape Recorders: A MCI, B M...
Mixing Consoles: S...
Monitor Amplifiers: M...
Monitor Speakers: B...
Echo Reverb and Delay Systems: E...
Other Outboard Equipment: F...
Microphones: AKC...
Instruments Available: A...
Rates: 1...
Extras: 1...



Ayre Studios
San Jose, CA

•••• AYRE STUDIOS
 458-A Reynolds Circle San Jose CA 95112
 (408) 279-AYRE, 279-2973
Owner: Richard...
Studio Manager: S...
Engineers: Richard...
Dimensions of Studios: 21 x 18...
Dimensions of Control Rooms: 14 x 18...
Tape Recorders: MCI...
Mixing Consoles: M...
Monitor Amplifiers: M...
Monitor Speakers: J...
Echo Reverb and Delay Systems: E...
Other Outboard Equipment: E...
Microphones: Ne...



**“Shure’s Headset Mic keeps us great drummers
from annoying us great singers.”**

Keith Knudsen—*Doobie Brothers*

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If you’re like Keith Knudsen, your vocal sound is just as important as your drum and percussion sound. That’s why Shure has created a special microphone just for you.

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voice from the instruments; and scintillating highs that add sparkle to your performance.

The Headset Mic is available in two versions. The standard SM10A (microphone only) and the SM12A which features a receiver for use as a monitor.

But whichever you choose, be sure of one thing. Now you’re free to play your instruments any way you want... without stretching for the vocals.

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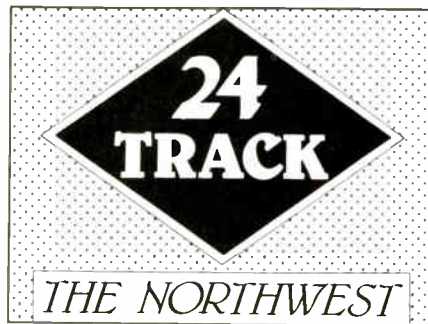
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Microphones: Neumann U47, U43, RM 84, AK 414's, 452's, Bever, Sennheiser, Sony, E.V. Shure, etc. Many portable mikes available.

Instruments Available: Yamaha C/B grand piano, vocoder, Fender amplifier, and more.

Video Equipment & Services: SMPTE, VCR, 2X, etc. 1.5 M, etc.

Rates: Top hour for rate, engineer available, block booking and special rates.

Extras: Copy machines, shower, sauna, and wheelchair color TV, and free off street parking.

Direction: This is one of a state of the art studio in a beautiful location, San Francisco View. Outstanding sound and technical capabilities. Complete production services, private atmosphere, and a professional and manager. Media voice-over and audio record. Recent clients include: Bill Summers, Pleasure, Walter Hawkins, Edwin Hawkins, David Grisman in Quarter, Walt Disney Company, and CBS.



*DNA Productions
Seattle, WA*

•••• DNA PRODUCTIONS
4034 N.E. 195th St., Seattle, WA 98155
(206) 364-5333
Owner: David W. Thompson
Studio Manager: David W. Thompson III

Engineers: David Thompson, Pat Hewitt
Dimensions of Studios: 18 x 7'
Dimensions of Control Rooms: 18 x 8'
Tape Recorders: Otari MTH 90 2 24 track Otari MTH 10 4 4 1/2 track 1/2" Otari MTR 10 2 2 track 1/4"
Mixing Consoles: Sound Workshop Series 40, 36 in x 32 out, fully automated
Monitor Amplifiers: Crown UREI, Symetrix
Monitor Speakers: JBL 4415 and 4412 Sentry 100 A Aura tone
Echo, Reverb, and Delay Systems: Lexicon 224X Super Prime Time Ewente H449 Harmonizer
Other Outboard Equipment: UREI compressors dbx Otari, Vocal Stressor compressors, Time Squeeze, Kepex EXR, EX3 all x noise reduction
Microphones: Neumann U47's 87's 89's 84's E.V. HF 20's AKG 414's 452's 441's, Shure SM57's 81's Festec M88P M85RP
Instruments Available: Yamaha grand, Fender amp, studio drums available, many guitars and basses
Video Equipment & Services: BTX Shadow syn control SMPTE decoder VCR recorder
Rates: \$125 A/hr. \$150 video. Block rates available.



*Eureka Teleproduction Center
San Carlos, CA*

•••• EUREKA TELEPRODUCTION CENTER
1250 San Carlos Ave., San Carlos, CA 94070
(415) 595-3200
Owner: Eureka Federal Savings
Studio Manager: Kenneth Cox



*Fane Productions
Santa Cruz, CA*

•••• FANE PRODUCTIONS
115-B Harvey West Blvd., Santa Cruz, CA 95060
(408) 425-0152
Owner: Fane Productions Inc.
Studio Manager: Core Opperman
Engineers: Fane Opperman, Peter Carlson, Dave Lake, Core Opperman
Dimensions of Studios: 14 x 26 x 11, general iso booth
Dimensions of Control Rooms: 10 x 12'
Tape Recorders: MCI JH 16 transformerless 24 & 16 track MCI JH 110B transformerless 2 track Otari MX5050 2 track Tascam 40 6 track Tascam 25 2 track Sony and Aiwa cassette decks
Mixing Consoles: MCI JH 16 transformerless 16 in x 4 out with automation
Monitor Amplifiers: Yamaha's Crown Hi Amp
Monitor Speakers: Tannoy Berkovlevs JBL 4311's Altec A7's

Microphones: Neumann U 87's AKG 414's 451's Shure SM 58's SM 57's SM 56's Sennheiser 421's 441's E.V. RE-20
Instruments Available: Yamaha C7 grand piano, Korg synthesizer
Video Equipment & Services: Sony BVU 800 long-run 24 track with BTX Shadow and remote controller. Full video sweetening equipment. Access to picture.
Rates: Studio A \$65/hr Studio B \$60/hr. Video sweetening \$125/hr. Night Block rates and 24 track rates on request.
Extras: Thirty-two new instruments as well. Summer Studios, another fine 24 track facility. Their MCI 24 track and automated rates are both 40 minutes, top studios with video interface.
Direction: Recording isn't only our business, but our hobby. We've worked on many "big" LPA award winning commercial and have a strong orientation to great sounding radio. Our 24 track studio with video sweetening is new this year and we've been enjoying the influence of working with our new toys. If you have a tape in mind while you're working, and you like to work in a comfortable place, you want to track it out.

The Little Mountain Sound Studios

*Little Mountain Sound Studios
 Vancouver, British Columbia, Canada*

◆◆◆ LITTLE MOUNTAIN SOUND STUDIOS
 201 West 7th Ave., Vancouver, British Columbia,
 Canada V5Y 1L9
 (604) 873-4711
Studio Manager: Bob Brooks
Dimensions of Studios: Studio A 70 x 30 x 22 Studio B 31 x 30 x 22. Canada's largest recording studio complex.
Echo, Reverb, and Delay Systems: (1) Loft Analog delay line, UREI 4 out DDL, Eventide 1745M 4 DDL, Harmonizer, (2) FMT 140 Plates, (2) FMT 240 GoldFoil Plates, AKG BX-20 Cooper Time Curve Lexicon 2, 4 digital reverb.
Other Outboard Equipment: Dolby NR (2) UREI 1176N limiters, Kexox II II, 1 Gain Brains, 2 Quab noise gates, Marshall Time Modulator, Eventide H910 Harmonizer, EL201 Instant Flanger, Intellit user Countryman phaser, (2) Triac parametric EQs, (2) Orban parametric EQs, Aphex Aural Exciter, UREI digital meter, noise Alter tube limiters, Orban De-essers.
Instruments Available: Baldwin grand Howard grand Fender Rhodes Hammond A 100 organ Hohner clavinet D6 and Fender D15 Pr phnet 5 Yamaha electric grand Conn strobe tuner Poly Moco Mini Moco, Solina string machine, Fender Precision bass, Camo and an Pearl drum kits, Fender Marshall and Mesa Boogie amps, 147 Leslie w/ Alter components.
Video Equipment & Services: BTX Shadow SMPTE syn JVC K200 4 VTR SMPTE Character generator reader, Sony color monitors.
Rates: Studio A 24 track \$145/hr Studio B 24 track \$115/hr, reduced block and 24 hour weekly lockout rates, all rates in Canada include tax (approx. 20% discount).
Extras: Enjoy complete home away from home kitchen facilities (kitchen by full time chef plus a game room lounge video movies etc.) 2 track mixdown now available.
Direction: A proven combination of artistic and innovative technical capabilities in the area of multi track recording, picture and electronic interface video tape techniques. An internationally acclaimed and best quality familiar with the disciplines and styles of the modern recording studio. Already the proven experience of name Hollywood first motion picture music producers who have taken advantage of superior technology and extremely competitive rates by both studio and musicians based on current toll free 800 rates.

◆◆◆ MENDOCINO RECORDING CO.
 Box 131, Comptche, CA 95427
 (707) 937-4611
Owner: Phil Hayward
Studio Manager: Lewis Correll
Engineers: Lewis Correll
Dimensions of Studios: 20 x 20 private and room
Dimensions of Control Rooms: 14 x 14
Tape Recorders: Ampex MM1100 16, 4 track SM 2 track Technics 2 track



Mixing Consoles: DeMeo custom API 24x16x24
Monitor Amplifiers: McIntosh 2100's
Monitor Speakers: UREI Time Aligned 811's
Echo, Reverb, and Delay Systems: 40' x 16' 2600' in chamber MKR digital delay
Other Outboard Equipment: Compressors limiters
Microphones: Neumann 7's AKG 414 451 Shure 57's AK 1 D100's
Instruments Available: 2 Pr phnet 5's pianos electric and acoustic guitars, amps, drums etc.
Rates: \$80/hr
Extras: 150 acre ranch 1+ miles east of Mendocino. Horse cabins available. Excellent training camp for groups with or without families.
Direction: Mendocino Record Co. is an independent label with a great production facility. Mendocino Record Co. offers complete record production and promotional packages for artists and companies. Production Direction: Steve Barnard CSN Grateful Dead etc. Promotion Direction: Audio Blume & Assoc. Management Direction: Jim Mitchell, Bullyhoop Prod.
 Mendocino Record Co. in conjunction with Headlands University provides college and high school course work as well as an alternate and alternative degrees in Music Business and Recording Technology on a residential and non residential basis.

möbius music RECORDING STUDIO

*Mobius Music Recording
 San Francisco, CA*

◆◆◆ MOBIUS MUSIC RECORDING
 1583 Sanchez, San Francisco, CA 94131
 (415) 285-7888
Owner: Oliver DeCervo
Studio Manager: Annew Olesen
Engineers: Oliver DeCervo, Ken Kesse, Andy Naroll, Annette Olesen
Dimensions of Studios: 15 x 15 (expanding to larger facilities in Spring of '83)
Dimensions of Control Rooms: 16 x 12
Tape Recorders: MCI JH 114 with Autolocator III 24/16 track, MCI JH 110 2 track, Revex A7HS 2 track, Nakamichi 600 cassette.
Mixing Consoles: Audiotronics 501 26 in x 24 out 8 effects returns.
Monitor Amplifiers: Crown D150 Crown D60
Monitor Speakers: UREI 811 Time Aligned Auratones Alter 604 w/ mastering lab crossovers, Sennheiser headphones.
Echo, Reverb, and Delay Systems: Lexicon 224 digital reverb MasterRoom MR 4 reverb, Lexicon 92 DDL, DeltaLab DI 4 DDL.
Other Outboard Equipment: UREI 1A4 limiter compressors dbx 150 limiter/compressors, Allison Kexox gates, UREI 540 graphic EQ, Orban 622 parametric EQ, AR burntable.
Microphones: Neumann U 47 tube, U 87's, KM 84's, KM 85's, Sennheiser 421's 402, Beyer M500 M69 Shure SM 57's E.V. RE 15 RE 20 AKG D2 KE D160 custom direct boxes.
Instruments Available: Yamaha C3 G grand piano, Moco Model 12 synthesizer, Fender Precision bass, Gibson Melody Maker, Slangerland Baxto King Drums, Fender Vibrolux and

Banmaster amps, Lebrecht piano in lounge
Rates: Please call for rates, block booking discounts are available



*Montage Recording Co
 Newark, CA*

◆◆◆ MONTAGE RECORDING CO.
 37532 Sycamore St. Bldg. 1C, Newark, CA 95037
 (415) 794-2992
Owner: Will Mullins, Bill Walsh
Studio Manager: Will Mullins
Engineers: Bill Llewellyn, Will Mullins, Dave Hartzem, Ed Alves
Dimensions of Studios: Main room 28 x 34, Drum room 10 x 12, Vocal booth 6 x 4
Dimensions of Control Rooms: 18 x 15
Tape Recorders: MCI JH 114 w/Autolocator II 16/24 track, ATH 100 w remote 2 track, TEAC 3440S 4 track, Tascam 122 TEAC A 450 cassette decks.
Mixing Consoles: MCI 416 modified 24 in x 24 out, Studio master, 16 in x 4 out.
Monitor Amplifiers: Yamaha Crown D150 D60, Uni Syc 100
Monitor Speakers: UREI 811's, Alter 604, Auratones
Echo, Reverb, and Delay Systems: Lexicon 224 digital reverb Echo Plate stereo reverb, Lexicon Prime Time delay line.
Other Outboard Equipment: Scamp gates, Peak limiters, expanders, sweep EQ, auto stereo panner, 1A4 limiters, Audio Arts parametric EQ, Eventide Phaser.
Microphones: Neumann U 87 AKG 414's 451's 224, Shure SM56 57 58 82, Beyer 500, Sennheiser 421, 441, E.V. RE-20's, HCA DX77.
Instruments Available: Heipinstil grand piano, Hammond C4 organ, Prophet 10 syn, Mini Moco syn, Oberheim 4 plus 8 voice syn, Chamberlain and Mellotron, Moco Taurus pedals, acoustic and electric guitars, Boogie, Fender and Roland jazz chorus amps, Leslie 122 and 910 speakers.
Rates: 2 track \$25/hr, 4 track \$30/hr, 16 track \$45/hr, 24 track \$60/hr. Block and lockout rates available.
Direction: It is the policy of Montage to give professional quality on a very personal level without compromise. Our rooms are clean and most comfortable. Our engineers are well trained and our second engineers are most supportive. As a "lowkey" facility, producers, independent labels, and artists are taking full advantage of what we have to offer. Montage has proven itself to be a facility of quality and integrity. Ask our clients: Tina Records SB Records, Aryon, Gypsy Prod., Doug Baker, Heartsong Records, Stepping Stone Prod., Randy Nichols, Inerarity, and so on.



*Mountain Ears Recording
 Boulder, CO*

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Circle #047 on Reader Service Card

**** MOUNTAIN EARS RECORDING

1939 Pearl St., Boulder, CO 80302
(303) 444-3277

Owner: MusicMakers Inc

Studio Manager: John Aldridge

Engineers: Jim Mason, John Aldridge, Ralph Carpenter

Dimensions of Studios: 48 x 22 x 14

Dimensions of Control Rooms: 18 ft x 22 x 12

Tape Recorders: MCI JH-116 24 track, MCI JH-110 2 track
Ampex ATR 2 track

Mixing Consoles: MCI JH 428 VII, 28 in x 24 out

Monitor Amplifiers: McIntosh 2105, 2505, 2200, 275, 75
Crown DC300, BGW 750

Monitor Speakers: JBL 4350WX, 4433, 4311, 4301, Tannoy
D-12, Little Reds

Echo, Reverb, and Delay Systems: EMT stereo 140, AKG
BX10 Eventide, Lexicon Marshall

Other Outboard Equipment: Eventide, UREI, Lexicon, Orban,
Marshall White, Allison Kexpex, dbx 160, dbx noise reduction

Microphones: Neumann (6) U87s, AKG (6) 414s, (2) 224 (2)
441s, AKG C 24, Beyer M500 (2), M101, Sennheiser 421 (2),
441, Shure SM81, SM57 (2), Shure SM87(2), SM56 (2),
SM77(2), E.V. RE-20, RE-117, 224, full selection

Instruments Available: Yamaha CF 9' concert grand or Stein
way B Hammond C 4 122 Leslie, Wuritzer electric piano

Rates: Please call for rates, block rates available

**** MOUNTAIN MEADOW RECORDING

570-26th St., #1, Ogden, UT 84401
(801) 394-3217

Owner: Ronald J. Watkins

Studio Manager: Ronald J. Watkins

**** MOUNTAIN MOBILE RECORDING INC

ONLY REMOTE RECORDING

Rt. 1 Box 25, Tulelake, CA 96134

(916) 667-5508

Owner: Web Staunton

Dimensions of Studios: Studio 20 x 8 control room

Dimensions of Control Rooms: 20 x 8 located in a 40' Super
Eagle Bus

Tape Recorders: Otari MTR 90 24 track, SM M79 2 track
Pioneer cassette

Mixing Consoles: Neotek Series II 28 in x 24 out, Sennheiser
Series II (modified) 20x20x5



Monitor Amplifiers: Crown DC 400-A, Altec 9440-A, Univox
50

Monitor Speakers: UREI Time Alans R11 A, E.V. Sentry III,
Auratone 5c, Galaxy Hot Spots

Echo, Reverb, and Delay Systems: AKG BX 10 F, Lexicon
Prime Time, Scamp Rack with parametric EQs, comp limiters,
noise gates, vocal stressers, Orban De-essers, Klark Teknik EQs,
White sound analyzer, etc

Other Outboard Equipment: 32 channel splitter, 46 channel in
put, full communications, video monitoring (color), wired for 24
track recorders, 12.5 kva generator, SMPTE Time code
available

Microphones: Neumann, Sennheiser, Shure, Sony, Countryman,
Countryman direct boxes, etc

Rates: Package rates available base price \$750/day (includes
engineer)

**** MUSIC ANNEX RECORDING STUDIOS

also REMOTE RECORDING

970 O'Brien Dr., Menlo Park, CA 94025

(415) 328-8338

Owner: Music Annex Inc

Studio Manager: David Porter, Traffic Manager: Linda
Tossmann

Engineers: Russell Bond, Allen Craft, Tom Size, David Porter,
Linda Procassini, Roger Wiersema, Chief Engineer

Dimensions of Studios: A 35 x 28 plus 10 x 8 iso booth, B



Music Annex Recording Studios
Menlo Park, CA

13 x 11, C 20 x 40 audio plus 10 x 12 iso booth plus 4 x 4
40 audio or video

Dimensions of Control Rooms: A 25 x 22, B 23 x 18, C 28
x 22

Tape Recorders: (2) MCI 1114 24 track, (2) Ampex MM1000
16 track, (2) MCI JH 110 2 track, (3) Ampex 440 2 track, Otari
5050 2 track, Sony H50 2 track

Mixing Consoles: Neve H036, 24x8x24; Amek (TAC) 168;
16x8x16; Amek M 2000, 24x16x24

Monitor Amplifiers: BGW Crown, Yamaha FET

Monitor Speakers: UREI R11 (A), JBL 4333A (B), UREI R11 (C)
con 224 4 4 version

Other Outboard Equipment: UREI 1176, 1178 limiters, In-
civonics 201 limiters, ADH compressor/limiters, Neve compressor,
limiters, ADH vocal stressor, ADH stereo EQ, ADH Scamp rack w/
EQ gates, delay Pan modules, etc. Eventide Harmonizer,
flanger, Lexicon Prime Time, Roger Meyer gates, SMPTE base-1
automation - all studios!

Microphones: AK41, Neumann, E.V., Beyer, Sennheiser, Sony,
Cairns, Shure, Countryman, PZM and FET direct boxes

Instruments Available: Yamaha and Steinway grand piano,
snare drums, toms and percussion instruments, Alpha Synairia
digital synthesizer, Ampeg bass amp

Video Equipment & Services: 4" U-matic (Sony) & VHS
(RCA) 3000 sq ft sound stage under construction (Addition to
existing Studio C)

Rates: \$45 - \$125 (Call for quote)

Extras: Lounge with color TV, kitchen, parking for 40 cars,
closed circuit TV for security, loading dock

Direction: Our new sound stage and audio/video control room
will be complete in April 1983. Studio C will now have 3 inde-
pendent recording areas (3000) with a central control room
(600)

HERE'S WHY STUDIO 'A' SOUNDS LIKE A MILLION:

Jeff Cooper—Acoustical Consultant/LA
Mathew Sutton—Audio Technician/Seattle
Craig Ingle—Pro Audio/Seattle
Tom Martin—Pro Audio/Seattle
Greg Paisley—RMS Sound/Seattle



Steve Lawson Productions

2322 Sixth Avenue • Seattle, WA 98121 • (206) 625-9153

See our listing on page 67.



