

MARCH 1983
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THE RECORDING INDUSTRY MAGAZINE

Mix

Interview: Tom Petty

**Listings:
Southeast Studios**
**Special Report:
Echo, Reverb and Delay**

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Mix

THE RECORDING INDUSTRY MAGAZINE



Cover:
Ardent, in Memphis, Tennessee, offers two 24 track studios, disk mastering and complete video production.

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World Radio History

feedback

Feedback

Dear Mix,

This is in response to Art Shifrin's dispute (*Feedback*, Jan. '83) of certain statements I made in an earlier edition of *Feedback*.

Mr. Shifrin need not give me a lesson with respect to the origin of the "His Master's Voice" trademark, as I am far more familiar with it than most anyone in the world today. I did not say that my grandfather produced the painting. I said that he created the trademark. I enclose a copy of the original registration of July 10, 1900. According to authority Leonard Petts and Miss Enid Barraud (in her book, *Barraud: Story of a Family*) her great uncle, Francis Barraud, who painted the portrait of his late brother's dog, Nipper, listening to an Edison-Bell cylinder machine, not only did Francis never paint Nipper while the dog was actually listening to a phonograph... because the dog was never observed doing so... but Francis created the slogan out of thin air. The pose of the dog with his ear cocked was Nipper's traditional stance when something interested him, and Francis painted Nipper in this pose strictly from memory, as he himself stated.

Shifrin's contention that Nipper was painted listening to his dead master's voice while perched with a phonograph on the man's coffin is a totally unproven myth that's been amusing people for decades. I enclose a copy of Phillip Barraud's photo of his brother Francis' first painting of Nipper, depicting the phonograph instead of today's gramophone. (How could Phillip have taken the picture of the painting if he were in "the coffin"?) Phillip was a professional photographer who took innumerable shots of Nipper, who came to live with him when the dog's first master, Mark Barraud, died at an early age. Francis later ordered all photos of Nipper destroyed, lest someone accuse him of copying a photo in order to create his painting, which now hangs in EMI's boardroom. I have stood to the left of the painting where it is easy to see the Edison phonograph under the paint of the Berliner gramophone. We owe a great debt to Frank Andrews for discovering in the British copyright office Phillip's photo of the painting prior to Francis' overpainting work. By the way, there is no evidence that Mark, Phillip or Francis ever made any recordings.

Shifrin further wonders what distortions are inherent in the Edison hill-and-dale recordings I mentioned. Apparently Mr. Shifrin has once again jumped to conclusions and further appears to have as little knowledge of physics as Mr. Edison evinced. First of all, I was referring not to Shifrin's "Diamond Discs" (the correct spelling, by the way, is *disks*) but to *cylinders* of Mr. Edison. Certainly there was less of a problem with the disks because they are superior to cylinders,

which was the point my grandfather demonstrated. But in both media the problem is the same. In order to, say, double the loudness of a musical passage (when the music requires it) in vertical recording you cannot just double the pressure because to get double the depth (to double the loudness) you must more than double the cutting power. The power required to double the depth of the groove increases geometrically, not arithmetically. Nobody's acoustic cutters could ever do this, not Edison's nor (even) Emile Berliner's (and fortunately the latter solved the problem by using lateral rather than vertical modulation).

Today's stereo disk cutters also have the problem because they incorporate both vertical and lateral cut. But things are not the same as in the Edison situation. First of all, today's cutters are driven by amplifiers of incredibly high wattage, capable of exerting all the force necessary without any strain. Secondly, the cut is vertical-lateral, not pure vertical. Third, the heated stylus softens the disk lacquer and also reduces noise (which is a form of distortion). Finally, the lacquer used today, along with the cutters of today, offers a far more suitable combination than did the materials and cutters of old.

In closing, I wonder if I mentioned in my initial *Feedback* letter that not only did Edison create the word *phonograph* by removing the letters *out* from Leon Scott's word, phonauto-graph, but Edison wasn't even the first to use the word he supposedly coined. In reality, according to Professor Ray Wile of Queens College, a "phonograph" was a stenographic writing by someone using the "phonography" system created years earlier by a man who then taught the system to secretaries. He actually complained to Edison that the latter was using his coined word, but apparently out of respect for the "wizard of Menlo Park" decided not to take action for infringement.

Sincerely,
Oliver Berliner
Audio International, Inc.
Beverly Hills, CA

Mr. Shifrin responds:

Mr. Berliner's response to my letter contains an intriguing tinge of vitriol. He pedantically and sophomorically contends that I misspelled "Diamond Discs," yet that is how the manufacturer spelled the phrase. As proof, I submit the accompanying photostat made of a typical Edison jacket.

My comments about the distortions to which Mr. Berliner referred were clearly subjective in that I stated that typical vertical cut cylinders and discs of that era *sounded* better (mean-

ing as perceived through the *ear*, not theoretical, cerebral postulation) than their lateral cut counterparts. I did not dispute the *principle* which he espoused. My hypothesis is that they *sound* better because the phenomenon to which he referred is that of an inadvertent compression: a "distortion" analogous to signal modifications today deliberately introduced into some of the finest contemporary recordings. That compression I think partially negated some of the horrendous harmonic resonances caused by most recording horns, including those used by Grandpa Emil. Notwithstanding what Oliver Berliner thinks, a typical Edison or "Indestructible" (another brand) celluloid cylinder *sounds* better than their shellac, lateral cut counterparts. The surface noise spectrum is of higher, thus less obnoxious frequencies. The sound is 'tighter' and has more 'punch' and of course, the equalization does not change as the recording progresses from beginning to end. If Mr. Berliner cannot hear this, then perhaps he does not know how to optimally play such records. Also, I will not dignify the personal insult he included in that paragraph by responding to it.

I neither inferred nor deduced that Mr. Berliner suggested that his ancestor painted the opus. He stated that his forebearer "created" the trademark. That statement infers that he conceptualized, titled, implemented and registered it, all of which he clearly did not do.

Mr. Berliner is certainly correct that I misrepresented an unproven allegation as fact with regard to the conceptualization of the painting. I had first, rather recently learned about this theory from an article "His Master's Casket" in Volume VI, #7 of *Antique Phonograph Monthly*. It presented a convincing argument for that theory, which the author, Robert Feinstein did not state was a fact I had simply not fully remembered the article's contents and am pleased to have been corrected.

Sincerely,
Art Shifrin
Douglaston, NY

P.S.: My 1979 edition of *The Random House Dictionary of the English Language* on page 409 conveys "disc" as one of two CORRECT spellings.

Correction

In our February issue we incorrectly identified the photographer in the Suzanne Ciani interview as Howard Sherman. Kerri Hamilton should have received those credits.

CURRENT

SPARS Solidifies Position on Education, Digital

The Board of Governors of SPARS, the Society of Professional Audio Recording Studios, at its January meeting at Criteria Recording Studios, in Miami, resolved to develop industry educational standards for professional recording engineers.

Proposals before the Board included: the feasibility of SPARS "Standard Testing for Entry Level Positions in the Audio Field," establishing what could become the first National Scholastic Aptitude Test for audio engineers; the develop-

ment of a three year "Apprenticeship Program" that could serve as a guideline or model for schools and universities offering music engineering programs; the establishment of Advisory Member and manufacturer's grant supported scholarships; the application of video, microcomputers, interactive videodisk and hands-on seminars in the educational process; and a study of the "Wage, Career and Educational Path of Recording Studio Employees in Los Angeles."

The Board of Governors appointed

members to a newly formed SPARS Educational Advisory Board, which will review the proposals and develop a plan of action to be presented to the Board in late April.

The Board of Governors is also exploring a proposed code and labeling system for digital audio recordings. The code would identify whether a recording was recorded, mixed and/or mastered analog or digital, or in combination. For example, "A-D-D" would mean recorded analog and mixed and mastered digitally.

The coding system is being designed to protect the consumer from confusing aspects of the new format. Upon completion of final recommendations, SPARS will be contacting the record and tape manufacturers regarding implementation of the new coding system.

—Lou CasaBianca

notes

Everything Audio, the Los Angeles based equipment supplier, has announced the opening of an Orange County field office, headed by **Paul Svenson**. The new office phone number is (714) 870-6632. . . . **Tim Mungovan**, formerly with Everything Audio, will now be heading the U.S. office for **AMEK Systems and Controls**, of Salford, England. . . . The restructuring of **3M's Magnetic Audio/Video Products Division**, begun earlier this year, has been completed with the appointment of a business development director, **Richard E. Hanson**; a sales director, **Joseph L. Leon**; and **Donald E. Rushin**, international director. . . . **George Sheehan** has been promoted to eastern zone manager, **Sony Communications Products Company**, according to **Koichi Tsunoda**, president and chief executive officer. Also at Sony, **Robert Mueller**, sales VP has named **Anthony E. Schicchi** as northeast regional manager for Sony Video Communications, and **John McPherson** as national marketing manager, Video Communications for SCPC. . . . **BASF Systems Corporation** has named **Terence D. O'Kelly** product manager for the company's line of flexible magnetic recording media. . . . The **Muscle Shoals Music Association** board of directors appointed **Steve Baccus** as legal counsel and elected **Terry Skinner** as a new engineer representative to the board at their January meeting. . . . Entry kits are now available for the second annual **International Radio Festival of New York**, which will take place May 18-20, 1983 in New York City. Categories in the Festival's awards competition are for radio advertising, programming and promotion produced or aired between June, 1982 and March 25, 1983, which is the deadline for entries in the second annual competition. For information contact

Michael Gallagher, I.R.F.N.Y., 251 West 57th St., New York City, 10019. . . . **Ampex Corporation** has reached agreements with Wheelabrator Financial Corporation and Commercial Funding Inc. to provide financing alternatives to its U.S. customers. The program provides customers with the opportunity to lease or purchase Ampex audio or video recorders through one of four financing alternatives: tax-oriented lease, lease purchase, conditional sale, or operating lease. . . . **International Music Corporation** has assumed all operations of **Studiomaster U.S.A.** The marketing, sales and warehousing functions for **Studiomaster** will be moved from Anaheim, CA, to IMC's home office in Fort Worth, TX. The Anaheim facility will remain intact and will be used as a west coast service center. Fort Worth will also be the service facility for the south, mid-west and eastern regions. . . . The **BTX Corporation** has named **Michael L. Sipsey** Vice President of Marketing, a new position in the company. . . . **Jim Van Way**, President of **VJ Electronics, Inc.**, Torrance, CA, has announced that **Gary L. Ford** has joined their marketing staff. . . . **Susan Harger** has been appointed Creative Services Director for **Audio Innovators** in Pittsburgh, PA. . . . **John Hoge** has been appointed Manager of Transducer Research and Development at **IBL Inc.** . . . **Wilson Audio Sales, Inc.** has moved to 210 Old Hickory Blvd. #53, Nashville, TN 37221 (615) 356-0372. . . . **Crown International** has recently started Service Plus, an extended warranty program which, for a nominal fee, extends the Crown warranty to six years. . . . The 11th annual **International Winter Consumer Electronics Show**, which concluded its four-day run in Las Vegas on January 9, attracted a record 78,126 attendees.

73RD AES Convention at Eindhoven

The 73rd Audio Engineering Society Convention will be held March 15 to 18, 1983 in the city of Eindhoven, in the Netherlands. In addition to the presentation of over fifty technical papers, the convention will have a special focus on the compact disk technology. An audiovisual briefing on this new format will be repeated several times during the convention.

An exhibition of over 125 manufacturers and new products will be held in the large convention center and adjoining demonstration rooms will provide a variety of sight and sound opportunities for over 2,000 expected attendees.

Beta Hi-Fi Debuts at CES

Beta Hi-Fi, a new method of recording stereo sound on video cassettes, was introduced at the recent Winter Consumer Electronics Show in Las Vegas, Nevada. The new format, to be available by mid-1983, records stereo sound utilizing the machine's video heads. The standard fixed audio head is retained to insure compatibility with existing Beta VCRs and tapes.

Beta Hi-Fi is said to have an 80 dB dynamic range, with a sound quality surpassing that of standard LPs, cassettes, and broadcast FM. Major video distributors planning to use the new format include Paramount, Warner, CBS and MGM.

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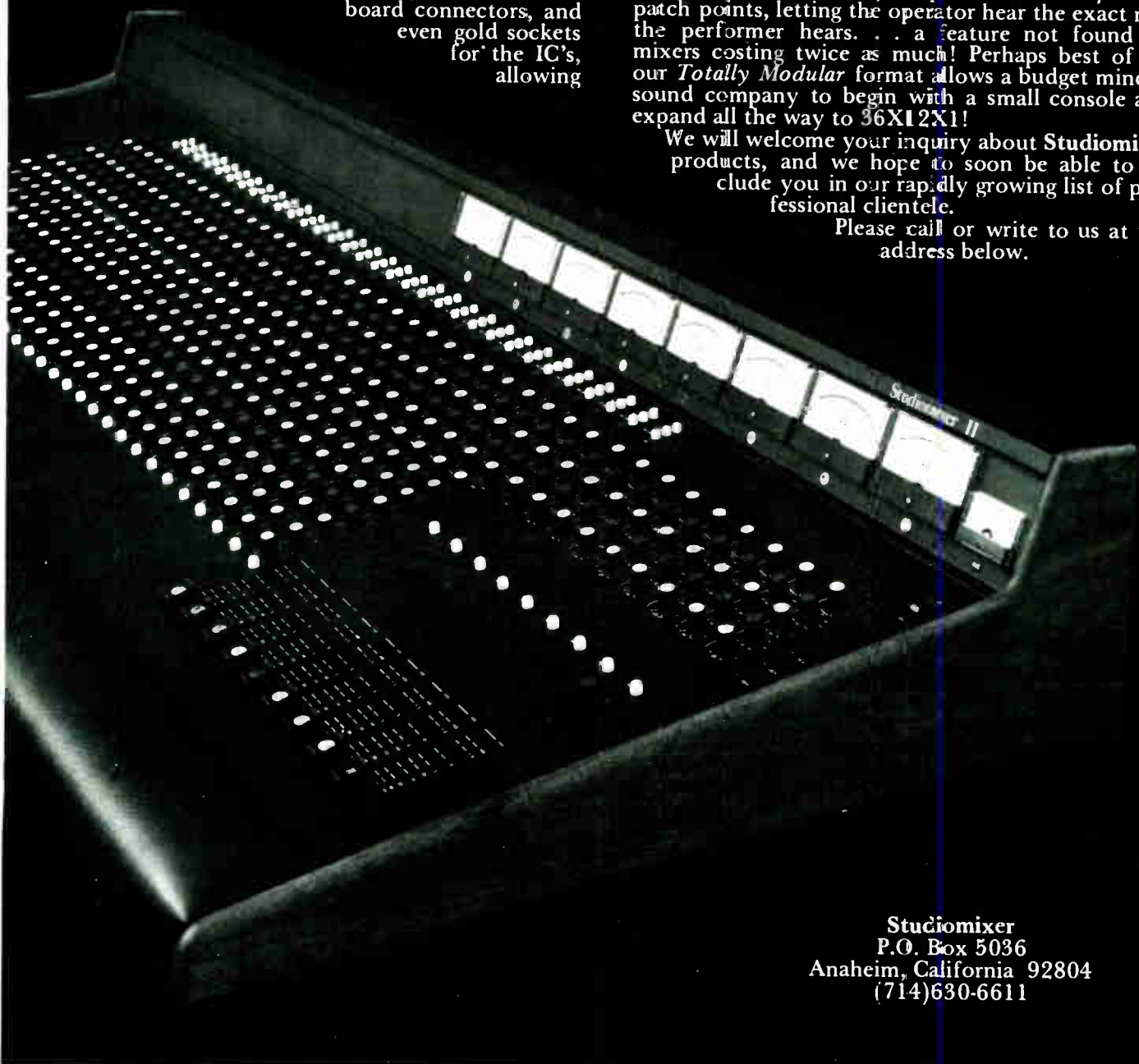
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NORTHEAST

At *Blank Tapes Recording Studios*, New York City, *Glenn O'Brien* mixing *New York Beat Soundtrack* for Warner Bros. Soundtrack includes James White, Walter Steding, and Kid Creole. *Joe Arlotta* and *Bob Blank* engineering.

... At *Greene Street Recording*, New York City, *Ray Manzarek* is finishing overdubs for his new A & M LP. *Philip Glass* and *Kurt Munkasci* are producing with conductor *Michael Reisman*, *Joe Arnold* assisting. ... At *Electric Lady Studios* in New York City, activity includes: *Roy Buchanan* for Electric Lady Productions, engineered by *Howard Massey* and assisted by *Michele Sauvage*; and *The Lost Tropics* produced by *Roma Baran* and engineered by *Lee Ann Unger* for MCA Records. ... At *Evergreen Recording Studios*, Pittsburgh, PA, producer *Michael J. Hurzon* is completing the first album by jazz fusion keyboard player *Max Leake*. Engineering by *Harry Coleman* and *Michael J. Hurzon*.

... At *Mountain Sound Studio* in Stroudsburg, PA, producer and drummer *Bill Goodwin* is mixing his second *Solar Energy* LP for Omni Sound Jazz with engineer *Chris Fichera*. ... At *Aura Sonic Ltd.*, Flushing, NY, *Steven Remote* is recording the Philibased dance band *Quest* at Quadrasonic, NYC, and will be mixing the date at Unique, NYC. Remote is engineering, mixing and producing the session with *Ray Monahan* and *Tom Stokes* for Fatal Charm Records. ... At *Sheffield Recordings*, Phoenix, MD, *Tony Sciuto* is currently in the studio laying down some new tracks for an upcoming album. *John Palumbo* is producing, *Bill Mueller* engineering.

... At *Rose Hill Studios*, Syracuse, NY, Todd Hobin Band keyboardist *Doug Moncrief* has completed final mixes on the new *Tickets* EP, and *Kentucky* is now recording with Moncrief again producing and *Cliff Kent* engineering. ... At *Kingdom Sound Studios*, Syosset, Long Island, NY, *Aldo Nova* is working on his new album for Portrait Records. *Clay Hutchinson* and *Ron Cote* engineering. ... At *Don Casale Recording*, Westbury, Long Island, NY, recent activity includes a *Buffalo T. Jones* album, and sessions with *Gary U.S. Bonds*, all projects engineered by *Don Casale*. ... At *Normandy Sound*, Warren, RI, engineer *Phil Greene* is mixing a live album of *Billy Cobham's* group, *Glass Menagerie*, for Elektra/Musician Records. The album, recorded at the 82 Montreux Jazz Festival features Billy Cobham, Dean Brown, Gil Goldstein and Tim Landers. The live taping was done in Switzerland by Phil Greene and assistant *Tom Soares*.

SOUTHWEST

At *Rivendell Recorders*, Pasadena, TX, music veteran *Ray Charles* was in producing vocals for artist *Sarah Jordan Powell's* current album project. Jazz pianist *Bobby Henschen*, with producer *Fletch Wiley*, have been recording direct to digital for his premier release. ... Activity at *Lone Star Recording Studios* in Austin, TX, includes *Ed Guinn* writing and performing the soundtrack to *Mongrel*, a psycho-thriller feature film recorded on the Synclavier II keyboard computer. ... *Huddleston's Recording Studio* in Garland, TX, announced the completion of an album for *Jim Newton*, entitled "Write Me A Song"—*Paul Hill* engineer/producer. ... *Randy Meisner*, formerly with the Eagles, booked the *Omega Audio* 24 track remote unit to cut a live date at Nick's Uptown in Dallas. The project is being mixed for early spring release at Omega's audio/video studio at Dallas Love Field. Engineering the project is *Buford Jones*. Assisting is *Ron Lagerloff*. Meisner is producing along with *Robert Joyce*.

NORTH CENTRAL

Activity at *Studio A*, Dearborn Heights, MI, includes *Miro Anderson* producing a single on *Tush*, an all girl rock and roll band. Country artist *Del York* continues work on his first album release. *Duane Smith* finishing a single. *Eric Morgeson* engineering. ... Recent recording activity at *Creative Sound Recording Studios* in Brazil, IN, include: *Bobby Helms*, *Loretta Pierce*, and *Kevin McCrea*. All laying tracks for each of their forthcoming releases on Natasha Dawn Records. Engineer *Steve Brown*; producer *Joe Anderson*.

NORTHWEST

The *Bodacious Audio* (Sausalito, CA) mobile truck rolled into the *Cine Rent West* soundstage to provide the audio production unit for Radio Video/Off the Top. *Scott Ross* mixed the live production with *Bill Raffetto*, *Herb Pallant*, *Bill Ashlee*, and *Rob Modeste* assisting. ... Violin virtuoso *Daniel Kobialka* is recording his latest album with the *Kronos Quartet* at *Starlight Sound Studio* in Richmond, CA, for Lisem Rec-

ords. *Andrew Kulberg* producing and *Norman Kerner* engineering. *Tim Song Jones* is assisting on these sessions. ... Recent projects at *Russian Hill Recording*, San Francisco, CA, include: scoring for "Eddie Macon's Run," a Universal release starring Kirk Douglas and John Schneider, composed and scored by *Ed Bogas* and *Norton Buffalo*. *Jack Leahy* engineering, *Marnie Moore* assisting. ... San Francisco's *One Pass Video*, known primarily for TV industry work, is entering the business of rock video. One Pass is in pre-production on two new videos to be used as showpieces on MTV and NightFlight. The videos will feature *Rad Solar* and electronic music duo *Mark Ellinger-Gregory Jones*. The music tracks are being recorded at *T&B Labs*, with chief engineer *Randy Beaubeaux* at the controls. ... Action at *The Automatt*, San Francisco, CA, includes *The Tubes* doing overdubs on a new Capitol release with *David Foster* producing and *Dennis Kirk* engineering. ... Recent sessions at *Triad Studios*, Redmond, WA, include: an LP project for gospel group *Follower* with *Dan Foster* producing, and the Portland group *Northbound* recording an album for Word Records. ... At *Mobius Music Recording* in San Francisco, CA, *Esmerelda* is recording a single with producer *Oliver DiCicco*. ... Recent recording activity at *Triad Recording Studio*, Eugene, OR, includes *Rob McIntosh* and *Laurie Brown's* self-produced album "A Touch of Sanity" engineered by *Don Ross*. ... At *Tres Virgos Studios*, San Rafael, CA, *John Erokkan* (formerly of Country Porn) was laying down tracks with guitarist Terry Nichols, Frank Rankus on bass and *Dennis Erokkan* (publisher of Bam Magazine) producing. *Robin Yeager* was at the console with second *Robert Missbach*. ... *Arial Records*, a new label that is an off-shoot of Moby Dick Records, recorded their first LP at *Hyde Street Studios*, San Francisco, CA. *Mark Wallner* engineered the sessions.

SOUTHERN CALIFORNIA

At *Paramount Recording Studios* in Los Angeles, *Jim Cregan*, *Kevin Savigar* and *Robin Le Measurier* from Rod Stewart's band are in with *Lee Kiefer* engineering and *John Pooley* assisting. ... At *Group IV Recording*, Hollywood, engineer *Dennis Sands* is behind the board for producer *Norman Granz*, mixing *Michele Legrand* tracks for a new Pablo Records LP. ... *Fleetwood Mac* were at *The Village Recorder*, West Los Angeles, recently, doing overdubs and mixing a project for HBO, with *Ken Callait* producing; *Gary Lubow* engineering and *Robin Laine* assisting. ... At *Mon-*

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World Radio History

tery Sound Studio in Glendale. *Finis Henderson* is recording a new Motown album, *Al McKay* producing with *Humberto Gatica* and *Phil Brown* engineering. . . . At *Salty Dog Recording*, in Van Nuys, *Wilton Fedler*, sax player of the Crusaders, is working on his new solo album for MCA Records. Wilton is producing and *Galen Senogles* is at the board. . . . Happenings at *Britannia Studios*, Hollywood, include a *Porter Wagoner* debut album for Viva-Warner Records, with *Snuff Garrett* and *Steve Dorff* producing; *Greg Venable* and *Russ Bracher* engineering.

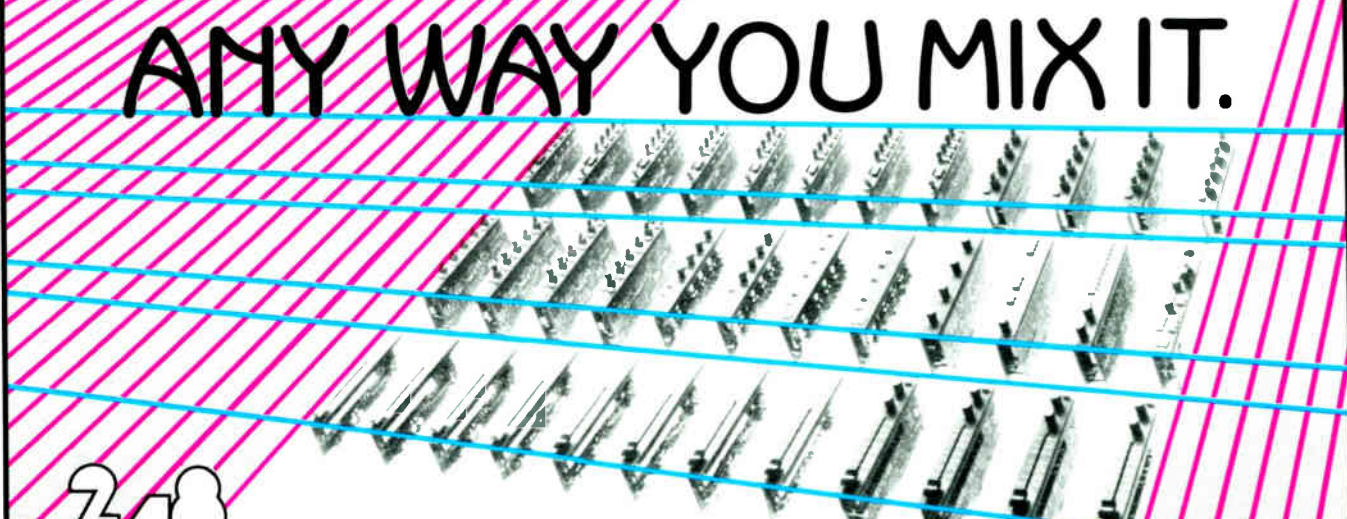
studio news

Sound Interchange, Ltd., of Toronto, Canada, is presently remodeling their Studio 1 facility. *Chips Davis* of *LEDE Designs*, Las Vegas, NV, has been retained to design and supervise the construction of an LEDE (live-end, dead-end) control room, along with an extensive renovation of the studio. *Neil Muncy* of *Neil Muncy Associates*, Rockville, MD, has been commissioned to design and supervise the technical aspects of the installation. An MCI JH532C automated console will be installed in the completed control room, along with a newly developed quintamplified, phase-coherent, 4-way monitor loudspeaker system designed by *Claude Forter*, of *State of the Art Elektronik*, Ottawa, Canada. The facility will

be operational by March 1, 1983. *Professional Sounds, Inc.* is moving to a significantly larger facility in Merrifield, VA. "We'd grown so much," says installations manager *Parker Chapman* "that we were practically bursting out of the walls of the old building." Professional Sounds' new address is: 2737 Dorr Ave., Merrifield, Fairfax, VA 22031. Phone (703) 698-8888. . . . *Real to Reel Studios* in Dallas luckily sustained only smoke damage when a fire in an adjacent business threatened their facility. However, after a thorough inspection and cleaning of their recorders by MCI, and new carpets and paint, they are back on line. . . . *Tres Virgos Studios*, San Rafael, CA, has started construction of an 8 track media, production and synthesizer studio. The new room will feature both off and on-line capacity with the Tres Virgos LEDE™ control room. The new production facility will be equipped with a Sound Workshop 2012 and Otari decks along with a full production effects rack, polyphonic and drum synthesizers. . . . *Scharff Communications, Inc.*, the New York City audio rental and mobile audio company has now added the Sony PCM 1600 digital encoder/decoder to their rental inventory. Scharff Communications was chosen as the sole rental agent for the PCM 1600 by *Frankford Wayne Mastering Labs*, owners of the unit, who use it in their mastering process. The 1600 has recently been updated to 1610 specifications. . . . *Louie Dituri*, in conjunction with *Tracy Music*, Tracy, CA, has opened an 8 track recording studio. The east side of the store has been converted into a studio utilizing

Tascam 38, 32 and 124 gear. The studio's intention is to meet local musicians' needs by offering quality taping at reasonable rates. . . . Country music star *Tom T. Hall* has named *Glennise K. Perkins* manager of his 24 track *Toy Box Studio* in Brentwood TN. Glennise, a native of Surrey, England, has worked with Toy Box for the past four years, first as bookkeeper and later as assistant manager of Tom T. Hall Enterprises. . . . *Southern Railway System* (subsidiary of Norfolk Southern Corporation) has just installed a new Convergence ECS-104S List Management video editing system in their Audiovisual Media Center. The Convergence ECS-104, DD-100 Dual Disk Drive, TCR-100 Time Code Reader, and SWI-110 Switcher interface will be used with Sony 5850 and BVH-1100 VTRs, and an LSI-1201 switcher. Southern Railway System's Audiovisual Media Center is located at the centralized technical training facility in McDonough, GA. They produce training and communications materials for the entire 13-state railroad system. . . . There are two new additions at *Patchwork/Patchbay*, in San Rafael, CA. First is the opening of their new Studio B, a TFAC equipped room featuring 16 channel mixing, and 8, 4, and 2 track recording. The room is designed for editing, vocal overs, and songwriters. Second is their new, all Jensen, mike input bay/splitter. The unit includes a 32 input remote snake with four 16 in subs, for a total of 64 mike inputs. This input is then split into three 32 channel outputs, all patched with multi-pin connectors and 450 feet of multi-pair cable.

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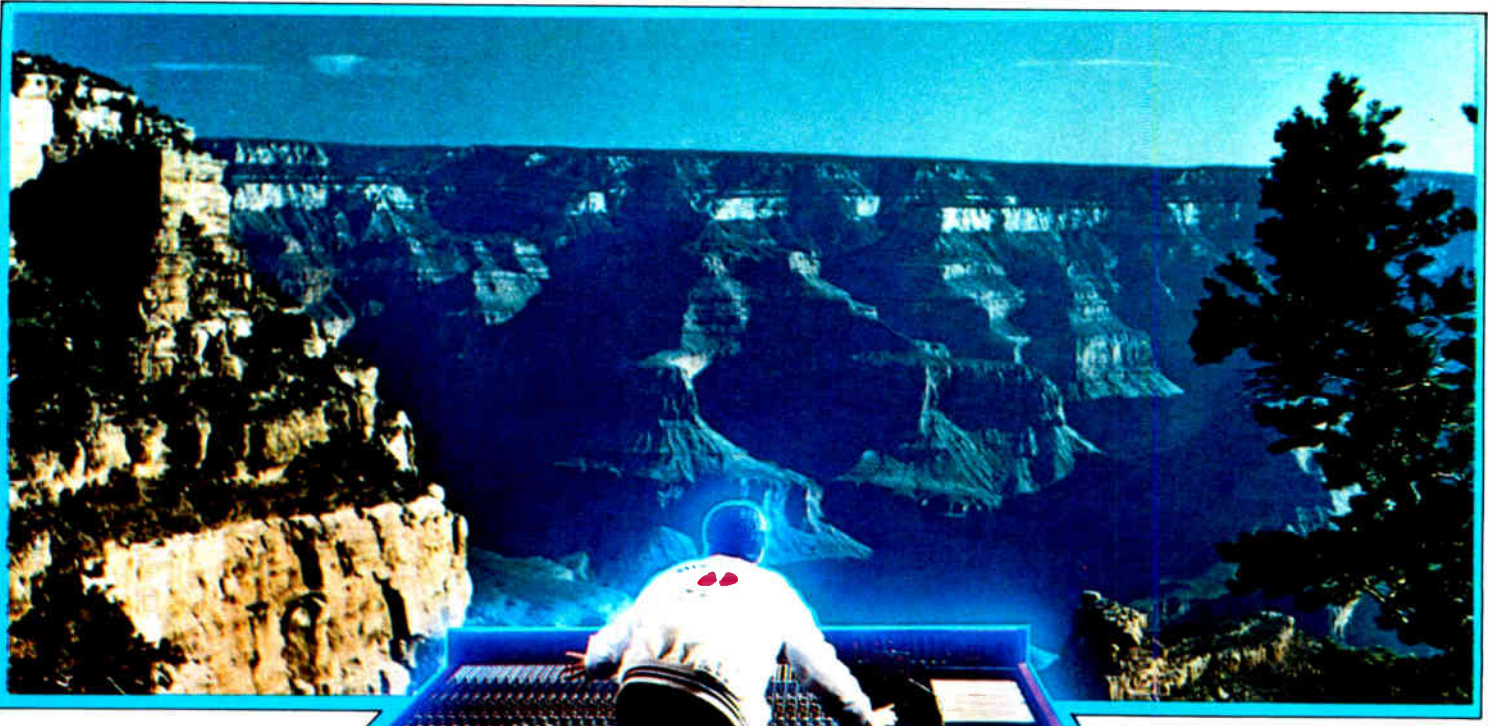


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Part One

by **Ken Pohlmann**
with research by
Greg Taylor

I've always admired the recording industry's grim determination to spend hundreds of thousands of dollars on acoustic treatment to eradicate any trace of echo and reverberation in their studios and then spend tens of thousands of dollars to artificially put them back in the control room; that kind of reasoning always appealed to me. Similarly, they persist in using close-miking techniques to get a dry sound and then waste valuable mix-down time trying to put some wetness

back. As if that weren't bad enough, an audio researcher recently proposed using pickups on all vibrating instruments (vocals hopefully excluded) to absolutely eliminate any ambient information whatsoever and instead use specially-designated acoustic microphones for that purpose.

Although such seemingly self-conflicting techniques might appear to be a little insane, there is sound method in the madness. The elimination of ambience in the recorded tracks, and its artificial restoration in the mix-down process provides unique flexibility in its precise control. Just as a scientist must carefully isolate the elements of his experiment, an engineer is given exacting opportunity to control the spatiality, as well as other timbral parameters of the elements of his mix when reverberation and delay can be carefully manipulated. The added cost of such opportunity is also economically justifiable. Firstly, it is prohibitively expensive to construct, or even rent, rooms with the good acoustics required for a fine recording. For example, in the case of classical music, there are a great number of concert halls and audi-

toriums, but only a few of them are acoustically satisfactory for making recordings. Whether it be problems with interior reverberation properties, or sound transmission problems from without, the fact is that good recording space is a rare commodity. Secondly, many rooms with many varied acoustic properties would be needed for the many types of popular recorded music. It seems obvious that it would not be economically feasible to construct such recording spaces with the required ambient properties.

This was quickly discovered in the early part of this century when the business of recorded music was finding its economic footing. The pragmatic solution was the construction of acoustically dry studios, a trick which circumvented the reverberation problem, but created the need for artificial reverberation, a need soon met by inventors and manufacturers. The creation of studios with low reverberation time encouraged the use of multi-track tape recorders which could take advantage of the opportunity to obtain tracks with good acoustic independence, even when recording live. Eventually, the overdub technique refined this method to yield total independence of tracks (give or take a little crosstalk). Now studios are designed specifically for multi-track recording, and paradoxically, great sums are spent to carefully control the short reverberation times. And in the control room, the artificial reverberation devices have incorporated great expertise in their design, to yield natural sounding ambience.

The quest for clean tracks by recording engineers and producers has led recording technique toward unprecedented extremes in acoustic design and microphone usage and conversely dictated the evolution of very sophisticated devices to artificially restore a semblance of reality to the mixed music. And, as one might expect, the availability of such advanced devices has encouraged innovations in the creative uses of reverberation and delay, and a wholly new perspective of the use of spatiality effects and other psychoacoustic cues in recorded music. In this article, I would like to present a short theoretical discussion of the nature of reverberation and delay, and specifically explain how the interrelationship between these two phenomena

Figure One: Distribution of reflections as a function of time

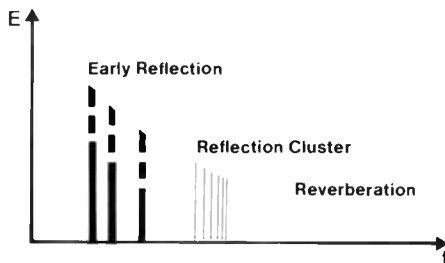
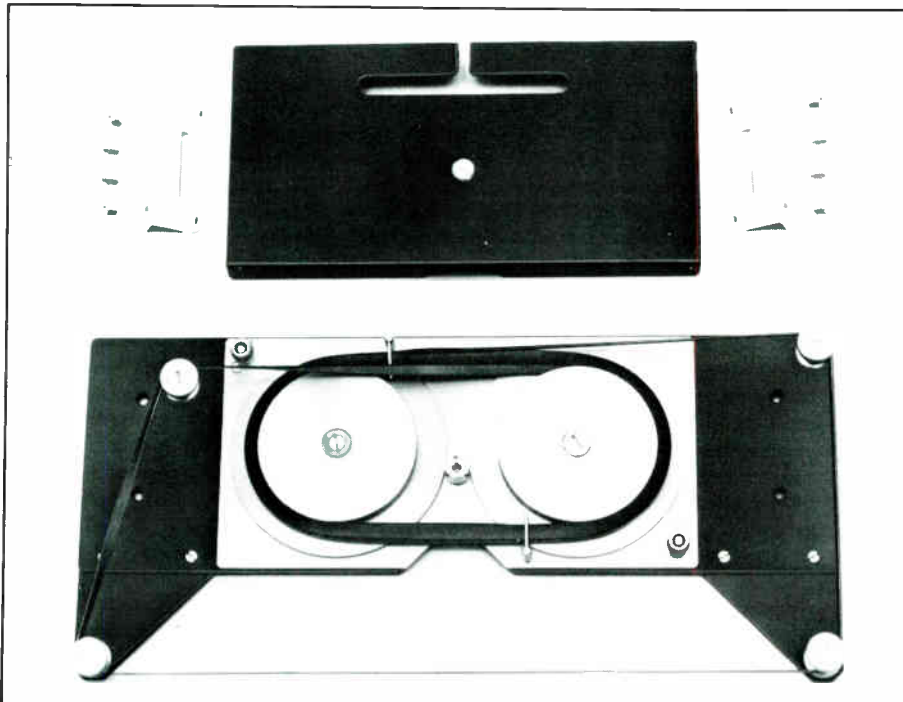


Figure Two: Endless loop conversion for Revox A77 (discontinued)



provides the ambient information we normally associate with sound in a closed space. Following this discussion is an examination of the design concepts of some of the principle methods of creating artificial reverberation and delay. Included is a look at some of the great, near-great, and not-so-great devices which have been offered by manufacturers.

Time And Space

Ambient information is an important part of music. A musical performance in a free field would be devoid of reflected reinforcement of its sound and thus would be anechoic – absolutely direct and dry. Fortunately, most music-making takes place indoors, it always has, and that is probably why we prefer an ambient characteristic, a sound component synthesized by the enclosing space itself, and repeatedly reintroduced back into the original sound a short time later to yield our complete perception of the sound, in its performance space. Thus, the two philosophical cornerstones of ambient information emerge – time and space. An echo is defined as a sound repeated in time. It is an easily recognized and interpreted phenomenon; a sound

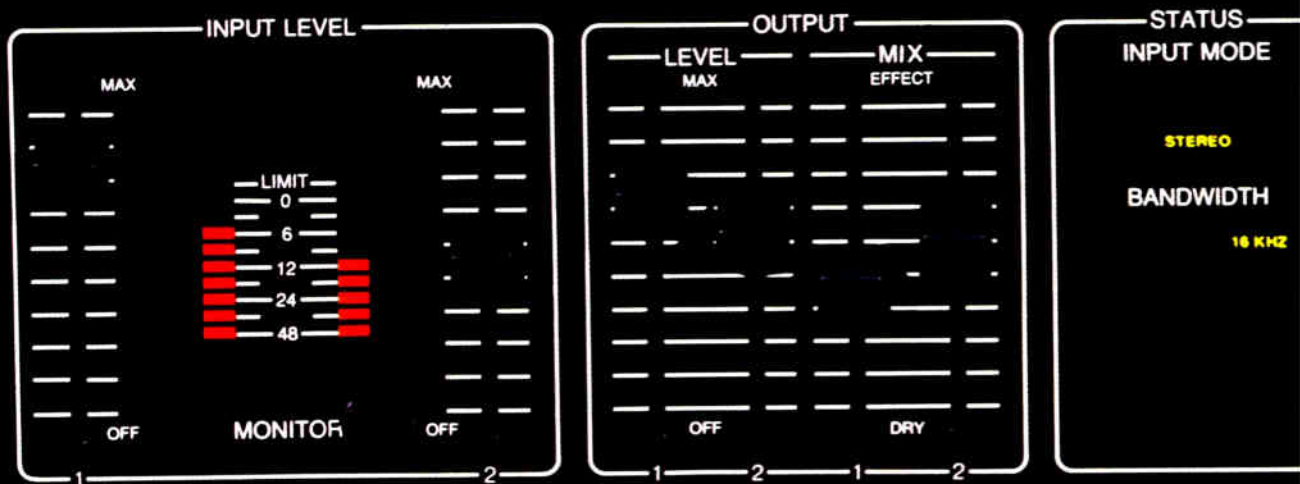
travels a distance through space, strikes a reflecting surface and returns later in time. The size of the space determines the length of time delay. Reverberation is simply a complex piling-up of delays of such density as to obscure identifiable perception of any individual echo. Because each reflected sound has lost energy to the boundary surface, the net result is a gradual decrease in the amplitude of the reverberation.