Ocean Studio
Stinson Beach, CA

**** OCEAN STUDIO

Box 747, Stinson Beach, CA 94970
(415) 868-0763

Owner: Tim Tomko

Studio Manager: Tim Tomko

**** PATCHWORK PRODUCTIONS INC./

PATCHBAY RECORDING

also REMOTE RECORDING

2111 Francisco Blvd. #7, San Rafael, CA 94901
(415) 459-2331

Owner: Pat Howard Productions Inc.
Studio Manager: Trent Bloyd
Engineers: Gordon Elliott, Ron Saarman
Dimensions of Studios: A 11 x 24 x 14 1/2, iso booth 10 x 11
 B (voice over) 17 x 13 x 9 1/2
Dimensions of Control Rooms: 16 1/2 x 18 1/2 x 12
Tape Recorders: MCI JH24 16 w Autolocator 24 16 track, MCI JH114 2 track, TEAC 808 w DXB 8 track, TEAC A 800 cassette, Alwa M700 cassette, TEAC A 340S 4 track
Mixing Consoles: Soundcraft Series 3 (2x) 16x16, TEAC Model 55FX 16 in x 16 out, Soundcraft LS 20x2x2
Monitor Amplifiers: HGW 750's, 250's
Monitor Speakers: JBL 4315, 4310, LE14C, 4311 Auratones
Echo, Reverb, and Delay Systems: AKG BX 10 II, Sound Workshop 262 stereo, Furman BV1's, Lexicon Prime Time, ambient arena
Other Outboard Equipment: 4 dbx 165 (2), LA 2A, Comrex stereo limiter, Ashly parametric EO dbx 164, Systech flanger, Systech dual phase shifter, 3/2 channels dbx noise reduction, IVEF 1/2 octave analyzer, Jensen direct boxes, Countryman phase shifter

Microphones: AKG (2) C451E, (2) 414EB, (2) C61, (2) CK28 N 66k, Audio Technica (4) AT812, (2) AT814, (2) ATM 11, (2) Beyerdynamic M 500 F.V., (2) RE 15, (2) RE 20, 20 assorted PA mikes, (2) Nakamichi CM700, Neumann M269, (2) U 47, (2) M49, (2) KM 56, REC 771X, Sennheiser 8, 421, (2) 441, Shure (2) SM56, (2) SM58, 2 Sony C500, Wahnbrock P2M (2)
Instruments Available: ARP 2600 vintage guitars (Fender Gibson) classic tube amps, variety of keyboards, DeKalb ruby grand
Video Equipment & Services: 1/2" stereo color video demos
Rates: Reasonable. Call for details

**** PRAIRIE SUN
 also REMOTE RECORDING
 1039 Madrone Ave., Cotati, CA 94928
 (707) 795-7011
 Owner: Mark Mooka, Rennick
 Studio Manager: Mark Mooka, Rennick

**** PRODUCERS STUDIO
 Suite 201, 45 W Broadway, Eugene, OR 97401
 (503) 683-1400
 Owner: Michael S. Dillely
 Studio Manager: Michael S. Dillely

**** RECORDING ASSOCIATES
 also REMOTE RECORDING
 5821 S.E. Powell Blvd., Portland, OR 97206
 (503) 777-4621
 Owner: Jay Webster, Bel Stoutenburg
 Studio Manager: Jay Webster

**** RECORD PLANT
 also REMOTE RECORDING
 2200 Bridgeway, Sausalito, CA 94965
 (415) 332-6100
 Owner: Laurie Norcochea
 Studio Manager: Terry Delsino

**** ROAD WEST RECORDING
 also REMOTE RECORDING
 964 Lorraine Ave., Salt Lake City, UT 84106
 (801) 484-6539 and (801) 485-0911
 Owner: Al Schultz, Charles Buehner
 Studio Manager: Al Schultz, Charles Buehner
 Engineers: Al Schultz, Charles Buehner
Dimensions of Studios: 80 x 50, Keyboard room 25 x 25, Iso room 15 x 20
Dimensions of Control Rooms: 27 motor home
Tape Recorders: Ampex MM 1200 24 track, MCI JH 110B 2 track
Mixing Consoles: MCI JH 42B, 28 in x 24 out
Monitor Amplifiers: Crown DC 400A, D75, D 150
Monitor Speakers: Calibration Standard MDM 4 JBL
Echo, Reverb, and Delay Systems: AKG BX 10, Eventide H949 Harmonizer
Other Outboard Equipment: UREI 1176 limiters, UREI 529 room EQs, Orban F22 parametric, EO Aphex CX 1 noise gates, Syle Mitchell mike splitters and mu systems
Microphones: Sennheiser, Shure, F.V., AKG etc.
Instruments Available: Steinway grand piano, Hammond B3 Baldwin harpsichord, Crumar Model T 2 synthesizer, Crumar Orchestrator
Rates: Upon request

**** R.O. STUDIOS
 3359 Walnut Ave., Concord, CA 94519
 (415) 676-7237
 Owner: Henry Brothers
 Studio Manager: Ralph F. Henry Jr.
 Engineers: Brian Kenry, Chris Ostrander, independents welcome
Dimensions of Studios: 25 x 15 & 20 x 15
Dimensions of Control Rooms: 16 x 15
Tape Recorders: Otari MTR 9011 24 track, Otari MX



R.O. Studios
 Concord, CA

5050-MKIII 8 track, Otari MTR 101 2 track, Otari MX5050B 2 track, Technics RS M95 cassette
Mixing Consoles: Sound Workshop Series 40, 28 in x 24 out with VCAs, 24 channel hi resolution metering, soon to be fully automated
Monitor Amplifiers: HGW 75 (2), McIntosh 2105
Monitor Speakers: UREI Time-Aligned B11's, Auratones, Kef listening speakers
Echo, Reverb, and Delay Systems: MICMIX MasterRoom XL 305 reverb, DelatLab DL2 Acousticcomputer, DelatLab 1024 Effects, mono delay
Other Outboard Equipment: UREI 1176LN Peak limiters, Symmetrix S4 200 class A summing amp
Microphones: Neumanns AK's, Sony, Sennheisers, Shures, E.V.'s, all of the best
Instruments Available: Yamaha grand piano, Roland Jupiter JP8 Polyphonic synthesizer, Fender, pro CBS Jazz bass, Jazmaster Stratovaster, 1/2 string electric Fender, Marshall Boogie guitar amps
Rates: 24 track \$75/hr w/engineer, 20/40 hr Block rate \$50, Block rate \$40/hr w/engineer, 20/40 hr Block rate \$30
Extras: Dial A Mix Headphone Boxes custom built and designed by Randy Stratman, of Los Angeles. Shower and kitchen facilities, Production and recording session packages available
Direction: Jimmy Lyons (formerly with Eddie Money band) brother Owens, Hwe Briss, Greg Lawry Band, Lee Hawkins and Gordon Kerr. Special thanks to Chris Ostrander for his state-of-the-art window and all his great ideas. Finally, there is a 24 track state-of-the-art studio in central Contra Costa county! Our philosophy is to make your recording as fun and easy as possible. Call us now for an appointment or tour of our facility.

**** RUSSIAN HILL RECORDING
 1520 Pacific Ave., San Francisco, CA 94109
 (415) 474-4520
 Owner: Jack Leany, Bel Shofar
 Studio Manager: Paul Henechian, General manager: Bob Shofar
 Engineers: Dick Leahy, Richard Greene, Sam Lehmer, Marnee Moore, Jett Kliment, David Coffey, Gary Clayton
Dimensions of Studios: A 10 x 31, B 18 x 28
Dimensions of Control Rooms: A 15 x 24, B 12 x 22
Tape Recorders: MCI JH 110 4 track, MCI JH 24 16 track, MCI JH 110B 2 track, Technics 5500 4 track
Mixing Consoles: Helios 52 in x 24 out, A Neotek Series III 28 in x 24 out (5)
Monitor Amplifiers: Yamaha P-200, McIntosh 2205
Monitor Speakers: UREI H11 1/2 Time Aligned, Control Rooms A & B JBL 4311, Studios A & B Auratones, MDM 4
Echo, Reverb, and Delay Systems: Lexicon 224, EMT 140 (2) plate, Lexicon Prime Time, Stamp, ADT
Other Outboard Equipment: Eventide H 949 Harmonizer, Scamp system, vocal compressor, UREI 1176LN, ADB compressors, Valley Prope Dynamic digital metronome, Symmetrix gate

Microphones: Full complement Neumann, AKG, Sennheiser, Shure, RCA, E.V. etc.
Instruments Available: Steinway and Yamaha grand pianos
Video Equipment & Services: IVC (C-R6) 50 1/4 broadcast compatible VCR, Sony 5" and Beta recorders, AK Q Lock 310 with ADB and SFX software. Sony color monitors in studios and control rooms. Projection monitor system. DA and complete video in terms among all studios and conference room
Rates: Upon request
Extras: Conference room equipped with piano, audio and video playback systems. Complete kitchen facilities. Off street loading. Located in one of S.F.'s best neighborhoods convenient to many restaurants, motels, bars, and transportation services
Direction: Our studios, designed by Jeff Cooper, are the very latest expression of acoustical and architectural achievement. Features such as high ceilings, hardwood floors, and tuneable walls finished in oak, velvet and brass help create a graceful ambience for anything from major label albums to voice overs, from mono to 46 track locked to video. Please feel free to ask for a tour

**** SANGRE STUDIOS
 9844 Business Park Dr., Sacramento, CA 95827
 (916) 361-3652
 Owner: Sangre Productions

**** SEA-WEST STUDIOS/HAWAII
 also REMOTE RECORDING
 P.O. Box 30186, Honolulu, HI 96820
 (808) 293-1800
 Owner: Corporation
 Studio Manager: Donna Alexa Kreter
Direction: Located on the beautiful north shore of the island of Oahu, Sea West Studios/Hawaii offers the latest in 24 track recording in a Polynesian paradise. We have the newest Synclavier II digital synthesizer, an MCI JH 24 and a large selection of outboard equipment. Sea West is rich on the charts with the Crosby, Stills & Nash, Daylight Agair, LP Studio. Extras include beach villa, hot tub, warm weather, and sunshine. Call us for very ultra-competitive rates for your next album project. (808) 293-1800

**** SIERRA NEVADA RECORDING/SNR
 also REMOTE RECORDING
 395 Hwy 40W, Verdi, NV (7 mi W of Reno, NV)
 (702) 345-0361
 Owner: Jody Peterson Sr.
 Studio Manager: Jody Peterson Sr.
 Engineers: Jody Peterson, Mark Landray, Mark Ishakawa, Charlene White, Jon Hallom
Dimensions of Studios: 28 x 44
Dimensions of Control Rooms: 20 x 20 live end dead end (modified)
Tape Recorders: MCI JH 114 24 track, MCI JH 110 2 track, Ampex ATR 102 2 track, Technics 1502 2 track, (4) Tascam 1/2 cassette 2 track
Mixing Consoles: MCI JH 528C automated 28 x 28, Aphex VCAs
Monitor Amplifiers: UREI 6500 HGW cue & PB
Monitor Speakers: UREI H13, Yamaha NS 10, Auratone 5L
Echo, Reverb, and Delay Systems: Lexicon 224 44BX 20 AKG MICMIX CEO 2, Lexicon 93, Eventide 910 4 DL 1, DL 2
Other Outboard Equipment: Eventide Harmonizer 2 Prime Time 2 dbx 165, 2 LA 3A, 3 LA 2 tube 2 Fairchild tube 2, 1176LN, 4 dbx 160, 6 Apex, Sontec EQ, 4 B&B Series EQ, EXB Exciter, ADB vocal compressor, Eventide OmniPressor, DL 2, DL 1 and more!
Microphones: Neumann U 87, U 47, 48 tube, KM-84, KM-88, KM-56, U 89, Telo 251, AKG 451, 452, 414 414 eqP48 C12A, Shure SM57, SM58, SM81, E.V. RE 20, Beyerdynamic M160
Instruments Available: Yamaha C7 grand piano, Eddie Broyolds modified Rhodes, string ensemble (ARP), Yamaha amps, Lab 15 Sonor and Cannon drums, Black Beauty Ludwig snare 8", Pearl maple snare, Zildjian cymbals
Video Equipment & Services: Available on request through Camrac and ELP video production houses (1" & 1/4")
Rates: \$85/hr, \$55/Day rate. Call Charlene White for details and bookings
Extras: Environmental studio, very private, picture window overlooking Sierra Nevada Mountains, lava rock drum cage (very bright), vocal booth and excellent food at the Sagebrush Cantina (1/2 mile away)
Direction: Being the only facility of our kind in the Reno area, we work with most major entertainers, while they are in the Reno Lake Tahoe area. Our regular return customers include: Merle Haggard, Willie Nelson, Leo Sayer, Billy Preston, Paul Bovey and the Raiders (the Raiders live in the area and are often used as a studio rhythm section). Roy Clark, Mel Tillis, and on! Working with these folks and others keeps us on our toes!

**** SOUND COLUMN STUDIOS
 also REMOTE RECORDING
 46 E. Herbert Ave., Salt Lake City, UT 84111
 (801) 355-5327
 Owner: Music Central/The Sound Column Companies
 Studio Manager: Clive Farnley

LUNCHING WITH BONZAI

being bold and unconventional. But somehow, having done that, you don't feel the need to be shouting and yelling all the time. To do something which is conventional then becomes a pleasure. One had to observe the rules, but having done that, I wanted to put in a few little twists.

IT'S RARE WHEN A HUMORIST CAN TRANSLATE HIS OWN IDEAS INTO FILM. WOODY ALLEN IS ONE OF RECENT YEARS, AND I SENSE THERE IS A DIRECT CONNECTION BETWEEN YOUR IDEAS AND THE FINISHED PRODUCT.

Well, That's good — I've always felt that I myself was not the sort of

by Mr. Bonzai

When I discovered that Michael Palin would be in town to publicize the new film which he wrote and stars in, "The Missionary," I immediately contacted Columbia and set in motion the necessary machinery for an interview. As a religious fan of the Python collection—TV, records, film, and books—and a zealot for Palin's solo ventures, I stocked my bandolero belt with notes and questions, tape recorder, and my customary bottle of Beaujolais and set off to the Beverly Wilshire in search of ripping adventure.

"The Missionary" is not a Python film. It is a traditionally crafted British comedy in the mold of the classic Alec Guinness films of the 40's and 50's. Set in the heyday of British imperialism, it traces the history of one Charles Fortescue, a missionary just returned from Africa who is given the job of saving the souls of London's fallen women. His good nature and good looks lead to an unorthodox series of misadventures. The film has the unmistakable Python touch, but the zaniness is woven imperceptibly into the overall fabric. Palin's goal was to assemble a "cast of excellent actors with a sense of comedy." But off to the interview . . .

I ALWAYS BRING A BOTTLE OF BEAUJOLAIS — WOULD YOU HAVE SOME?

What a nice chap. Why don't we. Do you have an opener?

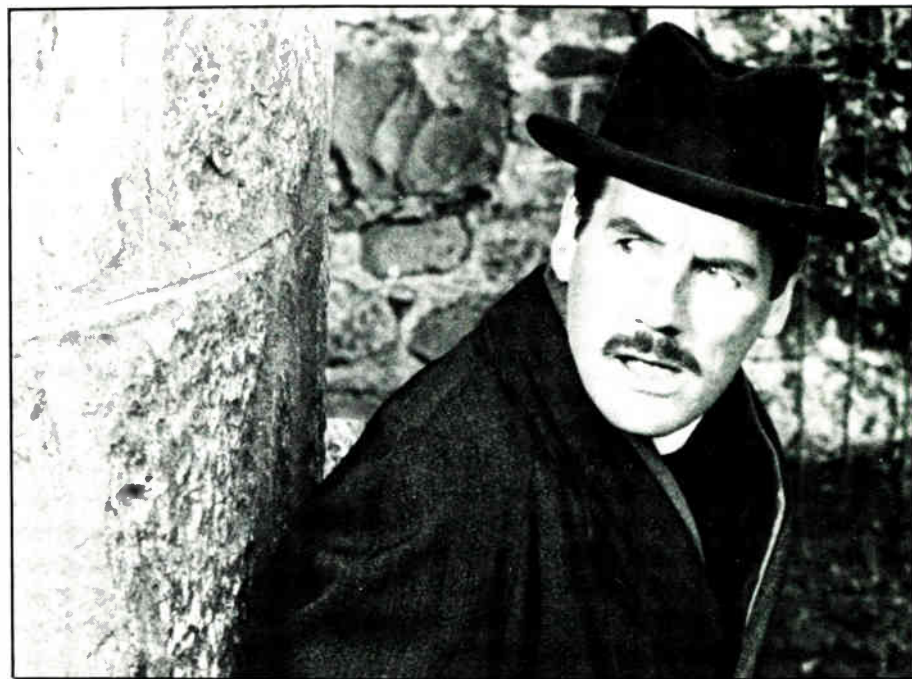
YES, I ALWAYS COME PREPARED.

Wonderful. I shall probably fall asleep at the Mike Douglas taping . . . but still, how nice. Lovely . . .

GEORGE HARRISON WAS EXECUTIVE PRODUCER ON THIS FILM — WHAT WAS IT LIKE WORKING WITH HIM?

He was not continually worried about what we were doing. I didn't feel I had to call him all the time. If I was in a good mood, I'd ring him up and say, "George, the film looks good." The worst moment was showing him the first rushes. I

Michael Palin A Python Becomes The Missionary



thought, "Christ, what if he doesn't like the way it's going?" But he loved it, which gave me a great deal of encouragement.

IT'S A SUBTLE FILM AND I FELT THAT A LOT OF THE JUICE OF MONTY PYTHON HAD BEEN DISTILLED IN A VERY HUMAN WAY. IT'S A LOVE STORY, TOO.

Well, those were areas you could never get into with Python. We were boys together. We didn't get into humanity and emotions, and certainly not love stories very often. In fact, we didn't get into women at all really. It's lifted a lot of restrictions getting away from Python to do this. Python is terrific for many things, certainly letting off steam and being outrageous and

single comic figure who could perform anywhere at any time. I need the settings, the other characters — the whole ensemble effect was important. There was a great feeling amongst the crew, because they were given something quite substantial to achieve: a comedy which looked absolutely right in the turn of the century setting — which could stand comparison with the very best dramatic, high budget movie set in that period. I love the way Peter Hannan, the cinematographer, and Richard Loncraine, the director, got the period feeling right.

YOU MENTIONED AT THE PRESS CONFERENCE THAT DURING THE FILMING ON ONE OF THE ESTATES YOU HAD TO

STOP SOME GORILLAS FROM MATING. EXACTLY HOW IS THAT DONE?

A warning is read to them by the local police force, and then the local policeman is called to break them apart and they are taken off for a night in the cell. Or, you can just take a lunch break and you find that the mating process doesn't last that long.

YES, I'VE HEARD IT'S ONLY A MATTER OF SECONDS — BUT THEY DO IT SO OFTEN . . .

So often, and so *very well*. It's amazing there aren't more gorillas born in England.

YOU ALSO DESCRIBED THE MISSIONARIES AT THE TURN OF THE CENTURY AS BEING MAINLY MIDDLE AGED WOMEN WITH GREAT COURAGE AND MADNESS. . . DOES THIS DESCRIPTION FIT YOU AS AN ARTIST?

I would love to claim that I have great courage — I certainly have madness. Doggedness and perseverance are things that I associate with those women, but I'm far too lazy. I'm not really like them at all.

I CAN'T BELIEVE THAT. FROM WRITING TO FINISHED FILM IT ONLY TOOK YOU 18 MONTHS.

It can be done; it can easily be done. The thing is there were no great complications. George and Dennis O'Brien said the money was there if there was a good script. I accepted no money and started the script on my own terms, so at the end of three months if it didn't work, no one would lose anything. There were no contracts, no lawyers huddling together. None of "If we can get Dustin, or Bob Redford, or Dolly Parton it will work . . ." There was a very efficient genesis to the whole thing. Even when we found we really had to accelerate because the Python movie ("Meaning of Life") was looming up, we managed to do it. There was a great team spirit and that's what enabled it to be done in 18 months.