Under most listening conditions, it is the combination of delay and reverberation which provides the cues which our auditory system needs to interpret the nature of the room in which we are listening. A listener in a concert hall would hear the direct sound from the stage first – it has to be the direct sound because any reflected sound would have an angular and thus longer path length. The direct sound is heard first, but early reflections are not far behind. In quick succession the listener hears, but probably cannot individually identify, several reflections from the principle reflecting surfaces in the hall such as the stage, proscenium, ceiling, side, rear or front walls, etc. Then the number of reflections increases dramatically because of the many surfaces with similar path lengths, and

the number of reflections with multiple bounces which begin to appear; the space within the concert hall becomes myriad reflected waves densely spaced in time. That phenomenon subsides with greater and greater density, and with exponentially decreasing amplitude because of boundary and air absorption. After the amplitude has decayed to one-one millionth of its original amplitude, we say that the reverberation has ended. Fig. 1 shows the component parts of a reverberant signal.

This combination of naturally occurring effects is completely self-documenting with respect to the room's acoustic and physical properties. The initial delay between actual sound and first aural perception indicates to the eye and ear the distance from the source. The time delays between the direct sound and the first reflection, and the other early reflections indicates the room's principle dimensions – the longer the delays, the larger the room. The duration of the continuum of reflections tells the absorptive nature of the room – whether the room is live or not. The frequency characteristics of the reflections and reverberation continuum tell the equalization characteristics of the room – its brilliance, warmth, or

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dullness.

The effect of these characteristics is to dictate the appropriate usage of each acoustic space. For example, a Wagnerian opera would demand a large room, with a warm and properly Romantic timbral characteristic; while reverberation times would be longer than for most other types of opera, they would necessarily be shorter than for purely symphonic music, to insure the intelligibility of the vocal lines. In the same way, an astute recording engineer uses the tools of delay, reverberation, and equalization to mutually create the definition of his imagined space; and moreover he defines an acoustic space which agrees with the effect his music is trying to project. For example, a highly reverberant brilliant sound with short time delays for a Broadway recording would improbably place the cast in a men's locker room. More appropriate would be a lively sound with slightly longer reverberation times in the 1 KHz to 3 KHz region with medium delays – an ambient sound common to old-style theatres. On the other hand, entirely new acoustic environments can be devised which have no naturally-occurring counterpart.

Thus armed with several delay

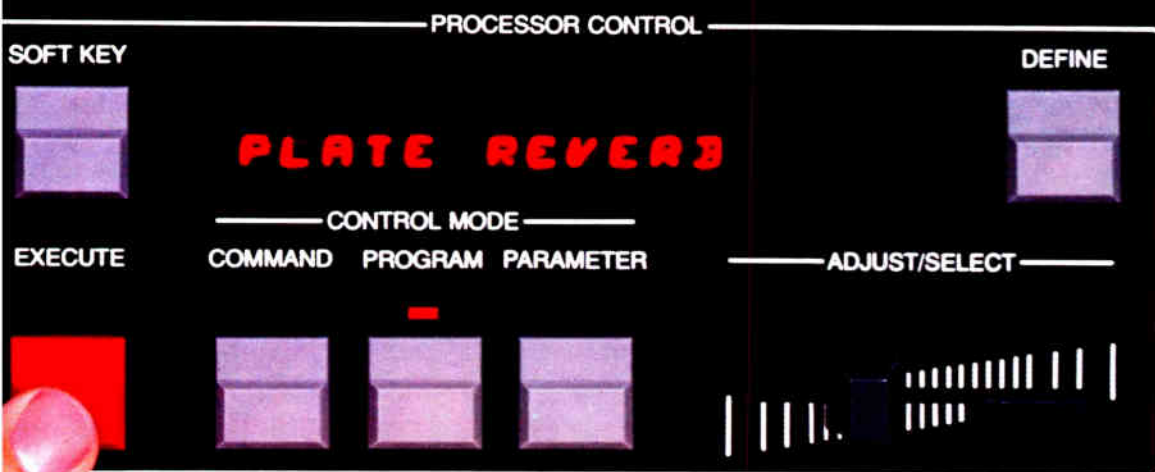
units, a stereo reverberator, and equalization, an engineer could reconstruct a facsimile of virtually any listening room, or create one entirely anew. This equipment would enable him to manipulate all of the principle parameters of ambient sound: a) vary initial delay times, b) simulate a continuum of reflections, c) adjust for desired reverberation time, d) effect a variation in absorption over the frequency range. Of course the specific choice of equipment more precisely determines which parameters may be effectively controlled. Although there is a wide variety of devices on the market with varying areas of expertise, any artificial reverberation device should meet various operational criteria: a) smooth frequency response, but one which falls slightly at the low and high frequency extremes, b) high pulse density to duplicate the many sound paths, c) overlapping normal modes which cover the audio frequency range, d) individual mode reverberation times must be approximately equal to provide for equal distribution of sound decay; a slight rise at low frequencies, however, and a slight fall at high frequencies is desirable, e) the reverberation density must be high quickly after excitation (within 20 to

50 milliseconds) to prevent audibility of individual echoes, f) response should be free from distortion or comb filter response, g) variability of decay time. Fortified with this bit of knowledge about the nature of reverberation, and some specifications to watch for, we are free to inquire into the operation of some of the available systems.

Reverberation Chamber Systems

Probably the most elegant, and most expensive means of obtaining artificial reverberation is to use the real thing. Given an enclosed and highly reverberant chamber, a loudspeaker, microphone, and mixing equipment to add the reverberated signal back to the direct signal, a high quality reverberation can be attained. The quality, however, depends exclusively on the integrity of the design and construction of this do-it-yourself project. The chamber must be carefully configured to eliminate surface parallelism, and to provide varying ratios of height to width to length. The minimum dimension of surface should be adjusted such that the lowest normal mode of vibration corresponds to the lowest frequency to be repro-

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duced in the chamber. This can be calculated by using the formula $D = C/2F$ where D is the minimum dimension in feet, C is the velocity of sound (1130 ft/sec), and F is the lowest frequency to be reproduced. The chamber must be carefully constructed for sound isolation and the interior surfaces must be rigid and reflective; plaster such as Keen Cement is a recommended treatment.

Apart from the chamber construction, placement of the transducers is critically important, yet mainly a matter of taste. Both should be positioned away from the geometric center of the chamber. The loudspeaker should be placed in the smallest corner of the chamber to best use the intersecting surfaces for reinforcement of sound levels. Usually, an omnidirectional microphone is placed by ear in an area with the maximum number of normal modes. A cardioid microphone directed away from the loudspeaker may be used for increased reflected sound.

The reverberation chamber achieves a very realistic facsimile of sound in a reverberant listening room, especially in its ability to duplicate the growth characteristics of sound in a room. Variation of decay time is an operational drawback. Absorption may be varied, or transducer placement altered; in 1947 Parisier even patented a chamber which could be evacuated to control the acoustic velocity and thus rate of decay, but the usual technique is to merely balance the amount of reverberant signal mixed with the direct signal and thus control only the effective reverberation time. Finally, the size of

the chamber (two for stereo) and the high cost of construction determines the ultimate exclusivity of live reverberation chambers.

Tape Delay Systems

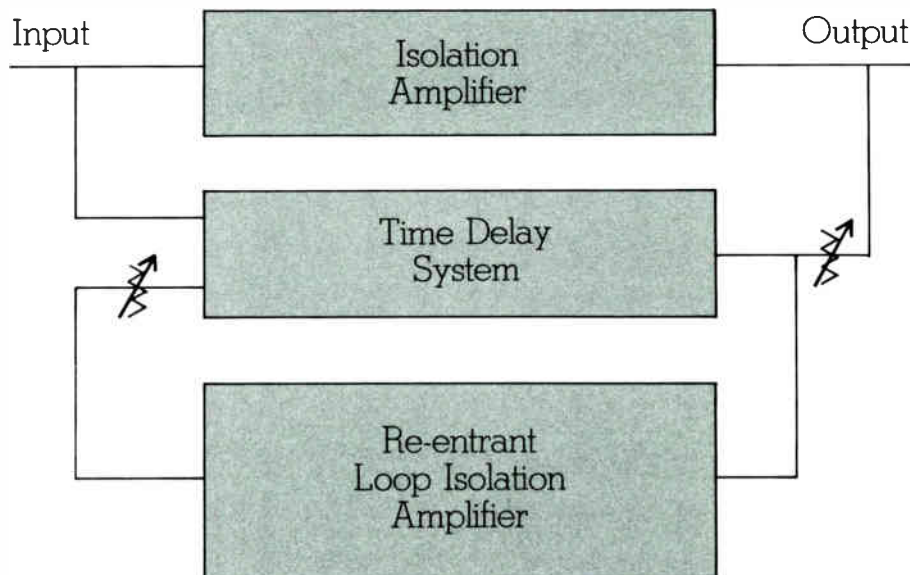
The traditional method of obtaining a single delayed signal uses a tape delay and is called 'slap echo.' The signal is recorded onto the tape and monitored from the playback head; the time delay is a function of the distance between the two heads, and tape speed. Vari-speed can provide an accurately controlled delay duration. The advantage of the method is freedom from specialized equipment, its only penalties being its commandeering of one of the studio tape machines, and constant tape rewinding. It is sometimes economical to set up a dedicated slap machine. An endless loop conversion system was formerly available for the Revox A77, as shown in Fig. 2. Undoubtedly, other ingenious conversions have been performed on various tape machines.

A simple tape delay can be enhanced to provide multiple echoes by using a re-entrant system as shown in Fig. 3. Many generations of copies of the original signal are generated to provide approximate decay patterns, exponential in nature. Playback heads must be correctly equalized, and adjusted for suitable delays.

•••

Next month we will continue our story with a look at tape, spring and plate reverberation. ■

Figure Three: Re-entrant Tape System



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by Jack McDonough

Atlanta: A sunny morning in mid-September.

At 10 a.m. my brother and I get off a night plane from California and are met by our friend Russ.

We proceed to the baggage area, where I expect to meet Buddy Buie, co-owner of Atlanta's Studio One, writer of a very large truckload of famous songs and producer for the past dozen years for the Atlanta Rhythm Section.

Buddy's not in sight at the claim area, so after a few minutes I decide to have him paged.

As I turn toward the paging desk Russ stops me, nods into the distance and says, "Here he comes."

This announcement startles me, since Russ has never met, nor ever even seen a picture of Buddy Buie.

One look at the shaggy bear figure ambling toward us through various knots of mid-morning Atlanta businessmen makes clear why Russ has had no problem sussing his man out.

Buddy, a pleasantly rotund and avuncular fellow with a shambling gait, flyaway hair, schoolboy smile and a personal manner that's a cross between Southern gentleman and cartoon strip crackpot, is wearing a yellow polo shirt, red suspenders and blue jeans. He is a personification of the down home casualness and sheer, idealistic love of music that marks the making of records in Atlanta and the South.

On this particular day Buddy is on his way to Lake Eufala—a boyhood fishing spot about 100 miles southwest of Atlanta on the Georgia-Alabama border (and the namesake of Buddy's publishing company, Eufala Music) for a week long songwriting skull session with ARS lead singer Ronnie Hammond. Since Hartsfield Airport is on the south side of Atlanta, it's a convenient place for Buddy to stop on his way to the country.

So over an airport breakfast he tells me the Buddy Buie story. It is a story which I know to some degree from previous encounters with Buddy, but a story which obviously stood ready to bear much closer inquiry since Buddy has had simultaneous careers as a promoter, producer, songwriter and manager and has worked with many of the major figures in Southern music, including artists like the Classics 4, Roy Orbison, Joe South, B.J. Thomas, and Bobby Goldsboro, as well as the Rhythm Section and industry figures like publisher Bill Lowery and producer Al Kooper.

Buddy was born in 1941 in an Alabama burg of 40,000 souls known

BUDDY BUIE

Studio One Anchorman



PHOTO: RICK DIAMOND

as Dothen. By high school he was "a big record fan," and began working with a local band called the Webs, one of whose members was Bobby Goldsboro. "They were all too bashful to get jobs," recalls Buddy, "and during college I evolved as their spokesman and manager. I was also writing poems at the time, and a few guys in the band and I started writing songs."

His experience in securing dates for the Webs led Buddy to become, during a period from 1957 to 1959, "one of the first rock promoters in the South. To this day major acts will still play Dothen because of the history we started there." But his first important break came when the Webs became Roy Orbison's backup band; Orbison, says Buddy, "was my ticket out of Dothen."

As the manager for the Webs and the road manager for Orbison, Buddy traveled all over the world handling concert dates on which Goldsboro would open by doing a few songs before Orbison appeared. Buddy was also acting as Goldsboro's manager, and when the singer left the Orbison entourage to pursue a solo career on United Artists, Buddy ended up in New York with him.

Shortly thereafter Buddy realized that "I didn't want to manage any more, I wanted to write." So he sold Goldsboro's contract and secured his own five-year writing contract with U.A. "I stayed in New York for awhile, and then tried Nashville, living out of a suitcase, peddling songs. I had very little success with the exception of a

few Orbison cuts."

The five years at U.A., says Buddy, "gave me time to develop as a writer," and in 1964 he scored his first hit by co-writing "Party Girl" with Tommy Roe, which listed at number 85 on the Billboard charts. During this early period Buddy "wrote a capella. I wrote in my head and then sang to the band. I've always preferred to write with someone who can play guitar well. I'm one of the few producers you'll ever meet who is not a frustrated musician. I've never harbored the thought of being a musician myself." Along with the writing Buddy was, in 1965 and 1966, "promoting shows all over the South. I've always been a combination of songwriter and manager and producer."

Through Tommy Roe Buddy met Bill Lowery, the grand old patriarch of Southern pop. "I fell in love with the guy right away. He told me to come see him when my UA deal ended. He really believed in me, and when I went with him we formed Low-Sal Music. I had full access to his studio, and so, voila! Producer! Because I didn't like the way other producers were doing my songs.

"My deal with Bill was to keep part of the publishing because I wanted to go out and bring other writers into the fold. And in 1966 I met J.R. Cobb of the Classics 4. At the time Joe South was their producer. But he had his own career to look after and by default I became their producer.

"Just to show you what it means

to have someone believe in a writer, we went from there to have an unbelievable three or four years, with all those hits like 'Spooky' and 'Stormy' and 'Traces of Love' and 'Every Day With You.' I did an LP with Billy Joe Royal. I did an LP with Joe South. I did quite a bit with B.J. Thomas and we had three top ten hits — 'Mighty Clouds of Joy,' 'Most of All' and 'No Love At All.' Almost everything I touched from 1966 to 1970 was a hit or a near miss. It was uncanny. I was producing so many sessions I was in the studio 16 hours a day, 7 days a week."

Most of this work was done at Lowery's three track studio. "We'd ping-pong so much on that three track that by the time we were done the tape was thin as a whisker. A lot of our work was in doubling J.R.'s guitar. It was our first and only innovation and we still prefer it to the electronic doubling you can get now with the digital delay. What we would do is tune the guitar just a little below pitch or a little above and play the exact same part. We'd get a wave form like string overtones. That was the guitar sound the Classics 4 became famous for. It had to be an exact double. We'd spend hours and hours because

we wanted it to sound like one guitar, not two.

"I've never been much on studio techniques. To me it's the song, first and foremost. It may be a cliché, but to me a song is like a beautiful woman. She can dress any way she wants and still be beautiful. But you have to have the woman before the clothes do any good. It's the same with the song. I feel that way so strongly that I think anyone else who doesn't think that way is nuts."

Then in 1970, in a four way partnership involving Buie, Lowery, Cobb and Paul Cochran (the latter two eventually left the partnership), Studio One was built in a new industrial park in Doraville, about 15 minutes north of downtown Atlanta. A principal force behind the creation of the studio was Buddy's "yearning to get away from Top 40 records and to produce albums. I could see no better way to do that than with the studio musicians we had. And to this day those musicians are the Atlanta Rhythm Section.

"At first we took in outside commercial work in order to make a living. We did that through 1972. By that time ARS had two albums on MCA and had just switched to Poly-

dor. That's when we said, 'No more outside sessions.' After that the only outsider allowed was Al Kooper. Jeff Franklin was managing me as a producer and Kooper was signed with him also. Kooper had always been a fan of my sessions, and he was intrigued by this little Southern studio."

Thus, when Kooper came to Atlanta to start Sounds of the South for MCA, he recorded the debut Lynyrd Skynyrd LP in Doraville. Skynyrd also cut the tune that made them famous, "Sweet Home Alabama," at Studio One, and then returned there again in 1977 at a crucial point in the recording of what was destined to be their final album, *Street Survivors*.

"Skynyrd always had this thing about studio musicians," recalls Buddy. "They just idolized them."

Together with engineer Rodney Mills [see related story] Buddy designed a studio that has "a very distinct sound because of its liveness. We have a famous standing wave in the middle of the room. Stand in the middle and clap and it will repeat. And we never fooled with that. We've always kept it that way.

"At that time, separation and

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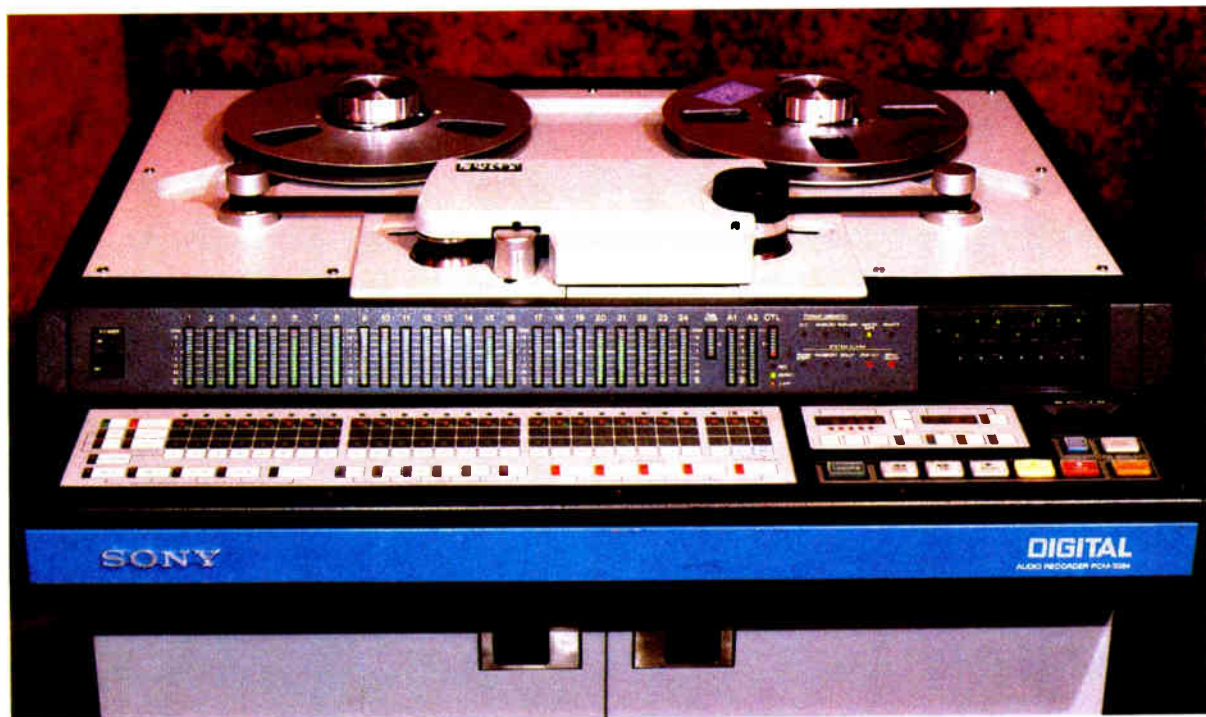


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absence of bleed were primary objectives for studios. But that's a two-edged sword. You can get that by making a room totally dead. But then you get a dead-sounding record. So at a time when everyone was making very dead rooms, we made a very live one. We had tile on a concrete floor and plywood on the walls with some sound-absorbent material. The panels are still there. The room has not changed.

"But we know we also had to have separation. So we built what we felt was the ultimate drum room—a large room on wheels, totally sound-proofed. It was like a vacuum. It was a studio within a studio. We also built our own echo chamber to liven it up. We used a big speaker in the chamber and we'd liven a dead drum sound by running it through the chamber."

Gradually this helped lead to an unusual situation in the recording of the ARS albums: "All the musicians with the exception of the drummer began to perform in the control room,

to keep from having to use headphones. So their monitors are my monitors. I don't know anyone else who does that. But sometimes it drives me nuts because I'll want to talk to Rodney or something and the guys are in there."

All 11 of the ARS albums have been cut at Doraville, with Buddy co-writing 90% of the tunes. "Sometimes," he smiles, "it gets confusing and I'll have to stop, because I'll have three songs going with one guy, three with another, and they start to run together."

As for the dynamics of the creative relationship, Buddy describes himself as "the instigator. I'll always be calling them up saying, 'Let's go write.' They look to me for lyrical content, structure, decisions. I feed off them for melodic content and chord inversions. I'm an inversion freak. We all are. I hear 'em but I don't know how to find 'em."

Until the beginning of 1982 Buddy managed ARS as well as produced them. Now he's limiting

himself solely to songwriting and to production deals made in conjunction with partner Arnie Geller. ARS is now managed by Sharon Lawrence, who had previously handled public relations for the band.

"I stopped managing because I needed to branch out creatively," says Buddy. "It was all-consuming the other way. It was three months writing, three months recording, six months of promotion, 24 hours a day. I lived in fear of the phone ringing because of a promoter foulup in Detroit or wherever the band was playing.

"I've wanted to take the step for several years. I'm going to spend every waking hour writing songs and get totally away from the business. I won't do any producing unless it's totally heartfelt. I'd like nothing better than to find a young band I could write with and let them use my experience. I think I have a lot to offer a young band, and they'd have something to offer me, because I feed off creating songs. I thrive on it." ■

by Jack McDonough

Rodney Mills, who originally helped lay out Studio One, has engineered all eleven albums done by the Atlanta Rhythm Section, receiving associate producer's credit on the last four.

In addition to his work with ARS, Rodney has also produced the last three albums for .38 Special and has worked extensively with hallmark Southern vocalists B.J. Thomas and Joe South. And, in a career in music that stretches back to 1962, Mills has worked—in encounters of various duration—with the sound of an intriguing array of artists that includes James Brown, Allen Toussaint, Lee Dorsey, Lynyrd Skynyrd, The Outlaws, Journey and Johnny Van Zant.

Several days after meeting with Buddy Buie at the Atlanta airport [see main story], I went out to visit Mills at Studio One, accompanied by my brother, who along the way periodically broke into drunken choruses of "Doraville," the song about their home better time to visit Rodney since "So Caught Up In You" was all over the radio as well as in Billboard's top ten and had obviously broken .38 Special into the first class section of rock. base that ARS had chosen as the leadoff tune on *Third Annual Pipe Dream*.

There could not have been a Rodney was beaming like a sunflower on a fine summer day.

Mills, who hails from Douglas, Georgia, started his career on a five

RODNEY MILLS

The Engineering Pride of Studio One



PHOTO: RICK DIAMOND

year stint with a copy band that toured through Florida, Georgia, Alabama and the Carolinas. The group was, says Rodney, "fairly successful as copy bands go," and at one point licensed a studio to try a few recordings.

"I was the only one taking an interest in the sound," recalls Rodney, "and I decided I was going to be the engineer. I knew in the end I had more

potential in the studio than as a musician—especially after coming to Atlanta and hearing the session players here."

Several years later—after getting married in the meantime—Rodney began frequenting LeFevre Sound, run by Mylon LeFevre's older brother. In his three years there Rodney recorded "primarily gospel quartets. We'd do

(continued on page 89)

SOUTHEAST RECORDING ACTIVITY

Peaks and Valleys

by Bob Millard

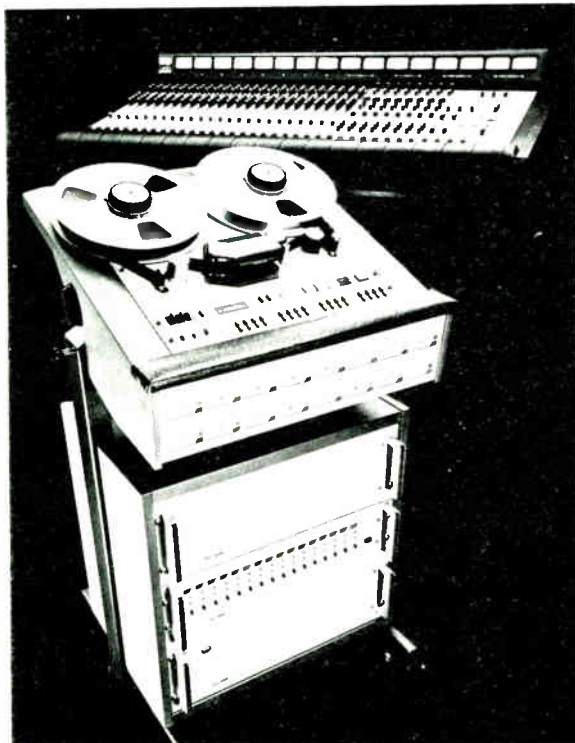
Recording studio operators, professional equipment manufacturers and dealers, and purveyors of other industry services in the Southeast reported that 1982 was a generally healthy year for the business. While business was tight in many sectors of the region during the early part of last year, things seemed to pick up during the last half, holding the ground gained for recording activity during the early '80s in the Sunbelt. "I think we (the Southeast) have suffered less

than the major centers in LA and New York," observes John Phelps of Orlando's Full Sail Recorders.

The region saw several new studios under construction during 1982, with some scheduled to open around the first of this year. Studio operators were cautiously optimistic about the first half of 1983 and were seen adding new and rebuilt equipment to many existing operations, with a few new rooms added to ongoing studio sites to update and expand. According to operators and equipment dealers alike the emphasis in '82 was on economy and utility when it came to equipment acquisition in most quarters. Expanding capabilities to

offer audio for video services and a growing trend toward aggressive marketing of these and other commercial non-record business recording services (such as industrial soundovers and commercial advertising jingles) emerged as new directions for regional operations.

The search for new clients and the addition of new services in the southeastern studios reflected a softening of the record business in the region. Perhaps not nearly as sharp as in pop and rock areas, country, black and gospel prerecorded music sales were generally weaker than in earlier years, with growth in country music particularly stifled in 1982. The small percentage hike in overall record sales that country music is expected to reflect, when sales figures for last year are released by NARM, really reflects lost ground in other sectors of the business. Still, the overall health of the



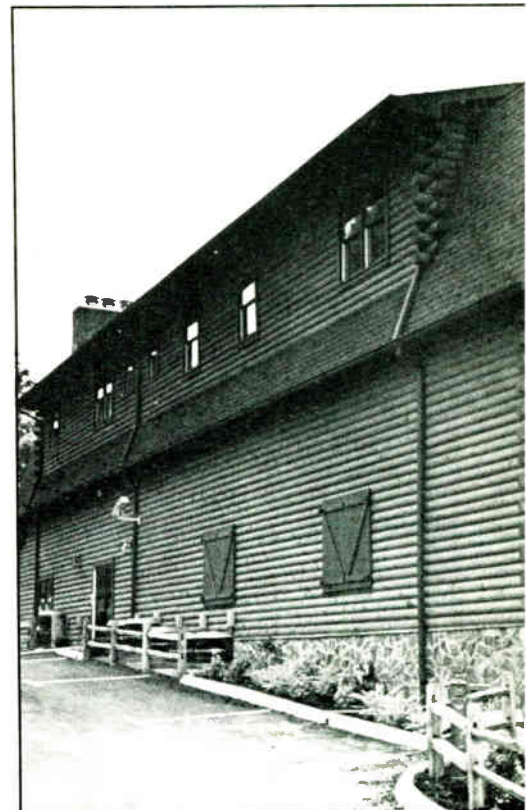
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Sunbelt recording industry showed the strength of the region's generally perceived price value and attractive attitudes going hand in hand to keep things humming in the face of adversity elsewhere.

NASHVILLE

Nashville, which never seems to slack off too much, showed a net gain of three as five major new recording operations opened up in 1982 and two shut down. Opening new operations or entirely new facilities in the Music City last year were Bullet Recorders, Music Mill, Treasure Isle, Emerald, and Stargem. Closing out operations during that time period were resort-like Bull Run Studio and the historic Columbia Nashville recording operations.

Bullet was the first new studio opening of last year, in operation early in the first quarter. Managed by Piers Plaskett, Bullet offers two recording rooms with a full capability video production option in the bigger room. Built from scratch into an existing Music Row office complex, Bullet features a pair of Studer A800 MK IIs with sync-linkage available for a 46 track option. They installed an SSL 4000A console which has Total Recall and Neotek Series III in the smaller room. Six video cameras, three video

Below: Alabama's producer Harold Shedd at his new Music Mill in Nashville

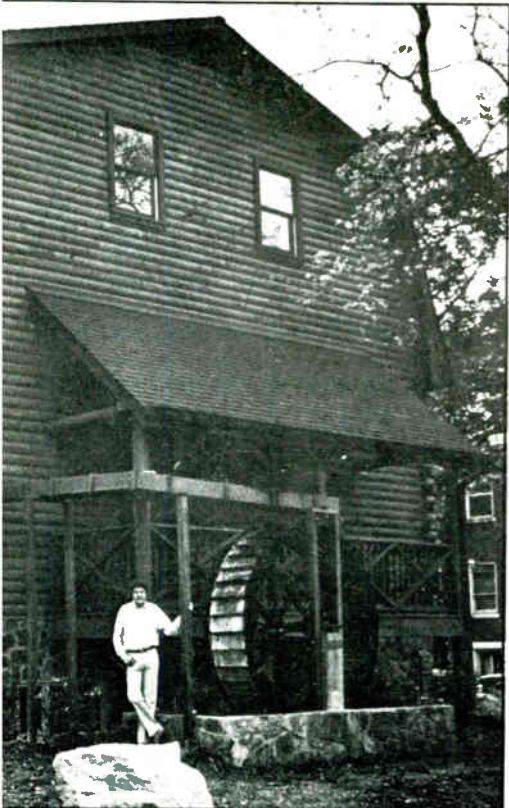


PHOTO: BILLY EASLEY



PHOTO: SUSAN HACKNEY

Epic recording artist Engelbert Humperdinck and his producer Even Stevens at Emerald Sound during Humperdinck's recent recording sessions at the new Nashville facility

recorders in the one inch format make this probably the most expensive installation of the 1982 season.

Alabama's producer Harold Shedd moved his Music Mill recording operations to a newly constructed, attractive log cabin-style two story

building this year. The building is affectionately known in The Row as Fort Shedd, but jokes aside, Music Mill hit the ground booked solid in the third quarter of the year. Manager Carolyn Thompson reports both recording rooms operating at full

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Dave Shipley, partner and chief engineer and Fred Vail, partner and general manager, Treasure Isle Recorders, Nashville, Tennessee

throttle ever since, with first of this year bookings running two months in advance. The rooms where current

Country Music Association Entertainer(s) of the Year crank out double and triple platinum features a pair of

Digital Multi-track Comes To Nashville

by George Petersen

John Morar, owner of Digital Services Recording, with facilities in Houston and Nashville, has announced the availability of the nation's first Sony PCM 3324 24 track digital recorder. The machine, based in Nashville but available nationwide, has already been booked by artists such as Neil Young and Frank Zappa.

"We are all of the opinion that the Sony is a superior system, for a variety of reasons," Morar explained. "One, it is a SMPTE-based device, and every point on the tape has a fixed address; you can go back and recall anything you want. Second, it is the compact disk format—this is geared towards the major artist, our primary user, but we try to make it affordable for everybody."

Digital services is now constructing a new, dedicated re-mix facility in Nashville's music row area. Barricading unforeseen delays, the as-yet-unnamed studio, designed by acoustician/designer Steve Durr, should be on line by mid-March.

Tom Semmes, Nashville Digital Services manager, talked about the new facility: "We're building something that Nashville currently does not have—

a dedicated remix facility that is not part of an existing studio... [reaction to] the concept of a remix room on the west coast and other areas has been good, but Nashville has never had a dedicated remix room. We're going with a Neve console, an expanded 8058 with more modules, and the NECAM automation. There are only two NECAM systems in Nashville, one in Ronnie Milsap's studio, which is closed to outside clients; the other is at the back room of the Sound Stage, and Elektra Records has a lease on that. So we would be the only NECAM facility in Nashville that's really for hire. One interesting thing we could do with the NECAM and the digital multi-track would be to go direct from the multi-track tape to the disk."

Semmes said the remix room will feature an extensive digital editing capability. "Our facility will also offer editing of tapes made on the Sony PCM F1. A lot of studios make tapes on the F1 and love the sound of the machine but need a place to edit. We're going to close the gap by giving people what they want. Another thing we're putting in is a full-blown Neumann disk cutting system with a quartz drive turntable motor, a Zuma computer system for the preview, and quite a bit of processing built into the mastering system." ■

Studer A20 24 track recorders, and a pair of Trident TSM consoles from Wally Wilson's Audio Sales. Acoustical consulting here as well as at Bullet was by Vermont-based John Sanford. "We've had our best year ever," reports Thompson.

Treasure Isle was built in the Berry Hill "little Music Row" area where Scruggs Studio, Wax Works, Reflections, Sound Track, Creative Workshop, Chips Moman's studio and other recorders are also located. Partners Fred Vail and Dave Shipley built this to supplant their former Island Recorders operation and stocked the studio with Studer 2 and 24 track recorders and a Trident 80 console. It is said to have the highest ceilings of any room built in Nashville in the past five years and gets Vail and Shipley into their own facility after about a year of taking clients' work to other studios around town.

Writer/producers David Malloy and Even Stevens went in together to build Emerald Sound Studio on famed 16th Avenue. They stripped Wally Heider's L.A. studio of a Neve 8058 console and put in a Studer A800 24 track and a pair of A80 2 tracks. With plenty of work on in-house projects scheduled, Stevens still recognizes the increasing competitiveness among Nashville studios and states, "This isn't going to be an overpriced studio."

Stargem, a small custom pressing label and recording operation, opened a snazzy-looking new studio/office complex in December. It features an MCI JH24 and MCI 636 console in a design and equipment package deal from Audio Architects.

Existing operations adding another room included Bennett House (Norbert Putnam), which installed an MCI 24 track in a second room. Creative Workshop built a second studio space, a George Augspurger design featuring all Studer recorders. Sound Stage installed a third room for overdub sessions and equipped it with a Studer A80 VU 24 track recorder and MCI JH500 console.

At the House of David, Neil Young was in recently, working on a new album. Produced by Eliot Mazer, the project was recorded on a 24 track Sony digital machine.

Producer Buddy Killen was at Soundshop Recording Studios with CBS artist Ronnie McDowell putting some finishing touches on McDowell's new LP. Killen also worked on sessions with the young and very talented Kippi Brannon, with Mike Bradley engineering all sessions.

Album activity at Sound Emporium Studios remains heavy, with MCA artist Don Williams and producer Gary Laney engineering

both projects. Grammy winner Larry Butler was in producing several sides for Ron Simpson, with John Abbott engineering.

Glenn Snoddy at Woodland Sound Studio noted a slight increase in business at his studio over the previous year as 1982 closed. Studio 19 manager Chuck Howard, Jr. noted, "I see things getting a little looser as we are getting into '83. There are more diverse, small budget things coming in like Avion Records and Flying Fish Records to take up the slack." He sees marketing as important for medium sized studios like his. Budget-priced MCI 24 track equipped Polyfox Studio has been proving that point for about two years now, setting a competitive tone fol-

Studio A with 2,000 sq. ft. vaulted ceilings, and Studio B with half that space but 23 ft. ceilings. Equipment here is an MCI package including 636 console, JH24 recorder and a 1/2" 2 track mastering recorder. LS-4 speakers in this control room are specially built prototypes from Fostex made just for Gettings. Owner Glen Gettings extolls the resort atmosphere and the lakeside location where trophy bass are available to the angling artist during rest breaks. The studios are designed for later installation of digital equipment and to meet Gettings' need for his own industrial and commercial production business. Area recording school Full Sail is teaching out of this operation this year.



PHOTO CHRISTOPHER HELTON

Gary Ladinsky (left) and Tom Werman working on Molly Hatchet's latest Epic LP at Bee Jay Recording Studios in Orlando, Florida

lowed this past year by Wild Tracks, which chose MCI to upgrade to 24 tracks and go for that promising small budget market. LSI Studio owners faced dwindling custom country session business with an aggressive run on Atlanta ad agencies and local accounts for jingle work, predicting a continuing trend of 'up East' ad accounts discovering Nashville studios' lower rates and quick results. Gene Lawson at Reflections Studio summed things up well, saying, "Competition is tough and it's getting tougher because there are still new studios being built here."

FLORIDA

The recording industry is alive, well, growing and diversifying in Florida centers. In the Orlando area, Stark Lake Studios (formerly Gettings Productions) completed 1982 construction work in time for a first of the new year opening with 7,084 sq. ft. in the total complex. Featured are two studio rooms with connecting option,

To the delight of their clients, Criteria Recording Studios in Miami has acquired a Mitsubishi X-80 and DDL-1 digital recording system, and will add digital mastering to their many available services. Mack Emerman, Criteria owner, sees the new digital capability as a key factor in improving business. "It's no secret that the studio business has been a little slow lately," he explained, "and we're hoping that our clients' increased recognition of digital audio's ability to improve the quality of their product will pay off here with increased interest in our studios."

Full Sail Recorders entered their fifth year in recording classes in 1983, adding on-site situations to the in-studio lessons with a new 27 ft. remote unit. The remote truck is a GMC coach with customized Sphere 32 x 24 console, which is a cross between the A and C models, and Otari MTR 90 24 track recorder with a second 24 track rented as needed. Gary Hedden Ltd., late of Chicago but now in Columbus, Ohio, designed

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the outfit. Among the new directions noted by manager John Phelps is an increasing interest in recording big LP projects in other-than-traditional sites using remote trucks for unique sound possibilities.

Ft. Lauderdale saw a mother-daughter team operating a new studio which opened in December after four months' construction. Virginia and Pauline Cayia run the first major Neve/Studer studio in south Florida, called New River Studio. Featured is an 8108 56 input/48 output board and a pair of A800 24s with Q-Lock sync to give an audio for video option interfaced with a JVC 3/4" video recorder. New River is another aggressive post production marketing outfit, expecting to nail down major clients right after their first-of-the-year test run.

ATLANTA

Crescendo Recorders here spent most of their time rebuilding after the physical plant sold to an area businessman at auction. Bill Ray and Randy Fuchs are leasing and operating the studio with Rod Revilock standing in as studio manager. Their video editing bay is a new addition at this metropolitan-area recorder, featuring two Sony BVU 800s and a BVU 820 with slow motion. Considerable new outboard equipment is also being added and the room was expected to be back in business by early February this year. Once again, audio for video is going to be a marketing focus for this reactivated Sunbelt studio.

Tom Wright reports "from all indications [business] shouldn't have been better, but the first part of last year and the last part were excellent." Wright's Cheshire Sound studios do a lot of major black LP projects in Atlanta. He reports Doppler Studios and RKM have area jingle work well in hand and he plans no change in his marketing direction to challenge. The record business was good to Web IV, too, according to chief engineer Ed Seay. Peabo Bryson, Paul Davis and the Commodores kept his room busy in 1982. Seay reports he is not about to switch to digital mastering, rental or not. "You can't edit on the stuff without having two machines," he says. "I guess I'll wait for them to standardize the technology." Though he isn't doing video yet, Seay took a look into his crystal ball and predicted, "In five years or so if your studio can't handle video—too bad."

The Eddy Offord Studio in Atlanta is busier than ever and is now available for outside projects, according to Valma Valle, studio manager. At first, Eddy was concerned that

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independent producers would have trouble adapting to the unique, barrier-free control room arrangement in the 40-year-old East Point Theatre building. "Since there's no glass between myself and the musicians," Eddy explained, "it's a different way of working and I felt I was the only one who could really get behind it. But it's worked out well, and Valma has started booking out the studio to other producers." Some of Eddy's recent projects include the newly-released Art in America album, and a forthcoming Coca-Cola video with The Dregs.

OTHER AREAS

Muscadine Studios opened in early 1982 to give Capricorn a run for the business in Macon, Georgia. Paul Hornsby says Muscadine paid bills with jingles and demo billings while they spent a lot of time with in-house artist sessions. An Ampex MM 1200 16 track recorder and a Tascam 80-8 are used through a Flickinger console built into a remodelled existing commercial building with Hornsby designing the acoustics. Louisiana's Studio A arose from the old Southern Recorders and characterized Bayou Country business as fair to partly cloudy. Jingles and industrial work from neighboring Texas concerns helped make up for a slowed record session climate in 1982. Their Ampex 1200 gives Studio A 8-16-24 track options as salesman Ken Chaumont focuses on marketing the studio's video production capabilities to companies needing complete individual training film packages.

Lee Daily at Muscle Shoals' Wishbone Studios says 1982 business was much better than '81 "but the year before was dreadful" due to having to rebuild following a fire. He thinks a digital mix job he performed in '82 on a Sony PCM 1610 outfit rented from Nashville's Digital Services was the first ever in the Alabama soul-center.

SERVICE & EQUIPMENT OUTLOOK

Studer/Revox regional sales rep. Joe Bean reports substantial gains in his company's market penetration, taking four of five new studios in Nashville and installing Alabama bandmember Jeff Cook's Ft. Payne, Alabama studio, among others. He cites favorable changes in the international currency exchange rates as helping put the Swiss-made Studer equipment on a competitive pricing basis with companies in this market, including MCI, Otari and Ampex, the

latter re-entering the audio sales marketplace again with a new Nashville sales and service office.

MCI Nashville office manager Graeme Goodall reports an increase in sales of about 15 percent over 1981 levels, citing service and troubleshooting as big plus factors for the company here. MCI parent company Sony named Goodall southern regional manager as Nashville became regional headquarters for the Sony pro audio line. Randy Blevins of Blevins Audio Exchange (BAE, Inc.) brokers major audio packages as well as manufacturing plate reverb units. Blevins noted he thought other equipment suppliers had seen the same 1982 month to month unpredictability in sales. Activity averaged out for a

reasonably decent year, a trend he predicts to continue through the first half of 1983. "Even though interest rates have come down, people are still being picky about what they buy."

It is an interesting sidelight to this overview of southeastern recording business to note that one of the grandfathers of all studios in this area, RCA Nashville Studio B, celebrated its 25th anniversary this past year. For several years now it has been out of active operation but is the only studio in the world kept intact and operated as a museum for the public to see what this business is really like on the inside. The Country Music Foundations, which has charge of RCA B now, struck sterling silver and nickel alloy medallions in honor of the event. ■



Mr. Randy Goodrum—
Composer, Artist, Musician, Producer,
Arranger, Writer of such hits as: "You
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Randy Goodrum

VALLEY AUDIO

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The Southeast

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16	Sound of Birmingham	34	16	Motomorphosis Recording Studio	32	24	Groundstar Labs	
4	Spectrum Recording Services	45	24	Motomorphosis Recording Studio	32	16	House of Gold Music Inc.	
Dothan								
24	Studio Four	46	8	Proxessive Music Studios	30	4	Humminbird Studio	
Ft. Payne								
24	Cook Sound Studios	37	16	Valparaiso	34	24	Mission Records	
Lexington								
8	Woodruff Recording Studio	31	16	Playground Recording Studio	34	4	Music City Music Hall	
Montgomery								
16	Brigadier Sound Studios	32	W. Palm Beach				24	Music Mill
Muscle Shoals								
24	East Avalon Recorders	40	16	Jalex Recording	32	24	The Nashville Sound Connection	
24	Fame Recording Studios Inc.	40	GEORGIA				24	Oak Valley Recording Studio
24	Wishbone Recording Studio	46	Atlanta				24	Pollyfox 24 Track Recording Studio
Shelfield								
24	Music Sound Studios Inc.	42	24	Axis Sound Studio	36	24	Quadrant Sound Studio	
BAHAMAS								
Nassau Beach								
24	Compass Point Studios	37	24	Cheshire Sound Studios	37	24	Roxy Recording Theater	
FLORIDA								
Altamonte Springs								
24	Full Sail Recorders	40	24	Creative Sound Concepts	38	24	Sonyas Sound Studio Inc.	
Coral Gables								
24	OL Mobile Recording	44	24	Crescendo Recorders	38	16	Sunclon Sound Studio	
Deerfield Beach								
16	Spectrum Recording Studios Inc.	34	24	Doppler Studios Inc.	40	24	Sound Emporium Recording Studios Inc.	
Deland								
16	Morning Sun Recording Studio	34	24	Master Sound Studios Inc.	42	24	Sound Stage	
Edgewater								
24	Conn Studio	37	24	Fidy O'Hord Studios	44	24	Sound Track	
Ft. Lauderdale								
8	Lafe Productions Audio	40	16	Real to Reel	34	24	Starcom Recording Studio	
24	New River Studios	44	16	Signal Sound Studio	34	4	The Stick Showroom Studio	
8	Soundshine Productions	40	24	Sonabird Studio	45	24	Studio 19	
Miami								
24	Criteria Recording Co. Inc.	38	24	Southern Tracks Recording	45	24	Treasure Isle Recording Studio	
16	Miami Sound Studio	32	24	Twelve Oaks Recording Studio	46	24	Woodland Sound Studios	
Monticello								
8	Surprise Productions	31	24	Web IV Studio	46	Summertown		
N. Miami								
24	Fantasy Workshop	44	Carrollton				8	Village Media
24	Quadrant Cinema Corp.	44	8	Coley Recording Studio	30	VIRGINIA		
8	Trak Inc.	41	Chamblee				Bristol	
N. Miami Beach								
24	Coconuts Recording Co. Inc.	37	4	Sound Technical Service	30	16	Tandem Recording Studio	
Ocoee								
24	Starko Lake Studios	45	Columbus				16	Chesapeake
Orlando								
24	BeeJay Recording Studio	39	16	Merit Recording Co.	32	16	Fink Pinewood Recordings	
Oviedo								
4	Hon. Sound Co.	30	24	Doraville	46	16	Harrisonburg	
Pompano Beach								
24	Artisan Recorders	36	24	Studio One	46	16	Alive Recording	
16	Audio Image	32	24	Ft. Oglethorpe	45	24	Norfolk	
Panama City Beach								
8	Creative Rediffusion Audio & Visual	40	24	Macon	37	24	Live Oak Sound	
16	PMB Productions	40	Rome				24	Richmond
16	Ocean Opry Recording Studio	34	16	Willow Creek Studio	34	24	Alpha Audio	
16	Gulf Coast Sound Studio	32	Savannah				4	Audio Image Recording
16	Sarasota	32	8	Bonoli Recording Studio	30	16	Roanoke	
16	Teistar Recording Studio	34	8	Statesboro	31	16	Threshold Recording	
Sunrise								
8	FXL Sound Studios Inc.	30	8	Savannah	30	4	Springfield	
WEST VIRGINIA								
Parkersburg								
8	Swenson Recording	31	KENTUCKY				4	Bas Recording Studio Inc.
LAUISIANA								
Alexandria								
24	Studio A Productions Inc.	46	Georgetown				8	Vienna
Bogalusa								
24	Studio in the Country	46	Lexington				8	Casmo Recording Inc.
Denham Springs								
16	Little Woods Recording	32	Louisville				8	Winchester
Lake Charles								
16	Goldband Recording Studio	32	Madison				8	Sounds of Winchester
MISSISSIPPI								
Jackson								
8	Mississippi Recording Co.	34	Antioch				4	Shoestring Studio
NORTH CAROLINA								
Bailey								
24	Mecca Sound Studio	42	Brentwood				24	Gold Mine Studio
Charlotte								
16	Audio Inc.	32	Cleveland				24	Maestri Sound Studio
16	Lamon Sound Studio	32	Franklin				24	The Beatles Home
24	Reflection Sound Studio	45	Henderson				4	The Castle Recording Studio
Granite Falls								
16	Fantasy Sound Studios	32	Kingsport				24	In. State Recording
Raleigh								
16	Sound Trax Inc. Recording Studios & Production Services	44	Madison				24	Cinderella Sound
PUERTO RICO								
Puerto Nuevo								
24	Crescendo Audio Productions Inc.	32	Maryville				24	Hilltop Recording Studio Inc.
SOUTH CAROLINA								
Charleston								
16	Recording Associates Studios	34	Memphis				24	Ardent Recordings Inc.
Columbia								
8	GEM Recording	30	Nashville				24	Blackwood Sound Factory
Greenville								
24	Mark Five Studios	42	Nashville				16	Mastercut Recording Corp.
Newberry								
8	MCP Davisound	30	Nashville				8	Mauw Beagas Lab
Spartanburg								
24	Creative Arts Studio	37	Nashville				8	Sounds Unreel
West Columbia								
16	Strawberry Jam Studios Inc.	34	Nashville				8	USC Sound Enterprises
TENNESSEE								
Antioch								
4	Shoestring Studio	30	Nashville				24	Audio Mista Recorders
Brentwood								
24	Gold Mine Studio	41	Nashville				24	Broken Door Studio
Cleveland								
24	Maestri Sound Studio	42	Nashville				24	Bullet Recording
Franklin								
24	The Beatles Home	36	Nashville				8	Cattish Bay Sound Studios
4	The Castle Recording Studio	37	Nashville				16	Cedarwood Sound Studio
Henderson								
4	A Summit Station	34	Nashville				4	Faale Studio
Kingsport								
24	In. State Recording	39	Nashville					

All studio information listed has been supplied to the Mix by studios responding to questionnaires mailed in November, 1982. People, equipment and locations change, so please verify critical information with the studios directly. The Mix does not take responsibility for the accuracy of the information supplied to us by the studios.

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In New Jersey, call collect:
(201) 781-3367

Vendor programs also available.

The Southeast 4&8 track

• **AUDIOIMAGE RECORDING**
also REMOTE RECORDING
 210 East Franklin St., Richmond, VA 23219
 (804) 644-7700
 Owner: Audioimage Production
 Studio Manager: Tom

• **CATFISH BAY SOUND STUDIOS**
also REMOTE RECORDING
 111 17th Ave South, Nashville, TN 37203
 (615) 244-8137
 Owner: Charles Emery
 Studio Manager: Charles Emery
 Dimensions of Studio: 28 x 14
 Dimensions of Control Room: 10 x 14
 Tape Recorders: Otari MX 5050 8 SH 1/8 track Otari MX 5050 6 1/2 track TEAC X1 4 track Sony ICK 1/8 track
 Mixing Consoles: Sound Workshop 1280 BHF0 12.4 x 8 foot
 Monitor Amplifiers: B&W 5 D Sony TA-270
 Monitor Speakers: JBL 4811 Arazone 50 Sony SS0 1050 boum 64
 Echo, Reverb, and Delay Systems: Sound Workshop 1280 reverb Digital A Azarone 50 tape delay
 Other Outboard Equipment: dbx 160 limiter dbx 155 noise reducer Otari Euphonix 100
 Microphones: Sennheiser MD 421 AKG D 1000 C 1001 Shure SM 57 SM 58 Crown PZM Beyer M 51 and Valley Audio direct boxes
 Instruments Available: Fender Telecaster Gibson Les Paul piano Fender Strat Fender Telecaster acoustic guitar resonator guitar and Fender Deluxe Fender Banjo and Fender Busman and Fender Super Reverb Univox Univox organ, Vox Cityline M 100 and Vox p 100 Hammond B 3 organ and the harp and Mar-Marc amps
 Rates: Call for rates

• **COLEY RECORDING STUDIO**
 10 Harris St., Carrollton, GA 30117
 (404) 832-0616
 Owner: Phil Coley
 Studio Manager: Phil Coley
 Extras: Coley Recording Studio operates Earl Clark Carrollton, Georgia 45 minutes west of Atlanta. We also provide a place that play significant in the careers Audrey, Gale and Black & M. Many are nearby.
 Direction: We've written, arranged and recorded music for national and local TV and radio. We have the business and demo business in the south. We also produce backing tracks, video soul tracks and there are package prices for 1/2 and 1/4 and 45's. Our staff are Berklee Alumni who can play. Wipe Out, Smokin' on the Water and Proud Mary. We are proud to be work hard for our customers.

• **CREATIVE REDIFFUSIONS AUDIO & VIDEO—
 PMB PRODUCTIONS**
 7019 Big Daddy Drive, Panama City Beach, FL 32407
 Owner: Paul Bailey
 Studio Manager: Nick Bailey

• **EAGLE STUDIO**
 50 Music Square W Suite 406, Nashville, TN 37203
 (615) 320-7161
 Owner: Bob Farnsworth
 Studio Manager: Lynn Farnsworth

• **FXL SOUND STUDIOS INC.**
also REMOTE RECORDING
 7766 NW 44 St., Sunrise, FL 33321
 (305) 741-7766
 Owner: Frank X. Lockton

• **G.E.M. RECORDINGS**
also REMOTE RECORDING
 307 Southwood Drive, Columbia, SC 29205
 (803) 799-8235
 Owner: John V. Epps G.H. (Dirk) Goodwin
 Studio Manager: John Epps

• **GIZMO RECORDING, INC.**
 1649 Trap Rd., Vienna, VA 22180
 (703) 938-6692
 Owner: Bob Dunbar
 Studio Manager: Bob Dunbar
 Engineers: Bob Dunbar, Chief Engineer, Ralph Dietz, Dave Dunbar, Richard Marlow, Neil Liebman

Dimensions of Studios: 12 x 12 mix room 11 x 12 14 x 8
 Dimensions of Control Rooms: 11 x 12
 Tape Recorders: 4MM 1/8 track Ampex w/Invision Electronic 1/8 track TEAC 1/4 track W/1/8 track
 Mixing Consoles: Tangent Series 4 20 x 4 x 2
 Monitor Amplifiers: B&W
 Monitor Speakers: JBL 4811
 Echo, Reverb, & Delay Systems: MXR Digital Delay EABA reverb Eventide Phasor
 Other Outboard Equipment: Valley People Dynamic Compressor limiter OmniCrab Noise Gate MXR doubler limiter PAIA parametric EQ AMI graphic EQ Pump graphic EQ
 Microphones: Neumann U 87 Wrid SD 1 Shure SM 57 SM 58 E V 119 P15 119 Sennheiser 421
 Instruments Available: Steinway and drums Tama snare Zildjian 4 Fasto symbar snare Zildjian amp Ampex amp Levee amp Gallien & Kruezer amp Marshall Fender Showman and PA gear
 Rates: Please call

• **HORIZON PRODUCTIONS**
 1010 W. Platt St., Tampa, FL 33606
 (813) 254-3399
 Owner: Robert Stephenson
 Studio Manager: Robert Stephenson



HUMMINGBIRD STUDIO
 Nashville, TN

• **HUMMINGBIRD STUDIO**
 7 Music Square West, Nashville, TN 37203
 (615) 254-2200
 Owner: Bob Farnsworth
 Studio Manager: Lynn Farnsworth

• **LIFE PRODUCTIONS AUDIO**
also REMOTE RECORDING
 9 S.E. Ninth Ave., Ft. Lauderdale, FL 33301
 (305) 524-5433
 Owner: AMI Corporation
 Studio Manager: Ther Frenk

• **LOST RIVER RECORDING STUDIO**
 631 N. 9th St., Paducah, KY 42001
 (502) 444-7594
 Owner: Clyne Wood
 Studio Manager: Andy Wood
 Engineers: Laddie Wood
 Dimensions of Studios: Studio A 14 x 12 Studio B 12 x 7
 Dimensions of Control Rooms: 9 x 12
 Tape Recorders: TEAC 1/34 IS 4 track TEAC 1/3400S 2 track TEAC A 1/70 cassette Technics M27 X cassette Panasonic RS 80H 8 track cartridge
 Mixing Consoles: Tapco 14 mixers in console 6000R series 24 in x 4 out TEAC Tascam Model 1 TEAC meter bridge MB20
 Monitor Amplifiers: Crown D60
 Monitor Speakers: Custom built also cubes
 Other Outboard Equipment: dbx 155 4 track mix 152 1 track Dolby (8 track tapes) Tapco 2200 graphic EQ TEAC PH 64 patch rack AKG B 40 headphones
 Microphones: Audio Technica AT 813 Shure 585 E V DS-35 Barcus Berry 1355 guitar transducer
 Instruments Available: Baldwin acrosoric piano Fender Rhodes piano bass synthesizer electric piano small organ Lesbe tone cabinet Fender Bandmaster amp Fender Bassman amp two Senn amp 8 & 12 string Alvarez acoustic guitars bass guitar

Gibson classic guitar steel guitar hollow body drums percussion. All instruments in studio.
 Rates: Call or write for prices
 Extras: Free coffee and tea
 Direction: We also sell musical equipment. In business one to ten years. We plan to continue growing as a studio in order to make our customers satisfied. We plan to expand soon.

• **MAUW-BOGGS LABORATORY**
 667-669 Hawthorne St., Memphis, TN 38107
 (901) 278-5003
 Owner: Bobby Davis Vikki Davis G.T. Davis
 Studio Manager: Billy Vack G.T. Davis

• **MAYS DEOST (The Songwriter's Friend)**
 345 North Court St., Georgetown, KY 40324
 (502) 863-1533
 Owner: Ernest Mays
 Studio Manager: Norman Mays

• **MCP DAVISOUND**
also REMOTE RECORDING
 P.O. Box 521, Newberry, SC 29108
 (803) 276-0639
 Owner: Hayne Davis
 Studio Manager: Philly Davis

• **PROGRESSIVE MUSIC STUDIOS**
also REMOTE RECORDING
 1904 S. Mac Dill Ave., Tampa, FL 33629
 (813) 251-8093
 Owner: Ken Vestrup III
 Studio Manager: Ken Vestrup III

• **RAGDOLL RECORDING STUDIO**
 205A Television Circle, Savannah, GA 31406
 (912) 927-1761
 Owner: Rocky Frazar
 Studio Manager: Rocky Frazar

• **RON SOUND CO**
 RTI Box 357A, Oviedo, FL 32765
 (305) 349-5832
 Owner: Ron Schrader
 Studio Manager: Ron Schrader

• **SHOESTRING STUDIO**
also REMOTE RECORDING
 Box 32 Rice Rd., Antioch, TN 37103
 (615) 361-4322
 Owner: Bruce Bossert
 Studio Manager: Bruce Bossert

• **SOUND TECHNICAL SERVICE**
also REMOTE RECORDING
 De Kalb/Peachtree Airport, Bldg. 34A, Chamblee, GA 30341
 (404) 458-0503 and 455-0968
 Owner: Lewis Frisch
 Studio Manager: Lewis Frisch
 Engineers: Lewis Frisch Hamilton Underwood Brian Davis
 Direction: Sound Technical Services offers musicians and recording studios an affordable real-time tape duplication facility. Seven open reel decks (Otari, Tascam Technics) and 15 direct drive cassette decks (Technics WC 15 noise reduction and stereo compressors JBL ROR and Crestion monitors Producers and voice over studio featuring Sennomaster 8 in 4 board and Technics SP 15 turntables. Specializing in high quality duplication from 1 to 250 copies.

• **SOUNDSHINE PRODUCTIONS**
 723 W. Sunrise Blvd., Ft. Lauderdale, FL 33311
 (305) 463-9882
 Owner: Tom Graete
 Studio Manager: Cary Altshuler

• **SOUNDS OF WINCHESTER**
also REMOTE RECORDING
 P.O. Box 574, 314 Lanny Dr., Winchester, VA 22601
 (703) 667-9379
 Owner: Sounds of Winchester
 Studio Manager: Jim McCoy

•• SOUNDS UNREEL
2027 Cortland Place, Memphis, TN 38104
(901) 276-8468
Owner: Jon Hornyak & Don Smith
Studio Manager: Jon Hornyak & Don Smith

•• SOUTHWIND RECORDING STUDIOS
also REMOTE RECORDING
Route 9, Box 239, Statesboro, GA 30458
(912) 681-2560
Owner: J. Lee Audio Video
Studio Manager: David W. Joiner
Engineers: David W. Joiner
Dimensions of Studios: 12' x 12' main studio, 12' x 12' live room, 14' x 12' control room
Dimensions of Control Rooms: 12' x 6'
Tape Recorders: Otari MX5050 8-track, Otari MX5050D 2-track
Mixing Consoles: Sound Workshop series 10 channel kit or Kelsey Intercom 24, 24 x 24 or 24 x 32 console
Monitor Amplifiers: Crown C-700
Monitor Speakers: FAW MS 50-BL 4 x 12's
Echo, Reverb, & Delay Systems: Sound Workshop reverb
Other Outboard Equipment: Altec Lansing compressor and/or Decca compressor comp. set
Microphones: Sennheiser AKM 4-EV
Instruments Available: Upright Fender and Haverstran 12 string 5 piece full wood drum set
Rates: 1 hour per track \$5, 5 hour per track \$30 per track and 1/2 hr.

• THE STICK SHOWROOM STUDIO
1014 17th Ave. S., Nashville, TN 37212
(615) 327-4981
Owner: SYNAPSE
Studio Manager: Andy Wilson, Ellis

• STONEBRIDGE RECORDING
Rt. 15, Box 54, Maryville, TN 37801
(615) 983-7448
Owner: Michael Schubert
Studio Manager: Michael Schubert

•• SUNSHINE SOUND RECORDING STUDIO
also REMOTE RECORDING
2826 Whitlock St., Louisville, KY 40213
(502) 968-8757
Owner: Chris Sautter
Studio Manager: David Sautter

•• SURPRISE PRODUCTIONS
P.O. Box 80, Monticello, FL 32344
(904) 997-4319 or 997-2573
Owner: Scott S. Caswell
Studio Manager: Joe Curo, Mike Garrison, Joel Dick

•• SWEETSONG RECORDING
also REMOTE RECORDING
P.O. Box 2041, Parkersburg, WV 26102
(304) 489-2911
Owner: Robert Hoover
Studio Manager: Rudy Moore, Rick

•• TRAKS, INC.
1943 N.E. 148th St., North Miami, FL 33181
(305) 940-4848
Owner: Trak, Inc.
Studio Manager: Robert Kushner

•• TRUSTY TUNESHOP
also REMOTE RECORDING
Rt. 1, Box 100, Nebo, KY 42441
(502) 249-3194
Owner: Elsie Childers
Studio Manager: Marjorie Childers

•• USC SOUND ENTERPRISES
also REMOTE RECORDING
P.O. Box 11211, 190 Waynoka Lane, Memphis, TN 38111
(901) 458-0275
Owner: Rodney Peppernett

•• VILLAGE MEDIA
also REMOTE RECORDING
156 Drakes Lane, Summertown, TN 38483
(615) 964-2286
Owner: The Firm
Studio Manager: Michelle Thacker

•• WOODRICH RECORDING STUDIO
P.O. Box 38, Geo. Wallace Park Dr., Lexington, AL 35648
(205) 247-3983
Owner: Woody Richardson
Studio Manager: Woody Richardson

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Recommendations by performers, as well as engineers, have made Telex the fastest growing wireless mic system in the industry.

Performers tell us they prefer Telex wireless mics because of the rich, full-bodied sound. And because the mics feel and look like conventional microphones.

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...for the money Telex outperformed all others we tried...

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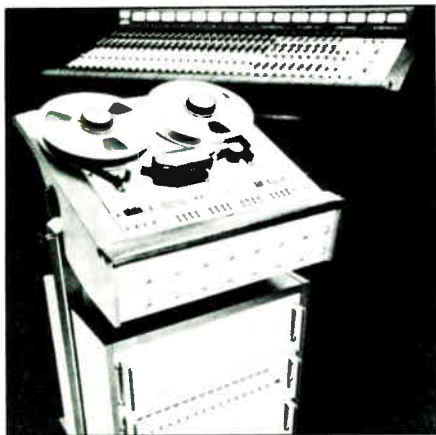
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••• **ALIVE RECORDINGS**
also REMOTE RECORDING
 1251 Virginia Ave., Harrisonburg, VA 22801
 (703) 434-6703
 Owner: Mennonite Board of Missions
 Studio Manager: Abe Bittenhouse



AUDIO IMAGE
 Pompano Beach, FL

••• **AUDIO IMAGE**
 3685 N. Federal Hwy, Pompano Beach, FL 33064
 (305) 943-5590
 Owner: Bob Henion
 Studio Manager: Bob Henion
 Engineers: Mike Hoffmann, Bob Henion
 Dimensions of Studios: 7'4" x 20' plus string barn, an emic room and drum room
 Dimensions of Control Room: 20' x 16'
 Tape Recorders: Tascam 85 16 Autolocator, 16 track, Tascam 80 8 4 track, (4) 2 track mastering decks
 Mixing Consoles: Tascam Model 16 24 outputs
 Monitor Amplifiers: SAE's
 Monitor Speakers: JBL 4011's, Auratones EAW MS 200's
 Echo, Reverb, and Delay Systems: Ursa Major Space Station Delalab Acousticcomputer, Delalab D1 1 MIC MIX
 Other Outboard Equipment: Loft analog delay, MXR flangers pitch transposers, numerous digital delays, parametric and graphic equalizers, Symetrix compressor/limiters, Technics turntable
 Microphones: Sennheiser (all models), AKG, Audio-Technica (all models)
 Instruments Available: Rhodes 88 Baldwin studio piano, Orchestrator organ synthesizer, full drum set, acoustic piano
 Rates: 8 track \$40/hr, 16 track \$65/hr

••• **AUDIO INCORPORATED**
 820 East Blvd., Charlotte, NC 28203
 (704) 376-3818
 Owner: Frank Rogers/Jay Howard
 Studio Manager: Frank Rogers/Jay Howard

••• **BRIGADIER SOUND STUDIOS**
also REMOTE RECORDING
 1119 Bell Street, Montgomery, AL 36104
 (205) 834-6881 or 269-5957
 Owner: Harold and Jayonn Beard
 Studio Manager: Jayonn Beard

••• **CEDARWOOD SOUND STUDIO**
 39 Muac Sq. East, Nashville, TN 37203
 (615) 255-6535
 Owner: Cedarwood Publishing Company
 Studio Manager: Clarke Schlicher

••• **DERBYTOWN SOUND STUDIOS**
 5900 Outer Loop, Louisville, KY 40219
 (502) 968-2320
 Owner: John Wesley
 Studio Manager: John Wesley

••• **FANTASY SOUND STUDIOS**
also REMOTE RECORDING
 14 Woods Dr., Granite Falls, NC 28630

(704) 396-1188
 Owner: Glen F. Heltner
 Studio Manager: Glen F. Heltner

••• **FINK/PINEWOOD RECORDINGS**
 P.O. Box 5241, Chesapeake, VA 23324
 (804) 627-0957
 Owner: Bill Johnson, Executive
 Studio Manager: Bill Johnson

••• **GOLDBAND RECORDING STUDIO**
 313 Church St., Lake Charles, LA 70601
 (318) 439-8839
 Owner: Eddie Shuler
 Studio Manager: Jeff LaJune

••• **GULF COAST SOUND STUDIO**
 P.O. Box 3062, Pensacola, FL 32506
 (904) 478-4361
 Owner: Wayne Blackmon
 Studio Manager: Mark C. Purser
 Engineers: Mark C. Purser & Mike Sheller
 Dimensions of Studios: 27' x 24' with drum isolation (9' x 9') and two additional isolation booths (9' x 5')
 Dimensions of Control Rooms: 14' x 5'
 Tape Recorders: MCI Studer Scully Only
 Mixing Consoles: Vintage 1975 Universal Audio (tube type)
 Monitor Amplifiers: BGW Crown McIntosh
 Monitor Speakers: Altec JBL, Auratone Koss
 Echo, Reverb, & Delay Systems: Lexicon models 224 and 93
 Other Outboard Equipment: Valley People MXR, Moog Lexicon S, Undertronic dbx URM
 Microphones: Neumann Sennheiser Shure Bros. AKG F.V.
 Instruments Available: Yamaha 6' concert grand piano, Fender Rhodes 73, Wurlitzer electric piano, Hammond C-3 with Leslie-Minimoga ARP, Yamaha drum kit with Zildjian and Paiste cymbals
 Rates: Upon request
 Direction: We are a 16 track facility utilizing what we feel are the best in both modern and vintage electronics. Our UA tube console, although re-conditioned to be fully compatible with today's electronics, still retains a warmth and clarity unmatched by any other transistor type board.

••• **HOUSE OF GOLD MUSIC, INC.**
 1614-16th Ave. S., Nashville, TN 37212
 (615) 383-4667
 Owner: House of Gold Music, Inc.
 Studio Manager: Howard Tooker

••• **JALEX RECORDINGS**
also REMOTE RECORDING
 319 Clematis St., West Palm Beach, FL 33401
 (305) 832-1538
 Owner: Jon A. Lind
 Studio Manager: Susan Elliott
 Engineers: Bill Harris, Jon A. Lind
 Dimensions of Studios: 38' x 17' plus vocal booth
 Dimensions of Control Room: 17' x 14'
 Tape Recorders: Ampex MM1100 16 track; Ampex AG 440B 8 track; Ampex AG 440 4 track; Ampex AG440 2 track; MCI JH 110H 2 track; Ampex 451 2/2 track; Naagra SD2 track; Naagra 4 2 mono; several other 1/4" machines
 Mixing Consoles: MCI 416 w/554's 24 in x 24 out
 Monitor Amplifiers: AB Systems, Peavey Crown
 Monitor Speakers: JBL Auratones
 Echo, Reverb, and Delay Systems: MIC MIX XI 365
 Other Outboard Equipment: Graphics limiters noise reduction DDL, vari-speed etc.
 Microphones: Neumann U 47's (tube) U 87's KM 84's, Sony C 500 C 7P's ECM 22P's, ECM 50P, Shure SM 57's, SM 76's, Sennheiser MKH 405 MD 421's MD 21 AKG C 412 D 224E D 119ES F V 6498 635A HF 55 Beyer M 900 Crown P2M's The Co direct boxes
 Instruments Available: Steinway grand, Hammond B 3 Rhodes piano, drums, congas, mimbba
 Rates: \$20 to \$100 per hour. Block time available. Call (405) 842-1548

••• **LAMON SOUND STUDIO**
also REMOTE RECORDING
 6870 A Newell Hickory Grove Rd., Charlotte, N.C. 28212
 (704) 537-0133
 Owner: Dwight L. Moody
 Studio Manager: David B. Moody
 Engineers: David Floyd, David Moody

Dimensions of Studios: A 20' x 30' (also a fully sealed, 8' x 10', comfortable isolation booth, and a special, very live, percussion annex), B 10' x 8'
 Dimensions of Control Room: 18' x 20'
 Tape Recorders: MCI JH 100 w/Autolocator 16 track; Ampex AG-440B 2 track, Technics SL 1500LIS 2 track, TEAC X 7 2 track, Kenwood KX-1030 cassette
 Mixing Consoles: MCI JH 400 (light meters), 24 in x 24 out, console has been extensively modified with reciprocal mid band EQ, channel mutes, mike padding, individual buss/tape return solos, large producer's desk, stop clock
 Monitor Amplifiers: Yamaha P-200
 Monitor Speakers: E-V Sentry V Auratone 5C, also E-V Sentry V in studio
 Echo, Reverb, and Delay Systems: AKG BX10, Eventide Harmonizer & keyboard
 Other Outboard Equipment: (2) UREI 1176LN, Orban 622B
 Microphones: (4) AKG C 414, (2) C 451 w/accessories, (2) E-V RE 20's, (4) 635 A's, (2) Shure SM-81's, 5B (1928)
 Instruments Available: Yamaha 6' conservatory grand, Leedy/Ludwig drum kit, many other instruments available on loan or rent from related company
 Rates: \$40/hr base, with special record packages and block time packages always available. 2" tape may be rented or purchased
 Direction: Lamon Sound Studios was opened by professional musicians for use by professional musicians. Experienced engineering competent production assistance, truly top grade equipment, and a comfortable environment are available at about half the price of competitive studios in Charlotte. Our clients are our only sales people.

••• **LITTLE WOODS RECORDING**
 Rt. 2, Box 356, Denham Springs, LA 70726
 (504) 664-3746
 Owner: Lyle W. Simms
 Studio Manager: Will Simms

••• **MASTERCRAFT RECORDING CORP.**
also REMOTE RECORDING
 437 N. Cleveland St., Memphis, TN 38104
 (901) 274-2100
 Owner: James Howard Craft, Sr.
 Studio Manager: James Craft, Jr.

••• **MERIT RECORDING CO.**
 3475 Buena Vista Rd., Columbus, GA 31906
 (404) 689-9629
 Owner: Thomas W. Merritt
 Studio Manager: Bruce Eddins

••• **METAMORPHOSIS RECORDING STUDIO**
also REMOTE RECORDING
 7120 N. Florida Ave., Tampa, FL 33604
 (813) 238-6257
 Owner: M.E. Erbaugh, G. Smith
 Studio Manager: Denny Little



MIAMI SOUND STUDIO
 Miami, FL

••• **MIAMI SOUND STUDIO**
 2819 N.W. 7 Ave., Miami, FL 33127
 (305) 635-4890, 4891
 Owner: Carlos D. Granados, Jr.
 Studio Manager: Ange D. Granados

Suddenly, everyone else has to start over.

Series Three from QSC. From this point on, every other power amplifier takes a step backward.

We've designed what will be the standard from which everything else is measured.

Series Three combines high-performance, reliability, and microscopic attention to detail, design and the execution thereof.

Our overall goal was to provide a series of reference-quality professional amplifiers designed specifically for major studios, touring companies and engineered sound installations.

We met our goal. As a matter of fact, we significantly exceeded it.

Take a look at the features of our Series Three amplifiers. High-efficiency circuitry, extended dynamic headroom, true dual-mono configuration, front-removable modular design. And we've packaged it all in a low-profile chassis. More power, less rack space.

We were so impressed with our prototype Series Three amps that

we decided to take them into the field for numerous "A/B" listening comparisons. They were compared for audio quality and performance under a wide range of power requirement conditions. As we had expected, the response was overwhelmingly positive. The Series Three amplifiers stood a significant step above the others.

The moral of the story: Why settle for a product that's only outstanding in a few areas? QSC Series Three is a comprehensive design approach that combines exceptional audio performance, solid reliability, state-of-the-art features, and more power in less rack space.

So we urge you to look into our Series Three amplifiers. Because while everybody else is looking where they've been, QSC is stepping into the future.

QSC Audio Products, 1926 Placencia Avenue, Costa Mesa, CA 92627. Phone: (714) 645-2540.

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John Kik & Assoc., Music

Grand Rapids

MINNESOTA

MSC Pro Sound

St. Paul

NEW JERSEY

Caiazzo Music

Freehold

NEW YORK

Alex Musical

New York City

Only Guitar Shop

Clifton Park

Universal Sound

Lake Grove

Whirlwind Audio

Rochester

NORTH CAROLINA

Associated Sound Prod.

Raleigh

Duncan Pro Sound

Winston-Salem

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Ro'Cel Electronic

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Pawtucket

SOUTH CAROLINA

Gordon Light & Sound

Greenville

TENNESSEE

Keiths Corner Music

Cockeville

Lowrance Sound Co.

Union City

Spectrum Sound

Nashville

TEXAS

Crossroads Audio

Dallas

L.D. Systems

Houston

Recorder Center

Dallas

VIRGINIA

Stage Sound

Roanoke

WEST VIRGINIA

The Pied Piper

Huntington

WISCONSIN

Regenberg Music

Middleton

Uncle Bob's Music

Milwaukee

Engineers: Carlos D. Granados, Jr., Juan G. Covas, Paul Khoury
Dimensions of Studios: 17'½ x 13'¼ x 28'
Dimensions of Control Rooms: 17 x 10 x 15'
Tape Recorders: MCI JH16 16 track, Ampex 440B 2 track, Studer/Revox 2 track, Scully 2 4 track
Mixing Consoles: NEVE 802R 24 in x 16.24 out
Monitor Amplifiers: McIntosh 2300, 2105, 255
Monitor Speakers: JBL 4343 (Gauss), JBL 4311 Auratone SC Tannoy
Monitor Amplifiers: McIntosh 2300, 2105, 255
Monitor Speakers: JBL 4343 (Gauss), JBL 4311 Auratone SC Tannoy
Echo, Reverb, and Delay Systems: Echo delay tape, 2 EMT 140 echo chambers
Other Outboard Equipment: Eventide Harmonizer, Scamp Rack UREI Teletronix LA2A limiters, LA3A limiters Pultec equalizers, compressors, NEVE limiters, vocal doubler, all effects possible, any outboard equipment upon request
Microphones: Neumann U 87's, U 67's, KM 84's, AKG 451, E.V. RE 20, Sennheiser, Shure 57, Sony C 37P, RCA 77 DX
Instruments Available: Yamaha grand piano, Fender Rhodes, Roland synthesizer, chimes, vibes, congas, timbales, Synare, Rhythm Box, Harmonizer, Slingerland drums, Hammond B3
Rates: Rates upon request, including block time
Extras: Complete Scully mastering room, stampers, record pressing and shipping, complete art dept. for jacket, label and logo design. In-house producers, arrangers and musicians. Colombian coffee, Latin food and lounge, with color TV. Also drum booth. Totally newly furnished lobby/wrelaxation room and stereo system
Direction: Studio philosophy: simply that our engineers strive to treat every recording as if it were their own. Aspiration: to be categorized as a hit-making, quality studio. Logo: "We've got the sound you want!"

••• **THE MISSISSIPPI RECORDING COMPANY**
 107 N. State St., Jackson, MS 39201
 (601) 354-0857
Owner: Jerry Parkett
Studio Manager: Lure Dinkins

••• **MORNING SUN RECORDING STUDIO**
 416 North Orange Ave. Mail: P.O. Box 935,
 Deland, FL 32720
 (904) 736-0300
Owner: Greg and Nancy Rike
Studio Manager: Greg and Nancy Rike
Extras: We do music videos!!!
Direction: We have done numerous ads, albums, and A.V. shows as well as work for Warner Brothers and Waylon Jennings. We are proud to be having a song on Tanya Tucker's new album and are also working with people now that you will be hearing of in the future. Our philosophy is to enjoy the recording process, encounter a relaxed atmosphere conducive to creativity.