I WANTED TO ASK YOU ABOUT THE "MATCHING TIE AND HANDKERCHIEF" PYTHON ALBUM — THE FAMOUS THREE-SIDED ALBUM WHERE YOU NEVER KNOW WHAT TRACK YOU WOULD GET WHEN YOU DROPPED THE NEEDLE. WHO CAME UP WITH THAT IDEA?

Terry Jones. I think he'd heard that it had been done in the 30's and he plugged the idea. Again, everything that we did, we wanted to do differently from what everyone else had done.

DON'T YOU STILL FEEL THAT WAY?

Yes, I suppose I do. We had to do things beyond just amalgamating our sketches on our records. Books,

too — we used to do books with dirty fingerprints already printed on the covers, which was wonderful.

I'VE READ YOUR "RIPPING YARNS" — GREAT STORIES. . .

If you like the book, you should like the television shows. George was a great fan of the "Yarns," which is really what made it much easier for "The Missionary" to get going. In one of the episodes there is a football club in Yorkshire that is absolutely pathetic. They lose every game and their players break down and cry in the middle of training. The character I played, Eric Olthwaite, is the only supporter the team has left. George actually founded a small outfit which supports this club and he was wearing his Botsworth United Supporters sweatshirt recently and I was very touched.

WHO DO YOU READ FOR KICKS?

Right now I'm reading William Boyd.

WASN'T HE HOPALONG CASSIDY?

No, there is another one. A very good writer. I'm now reading "An Ice Cream War" — a very nice mixture of comedy and drama.

IF YOU COULD BE ANY WOMAN, WHO WOULD IT BE?

Hmmm . . . I would be Karen Blickson, who also wrote under the name of Isaac Dineson. She wrote "Out of Africa" and was a remarkable woman. I read the book while we were filming in Africa. She was a Danish noblewoman who went out for awhile and farmed in Africa. Her husband died and she ran the place. She's wonderful, a brilliant writer — full of beautiful images and rich language. She also had a castle in Denmark which she came back to. She was part of a circle of glittering contemporaries and is the sort of person I would love to be.

WHAT IS THE MOST ATTRACTIVE PART OF A WOMAN'S BODY?

The back. Absolutely no problems there, unlike any of the other bits.

HERE IS A QUESTION I OFTEN ASK SWAMI'S AND GREAT SPIRITUAL LEADERS BUT I COULDN'T RESIST ASKING YOU: WHAT IS THE THIRD EYE?

I can't remember exactly, but it has something to do with hotel plumbing, doesn't it? The third eye is the one where you know the cold air comes out after the hot air. . . Anyway, it's best not to sleep in a room which has the third eye.

WHAT DOES YOUR MOM THINK OF ALL THIS PYTHON STUFF?

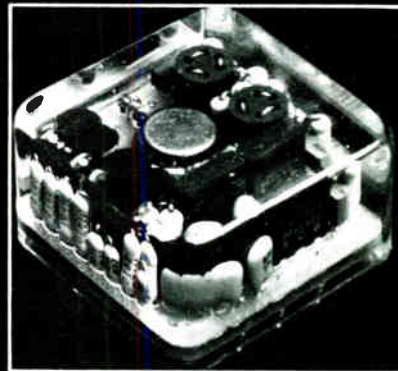
She isn't exposed to it an awful lot. She sees me as the quiet boy who comes home now and then to write a script. ■

990

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Jensen Transformers

Packaging and production design by
John Hardy, Hardy Co.



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- CAPITOL RECORDS, INC
- 20TH CENTURY FOX
(Console by De Medio Engineering)
- ARMIN STEINER
- K-DISC MASTERING
- DE MEDIO ENGINEERING
- JENSEN TRANSFORMERS
- BONNEVILLE PRODS
- WFMT, Chicago
- ABC-TV

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documentation available.

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THE HARDY COMPANY
P.O. Box AA631
Evanston, IL 60204 USA
(312) 864-8060

Part 2

Sonic Restoration of Historical Recordings

Problems and Techniques at the Edge of the Art

by Michael R. Lane

RESONANCES AND PARAMETRICS

Unnatural resonance may be found on some early electric recordings, but is especially bad on acoustics, where the conical recording horns (true exponential horns were seldom used) resonated not only on the harmonics of the basic frequency, but also generated spurious *subharmonics*. Since subharmonics occur

only under certain very specific conditions, they are not a part of what we consider "natural" sound and are perceived as a form of distortion. A one octave, or better yet, a one-third octave, multigraphic equalizer can reduce the grosser effects, but only a true parametric equalizer with individual control over center frequency, positive gain or notch, and bandwidth or Q, can effectively eliminate the subtler effects of unnatural horn reso-

nance without damaging the natural sound. With electric recordings two or three parametric channels usually suffice, but with acoustics, seven or eight channels of parametric EQ are needed, sometimes more. A great deal of time, patience and practice is needed for this work with parametrics, and anyone who is not prepared to WORK at it for weeks and months to gain the needed skills will do better to stay with a straight one-third octave multigraphic equalizer. For those willing to do the work, the great flexibility of the parametric offers almost unlimited possibilities for improvement.

We'll give just one simple example. A typical Victor acoustic generally has one of its stronger resonant peaks in the area of 3100 Hz; the precise frequency will vary from one record to another (Fig. A). By adjusting a parametric channel for a narrow positive spike and sweeping the frequency back and forth (Fig. B) while listening for the WORST sound, you can easily find the exact center frequency of the resonant peak. This method of finding a resonant peak by exaggerating it is more readily audible than trying to locate it by notching it out. Having found the exact center of the resonant peak, lower the gain of the parametric channel to create a deep notch. The result will be something similar to Figure C and will sound much better. Next decrease the notch depth (increase the gain) and bring back some of the ugly sound; then adjust the bandwidth wider or narrower for best sound. Work back and forth between the notch depth and the bandwidth until no further improvement is possible (Fig. D). If you're good at it, you will produce an exact, but opposite, curve to the original resonance, and their algebraic sum

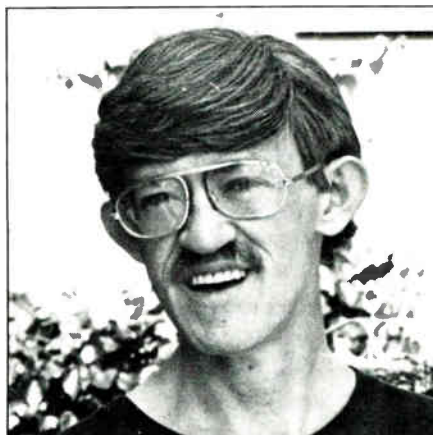


Michael R. Lane (left), owner of Lane Audio & Records, works during the days as a technical specialist in electronics at Pasadena's Jet Propulsion Laboratory, but his first love is in the field of sonic restoration where he has been active for over 30 years. This series is an expanded version of a talk Mr. Lane gave at the 1981 convention of the Association of Recorded Sound Collections (ARSC), held at Syracuse University.

Don Holmes (right), Mr. Lane's associate, has worked with historical recordings for many years, is an expert in the use of para-

metrics, and has developed several innovative techniques for handling the severe resonance problems encountered in historical recordings.

Lane Audio & Records does sonic restorations for private individuals, institutions and the recording industry. They buy and sell rare records, offer a consultation service, manufacture and carry equipment for the reproduction and restoration of rare records, and produce a line of historical sonic restorations on tape. They work out of their home studio in the Hollywood Hills (see figure). Their motto is "Everything in 78's."



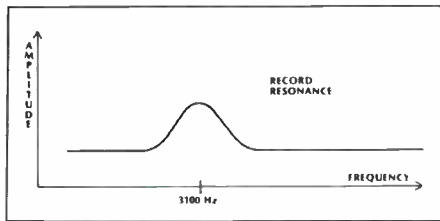


Fig. A

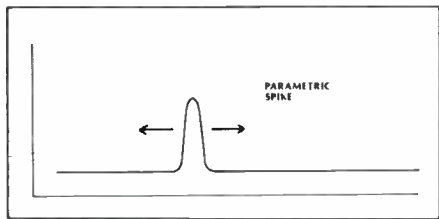


Fig. B

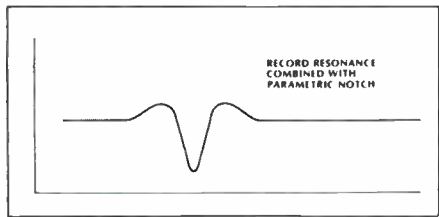


Fig. C

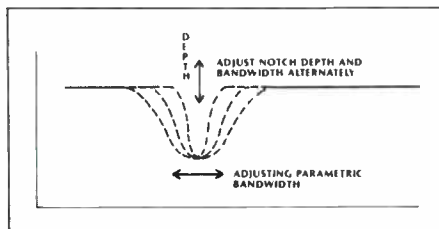


Fig. D

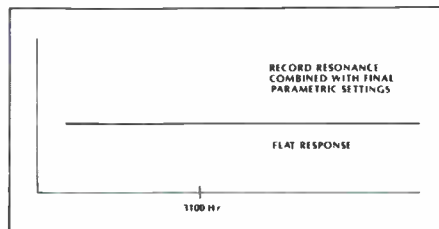


Fig. E

will be a natural response (Fig. E), without any damage or loss to the natural qualities of the sound.

It takes practice, but the results are well worth it. Of course, you won't usually get rid of all the resonance unless you repeat the process on a lesser scale at the second harmonic, 6200 Hz. If an electric 78 had this same resonance, it might require additional work at the third harmonic, 9300 Hz. Acoustic records may require this same technique at the subharmonic frequency of 1550 Hz! In addition to eliminating unnatural resonance, parametrics can readily notch out 60 or 120 cycle hum and cutter whistle, and can be an aid in reducing surface noise in conjunction

with the Packburn and Phase Linear 1000, Series II, (modified) units described in Part I. Anything that other equalizers can do in the field of sonic restoration, parametric equalizers can do as well or better, but the amount of work is formidable.

It is important that only a true parametric be used. The quasi-parametrics that are sometimes encountered have interacting parameters. For example, an adjustment in Q or bandwidth of a channel will alter that same channel's frequency, etc.! Repeatability of settings is poor. Only the true parametric, where the parameters within a given channel are in series, should be considered for work in sonic restoration.

NON-LINEARITY/BLASTING AND SELECTIVE GAIN RIDING

Another serious problem on acoustics, but almost never encountered on electrics, is that of non-linearity, especially in the treble frequencies. The acoustic recording process suffered from mechanical hysteresis — a slop or play in the linkage between the horn and the cutting stylus. Hence the higher frequencies, insofar as they could be recorded, came through rather well at loud volumes, but poorly at soft volumes. This problem varies from recording to recording. Among collectors of acoustic records, this is thought of as a blasting effect; that is, if a standard type treble control is advanced to

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where the treble sounds relatively bright on normal passage, the loud peaks come blasting through in an irritating way. The sound is very similar to over-modulation on electric recording systems. This non-linear/blasting phenomenon on acoustics is, of course, strongly aggravated by unnatural resonances, but even when these are removed with parametrics, the problem remains, although on a reduced scale.

The best way to handle this non-linearity/blasting problem, at least at present, is by downward gain riding of treble EQ while keeping the full treble EQ for normal and softer passages. A standard treble control with variable turnover, one or more multigraphic channels, or a parametric channel may be used. In some cases a combination of these is desirable. The best procedure is to play the record a number of times, practicing the changes in treble EQ until they can be done smoothly and imperceptibly before a final tape is made. Acoustic recordings of material with a relatively narrow dynamic range are not likely to show this problem; it is most noticeable on vocal material, particularly when performed by singers with a strong dramatic quality, such as

Marcella Sembrich or Ernestine Schumann-Heink. Recordings by such singers can't be successfully restored without this frequency selective gain riding technique.

In a similar way, although not for the same reasons, bass EQ gain riding can be of great help on acoustics and even on some electrics. Sometimes fixed low frequency cut-off filters, even when combined with the low frequency gating system found in the Phase Linear 1000, Series II, can't totally eliminate rumble and low frequency noise without cutting into the sound. In these cases the bass should be set for the best sound at loud and medium levels, and downward EQ riding should be used on the soft passages where the "masking effect" of the music is less present. Again, great care is needed as the changes must be inaudible to the final listener. Most difficult of all are the situations where, for the best sound, both high frequency and low frequency gain riding are needed at the same time. You may have to tape a record a dozen times before the results are just right! We can't stress too strongly that subtlety is the prime consideration in this technique, indeed, with all techniques used in sonic restoration.

DYNAMIC EXPANSION

Among purists, dynamic expansion has a very bad name, and perhaps deservedly so. This is not because it is inherently a poor idea, but due to its excessive use or because the quality of the expander is poor. On most electric 78's it can greatly aid the sense of life and realism. Even acoustic disks, contrary to general belief, need some expansion, as the recording horns and techniques of the day compressed the sound in unnatural ways. If the resonance and non-linearity/blasting problems are corrected, then three to six dB of expansion will be of great help. Noise "pumping" must be avoided at all costs, but proper noise reduction techniques usually reduce noise pumping to inaudible levels on all records except those in really bad condition. Downward expansion of quiet passages, as well as peak expansion of loud passages is usually beneficial in adding realism to the sound and, again, subtlety is the watchword.

REVERBERATION, TIME DELAY, AMBIENCE

Even when all the techniques we've discussed so far are employed effectively, there is still something missing from the sound of the early electric 78's and even more noticeably from the acoustics. Music exists in some type of environment - an acoustic space. The sonic reflections

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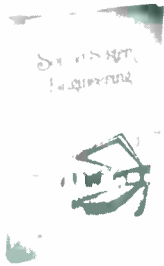


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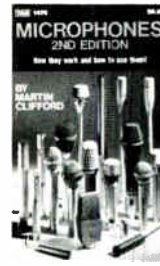
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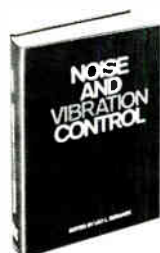
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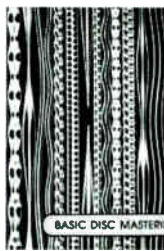
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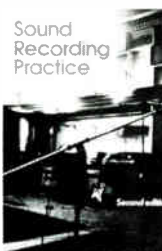
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of the recording hall or studio are all too often very weak on old records. A quality time delay, reverb and ambience system can be of great help in restoring this sense of acoustic space. The acoustic records were very close miked, or should we say "close horned"? It was the only way to get enough energy to drive the mechanical cutters. Hence the medium and long sound reflections are almost entirely missing with only a small amount of the shorter room reflections being present. The result is an extremely "dead" sound. What is needed is to reintroduce a fair amount of longer delays (reflections), a larger amount of the medium length delays, and very little or none of the shortest delays as these tend to exaggerate the always present resonance and non-linearity/bleating problems. A very small amount of reverb mixed in as well may also be helpful in "opening up" old records, but none is far better than even a little too much.

The delay, reverb and ambience system which we favor is the ADS Model 10 Audio Dimension Synthesizer. Since it is designed for home entertainment use, its flexibility is limited, but its moderate price and extremely natural sound (more natural than some professional units costing four or five times as much) outweigh its limitations. It has three delays: short, medium and long, plus reverb and ambience. We recommend the DS 10 version without the internal power amplifier as an outboard amplifier is better when using the ADS with modern recordings in its normal stereo mode of operation. For historical records we need to use it in a monophonic mode. Paralleling the three delay outputs would result in op-amp output loading op-amp output—a distortion causing no-no. What we require is a summing amplifier (see Fig. F). The Delay 1 left and right

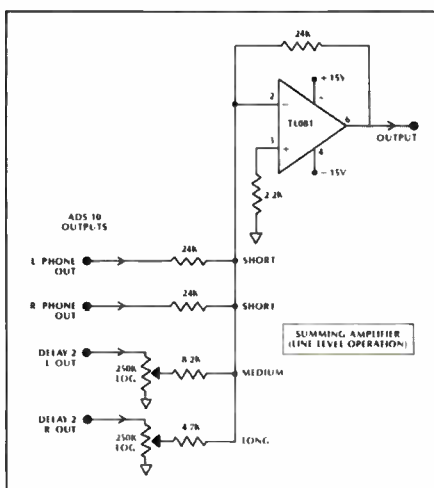


Fig. F

outputs are similar to each other and are mixed with the unprocessed signal in amounts controlled by the ADS output control, then appear at the phone output jack. The Delay 2 left output is of medium length and the Delay 2 right is of long length. Level controls must be added to the medium and long delays as the ADS lacks them. The output gains in the summing amplifier have been selected so that the medium delay (acoustic records need a lot of this) has the greater output. Taping is done at the output of the summing amplifier.

SPECTRUM ANALYZERS

A one-third (or narrower) octave real time spectrum analyzer can be a very useful tool. It should have as fast a sampling rate as possible, with peak and averaging display modes covering four or five seconds or longer. It is particularly useful in locating resonant areas for parametric work. It is also useful for checking inherent record EQ and in sonic rebalancing of weak treble and bass.

FREQUENCY SELECTIVE TIME DELAY

One area we are investigating involves the addition of frequency selective delay via the Haas effect, the apparent unity of separate sounds which are very close in time. If the higher frequencies, say above 2, 3 or 4 kHz are delayed and mixed with the original signal, an apparent improvement in high frequency sound can occur. This delay should not exceed 30 or 40 milliseconds or separate sounds will be heard. The same type of delay can be added to low frequencies, say below 250, 200 or 150 Hz with a resultant apparent increase in bass. Of course these frequency selective delays should be added before any overall delay or reverb is used as their purpose is to augment the lowest and highest frequencies only. This appears to be especially helpful with the limited frequency range of acoustics.

PROCESSING SEQUENCE

We have found that our best results are obtained when the restoration sequence is as follows:

1. Play the record, adjusting for optimum stylus size and correct speed for proper pitch.
2. Adjust inherent EQ for optimum sound using the record EQ chart as a starting point.
3. Adjust for best noise reduction.
4. Rebalance sound with a multigraphic equalizer.
5. Study the results carefully for unnatural resonances

and the non-linearity/bleating problem.

6. Work with parametric channels and selective frequency gain riding for best sound.
7. Add dynamic expansion, subtly, as needed.
8. Tape the results at 15 ips to create a master tape. It may be necessary to do this tape more than once until the selective frequency gain riding (if used) is imperceptible.
9. Edit the master tape for side blending and remove any clicks and pops which may not have been totally eliminated.
10. Reprocess the edited master tape as follows, with:
 - a. More multigraphic EQ if needed.
 - b. More parametric EQ if needed.
 - c. If the tape is of individual selections rather than a continued piece, adjust levels as needed to create a fairly uniform output level.
 - d. Add reverb, time delay and ambience as needed.

The results of this final processing, steps a through d, yield a final "copy master" which becomes the source of all user records and tapes.

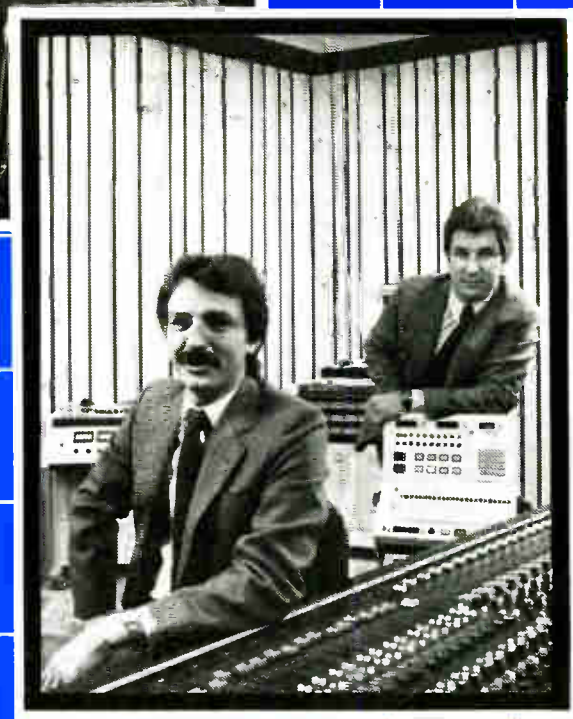
FUTURE DEVELOPMENTS

Additional noise reduction would be very desirable for badly worn records, but it must be clearly understood that noise reduction for 78's is an open-ended system, unlike a process where some change is made during the recording and another change made after. On historical recordings we can only affect what is done after the recording. It's a much more difficult situation than the closed systems such as Dolby, dbx, etc.