••• **OCEAN OPRY RECORDING STUDIO**
 8400 W. Hwy 98, Panama City Beach, FL 32407
 (904) 234-5464
Owner: Wayne Rader
Studio Manager: Dennis Rader

••• **PLAYGROUND RECORDING STUDIO**
 103 Westview Ave., Valparaiso, FL 32580
 (904) 678-7211
Owner: Finley Duncan
Studio Manager: Graeme Iyco

••• **POLYMUSIC RECORDING STUDIOS INC.**
also REMOTE RECORDING
 225 Oxmoor Circle, #812, Birmingham, AL 35209
 (205) 942-3222
Owner: Daniel E. Whiteside
Studio Manager: Michael Panepinto

••• **REAL TO REEL**
 4911 Henry Blvd., Stockbridge, (Atlanta), GA 30281
 (404) 474-4776
Owner: Bill Turpin
Studio Manager: Scott Lantz, Asst. Mgr. Mark Hobson

••• **RECORDING ASSOCIATES STUDIOS**
also REMOTE RECORDING
 St. Andrews Center, 1045 Savannah Highway,
 Charleston, SC 29407
 (803) 556-5770
Owner: Michael J. Harbin, Ronald E. Clifton
Studio Manager: Ronald E. Clifton

••• **SIGNAL SOUND STUDIO**
 2310 Marietta Blvd., Ste. D, Atlanta, GA 30318
 (404) 355-0909
Studio Manager: Dick Roberts
Engineers: Dick Roberts—staff, Maintenance Engineering, Asst. Engineer, Peter Mercure, Trackside Engineering, Les Duncan
Dimensions of Studios: 25 x 40 x 14

Dimensions of Control Room: 18 x 18 x 14
Tape Recorders: MCI JH 10, 16 track, TEAC 3340 4 track, Ampex ATH 700 2 track
Mixing Consoles: Trackside Engineering Proto, 16 in x 8 out
Monitor Amplifiers: AB Systems 205, Dynaco ST 80
Monitor Speakers: E.V. Sentry III's, ROR's
Echo, Reverb, and Delay Systems: Lexicon 224 and automated mixdown Eventide Harmonizer H 910
Other Outboard Equipment: Orban parametric equalizers (2) dbx 160 comp/limiter (2), Kepex, 16 tracks dbx, Echoplex, asst flangers & phasers, TRS 80K computer handles track logging and information storage interfaced with Eventide's 1/8 octave frequency analyzer
Microphones: Beyers M 500, AKG 414 ER, 451 s, 505's, 707, Shure SM 57's, SM 58's, Sennheiser 421, Wright SR 1
Instruments Available: Studio upright piano, Mini Moooi, string synthesizer, steel guitar, Martin D 45 acoustic & Gibson 150 guitars, asst percussion
Rates: Upon request

••• **SINGLETON SOUND STUDIO**
 3106 Belmont Blvd., Nashville, TN 37212
 (615) 385-1960
Owner: Shelby Singleton
Studio Manager: John Singleton

••• **SOUND OF BIRMINGHAM**
also REMOTE RECORDING
 3625 5th Ave. So., Birmingham, AL 35222
 (205) 595-8497
Owner: Don Mosley
Studio Manager: Don Mosley

••• **SOUND TRAX, INC. RECORDING STUDIOS AND PRODUCTION SERVICES**
 1626 Glenwood Ave., Raleigh, NC 27608
 (919) 832-9953
Owner: Sound Trax, Inc.
Studio Manager: Don Stone

••• **SPECTRUM RECORDING STUDIOS, INC**
also REMOTE RECORDING
 999 S. Federal Hwy., Deerfield Beach, FL 33441
 (305) 428-0119
Owner: Spectrum Recording Studios, Inc.
Studio Manager: Ray Lyon
Engineers: Michael Grosso, Ray Lyon
Dimensions of Studios: 20 x 16 live area dead area design, 13 x 10 piano isolation room, 4 x 3 1/2 triangular shape isolation booth
Dimensions of Control Rooms: 14 x 12
Tape Recorders: Tascam 90 16 16 track, Tascam 35 2 (custom modifications) 2 track, TEAC A-3440 4 track, Nakamichi 480 cassette, TEAC A 103 cassette
Mixing Consoles: Sound Workshop Series 4028MB 20 in x 16 out
Monitor Amplifiers: B&W SAE, Yamaha
Monitor Speakers: UREI 811A Time Aligned, Auratone SC & 5W, Delphi, Foxtex T10 headphones
Echo, Reverb, & Delay Systems: Studio Technologies Etoplate II, Eventide H949 Harmonizer, Lexicon Prime Time
Other Outboard Equipment: (2) UREI LA 4 compressor/limiters, Symetrix SG 200 signal gates, Symetrix CL 100 compressor/limiter, dbx 163 compressor/limiter, Spectro Acoustics Model 210 stereo 10 band EQ, full dbx noise reduction, Technics SL-1205 turntable
Microphones: Neumann U 87, AKG 451EB, 414FB, D12F, D 1000E, Sennheiser 421MD, E.V. RE 15, RE 20, Shure SM 81, SM 57, 565SD, PF50SP, Audio Technica 813, Countryman Associates DI boxes
Instruments Available: Ivers and Pond grand piano, Rhodes electric piano (suit case 73), Mini moooi, Sequential Circuits Prophet 5, Tama drums, percussion, other instruments and amplifiers available on request
Video Equipment & Services: Professional services available on request
Rates: \$17-\$55/hr. Special package and demo rates available
Extras: Control room design by Studio Supply Co. of Nashville, IVC DAS90 digital mixdown available on request, full RV hook up on premises, record pressing, tape duplication, reception lounge w. retro-arcade and headphones jacks for private monitoring of sessions, close proximity to area beaches, hotels, restaurants, etc.
Direction: Upgrader to 24 tracks in early 1983. Our philosophy is to provide a quality recording service at the best possible price to you. Flexibility is a key to our operation, both in our pricing and in the control room. We specialize in recording contemporary Christian and gospel music. Our affiliate, Paragon Productions produces top notch jingles and broadcast products for radio and TV. Call or write for brochure and rate card.

••• **TRACK-16 RECORDING STUDIO**
also REMOTE RECORDING
 118 Constitution Ave., Lexington, KY 40508
 (606) 253-0588
Owner: Thomas D. Tandy
Studio Manager: Thomas D. Tandy

••• **STRAWBERRY JAMM STUDIOS INC.**
also REMOTE RECORDING
 3964 Apian Way, West Columbia, SC 29169
 (803) 356-4540
Owner: Bob & Mary Curlee
Studio Manager: Bob Curlee

••• **"A SUMMER PLACE" (Formerly Studio by the Pond)**
also REMOTE RECORDING
 204 Shoreside Drive, Rt. 2, Hendersonville, TN 37075
 (615) 824-2311
Owner: Lee Hazen
Studio Manager: Lee Hazen

••• **SWEETBAY RECORDING STUDIOS**
also REMOTE RECORDING
 1317 Jackson Bluff Rd., Tallahassee, FL 32304
 (904) 576-8868
Owner: Burt Norton
Studio Manager: Burt Norton

••• **TANDEM RECORDING STUDIO**
 13 Moore St., Bristol, VA 24201
 (703) 466-8675
Owner: Tandem Records, Inc.
Studio Manager: Joe Deaton

••• **TELSTAR RECORDING STUDIO**
 2074-17th St., Sarasota, FL 33580
 (813) 365-0337
Owner: Rick C. Moulton
Studio Manager: Rick C. Moulton, Officer Mgr. Lynne Nieder
Engineers: Rick C. Moulton, Bud Snyder
Dimensions of Studios: 850 sq ft
Dimensions of Control Room: 400 sq ft
Tape Recorders: MCI JH 114 16 track, MCI JH 110 2 track, MCI JH 110 2 track
Mixing Consoles: MCI JH 428, 20 in x 20 out
Monitor Amplifiers: JBL, SAE, HGW Phase Linear
Monitor Speakers: JBL 4343, JBL 1100, Auratones
Echo, Reverb, and Delay Systems: MasterRoom, Lexicon, Lexicon 224, Eventide
Other Outboard Equipment: dbx limiter, UREI limiters, Kepex Gain Brain, Audioarts parametric EQ, EXR, Orban De-Esser, White 1/6 octave EQ
Microphones: Sequential Circuits PZM's, Neumann U 87's, AKG 414's, SM-56's, 57's, Sennheiser 421's, Sony and E.V.
Instruments Available: Kawai baby grand, ARP Hammond B3 w. Leslie, Tama drum kit, B and K test equipment
Rates: Call for quotation
Extras: Studio design by John Strzyk

••• **THRESHOLD RECORDING**
also REMOTE RECORDING
 410 Elm Ave. S.W., Roanoke, VA 24016
 (703) 345-2539
Owner: J. Harold Thompson, F. Howard Beasley
Studio Manager: F. Howard Beasley
Engineers: J. Harold Thompson
Dimensions of Studios: 30 x 25
Dimensions of Control Rooms: 20 x 12
Tape Recorders: Ampex 1100 16 track, Ampex 440B 8 track, also (2) 440B 2 track and mono machines
Mixing Consoles: L. H. Modular Dev; es 440, 24 in x 16 out
Monitor Amplifiers: AB Systems, Ashley Audio FET
Monitor Speakers: E.V. Sentry III, Altec 9845, Auratones
Echo, Reverb, & Delay Systems: AKG BX 20 reverb, Lott Modular Devices analog delay (2), Eventide Digital Delay 1745A
Other Outboard Equipment: UREI 1176 limiters, Ashley SC 50 limiters, Gain Brains, Ashley SC 66 parametric EQ, Allison Kepex Orban/Parasound stereo synthesizer, Orban/Parasound D'Esser
Microphones: Neumann U 87, AKG 451, Shure SM 58, 57, E.V. RE 15, Sequential Circuits PZM 130, Studer SKM 511
Instruments Available: Steinway grand piano, Hammond B 3 organ, Fender P bass, Ludwig drums, clavinet, Rhodes 88
Rates: Available on request

••• **WILLOW CREEK STUDIOS**
also REMOTE RECORDING
 2228 Redmond Circle, Rome, GA 30161
 (404) 232-6954
Owner: Morgan Ayers
Studio Manager: Morgan Ayers

Need Equipment? Check MIX Classified Page 101

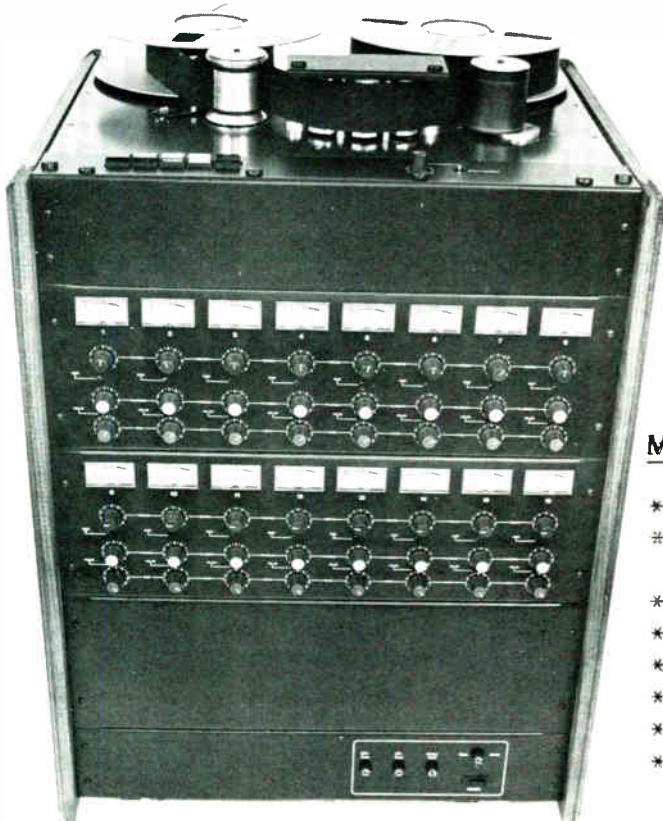
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| 1 Model TR16 16 track-2 inch.....\$14,900 Plus | 4 Model SM24'16'2 console...\$12,900 |
| 2 Model TR24 24 track-2 inch.....\$17,200 | 5 Model ML24'24 24 into 24 in line console with patch bay\$15,900 |
| 3 Model TR2 2 track-1/2 inch.....\$ 5,000 Plus | |



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- * 30 i.p.s. to order
- * Full function remote
- * Zero locate
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With our total 'IN HOUSE' manufacturing techniques, we are able to ensure that each product is manufactured to very high standards ensuring the most cost effective use of materials while maintaining long-term operational reliability.

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•••• ALLEN-MARTIN AUDIO
also REMOTE RECORDING
9701 Taylorsville Rd., Louisville, KY 40299
(502) 267-9658

Owner: Ray Allen Hardy Martin
Studio Manager: Martin I. Andersen
Engineers: Martin I. Andersen
Dimensions of Studios: 40 x 24 x 16
Dimensions of Control Rooms: 18 x 25 x 6
Tape Recorders: MCI JH 114 24 track, Ampex 440 C Scully 280, Sony

Mixing Consoles: Lewellyn Martin Custom 24 in x 24 out
Monitor Amplifiers: Spectra Sonics 701
Monitor Speakers: JBL 444 (4) 11

Echo, Reverb, & Delay Systems: DBL Eventide digital delay Eventide Harmonizer AKG BX10 reverb Lexicon digital reverb

Other Outboard Equipment: Eventide tuner Sontec parametric EQ Spectrasonics compressor dbx noise reduction MXR flanger

Microphones: Neumann U87 Sennheiser 421 F.V.BF 20 & 16 AKG 451 Shure SM57 & 58 Sony C55P

Instruments Available: Steinway grand piano stereo Fender Rhodes, Roland 2000 synthesizer, clavinet, B3 Hammond wireless, Yamaha bass and auto amplification, Ludwig drums

Video Equipment & Services: Sony Type 5 1/4" and 1" format C remote (EFP) and studio recording Ikegami & Sony cameras, special effects generator A/B roll 10x search ADDA dual channel digital effects, electronic graphics w/colorizer; full in house editing and audio mix. 40x10x30 video sound stage w/cy video-tape duplication, Sony Ampex tape dealer JBL studio monitors

Rates: Rates available upon request. Contact Project Manager

•••• ALPHA AUDIO
2049 W. Broad St., Richmond, VA 23220
(804) 358-3852
Owner: Alpha Recording Corp
Studio Manager: Joe Horner



ARDENT RECORDINGS, INC.
Memphis, TN

•••• ARDENT RECORDINGS, INC.
also REMOTE RECORDING
2000 Madison Ave., Memphis, TN 38104
(901) 725-0855
Owner: John Fry
Studio Manager: John Fry

Engineers: William C. Brown, Robert Jackson, John Hampton, Eddie DeGarmo, Dana Key, Joe Hardy, Larry Nix, Jack Holder, Henry Bush

Dimensions of Studios: Studio A 25 x 40 x 16, Studio B 25 x 20 x 16, Studio C 25 x 35 x 14, Mastering 15 x 20 x 10. Each studio with two isolation booths

Dimensions of Control Rooms: Studio A 16 x 25 x 10, Studio B 16 x 25 x 10, Studio C 18 x 25 x 10

Tape Recorders: (3) MCI JH 1624 24 track, 3M M56 16 track, (3) MCI JH 110 2 track, 3M M79 2 track, (2) 3M M64 2 track, (3) Scully 280 2 track

Mixing Consoles: MCI 542 42 in x 32 out, Spectra Sonics 24-16, 28 in x 24 out, Spectra Sonics 22-16 24 in x 24 out. Mastering room equipped with Neumann VMS 70 lathe

Monitor Amplifiers: BGW, Crown
Monitor Speakers: JBL 4350, Audicon, JBL 4311, JBL 4340, Auratones, Advent, Braun

Echo, Reverb, and Delay Systems: 3 EMT 140, 3 acoustic chamber, (2) H949 Harmonizer, Lexicon, Allison, Eventide, Marshall, ADR

Other Outboard Equipment: Limiters and compressors: Newt, dbx, ADR Fairchild UA EMT EQs Neve Orban, ADR Pultec Noise gates Kojex ADH All multi-tracks and two tracks equipped with Dolby A (dbx optional for two tracks) All rooms tuned with UHEI filters and B&K spectrum analyzer (Studio equipped with MCI automation)

Microphones: Neumann U87 U67 U64 M249 KM86, KM84, AKG C 414 C 451 D 224 D 11, D 200 Sennheiser MD 421 MD 441 F.V.BF 20 RE 16 Shure SM 57 3, Beyer M201

Instruments Available: Steinway grand Yamaha grand Chick grand organ AHP 2500 Hohner clavinet Hammond organ Fender Rhodes B3 Gretsch drums Fender HiWatt Acoustic Ampex amplifiers

Video Equipment & Services: Complete video production services and synchronization

Extras: MCI SMPTE synchronization cable television kitchen lounge

Rates: Upon request
Direction: Clients ZZ Top, Bar Kays, Parliament Funkadelic, Point Blank, Boba, Trower, Led Zepplin, Con Funk-Shun, Anita Wray Emerson Lake & Palmer, Bootsy, Hubert Pan, Cheap Trick, Memphis Horns, Commodores, Leon Russell, Isaac Hayes, Black Oak Key, Clark Charlie Rich, Amazing Rhythm Aces, De Garmo & Roy, Mylon LeFevre, Tom Tail Jones, Shaun Cassidy, Ethonee Webb, Chocolate Milk, Kwick

•••• ARTISAN RECORDERS, INC.
ONLY REMOTE RECORDING
1421 S.W. 12 Avenue, Pompano Beach, FL 33060
(305) 786-0660

Owner: Peter J. Yanilos

Studio Manager: Peter J. Yanilos and Roy Monzon
Direction: Some clients AC/DC Atlanta Rhythm Section, Blackfoot, Pat Benatar, Roy Clark, The Commodores, Crosby Stills & Nash Heart, Al Jarreau, George Martin, Willie Nelson, Leo Pastorius, The Police, Kenny Rogers, Linda Ronstadt, Spyro Gyra, Weather Report. We have been providing complete on location multi-track recording & soundmixing services to the record, television, radio, and film industries for 6 years. In that time we have earned a reputation as one of the finest mobile recording companies in the business. We are very grateful to our many clients for putting their faith in us and putting us on the map.

•••• AUDIO MEDIA RECORDERS
808 19th Ave. South, Nashville, TN 37203
(615) 327-9301
Owner: C.E. Jackson, Paul Whitehead, Doug Yoder, B.C. Patrick
Studio Manager: Paul Whitehead
Dimensions of Studios: #1 30 x 28 #2 14 x 13
Dimensions of Control Rooms: #1 22 x 16 #2 13 x 14
Tape Recorders: #1 Studer A 80 24 track Studer B 67 2 track #2 Studer A 80 24 track Studer B 67 2 track
Mixing Consoles: #1 Harrison 32 2C, 28 in x 28 out, #2 Harrison MR 2 28
Monitor Amplifiers: BGW Phase Limiter
Monitor Speakers: Westlake TM 1 JBL 4410 and A trapezoid, both studios
Echo, Reverb, and Delay Systems: (4) EMT steps units Lexicon 102
Other Outboard Equipment: Eventide Harmonizer, (6) dbx 160's dbx 165, Dolby noise reduction, UREI 1176LN's (2) 2) LA3A's stereo Orban EQ Pultec EQ Acou Punch Auto Syn

Microphones: Shure SM 57's, Sennheiser 421 Neumann 87 FET, 47 FET, 67's 249's, 84's; AKG 414's, 451's 202F C 60 F.V. RE-20's, RE 15's, 635's, Studer, Schoeps SKM's

Instruments Available: Yamaha 9' grand, B-3 organ Fender Rhodes, Hohner clavinet, Wurliizer electric piano, AHP Axte and Omni Pearl drum set 50 percussion instruments

Rates: Supplied on request and based on volume

•••• AXIS SOUND STUDIO
1314 Ellsworth Industrial Dr., Atlanta, GA 30318
(404) 355-8680
Studio Manager: George Pappas

•••• BEE JAY RECORDING STUDIOS
5000 Eggleston Avenue, Orlando, FL 32810
(305) 293-1781

Owner: Eric T. Schabacker, President
Studio Manager: Jim Katt
Engineers: Bill Vermillion, Andy deGanahl, Dana Cornock
Dimensions of Studios: A 35 x 45 B Irregular 25 x 12 and 12 x 12

Tape Recorders: Stephens 821B 16/24/32 track; MCI JH 115-24 8/16/24 track, Ampex ATR-100 2 track, Studer B 67 2 track (2), ElectroSound ES-500 2 track, Ampex MR-70 4 track, Ampex MR 70 2 track; Studer A800 24 track

Mixing Consoles: Studio A Sphero Super Eclipse C 40 in x 24 32 out Studio B Audtronic 501, 26 in x 16/24 out
Monitor Amplifiers: Studio A Crown DC 400's (mids lows), BGW 100 (highs) Studio B BGW 750
Monitor Speakers: Studio A Westlake TM 1 (modified ported Gauss drivers, woofers trapped) Studio B UREI 811 Time Alcon, Auratone 5C and JBL 4311 also available

Echo, Reverb, and Delay Systems: 2) EMT ST 140, MCMIX Model III (Super C), MCMIX Master Room Lexicon 224
Other Outboard Equipment: ADR Vocal Stressor ADR Stamp Rack dbx 160 dbx 162 dbx 165 Marshall Time Modulator Eventide 1745 DDL Harmonizer 949 Harmonizer 910 Eventide Instant Flanger Lexicon Prime Time UREI LA4A, UREI 1176 Orban stereo synthesizer, Orban dual parametric, Pultec EQP 1A 4

Microphones: Neumann U87 U47 KM 84 KM 86 AKG C 414 C 451F C 24 D-12 D 200 Sony C 3/P Schoeps CM 54 Sennheiser 421 441 Shure SM 5 SM 7 SM 53 SM 57 SM 58, Beyer MD 160, RCA 77DX, E.V.CS 15 RE 20, RE 16 RE 15, 635A, Wahnebrock P2M A

Instruments Available: Kawai 74 grand piano, Steinway 6 grand piano Hammond C 3 w Leslie Hohner clavinet Rhodes 73 Mini Moon Model D FM1 100 200 "Poly Box" synthesizers Pearl drum set, Rogers drum set, Music Man amps Mu Tron HiPhase, Mu Tron III

Extras: dbx noise reduction (56 channels), Allison 65K automation Studio A), lounge areas, guest cottage
Rates: Studio A \$145/hr (16 24 or 32 track) weekly rates available Studio B \$95/hr 24 track \$75/hr 16 track, weekly rates available. All instruments signal processing included at no extra charge

Direction: As our advertising denotes, we believe "The difference is How You're Handled." Groups like Molly Hatchett, Blackfoot, Pat Travers, Doc Holiday, Cameo, Nitty Gritty, Long John Baldry, Axe, Krokos, Lucas Priest, Gladys Knight and others have proven that it's true. Credits include 6 gold 2 platinum LP's

•••• THE BENNETT HOUSE
134 4th Ave. N., Franklin, TN 37064
(615) 790-6896
Owner: Norbert Putnam
Studio Manager: Ann Keener
Engineers: Call for list of independents. Studio provides tape assistant

Dimensions of Studios: 44 x 18, two isolation booths
Dimensions of Control Rooms: 20 x 26
Tape Recorders: (2) MCI transformerless w SMPTE lock up, BTX syn - 24 46 track (2) Studer B 2 2 tracks Ampex ATH 100 - 2 track (2) Technic cassettes

Mixing Consoles: Trident A 28 in x 24 out
Monitor Amplifiers: Yamaha
Monitor Speakers: Tri Amp Klein & Hummel, JBL 4313 4315 & 4310s, Technics F 28, Yamaha NS10s, Braun 3 way, Auratones

Echo, Reverb, & Delay Systems: EMT 250 Digital, Lawson Plate AMS DDL Eventide 949
Other Outboard Equipment: Stamp Rack with 10 noise gates (2) EQs, (2) limiter/compressors, time shape module auto pan vocal stressor

Microphones: Tube M-249, 87's, 414, 421's, 224's, etc
Instruments Available: Baldwin 7' and Eddie Reynolds Rhodes
Rates: \$125/hr

•••• BIAS RECORDING COMPANY, INC.
also REMOTE RECORDING
5400 Carolina Place, Springfield, VA 22151

Mixing Consoles: Studio A Sphero Super Eclipse C 40 in x 24 32 out Studio B Audtronic 501, 26 in x 16/24 out
Monitor Amplifiers: Studio A Crown DC 400's (mids lows), BGW 100 (highs) Studio B BGW 750
Monitor Speakers: Studio A Westlake TM 1 (modified ported Gauss drivers, woofers trapped) Studio B UREI 811 Time Alcon, Auratone 5C and JBL 4311 also available

Echo, Reverb, and Delay Systems: 2) EMT ST 140, MCMIX Model III (Super C), MCMIX Master Room Lexicon 224
Other Outboard Equipment: ADR Vocal Stressor ADR Stamp Rack dbx 160 dbx 162 dbx 165 Marshall Time Modulator Eventide 1745 DDL Harmonizer 949 Harmonizer 910 Eventide Instant Flanger Lexicon Prime Time UREI LA4A, UREI 1176 Orban stereo synthesizer, Orban dual parametric, Pultec EQP 1A 4

Microphones: Neumann U87 U47 KM 84 KM 86 AKG C 414 C 451F C 24 D-12 D 200 Sony C 3/P Schoeps CM 54 Sennheiser 421 441 Shure SM 5 SM 7 SM 53 SM 57 SM 58, Beyer MD 160, RCA 77DX, E.V.CS 15 RE 20, RE 16 RE 15, 635A, Wahnebrock P2M A

Instruments Available: Kawai 74 grand piano, Steinway 6 grand piano Hammond C 3 w Leslie Hohner clavinet Rhodes 73 Mini Moon Model D FM1 100 200 "Poly Box" synthesizers Pearl drum set, Rogers drum set, Music Man amps Mu Tron HiPhase, Mu Tron III

Extras: dbx noise reduction (56 channels), Allison 65K automation Studio A), lounge areas, guest cottage
Rates: Studio A \$145/hr (16 24 or 32 track) weekly rates available Studio B \$95/hr 24 track \$75/hr 16 track, weekly rates available. All instruments signal processing included at no extra charge

Direction: As our advertising denotes, we believe "The difference is How You're Handled." Groups like Molly Hatchett, Blackfoot, Pat Travers, Doc Holiday, Cameo, Nitty Gritty, Long John Baldry, Axe, Krokos, Lucas Priest, Gladys Knight and others have proven that it's true. Credits include 6 gold 2 platinum LP's

•••• THE BENNETT HOUSE
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Mixing Consoles: Trident A 28 in x 24 out
Monitor Amplifiers: Yamaha
Monitor Speakers: Tri Amp Klein & Hummel, JBL 4313 4315 & 4310s, Technics F 28, Yamaha NS10s, Braun 3 way, Auratones

Echo, Reverb, & Delay Systems: EMT 250 Digital, Lawson Plate AMS DDL Eventide 949
Other Outboard Equipment: Stamp Rack with 10 noise gates (2) EQs, (2) limiter/compressors, time shape module auto pan vocal stressor

Microphones: Tube M-249, 87's, 414, 421's, 224's, etc
Instruments Available: Baldwin 7' and Eddie Reynolds Rhodes
Rates: \$125/hr

•••• BIAS RECORDING COMPANY, INC.
also REMOTE RECORDING
5400 Carolina Place, Springfield, VA 22151



RECORDING STUDIOS
ORLANDO, FLORIDA

BEE JAY RECORDING STUDIOS
Orlando, FL

•••• THE BENNETT HOUSE
134 4th Ave. N., Franklin, TN 37064
(615) 790-6896
Owner: Norbert Putnam
Studio Manager: Ann Keener
Engineers: Call for list of independents. Studio provides tape assistant

Dimensions of Studios: 44 x 18, two isolation booths
Dimensions of Control Rooms: 20 x 26
Tape Recorders: (2) MCI transformerless w SMPTE lock up, BTX syn - 24 46 track (2) Studer B 2 2 tracks Ampex ATH 100 - 2 track (2) Technic cassettes

Mixing Consoles: Trident A 28 in x 24 out
Monitor Amplifiers: Yamaha
Monitor Speakers: Tri Amp Klein & Hummel, JBL 4313 4315 & 4310s, Technics F 28, Yamaha NS10s, Braun 3 way, Auratones

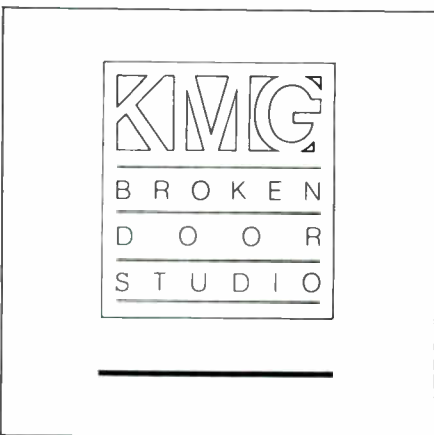
Echo, Reverb, & Delay Systems: EMT 250 Digital, Lawson Plate AMS DDL Eventide 949
Other Outboard Equipment: Stamp Rack with 10 noise gates (2) EQs, (2) limiter/compressors, time shape module auto pan vocal stressor

Microphones: Tube M-249, 87's, 414, 421's, 224's, etc
Instruments Available: Baldwin 7' and Eddie Reynolds Rhodes
Rates: \$125/hr

•••• BIAS RECORDING COMPANY, INC.
also REMOTE RECORDING
5400 Carolina Place, Springfield, VA 22151

Owner: Bill McElroy & Bob Dawson
Studio Manager: Gloria I. Daniels Asst. Studio Manager
 Janet L. Davies

**** **BLACKWOOD SOUND FACTORY**
Box 17272, Memphis, TN 38117
 (901) 767-2220
 Owner: Ron Blackwood
Studio Manager: Harriett Boyette



BROKEN DOOR STUDIO
 Nashville, TN

**** **BROKEN DOOR STUDIO**
 also **REMOTE RECORDING**
 5405 Stanford Dr., Nashville, TN 37215
 (615) 269-0727

Owner: Keeble Media Group
Studio Manager: Peter Keeble
 Engineers: Richard A. Hor, Peter Keeble, various
 Dimensions of Studios: 17 x 25
 Dimensions of Control Room: 10 x 14
 Tape Recorders: MTH 114 24/16 track, Studer B 67 2 track
 Ampex 440 4 1/2 mono, Revox A 700 2 track, Sully 280 2 track
 Technics cassette
 Mixing Consoles: Tangent 210 24 in x 24 out, mainly modified
 w/4 additional effects sends, 12 additional returns
 Monitor Amplifiers: Bryton 415, McIntosh 2200, GAS, BGW
 Crown
 Monitor Speakers: ADS 730, ADS 810, JBL 4+1, JBL 4+11,
 MDM 4, Aratoron, Celestion, Yamaha NS-10
 Echo, Reverb, and Delay Systems: Digital plate, Lexicon 224
 AKG BX 10, Eventide Harmonizer H 110, Deltalab DL-1, DL-2,
 Lexicon 91
 Other Outboard Equipment: dbx 165, 160, 161, UREI 11A, A
 Orban Stereo Parametric EQ, ADP Stereo Sweet EQ, Kepex
 500's FXB Exciter, Orban bilateral compressor, high pass filter,
 30 channel dbx 411, Dolby 36 1/2, White active EQ, Tele
 tracks LA-2, Mr. Cyflex
 Microphones: Neumann, AKG, Beyer, Crown PZM, Sennheiser,
 F.V. Sony Shure
 Instruments Available: 1923 Steinway M grand piano, Ham-
 mond organ, Rhodes piano, Wuritzer electric piano, Music Man
 and Fender amps, Pearl drums, Shureland drums, Gen Box
 congas
 Rates: Supplied upon request, very reasonable
 Extras: Convenient, private, nice view, good food
 Direction: Primarily a private production facility utilizing an inte-
 grated media approach with emphasis on audio production, music
 publishing, artist management, creative career development and
 associated film/video production. The studio is available inde-
 pendently or in conjunction with the other services. We are focus-
 ing cost effective growth. Prov. and relaxed environment while
 maintaining quality and creativity throughout every involvement.

**** **BULLET RECORDING**
 also **REMOTE RECORDING**
 49 Music Square West, Nashville, TN 37203
 (615) 327-4621
 Owner: Charles and Barbara H. Hildred
Studio Manager: Peter Plank

**** **CAPRICORN STUDIOS**
 561 Cotton Ave., Macon, GA 31201
 (912) 745-8518
 Owner: Phil Walder
Studio Manager: Tad Bush
 Engineers: Tad Bush
 Dimensions of Studios: 42 x 26, 42 x 20 (rehearsal studio)
 Dimensions of Control Room: 26 x 20
 Tape Recorders: Studer A80 24 1/2 tracks (2), B67 (2), Revox
 A 700, A 77 (4)
 Mixing Consoles: API Custom w/ Allison Faded Automation
 Monitor Amplifiers: Studer A 68 (2), Crown DC300 (7), D150,
 De0
 Monitor Speakers: Westlake TM 1 (4), JBL 4320 (4), JBL 4311
 (4), MDM, Aitec 604 (4), KLF #6, KLF #17, B&O #S60, Aratoron
 tones

Echo, Reverb, and Delay Systems: EMT 250, EMT 140 (2), (2)
 live chambers, Lexicon Prime Time, Eventide 1745 (2), Cooper
 Time Cube, Echoplex, tape slap
Other Outboard Equipment: 30 channels Dolby, Eventide
 Flanger and Phaser, Audio Design EMT, UREI, Universal Audio
 (tube) and Spectra Sonics limiters API, Sontec and UREI EQ,
 dbx Room Box, Kepex (6)
Microphones: Neumann, Sony, RCA, AKG, Beyer, E.V., Studer,
 Sennheiser, Shure
Instruments Available: 9' Steinway, 6' Kawai, Rhodes, Wurli-
 zer and Schulz upright pianos, clavinet, MiniMoog, Hammond
 B-3, Teaanon vibes, Gretsch drums, Zildjian cymbals, Ovation 6 &
 12 string, Fender and MESA amps, various percussion instru-
 ments
 Rates: On request

**** **THE CASTLE RECORDING STUDIO**
 Old Hillsboro Road, Route 7, Franklin, TN 37064
 (615) 794-0189
Studio Manager: Ned Wilburn
 Engineers: Supplied by clients or The Castle can supply
 Dimensions of Studios: Size of a castle!
 Dimensions of Control Room: Size of a castle!
 Tape Recorders: (2) Studer A 80 24 track, Studer A 80 2 track
 (2) Studer B 67 2 track
 Mixing Consoles: Harrison modified computer board 46 in x
 24 out
 Monitors: Fastlake TAD w/ White EQs and BGW power
 Equipment: All equipment is state of the art
 Other Outboard Equipment: Full assortment of outboard equip-
 ment
 Microphones: Complete assortment of Neumann, AKG, Shure
 Instruments Available: Full length Bosendorfer grand piano,
 Jupiter 8, Sequential Circuits Prophet 1, Prophet 10, Hammond
 B-3 organ, Fender Rhodes, D6 Clavinet, Oberheim DMX drum
 machine, full kit of Pearl drums
 Rates: Please call for rates
 Extras: The Castle sits on 35 acres of pastoral land. Inside the
 Castle is a lounge, TV room, full kitchen with microwave, recep-
 tion area, bedroom, 4 bathrooms, a very large parking lot, full
 security with a 24 hr. guard.

**** **CHESHIRE SOUND STUDIOS**
 also **REMOTE RECORDING**
 2093 Faulkner Rd N.E., Atlanta, GA 30324
 (404) 633-6626
 Owner: T.G. Wright Jr.
Studio Manager: Susan Giles
 Engineers: Director of Engineering, Tom Rice, Engineers Tom
 Wright, Ted Kaliman, Ken LaMorta
 Dimensions of Studios: A 12 x 44 x 16 B 18 x 15
 Dimensions of Control Room: A 18 x 24 B 14 x 10
 Tape Recorders: Ampex MM1100 24 track, Ampex 4 440B
 24 track, Ampex 1200 24 track
 Mixing Consoles: MCI 428B automated, 28 in x 24 out, MCI
 616C automated complete cassette production facility 1/2 master-
 ing 1/4 track to 2/4 track dubbing
 Monitor Amplifiers: SAE, Yamaha Crown
 Monitor Speakers: JBL Eastern Acoustic Works Auritec
Echo, Reverb, and Delay Systems: Live echo chambers Lex-
 icon 224, Model 93, Model 92, Deltalab DL-1, DL-2, Eventide
 Harmonizer, MXR transposer
 Other Outboard Equipment: Parametric equalizers UREI
 117-N, dbx 160 Orban, 245F 111B 24 channel dbx and Dol-
 by
 Microphones: Wright microphones SR 1 and TSR 2, Neumann,
 AKG, Sony, etc.
 Instruments Available: Send for brochure
 Rates: Send for brochure

**** **CINDERELLA SOUND**
 1108 Cinderella St., Madison, TN 37115
 (615) 865-0891
 Owner: Wayne Moss
Studio Manager: Paul Moss

**** **COCONUTS RECORDING CO., INC.**
 1830 N.E. 153rd St., N. Miami Beach, FL 33162
 (305) 940-4656
 Owner: Shirley P. Kaye
Studio Manager: Shirley P. Kaye

**** **COMPASS POINT STUDIOS**
 P.O. Box 4599, Nassau, Bahamas
 (809) 327-8282
 Owner: Chris Blackwell
Studio Manager: Lorene Fraser

**** **CONTI STUDIO**
 also **REMOTE RECORDING**
 P.O. Box 968, Edgewater, FL 32032
 (904) 427-2480
 Owner: Cont, Corporation
Studio Manager: Dick Davis



COMPASS POINT STUDIOS
 Nassau, Bahamas

**** **COOK SOUND STUDIOS**
 1419 Scenic Rd., Ft. Payne, AL 35967
 (205) 845-2286
 Owner: Jeff Cook

**** **CREATIVE ARTS STUDIO**
 P.O. Box 2764, Spartanburg, SC 29304
 (803) 576-9081
 Owner: Jerry Eukinks, Doug Gray, George McCorkle
Studio Manager: Randy Merryman
 Engineers: Randi Merryman
 Tape Recorders: MCI 24 track
 Mixing Consoles: MCI 24 outputs
 Monitor Amplifiers: McIntosh, Crown
 Monitor Speakers: UREI 813A's
 Echo, Reverb, and Delay Systems: Lexicon 224 plates
 Other Outboard Equipment: Prime Time, Eventide
 Microphones: Neumann's
 Instruments Available: Pianos, organs
 Rates: Call for rates

**AUDIO/VIDEO/FILM
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 CREATIVE SERVICES
 MUSIC PUBLISHING
 MANAGEMENT
 CONSULTATION**

**KEEBLE MEDIA GROUP
 KEEBLE MUSIC GROUP
 BROKEN DOOR STUDIO
 5405 STANFORD DRIVE
 NASHVILLE, TN 37215
 615/269-0727**

The Southeast 24 track

•••• CREATIVE SOUND CONCEPTS
1066 Briar Vista Terrace N.E., Atlanta, GA 30324
(404) 634-3382
Owner: Dennis Baxter
Studio Manager: Spence Herzog



CRESCENDO AUDIO PRODUCTIONS, INC
Puerto Nuevo, Puerto Rico

•••• CRESCENDO AUDIO PRODUCTIONS, INC
also REMOTE RECORDING
#707 Calle Constitucion, Puerto Nuevo, Puerto Rico 00920
(809) 792-1970
Owner: Brooke F. Carballero
Studio Manager: Maysa Acosta
Engineers: Alan Mander
Dimensions of Studios: Studio A 50 x 40 x 20, Studio B 39 x 23 x 20

Dimensions of Control Rooms: 2. x 24 x 14
Tape Recorders: MCI JH 24 24 track, MCI JH 110B 2 track, MCI JH 110B 4 track, Ampex 44 2 track, Scully 280B 4 track, Revox B77 2 track
Mixing Consoles: MCI 528B 28 in x 24 out, Spectra Sonic 1024 24 in x 24 out
Monitor Amplifiers: Crown M 600, McIntosh MC2120
Monitor Speakers: UREI B14, UREI B11, Bio Res, Auratone & Ed Long
Echo, Reverb, & Delay Systems: Echoplex AKG BX10
Other Outboard Equipment: Eventide H 949, Delat ab DI 2, Acousticcomputer dbx 165, compressor limiter dbx 160, compressor/limiter, Valley People Gain Brain II, Valley People Keyex II, Valley People Dynamite 410, Ashby SC 68 parametric notch filter, Dolby 24 track, Dolby 2 track, UREI 964 dual metronome, MCI time code
Microphones: Neumann U67, U48, U47, EET, U89, Sennheiser 406, 416, 421, 441, AKG 414, C406, Boyer M 500, Shure AM 57, EV RE20, RCA 77D, BK5, 44
Instruments Available: 9 grand piano, marimba, vibes, Fender bass, Roland guitar synthesizer, Yamaha Oberheim Crumar synthesizer, Fender twin reverb, Leo Paul Fender Bassman, Yamaha bass amp
Video Equipment & Services: Magnetics 16 35 mm Xenon lamp projector, Sony BVU 200 U-Matic video tape recorder, Airtel large screen & Sony Trinitron monitor, Magnetics non speed film mixing system
Rates: Available upon request

•••• CRESCENDO RECORDERS
also REMOTE RECORDING
125 Simpson St. N.W., Atlanta, GA 30313
(404) 223-0108
Owner: William Ray Hanley, Jr.
Studio Manager: Roger & J. Beckwith
Engineers: W. Erickson, Gary Hart, Rex Bevel, Joe John St. John, Grant Hestley
Dimensions of Studios: A 41 x 25, B 18 x 18
Dimensions of Control Rooms: A 22 x 18, B 14 x 9
Tape Recorders: Otari MTR 90 II 24 track, MCI JH24 24 track, Otari MTR 10 2 track, Otari MX505C Mark III 2 track, di x

model 700 Digital Audio Processor 2 track
Mixing Consoles: Harrison 3232 42 in x 32 out, Soundcraft 2400 24 in x 24 out
Monitor Amplifiers: Crest, BGW, Crown, SAE, AB Systems
Monitor Speakers: Custom Westlake, EAW, Auratone, TOA, Bio End, JBL
Echo, Reverb, & Delay Systems: (2) live chambers, FMT 140 TS, MICMIX XI 515, Lexicon Prime Time, Delat ab, Eventide, Marshall, Roland, Cooper Time Cube
Other Outboard Equipment: B x 402, 903, 904, 906, 160X, 165, UREI 11N176, LA-4A, Teletronix LA-2A, ADR Vocal Stressor, Orban 602, 245E, 516H, SAE 2700S, Dolly A noise reduction, dbx Type I and Type II noise reduction
Microphones: AKG 414, 452, Sony C37P, Neumann U47, U87, KM8, KM84, Sennheiser 421, 441, Audio Technica B14, B12, Shure SM54, SM57, F V C515, HF 20, Boyer 260, RCA 770X
Instruments Available: Yamaha Conservatory, Bosendorfer T, Hammond B-3, Musser vibes
Video Equipment & Services: (2) Sony BVU 800s, Sony BVU R20, Hitachi HR2006, 1 crosspoint latch switcher, control video lighting editor with SMPTE lock, (4) video machines, (2) audio mixers
Rates: Two lounges, salsa jazz, video games, tape duplicator, hotel accommodations nearby, staff includes arrangers, producers, writers
Extras: Our primary objective is to provide a creative atmosphere, personnel, our facilities for any type of audio video production. From simple radio spots to full music video, we have the staff and equipment to take your creative idea from conception to a finished product. All of this is totally unexpensive and we are equipped to handle any project.



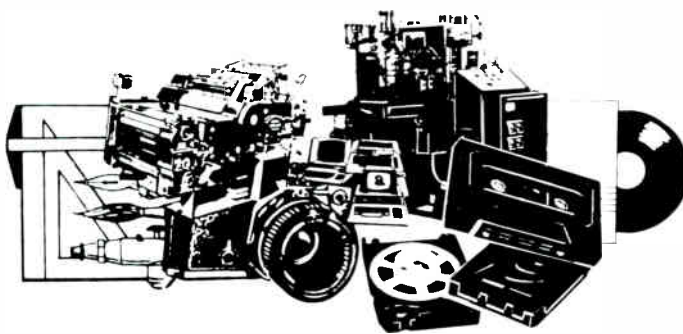
CRESCENDO RECORDERS
Atlanta, GA



CRITERIA RECORDING CO., INC.
Miami, FL

•••• CRITERIA RECORDING CO., INC.
also REMOTE RECORDING
1755 N.E. 149th St., Miami, FL 33181
(305) 947-5611
Owner: Mark Emerman
Studio Manager: General Mar, Bharat Lee, Marcia Latta (Traffic), Marne Curry (Studio Manager), Chris Joyce (Technical), Joe Foglia (Remote)
Engineers: Steve Klein (Senior), Debra, Hetzenforter, Bob Casale, Patrice Levin, John Jim Sessody, Mastering: Mike Fuller, Technical: Chris Joyce (Chief), Scott Phillips, Oliver Masciarotte, Bob Kosiba, Stan Lambert, Remote: Jim Sessody, Eddie Garcia
Dimensions of Studios: A 50 x 75 x 20 high, B 40 x 40 x 16 high, C 25 x 32 x 16 high, D 15 x 22 x 10 high, E 40 x 50 x 28 high
Dimensions of Control Room: A 14 x 16, B 12 x 24, C 15 x 16 (modified LEDE), D 17 x 19, E 24 x 25 (modified LEDE)

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 Torrance, CA 90501 USA
 (213) 328-2595
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INVOICE

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1	PATCH BAY	N/C
1	FLOOR STAND	N/C
1	POWER SUPPLY	N/C



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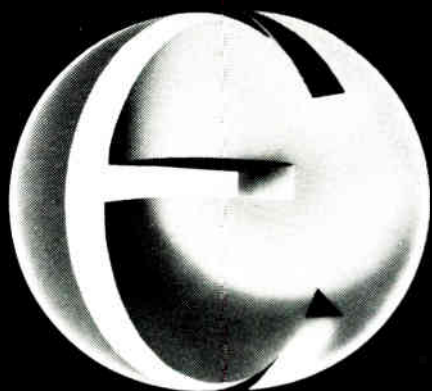
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INVOICE TOTAL \$19,950

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THE EDDY OFFORD STUDIO

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CONTACT: VALMA VALLE

LONDON ADDRESS: 46, COLEHERNE COURT, THE LITTLE BOLTONS, LONDON, SW50DN;

TELEPHONE (01) 373-8629, 730-7291; TELEX 895571- MUSIC G

CONTACT: DENNIS MUIRHEAD

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World Radio History

The Southeast 24 track

Greenwood, Larry Gatlin, Johnny Cash. During the 1980's Sound Emporium averaged 11% of the singles and 15% of the albums on the country charts. Write for free brochure.

•••• REFLECTION SOUND STUDIOS

also REMOTE RECORDING
1018 Central Ave., Charlotte, NC 28204
(704) 377-4596

Owner: Wayne Jerriean
Studio Manager: Jane Stow
Engineers: Steve Hamner, Mark Williams, Wayne Jerriean, Chip Garrett
Dimensions of Studios: Studio A 42 x 45 x 16 ceiling. Studio C 28 x 24 x 12 ceiling
Dimensions of Control Rooms: Studio A 16 x 18. Studio C 14 x 18
Tape Recorders: (2) MCI JH 24 w/Autolocator III 24 track, (2) Ampex ATR-102 2 track, (3) Ampex 440 2 track, Otari 5050 B track, Otari 5050 1/4 track
Mixing Consoles: Studio A MCI JH 686 automated 36 in x 24 out. Studio C MCI JH 686 28 in x 24 out
Monitor Amplifiers: BGW, AB Systems
Monitor Speakers: 1 At Monitors w/TAD components, Alterco 4 w/mastering lab crossover, JBLs, KEF, HOH, E.V. Sentry III, Big Boxes
Echo, Reverb, & Delay Systems: FMI, Lexicon 224, AKG BX 20, Deltalab DL 1 & DL 2, Lott 440 Analog Delay
Other Outboard Equipment: UREI 1176 limiters, dbx 9000 frame wideessers, noise gates, limiters, dbx 160, 162, 165, FXR Exciter, White bi-amplified 1/3 octave EQ in Studio A. White bi-amplified 1/3 octave EQ in Studio C
Microphones: Neumann U67, U67, U64, U47, AKG 414, 452, 224, 202, Shure SM7, SM57, SM54, SM56, 58, Sennheiser 441, E.V. RE 20, RE 15, RE 16, RCA 77DX
Instruments Available: Yamaha piano, Kawai piano, stereo Fender Rhodes, Wuritzer electric piano, ARP Omni, Clavinet, Tack piano, Farfisa organ, Hammond B 3 organ w/Leslie, Sonor drums, concert toms, congas, Maraca, vibes, Fender guitar, amp.
Rates: Available upon request

•••• ROXY RECORDING THEATER

827 Meridian St., Nashville, TN 37207
(615) 227-0920
Owner: RRT Inc
Studio Manager: Brenda Bridges, Bookina, Donna Bridges

•••• SCRUGGS SOUND STUDIO, INC

2828 Azalea Place, Nashville, TN 37204
(615) 383-7994

Owner: Randy Scruggs and Steve Scruggs
Studio Manager: Trina Johnson
Engineers: Tom Brown, Steve Scruggs, Randy Scruggs
Dimensions of Studios: 26 x 45 w/balcony, ceiling
Dimensions of Control Rooms: 12 x 14
Tape Recorders: MCI JH 24 track, smless 24 track, MCI JH 110 1/4, transformless 2 track, MCI JH 110 1/4, track, smless 2 track, Sony cassette deck
Mixing Consoles: MCI JH 686 w/bill automation & VCA group mtr 28 in x 24 out
Monitor Amplifiers: McIntosh 2400, Crown DC 400, Crown DC 150, BGW
Monitor Speakers: Alterco 4ME Bio Head w/Mastering Lab crossovers, JBL 4311s, MJM 4 mixdown monitors, Auratones, Boliders
Echo, Reverb, & Delay Systems: FMI 250 digital reverb, custom plate reverb, Lexicon Prime Time
Other Outboard Equipment: Vocal Stressor, A idioarts stereo parametrics, dbx compressor/limiters, MKH Phaser, Eventide Harmonizer, API 550 A EQ, 24 tracks of dbx noise reducer, Orban Silence Controller
Microphones: Neumann U87, KM84, U47, AKG 414s, 451s, 452s, Sennheiser 441s, Sony condensers, Calrec condensers, Shure SM57s, SM58, E.V. RE 20s
Instruments Available: Yamaha 7'3" grand piano, stereo Rhodes 88 electric piano, ARP synthesizer, Ludwig wood shell drums, various assortment of amplifiers, musical instruments, Hammond A 100 organ w/Leslie, other equipment available on rental basis
Rates: \$130/hr including engineer

•••• SONGBIRD STUDIO

also REMOTE RECORDING
1715 DeFoor Ave., Atlanta, GA 30318
(404) 351-5955

Owner: Richard Head
Studio Manager: Richard Head
Engineers: Richard Head, Barry Placentino
Dimensions of Studios: 30 x 24
Dimensions of Control Rooms: 15 x 12
Tape Recorders: Ampex MM 1100 w/1200 electronics 16/24 track, Techniques 1520 2 track, Ampex 440B 2 track, Tech niques 1506 2 track, Tascam 80 B 8 track, Tascam 25 2 2 track, Ampex ATR 100 2 track w/1/4 heads
Mixing Consoles: Sound Workshop 1600 28 in x 24 out w/bill "Arms" automation—noise gates on all channels, Tapco C 12 for remote recording
Monitor Amplifiers: Crown DC 400, Tapco CP 120

Monitor Speakers: JBL 4311 Auratones
Echo, Reverb, & Delay Systems: Ursa Major digital reverb, Lexicon Prime Time delay, Ibanez AD 220 analog delay, Lexicon 224X Digital reverb
Other Outboard Equipment: UREI 1A 4 compressor/limiters, LT Sound Ave II compressor/limiter expander, dbx 163 compressor/limiters, KCI pre-amp SAE parametrics, 26 channels dbx LT sound parametrics
Microphones: Neumann U87 (2), KM84, (2) U64 (tubes), Sony C44s, ECM 22s, E.V. RE 20s, Sennheiser 441s, 441s, Crown PZMs, Shure SM57s, AKG 414 EBs, Beyer 101, 201, Countryman EM101s
Instruments Available: Kawai 74" grand piano, Gretsch drums, ARP Omni, ARP Axse, ARP Avator, Fender Rhodes with Satellite speakers, Hohner clavinet, Univox organizer (for Hammond B-3 sound), Wuritzer acoustic piano
Rates: Call for rates
Extras: Studio has a great atmosphere with 400 foot cathedral type ceiling, main room, drum booth and vocal booth. It has a great acoustical balance between live and dead surfaces utilizing both hard wood surfaces along with the newly developed sonex material.



NASHVILLE SOUND CONNECTION, INC
Nashville, TN
See listing on p. 44

•••• SOUND EMPORIUM RECORDING STUDIOS, INC

3102 Belmont Blvd., Nashville, TN 37212
(615) 383-1982

Owner: Larry Butler, Hoy Clark, Jim Williamson
Studio Manager: Jim Williamson
Engineers: Jim Williamson, Gary Laney, John Abbott, Cathy Polts (staff), Charlie Tallent, Garth Fundis, Mike Peston (independents)
Dimensions of Studios: Studio A 33 x 39 x 22, with string alcove 16 x 20. Studio B 14 x 24 x 9, with 11 x 21 door lead and 10 x 7 drum booth. Studio C 35 x 45 x 18, including drum booth
Dimensions of Control Rooms: Studio A 19 x 19, Studio B 15 x 17, Studio C 15 x 17
Tape Recorders: Studer A 80 VU II 24 track (16 track capability), Studer A 80 RC 2 track, Studer B 67 2 track, Ampex AG 440B 4 track
Mixing Consoles: Harrison 4232AB (Studio A), Harrison 32 4/2 (Studio B), Harrison MR2 (Studio C)
Monitor Amplifiers: Altec, BGW, Crown, McIntosh, Sony
Monitor Speakers: The ONES cabinets by John Gardner with Gauss woofers and TAD drivers, Sierra
Echo, Reverb, & Delay Systems: EMT 140 stereo plates (two per studio), Quad/Echit spring reverb, acoustic echo chambers (two 8 x 10 x 35 chambers with nonparallel walls)
Other Outboard Equipment: Dolby (24 tracks in all studios) DDL noise gate, Harmonizer, phaser, flanger, Vocal Stressor, limiter/compressors, digital metronome base and guitar amplifiers, Prime Time
Microphones: AKG E.V. Neumann, Crown PZM, RCA Sennheiser, Sony Snider, Superscope, PMI, Wright, Shure
Instruments Available: Fender Rhodes electric pianos (3), Wuritzer electric pianos (3), Hammond B 3 and C 3 organs, Clavinet, Celeste, Chickering grand piano (Studio A), Steinway grand pianos (Studios B & C), Tack pianos (Studio C), tympani, congas, vibes, marimba, orchestra bells, MiniMoog, harpsichord
Rates: Upon request
Extras: Pre set string alcove (Studio A), 15 and 30 ips capabilities in all studios. Other instruments and equipment available upon request—ask us! We have both 14" and 12" mastering available
Direction: Paul Anka, Julie Andrews, Moe Bandy, Debby Boone, Sunny Davis, Jr., John Denver, Terri Brock, Marshall Tucker Band, Little River Band, Don McLean, Jerry Reed, Kenny Rogers, Joe Stimpney, Dori Williams, George Jones, Larry J Dalton, Lee

•••• THE SOUND ROOM, INC.

325 Patterson Ave., Fort Oglethorpe, GA 30742
(404) 866-2432
Owner: Steve Mullnix
Studio Manager: Steve Mullnix

•••• SOUNDSHOP RECORDING STUDIOS

1307 Division St., Nashville, TN 37203
(615) 244-4149
Owner: Buddy Killen
Studio Manager: Travis Turk

•••• SOUND STAGE

10 Music Circle South, Nashville, TN 37203
(615) 256-2676

Owner: 8 owners—Incorporated
Studio Manager: Pat Meyer
Engineers: Chad Engineer, Brent Kinc, Maintenance Supervisor Gordon Evans, Engineers Steve Fralick, Ron Treat, Steve Tillisch, Warren Petersen
Dimensions of Studios: Studio A (front stage) 48 x 30, Studio B (back stage) 30 x 20
Dimensions of Control Rooms: Front stage 15 x 30. Back stage 24 x 24
Tape Recorders: Studer A 800 24/16 track, Studer A 80 1/2" and 2" 24/2 track, Studer A 80 1/4" 2 track, Studer B 67 1/4" 2 track, upon request JVC Digital System 2 track
Mixing Consoles: Neve w/Necam 8068, 32 in x 16 out, Trident w/65k automation TSM, 32 in x 24 out
Monitor Amplifiers: AI Systems, McIntosh, BGW, Crown
Monitor Speakers: George Augspurger custom monitors, JBL 1176s, Auratone, Boliders, JBL 4311, Yamaha NS10
Echo, Reverb, & Delay Systems: EMT 251 digital reverb, (4) EMTs, EMT Gold Foil, Lexicon Delta T, Lexicon Prime Time, Eventide digital delay, Cooper Time Cube
Other Outboard Equipment: Eventide Harmonizer, UREI Trietronix dbx Neve limiters, ADR Vocal Stressor, ADR Scamp Rack, Kojak, Gian Brain, Fulltec tube EQ, Orban De-esser, UREI Soundcraft parametrics, etc.
Microphones: Neumann U47, U87, KM86, KM84, KM54, AKG 414, 451, 452, D12, D224, Sennheiser 421, 441, Sony 34P 22, Beyer M69, Studer SKM50, SK S501, Crown PZM plates, E.V. RE 16, RE 20
Instruments Available: 9' C Bechstein, 7' Steinway, Hammond B 3, Rhodes stereo 88, 73, Hohner clavinet, Wuritzer Star Tack piano
Rates: \$130/hr w/engineer, \$160/hr mixdown w/Neve

•••• SOUND TRACK

2830 Dogwood Place, Nashville, TN 37204
(615) 297-2239
Owner: Wayne Edmondson
Studio Manager: Wayne Edmondson

•••• SOUTHERN TRACKS RECORDING

1224 Fernwood Cir. N.E., Atlanta, GA 30319
(404) 231-9319, 231-9489
Owner: Bill Lowery
Studio Manager: Mike Clark

•••• SPECTRUM RECORDING SERVICES

also AUDIO, VIDEO, & REMOTE RECORDING
536 Huffman Rd., Birmingham, AL 35215
(205) 833-6906
Owner: Huffman Assembly of God Church
Studio Manager: Noah L. White

•••• STARGEM RECORDING STUDIO

43 Music Sq. East, Nashville, TN 37203
(615) 244-1026
Owner: Wayne Hodges
Studio Manager: Dan Hedrick

•••• STARKE LAKE STUDIOS

275 North Lakeshore Dr., Ocoee, FL 32761
(305) 656-8989
Owner: Glen Gellings
Studio Manager: Karen Helenthal
Engineers: Terry Cox, Chief Engineer Terry Dycus
Dimensions of Studios: Studio A 2,000 sq ft plus 1,000 sq ft isolation
Dimensions of Control Rooms: 675 sq ft finished
Tape Recorders: MCI JH 64, (2) MCI JH 110B, Scully, Nakamichi
Mixing Consoles: MCI JH 636 automated, fully parametric, plasma VU
Monitor Amplifiers: Crown PSA2, Fostex
Monitor Speakers: Custom built Fostex LS 4 in control room, Fostex LS 4 in studio, UREI 811, Yamaha NS1000, Auratone
Echo, Reverb, & Delay Systems: Lexicon 224, AKG BX 20, Lexicon Prime Time and Super Prime Time
Other Outboard Equipment: (2) dbx 900 racks filled with gates, compressor/limiters, de-essers, parametrics, phaser/flangers, and

ELECTRONIC RELIGION

Audio and Video Communications Flourish in the Worship Environment

by Rollins Brook

With retail sales of records off more than 30% over the past few years and the recording studio business depressed, it is possible that the busiest production activity in town is at the church or synagogue around the corner. All over America houses of worship are installing electronic facilities that were unheard of only a few years ago. Today's religious environment may include multi-image projection systems, computerized theatrical lighting, television production facilities, a separate fully-equipped recording studio, and a live reinforcement system that will challenge many road-show systems.

BROADCASTING

From the earliest days of radio broadcasting, it has been traditional that Sunday morning is largely given over to religious programming with at least one live presentation of a local church service. In addition to these Sunday broadcasts there are always a number of specials during religious holidays, and occasional evangelical specials of which Dr. Billy Graham's Crusades are typical.

The radio station usually furnishes the equipment and an operator for the weekly worship service broadcast. But in the early days of television, it was quickly evident that the cost of furnishing the equipment and the production crew for live telecasts from the local church was greater than most stations or churches could bear. A few churches purchased their own cameras and microwaves—usually second-hand equipment from the local station—and trained their own crews. But these TV-equipped churches were generally limited to one or two in each of the 200 TV markets.

With the coming of local access channels on cable systems in most cities and towns of the nation, the number of outlets available for local church telecasts has become almost limitless. At the same time, good

quality, low cost TV cameras and other production equipment have become available. Now any church in a town with its own cable service has the possibility of broadcasting to its community.

As thousands of smaller community churches are considering

TV service to their local area via cable, a few large churches are looking at service to the entire nation. By tape delay and live by satellite, the large churches are now able to become national super-churches broadcasting their message nationwide and even worldwide. Dr. Robert Schuller's "Hour of Power" broadcast from the Crystal Cathedral in Garden Grove, California, exemplifies a local

RELIGIOUS MEDIA 1983:

Directions and Developments

by George Petersen

Religious media, in all forms, have undergone tremendous changes over the past decade. Churches all around the country (and the world, for that matter) have slowly, but steadily, been increasing their involvement in both the visual and audio media. Access to cable television channels and the decreasing cost and complexity of video equipment has allowed even the smallest congregations to become involved in spreading their message via electronic means. Many churches have incorporated computerized multi-image slide presentations into their ministry, a far cry removed from the Bible film strips we can remember from our Sunday school days.

On a somewhat smaller scale, the notion of cassette ministry—the distribution of spoken word programs and recordings of church services—is almost universally used and has become a standard, established practice of churches everywhere. An ever-growing number of congregations are now equipped with high speed, in-cassette duplicators which make tapes of services available almost before parishioners leave the building.

Improvements in sound reinforcement systems and recording

systems are also gaining a strong foothold in today's church. Jim Scott, owner of New World Audio, a San Diego, CA sound retailer, says, "Churches are now realizing there's quality stuff out there. They're getting away from the M.I. gear and getting into the pro stuff. . . A lot of churches are now seeking 24 input systems, rather than six or eight. A handful of churches are getting into video now, and this is also an increasing area of interest."

Jim recently sold a Ramsa 24 channel console to the Scott Memorial Baptist Church, who uses it for both sound reinforcement and in the production of their weekly, one hour video production, "The Turning Point." This magazine-style show has been airing for over 35 weeks now and is run on one cable and two broadcast stations. Brian Frese, sound coordinator for "The Turning Point," was "very impressed" with the Ramsa board. "We also have two SK 70 Hitachi cameras, Sony 3/4" video decks, a mobile video truck, and an ENG camera for interviews and news." He continued, "We were thrilled to have the opportunity to produce the show. Here in San Diego, it's a wide open market."

This phenomenon is not, however, limited to San Diego. All around

church which has become a national super-church. Jerry Falwell also has become a national figure through his TV super-church. The number of super-churches has grown with the expansion of cable, and it is likely to grow even more as direct satellite broadcasting becomes a reality.

SATELLITES

But these super-churches are only the visible tip of the electronic iceberg. The national organizations of many denominations are now beginning to go beyond the traditional broadcast of the weekly worship service. They are using direct satellite transmissions and cable access to present open broadcast and non-broadcast (or narrowcast) programming for church schools and local congregations. Production facilities and satellite downlink receivers are being installed all over the country.

In the last few months the Catholic Telecommunications Network of America has begun operation with

a budget of \$6 million for the first three years. This operation will include television and radio broadcasting, videotex, and data transmissions. The satellite-relayed productions will be both religious programs for broadcast over the air and cable to the general public as well as narrowcasts of tele-conferences and tele-seminars to schools and local parishes.

The Southern Baptist Convention has devised two satellite distributed services: American Christian Television System for general broadcasting of "good, clean, Christian television programs" for stations and cables; and Baptist TelNet for educational and training programs beamed directly to local churches and schools via individual downlinks. Microwave dishes are sprouting up like toadstools in churchyards all over the South.

The Lutheran Church in

America has adopted an approach different from that of most national church groups. Their distribution medium is video cassette tapes with the productions in a magazine format. Some of the segments are produced by the national group, others may be contributed by member congregations. Space is left for each local group to add its own contribution. The tapes may be played as a part of a discussion program at the church or they may be shown to the entire community via cable access channels.

The Mormons from their headquarters in Salt Lake City have long used teleconferencing for their twice-a-year Priesthood meetings, connecting local groups throughout North America in a special network. Now they have their own transponder on Westar IV. In fact, it is through a sublease of time on the "Mormon" transponder that the Catholic Network operates three hours each day.

These are only a few examples of how modern organized religion is

the country, churches are upgrading and expanding their capabilities. Steve Jellerson, at His Sound, in Portland, Oregon, explained, "The gospel industry is huge. It's a big market now. We put in a couple of \$100,000 installations and we now have local churches with facilities rivalling the recording studios around here."

One of the most dramatic changes over the past decade has been the emergence of the enormously popular contemporary Christian music (CCM) genre. Once limited to traditional gospel and church hymns, contemporary religious music now includes pop, country and western, folk, rock, and even new wave, comedy, and aerobic exercise music. The emergence of mass market artists such as B.J. Thomas, Noel Paul Stookey, Joe English, Michael Omatian and others in the field, drawing their fans with them, has been a factor in the rising popularity of CCM. But more importantly, perhaps, is the ever-increasing quality of both recording techniques and musicianship. Today's CCM buyer has become used to a level of production comparable to that of mass market artists, and the rising album budget allotments by CCM record labels reflects this.

Although it is difficult to ascertain whether it is a cause or an effect of the popularity of Christian music, CCM has recently been appearing more frequently in secular (mainstream) record stores, and has been receiving greater airplay on non-gospel radio stations. "Constantly

Changing," a video by the group Jerusalem, has been aired on MTV, and Christian aerobic video-cassettes have begun appearing on the market.

According to Don Klein, a spokesman for the Benson Company, the parent company for a large number of CCM record labels, the market has changed considerably. "Ten years ago, there was no mass media attention to gospel music," he explained. "Since then, for example, the Grammys have been giving gospel a spot on the award telecast. That alone puts it in front of 25 million people in America. Barbara Mandrell has a gospel part on her show. In the next ten years, I expect to see more crossover, and that kind of exposure can only help."

The new-found success of Christian music has also given rise to different approaches in production methods and styles. At Studio in the Country, in Bogalusa, Louisiana, owner Gene Foster is producing an album with the Williams Brothers, a gospel quartet. "All of their other albums were produced by the record company," Gene explained. "Of course, they've got a track record, so the label is letting the group do what they know best. The record companies have been giving groups more and more leeway on production."

Daryl Bush, manager of Gold Mine Studio in Nashville, has recently noticed an interesting musical trend: "I think people are now more FM and radio oriented. People are looking for more airplay. In Nashville, on a lot of

projects people have been going for a little more of the polished LA sound."

Another area of growth in the CCM market is the sale of independently produced albums. Steve Moore, owner of East Avalon Recorders, in Muscle Shoals, Alabama, compares these projects to "the way the country music market started years ago, with off-stage sales and on-the-road sales. This is the way this (CCM) market is beginning to develop."

Randy Bugg, of 12 Oaks Recording Studio in Smyrna, Georgia, gave this surprising account: "I know of one Christian artist, he was a coal miner, who made his record and felt this is what the Lord wanted him to do, and he sold over 100,000 albums, in essence out of the trunk of his car."

Although there has been much talk in the past about a slump in the recording studio business, studios who do a lot of gospel work don't seem to be affected. Bill Cobb, the owner of Poiema Studios in Camarillo, California, says, "There's a lot of work in this area. We do about 70% contemporary Christian work, and it's very consistent."

Michael Grosso, of Spectrum Studios in Deerfield Beach, Florida, notes that the current economic slump doesn't affect gospel studios: "You don't notice the slump because the gospel market is growing. It's faring better than the secular market. The upward trend outweighs the effects of the economy."

making use of electronic systems to broadcast Sunday worship services and to narrowcast educational programs, training programs, and teleconferencing to their local congregations. (Since this article deals with activity in and for the local church, we will just mention in passing that

there are several TV-only religious operations such as PTL and the 700 Club.)

FACILITIES

While many churches are installing their own production facilities for TV, there is a growing reliance

on outside production companies to furnish on-location recording and subsequent post-production. In some cases the church may own the equipment and hire a production company to operate the system. These facilities vary widely in size and sophistication.

A small community church may have a simple and rather inexpensive system for broadcasting the Sunday service over the local cable system. Typically the system would include a pair of one-tube color cameras, a simple character generator for adding titles, a small switcher without effects, and a 3/4" or 1/2" video tape recorder. The audio pickup system is likely to be a good bit more sophisticated. It probably includes a professional-type multi-channel recording/mixing board which also serves the audio cassette ministry and other church sound needs, which are discussed below.

The super-church production facility—whether owned or rented—will include only broadcast-grade three-tube color cameras. Both graphic generators and closed-captioning systems are likely to be included. Recordings are made on 1" or 2" machines. Considerable post-production work is often done on both the video and the audio tracks. Open captioned versions are produced for cassette distribution to the hearing-impaired. Foreign language sound tracks are created for broadcast in countries around the world.

In these churches the audio facilities are indistinguishable from state-of-the-art recording studios (and generally do include a studio) and require a staff of several trained professional operators. The church usually owns and staffs its own audio facility. In frequent fact, the "broadcast feed" is only a minor part of the sound operation. There are many churches with no broadcast program that still have a very large sound facility.

CASSETTE MINISTRY

Many churches without broadcast programs to reach beyond the attending audience have established an audio cassette ministry. While originally conceived as a way of reaching the sick or shut-in members of the congregation, the uses of the cassette ministry are often much broader. The cassettes may be copies of the worship service or specially-produced teaching, inspirational, or counseling programs with a wide distribution in the congregation. Through the use of high-speed, in-cassette duplicators, cassettes can be made available for distribution (sale)

(continued on page 54)



Designing for Top Quality Sound

Willow Creek Uses 105 dB Criteria

At Willow Creek's sound control position . . .

by Wolf Schneider

The sound system at Willow Creek Community Church exemplifies today's trend toward higher quality sound reinforcement in houses of worship. The thoroughly modern Willow Creek Community Church permanent edifice, completed in 1981, is equipped with a dynamic sound system that delivers 105 dB sound pressure levels with striking clarity. A 15 foot high by 42 foot wide custom built projection screen, a multipurpose lighting console, recording and playback equipment, a double-walled "floating" recording room, and two acoustically isolated rehearsal studios complete the impressive installation.

The increasingly sophisticated media orientation works. On a typical Sunday, the 2,500 seat Willow Creek Community Church is filled to capacity. In fact, just a year and a half after it opened, the church directors were forced to begin a series of expansion alterations in order to accommodate the growing congregation.

Not surprising, says sound contractor Bob Ancha, whose prestigious Midwest firm, Ancha Electronics, handles the installation of at least one church sound system each week. "Willow Creek," Ancha comments, "is one of the most dynamic, exciting congregations we have worked with anywhere in the country."

Willow Creek Community Church serves a varied congregation, many of whom are from younger age groups. The use of contemporary Christian music was particularly important in attracting these members, and so the church's technical producer, George Everding, specified the 105 dB

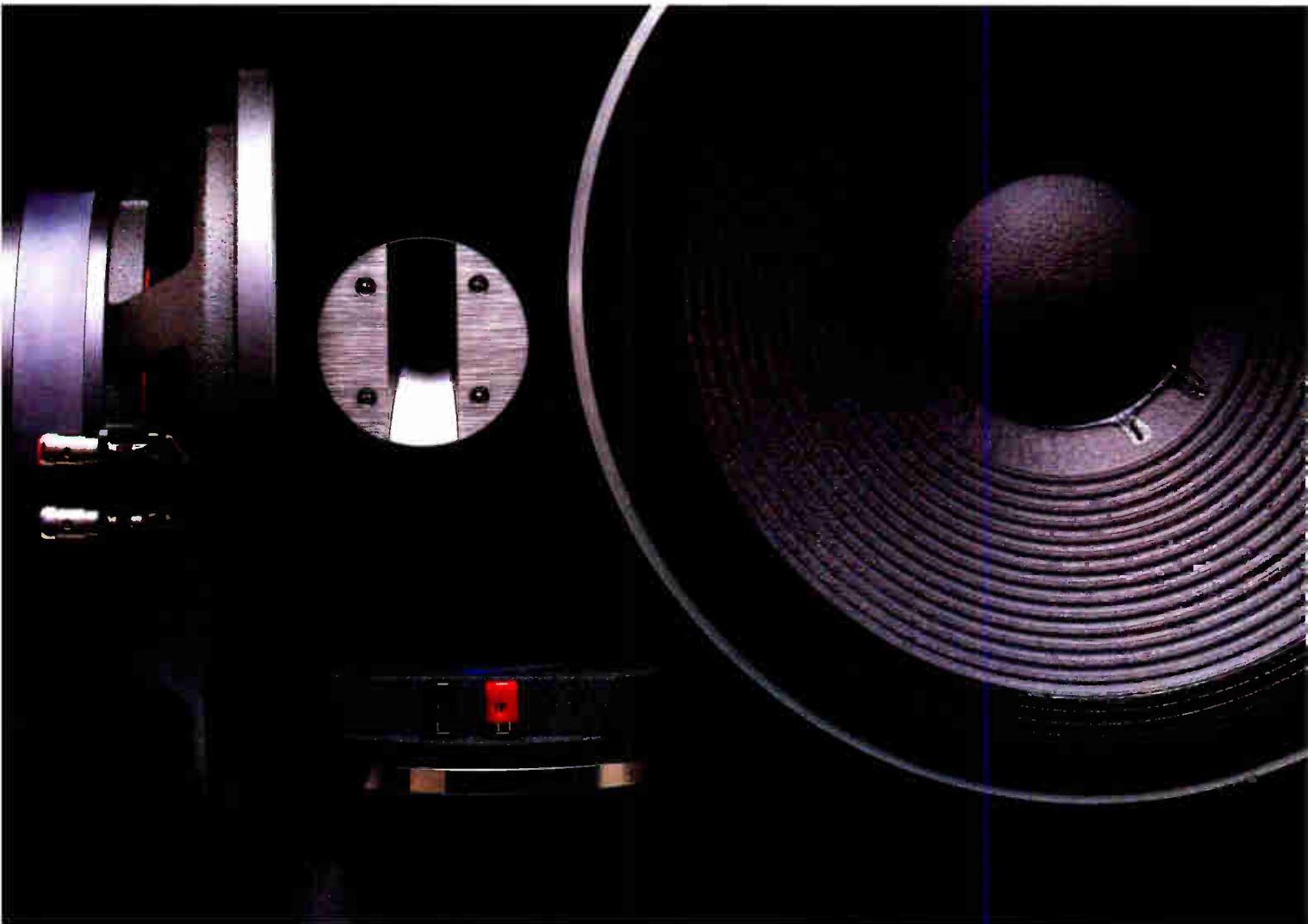
SPL. He felt that a less powerful system would be overdriven and therefore broken half the time; sound pressure levels of 105 dB would allow enough headroom for the electric guitars, bass, pianos, drums, horns, and synthesizers commonly used in their meetings.

Prominent acoustical consultant George Augspurger was contacted in the summer of 1980. Augspurger paid two visits to Willow Creek during the construction phase, and then prepared a recommended acoustical treatment, wherein ambient noise would be kept to NC-25 and reverberation time would be at a comfortable 1 - 1.25 seconds ("adding a little warmth to the music as opposed to a long, dying-out sound," he explained). The diagonal orientation of the sanctuary prohibited desirable early sound reflections from the side walls, so sound transmission would depend almost entirely on amplification, making a clean loud-speaker system a necessity.

According to Everding, everyone, from the technical staff to the congregations to the visiting musicians, has been very pleased with the sound at Willow Creek. "A good sound system," he concluded, "consists of many high integrity links in a long chain. The 1982 expansion was only the first in a series of enlargements which will eventually increase capacity to 5,000.

Augspurger translated the trend into dollars and cents: "Ten or twelve years ago, the number of churches that had spent more than \$10,000 on their sound systems could be counted on the fingers of one hand. Today, they expect good sound, they expect intelligibility, and they will reluctantly agree to pay for it." ■

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Only those who can afford to eliminate the word "compromise" from their vocabulary.

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Audio Devices

Professional Products Division of Pioneer Electronics (USA) Inc.
4201 Long Beach Blvd., Long Beach, CA 90807. (213) 639-5050. Telex 656431



Audio Accessories

Qty	Description	Sale Each
6	Altec 15095A XFMR	\$ 45
1	DBX 2001 VCA Module	35
1	ESE ES-1296/80 Timer with Seq. Option	200
1	ESE ES-240S Slave	100
2	ESE ES-510 Digital Clock. In Case	100
1	Sescom SB-1 Stereo Balance Box	135

Headphones

Qty	Description	List Each	Sale Each
1	Beyer DT-108K H-set, 800 Ohm	\$ 115.95	\$ 98
5	Beyer DT-109K H-set, 200 Ohm	144.95	123
3	Beyer DT-109K H-set, 800 Ohm	139.95	119
6	Sennheiser HDI-406 Infrared Headset/Receiver	156	105
2	Sennheiser HDI-407L Infrared Receiver	135	92
1	Sennheiser SI-1011 Infrared Transmitter	1,014	679
2	Sennheiser SZI-1019 Infrared Radiator	1,341	889

Distribution Amplifiers

Qty	Description	List Each	Sale Each
12	Spectra Sonics IO3 Mix. Amp.	\$ 69	\$ 49

Phonograph Equipment

Qty	Description	List Each	Sale Each
1	QRK 16 Turntable	\$ 595	\$ 168
1	Russco 2B Preamplifier	169	127
2	Russco Mark V tt.	625	442
6	Shure V15-IV Cart.	181	100
1	Technics EPA-A501H T/A	140	97
1	Technics EPA-A501M T/A	140	97
1	Technics EPA-B500 T/A Base	250	176
1	Technics RP-9690-P Remote	100	64
1	Technics SH-10-B3 Turntable Base for SP-10MKII	520	330
2	Technics SP-10MKII tt.	1,100	720
1	Thorens 126MKII tt.	562	375

Tape Recorders

Qty	Description	List Each	Sale Each
1	3M 9544 Cassette Deck	\$ 315	\$ 210
1	Ampex AG-440C-1 W/2 Tr. Head Ass.	4,600	4,112
1	Ampex 4010264 Remote Control for ATR-100	500	333
1	Ampex ATR-700 Tape Rec.	1,995	1,676
2	Ampex ATR-700 Tape Rec.	1,995	1,676
1	Ampex ATR-800 Console	495	416
1	Ampex ATR-800-2 Tape Rec.	5,450	4,580
3	Ampex Ped. for ATR-100	395	330
1	Ampex ATR-102, Demo	6,700	5,500
1	Ampex ATR-102, New	6,700	5,985
1	Fostex 250 Cass. Multi-Tracker	1,300	1,040
2	Fostex 9050 A8 Case	165	125
1	Fostex 9070 250 Case	165	125
2	Fostex A8 Tape Rec.	2,500	1,888
1	Sony ER-740 Recorder	361	242
1	Sony ER-750 Cass. Booth Rec.	526	351
1	Sony TC-182 Sync Rec./Player	330	220
1	Sony TCM-280 Cass. Rec.	199.95	133
1	Sony TCM-5000 Cass. Rec.	449.95	296
1	Studer/Revox B-77	1,799	1,240
1	Soundcraft SCM-38216 Track Rec. with Auto-Locator, Convertible to 24 Track	26,576	19,000

Test Equipment—Used

Qty	Description	List Each	Sale Each
1	Amber 4400A Multi-Purpose Test Set	\$ 5,555	\$ 3,150
1	Communications Co. RT-60 Reverb Time Test Set	655	450
1	H-P 8056A-H01 1/2 Oct. Filter Set, needs work		200
1	H-P 400D AC VTVM		200
1	D&R FL3C Flutter Meter, As Is		75

Tape Accessories

Qty	Description	List Each	Sale Each
1	Ampro MX-1 Monomax	\$ 515	\$ 275
1	Ampex VS-10 Rack Kit	45	35
1	B.E.I. TG-2 Tone Gen.	895	835
1	BTX 4500 Synchronizer	3,300	3,060
2	Fostex 3040 Dolby C, 4 Ch.	450	340
1	Teac RM-33 Rack Mount	60	30
2	Teac RM-34 Rack Mount	60	30
1	Teac RM-7 Rack Mount	40	20

Power Amplifiers

Qty	Description	List Each	Sale Each
2	Altec 1594B 100W Amp.	\$ 900	\$ 467
6	BGW 150 Amp.	619	475
1	BGW 250E Amp.	929	700
4	BGW 600 Amp.	999	660
8	BGW 620B Amp., 70 Volt	1,179	885
12	Crown PSA-2 Amp.	1,699	1,425
1	JBL 60-6008 Amp. Mod.		24
1	JBL 6011 Amp., 100 Watt	655	392
2	JBL 6021 Amp., 200 Watt	745	445
1	JBL 6233 Amp., Dual 300W	1,500	750
1	UREI 6300 Amp.	1,296	1,135

Reverberation & Delay Equipment

Qty	Description	List Each	Sale Each
2	DBX K9-22 N/R Card	\$ 350	\$ 270
1	Lexicon 93 Primetime DDL	1,980	1,520
1	AKG BX-10E Reverb with Rack Mount	2,670	1,730

Intercommunications

Qty	Description	Sale Each
1	TTI PCS-201S Intercom PS.	\$ 188

Equalizers/Com

Qty	Description
1	Tapco C-201 Equalizer
1	Thomson/CSF 4111
1	UREI 529 Room Equalizer
1	White 4100 Equalizer
1	ADR Easy Rider Compressor
4	DBX 142 NR System
1	Altec 9062 1/2 Oct. (used)
1	Altec 9018-A 1/2 Oct. (used)



Consoles

Qty	Description
1	Yamaha EF-200C
1	Yamaha IP-1000
1	Yamaha IP-2000
1	Yamaha MT-100C Mod.
1	Yamaha MT-200C Mod.
1	Yamaha PN-200C Mod.
1	Yamaha TB-200C
1	Fostex 350 Mixer
1	Fostex 3060 Meter
1	Fostex 9030 350M
2	Roland 800 Com
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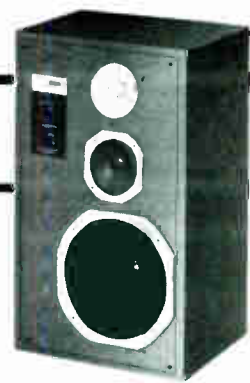
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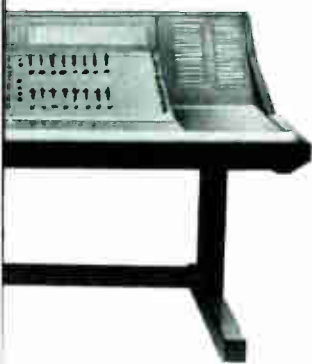
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1	AKG C-45IE Mic w/CK-1 Cap.	350	290
1	AKG C-535EB	280	204
1	AKG C-452EB Mic Preamp.	234	195
3	AKG C-452EB-BLK Mic Preamp.	260	210
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1	AKG CK-1 Mic Cap.	105	65
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2	Studer/Revox BR-530 Spkrs.	369	290
2	UREI 813A Monitors	1,776	1,250
2	Advent Utility, used		50



Financing Plans Available

(continued from page 50)

within minutes after the weekly worship service ends.