In the analog world there are only two theoretical approaches to the reduction of surface noise in an open-ended system—"divide-and-conquer" and "gating systems" utilizing the "masking effect." The first useful divide-and-conquer system was the Olsen Noise suppressor, developed by Harry Olsen. It breaks the audio spectrum into discretely separate channels, processes them via a threshold technique and then recombines them. With the Olsen, as with all divide-and-conquer systems, the larger the number of discrete channels, the better the noise reduction; however, as the number of channels increases, phase shift problems mount and rapidly become overwhelming in

(continued on page 108)

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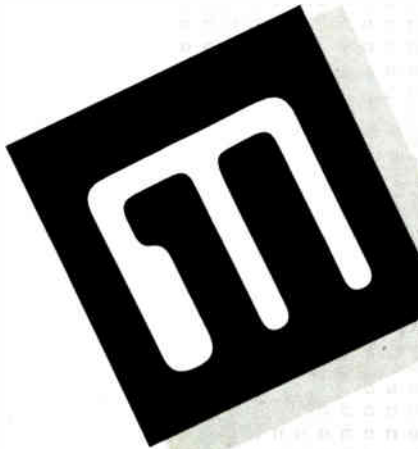
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MICROPROCESSORS

by Ken Pohlmann

It was the same as with many great breakthroughs – it happened almost by accident. In 1969 Datapoint Corporation designed an intelligent terminal with a simple computer as its processing nucleus, and contracted Intel and Texas Instruments to implement the design on a single chip. Intel took up the challenge and indeed fabricated the device. Unfortunately, its execution speed was only a tenth of what the specifications called for; Datapoint turned it down and used a discrete design instead. Undaunted, Intel decided to try to capitalize on its R & D effort by offering the chip to the general market in 1971. They designated it the 4004, and the first central processor unit on a chip was for sale. The response over the next decade was encouraging. Today everyone uses such programmable logic devices, called microprocessors.

In my mind, microprocessors represent a miraculous reconciliation of complexity and simplicity. Microprocessor chips exist only because of the success of very sophisticated Very Large Scale Integration (VLSI) fabrication techniques yielding over a thousand gates per chip such that several subsystems or a complete system may be placed in one package. The Intel 8085A, for example, a descendant of the 4004, contains approximately 6,200 gates on a 164 x 222 mil chip. This hardware sophistication supports an elegantly simple software system which, for the 8085A, includes an instruction set of 74 instructions. The carefully-chosen utility of those instructions in turn facilitates the microprocessor's wide variety of hardware applications. The designer who uses microprocessors is given a great competitive advantage because a flexible hardware scheme is initially available; his job lies merely in configuring

specific interfacing details, and providing programming.

Although the architecture of various microprocessors varies from model to model depending on their intended areas of expertise (that is, the applications marketplace the manufacturers have aimed them at), the basic subsystems remain the same and serve to illustrate the nature of microprocessors. A general block diagram of an 8 bit MPU (MicroProcessor Unit) is shown in Fig. 1. The ALU (Arithmetic Logic Unit), working registers, control unit, and internal data buss from the four main subsystems of a microprocessor.

The ALU is perhaps the busiest part of the entire system. This circuit performs all of the arithmetic and logical operations on data supplied to it. Through addition and subtraction, complementation, one-bit shifting, and Boolean operators AND, OR and EXOR, all of the number-crunching for the entire computer is accomplished here. All of the other, more sophisticated manipulations which programmers might call for are accomplished through these simple operations taking place in the ALU.

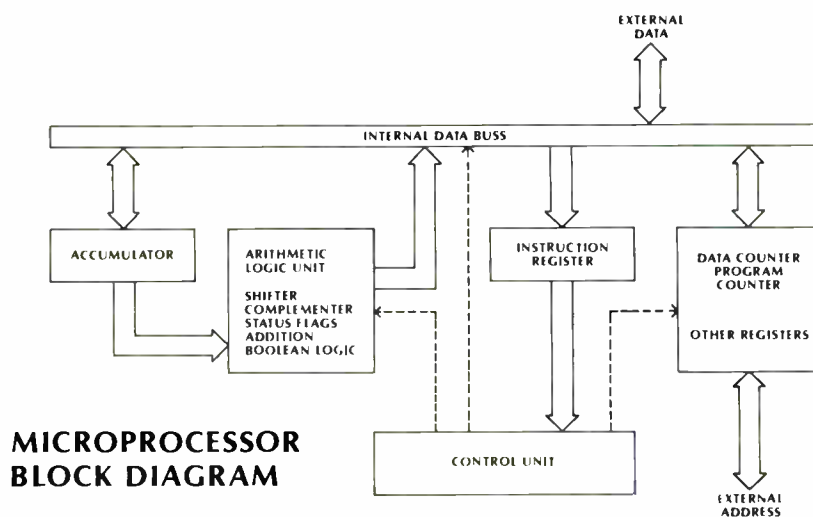
The working registers point out the important fact that in computers, binary bits may be interpreted in a variety of ways, for example as pure data, coded data, and character or instruction data. To differentiate between these data types, and provide holding buffers while processing is accomplished, a number of registers are located in the MPU. The four most common registers are the accumulator, instruction register, data counter, and program counter. The registers perform special functions and automatically interpret the various forms of data by virtue of which data goes into which register. The accumulator is an 8 bit register (in an 8 bit MPU) into which data words are placed

from memory. The MPU acts on the accumulator contents rather than memory directly to save time and logic by reducing the number of memory accesses. The instruction register is another 8 bit register, which holds the instruction code. The MPU always interprets these contents as an instruction to be executed. The data counter is a 16 bit register; it holds the address of a memory location to be read or written. Without additional expansion, the 16 bits could address up to 65,536 words of data memory. The program counter is another 16 bit register; it holds the address of a program memory word. In operation the register always points to the place in memory containing the next instruction code in the executing program. It is typically set to the start of the program and is successively incremented as execution occurs; only a jump would temporarily disrupt its orderly count. Since all 64K of memory is potential programming space, the program counter needs 16 bits.

The control unit, using the program counter as an index, decodes the contents of the instruction register to manipulate all ALU operations, move data, and accomplish I/O - whatever is required to carry out the current instruction. All MPU functions are initiated by the CU, and indicator lines detailing the system status are output from the CU. The control unit contains the instruction set in ROM, and it uses that microprogram memory to generate the required sequences of enable signals at the proper time. The CU accepts inputs from the master clock to set up its timing structure, and system status inputs to alter its operation.

The internal data buss handles the data flow between subsystems. The specific design of the data buss may vary from optimization and thus architectural considerations, but essentially the buss connects the ALU, the accumulator, the instruction register, and the other register array to a common route. Also, the internal buss forms a bidirectional route through a buffer/latch to the outside world.

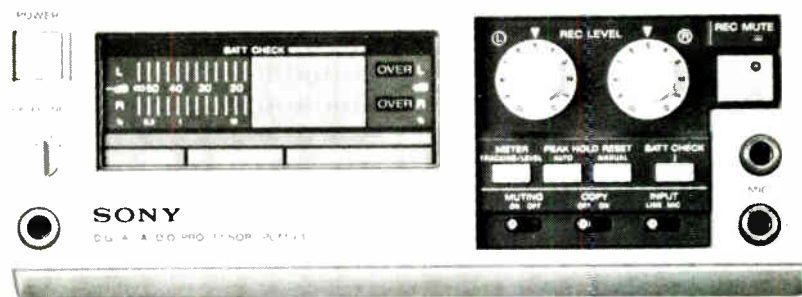
The microprocessor's operation is as straightforward as its organization. Although various instructions provide elaborations, and special processing such as DMA yield embellishments, the fundamental operation is as simple as a human pulse. The microprocessor's heartbeat is a cyclic operation known as the instruction cycle. The execution of every instruction may be divided into two parts: fetch and execute; and every execution begins with the instruction being loaded into the instruction register, that is, a fetch. The fetch is accomplished through a read operation in which the contents of the program counter are routed to the out-



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put and decoded along with read control signals, to find and return with the specified memory data word. While this takes place, internal logic increments the program counter to prepare it for the next fetch. When the memory contents are received, they are placed in the instruction register. The second part of the cycle occurs when the instruction is executed, that is, the microprogram of events in the CU is carried out. For example, consider a complement instruction; depending on how the architecture was designed, and the microcode was written, the sequence of microinstructions needed to complement the contents of the accumulator might go something like this: Move the contents of the accumulator to the ALU complements. Activate ALU complements logic. Move contents of complements to the data buss. Move contents of data buss back to the accumulator. Such a sequence of microoperations, stored in control unit ROM, is required to carry out any MPU operation.

Thus the microprocessor operation may be characterized by a process of fetch, decode, increment PC, execute, etc. More specifically, the cycle may be broken down into fetch (address instruction data, control memory read timing, data transfer of instruction) and execute (address I/O or memory, control of synchronous execution, transfer of data). From this simple sequence is derived the working menu of the system: fetch, memory read, memory write, stack read, stack write, input, output, halt, and interrupt. From this list, all of the sophisticated instructions and their appropriate microcodes may be devised to form the microprogram's library of recognizable tasks.

The instruction set is the language which each type of microprocessor uniquely speaks; specifically it is the library of characters utilized to control the MPU and in turn execute its operations. As previously mentioned, that library of microcode is stored in the control unit ROM as binary sequences representing microoperations. To make life easier for the programmer, a mnemonic is given to each instruction word which calls its particular sequence of code when the instruction word is set at the MPU's input. That library and its hierarchy is immutable; the manufacturer has exhaustively striven to provide a versatile and complete instruction set for the device, and designed the hardware architecture accordingly to optimize the device's operations.

Some upward compatibility exists in instruction sets because of device geneology, but otherwise the codes are not compatible. However, the categories of operations covered by the codes can be generalized: Data

transfer group to move data between registers. Logic group to perform logic operations such as AND and OR; these usually act on data held in the accumulator. Arithmetic group to add, subtract, increment and decrement data. Branch group such as conditional and unconditional jumps and subroutine calls and returns; program execution sequences can be altered with these instructions. Stack, I/O and machine control group to manipulate the sequential data held in the stack, an allocated area of external memory where register data may be held; other operations include reading from input ports, writing to output ports, setting and reading interrupt masks, and setting and clearing flags.

From this instruction library, the microprocessor programmer selects those operations which can be sequenced to form the required software program. Most of these instructions can be considered in two parts: the operation code, and operand. The op code specifies the type of operation and the operand details where the operation takes place. Non-data-based instructions contain only an op code; these single-byte instructions always act inside the MPU. Data-based instructions are one to three bytes long; the op code takes the first byte, and the required operand fills up the rest.

Although no standard exists, instructions are usually classified by op code, operand class, and number of bytes. Furthermore, because of the complexity in operand classes, the nature of their addressing modes can be broken down into at least four types of addressing: immediate, relative, direct, or indirect; the net result is a greater sophistication in programming possibilities. The buyer of any microprocessor should be forewarned - because classification schemes vary from company to company, it is often tricky to compare the instruction set of one device to that of another.

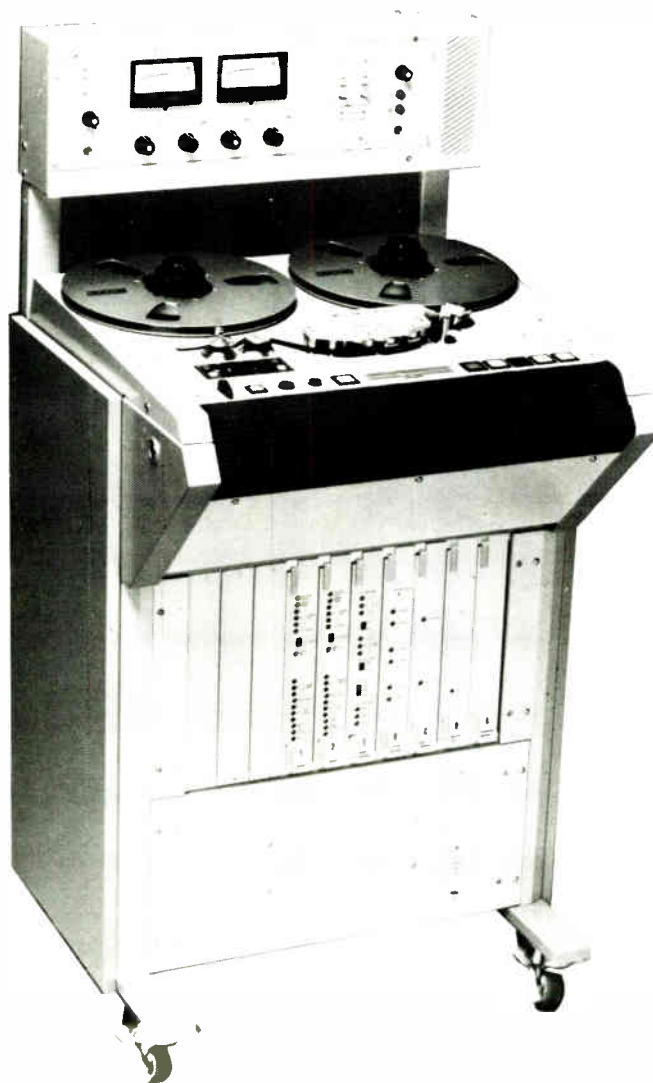
In a typical microprocessor instruction set listing an instruction might thus appear as a mnemonic, usually a three letter abbreviation of the operation itself, and an abbreviated operand field. For example, some Intel 8085A instructions are: LDA addr - a memory content is loaded into the accumulator. DCR r - register r contents is decremented. JMP addr - control is transferred to a specified address. OUT port - contents of accumulator is placed on data buss for specified port.

Armed with this knowledge of organization (the four subsystems), operation (the instruction cycle), and brainpower (the instruction set), we are ready to examine a current and extremely popular incarnation of the microprocessor, the Intel 8085A. But that is next month's discussion. ■



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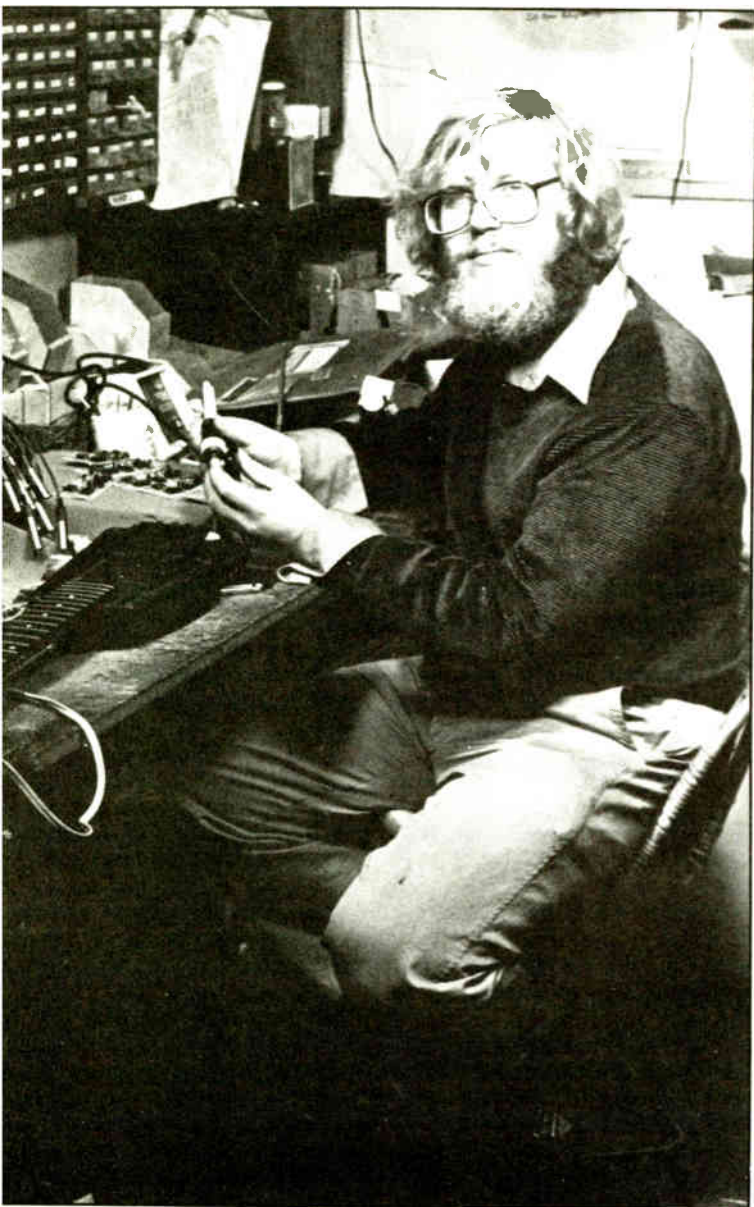
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PROFILE OF A COTTAGE INDUSTRY

Interview with Keith McMillen of Zeta Systems



Keith, owner and founder of Zeta-Systems, installs his quad bass pickup in a Steinberger bass.

by Steven Michaels

In our industry, major corporations tend to dominate the marketplace, with massive advertising and Research & Development budgets. Although giants generally take the lead in pioneering changes in technology, many of the products in our musical world started with an idea hatched on someone's workbench in a garage. "Cottage industries" provide much of the raw creativity and originality which eventually finds its way into our lives. For every multi-million dollar R & D facility there are a thousand little garage operations powered by the gleam of a maniacal tinkerer, bent over his computer terminal or soldering block.

In Berkeley, California, just up from the Bay flats and in view of the prestigious ivory towers of the Cal campus, sits a nondescript brown two-story building. The door opens to reveal a plump and cherubic young man who runs a small manufacturing lab that makes one think of Les Paul or Robert Moog in their earlier days. The man is Keith McMillen, owner and chief architect of Zeta-Systems, a company involved in everything from piezo-ceramic transducers to violin synthesizer controls.

Starting with \$25,000 of family money, Keith produced a little guitar device known as the Feanc (pronounced fink). This device is a five component active-electronics circuit mounted on the guitar to put all the player's favorite effects at fingertip control. His next innovation involved a major step forward in unlocking the potential of piezo-ceramic crystals as guitar pickups. Upon hearing it "couldn't be done," Keith developed a pickup consisting of individual piezo-ceramic crystals for each string. This achieves new levels of crosstalk rejection between strings while at the same time picking up string vibrations in all three dimensions. The sonic quality of the pickup itself is impressive in its own right. What makes it doubly unique is Zeta uses it as the input to a synthesizer-like processing network which enables the guitar to sound like a guitar synthesizer costing five times as much. The same technology is also available in a four pole bass pickup.

The next evolution was the violin controller. This is a solid body violin whose fingerboard is inlaid with another unique Zeta exclusive - a laser trimmed resistor strip under each string. A voltage output is generated at each point where the finger presses metal string to fingerboard. With digital and analog circuits designed to provide error free tracking for the violinist, this controller generates a voltage control signal that can be read by most analog synthesizers.

Following is an interview with the affable and energetic Mr. McMillen, wherein we learn what really goes on in the world of the cottage industry and what new life forms are being hatched in the fertile laboratories of Zeta-Systems. This discussion underscores some of the important business lessons facing most entrepreneurs and points to the joys and pitfalls of

a small company which relies on innovation and creativity to achieve success.

...

WHAT IN YOUR BACKGROUND LED YOU TO DEVELOP ZETA-SYSTEMS?

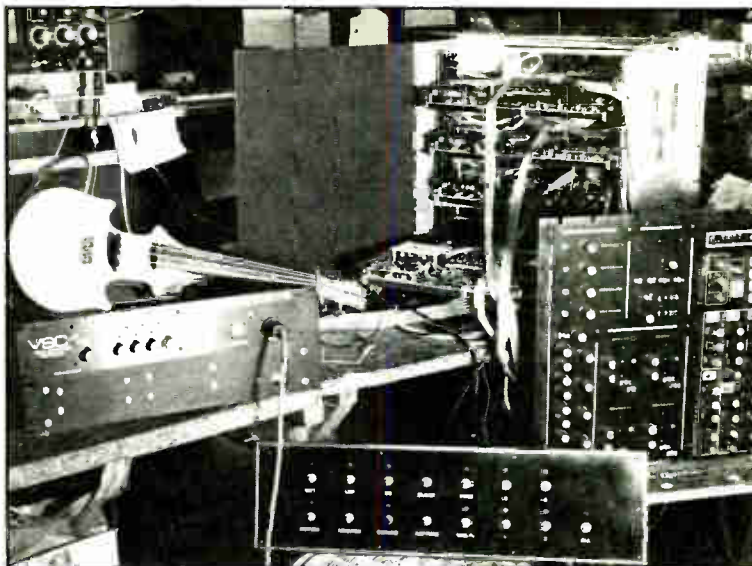
"I got a degree in acoustics at college, was studying and playing music, and while at U. of Illinois I became a Martin guitar repairman. I learned a lot about craftsmanship and worked with people who were really competent. I've always been a guitar player and composer. My musical interests then were mostly in sound and waveform. I approached music very scientifically and science very musically. I really couldn't separate the two. So I was playing music that was very harmonic but very non-traditional. I found that I needed more timbre than the guitar afforded."

SO IT WAS A VOID IN THE MARKET WHICH PROMPTED YOU TO START YOUR OWN COMPANY?

"Yes. And to bring the same technology available to the keyboard player to the guitar player. We started business three years ago."

BRIEFLY OUTLINE THE STEPS YOU TOOK TO GET UP AND RUNNING.

"I needed space and the building I was living in worked out perfectly. We converted some of the rooms into manufacturing space. We had to get the proper tools and equipment, scopes, test equipment, machine tools. I befriended a machinist who showed me how to machine my own parts. Dave Tarnowski at A/DA helped tremendously. I'd go over there and see how he set things up. Then I figured out my first product - the little fink. I went to a NAMM show and displayed it and got some good press, sold some units, started paying the bills, and began figuring out marketing. Marketing is the trickiest. It's the thing I understand the least. It's a dif-



A composite view of the violin synthesizer controller. Note in back the electronics tray - one for each string of the violin.

ferent set of laws than electronics. One year you need blanket advertising, then the next year you need selective advertising. I have mostly relied on a lot of press releases and word of mouth. I still find most of my customers say, 'A friend of mine has one,' or, 'I've heard about it from someone else.' "

HOW DID YOU SET UP THE DISTRIBUTION AND THE SALES END OF IT?

"Well, I went to A/DA and had them market things. I had offers from St. Louis Music and Coast Wholesale through the NAMM show. Everyone wanted to be exclusive distribu-

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tor of my product. At the time I wasn't certain about that. I was a little nervous about getting involved with a large operation. Part of it was that I didn't want to become a manufacturer. I wanted to do mostly engineering and build stuff. I saw all this entrapment, a constant fight to get the day's production done, no time for the circuit design and the advanced controllers and the things I'm really interested in. Now I'm aligned with Dunlop Manufacturing. They build all kinds of accessories and stuff for guitars. I'm setting up electronics manufacturing with them to make my pickups. They've got a 25,000 sq. ft. plant, and their product line is lacking in electronics, so there's no conflict."

WHAT UNIQUE INNOVATIONS HAVE YOU COME UP WITH THROUGH R & D?

"Probably the most important and most marketable are the pickups. I feel it's the most important event in transducer technology since Les Paul wired two coils out of phase and came up with the Humbucker. It uses piezo crystals."

CAN YOU DESCRIBE WHAT KIND OF PICKUPS THESE ARE?

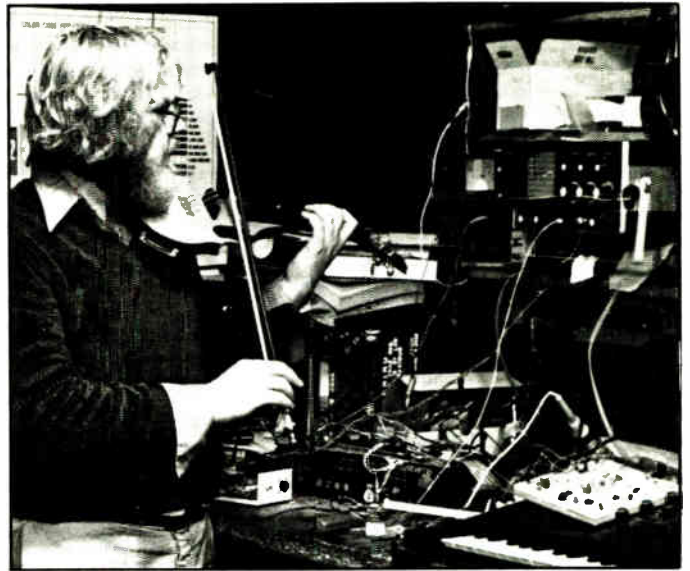
"Most regular pickups have to pick up all six strings, which causes IM distortion. I'm able to get about 43 dB of rejection of adjacent string signal, so the output of each string is separately picked up, buffered and then summed in a mixing amplifier. That's where everyone told me I was crazy. I was desperate, so I tried it and it worked. I needed that crosstalk rejection for synthesis."

ARE THERE ANY PROPRIETARY PRODUCTS OR METHODS YOU HAVE DEVELOPED BESIDES THE PICKUPS?

"The violin controller. The whole reason these pickups exist is for synthesis. That's my main thrust; synthesis and synthesizer controllers. The bass pickups will probably make me a lot of money but it's just a by-product of my main approach. In the violin controller I use the sensors in the neck of

the violin to give me the general location of the string information and then use a frequency correction circuit to automatically round to the nearest note.

"It's the best thing I've built here. It allows the violinist to play with the same technique used on a fretless violin, yet have that information turned into control voltage information which can be read by any synthesizer. I can do it for a normal violin. The uniqueness in this product is the laser trimmed resistor strips, which I dropped into the fingerboard under each string. It's like a Moog Ribbon Controller in a sense. But it's made so the string itself contacts the strip. This allows me to track left hand



Keith demonstrates the violin synthesizer controller.

hand technique accurately, whether played staccato or vibrato or by bouncing the bow on the string. It's all carefully captured. I didn't want to sacrifice any violin technique.

"I'm going to do the same thing with the guitar, both fretless and fretted."

DO YOU FEEL THAT THE HIGH-TICKET, LOW VOLUME PRODUCTS ARE MORE PROFITABLE?

"For the small business manufacturer... without a doubt! I don't have to stand over my employees with a whip and say, 'You have to take ten seconds off that soldering.' The small business approach is more suited to the customized individual product approach. You can't go to your local music store and ask for something sophisticated and customized. And you can't go to Yamaha or Roland and ask for that either because they're too big. So between your local repair store and the large manufacturers there is an incredible void. I get calls from all over the world. That is the reason I have survived. Even with my ineptness in business it is difficult to flounder."

WHAT IS IN THE FUTURE FOR ZETA-SYSTEMS?

"Two things. We'll continue to produce our existing product line. More controllers. The '80s is the decade for synthesizer controllers. The Synclavier is making some of the most incredible sounds in the world but it's still only available for the white and black keys. A lot of musicians don't play piano. How about voice, woodwinds, string instruments? Every aspect, every nuance can be interpreted if it can be transduced. That's why I'm interested in transducers. My main thrust is making music easy... because I'm lazy. Instruments that will change modes upon command. You can play in a major mode and then you can automatically transpose them to a minor key by pressing a certain spot on the fingerboard. You can play single note lines that will do counterpoint and harmony, instantly, along with it. My goal is improvisational orchestration: one person to go out there in real time and sound like many, with the sound of a jazz band that's been playing together for many years. With hot jazz improvisers new things happen every night. That's what fascinates me about music. The focus of Zeta-Systems is going to be more controllers and computer processors of that control information to turn it into musically useful events."

DO YOU HAVE ANY ADVICE FOR OTHER SMALL MANUFACTURERS LIKE YOURSELF?

"Be different. Do what you really want to do. You can't compete with the big guys. You have to find your market and make it, even if you're a small business. In general, be different and do what you like, because you're going to be doing it a hell of a lot."



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NARADA MICHAEL WALDEN

by Derk Richardson

"The difference in being an artist-producer and being *just* a producer is that I'm involved in the whole gamut of things from the song's birth to its completion," says Narada Michael Walden, "and it gives me a real strong love for the material." Even at the relatively tender age of 30, the drummer-keyboardist-singer-producer speaks with seasoned insight about the advantages, difficulties and rewards of filling the roles of both musician and producer in the pop music industry.

As we spoke in Studio A of the Automatt in San Francisco, Walden was finishing work on a new album by soul/funk singer Carl Carlton and he used the project at hand as an example of how thoroughly involved he can become in the entire creative process. "First of all," Walden explained, "I write songs. Then I bring the person into the studio with the band and I'm playing the drums. I'm showing what chords I want and what voicings I want on the keyboards. Then I teach it to Carl and actually track a song. I listen to it and make sure the sounds are correct—maybe I want a little more high end on the snare drum or a little more bottom on the bass—just check out the overall sounds and if it's not quite right, we'll go back and cut it again two or three times. After I have the exact take I want, *then* I'll work on the vocals."

But far more interesting than his descriptions of his physical immersion in the genesis of a recording are Walden's carefully considered and gently spoken observations on the delicate relationships between artist and producer. As a drummer, Walden was first heard on record in the early 1970s on the Mahavishnu Orchestra's *Apocalypse, Visions of the Emerald Beyond* and *Inner Worlds*. By 1981, the young man from Kalamazoo, Michigan, had performed on nearly 40 record dates and had produced a dozen albums by such artists as Sister Sledge, jazz trumpeter Don Cherry, Stacy Lattisaw and Angela Bofill. With the release of *Confidence* (Atlantic) in 1982, Walden had also recorded six albums under his own name aimed at the commercial R & B market.



When he first worked with guitarist Mahavishnu John McLaughlin, Walden not only found a guru in Sri Chinmoy (who gave Walden the name Narada) but he studied the production techniques of George Martin. Later, when he cut his debut solo album, he was looking over the shoulder of Tom Dowd. "I was always keeping my eyes open, my ears open to what we were doing," Walden recalled, "why we were doing what we were doing and what they were looking for in a take."

He was eager to produce himself but had yet to prove himself to his record company. "I know when I was forced to use producers," Walden said, "I couldn't find anybody I wanted to work with. People who I wanted told me, 'Okay, two years from now we can work with you but right now we're tied up.' It really slapped me in the face how desperately needed producers are."

And he learned how sensitive and tender a producer needs to be with a performer. "I think what an artist comes to a producer for in the first place is love and care," Narada mused, "and to make it easier to get a big record. An artist is insecure. An artist wants to feel that there's someone there to help him. When you're out there by that microphone, you're exposed to the whole world. I have found in my life that I have a talent to

make people feel comfortable when it comes to exposing themselves in that way.

"Every producer-artist relationship is different," Walden continued. "Some artists need you to do very little. Other artists need you to do almost everything but sing and I enjoy that. I've never really tried just doing very little." As most of Walden's artists are singers, he views the individual song as the determinant of success or failure. "I think music is among the last enterprises left where you can go from rags to riches overnight, *if* the song is there," Walden explained. "One of the hardest things in what I'm doing, whether with Carl Carlton or Angela Bofill or Stacy Lattisaw or even myself, is either finding the right song or having the capacity to write the right song. So many albums do not do well because the right song was not there.

"That's where most of my energy goes," Walden elaborated, "into just finding the right direction for the artist. Where do you want to take them? And what is the song? Is it the right song for this person? Everybody has to have their own niche, their own sound, or else everyone ends up sounding alike and you're down the tubes. But once I've got the song that I know I want to do, it's a piece of cake just to make it shine and cut the right track for it. That's the easy part."

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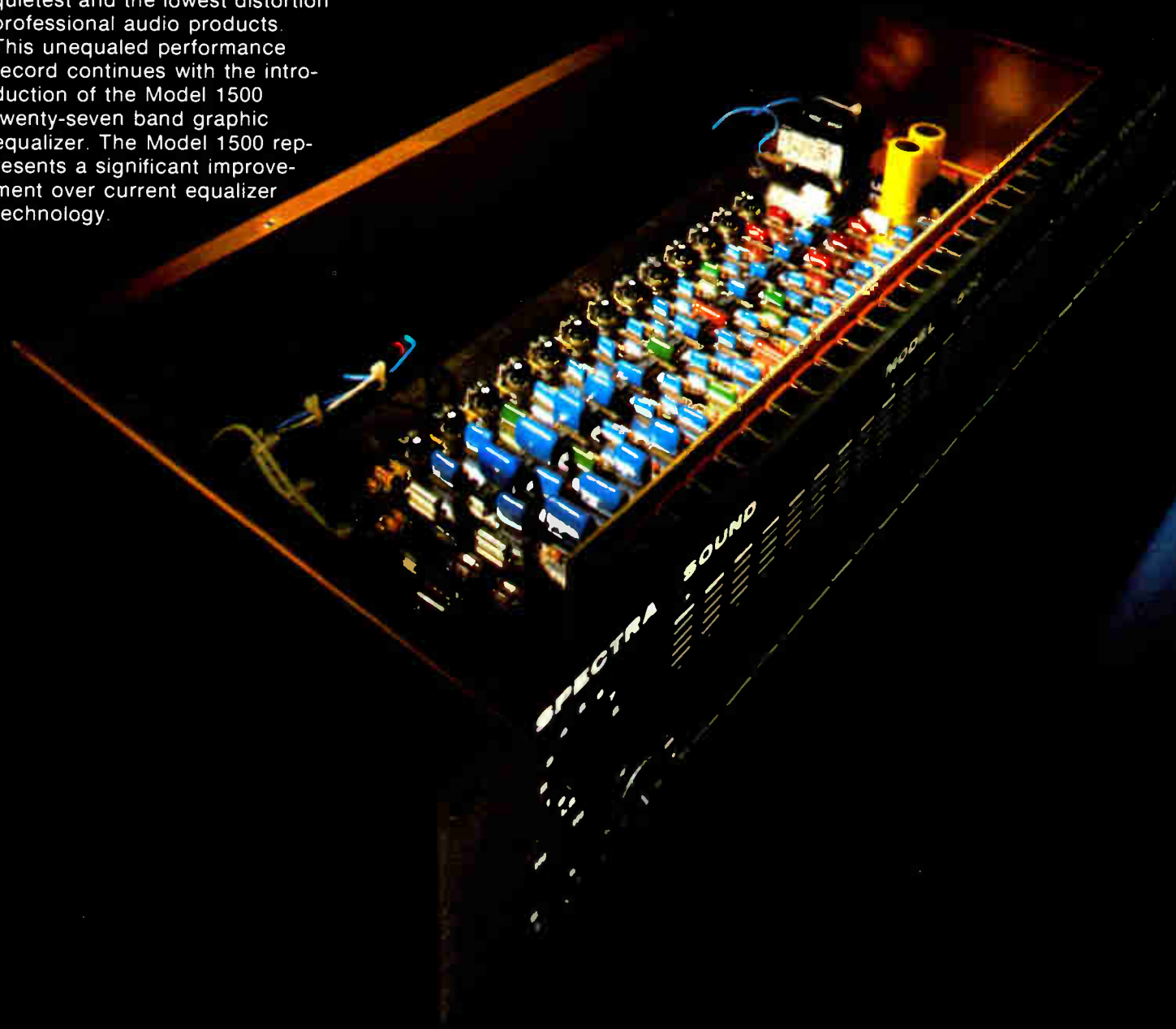
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Narada Michael Walden and Stacy Lattisaw

this but it's not really right for the record.

"Producing my own records is the hardest thing I have to do," Walden admitted, "because it's very difficult to be detached and to really judge your own vocals. When it comes to vocals, that's when you really need an objective view. So when I go to sing, I have to have an engineer with me who I know is very acute when it come to flat and sharp to the minutest degree."

Unlike his performing group, Warriors, which is more in the Mahavishnu vein, Walden's solo records fall into the contemporary funk/R & B groove. And similarly, he says, "It's a certain type of artist that will approach me at this point but I feel like I'm not limited at all. I'm just making my name getting hits doing what I'm doing—the Angela Bofill's and Stacy Lattisaw's—getting these people out to where they're recognized, then all of a sudden I become a little more valuable where I could more easily do the Barbra Streisand's and Kenny Loggins'."

Does he feel limited by the tighter black/white formats that have

taken hold in radio with the trend toward more conservative audience-targeted playlists? "I feel like it's just a state of things. But, if you do a Carl Carlton, say, it's automatic that you know that for him to even get played on crossover white radio, he's first of all got to have a top ten black hit. So you've first got to get him up there on those black charts. It's my job as a producer to be that guideline to the artist and to the company and to myself, in a way. If I know that I'm being paid to come in and give this person a hit, then that's what I must do. Now if it's agreed upon in the beginning that we don't care about hits, that we want to make an artistic statement, that's another ballgame."

But Walden does not approach his task with the cynicism of a boardroom chart-watcher. His integrity as an artist and his unselfish nature shape his concern for the talents he transfers to vinyl. "I feel a great mission to taking on undeveloped talent or people who are great but have not had the chance to go to the Grammy's," he said, "a mission in my life to serve up-and-coming artists who are so talented and not exposed to everyone. I feel like if I have any talent at all in this business, it's to serve others." ■

Even while he strives to create an individual sound for each artist, Walden does have certain preferences. He has worked at the Power Station and Atlantic Studios in New York and Trident Studios in London but he makes the Automatt his home base both because it is not far from his Marin County residence and because he loves the "very clear powerful sound" of the big Trident console there. And he likes all of his records to have a certain feel. "One thing that I really love," Walden explained, "is a huge wall of sound. I love echo. As I was growing up I was very impressed with Phil Spector and his sound. And I've ever since been impressed with that bigger than life sound. I like it when my record comes on the radio and no matter what I'm doing it just takes over."

Not surprisingly, the essence of that overwhelming sound for Walden is drums. "I really feel that being a drummer I have an advantage in making records," he explained, "because you can have an adequate bass player, an adequate guitar player but, I'm telling you, if the drums are not happening, if the drums are not locked, it's like the heart of the music is gone. If the drums are not spectacular sounding the record's just mediocre. If you have really great drums then everything around it can be just okay and it'll still sound like a great record."

Can he play and produce 'great' drums simultaneously? "A hard part about producing and cutting at the same time is being able to know if the part you're playing is really correct. When you're on that side," he said, pointing across the board to the studio, "it's rough to know if this little 'daka doo doo sshhh' is as good as just 'dat, dat-dat bumm.' But I've learned how to develop that. I really listen to myself more, have my earphones adjusted so I can hear everything crystal clear and I pretend that I'm inside of them as I'm playing. I try to be in a detached state of mind as I'm recording so I'm not involved with, "Well, my ego wants to do all

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World Radio History

RECORDING MUSIC AND SOUND WITH CON BRIO PRODUCTIONS



(Left to right): George Sanger, engineer/producer, Brian Horner, synthesizer programmer/producer; Bob Randles, MuSync creator and operator; Alan Danziger, computer programmer

by Roy Brown

Con Brio Productions is a one-stop music and sound effects production company specializing in Soundtrack accompaniment for video and film. Founders Brian Horner, Adam Holzman and George Sanger have assembled an impressive array of advanced equipment based at Digital Sound, a 24 track Los Angeles recording studio.

The studio houses over a dozen analog and digital synthesizers,

back as a trigger for a Wavemakers synthesizer, which played the unaccented notes. At the same time, the clicks were run through a Kepex, with the oscillator tones at the key, and the output to another synthesizer module, which played the accented notes. The taped pulses played the synthesizer in real time while we recorded. We took the resulting sound and ran it to the live room, and then miked it with a coincident stereo pair of AKG 414's for enhancement.