The church recording system may include a dedicated studio or a combination studio/music rehearsal room. A smaller narration studio is often provided for speech recording. The sanctuary is the "main" studio; the large musical and dramatic productions as well as the weekly worship service will be recorded here. The recording control is usually separate from the sanctuary reinforcement system but will have tie lines and mike line splits or parallels with the reinforcement control. Professional multi-track control, processing and recording systems are the rule rather than the exception in these facilities.

STAGE SYSTEMS

Man has always expressed his religious beliefs in pageantry, using music and drama to re-enact the great stories of his religious heritage. The electronic church continues that tradition by making use of every tool of the modern stage. The presentations vary from elaborate musical production numbers for the weekly worship services to fully-staged holy-day pageants. The production-oriented church will have professional

theatrical lighting, often including a memory control system, and a production communication system connecting sound and lighting operators, projectionist, conductor, and stage manager. The more modern buildings will have lighting catwalks, side lighting slots, and even flys and pits. In fact, the modern electronic church is a specialized theatre with all the fittings of the professional stage.

To an older generation, a projection screen set up in church usually signalled a lecture by a visiting missionary from some far off land. In the electronic church, projections on built-in screens are a regular part of the worship service. The projections may be visual supports for the spoken message of the minister or they may be complete multi-image presentations. Many churches have solved the costly problem of replacing hymn books by using projections of the hymn words and music for congregational singing.

Quartz-arc projectors are usually needed to provide the large image sizes and light levels required for good viewing in all parts of the

sanctuary. Front-projection screens are the general rule, although a rear-projection screen at the back of the chancel can be very effective. Where multiple images or multiple screens are used, a computerized memory control system will operate the projection system. For simpler productions, a two- or three-projector dissolve system will be controlled by an operator or from a tape control track. Sixteen millimeter motion picture film and TV projectors are likely to be included in the system.

TYPICAL ELECTRONIC CHURCH

Of course, not all churches are production-oriented, have broadcasts, or have cassette programs. Many churches, probably the majority, have little or no electronic systems. But an increasingly significant number are making electronic systems a basic part of their ministry. For an example, let's look to Pomona, California, a city of about 100,000 near Los Angeles. Here the First Baptist Church is building a new sanctuary to seat 2,800. This facility is typical of the medium-size electronic church being built today.

The church has no broadcast program at the present time, but a future TV control room has been provided next to the audio recording control room. From the audio/video rack room, co-ax cables are installed to 20 locations in the sanctuary, the music rehearsal/recording studios, and control locations. These lines terminate at a patch panel where any line may be assigned for video or pulse use with cameras or monitors. This system can be used for broadcast/recording; at the same time it can be used as a production aid (remote viewing) for the elaborate musical and dramatic works which are produced in the sanctuary.

The reinforcement control is located in an open cockpit at the front of the balcony. The equipment includes a 36x12x19 theatre matrix board by Neotek, dbx noise reduction, and 900 series signal-processing modules (flangers, limiters, gates, etc.). The control and processing system patches to 95 microphone receptacles in 23 locations around the sanctuary. These 95 lines also are parallel to the isolated recording control room. Sixteen matrix and four mix buss outputs drive twenty 100 watt amplifiers which are switch-connected to 50 loudspeaker (or headphone) receptacles for use as foldback and effects. The main loudspeaker system includes 3600 watts of bi-

(continued on page 57)



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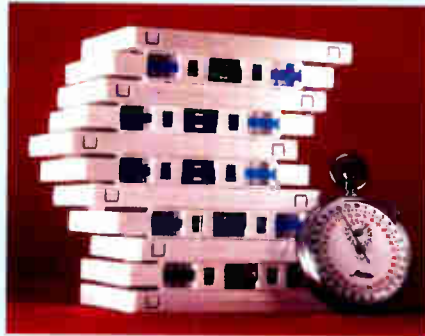
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(continued from page 54)

amped power for four constant-coverage horns with compression drivers and two vented low-frequency boxes each with four 18" drivers. The main system can produce sound pressure levels in excess of 110 dB in the reverberant field.

The recording control room is isolated from the main sanctuary and has visual contact with two of the three rehearsal/studios it serves. Closed-circuit TV provides the recording operator with visual contact in the sanctuary. The control room is an LEDE-type room with built-in, phase-aligned JBL monitor loudspeakers. The board is a 26x8 Neotek Series I. dbx noise reduction and 900 series signal processing modules are shared with the reinforcement system. Recording equipment includes 8, 4 and 2 track open reel recorders, cassette recorders, and in-cassette high-speed dubbers. Each of the three studios has 16 mike lines, 4 foldback channels, talkback, and playback. The three studios are the rehearsal rooms for choir, orchestra, and ensemble.

The stage systems include a raised thrust staging area with a removable pulpit. Rising behind the stage platform is a choir area with removable seating for 300. To one side of the thrust stage is a sunken (not quite a pit) orchestra area. A system of catwalks allows extensive theatrical lighting of the choir and stage. The computerized memory control for the 100+ lighting circuits is located in the balcony control cockpit with sound and projection control. The projection system provides multi-image projections from three quartz-arc 2" x 2" slide projectors housed in sound proofed recesses in the balcony front. Follow-spot booths are located in the two rear corners at the top of the balcony. A two-channel Clear-Com system connects to a total of 65 locations of which 8 are self-contained wall boxes while 57 are receptacles for portable headsets.

F...
or one who has not seen a modern electronic church, the first question is likely to be, "Does all this hardware get used?" Indeed it does. In fact, in the case of the First Baptist Church of Pomona, their Christmas pageant is too big for the church. They rent the National Guard Armory for a staging area large enough for the 1000 actors and musicians. Here the rented sound system has 100 mike channels—and this only a medium size church. ■

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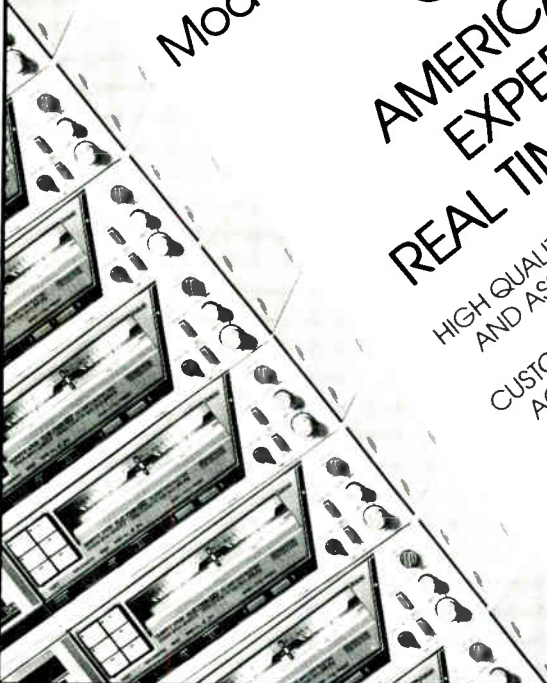
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DIGITAL

DISCUSSIONS

MICROCOMPUTER SYSTEMS

T by Ken Pohlmann

There are over a million personal microcomputers in America today, and the number is rapidly growing. Everyone from business executives to school kids is discovering the profits and joys of computers in applications ranging from general ledger to laser attacks. As rapid as the proliferation has been, most analysts agree that market penetration has just begun. Microcomputers have just celebrated their 10th birthday; the strength of such a young technology verifies predictions of its future dominance of our technology. And it isn't surprising that those technology frontrunners, the recording studio equipment manufacturers, have discovered the advantages of microprocessor systems as well. Dedicated systems have helped propel automation packages into the recording mainstream, revolutionized the role of peripheral special effects devices, and as we saw last month, even glamorized the lowly tape counter. These kinds of microprocessor applications are virtually limitless and the move toward heavier usage is clear, but an even more impressive

trend is becoming apparent. Several manufacturers are beginning to integrate the general purpose computer into the studio environment. Applications including FFT, signal processing, and disk-based automation have demonstrated the utility of microprocessor systems in the studio.

The bottom line is apparent. Studio owners and users—everyone from producers and engineers to technicians, as well as enlightened musicians—will have to figure out all the ways that microcomputers can make their work more meaningful, or at least more productive. That, of course, is the irony of advanced technology – it offers incredible extensions of the various processes in which we are engaged, but only at the up-front price of learning how to use the technology. That idea should be familiar to all who have survived in the recording business for more than a few years – they have successfully recognized the need for continuing education, otherwise they wouldn't still be around. But speaking of education, let's stop digressing and get

on with it.

This month's discussion will try to put together the previous six. All of the hardware pieces we have talked about are useless until they are coordinated into an up and working system, and of course a microcomputer, or microprocessor system, is just that – a microprocessor combined with input and output, and memory, to form a functioning system. Thus a microcomputer has a microprocessor as its central component. That is an obvious statement, but its truth relies on its generality because the implementation of the idea is sometimes diverse and quite complex. Depending on the hardware architecture employed, the microprocessor may be present in any one of several forms. The microprocessor might be contained on one chip with the other functions such as I/O, ROM, and RAM, distributed across several other chips. Another method of architecture results in a bit-slice multichip microprocessor design in which one chip contains the control unit, and 2 or 4 bit slices of the ALU and registers are

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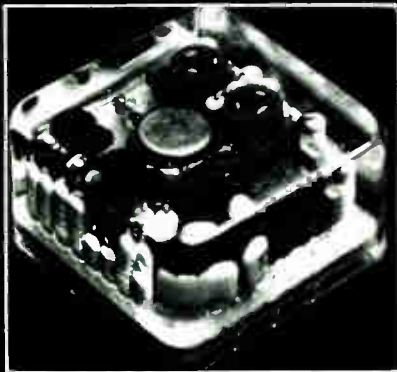
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distributed across several identical chips. This parallel configuration facilitates design of unusual word length systems and results in very fast processors. Another approach places the entire system's circuitry on a single chip to form a single chip microcomputer. Still another approach uses multiple microprocessors in which the total system function is partitioned into tasks and each task is allocated to a different microprocessor. This technique has gained wide popularity. Thus terminals, printers, and other peripherals often contain their own microprocessors to help out the controlling system.

The classical design approach, with each system function located on a different chip, is the most widely-used, and perhaps the most easily understood configuration. A typical arrangement is shown in Fig. 1.

The two previous Digital Discussions centered around the microprocessor, the programmable logic heart of the system. Although it is the control

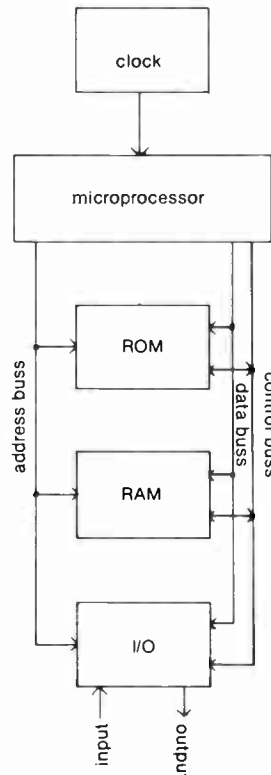


Fig. 1: Microcomputer block diagram

center of the system, it requires several kinds of support circuitry to accomplish its tasks. Thus no system is complete without system components such as ROM, RAM, I/O, and special purpose chips such as programmable peripheral interface (PPI), programmable direct memory access (DMA) controllers, universal synchronous receive-transmit (USART), interval timers, floppy disk controllers, and video controllers.

Every computer needs a memory, and for a variety of reasons. A computer needs a nonvolatile memory which holds pre-programming called firmware, which permits the system to bootstrap itself upon power-up. It needs fast, easily accessible scratchpad memory for rapid exchange and storage of data. It needs larger areas of economical on-line storage, as well as slower, off-line mass storage. Predictably, there is a vast variety of memory types to service these needs. Reserving discussions of mass storage such as floppy disk and slightly exotic memory types such as bubble memories and charge coupled devices, there exist three broad classes of semiconductor memory: read only memories such as ROM and PROM, read mostly memories such as EPROM and EAPROM, and read/write memories such as static and dynamic RAM.

When most microcomputers are turned on, a friendly message appears on the screen; the computer is ready to receive keyboard commands, and visually respond, the floppy disks are ready to read or write, and in general the system is waiting for whatever you have in mind. That preparedness is achieved through firmware programming which resides in nonvolatile read only memories such as ROM, PROM, or EPROM, depending on the application. This is essentially permanent programming which supplies the system with its characteristic operating parameters and is not typically user-accessible. In fact, ROM's are programmed at the factory and can never be changed. Items such as a microprocessor's instruction set, and a floppy disk controller's internal programming, are placed on a ROM area inside the chip to control the chips' operation. Programmable ROM's (PROM's) may be purchased with all of their bits fixed at either logical '1' or '0,' and may be programmed with specialized equipment only once. This would be appropriate for smaller companies who wish to accomplish their own firmware programming. A serious user can customize his operating parameters with erasable PROM's (EPROM's). With EPROM's the memory is erasable by exposure to ultraviolet light, which puts all of the bits to logical '1.' Programming through consecutive repetitions of 26 volt pulses introduces appropriate '0's into the memory to store the data. Upgrading is simple - just pull out the chip, erase, and reprogram. Also available are electrically erasable PROM's, called EEPROM's, which permit in-system erase without the need of UV light.

For most users, the ROM firmware forms an oblivious part of the microcomputer. Most of their memory concerns center on RAM, and specif-

ically on how much RAM is enough to be currently fashionable. RAM (random access memory) gives both read and write capability to the system. For example, the microprocessor must read from the program stored in memory to be told what to do next, and can write its accumulated data into semiconductor memory. Memory access time is an important parameter when assessing RAM specifications. Since large quantities of data are constantly moved to and from RAM, it is important for each byte transfer to take place as quickly as possible. A memory access time of 500 nanoseconds, for example, is the speed at which memory may be written into, or read from. Currently, a speed of 250 nanoseconds is preferred. The size of RAM loosely determines the complexity of the programming capacity in terms of program length and output storage area. In systems lacking other forms of mass storage, the amount of RAM is the bottom line – when it is full, the fun ends. For a floppy disk system, the quantity of RAM is of lesser importance because it acts mainly as a buffer for information going to and from the disk. Thus a very large program may be stored on disk, and worked with in a much smaller semiconductor space. What memory size is fashionable now? I suppose one could survive with 64K of

RAM, but 256K is currently the sign of a hacker of distinction.

Two fundamental types of RAM are commonly used – static and dynamic. Static memory utilizes our old friend the flip-flop because the data is simply stored as the bistable state. Because of the inherent stability of this technique, no further refreshing or clocking is needed; the data simply stays as long as power is applied. Dynamic memory uses a capacitive MOS component to store the data. Because of charge leakage, the data needs refreshing regularly to retain its contents. Thus a hundred or a thousand times each second, the entire contents of memory are read and written back where they belong. While dynamic might seem precarious at first glance, innovations in performance and reliability have made it the overwhelming current favorite. Specifically it is cheaper, runs faster, and can be fabricated much more densely. The refresh circuitry, however, adds slightly to the overhead complexity of memory.

At some point in its life, every microcomputer must face the real world. Thus the question of I/O must be considered, and it is an important question. Obviously even the fastest, most efficient computer, merrily computing away in its own little world, is useless to

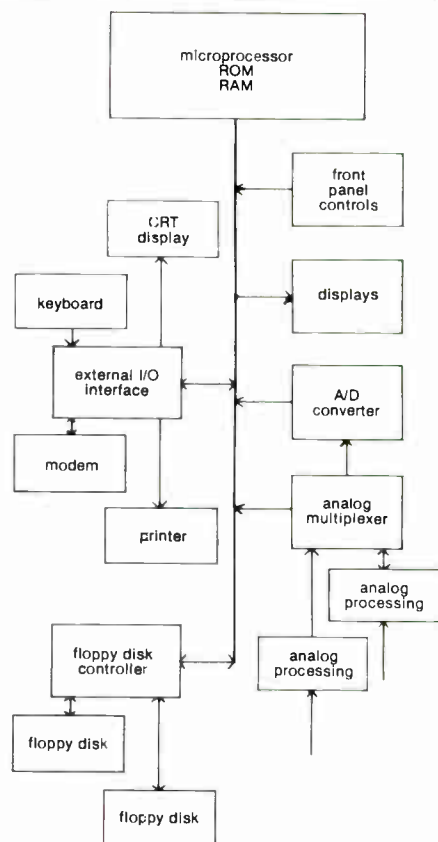


Fig. 3: 8085A microcomputer block diagram

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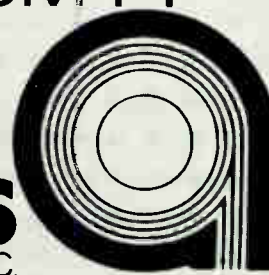


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its owner if the data can't be effectively input and output. That paradox has even compelled some companies to design microprocessors with pipeline architecture which purposefully devalues internal processing efficiency to enhance the speed of I/O. For I/O-hungry applications, such as graphics, such designs would overall be most efficient. In general, I/O must be carefully optimized to the system's other abilities.

Just what is I/O? Simply speaking, it is everything coming and going to the computer. If we lump the microprocessor, and its various memories into one box, a typical system might appear as shown in Fig. 2. Thus, items such as keyboard and video display, mass storage, printers and modems,

and other signal inputs and outputs must all be accommodated as I/O. The electrical system through which controlled access to the buss structure is achieved, in both directions, is called a port. Predictably, they come in a variety of types. There are interrupting and noninterrupting ports, and each of these types may be programmed, or programmable. The term programmed describes a software mode of operation, while programmable denotes that hardware is used to operate the port. The most common ports are noninterrupting, programmed I/O ports in which the microprocessor is in charge of the operation of the port via its program execution. Thus the port is not functioning independently. In its simplest form, a

port may appear as a tri-state buffer arrangement, which prevents buss loading yet provides a simple method of timing control. A more sophisticated method uses special I/O chips such as the Intel 8212, an 8-bit port chip which can be used for both input or output. It consists of a set of D flip-flops feeding a set of tri-state buffers. This forms a universal configuration which can be used for applications such as gated buffer, bidirectional buss driver, handshaking port, latch, and interrupting port.

Programmable ports rely on complex hardware to accomplish the I/O tasks otherwise handled by software. Control words are supplied to the device to set up a particular internal hardware configuration of input or output for individual or sets of lines. The Intel 8255 programmable peripheral interface (PPI) is an example of such a device, which contains three directionally-controlled ports on one chip. Using control words, over ninety possible combinations of port configurations may be employed. Thus it is possible for the computer to interface to a wide variety of peripherals.

Interrupting ports provide hardware-based initiation of an interrupt, that is, a method to call a special subroutine to service I/O requirements. This can provide a very efficient scheme for a microcomputer to control many peripherals or, in the case of networking, for many microcomputers to share and exchange information between themselves and their peripherals. A special type of interrupting port is direct memory access (DMA), which permits a very rapid transfer of data with little or no software overhead. For example, a microprocessor clocked at 4 MHz might require 45 microseconds to accomplish a fifteen byte loop needed to transfer one data byte to or from a peripheral device. A block transfer of 500 bytes would take 25 milliseconds, during which the microprocessor is completely tied up. With DMA, memory is accessed directly rather than operating through the microprocessor. The same 500 byte block might be transferred in 25 microseconds, a time savings of 99%. The Intel 8257 programmable DMA controller provides a four channel DMA with priority request logic. It is capable of operating from 20 to 30 nanoseconds access time per byte for extremely fast data transfers.

A microcomputer using the Intel 8085A as its processor, 8212 for I/O, and 8257 for DMA is shown in Fig. 3. With the addition of memory, it would form a complete system, ready to communicate with user devices such as terminals and printers.

Thus a picture emerges of the microcomputer as a microprocessor nucleus surrounded by special support

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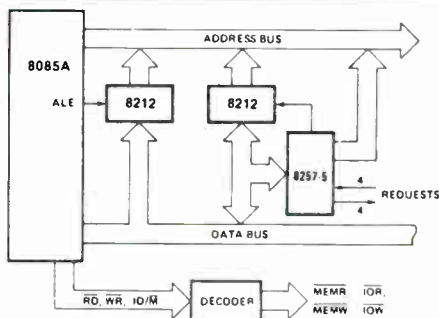


Fig. 2: Microcomputer I/O block diagram

chips. The designer is free to optimize according to the application at hand, and optimization is simply accomplished through the selection of support chips. This provides a great cost savings in hardware, and more importantly, the savings of software compatibility between possibly widely differing computers, using the same microprocessor.

The limiting case of this extremely efficient method of hardware design is, ironically, a theoretically rather inefficient concept in which *all* of the possible support devices are grouped around the microprocessor on the same chip. The subsystems on the single-chip computer may be employed, or not, depending on the application. Because of ever-decreasing costs of fabrication, and growing circuit reduction expertise, this new trend is developing rapidly in which microprocessor, ROM, RAM, I/O ports, clock, and timer are integrated. Some models are configured for specific applications while others are general purpose in nature. Typically they are extremely cost effective. The Intel 8748 is one example of a single chip microcomputer. It is a microcomputer chip containing an 8-bit microprocessor, 1K EPROM, 64 byte RAM, three I/O ports, 8-bit timer event counter, and three interrupt inputs. The microprocessor has 96 instructions and operates with a 6 MHz clock. By using one of the ports as a multiplexed address/data buss, memory and I/O expansion is easily accomplished; for example, an 8212 latch could be used. Other versions of the chip substitute a ROM for the EPROM, or offer larger on-board memory, or low-power CMOS circuitry.

In practice, even a single chip computer, as currently available, would still require at least a few support chips for a keyboard, video display, and perhaps floppy disk. It is not difficult, however, to imagine a next generation of chips where even those subsystems are integrated into the same square of silicon. At this point we are already limited by the ergonomic fact that keys must be big enough to touch, and screens must be wide enough to see. At least that is the case in applications where we wish

to interactively use the computer. Otherwise, where it is unobtrusively controlling something we've chosen to forget about, it will take a strong light and a heavy lens to even tell it's in there.

This seventh article has brought us close to a cadence point in this series of discussions. Beginning with the barest conceptuals of computer systems - the number systems which they employ - and working our way through Boolean Algebra, flip-flops, TTL, and microprocessors, we have come at last to the completed hardware arrangement which puts all the theory and practice together into a working arrangement. Whether it is a general purpose computer or a dedicated system, the elements of CPU, I/O, and memory have been coordinated to get the job done. And yet there is still something missing - without which all the best computer hardware in the world is still left stupid. We need, of course, the software. Next month we will consider some of the nomenclature and philosophy underlying the programming which makes computers go.

Postscript: I've received a number of requests from readers for information on textbooks about digital audio. Unfortunately, no such books exist. That lack of a definitive text is one reason why these discussions have been offered. Each discussion serves to introduce a topic with the hope that the interested reader will be motivated to continue study on his/her own. So - where does one go from here? Well, there's the college course I teach in Miami on digital audio, but aside from legitimate academics, I'd like to recommend a personalized strategy to help a person come to grips with digital electronics. Firstly, read the journals, manufacturer's literature, and data books. They represent the most current information. Secondly, stop by a good bookstore and buy some electrical engineering textbooks. Thirdly, there's no substitute for hands-on experience. I'd recommend investing in a prototype single board computer to let you play with hardware interfacing and software development. An inexpensive but powerful system is the SD starter kit, available from SD Systems in Dallas, Texas. Finally, good luck! You'll be building your own digital consoles in no time.

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LUNCHING WITH BONZAI

PHIL DUNNE

Engineering
for the Gentry

by Mr. Bonzai

Left to right: Mike Estelle (the chauffeur), Gus Dudgeon, Phil Dunne. Boating on the Thames between sessions at The Mill (1978).



Phil Dunne is an engineering artist with a passion for music and a love of only the finest of recording environments. He describes his role as "engineering for the gentry." His talents and his gentleman's approach to the craft have taken him through sessions with Kiki Dee, T-Rex, Van Morrison, Vangelis, The London Symphony Orchestra, a large portion of the Elton John albums, and at last reckoning he had engineered 25 platinum albums and twice as many gold. As a man who understands the electronics hidden under the plush carpets, he was largely responsible for the introduction of the MCI console to Britain. Working with Gus Dudgeon and Elton John, he was instrumental in the creation of The Mill, the legendary recording palace built outside London in the mid-Seventies.

For the past two years, Phil has been traveling North America - first Canada, then New York, and most recently Los Angeles. He has plans to build another studio along the lines of The Mill - a very private recording center which he describes as "an exclusive gentlemen's club for those with taste." Los Angeles is the proposed site for this engineer's dream.

At the age of ten, Phil reached the early conclusion that he hadn't been studying hard enough to get into university as a medical student. He tinkered with modest recording equipment as a boy, became a photographer, and by the age of 16 was managing a local band in Devon, members of which would go on to

form Wishbone Ash. The band made the trek to London in 1964 to record at Advision, one of the city's four state-of-the-art studios.

Following the Advision sessions, Phil put together a small demo studio in Devon. He later returned to London and worked his way up from tea boy to tape operator to second engineer at Advision under Roger Cameron. His first solo session was with a three-piece band led by Steve Race, known widely as "Mr. Pleasant." The session was a disaster, the client turned out to be a "bastard of the first order," and Phil told him to get stuffed. He quietly resigned, but Cameron admitted that it had been a difficult session and kept him on. Two days later an engineer got sick and Phil recorded his first record, with Julie Driscoll.

HOW MANY TRACKS DID YOU HAVE TO WORK WITH ON THAT FIRST TRIP TO LONDON?

Four. We had to have that studio, and the engineer, Roger Cameron, who had just recorded "For Your Love" by The Yardbirds. The studio had those old signal box faders and four Tannoy speakers.

WHY FOUR SPEAKERS?

Four tracks, four speakers - that's how it was done. When 8 track came along and people put up eight speakers, everyone got a headache and started getting sensible.

WHAT ARE YOUR FIRST MEMORIES AS AN ENGINEER?

The horrors start on the first session you do. You look at the desk and freeze, but you know you'll get it together, because everyone else had. Ten years later you begin to realize how you do certain things. It had nothing to do with punching buttons - you really have to be a diplomat in the studio. I was always amazed at how the producer was always the last one to be aware of little things boiling between people.

CAN YOU REMEMBER YOUR WORST SESSION?

Well, I had left Advision because I knew that I could only go so far as a second engineer. The hot albums that I did were by accident. I did the first Yes album because the engineer absolutely loathed what he heard and I thought it was incredible. I moved on to a studio called Marquee. They didn't have much money and had put 3/8" glass in the control room window. I put up the stereo monitoring—the first pair of JBLs in London—and the room sucked. Literally, this ridiculous window was sucking all the bass out of the room. They kept postponing a

new window and one night I just snapped. I tore the phone out and hurled it at the window. It bounced back and hit me in the chest, but the second time it worked. It gave me a great deal of satisfaction and it was the only way to make them do it right.

DID THIS MAKE YOU A WELL KNOWN FIGURE?

Yes, it was a hot story. After that, no one argued with me. They did send me away for a week, though.

WHAT ARE THE CHARACTERISTICS OF A GREAT ENGINEER?

First of all, a sense of humor. Secondly, absolute assuredness in

what you are doing. It has nothing to do with how fast you can push faders; it has to do with the chemistry between people. You have to be very flexible. I also feel you have to have a real love of the music. I've always stayed just an engineer—an engineer to the gentry—but just an engineer. I never wanted to be half and half, although there are those who choose to do more. Ken Scott and Roy Baker, who was the engineer at Trident, are the best of the catch.

WHICH ARTIST YOU'VE RECORDED WAS THE MOST SENSITIVE TO THE ROLE OF THE ENGINEER?

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Phil Dunne is formally presented to Princess Margaret and her aide-de-camp at inaugural sessions at London's De Lane Lea Studio (1972).

knowledgeable, in all honesty, are a pain in the ass. Do I engineer or don't I?

WHO WAS THE BEST AT INTEGRATING MUSICAL CREATIVITY WITH THE POTENTIAL OF THE RECORDING STUDIO?

Vangelis. I was only a hindrance to him, and I served him as best I could. He came into the studio with Clavinets and Hammond organs that he had wired into and fed through echo chambers and then he presented me with a signal. He wanted to do things with the board and stretch more than I had sight for at the time. This was long ago when he was known as Vangelis Papaathanasiou.

IN YOUR OPINION, WHO IS THE FINEST ENGINEER?

An Englishman named Phillip MacDonald. He has done many fine albums, one of my favorites being Harry Nilsson's *A Little Touch of Schmillson in the Night*. Gordon Jenkins arranged it and it's superb. The pure sound comes over. He is a classic engineer, but he's very low profile.

IF YOU HAD BEEN BORN BEFORE RECORDING, WHAT WOULD YOU HAVE DONE?

I would like to have designed concert halls, the ultimate instrument. I also have no problem with manual dexterity and I might have been an organ builder or a builder of mechanical musical instruments.

CAN YOU DESCRIBE YOUR DREAM STUDIO?

I acutally built one once. It was built into an old mill on the Thames. The building dated back 850 years. Gus Dudgeon had the option of moving to the States or spending his money. It cost about a million pounds. It was, and is, exquisite. We had total freedom in choice of equipment and there were only two companies that could build the console with the automation we wanted: MCI and Quad-Eight. We chose to work with MCI and our console was the first of the 500 series. I originally bought the first MCI console in England—the 400. We had it at the Marquee and people were gaga. It was a dream. It made things fast and musical.

WHY DO YOU FEEL YOU ARE A SUCCESSFUL ENGINEER?

Because I am a pleasure to

work with. People have such a good time that they don't realize they have made an album—an album with great quality—if they allow me some basic requirements, such as MCI equipment, because I can drive it like a grand Prix racing car. I can throw it around corners that other people don't even know exist.

I MET JEEP HARNED AT THE LAST AES SHOW AND HE TOLD ME THE STORY OF HOW YOU WERE THE ONLY ENGINEER IN EUROPE WHO WOULD TAKE A CHANCE ON MCI...

I had heard two albums, one recorded at Criteria in Miami, and one at Sigma in Philadelphia. I found out which consoles were used and had to know who these people were.

Jeep is the most honest person I have ever met in the audio industry. He never gave me a wrong word.

WHO MAKES THE BEST STUDIOS?

There is only one man in the world who I believe speaks the truth about studio acoustics: Eddie Veale. His studios are the most expensive, and they are all gems. He's only built a few – he built The Mill, John Lennon's studio in Tittenhurst Park, he built a studio for Ringo, and George Harrison, and the original Apple Studio at No. 3 Saville Row in London.

YOUR SESSIONS WITH ELTON JOHN SPANNED THE ALBUMS FROM "CAPTAIN FANTASTIC" THROUGH "SINGLE MAN." IS THERE ANYTHING ABOUT THAT PERIOD THAT STANDS OUT IN YOUR MEMORY?

I remember one session in particular. All at the same time, we were tracking "Don't Go Breaking My Heart" and we knew it was a hit record; the producer was on the phone getting the figures that we had hit number one with the previous record; a company was delivering a pair of very rare Rolls-Royces to Elton; two Rembrandt's were being delivered by Harrod's, and the guy from Rocket Records was jostling in the doorway with gold disks in quantity. Elton turned to me and said, "What's up?" Can we roll tape?"

WHAT IS YOUR WORKING PHILOSOPHY?

It has to do with my northern industrial upbringing. My grandfathers were precision metal engineers who helped build the Queen Mary. I say, let's have the best. Why go for something that's okay and elevate it to good? Isn't it better to go for something that is excellent, bring all you can to bear on it, and elevate it to something truly wondrous? There's no point in doing anything else. I believe in a solid job, a job done properly with 100% technical integrity. ■

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WHICH ARTIST WAS THE MOST KNOWLEDGEABLE OF THE ART OF RECORDING?

The people who are the most

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Joe Chiccarelli

by James Riordan

Joe Chiccarelli has engineered or produced successful projects with artists as diverse as Frank Zappa, Oingo Boingo, and Juice Newton. A genuinely nice person, Joe developed his technical skill back in Boston. "I was in high school and a cousin of mine owned a recording studio. I started hanging out there because I was just fascinated by it. I got to sweep the floors, repair broken mike cables and got into it from the bottom up. I played guitar in a bunch of local bands and wanted to be a studio musician, but I didn't have the patience for practicing. I was the one who always dealt with the P.A. system so I jumped at the chance to work in the studio. One of the things the studio did was put together documentary albums like the Boston Red Sox the year they won the pennant.

"I got my tape editing chops editing baseball broadcasts. I worked my way up in the Boston music scene, which wasn't that extensive, and I came out to L.A. in '76 looking for a gig as an engineer because I didn't know that no one hires engineers. They just hire seconds and gophers. I was really disappointed because I'd had a decent track record back east and worked on some records that sold nationally, but that didn't matter."

After facing up to the fact that he was going to have to start at the bottom again, Chiccarelli took on a second engineering position at Cherokee. "They had Bowie in there and Rod Stewart, the Bee Gees, so I figured that was the happening place. I worked there about six or eight months and since I had a lot of first engineering experience they would

always hook me up with the real difficult producers. One day Frank Zappa booked the studio and everybody had heard that he was real demanding and difficult, so they stuck me in there. Frank had just come off a tour and somehow his engineer had gotten hung up in another country for some reason. The studio didn't know that and so when Frank walked in without an engineer I ended up doing the session. He and I got along really well and after a week or so he asked me if I wanted to leave and finish the record with him."

Beginning with "Sheik Yerbouti," Chiccarelli worked on five albums with Zappa. He considers his work with Zappa to be a thoroughly stimulating education. "His whole approach seems off the wall but he knows exactly what he's doing. He

would do all kinds of bizarre stuff in the studio and you would just have to be patient until you figured out what was going on. He comes in with things planned out, but it's not uncommon for him to make a left turn in the middle. *Joe's Garage*, for example, was never planned as that. We went in to cut two tunes, "Joe's Garage" and "Catholic Girls" as a single, and Frank just got into tracking. He hadn't done it in a while and the tracks were going real well so we ended up doing something like twenty tracks instead of two."

The concept for the album *Joe's Garage* came after the tracks were laid down, according to Chiccarelli: "One night Frank went home a little bit early and the next day he came in with almost a complete script which connected all these tunes together. All the tunes came from various things... old tunes he reconstructed, new ones he wrote on the spot. He somehow strung them all together and they made perfect sense. He was amazing like that."

Zappa's approach to basic tracks is also unusual. "He never likes to take the band into the studio. What he did for almost every album except *Joe's Garage* and some of his earliest ones was to record everything live with a mobile truck. He would then take the tapes and scrap everything other than keyboards, bass, and drums, and maybe an occasional guitar or vocal. He just felt like there was no energy in the studio so he would always use these great live performances to build upon. I thought it was crazy when I first started working with him. Some of the tunes would just have the live tracks as basics and the rest would be recorded in the studio."

One of the benefits of working with Zappa was the freedom to be imaginative with sounds. According to Chiccarelli, Zappa never wanted anything to sound normal. Some of his recording procedures were equally imaginative. "Frank was using four Marshall bottoms at this time, two on each side of the stage. Two of them had distorted signals and two had clean signals. Frank took a Nagra on the road with him and put two (Electro-Voice) RE20's flush against the speakers and recorded that on two tracks of the Nagra for all his live performances. He came off the road with a handful of tapes that had isolated guitar solos, in case he came up with some licks or parts that he really loved. There was nothing but guitar on them. So one time we cleaned them up a little bit and transferred them to 24 track. He told Vinnie Caliuto, the drummer, the time signature and he asked him to start

(continued on page 89)

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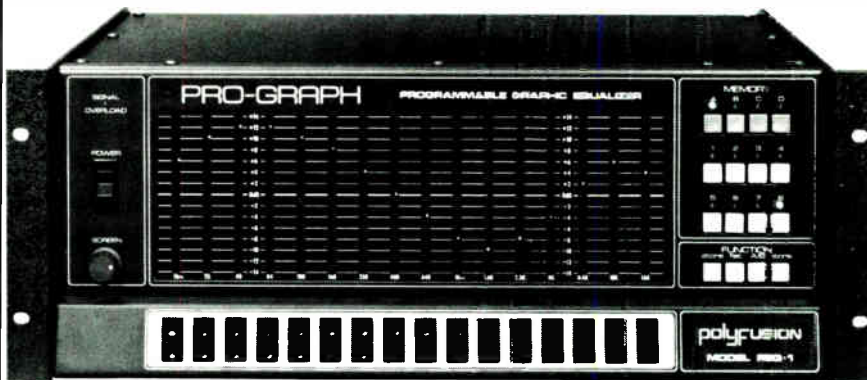
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Alabama's Jeff Cook Sound Studios

by Sam Borgerson

Jeff Cook of Fort Payne, Alabama was a picker no different from all the rest: a dedicated, traveling-band guitarist who nurtured dreams of someday coming home to his own private recording studio. No different, that is, until his talent and good fortune made him one-fourth of a country-rock supergroup that now proudly bears the name of its members' home state. Jeff Cook's "home" studio, therefore, is hardly typical.

Granted, the project started out modestly enough. Late in 1981, Cook decided to build a barn-shaped building near his home to contain—among other things—a studio for his 8 track Tascam system. However, as Alabama's LP's turned to gold and platinum (and double and triple platinum) with monotonous regularity, Cook's upgrading program proceeded with uncommon rapidity. Now, not much more than a year after initial groundbreaking, Cook Sound has emerged as a full-fledged 24 track Studer/Neve facility.

But . . . but . . . in Fort Payne, Alabama—a scenic detour cradling 11,500 souls, tucked away in the southern Appalachians between Chattanooga and Birmingham? Why not? Ames, Iowa also boasts a 24 track room, and how many multi-platinum acts live there?

Although not pressed for immediate studio profitability, Cook is already laying the groundwork needed to make the studio a self-supporting venture. "People are starting to find out that I'm doing this place first class," says Cook, "and I'm getting a lot of calls, both from amateurs and professionals. This area is full of bluegrass groups, country pickers, gospel groups, and song-



Jeff Cook (left) and John Estes (right) in the post-Studer, pre-Neve control room

writers who need good demos. Also, because of my low overhead location, it's not as expensive to do something here. I may have to go up on my rates later on, but right now you can cut here for roughly half of what a comparable facility would cost in Nashville or Atlanta."

Cook encourages outside bookings since his own personal use, and use by Alabama, will be restricted in the near future. "My own use will depend on how much time I have off," he admits. "We booked about 150 days last year, so we're out on the road quite a bit. I would like to have the band come in here to do overdubs, vocals and mixing after we cut tracks in Nashville, but that's just my personal hope. We haven't made any definite plans in that regard." Alabama currently does most of its recording at the Music Mill, a Nashville studio owned by the group's co-producer, Harold Shedd.

Cook's dream of owning a studio first took hold in his early teen years, back when he was honing his musical chops with local bands such as The Viscounts and J.C. and the Chosen Few. His interest in recording heightened after a few sessions for custom labels in Atlanta and Birmingham, and he soon assembled a rudimentary recording facility in his parents' house.

"My greatest claim to fame around that time," beams Cook with subdued pride, "is that I recorded Jerry Lee Lewis in my dad's basement back in July of 1967. I had a little four-channel mixer that I bought from Olsen Electronics in Atlanta—I paid \$75 for it—which I ran into either a Sears or a cheap Sony mono recorder, I don't remember which one it

was. I had some Shure 55S mikes, and I picked up the upright piano by using two four-inch speakers—one at each end—with the output transformers reversed. A very basic set-up. Anyway, Jerry came into Fort Payne for a one-nighter, and since I knew the promoter I got him to come by after the show. Jerry Lee just sang, somebody else played piano, and I played the drums. I still have the tapes."

Cook played the tapes after our interview, and although the sound is rough and occasionally distorted (limiting was, uh, limited), the voice and feeling are unmistakably Jerry Lee Lewis.

Cook's dream of owning a real studio was shelved for more than a decade while he split his time between day jobs (disk jockey, microwave installer for Western Electric, electronic tech for missile guidance systems) and evening gigs as a picker. Music became the main job when the group destined to become Alabama left for Myrtle Beach, South Carolina in 1973 to work full time in the beach resort clubs—the first stop on Alabama's arduous rise to "instant stardom." Eight years later, success brought the studio dream back to life.