"The Con Brio ADS 200 digital synthesizer records the actual

compatible with each other and often patched together to produce special, unique effects. Their applications are not always predictable, explains engineer George Sanger. "Once we were required to record a part that was too fast for the performer to play. The part was all rapid sixteenth notes, accented in a non-repeating pattern. It had to be extremely precise, so we set up a sequencer to multiply the click track from quarters to sixteenths. We recorded a tone under the beats we wanted to accent, running at half speed. The clicks were then played

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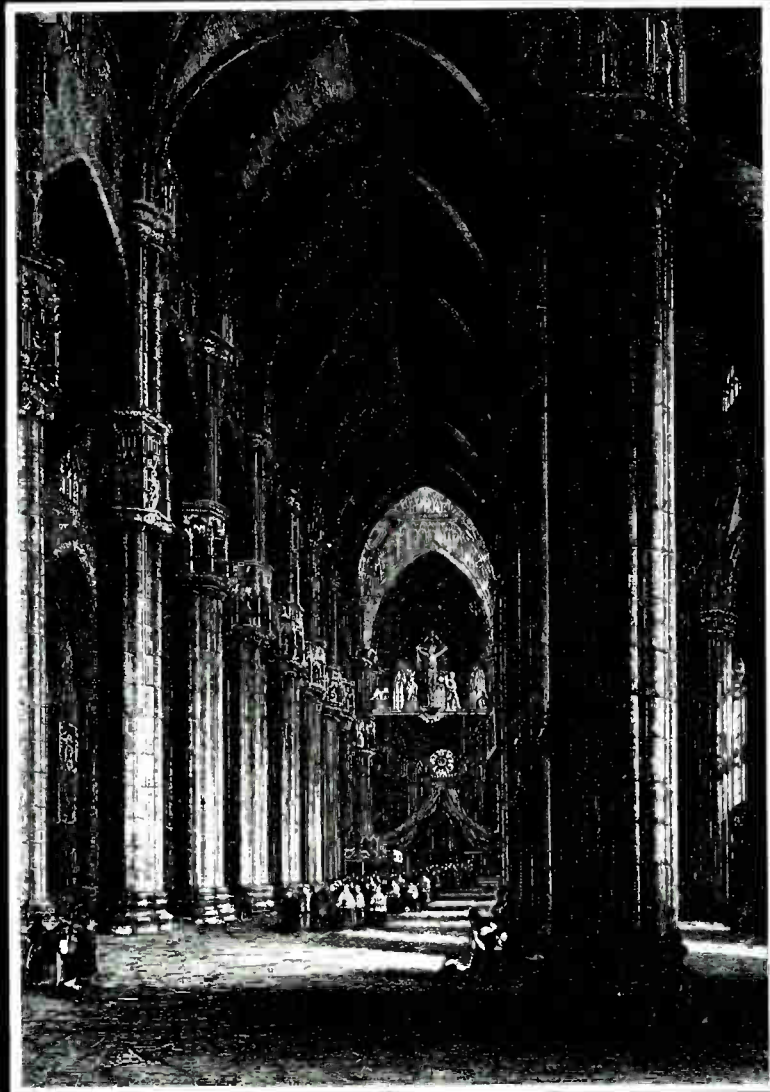
performance; the sequence in which the keys were pressed, the nuances of that performance in terms of timing and duration, as well as the changes of instrumentation occurring during the performance. These are stored as control voltages in the instrument.

Any factor can be changed *after* the performance has taken place. The synthesizer can record up to sixteen tracks, up to eighty thousand notes. Any note can be inserted, any sound can be changed for any portion of the recorded piece, and the performance will retain first generation quality, with a 95 dB dynamic range."

Con Brio Productions also employs a Sony PCM 1600 digital audio recorder for sound manipulation and editing; and the MuSync computerized tempo editing computer, created and operated by Bob Randles, which controls the process of tempo and music editing for film and video. The MuSync is a flatbed viewer equipped with a computer and two CRT's. One CRT gives a visual representation of the frames of the film, with action and music cues written over the appropriate frame. Move the cursor to a "frame," and the film will physically move to that point in the action. Program in a tempo, and the computer screen will mark the "frames" on which the beats appear, with a different mark for downbeats. As you view the film on the flatbed, the cursor moves along the "frames" on the screen, while a third screen shows a conducting display. This conducting screen visualizes the exact placement of each beat, and each downbeat, as well as the number of beats remaining in the measure. A metronome "beep" is also produced. The MuSync is a full-scale computer, able to solve mathematical problems of tempo editing. The computer will "fix" tempi to coincide with important visual events, and will perform *accelerandi* and *ritardandi* between sections of different tempi.

When the MuSync controls the speed of the ADS 200's playback, the result is a frame-accurate, programmable electronic orchestra. Performances on the Con Brio can be tailored to fit the visuals of the film, without going back to the recording process. The length and speed of a piece can be changed at any point by the MuSync, without altering pitch, to match the pacing of the film. "Essentially," says Sanger, "the film is conducting the orchestra."

"The MuSync can be hooked to other synthesizers. Connected to an Emulator, for instance, sound effects cue themselves right to a given frame of film. Any sound can be digitally sampled and altered, recorded on floppy disc, and then played back at



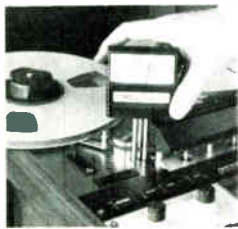
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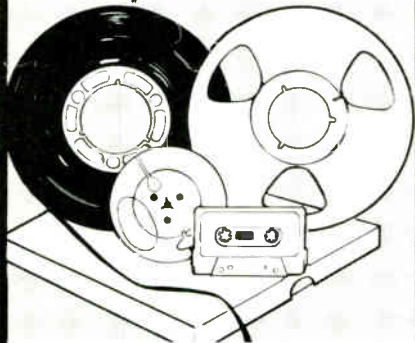
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The Control Room at Digital Sound, site of Con Bric Productions

a moment's notice, at any pitch, any number of times. These sounds can be recorded right to mag film or video tape, or can be put on the 24 track with a SMPTE code for additional sweetening."

For interlock purposes the Con Bric staff uses the flatbed of the MuSync, a VCR, and/or a 9' x 9' projection screen, nesting in a wall of the studio.

Adan, Holzman, Con Bric's composer/keyboardist, and a staff of on call musicians - composers and arrangers take care of the perform-

ance end of Con Bric. When a traditional ensemble is unnecessary, Holzman, Horner and Sanger have 368 tracks available to them (16 in the Con Bric x 23 or the 24 track before bouncing tracks). By running the output of the ADS 200 into the board, and recording on the Sony PCM 600, a digital-to-digital tape can be made.

Says Brian Horner, "We're working with people who either invented the equipment or pioneered its use. This is an extremely useful situation."

The MuSync. Hash marks on right-hand screen represent frames of film. Cues, beats, downbeats, and streamers can be placed over any frame mark, and will appear on the left-hand "conducting" screen. The middle screen is for viewing the film, which is frame-synchronized with the computer screens.



SOUND ON STAGE

by Pat Maloney

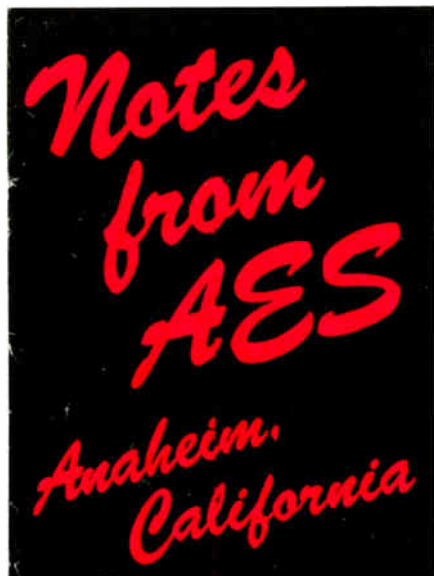
I attended the A.E.S. Convention last October for a number of reasons: to see what's new equipment-wise in the PA business; get away from the phone sessions, appointments, meetings, and magazine deadlines; and go to the MIX party at Knott's Berry Farm.

Although it was developed as part of their Producer Series line of musician-operated equipment, Yamaha has come out with a self-powered small monitor speaker—the MS10—that could prove to be very handy for the pro sound mixer as a console cue speaker.

I don't know about you but I prefer to solo individual channels on a speaker instead of headphones. You don't waste time picking up and putting on the phones and you don't isolate your ears from the ongoing show. The SM10 weighs just 8½ lbs., and is a small 6¾" x 6½" x 11". A five inch full range speaker is powered by a 20 watt rms internal amp with separate bass, treble and volume controls. There are a few other self-powered cue speakers on the market, most notably the JBL 4301E and the Anchor, but this is the first I've come across with tone controls. Speaking of Anchor, I was pleased to see that they've come out with a beefed up version of their popular mini-monitor. The new, slightly larger unit houses two cone speakers and a separate tweeter.

Speaking of cueing facilities, I saw a console at the show manufactured by a Swiss company named Sonosax that had a nice approach to soloing. A pfl "Auto Reset" function enables each pfl button to cancel the previous one so that you could, for instance, go down the board in search of a buzzing line a heck of a lot faster since you don't have to switch off each button as you go. This handy feature is a good example of the type of design that should be incorporated into live performance equipment. Downtime in a studio may be annoying but it's a disaster in a live situation!

There was a notable increase in the number of companies with speakers boasting Time-Aligned® or otherwise time corrected circuitry. Modular Sound Systems Inc. of Barrington, IL exhibited their new Bag



End TA12 series of monitors. These speakers use a proprietary Bag End 12" woofer coupled to an Electro-Voice ST350B tweeter via a Time Aligned® passive crossover and are available in either rectangular or floor monitor configurations.

PAS (Professional Audio Systems, Harbor City, CA) introduced a line of coaxial loudspeakers with what they call Time Offset Correction designed into their passive crossover networks. I listened to one of their stage monitors and found the sound to be very Altec 604-ish but with a heck of a lot more power and punch. Incidentally, PAS is the OEM supplier for the woofer used in the new UREI 813B Time Aligned® studio monitor.

PAS also demonstrated a new item that should be available by the time you read this and that's the TOC 203 three way electronic crossover (12 dB/octave) with built-in time delay. A full range limiter as well as a separate high-end limiter are also incorporated into the device. Crossover points and level controls are adjustable from the rear panel while all the time delay settings for the various frequency bands are accessible from the front. Although it can be used simply as an electronic crossover and even includes a separate subwoofer output, the TOC 203's big attraction is the adjustable time delay circuitry that compensates for the staggered arrival times of signals from the various sections of almost any PA system, whether it be made up of

separate components or full range boxes. The delay circuitry can be switched on or off independent of the crossovers and I noticed a definite improvement in the sound from a three way PAS cabinet that was set up in their demo suite in the Hilton Hotel. The unit sells for less than \$600 and should be picked up by anyone who still isn't convinced of the value of designing a system with attention paid to proper alignment of the components. The only one who wasn't impressed was the hotel security guard, whose big concern was for the amplitude, not the coherency of the sound!

As I talked to the various manufacturers who now have some sort of "aligned" product on the market, I was amazed to hear how many times the words "Meyer Sound" and "John Meyer" were mentioned in a comparative sense, as in, "Well, it's not a Meyer UltraMonitor™ but then again..." or "It's not as good as Meyer's

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stuff but " John's company, MSLI in San Leandro, CA, was one of the first, if not *the* first, to put out professional sound reinforcement equipment incorporating active alignment circuitry. So I checked in at the MSLI booth on the main floor and saw two of John's newest products, the UPM-1 and the 833 studio monitor. The 833 supercedes the much heralded, albeit somewhat expensive, ACD/John Meyer studio monitor and is available at about half the price. The UPM-1 is a small speaker consisting of two 5 inch low frequency cone drivers in a vented enclosure and a 2" x 5" horn loaded piezo tweeter with three-way passive crossover. A separate control unit contains frequency response alignment circuitry and Meyer's SpeakerSense™ driver protection electronics. It should find favor as a high powered keyboard or drum monitor (it requires a 125 watt into 16 ohm amp) since it is less than 7" wide and comes fitted with a standard threaded mike stand mount.

On another issue entirely, an interesting item came to my attention that I should pass on to all of you who have run out of excuses for equipment failure. It seems that one possible cause for intermittent and/or failed circuit card connections is due to the fact that, as Mort Feld of McCune Sound put it, "There's a fungus amongus!" McCune engineer Bob Cavin, who now heads up the company's computer rental division, came across an item about Apple Computers that pertains to the sound business as well. Seems that an Apple user's complaint about circuit board contact failure was traced to the presence of a type of fungus that thrives on the electrical potential present at the pins and gradually spreads the contacts as it grows. The customer had noticed that simply reinserting the card cleared up the problem but the loss of contact always reoccurred a month or so later. This should be good news to those of you who have ever pulled out a malfunctioning console input strip, found nothing wrong, replaced the strip and noticed that it worked perfectly. The bad news is that now you have to carry along a can of fungicide to every gig. More on this mushrooming development later.

On a final note, I would be deeply indebted to any of you sound mixers who would send me a post-card in care of this magazine listing your name, address, phone number and employer whether it be yourself, a sound company or an artist. Thanks!

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MUSIC NOTES

by David Gans
**Punk Pix Outshine
Pregnant Prose**

Weird Angle is a collection of excellent images of the "punk" scene by f-Stop Fitzgerald (a.k.a. Richard Minisali). The title is explained in the introduction, by Mark Levy: "for [Fitzgerald], weird subject matter necessitates a weird angle."

And much of the (mostly San Francisco) punk-rock crowd does in-

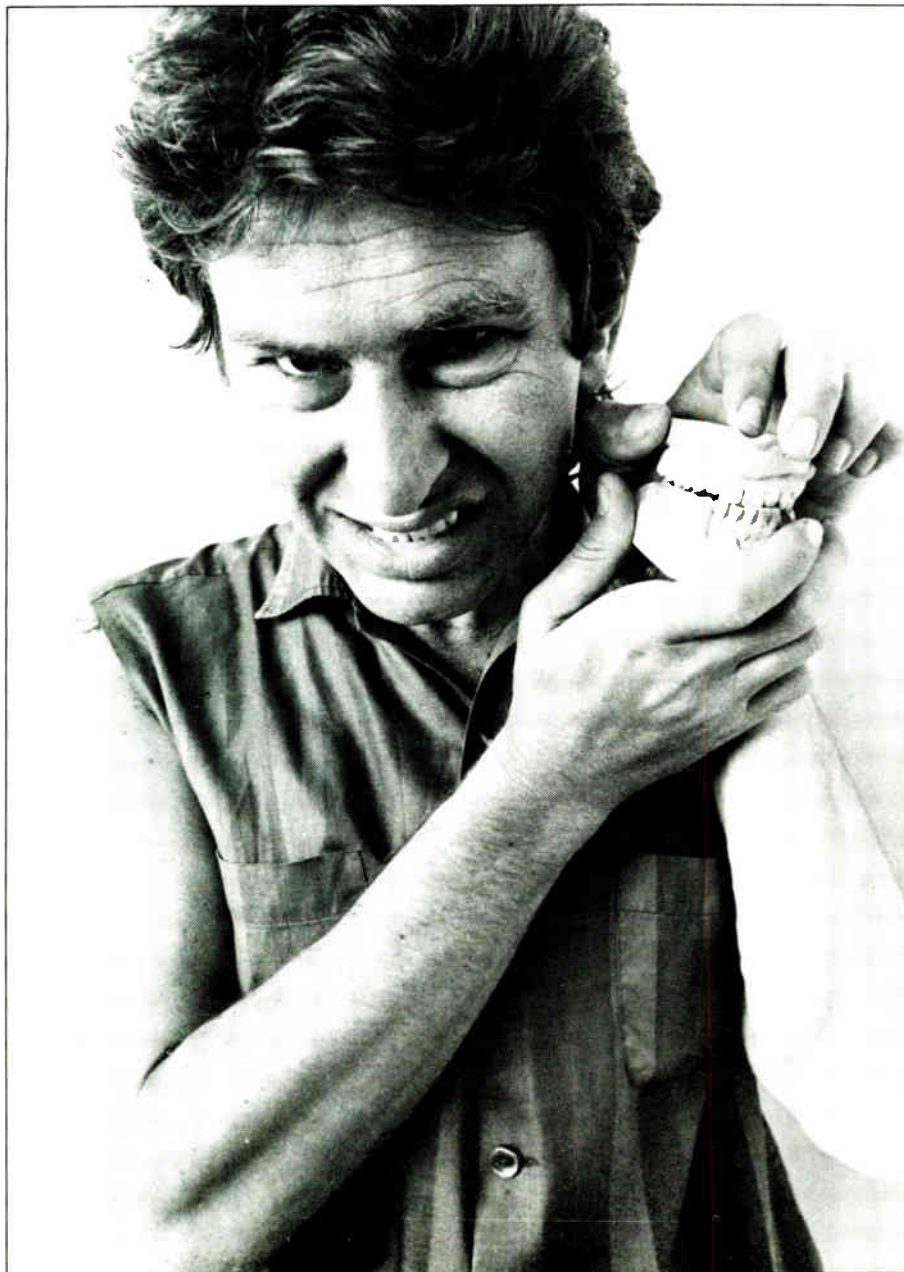
deed constitute weird subject matter. Fritz Mutant glares coldly out from under his domed forehead, his garb suggesting a physicist impersonating a bag lady in clothes borrowed from a fireman; the members of Translator crowd into the frame like a bunch of regular, if bored, guys (so how come they're weird?); The Punts (before changing their name to Wild Combo) react violently to a playback while handler Bonnie Hayes smiles her

cheshire threat; and in one memorable juxtaposition of images, Olga de Volga adjusts her glasses and purses her lips schoolmarmishly while across the binding, Wendy O. Williams' leopard-clad torso bursts out of the picture in much the same way her taped-up breasts burst out of her costume.

The most interesting shots here are the individual portraits (Laurie Anderson's pleasant smile; Jennifer Blowdryer's frightened, wide-eyed sensuality) and posed group shots (Other Music, an all-black motif with one glowing light bulb per musician; Rhythm and Noise in a jungle of circular metal things, with a video screen in the picture showing the same scene). Many of the pictures are tilted, either in the original frame or in the reproduction, in keeping with the theme.

Weird Angle is a more effective photo essay than *X-Capees*, in which Fitzgerald was one of three visual contributors. Every image is chosen for its impact as a photograph rather than

"Snake Finger" from the book *Weird Angle*



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as part of the history *X-Capees* sought to tell (and which required the inclusion of less arresting photos just to complete the cast of characters). The only problem with *Weird Angle* deals with most of the accompanying text. Five writers contribute largely overwrought, precious and self-important sociobabbling essays with such titles as "Punk's Heroic Period in San Francisco: a Memoir" (by Marian Kester) and "The Beautiful and Damned Babylon Revisited" (by Richard Irwin).

Particularly grating are Mark Levy's pseudoacademic Introduction (complete with footnotes and references to defunct publications and philosophical movements) and Kester's harangue, which presumes an awful lot. In charac-

terizing punk music as "autobehavior-modification," she states that "although the lyrics were unaudible, you could safely assume... [they] were aimed at you, and yes, it is not a pretty picture." After gratuitously slashing The Beatles' "flat melody and zombie vocals" (in "Love Me Do"), Kester confesses that she isn't into punk-rock any more. "The novelty wore off," she shrugs. "Now I am content to let kids half my age take over while I rediscover the classics"—which made me wonder how much of punk art sticks to people's intellectual ribs; whether it snarls about immediacy or not, all art aspires to permanence—doesn't it? Shouldn't it?

Considerably less obnoxious are Sue Klein's catalog of current San

Francisco bands (but many of the groups she mentions are not pictured) and Annette Jarvie's cogent account of the role of women in New Wave, which at least states and supports a case rather than just raving on in a morass of tenuous words like the introduction. But Jarvie omits Wendy O. Williams, perhaps the most powerful single portrait in *Weird Angle*. It's possible that Williams' role in this thing may be that of the ultra-punk, the sublimely calculating/mindlessly sexual iconoclast whose medium/message is that *everything* is an insult to our intelligence.

And like this review, the text of *Weird Angle* displays absolutely no empathy with the idiom of the punks. Rather than using rough-hewn, top-of-the-head language to express these ideas, all five writers opt instead for the la-dee-da phrasemaking that punk sought to short-circuit. I recommend you buy the book and ignore the blather, which serves mostly to illustrate the time-tested truth that a picture is worth a thousand words. (\$10.95, from Post-Contemporary Productions, 2319 40th Avenue, San Francisco, CA 94116)

Good as Gold:

Not only do Maxima Gold Strings go beautifully with the mahogany of my Turner guitar, they also sound extremely good and they seem to be lasting longer than regular strings. You don't have to take my word for it, though — Grateful Dead bassist Phil Lesh is trying a set on his second bass, and he told me they sound pretty good to him, too. Company literature says that the gold plating means that Maxima Gold Strings are "100% immune" to rust and corrosion. They're available flat- and round-wound in a variety of gauges for electric guitar and bass, and in light and medium gauges for acoustic guitar. For information, write The No Sweat String Company, 61A Presidio Avenue, Mill Valley, CA 94942.

Random Axes

Craig Anderton, that ever-practical apostle of do-it-yourselfism, has published the *4/8 Track Studio Logbook*, presumably for the lazy do-it-yourselfer (is that a contradiction in terms?). Each two-page spread in this spiral-bound book has space for information concerning what's been recorded on each track; the title, tape brand, format, speed, personnel, etc., and a large block for notes. It's the kind of handy tool I've come to expect from Anderton, who spends a lot of time thinking about this kind of stuff so we don't have to. (\$4.95 plus 10% shipping and 50¢ handling per order, from Polymart, P.O. Box 20305, Oklahoma City, OK 73156) . *Sanox's 98SX Pedal Driver* supplies 9-volt, 200 mA

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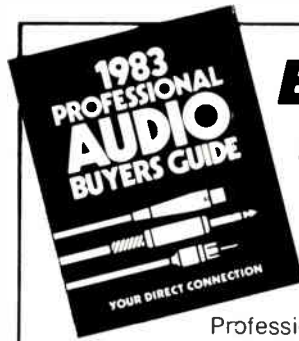
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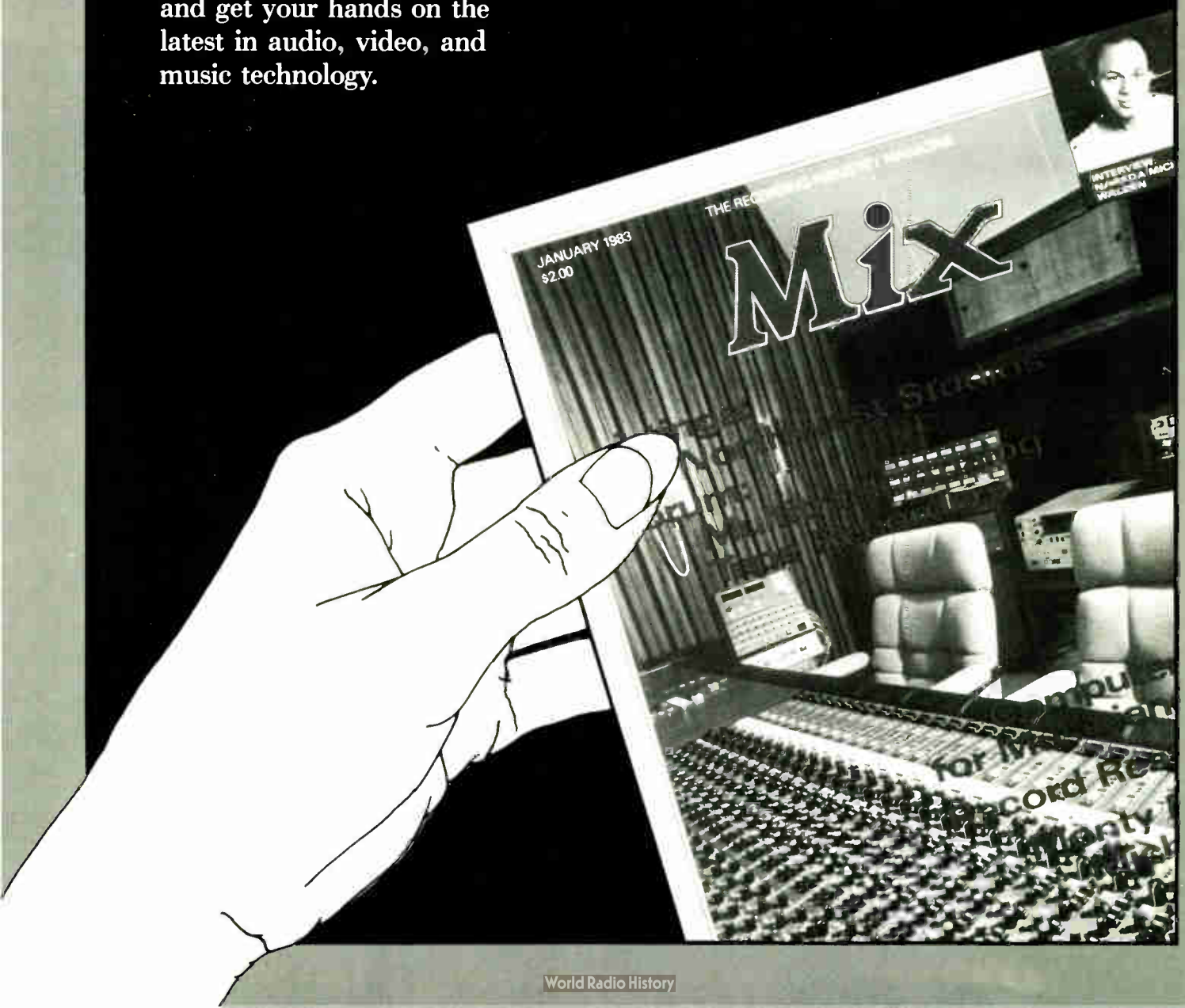
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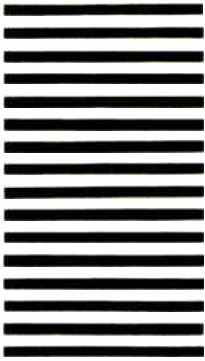


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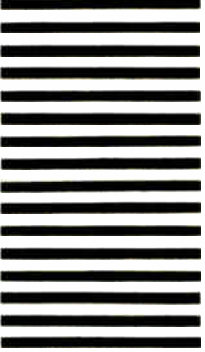


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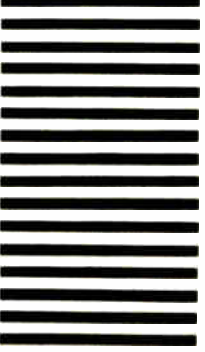


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PREVIEW



STUDER A810 HAS TOTAL MICROPROCESSOR CONTROL

The Studer A810, a four speed (3.75 to 30 ips) microprocessor controlled audio recorder, has been introduced by Studer Revox America. In addition to total microprocessor control of all transport functions and electronics switching, the A810 also offers a set of three "soft keys" which may be user programmed for a variety of functions. This innovative design enables the A810 to offer mixed combinations of the following operational features: autolocate (up to 4 addresses), start locate, pause, fader start, tape dump, remote ready, code channel ready, and a choice of two lifter defeat modes. The A810 also provides programmable audio electronics, a revolutionary system which stores electronic alignment parameters (level, bias, equalization, and erase) for different tape formulations in memory for instant recall at the push of a button. Trimpots, normally used for this function, have been eliminated.

The A810 may be ordered with a new SMPTE time code system, developed by Studer, which places the code data on a center track between the two audio channels on 1/4" tape.

Suggested list price for a 2 track stereo A810, rack mount version, is \$6,200.

Circle #085 on Reader Service Card



LOW-COST PROFESSIONAL DIGITAL AUDIO PROCESSOR DEVELOPED BY dbx®

As mentioned in our last issue, dbx unveiled its "under \$5,000" digital audio processor for the professional market during the 72nd Convention of the Audio Engineer-

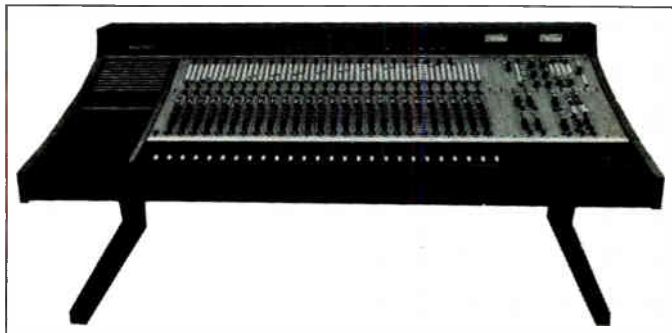
ing Society, in Anaheim, CA.

The dbx Model 700 Digital Audio Processor does not employ the Linear PCM (Pulse Code Modulation) technology upon which other digital processors are based, but rather a system that dbx calls CPDM — "Companded Predictive Delta Modulation." According to dbx, their digital audio processor, used in conjunction with a professional quality video cassette recorder as a storage medium (as is done for PCM processing), provides sound quality as good as, if not better than, that of 16-bit Linear PCM processors at far lower cost.

In Delta Modulation, the numbers produced by the A/D converter represent differences between successive sampled voltages, rather than the instantaneous voltage of the input signal at each point of time, as used by a conventional PCM audio processor. To solve serious problems inherent in the basic Delta Modulation system, dbx developed Linear Prediction and Precisor Companding.

The Linear Prediction circuit estimates a signal's future by monitoring its recent past history, sampling at 700,000 times a second. In addition to avoiding audible noise modulation effects, the dbx Linear Prediction circuit is responsible for increasing the dynamic range of the basic Delta Modulator from 55dB to 70dB. By further employing a Precision Companding circuit, a novel compander design with a direct digital link between encoder and decoder, the dynamic range of the CPDM system is increased to more than 110dB.

Circle #086 on Reader Service Card



NEOTEK SERIES III-C CONSOLE

Based upon its popular predecessor, the Series III, the new III-C console offers improved styling, higher resolution metering, extensive use of logic-controlled solid state switching, and the latest refinements in the circuit designs. New facilities include a stereo and four mono auxiliary busses, eight stereo submasters with individual effects busses and stereo returns, and a submixer that allows control of the headphone cue mix. Series III-C consoles are available in 24 and 48 track versions with up to 56 plug-in input channels. VCA grouping, automation, and custom cabinetry are among many options.

Circle #087 on Reader Service Card

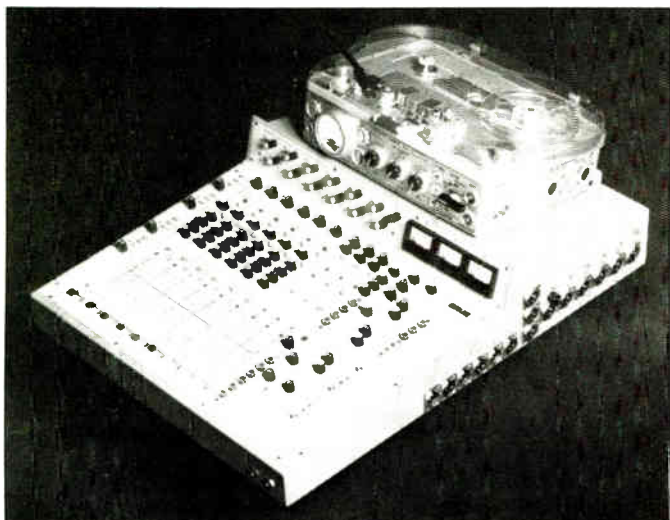


GEORGE MASSENBURG LABS MODEL 8200 PARAMETRIC EQUALIZER

The GML 8200 Parametric Equalizer is the fourth generation result from the original ITI Parametric Equalizer. According to the manufacturer, "its design, the result of nine

years of creation and listening analysis, uses the most versatile and musical sounding circuit topology with fine tuned control parameters to satisfy the needs of the most demanding professional."

Circle #088 on Reader Service Card



ASC SELA 6F MIXER

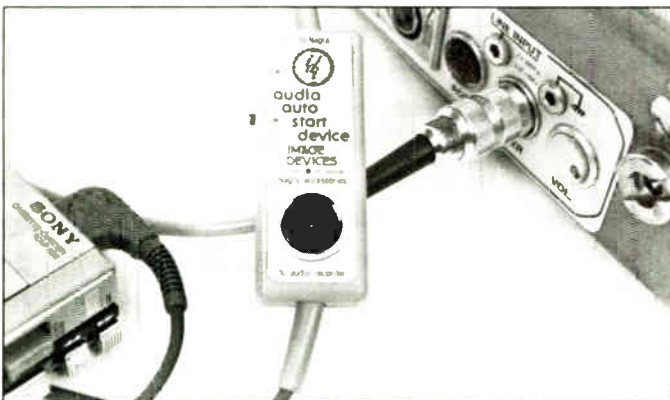
Audio Services Corporation has introduced the new ASC SELA 6F Portable Mixer, a six mike, four line input by three out plus foldback out unit. The Mixer is expandable by up to four more mike inputs.

The mike inputs feature variable highpass, Bass, Parametric Midrange, and Treble Equalization. The inputs are differentially audio phase reverse. The faders are Penny and Giles conductive plastic. A solo/PFL button on each input allows the mixer to monitor that channel only, before the fader, but after the EQ, without affecting the program.

The three line outputs have variable threshold limiters and input and output patch points. Two separate variable oscillator levels are available to any of the outputs. The slate mike has a 33 Hz sub-audible tone for highspeed search.

The mixer is powered internally by twelve "D" batteries, and will run for twenty hours. The mixer can also be powered by an external 18 to 35 volt DC source. The ASC Sela 6F is priced at \$7,900.

Circle #089 on Reader Service Card



NAGRA TO CASSETTE RECORDING DEVICE

Designed especially for documentary-type producers, IDI's Nagra to Cassette Auto Audio Recording Device automatically starts an audio cassette recorder. When you "roll" quarter inch tape, the cassette starts. It stops when the Nagra stops.

The device includes an accessory lock to prevent

the one used to power and connect it to the recorder. Price is \$275.

Circle #090 on Reader Service Card



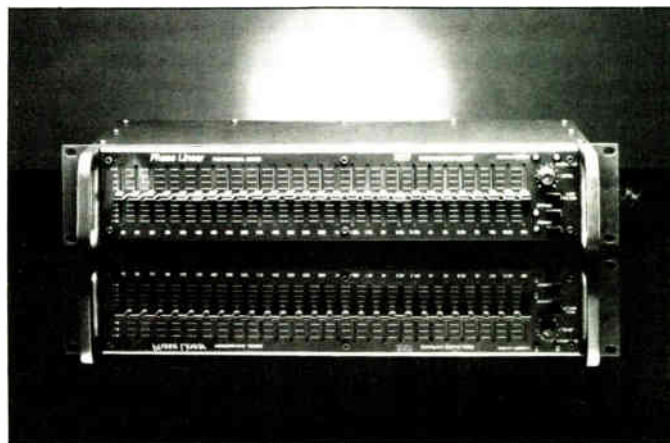
AMBER 3501 MEASURING SYSTEM

The Amber Model 3501 is a high performance, comprehensive audio distortion and noise measuring system. Total harmonic distortion measurements can be made to below 0.0008% (-102dB) and noise measurements to below -120 dBm. The built-in generator can deliver up to +30 dBm to a 600 ohm load over the instrument's frequency range of 10Hz to 100 kHz. Offering automatic operation and extremely fast settling time, the 3501 can be configured with a fully balanced input and output to interface to telecommunication, broadcast and professional audio equipment.

The portable instrument may also be supplied with optional rechargeable battery pack. All system options may be field retrofitted.

Prices for the 3501 start at \$2,100 in the USA. Delivery is 4 to 10 weeks.

Circle #091 on Reader Service Card



PHASE LINEAR 27 BAND GRAPHIC EQUALIZER

The introduction of the Model E27 single channel 27 band Graphic Equalizer for professional applications recently was announced by Phase Linear.

The E27 utilizes state variable filters to achieve amplitude change independent of bandwidth. Other features include: +12dB, -15dB control range; switchable 40Hz high pass filter; 12dB available gain; signal/noise ratio of 111dB below maximum output with sliders centered; passive bypass; and balanced input and output.

The suggested retail price of the E27 Graphic Equalizer is \$549.

Circle #092 on Reader Service Card

Back Issues

- 1980 August, Southeast Studio Listings. Opryland Mixing. South Florida Recording. Recording School Listings.
- 1980 September — SOLD OUT.
- 1980 November — SOLD OUT.
- 1981 January, Northwest Listings. Recording Schools Update. Laservision. Leo Kulka.
- 1981 February, Southeast Studio Listings. Ray Stephens. Norbert Putnam. Ardent Recording.
- 1981 March, Southwest Listings. History of the Tape Recorder. Producer's Role. Indian Creek Recording.
- 1981 April, Northeast Listings. Todd Rundgren's A/V Studio. Women in Audio. History of the Tape Recorder, Part 2.
- 1981 May, AES Spring Update. Mike Love's Studio. Envelope Controlled Filters. Women in Recording, Part 2.
- 1981 June, Video Focus. Moogy Klingman. Video Equipment Manufacturers. Introduction to Video.
- 1981 July, Recording Services Listings. Recording School Listings. Remote Recording. Maintenance.
- 1981 August, Studio Design Listings. Dealing with the Bldg. Dept. Building Materials. Monitor Field.
- 1981 September, S. Cal. Listings. Tape Editing. Creative Record Promotion. Janna Feliciano.
- 1981 October, N. Central Listings. Digital Reverb. Chicago Music Recording. John Ryan.
- 1981 November — SOLD OUT.
- 1981 December, Tape to Disk Listings. Lee Ritenour. Tape Tips. Sony Compact Disc. High Speed Duplication.
- 1982 January, Northwest Listings. Mixing Consoles. Grateful Dead's Studio. Lindsey Buckingham.
- 1982 February, Southeast Listings. Digital Synthesizers. Dave Edmonds. John Meyer.
- 1982 March, Northeast Listings. Car's Studio. Microphones. Phil Ramone.
- 1982 April, Video Focus. A/V Studio Listings. Video Music Satellite. Mike Nesmith. Legal Issues in Video.
- 1982 May, Southwest Studios. Quarterflash. Charlie Pride's Studio. Digital Recording. Fantasia Digital Soundtrack.
- 1982 June, Concert Sound & Remote Recording. Drum Machines, Part 2. Keyboard Artists Forum. Video Legal Issues.
- 1982 July, Studio Design. Listings of Designers. Suppliers. Power Amp. Report. Alan V. Jones.
- 1982 August, 5th Aniv. Issue. History of Recording. Asia. Oscar Peterson. Bill Peeler.
- 1982 September, S. Cal. Listings. Film Sound. The Dream. Video Synthesizer. Saxon. P. J. D'Amico.
- 1982 October, N. Central Listings. Studio Monitor. John Cougar. Project. D'Amico.
- 1982 November — SOLD OUT.
- 1982 December, Tape to Disk. Report. Restoration. Starting Out in Video. P. J. D'Amico.

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INTERNATIONAL UPDATE

(continued from page 80)

APRS Firms at AES in Holland

A total of 28 British companies will be exhibiting at the 73rd AES Convention in Eindhoven, Holland, March 15 to 18 under the joint sponsorship of the Association of Professional Recording Studios (APRS) and the British Overseas Trade Board. Since the first time APRS went to AES—in Paris in 1977—the number of UK companies showing has grown from 19.

Those APRS member firms who will be in the POC Congress Centre in Eindhoven, the home of Philips, are: Audio Design, Audio Developments, Audio Kinetics, Advanced Music Systems, Calrec Audio, Court Acoustics, Dolby Laboratories, Future Film Developments (Allotrope), HH Electronics, Klark-Teknik, Keith Monks, Leever-Rich, Midas Audio Systems, Mosses & Mitchell, Neve Electronics International, Penny & Giles Conductive Plastics, Raindirk, Rank Strand Sound, Red Acoustics, Solid State Logic, Soundcraft Electronics, Soundtracs International, Trident Audio Developments, Theatre Projects, Tannoy, Turnkey 2, Zoot Horn and Zonal.

Project Universe at INFO '83

Project Universe will participate at INFO '83, the sixth European Information Technology and Office Automation Exhibition, which will be held at the Barbican, London, February 22 to 25, 1983. Project Universe is a recently formed cooperative research project into high technology involving high speed telecommunications, satellite communications and many allied applications. The participants are British Telecom, Cambridge University, the Department of Industry, GEC Marconi Electronics Ltd., Logica Ltd., Loughborough University of Technology, the Science and Engineering Research Council and University College, London.

In February 1982, INFO attracted a record 17,500 visitors from the UK, Europe and North America; 135 exhibitors took part.

The 1983 show, expected to

be larger, will occupy Halls A, B, C and D at the Barbican for a total of 36,000 square feet of exhibit space. Exhibiting firms will include: IBM, ICL, Burroughs, Siemens and Wang, Bell and Howell, AES Data (UK) Kodak, Dictaphone, Grundig, Ferranti, Rank Xerox and Cable and Wireless.

For further information, contact the organizer: BED Exhibitions Limited, 44 Wallington Square, Wallington, Surrey SM6 8RG England. Telephone: (01) 647-1001.