Since his initial plans were relatively modest, Cook decided to design the studio and supervise construction himself. But problems developed. The carpenters had never worked on a studio before. Cook was on the road and forced to make crucial decisions over the phone. Also, the art of studio design turned out to be more complex than he had anticipated. Meanwhile, the equipment was upgraded as the Tascam was replaced by 16 and then 24 track MCI units.

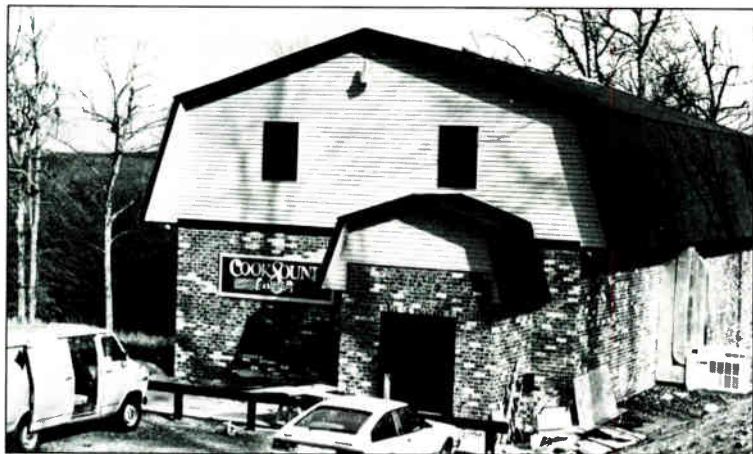
Speck and Auditronics consoles were tried before settling on an APSI 32 in/24 out board. However, when the studio opened late in 1982, the results were less than satisfactory.

Chief engineer John Estes, a Fort Payne native who'd learned his trade in Muscle Shoals, was also unhappy with the 'first incarnation' of Cook Sound. Finally, owner and engineer consulted, then agreed: try again, but this time go whole hog.

Acoustic engineer Steven Durr was brought down from Nashville to redesign the room acoustics and completely rework the control room. Experienced studio carpenters were imported. Walls, carpet, burlap and insulation were pulled down and pitched out the door. Sturdier walls, cedar surfaces, and correct angles

Man and Fender amps, and Gretsch drums. A veteran Ampex 354 and new Revox PR99 tape decks are on hand for dubbing and other general uses.

To satisfy the old disk jockey urges still in his blood, Cook has constructed a small broadcast-style production studio in the second floor office suite located over the main studio. When positioned behind his Harris Stereo 80 mixer, Cook is surrounded by a QRK turntable, a Revox PR99 open reel, JBL L19 monitors, and racks holding cassette decks (Studer, Pioneer, Sharp), not to mention a variety of outboard gear, including graphic equalizers, pitch transposer, dynamic range expander, and a real time analyzer. "All I need is a transmitter and I'm in business."



Cook Sound Studios (with debris from latest remodeling)

came in. A new drum booth was constructed. Wiring was re-done, including cables for 9-camera video operations. New UREI 813 monitors—biamped with Yamaha and McIntosh and equalized by White—were put in place, with video monitors tucked in between. The MCI went up for sale as the new Studer A80VU MKIII 24 track, 1/2" 2 track, and 1/4" 2 track decks were rolled in. A brand new console was bypassed in favor of a "proven classic": a Neve 8058 MKII, purchased from a studio in Meerbusch, Germany and refurbished at the Neve factory in England.

The outboard gear roster at Cook Sound includes a Scamp rack (compressors, gates, de-esser, and sweep EQ), Lexicon Super Prime Time, Eventide 910 Harmonizer, 1176 LN limiters, and dbx 160x limiters. An EMT plate reverb is already in place, and a new Ursa Major digital unit is contemplated. The mike cabinet is stocked with a variety of Neumann, Shure, AKG, and E-V models; and studio instruments include a Yamaha grand, Crumar electric piano, Farfisa mini-compact, Music

claims Cook—a possibility he may take seriously if the FCC turns loose some more low-power FM licenses. In the meantime the room is utilized to produce promotional materials for Alabama.

Despite this abundance of new gear, Cook holds on to his earliest recording roots—literally. He still owns a vintage Sears and Roebuck wire—that's right, *wire*—recorder that was passed down from his father. "It's at least 33 years old," Cook surmises, "since I remember doing things like 'Hound Dog' on it when I was only 4 or 5 years old. It has one 1/4" mike input on the front, and a clock timer to start it automatically—and the timer still works! If the wire breaks on it, or if you want to edit, you just tie a square knot in the wire and clip off the ends. It goes by so fast you don't really hear it."

Cook admits no plans to do mono mixdowns from the Studer 24 track through the Neve into this nifty "easy-edit" Sears machine. But somehow you get the feeling that he won't be able to resist trying it—just once.

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Stage Monitors

by Pat Maloney

This month's column continues to look at some of the latest developments and ideas in the design and manufacture of stage monitors.

Phil Moon of Yamaha told us about his company's newest entry into the stage monitor field, the S2112H. Incorporating a single 12" speaker and flush mounted radial horn, the new speaker is smaller and a little less expensive than their previously available 15" version, the S2115H. Both speakers are constructed in Yamaha's factory in Georgia from components shipped in from Japan. Introduced at the last AES, the suggested list price of the S2112H is \$365. According to Phil, the new unit is capable of delivering 100 watts into 8 ohms and covers a frequency range from 50 to



Yamaha S2112H Stage Monitor

15 kHz, plus or minus 6 dB. "We like to design a new loudspeaker for each individual cabinet we come out with and in this case we are using a new woofer called the JA3105 as well as a new horn."

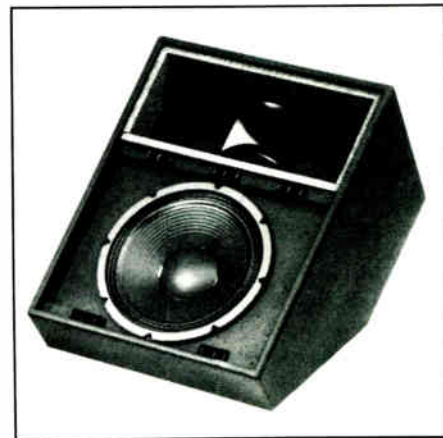
Integrated Sound Systems manufactures speakers marketed under the Vortec and GLI brand names. Production manager Steve Emspak reports that the Vortec line includes a personal 'spot' monitor that's available with or without a built-

in power amp. The vented cabinet is about the size of a large shoebox (17" x 10" x 9"), screws onto a standard microphone stand and contains two 5¼" drivers and a radial compression horn-type tweeter. The amp module accepts a line level unbalanced input via a ¼" phone plug and is rated at 30 watts. The unpowered version of the speaker is designed to handle 80 watts and is available in either 4 or 16 ohm versions. Emspak states that the speaker will produce 97 dB SPL at 18" from one watt input. The SRS25E powered version retails at \$299 and the unpowered SRS25 sells for \$169. On the drawing boards and due out this spring is another model of the powered speaker which will include a mike level input stage with separate gain control.

Tom McCauley of McCauley Sound, Inc. says his company builds monitors on a somewhat broader scale than most manufacturers. Since his products are purchased by several large sound companies such as DB Sound in Chicago and A-1 Audio in L.A., he is set up to supply a wide variety of products to meet the changing demands of these companies' various clients. "We make thirty different horns, half a dozen cone speakers, and two dozen enclosures," Tom told me. With any horn or speaker able to mount into virtually any enclosure, the possible combinations are nearly endless. "Our multiple systems allow us to find out what the dealer or user is specifically trying to accomplish and then we help them design a system in terms of the components and style of enclosure they want." At the moment, they don't supply the compression drivers with a system, although field tests are being conducted on some prototypes that may be available in the near future. Nine ply birch is used for most cabinets, and 13 ply is available for an additional charge. Connectors are available in any configuration you specify. (Tom, however, doesn't like to see ¼" jacks used in real high

powered situations.) One recent request was a bit unusual: someone ordered the waterproof electrical connectors normally used on trailers. "They were kind of expensive but they did work well!" he recalled.

Jim Wischmeyer of Modular Sound Systems, Inc. describes his company's "Bag End" speakers: "The TA-12 Time Aligned monitor employs a special time offset correction technique and is licensed by E.M. Long

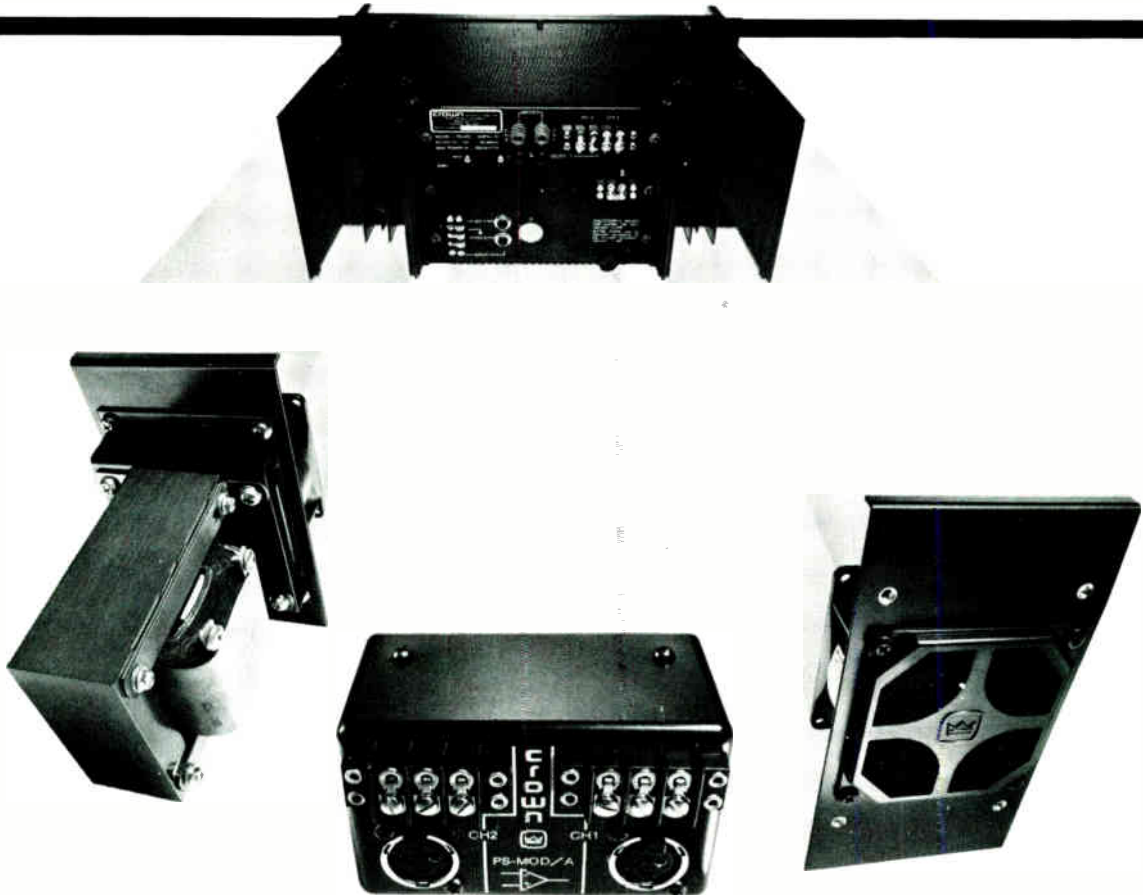


BagEnd's TA-12 high performance loudspeakers w/time offset correction

and Associates. It's a two way system incorporating a 12" woofer with a 2½" voice coil, 80 oz. magnet and a separate tweeter." The same components are available in two cabinet configurations, one rectangular and one wedge shaped for use as a floor monitor. The speaker is fairly new to the market, the first ones being shipped in 1981. "We worked together with Ed Long to develop this speaker," Jim reported. "We looked at the components, performance, and price and came up with a pretty flat response system that was coherent, aligned, efficient, and capable of high power handling." Wischmeyer conservatively rates it at 150 watts continuous sine wave and 300 watts continuous program. Sensitivity is said to be 103 dB spl, one watt, one meter. "We designed the woofer ourselves and also developed a passive limiter to protect the tweeter. You can get either shape cabinet in domestic plywood for \$439 or for \$100 more you can request 13 ply Finland birch. In both versions, however, the speaker baffles are constructed from the stronger Finnish ply." Overall response is quoted at plus or minus 3 dB from 125 to 17 kHz, and plus or minus 5 dB from 70 to 19 kHz.

Because the area of stage monitors is developing quickly, we will keep this forum open and pass along the information to you as we receive it. Stay tuned.

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TOM PETTY

by David Gans

Tom Petty and Jimmy Iovine first collaborated on Petty and the Heartbreakers' third album, *Damn the Torpedoes*, which was recorded during Petty's protracted courtroom battles to keep control over his recording destiny. Each of the three albums resulting from their co-production—*Torpedoes*, *Hard Promises* and the new *Long After Dark*—has added to the Heartbreakers' strength on the radio and the sales charts, and the two men have become close friends.

Petty talked about working with Iovine during an interview shortly before he left on a world tour in support of *Long After Dark*, which reached the *Billboard* Top Ten shortly after its release.

HOW DID YOU GET STARTED WITH JIMMY IOVINE?

It was around '78, I guess. I met Jimmy after I heard "Because the Night" [by Patti Smith] on the radio. I really liked the sound of that record. He also worked on the John Lennon *Rock And Roll* album and *Walls and Bridges*, and I liked both of those records a lot.

I wasn't really familiar with Jimmy, but at the time I heard "Because the Night" I was at a point where I wanted to change sounds. I'd done two records that sounded pretty much the same to me, and so I wanted to move on. By coincidence, Jimmy called Denny [Cordell, the head of Shelter Records, Petty's label at the time] and asked him, "What's going on with Tom, because I'd like to do it."

For some strange reason, sight unseen I said, "Okay, let's do it." I was just in a strange frame of mind at the time. Denny, whose opinion I respect a lot, said to me, "I talked to him on the phone, and the guy's really a rocker—I can tell. If it doesn't work we'll call it off, but I would do it if I were you."

I thought, "Well, okay, let's do it." It's funny now, because now he's like my closest friend in the world. We hit it off very good from the first day we met. We're a lot alike. We went to work on the album, went through a good ten months of lawsuits, and ever since then we've been working together.

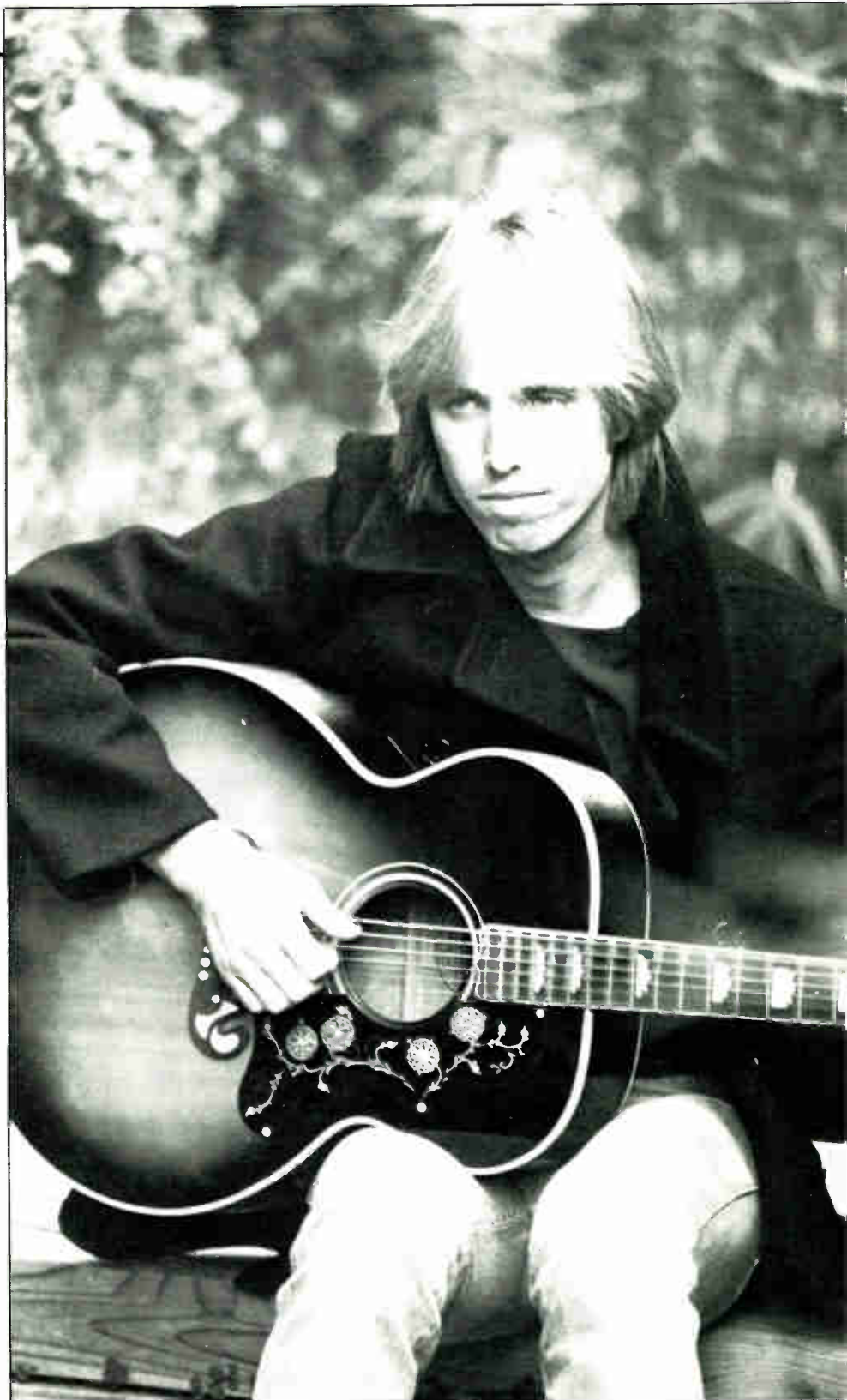


PHOTO: DENNIS CALLAHAN

On Co-Producing with Jimmy Iovine

IT MUST HAVE BEEN HARD TO CONCENTRATE ON MAKING A RECORD WHILE YOU WERE FIGHTING IT OUT IN COURT OVER YOUR CONTRACT.

Oh, I could write a book. I don't even like to talk about those days much, 'cause the story's been told so many times. It was something to go through, and I think that after Jimmy went through that with us, we were kind of like blood brothers. He wasn't going to court, but he was suffering greatly, because we were all in love with that record [*Damn the Torpedoes*].

IT DOES SEEM LIKE A GREAT PLACE TO FORGE A FRIENDSHIP.

He had amazing strength. He's an amazing guy. I hate to even say it, 'cause I have to live with him [laughs]. I'm sure Jimmy Iovine is one of the only real record producers there is who actually knows how to make a record and produce a record, and who cares about the record and works on records that he likes.

HE DOESN'T WORK ON RECORDS HE DOESN'T LIKE?

No. And he brings something out of the artist. I haven't worked with that many producers, but I've seen a lot that ain't got nothing going on, that are just useless people in the room and actually, I think, work to the detriment of the project a lot of the time. Jimmy really knows his craft and his job, and even as close as we are, he keeps me in line.

HOW SO?

It'd be very easy for me to go in and produce the records without anyone and have no one to argue with, whereas Jimmy will question me until the cows come home. He'll push me and push me and push me, to the point where it's ridiculous sometimes. I've seen him do it with other artists that he works with, too. I hate to even say it, because he's going to carry this around to every studio [laughs], but he's usually right. Sometimes he's wrong, and he'll admit it, but he's usually right.

IS THAT TRUE FOR YOU, TOO—THAT WHEN YOU'RE WRONG YOU'LL ADMIT IT?

I'm pretty good about it, yeah. Having an ego in the control room, or in the studio, is a waste of time. You can just get on with it, you know? In a

session, it's a very simple thing: if one guy feels one way and another guy feels another way, then it's very simple to do both and then listen. Then you know immediately—"Is this better, or is that better?"

HOW IS THE RESPONSIBILITY DIVIDED UP BETWEEN YOU, JIM AND [ENGINEER] SHELLY YAKUS?

Sound is mostly Shelly. Neither one of us likes to even be bothered with it very much. I tell him, "Shelly, that doesn't sound right. I want it to sound more like this," and he deals with it.

DIDN'T JIMMY START OUT AS AN ENGINEER?

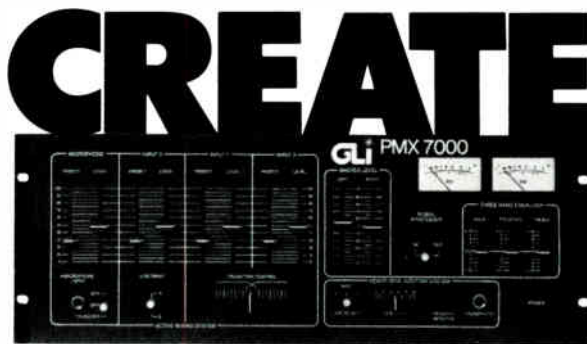
Yeah, but it's easier for Jim to concentrate on the songs and the arrangements if he's not leaning over the board trying to get a sound. And

Shelly's so good and so thorough—I don't question whether the sound's going to work later when I want to mix it or put it on a disk.

When I work with Jimmy and Shelly, it's a different sound than when they work on their own. At times, the sound will get too good for me, and I'll say, "Let's back up." They see that. We just go by the character of each track—we want a given track to have this texture, that kind of character. Those are the only real guidelines that we use, and the rest is just up in the air.

There's a lot of experimenting, too. "Ben, play that organ part," or whatever. We really have a lot of fun. We probably spend way too much money [laughing], but we really have a lot of fun. ■

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ALBUM COVER ALBUM: The Second Volume

by Roger Dean and David Howells
A & W Visual Library \$14.95

"The 12" square is the only limitation," say the authors of this excellent collection in their introduction to *Album Cover Album: The Second Volume*, a successor to their 1977 work. And whatever the music industry may have done in recent years to limit the quality and variety of what's available behind these foot-square canvases, the art of packaging records has continued to develop in many pleasing directions. Fashions come and go in commercial art even faster than they do in commercial music, and the designer/authors of *Album Cover Album* have selected examples of the trendy and the traditional, the primitive and the high-tech, the tasteful and the tacky. Images are grouped by themes (the nine faces on page 101), style (the posterized portraits on page 100), by artist (the Fleetwood Mac, Earth Wind & Fire and Chicago groupings on page 105), etc., and every style of music is shown to be packaged in every style of cover art.

The *Album Cover Album* isn't just for music lovers. Anyone who appreciates good art, especially the punchy and imaginative kind that is used to sell products, will enjoy this book. Several interesting photographic styles are represented, from the straightforward to the extremely doctored. For example, on one two-page spread there are steaming hot red peppers slightly overexposed to add to the spicy effect (Mongo Santamaria's *Red Hot*), a pair of eggs "lookin' at ya" on the double sleeve of Wilbert Longmire's *Sunny Side Up*, a photomontage of hands and flamingoes (Herbie Hancock's *Mr. Hands*), and a peeled-emulsion effect on Steve Tibbetts' *Northern Song*.

Typography ranges from elaborate to original, to clichéd, to casual and tossed-off; illustrations run the gamut from classical to Dada to photorealism, with many stylistic stations visited along the way. Minimal and excessive, mundane and fantastic, comical and oh-so-heavy, political and whimsical, ultramodern and pointedly retrograde—there's something from every corner of the esthetic playground to be found in this book.



A section on Japanese album cover art shows that nation's marriage of progressive and traditional influences, as well as the incorporation of Western ideas. And the Japanese style, which has been borrowed from by Western artists for years, turns up in several places elsewhere in *Album Cover Album*—rather subtly on Sea Level's *On the Edge* and two Eric Gale albums, and much more literally on *Japanese Melodies for Flute and Harp* by Jean-Pierre Rampal and Lily Laskine, as well as Kate Bush's *The Kick Inside*.

While many album covers aren't specifically related to the material on the enclosed vinyl, often there's an attitude expressed that relates directly. I was particularly taken with a pair of parodies, for example. The Pee Cees' single, "Too Depressed to Commit Suicide," depicts three decidedly less handsome blokes arranged in the manner of The Police on *Zenyatta Mondatta* (and there's a Police single sleeve in the book that deals with the same theme in a marginally tasteful way, illustrating "Can't Stand Losing You" with a photo of a guy with a noose around his neck standing on a block of ice waiting for a nearby electric heater to do its stuff). Even better is the Hee Bee Gee Bees' sendup of the Bee Gees' windblown look: "Meaningless Songs (Sung in High Voices)" shows three fellows in aviator jackets and scarves gazing off toward the horizon, each holding a hair dryer in his hand.

Album Cover Album shows us that the quality of the graphics on the outside doesn't always indicate the quality of what's in the grooves. There's

some first-rate art surrounding third-rate music, and while people are unlikely to buy a record solely because of its cover, it's nice to have these wonderful designs collected in such a well-presented form. The cliché about judging books by their covers holds equally true for records. —David Gans ■

KANTNER'S SOLO SPIN

Jefferson Starship commander Paul Kantner is at work on his second solo album, *Planet Earth Rock 'n' Roll Orchestra*, which is tied in with his recently-completed novel of the same name. Among the players on the record are his former Jefferson Airplane bandmate, bassist Jack Casady, former Starship drummer Aynsley Dunbar and current shipmates Grace Slick, Pete Sears and Craig Chaquico, guitarist Ronnie Montrose, and legendary vocalists and all-around fun characters Flo and Eddie (Howard Kaylan and Mark Volman). The album, produced by Kantner and The Durocs (Ron Nagle and Scott Mathews), is due out later this year. And watch for a new RCA stereo videodisk featuring the Starship, taped in concert February 19-20 at the Queen Elizabeth Theatre in Vancouver, B.C. —D.G. ■

CLOVER BOYS REUNITE

Clover was a Northern California band whose countrified rock 'n' soul music never caught on with the public as strongly as it did with the critics and their fellow musicians. After recording two albums for Fantasy and gigging around the Bay Area until the mid-'70s, the band moved to the more receptive environs of England in the pub-rock days. They released two excellent LPs on Mercury, *Clover* and *Love on the Wire*, and backed Elvis Costello on his debut album. They returned to their home turf a couple of years later, only to break up for lack of funds, even though they would have preferred to continue as a band.

How good was Clover? If the subsequent successes of several members is any indication, it was a pretty

fine band indeed. John McFee went on to join the Doobie Brothers, where his pedal steel playing was as welcome as his rock and R&B chops on the six-string; vocalist/harpist Huey Lewis and keyboardist Sean Hopper formed Huey Lewis and the News, a band which made plenty of news in 1982; and singer/songwriter Alex Call's career is just beginning to take off: he and Tommy Heath co-wrote the Tommy Tutone hit, "867-5309/Jenny," and he's solely responsible for Pat Benatar's current single, "Little Too Late."

Call's solo debut, released by Arista on February 23—"the day of the Grammys and the day the State of California is scheduled to run out of money," as his manager, Marty Wolff, points out portentously—was produced by Ron Nevison, who is also responsible for Rex Smith's forthcoming Columbia disk. Both records feature versions of Call's "New Romeo," which was first recorded by Tim Goodman a couple of years back.

The four ex-Clover boys were reunited at the Sausalito Record Plant a few weeks back when John McFee dropped in to add guitar and vocal support to Call's project while Lewis and Hopper were across the hall working on the third Huey Lewis and the News album. Pizza and pleasantries were shared by all. —D.G. ■



PHOTO: DAVID GRANS

Left to right: Huey Lewis, Sean Hopper, Alex Call, John McFee

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by John Tobler & Stuart Grundy
St. Martin's Press
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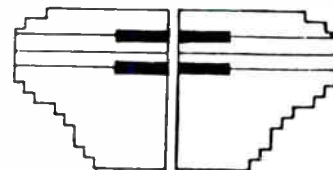
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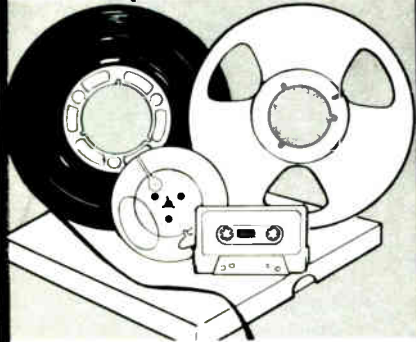
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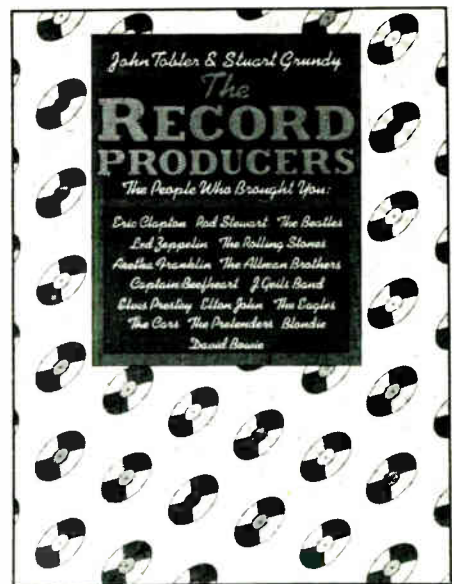
Circle #050 on Reader Service Card

The Record Producers, which features profiles of 13 American and British producers, takes the backstage approach getting to the meat of the issue via some great gossip, but in the end still delivers an informative account of what really goes on inside the walls of a recording studio.

Among those covered in the book are Leiber & Stoller, Tom Dowd, Phil Spector, Richard Perry, Bill Szymczyk, Todd Rundgren, George Martin, Mickie Most, Glyn Johns, Tony Visconti, Chinn & Chapman, Roy Thomas Baker and Chris Thomas. The book is easy to zip through because it is essentially 13 lengthy magazine articles bound together. When you're through with it you'll be filled up with a wealth of little facts which together make up about 70% of rock history.

The authors obviously did their homework, researching not only the major recordings each producer did, but most of the obscure ones as well. They tell us much about George Martin's ultra-success with The Beatles, but they also discuss the enormous effort he put into doing a Jimmy Webb album which was a miserable commercial flop.

The most interesting passages



are the ones that deal with producers who have covered the most ground, especially Leiber & Stoller, Phil Spector, Glyn Johns, Chris Thomas, and of course, Martin. The chapter on Johns is extremely fascinating since Johns himself speaks frankly of his experiences in the studio with Led Zeppelin, The Who,

EVENTS OF NOTE

A new version of the *Buchla 400*, a powerful music computer, will be demonstrated at a symposium Wednesday, March 7 at 7:00 p.m. at West LA Music. Composer Morton Subotnick and keyboardist Ralph Grierson will each perform a composition using the instrument, which features a weighted, piano-style action as opposed to the touch keyboard of the original version, and the 400 is sensitive to keystroke velocity and pressure. Don Buchla, developer of the instruments, will discuss the system's architecture and software, including the two powerful programming languages. MIDAS, says Buchla, is a keyboard-oriented language with a traditional approach (note-oriented, score-editing, but by no means limited to traditional Western music); PATCH 5 is more flexible, giving the user more control over the structure of his music. There is no charge for this symposium. West LA Music is located at 11345 Santa Monica Blvd., Los Angeles. For more information, call West LA Music at (213) 477-1945.

The University of Southern California School of Music is offering a Studio Guitar Program designed for players who seek careers in live performance as well as television, film, radio and recording. The four-year program, leading to a Bachelor of

Music degree, includes courses in music and general education, individual and ensemble instruction, and intensive training in studio guitar performance. "To be successful you must have mastered the art and techniques of jazz, ragtime, bluegrass, country, urban and country blues, bossa nova, fusion and rock," says the brochure. "You must be equally at ease in all kinds of ensemble playing, from small combo to big band, and in all kinds of situations from the night club stage to the recording studio." To prepare students for this multifarious challenge, the faculty includes several veterans of all the aforementioned realms. In addition, master classes are taught by such leading artists as Laurindo Almeida, Lenny Breau, Mitch Holder, Lee Ritenour and others. The Classical Guitar Program, led by James Smith, features master classes and special sessions by guests including Ernesto Betteti, Manuel Barrueco, Michael Lorimer, Andres Segovia and others. For information on admission requirements, financial aid, etc., call the School of Music's Office of Student Services at (213) 743-2741 (call collect if necessary, it says here); if you'd like to have an interview with the Studio Guitar faculty before applying for admission, call E.C. "Duke" Miller, Guitar Department chair, at (213) 743-2527 (collect if necessary).

The Beatles, The Rolling Stones, The Eagles and several others. Johns tells how frustrating it was working with Eric Clapton on *Slowhand* because Clapton was so lazy during most of the sessions that Johns would have to drag him inside from playing football. The authors also get Johns to bring out some of his recording secrets, such as how he and The Who put together *Who's Next* (the song "Won't Get Fooled Again" was actually done in Mick Jagger's Victorian mansion).

The Producers is not a technical document. It is meant to be understood and enjoyed by the rock and roll layman. Tobler and Grundy have gathered a wonderful and very complete collection of photos to accompany each profile. Since many of the shots were taken in the studio while artist and producer were hard at work, they often relay the mood of the session.

This book is an important music history document for many reasons. Before the 1940s and magnetic recording tape, the producer's role was minimal; he was mainly a glorified arranger and song selector. But with the advent of technology in the studio, the producer's role has completely changed. As George Martin says here, "He [the producer] works with an engineer to create something which is larger than life. He is there to superimpose his will on the artist, to steer the recording into the particular musical direction he wants. He has, in a sense, become a star in his own right."

The Record Producers, for the first time, tells the story of these "stars." —Bruce C. Pilato ■

Ripley's Stereo Guitar

Nestled among the synthesizers, drums and revolutionary new guitar picks at the NAMM show last January was a small, unadorned booth outfitted with a couple of small amplifiers a few feet apart. Between them sat Steve Ripley, playing a very colorful guitar of his own manufacture. But it wasn't the visual appeal of the instrument that caught my attention—it was the startlingly clean stereo sound Ripley's guitar made.

Since I fell in love with the Turner guitar a few years back, I haven't so much as looked at another instrument. But the Ripley guitar sounded so sweet and did so many nice things that it just jumped into my lap and made itself comfortable. The two Bartolini pickups each have six separate outputs, and there's a tiny pan pot for each string—plus individual (Gibson-style) pickup selector switches for each.

For more information, contact Steve Ripley at his Southern California snop, (213) 954-9910.

—D.G. ■

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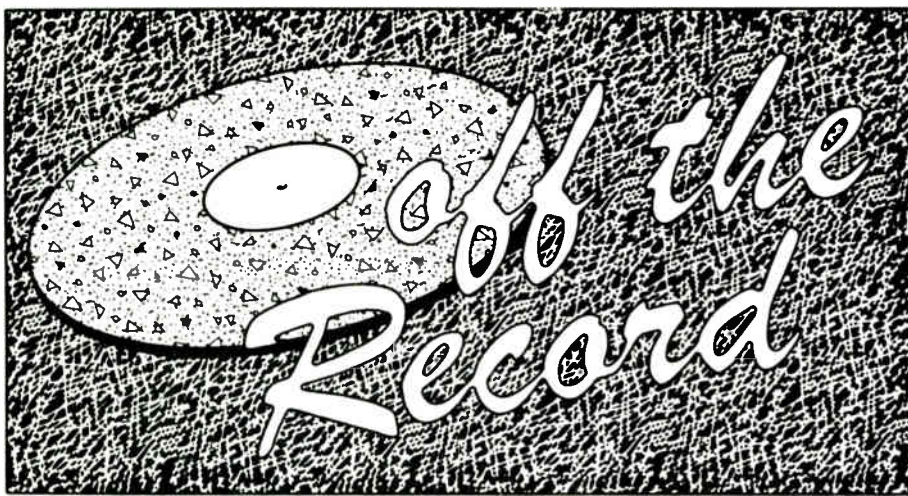
- MM 12 MONITOR MIXER: 12-in/6-out with parametric EQ, compact 19" X 21" X 2.5" deep rack mount chassis: \$1299 list
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BRUCE SPRINGSTEEN
Nebraska
Columbia TC 38358

Recorded in New Jersey by Mike Batlin on a TEAC Tascam Series 144 4 track cassette recorder. Mastered at Atlantic Studios by Dennis King; Mastering consultants: Bob Ludwig (Masterdisk) and Steve Marcussen (Precision Lacquer).

Before the release of *Nebraska* the media reported some reluctance among radio programmers to add the album to their playlists. Springsteen or no Springsteen, said some PDs, this record doesn't fit the sound of our station. Retailers, too, expressed some reluctance to jump on the album, fearing that the absence of the E Street Band's backing and the downcast nature of the songs on *Nebraska* would turn the fans off.

Such was not the case. Without help from the usual sources—such as a single or a video ("Atlantic City" was shown on MTV, but not in heavy rotation)—*Nebraska* ended up getting considerable airplay out of the box and began dancing off retailers' shelves immediately upon its release and kept on moving until the end of the year. Perhaps the best comment came from a retailer quoted in the tip sheet *Album Network* saying that people shouldn't complain about the \$8.98 list price, since if *Nebraska* were a white-label bootleg people would gladly pay a hundred dollars for it.

Bruce Springsteen's music has always been as American as Prom Night: romantic, optimistic, proud but respectful, celebratory of what all this country's people and institutions do for and

to each other. There's always been plenty of joy to balance the grief, and most of Springsteen's characters have come to grips with their lives one way or another.

Not so with *Nebraska*. As American as a midnight gas station robbery, these songs strip away the patina of optimism and awake from the American Dream to smell the bitter coffee of a digital-age depression that elevates the wealthy while grinding more and more of the New Peasants into the asphalt of the cities and highways of America.

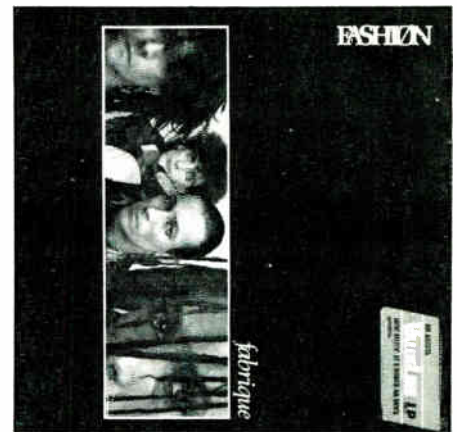
Closed in on all sides, the people in these songs cling doggedly to ideals long since spent—or else they explode into aimless, mindless action that does nothing besides bring an end to the monotony of misery. There's a highway patrolman whose brother is the only thing that can come between him and his badge—and does so again and again; a boy shares his father's shame over having to buy another used car, but puts his hopes in the lottery because there's no other way to escape the same fate; and at the end of the album, "Reason to Believe" presents a heart-breaking series of situations that make you wonder what reasons there could possibly be.

Nebraska is full of people cut off from their options, whose prospects were none too good before these hard times squeezed them down to nothing at all. Springsteen tells the stories in blemished, one-take renditions accompanied by acoustic guitar, harmonica and very little else. *Nebraska* is for Springsteen what *Tonight's the Night* was for Neil Young: a statement that the artist was absolutely compelled to make at that time and in that way because if he didn't, nothing he did then or thereafter would make sense. Springsteen demands that his fairweather fans—especially the ones who came on board because of "Hungry Heart"—understand that you can't deal with him in the same mental breath as Eddie Money or John Cougar. There will again be a joyous "Rosalita," of course, but right now there's some serious stuff to think about. *Nebraska* might strip away some of the shallower fans—or more desirably, re-educate them so they can get all there is to get from Springsteen.

Springsteen recorded *Nebraska* at home on a Portastudio. These versions were intended only as demos, but when he tried the songs with the E Street Band he found their impact diminished. An attempt to rerecord them solo in the studio failed to capture the naked

power of the Portastudio takes, so Bruce and engineer Chuck Plotkin bit the bullet and did the best they could to improve on the four-track cassette's sonic limitations. The result is an utterly unforgettable record that transcends all its flaws because it contains one essential ingredient that has nothing to do with recording quality: truth, well-said and earnestly spoken.

—David Gans



FASHION
Fabrique
(Arista AL6604)

Produced by Zeus B. Held; recorded digitally at various studios in Paris, Germany and London.

Fashion is a different breed of technology band which incorporates heavy electronic keyboards with standard guitars, bass and drums. Where most groups of this type are mostly electronic and require technicians rather than musicians, Fashion is mostly a band of real live players.

Their debut American release, although lacking in the quality of its material, is a good example of the right blend of technology and pop music. By mixing standard pop melodies with solid R&B rhythms and futuristic electronic keyboards, the record takes some pretty well known ideas and sends them off to other galaxies.