Sound Workshop Announces Japan Representation

Michael Tapes, President of Sound Workshop Professional Audio Products, Inc., recently announced that negotiations were finalized at the past AES Convention in Montreux, Switzerland between Mr. Takao Aoki, Director of the Otec Corporation, and Emil Handke of Sound Workshop for representation of the Sound Workshop product line in Japan. Otec Corporation is a division of Otari Electric Company LTD., manufacturer of multitrack tape recorders, cassette duplicators and video tape duplicators.

Telearte Open in Venezuela

Radio Caracas Television (Venezuela) recently completed their 24 track studio, "Telearte." The control room is the "Live End, Dead End" Design, created by Chips Davis with H.N.E. Inc. of Burbank, CA. The new facilities include a Sphere-Eclipse "C" 32 input console, with UREI 813A Time Align speaker-monitors, linked to an ATR 124 24 track, an ATR 100-102 2 track, and ATR 104 4 track, Echo Plate echo unit, 24 channel Dolby, digital delay, Harmonizer H949, BX-20 and mikes by Shure, Neumann and PZM. To give their personnel the final touches in the creation of this most unique South American Recording Studio, Telearte invited Sherman Keene, the author of the recording textbook "Practical Techniques for the Recording Engineer," to come down and train the entire staff in the latest recording techniques.

degrading the sound quality. Years ago we built an eight channel suppressor based on the Olsen design. It works well, but definitely degrades the sound, and we use it today only on records in hopelessly bad condition. The Source Noise Suppressor available on the market today is based on the Olsen concept, but has too few active channels, along with noise and phase shift problems. The auto-correlator approach as incorporated in the Phase Linear 1000, Series II, which we modify for 78's, was developed by Bob Carver and is easily the best of the divide-and-conquer systems, having no noticeable bad side effects when it is properly adjusted.

The gating system was first used on the Scott Dynaural Noise Suppressor, but wasn't very successful due to noise pumping and transient degradation. The Garrard and Burwen systems are also based on this approach but are of little use on 78's. The noise gating system as perfected by Tom Packard as on the the Packburn's three noise reduction systems is the best way to go.

For click and pop suppression the highly advertised SAE 5000 consumer unit was good in theory, but not so good in practice. It was effective on contrived demonstrations but didn't fare well in the real world of clicks and pops as found on old records. It is no longer being manufactured. The Packburn "blankers" (its click and pop suppression system) are very effective, but not perfect, as they cause minor transient degradation on high quality material; but it is head and shoulders above all the competition. We hope that Tom Packard, the developer of the Packburn proprietary circuitry in collaboration with his colleague, Dick Burns, will be able to make even further refinements on this process. The Packburn's other noise reduction systems, the "switcher" and "continuous noise suppressor" (gated system), as so good now that any theoretical improvements in these would be superfluous.

For open-ended noise reduction systems we expect no major breakthroughs in analog technology, but only further refinements of the existing systems. Digital noise reduction is simply not available now to the sonic restorer although it seems to offer considerable possibilities in the future, but probably not the near future.

A most neglected area in the sonic restoration of historical recordings is that of standards and morality. This, with other considerations, will round out our discussion next month.

Korg's New SDD-3000 Programmable

Korg, world leader in electronic musical products, brings you a Programmable Digital Delay that really racks up points with recording engineers, pro sound men and musicians. It combines superb audio specs, long delay time and programming versatility at a price (under \$1,500) that makes the SDD-3000 the most cost-effective signal processor on the market today.

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Digital Delay

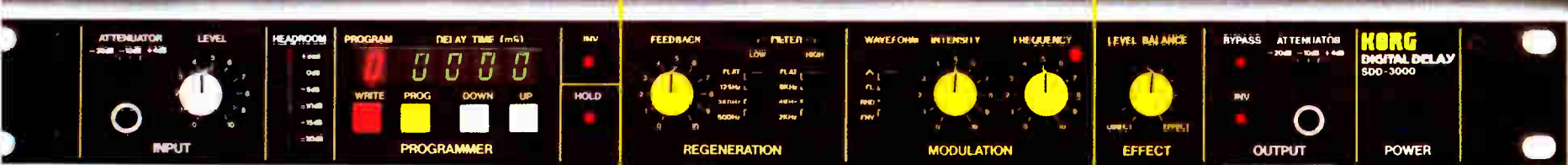
- Short and Long Echoes
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If you want a sophisticated delay at an unsophisticated price, see and hear the new SDD-3000 at your Korg dealer today. For name of nearest dealer, call: (800) 645-3188. In N.Y. (516) 333-9100.

by Neal Weinstock

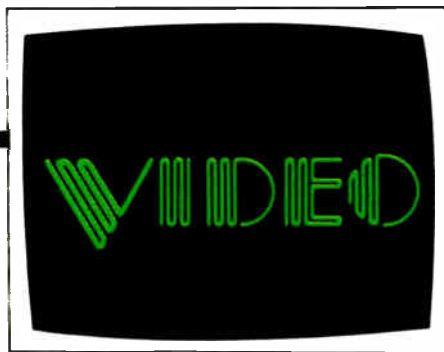
Each month this column necessarily concerns business expansion, although it may not usually seem so. Though talking to engineers about expanding into video is instructive, there comes a time one must talk to one's banker. For the engineering-minded a few simplistic equations:

$$A + V = (A)(\$).$$

Or,

$$$(V) = $(A)^3$$

Even for the digitally minded, audio plus video is not a simple matter of one plus one



INTERFACE

dent. Finance puts video, or audio, in place: its higher knowledge is more obscure as it is more powerful.

Investing in Video

Unless talking to your banker is generally as fun as talking to your engineer—the first step towards expansion—financing—may be a hurdle instead. The three tried and true methods of financing for small businesses are, first, the proverbial rich uncle; second, venture capital; third, bank loans. Also, if your business has used all of the above methods and is already quite large, there is the route of "going public." One way or another, the studio owner(s) must communicate the profit potential of video production to people who, likely, don't understand a thing about video.

We talked with several financial-types at studios and production houses that seem to have built well. As studio designer and architect John Storyk says, "We look at financial design in the same way as architecture. It's a very complicated structure to build." He was speaking of the design work of his partner, Alex Major, in the development of the slowly rising Metropolitan Studios. However, one of the things architecture and finance do not have in common is that it is easy to get a designer to show off and discuss his studio, but it is not so easy to get a financial wiz to enlighten even a willing stu-

This writer does not intend to try to parse that gnosis in a short column. But a few succinct steps come to mind. Logically, if you know what you want to build, or buy, you know what it will cost and you have a good idea of what you will use it for. Committing the uses, or the market, for your new video product down to paper may help clarify some things about it.

Defining the market seems easier than it is. Most of the new video studios in New York and Los Angeles that are now inundated with cable work presented their expansion plans to investors in terms of servicing the commercial market. At studio after studio I've been told that planners consistently and completely mis-forecasted the size of the market for their services. Luckily, they'd all guessed too small. But then, logically, journalists don't get around to interviewing people whose guesses are greatly larger than their market.

So if you guess conservatively, and there's still a market in that guess, maybe you're not doing too badly.

A computer can help. If you don't have one, and you're looking for a loan of upwards of \$50,000 (you can't really do anything in video for less, and even this is a pretty paltry

sum), a few thousand for a personal computer is peanuts. Just in planning this expansion, the machine will pay for itself by making market projections, word-processing plans, surveys and presentations—not to mention designing the studio. Bankers tend to look most kindly on impressively computerized plans.

Actually, getting to know your banker is the most important thing you already should have done. If, as in most businesses, you handle all routine activities through one bank, you should have been working with one that is the right size—at which you have had repeated personal contact with decision-makers. You should be sending the bank quarterly statements unasked. The officer you intend to put the squeeze on should be expecting the loan, considering your history of friendly conversations, and should be looking forward to making it.

The problem is most people never bother to get to know their bank until they need the loan. There's even a bit of Grapes of Wrath resentment of banks in a lot of the ex-hippies of the audio industry. This writer, for one, was astounded to find human beings resident at Manufacturers' Hanover and Citibank, of all places, in successfully underwriting video productions. Obviously, I shouldn't have been surprised. There's another excuse which also applied, however: whoever has enough free time to stop in and have a friendly conversation at the bank every few months? Well, this writer learned to make time.

Okay, let's say you don't really know your banker, but you want to expand this year, and venture capital is too expensive and Uncle Moneybags is paying for eighteen grandchildren in college. You're too small to go public and you've already got a mortgage on your house. You are likely planning on putting together the best package you can and then going, hat in hand, from one bank to another. Well, just don't sell yourself short.

Your video expansion is far from the smallest potatoes a bank encounters, and is indeed likely to sound pretty glamorous to the average banker. Run your story through with a financial analyst to make sure you're talking the right language, then do your investors a favor by letting them get involved. ■

Little Things Make A Big Difference

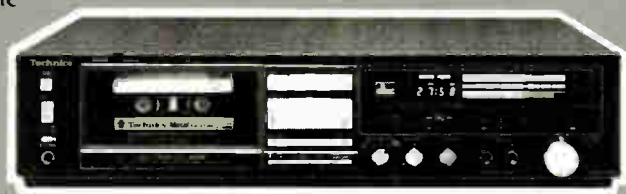
What kind of features does a professional look for in a cassette deck? Take noise reduction for example; what's the professional choice?

When Technics designed the RS-M275X they included Dolby B™ and Dolby C™, and dbx. So the 275X is compatible with cassettes recorded just about anywhere. A number of other little features make life a lot

more pleasant. An electronic counter keeps track of time as well as numbers. Either can be re-set without the other, so you can time each selection without losing your place. A handy new feature called intro search plays the first 10 seconds of each cut, and music select locates the cut you specify. Like professional open reel decks the 275X uses three motors:

two motors for the reels and one direct drive for the capstan. The deck has an accurate meter range from -40 to +18 dB, and features peak holding that make it easy to spot transients. Tape type is selected automatically, and fine bias adjustments can be made manually, and of course all tape motion is micro-processor controlled so there's no chance of jamming. Manufacturer's suggested list: \$600.

If you're tired of the time and hassle involved in making cassette dubs, but aren't ready to buy a cassette duplicator, the RS-M222 may be just the deck for you. It features both normal and double speed dubbing, separate biasing for tapes 1 & 2, and sync start up. The 222 has the same



peak holding as the 275X, plus a mic mixing section that allows you to do simple overdubs. Both sections of the RS-M222 can also be used in playback mode to provide up to an hour-and-a-half of uninterrupted listening. Manufacturer's list is just \$299.

Technics turntables are a modern broadcast standard from the moderately priced SL-1200MK2 to the top of the line SP-10MK3 (pictured). The new Mark III offers an incredible 0.3 sec. breaking time. Speed is accurate to + or - 0.001% and wow and flutter are 0.15% WRMS. Rumble is virtually nonexistent at -92 dB. A separately housed Remote Control and Power Supply unit allows you to control speed in 0.1% steps at all three standard speeds up to plus nine or minus 9.9%. The SP-10MK3 is unequivocally the finest professional turntable in the world.

Technics backs their product line with a two year parts and labor warranty -- that means reliability and accountability. At Recording and Broadcast Supply, we're proud to place Technics products on our line card right along side Otari, Neotek, and over 100 other professional audio lines. Innovative, cost-effective Audio: that's our buying criteria. Technics meets it.

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VIDEO NEWS

by Mia Amato

CABLE AUDIO: TRENDS

The audio-for-video field will, in 1983, find its fate intricately linked with developments in cable television. New cable "products" such as pay-per-view concerts and "pay radio" are trends that bear watching.

In retrospect cable TV's impetus to music-video production is enormous. The first video programs to place attention on high-quality, multi-track sound (excluding public broadcasting) were musicals created for Showtime and Home Box Office. MTV single-handedly saved the careers of budding video-music producers; financially strapped record companies were on the verge of eliminating promo clip

budgets as "frills" when the Warner cable service began to prove it could indeed sell records.

The success of MTV led Warner to begin cablecasting stereo sound for its all-movie service. "Now HBO and Showtime are both looking into stereo transmission," claims one source. "Every major satellite program service will be stereo within eighteen months."

The stereo processors required—a black box unit with a miniature FM transmitter—cost the cable system less than \$3,000. In the home, the signal passes through a wire connecting the consumer's TV with his FM receiver: a simple installation that nets the cable company an extra \$2 - \$3 per month per subscriber.

The processors are made by two firms, *Wegener Communications* (Norcross, GA) and *Leaming Industries* (Costa Mesa, CA). The two companies also make stereo synthesizers which cable systems are buying to make even their monaural movie channels available in simulated two-channel sound.

So cable systems around the country have begun to offer simulated stereo on all their movie services and all-sports channels, too. "The viewer acceptance of enhanced audio is terrific," comments a spokesman for a system in suburban Los Angeles, "With the sports programs, they're getting the overtones, the crowd noise, the excitement they'd never get with regular TV sound. And on the movies they get all the sound effects. There is definitely a demand on the part of the subscriber." Stereo TV—delivered by wire—is moving yet another step closer in the U.S.

WHAT'S PAY RADIO?

The concept of "pay radio" is similar to that of pay television. A signal is beamed by satellite to cable systems, which send it out by wire in a scrambled form to subscribers' homes. Cable viewers who decide they want the service pay an additional fee per month for a "decoder" which unscrambles the signal. Again, the audio is hooked up to the customer's existing stereo components.

Pay radio made a big splash at the most recent cable convention in Anaheim, CA. *Southern Satellite Systems* announced the launch of six audio-only pay services, which include country and western and "oldies" formats, a foreign language service, and a "comedy channel." Wegener Communications, which developed the processor used for MTV, demonstrated a pay-radio decoder which will be manufactured by *Pioneer*.

HANDWRITING ON THE WALL DEPT.

MTV has been showing up in hundreds of *Arbitron* radio diaries, according to a representative from the ratings service. Clearly, some MTV viewers perceive the music channel as

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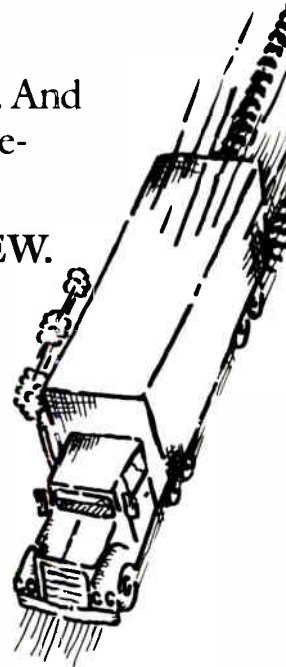
The only people to offer Ampex 1/2-inch 2-track in the Bay Area, plus 24-track capabilities with digital mixing and mastering. And one of the few remote recording specialists whose people and credentials are as impressive as their equipment.

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radio, as they are inking in MTV as station call-letters in diaries. Listening to the television instead of watching the radio? You're not alone, according to Arbitron; the Nielson radio ratings service has so far no comment.

ONE-INCH: A TRUE PORTABLE

The higher production values of the one-inch format are now truly portable with the introduction of a fifteen-pound, Type C VTR from **Ampex**. Shoulder-slung, it looks like a metal tote bag and is one-third the weight of earlier one-inch "portables" whose only virtue was that they could be wheeled from place to place.

The name of this fine little machine is the Ampex Nagra VPR-5.

As its middle name would indicate, care has been taken on the audio recording of this second-generation VTR. The two audio channels can be switched to stereo recording or single-channel. There's a separate SMPTE time code channel. Separate audio playback (via "confidence heads") allows you to check sound in the field. VU metering is an LCD display.

The VPR-5 takes 20-minute reels and should become available by late spring; it's being manufactured in Switzerland through an agreement with **Kudelski SA**. Yes, it will be expensive, but odds are you'll be renting this VTR on a per-shoot basis.

Sony will also be bringing out a smaller Type C VTR this spring. **Bosch** is expected to bow a one-inch

Type B of comparable size as well, for the delight of those studios in Southern California and Europe who are using Type B.

SHORT TAKES

A promo clip for **Billy Squier** got a new lease on life after being "Homerized" for Capitol Records by **Homer & Associates**, a special effects house based in L.A. Homer's **Peter Conn** says an existing film clip of Squier singing "Everybody Wants You" was re-edited with new footage of the album cover graphic which had been designed by Andy Warhol. The new clip features the idiosyncratic stepped-frame special effects from the Homer computer plus image processing with an Ampex ADO.

Linda Carhart, lately with Chrysalis' video division, has opened her own company which will market video programs to the cable, pay and home video crowd. She is handling some **Chrysalis** products (i.e. **Jethro Tull's 'Slipstream'** video) and is looking to acquire rights to other programs an hour or longer in length. Her new address is in Reseda, CA.

E.J. Stewart (Philadelphia) has added four new RCA TK-47 cameras to its mobile and studio services. **Versatile Video**, of Sunnyvale, CA, has launched a video demo "package deal" which includes the use of studio, three cameras (one on a crane) crew, and Quantel special effects for a two-hour lip-sync session. In Washington, the Recording Industry Association of America (RIAA) filed an amicus curiae brief on the on-going "Betamax Case," on behalf of **Walt Disney Studios**. Disney is a plaintiff in the lawsuit, now before the Supreme Court, following a decision by a lower Court holding that off-air taping is illegal. The RIAA's statement, which charges that home taping of TV programs is a copyright infringement, came less than a week after Walt Disney Studios joined the RIAA trade group.

20th Century Fox has captured the worldwide television and video rights to the **Who's** farewell concert tour. Fans can expect both a disk and cassette from the CBS/Fox Video label. **Paramount** slashed the price of **Star Trek II** to \$39.95 in an attempt to encourage sales, rather than rentals, which profit the dealer but not the distributor. **Madison Square Garden Network**, which packages the Garden's sports for cable via USA Network, will be uplinking concerts this year as well. The arena is already outfitted for videotaping; no acts or dates have been named yet, but MSG management states the events will probably be delivered to cable and STV as pay-per-view. Executive in charge of the concert telecasts is **Peter Rudge**, former touring manager for the Rolling Stones. ■

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SERIES

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David Harrison relates the complete story of how the new Series 4 consoles came to be

All of the consoles Harrison has traditionally offered come from a family of consoles that share common design elements. Their amplifier designs, interconnect methods, structural systems, and other mutual elements make the differences between our traditional consoles only skin-deep. They all share a common technology of design and experience.

Two years ago we at Harrison saw the need for more cost-effective consoles to meet the needs of our customers in a changing economic climate.

Others were beginning to offer less expensive consoles, but their cost savings were often brought about by design and construction practices that produced consoles with marginal operating characteristics and questionable long-term reliability. This rather common approach to low-cost consoles has usually been accompanied, even until today, by an outdated and inefficient distribution method—a method of distribution based on a network of dealers, each making a profit of 30 to 35 percent on a typical console sale.

Harrison has chosen a **better way**. Two years ago we made a cold, hard business decision. Regardless of the difficulty created by the task we set for ourselves, we decided we would only be involved in the

low-cost console business if we could continue to offer consoles with the qualities we had built our business upon: features, performance, and long-term reliability.

The first step of our "better way" was to carefully trim factory profits and to reduce the profits of our dealers to more realistic levels.

The second step, taken one year ago, was to radically change our method of distribution within the United States. Rather than continue under the old dealer-network mode, we began offering our consoles through Harrison-employed salespeople and selected organizations acting as factory representatives. Reasonable commissions paid through this method of representation are much lower than the traditional dealer profits.

The third step was begun almost one year ago. Our console design technology was not technically dated or inadequate, but it was certainly economically inadequate for a market that was making purchase decisions based on purchase price alone.

I knew what I had to do. I turned over all my normal business duties to other well-qualified associates. I then went back into the lab and, for the first time in seven years, began to design a console **from the ground up**.

The result of that work is our Series 4 consoles. Creative application of today's best technologies has allowed us to actually construct a superior console at a lower price than ever before.

It would have been easier for us to simply lower our standards in order to lower our prices. Others have done that. **But it is with much difficulty that we offer you a better way.**

Others have offered low prices, but now, **you get the price and you get a Harrison.**

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There's a lot of musical moments that have been captured on that machine ... some of which have been

directly transferred to the final multitrack masters. ... Elliot Randall, Doobie Brothers, on and on. The Steely Dan Pretzel Logic album was mastered on an Otari 2-Track. And, that's obviously a statement in itself. ... how I feel about the quality of the sound."

Jeff Baxter's always been into instruments that musicians can afford. It's obvious that he's also been heavily involved at the leading-edge of recording technology.

Besides telling you his feelings about Otari tape machines, there's just one other tip Jeff would like to leave you with:

"Try anything and everything and always roll tape."

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