The band, which actually evolved out of an art video/music experiment begun in 1978, seems to defy classification. At times they can sound like Chicago in the space age (with electronic keyboards replacing the trademark brass sound), while on other songs they give the feeling of an American R&B group joining forces with the likes of Eno or The Human League.

Spearheaded by guitarist Dee Harris and Salvatore J. Mulino on keyboards, the group has debuted with 10 songs that are crossed in dark musical surroundings and served in a dense, powerful production.

Though the group has been influenced strongly by American R&B and contemporary jazz, they may be too "European" sounding here. That's the same problem that Ultravox has struggled with for years in their homeland: they're monsters, yet over here they can't get arrested.

Despite some very strong tracks ("You Only Left Your Picture," "Love Shadow"), the album's songs are not as interesting as the group itself. Whereas the musical concepts here are haunting and modern, the lyrics are embarrassingly dull, sporting such titles as "Do You

Wanna Make Love," "Dress to Kill," and "It's Alright." At one point I wondered if Harris had written the music in 1982 and the lyrics in 1968.

Despite its pitfalls, *Fabrique* shows enormous potential for Fashion. The group, although not pioneers in techno-pop, are indeed trying some new and innovative things. With some fine tuning, Fashion will be among the few new bands to take us to the next age in music.

—Bruce C. Pilato



DAVID DARLING
Cycles
(ECM 1-1219)

Produced by Manfred Eicher in November 1981 at Talent Studio in Oslo, Norway; engineer: Jan Erik Kongshaug

This is a lovely album. Producer Manfred Eicher assembled an international group to record under the leadership of cellist-composer David Darling. Don't expect this to be an album of cello solos. On the contrary, it's an ensemble work. Darling gives his partners plenty of space, notably pianist Steve Kuhn and saxophonist Jan Garbarek.

The music is moody and introspective with soaring passages in which cello and saxophone echo and challenge each other while Kuhn's piano provides a warm counterpoint. Colin Walcott plays sitar on my favorite cut "Cycle Song" in a guitar-like style and his percussion work throughout the album is kinetic. Bassist Arild Andersen's tone is beautiful and the interplay of bass and cello on "Ode" is stunning.

The album's title "Cycles" is apt. The music is like a changing weather front; clear and calm, then cloudy, then stormy and violent, and back to calm again. The recording is exquisite.

—Bob Goldstein

NEW AND NOTEWORTHY

The Shags, *The Shaggs Own Thing* (Red Rooster/Rounder) — This is what our parents must have thought *all* our records sounded like back in the '60s—and *The Shaggs' Own Thing* is a lot better than *Philosophy of the World*, the first album by this unholy three, the sisters Wiggins. It is interesting to note that the Wiggins' father produced the sessions himself—

but he probably did it with the same vengeful irony with which Ward Cleaver might nominate Eddie Haskell for membership in the country club from which Fred Rutherford had him blackballed. *Own Thing* is notable for a new version of "My Pal Foot Foot" from the 1969 LP, and "Gimme Dat Ding," unquestionably the worst live recording ever pressed into vinyl. An essential document in the history of the, er, music of the late 20th century.

Firesign Theatre, *Shakespeare's Lost Comedie* (Rhino) and *Lawyer's Hospital* (Rhino) — As long as politics and television steadfastly refuse to get any less ridiculous, the Firesign Theatre will never run out of material. After several years of working separately and in pairs, the four funnymen from LA have returned to both studio and live work with a pair of new LPs. *Lawyer's Hospital* contains one side of material

recorded on their 1981 national tour and one side of studio and broadcast material taken from over a dozen years of political commentary and satire. Among other blasphemies, the latter program presents all the latter-day Presidents sharing after-dinner obscenities in some trophy room in Hell.

Buddy Holly, *For the First Time Anywhere* (MCA) — Despite some sonic imperfections, these early recordings are a valuable addition to the collection of anyone interested in the development of rock and roll. Some of these sides—all but one recorded by Norman Petty in his Clovis, New Mexico studio with Holly producing himself—were later overlaid with extra vocals and instrumentals and released. What we hear is Holly in the process of inventing himself, and it's spirited stuff indeed.

—David Gans

THE CAT

A NEW DIMENSION IN REMOTE RECORDING

Chaton Recordings' 24 track CAT (Chaton Audio Truck) is capable of complete interface and synchronization with any video or film facility, via SMPTE code. Expert, experienced engineers are provided, and independents are welcome.

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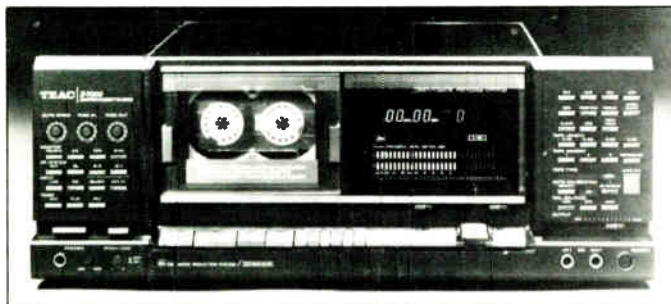


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PREVIEW

proved noise and distortion specs. In addition, the attack and release control circuitry has been significantly upgraded, providing increased range and improved accuracy.

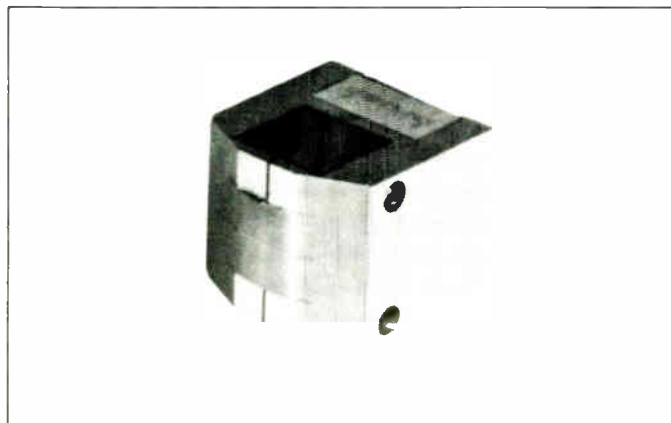
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NEW CASSETTE DECK FROM TEAC

The Z 7000 is a new 3 motor, 3 head cassette deck from TEAC, which features automatic bias, level, and equalization calibration. The unit also employs three noise reduction systems: Dolby B, Dolby C and dbx. Additional features include a sendust record head and a ferrite playback head; 30-segment fluorescent peak level meters; pitch control; a motorized head loading system; power eject; automatic fade-in/fade-out; memory stop/playback/repeat; a recording and playback timer; a built-in headphone amplifier with adjustable volume; MOL balance; a remote control plug; and more.

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HIGH-ENERGY RECORDING HEADS

A new magnetic head, available from Brush Magnetic Heads, performs erase-resistant, alteration-resistant mag-stripe encoding. The head can fully saturate magnetic recording media of H 4000 Oe. Its proprietary HSI core material sustains a field of 20 k gauss in the gap.

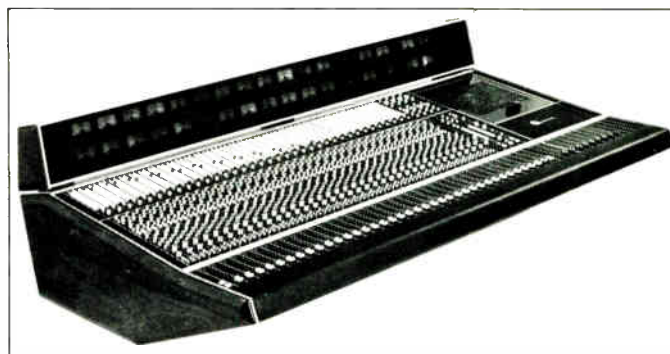
HSI heads are available in any track configuration, included ABA, IATA, and THRIFT; track widths to .375".

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FURMAN LIMITER/COMPRESSOR

The LC-3 Limiter/Compressor, from Furman Sound, features all of the same flexibility of control (i.e. continuously adjustable control over the attack and release times, the compression ratio, and input and output gains) which made its predecessor, the LC-2, so popular. It also retains the De-Essing and Side Chain capabilities.

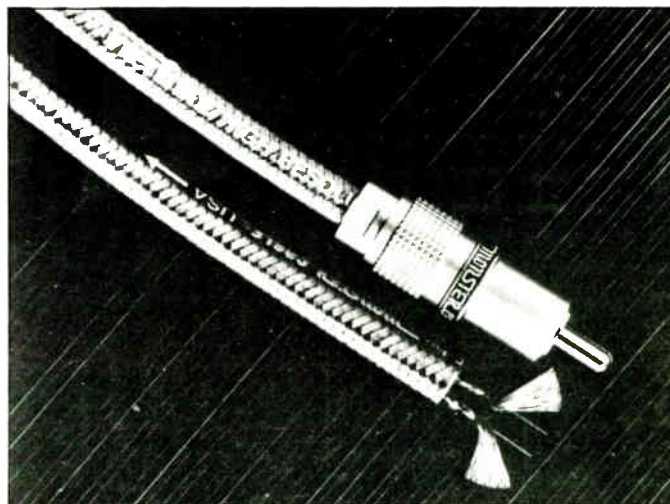
It incorporates an updated design which employs a new Voltage Controlled Amplifier (VCA) providing im-



AUDITRONICS 700 SERIES CONSOLES

The 700 Series consoles have been designed by Auditronics for multi-track recording as well as audio production for broadcast, and are available in configurations of up to 36 inputs and with 8, 16 or 24 outputs. Standard features include VCA grouping, 3 band equalizer and HP/LP filters on each input, 2 foldback and 4 effects sends, 4 solo points per input, condenser mike powering, 4 effects returns, stereo and dual mono mix outputs each with their own master level control, and studio monitoring controls. Automation is optionally available. The 700 Series is available in several mainframe sizes for studio installation and in special mainframes with remote patchbays for mobile installation.

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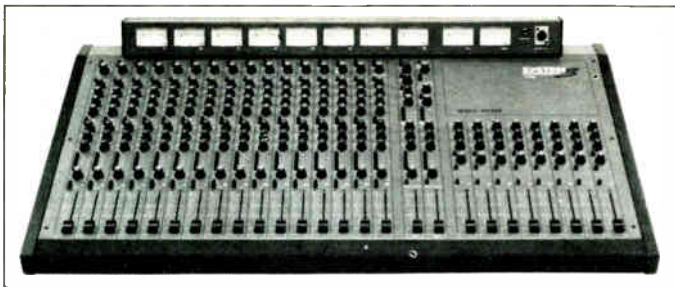
BALANCED INTERCONNECT CABLES FROM MONSTER CABLE

Monster Cable has introduced Interlink High Resolution "Bandwidth Balanced" Cables for audio component systems, designed to increase clarity, dynamic range and imaging, while lowering distortion in the musical reproduction chain.

The new cables feature a balanced line configuration of two identical litz wires inside a densely braided copper shield. Since both sides of the waveform see the same impedance, variations in frequency response, phase disturbances, and transient blur are virtually eliminated.

The cables are priced at \$50/meter pair, and custom lengths are also available.

Circle #066 on Reader Service Card



SYSTEM 8 FROM AHB

System 8 comprises four compact main mixers and an 8-input expander module. Model 164 is of 16-4-2 format, models 128 and 168 offer 12 and 16 inputs respectively, and the top-of-the-range 1616 includes full 16 track monitoring as standard.

One of the most important features of System 8 is the ability to cascade two or more mixers without sacrificing any inputs or outputs. Rear panel sockets allow direct access to and from the monitor and remix groups, auxiliary sends, PFL system and the main output groups.

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OTL AMPLIFIERS FROM FUTTERMAN

The Futterman OTL Amplifiers are the only tube amplifiers in the world using no output transformer. The amplifier combines the musicality of a tube amp with the speed and clarity of a solid state amplifier.

The OTL-3 is a mono 125 watt amplifier with a bandwidth of 10 to 200 kHz, and a slew rate of 33V per microsecond. The unit features separate audio and earth grounds to eliminate ground problems in rack installations. Internal construction features an entirely modular circuit

board. The retail price is \$3,700 per pair.

The stereo model, OTL-4, features the same circuit with less output tubes; two channels in single classes, 60 watts per channel. The retail price is \$2,400. Standard input is 270K unbalanced with optional XLR balanced inputs available.

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NEW PORTABLE WESTLAKE MONITORS

The EBSM-12's, from Westlake Audio, are medium power three way monitors available in either black or walnut. The EBSM-12 consists of two 12" low frequency drivers, a 6.5" mid frequency cone and 1.25" dome tweeter, and incorporates the 24 dB per octave crossover slopes used throughout the Westlake monitor line.

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900 SERIES POWER AMPLIFIERS

The new 900 series amplifiers from CM Labs have been designed to give a smooth "tube-line" sound. Available in 70, 150, and 250 watt versions (at 8 ohms), these 900 series amps feature stepped input attenuators, front panel circuit breakers, and LED indicators for power output, thermal overload and operating status.

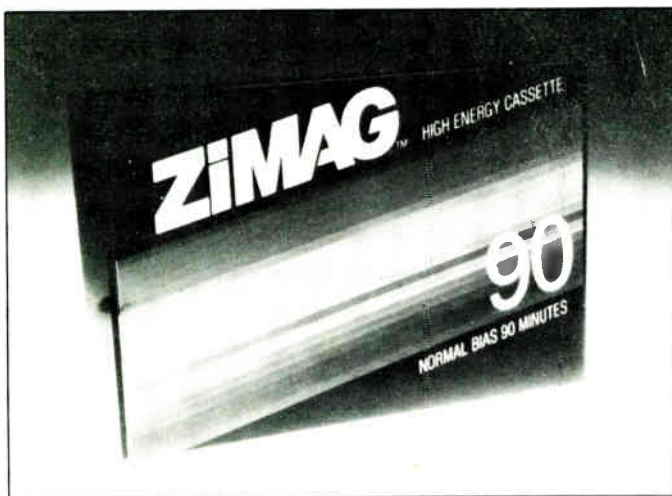
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ASC AS6000 RECORDER

The German-made ASC AS6000 recorder is now available in the U.S. This three motor, three speed, 10½" capacity machine comes in two and four track configurations, and features peak reading meters, a digital tape counter, a twin playback head option, and line/mike mixing. Distributed by Hammond Industries, the ASC AS6000 has a list price of \$1,795.

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ZI MAG CASSETTES

Magnetic Tape International (MTI) is marketing its new blank audio cassette line in two versions: a high energy, ferric oxide line and a low noise series.

The high energy line is available in C-45, C-60, C-90, and C-120 lengths in cello wrap, blister card and multi-pack Philips boxed bags.

The extra low noise audio cassette line consists of C-45, C-60, C-90 and C-120 lengths in cello and blister carded cassettes. Cassettes are bulk packed in polybags in two pack C-60, three pack C-60, two pack C-90 and three pack C-90.

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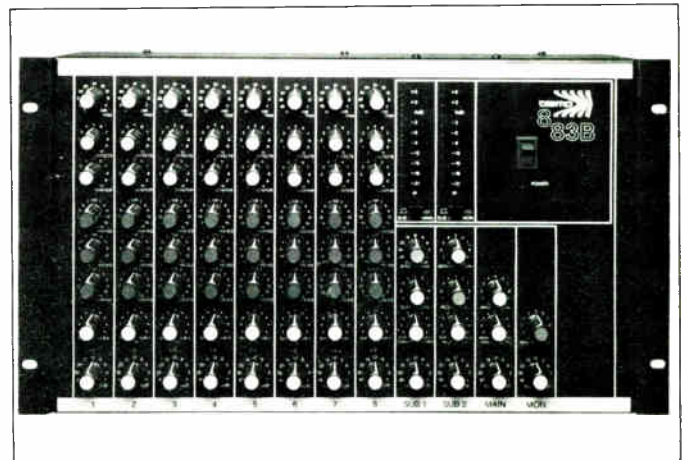


BTI DISTRIBUTION AMPLIFIER

The one in, ten out Model 7111 Distribution Amplifier, available from Broadcast Technology, is self-contained, internally powered and has an additional front panel output jack which can be used for monitoring or metering purposes. Input and output lines are transformer isolated, and proprietary BTI Model OA 400 operational amplifier modules are used as the active elements. This assures high reliability, low noise and distortion, fast slew rate and high output.

Parallel male and female 3 pin XLR input connectors provide a rapid way of interconnecting additional 7111s or other equipment. The unit is priced at \$650.

Circle #080 on Reader Service Card



NEW BIAMP MIXER

The Biamp 883B is an eight input mixer which features new circuit topology, utilizing discrete transistors in critical areas, rather than integrated circuits. The compact unit can be rack mounted or used as a console. Other features include LED metering on all outputs, a separate monitor reverb control, and three band EQ on each input.

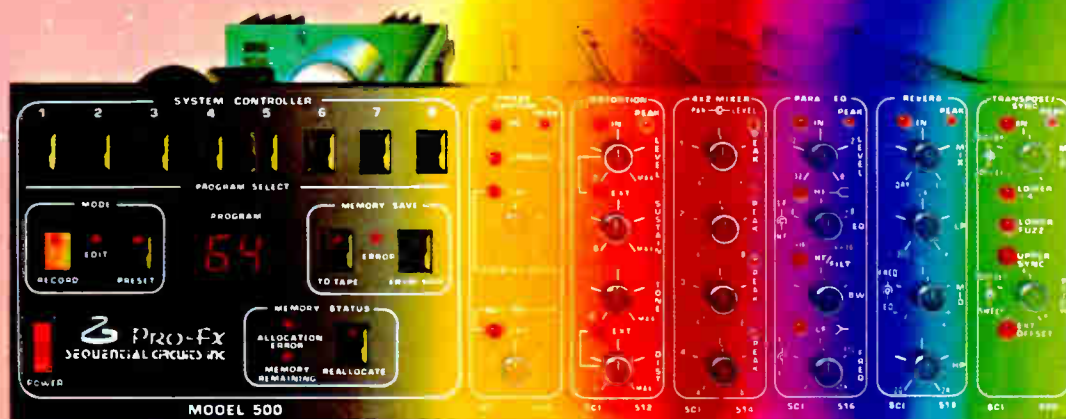
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THE PRO-FX

Programmable Signal Processing System

No matter how you mix your effects, the PRO-FX audio signal processing system will recall your custom sounds instantly, exactly.

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- The PRO-FX Mainframe will control up to 30 individual effects.
- Every knob and switch setting on each module is completely programmable and can be recalled at one touch.
- The PRO-FX Mainframe will store 64 custom sounds (programs) and allow you to preset sequences of program changes.
- All programs can be easily edited while in use, and activated by a footswitch, or by a synchronized tape pulse.

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For a complete SCl product catalog, including decals, send \$2.00 to Sequential Circuits, 3051 N. First St., San Jose, CA 95134.



EFFECT SWITCHER

The Effect Switcher, from J.L. Cooper Electronics, is a microprocessor-based signal-path switcher with memory, used in conjunction with the musician's own collection of effects devices. A total of fourteen effects may be plugged into the Effect Switcher, which may then be switched into the signal-path in any order desired. In addition, two different inputs and two different outputs may be used, allowing stereo signal paths and mono-to-stereo conversions.

Signal path flow is defined by pressing a front panel switch to "punch in" an effect. The associated LED turns on, and the corresponding letter code appears on the alpha/numeric display. The standard unit is priced at \$2,000, and custom units are available.

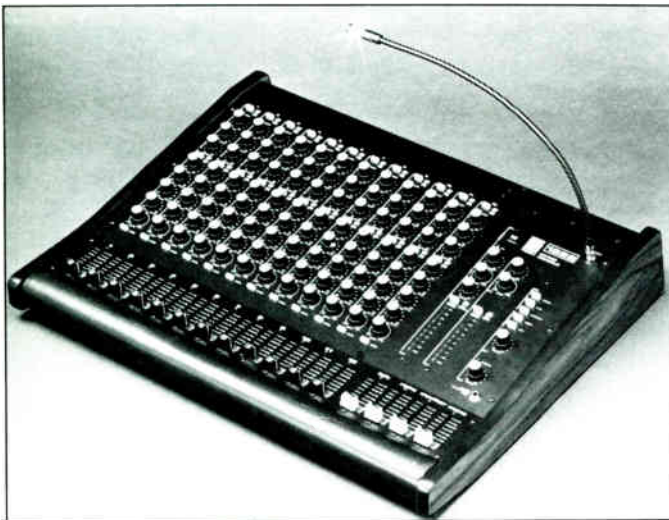
Circle #070 on Reader Service Card

DIGITAL TAPE TIMER

The Timesaver is a field-installable accessory for older audio tape recorders which provides an accurate readout of tape time. It is a two part system containing a precision tachometer which is mounted to the tape transport. The tape is threaded around the tachometer and when in motion sends a signal to the electronics unit. The electronics unit counts and displays the tachometer signal.

The Timesaver will display time up to four hours in the positive direction and up to one hour in the negative direction on five seven-segment LEDs. Time is displayed in hours, minutes and seconds.

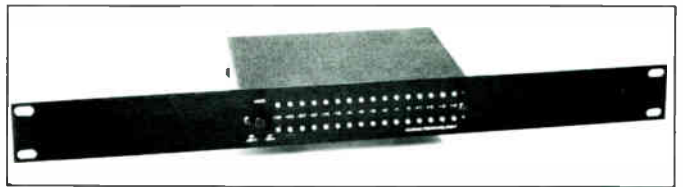
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NEW CONSOLES FROM NEPTUNE

The 22 Series is a new line of 8, 12, and 16 input mixing boards from Neptune Electronics, Inc. These consoles feature switchable balanced mike and line level inputs, input preamp in/out jacks, monitor, built-in Accutronics reverb, 3-way EQ, pan, solo, and slide faders. Headphone monitoring and selectable LED metering are standard, and options include a remote 220v, 50 Hz power supply.

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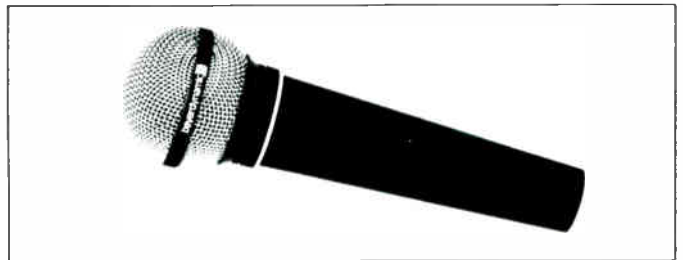
AUDIO TECHNOLOGY L.E.D. DISPLAY

Audio Technology has introduced their digital peak hold L.E.D. audio level display - the Model 511. The Model 511 incorporates highly linear, dual phase peak detectors (patent pending), both line level (dBm) and power level (dBw) inputs.

In use, the highest L.E.D. is digitally held while the lower L.E.D.s continue to function in real time. The peak hold circuitry functions in both the dBm and dBw modes and is operated by turning the mode selector button on the front panel to the desired hold time.

The Model 511 is available in horizontal or vertical format. Rack panels are available for combinations of one, two or eight displays. Suggested list is \$219.95.

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BEYER INTRODUCES M 300 VOCAL MICROPHONE

The Beyer M 300 is a cardioid unidirectional moving coil microphone designed for the rugged demands of musicians, vocalists and entertainers. Featuring a tapered frequency response with a subtle high frequency rise and a midrange presence boost, the M 300 retains the full, warm sound of a ribbon microphone without the harshness or exaggerated proximity effect. With a frequency response of 50 to 15,000 Hz, the M 300 is housed in a sturdy, matte black anodized aluminum case and has a tough one piece stainless steel basket. Other Beyer features include a built-in pop filter, field replaceable element, extremely low feedback and excellent hand-held noise suppression and 25' cable with Neutrik XLR connector.

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DISKMIX SWITCHES TO IBM PC AS CONTROLLING COMPUTER

Sound Workshop Professional Audio Products, Inc. has announced that DISKMIX, the Automation Storage/Editing System, now includes the IBM PC 1550 as the controlling keyboard computer.

Commenting on this change, Sound Workshop President Michael Tapes stated, "We are extremely excited about the change from the NEC to the IBM as the control computer for DISKMIX. Our original concept was for us to design the host computer that speaks to the console through the existing automation system in the console while using an existing 'personal computer' for the human interface. We originally chose the NEC because of its relatively small size, good keyboard layout and technical compatibility with DISKMIX. We also investigated the IBM, but at that time there weren't enough available to consider them as a viable alternative. At this point, the IBM computer is in plentiful supply and offers the finest keyboard set-up in the industry."

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THE RECORD PRODUCERS
John Tabler, Stuart Grundy
 Profiles of 13 top American and British producers based on exclusive interviews. Reviewed this issue, page 78.

(3) \$10.95



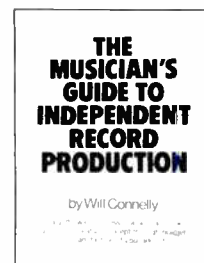
HOW TO BUILD A SMALL BUDGET RECORDING STUDIO FROM SCRATCH
F. Alton Everest
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PRACTICAL TECHNIQUES for the Recording Engineer
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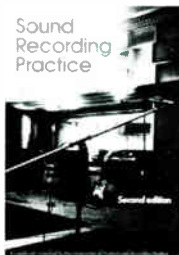
MUSICIAN'S GUIDE TO INDEPENDENT RECORD PRODUCTION
Will Connelly
 Straightforward advice on the entire process of record-making for the aspiring producer.

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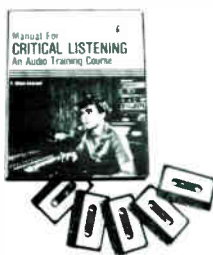
SOUND RECORDING PRACTICE edited by *John Borwick*
 Updated handbook compiled by the Association of Professional Recording Studios, designed for the user.

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World Radio History

(continued from page 21)

three or four records a week, custom work for evangelists who would sell the albums on the road. The Stamps Quartet, the Blackwood Brothers, a lot of others. We'd do the whole package for them."

Soon, however, because of agitation from Mylon for more contemporary stuff, Rodney got the chance to do some rock and pop—including work with Buddy Buie, who at the time was working with a number of important Southern acts and who sometimes used LeFevre.

"Buddy was working with enough artists to justify building his own studio, and when he asked me to be his engineer I jumped at the chance. That's the only career move I've ever made, aside from leaving the band.

"Buddy and I designed the whole space for Studio One—knowing nothing about acoustics. I became a frequent visitor to the Atlanta Public Library. I read every piece of information I could get. I made the book publishers happy. At that time there was hardly anyone to get advice from. And I studied the plans of LeFevre, since I know exactly what that studio could do.

"The Studio One building was just dirt floor when we got it. We were just renting four walls. We built everything else and paid for it ourselves. We started with eight track, but six months later we went to 16." (The studio now has a 24 track Studer A80 recorder linked to a Harrison 3232 board.)

Soon the entire focus at Studio One was on the Rhythm Section. "The Rhythm Section was something that Buddy believed in so much that after the first two albums he concentrated totally on them. At times it was difficult, because we'd work our hearts out and then the album wouldn't generate anything. Every time we put an album out we *knew* it would be the one. Then when it wasn't we'd have to struggle on to the next one. Then finally we hit with 'So Into You' and then 'Imaginary Lover.'"

Mills' opportunity to move into production on his own came at just the time that ARS was enjoying the success from these hits in 1976-77. Until then Rodney, in addition to engineering for the band in the studio, served as their road manager and live-sound mixer. "I wanted to supplement my income and I also wanted to do everything I could for the band because I had been involved in their sound from the beginning. But I was very unhappy on the road."

At this same time Lynyrd Skynyrd, who had cut their first album at Studio One a few years earlier (with Mills engineering) decided to come back to Doraville to recut *Street Sur-*

vivors after hitting an impasse with Tom Dowd at Criteria in Miami. Rodney asked to do the album and, working with Kevin Elson, completed the mix. "They gave me a bonus based on sales," notes Rodney. "That was my first step into production."

Rodney went on to do an Outlaws album with Mutt Lange producing, and also cut demos on the two brothers of Skynyrd lead singer Ronnie Van Zant: Johnny, who now fronts the Johnny Van Zant band (Polydor) and Donnie, who fronts .38 Special. In fact, Rodney did the final mix on Johnny's *Last of the Wild Ones*, which yielded a hit, "It's You," at the same time "So Caught Up In You" was a national smash.

Of the alliance with .38 Special, Rodney credits guitarist Jeff Carlisi as "most responsible for making that happen. The band had asked me to produce the third album (*Rock Into The Night*) but A&M didn't want to turn me loose. As a last-ditch effort I said, 'Come up and we'll do some demos. A&M consented to that. We submitted it and A&M felt it was the best stuff the group had on tape. And it was just demos. The band had already done two albums. So we've been together since.

"Me producing a record with .38 Special is more of a team effort than it is me producing. It's completely different from working with the Rhythm Section, because over the years Buddy had influenced me so greatly and with this band I don't have that.

"I owe so much to Buddy because he was the first one to allow me the freedom to experiment in the studio. Live, you have to go with what you know will work, and not elaborate, especially if a band isn't so creative. The studio is different. You can take a song and out of the blue make a record from it. It's the whole idea of being able to go into a place with a certain concept in your head and then make something from it. What I could make in the studio sounded bigger than life to me. I suppose that's why, once I got started, all I wanted to do was make records.

"The gratification in this work is having someone say, 'That sounds great.' It's being able to get on tape precisely what a group or artist hears as being themselves, of making it sound better to them than they would imagine it *could* sound."

In the course of our conversation Rodney remarked on a number of people he's worked with over the years:

B.J. Thomas: "The most perfectly gifted natural voice of anyone I've ever heard. Just put him on a mike and he'd sing the song better than

(continued on page 90)

(continued from page 69)

playing in that time signature when Frank pointed at him, on cue. When it was all done it sounded like Vinnie would play a little lick and Frank would answer him. It worked out great, even though it didn't happen at the same time."

Chiccarelli feels that the role of the producer-engineer has expanded with the public's increasing awareness of sound quality. "Kids know audio today. They know what a good sounding record is and they want the records to sound good. I think a lot of producers who don't have a real good awareness of the studio fall behind the times, especially when it comes to synthesizers and effects. I think the musician that comes into production has similar experiences to the engineer turned producer because most of those guys have little home studios and they've been into the studio enough to be pretty aware. I know producers who have excellent ears, but who don't really have a technical awareness and, as a result, are a little intimidated by the studio. They may be a little afraid to try some of the effects or take the time to get the sounds because they're not sure enough of the process in some cases to risk the time against the budget."

He feels that the role of a producer is almost undefinable because it changes so much with each project. "Some situations are part engineer and part analyst. Others are doing everything from rehearsing the songs, coming up with parts, dragging somebody out of bed to get them into the studio; it can vary so much."

Chiccarelli says that his main criteria for deciding to work with an act are believing in the artist and liking the songs. "If I hear some songs that really impress me, then I start to get excited. It was great working with Oingo Boingo. They're real experimental and creative and I really appreciate that. I'd love to get involved with King Crimson or somebody like that. I like people who are using different rhythms and instrumentations."

His advice to those wanting to become producers is, "Learn everything you can, from being a musician to figuring out how the business works. This last year I've spent considerable time hanging out at the record companies and trying to get to know the people, learn about promotion and so on. A lot of established producers don't even know how to effectively work the record company and get them excited about a record. If you want to be a producer today you have to be aware of every aspect of the business. Don't leave it up to somebody else."



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(continued from page 89)

you'd think possible, right on the first take."

Joe South: "Eccentric from the day I met him. He'd be six hours late sometimes. He wrote his own charts. He'd write out the string parts in a way he figured the players could interpret—he'd put in the bottom note and the top note and draw a line in between."

James Brown (with whom Mills cut "Popcorn"): "The most intimidating session I've ever had. At that time just his presence would intimidate you, the same as Elvis would."

Allen Toussaint: "He and Marshall Sehorn tried Macon first but didn't like it so they came to Atlanta and tried LeFevre. They brought in the Meters and did three LPs. They were incredible. Then they finally built a studio in New Orleans and asked me to come down. But I wanted to stay here. We did Lee Dorsey's 'Everything I Do Gonna Be Funky' together also. That's my voice on the intro of the song."

Lynyrd Skynyrd: "Skynyrd was a very innovative band. Their first album here was so different from what I'd been used to with the Rhythm Section. I think Ronnie Van Zant was one of the most beautiful people this industry has had. That band was closer than family to him. To him it wasn't, 'We're making a record here.' It was, 'This is the future of our wives and children.' He had to make some of the hard decisions that he made because he felt it would be better for the band. And that's the *only* basis on which he ever made a decision."

Bill Lowery: "A great influence on me. He generates enough enthusiasm for ten people. Very few people have the enthusiasm he has for this business."

Currently Rodney is working with two lesser known bands: Stillwater, who had done two albums in the early 70s for Capricorn but got lost when the label folded; and San Francisco group Eric Martin Band (formerly 415), managed by Nightmare (Journey) and signed to Elektra.

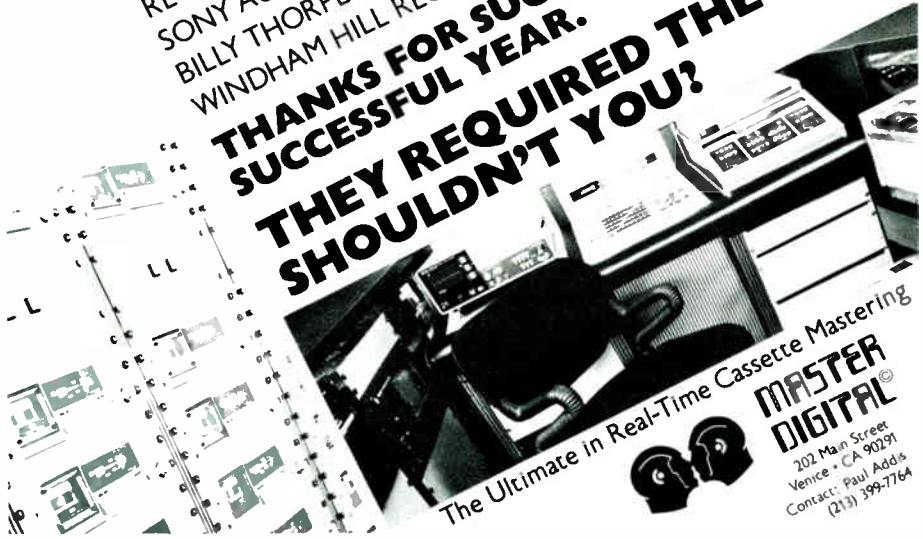
This work, like all of Rodney's, happens at Studio One. "Through the years I've worked in a lot of studios, but I've never been in another studio and wished I were there all the time instead of here all the time. It's a free situation in Atlanta. Over the years we've made records a little differently than other places. We believe you should feel relaxed recording and if we can't do that for you we feel we've defeated our purpose. Because to me making a record is a *very* personal thing. I've never been able to make a record objectively.

"I'll be satisfied to make records in Atlanta the rest of my life." ■

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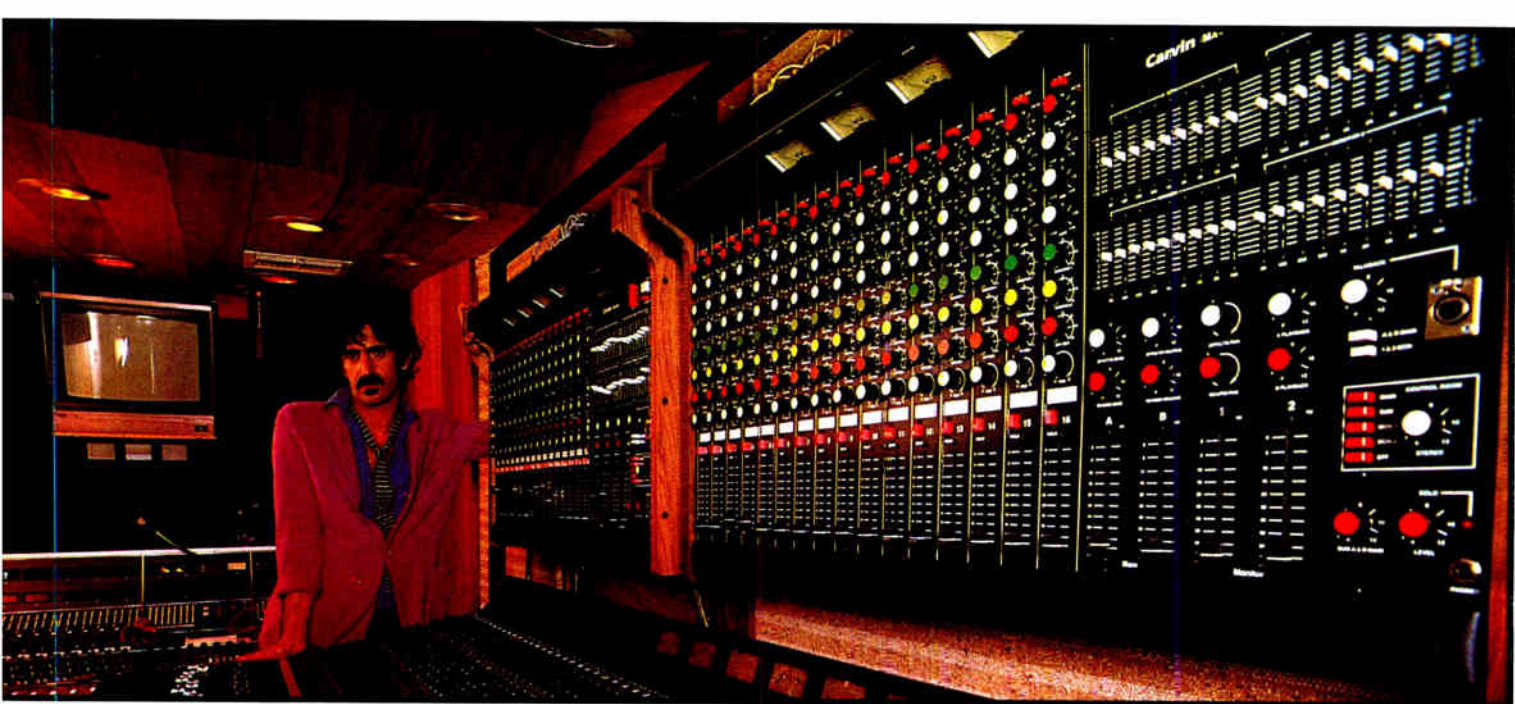


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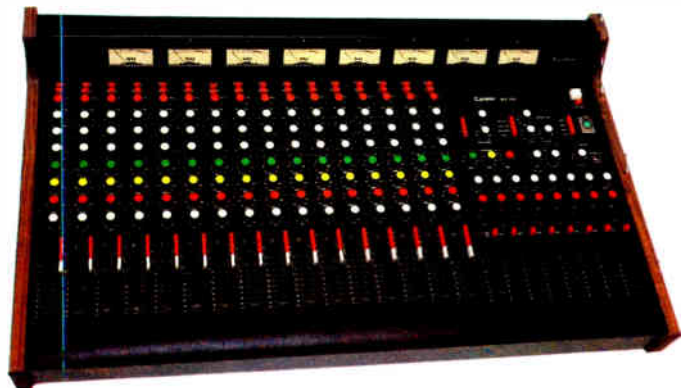
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audio to crack, because there are a lot of old pros out there with soft jobs who don't want to learn any new tricks. But the TV industry is changing structurally enough so gradually, audible change is forced. On the video-film axis, the feeling of unity is a new but cemented fact. There was little talk of traditional rivalry here; in fact, the film industry could now perhaps better be thought of as the high resolution production and delivery industry, video as the low res production and delivery industry. That resolution difference applies to audio as well as pictures, for the time being.

...

A FEW NEW PRODUCTS

Ross Video RVS 524

Ross Video has a new compact production switcher, designed for small studios, editing suites, and mobile vans. Available with 12 or 20 inputs, it offers Ross's multilevel effects system, permitting manipulation of up to four video signals at one time without locking up the switcher.

The RVS 524 also offers a preview function, and interfaces with most computer editors, digital FX systems, key borders, and the company's own scene-store memory system.

Solid State SL 6000E

Aimed at those recording stereo for video, Solid State's SL 6000E combines an in-line format with centralized master facilities, allowing a lone operator to control signal processing and all routing functions. This console series has 24 group outputs for multi-track audio and six group post-production mixing matrix. The matrix offers three discrete stereo mixing groups for music, effects, and dialog.

The standard mainframes accept up to 24 or 32 input/output modules, for as many as 32 mike and 64 line inputs, plus four stereo echo and effects returns. Each I/O module contains complete I/O monitoring controls, and also high and low pass filters, four band parametric EQ, an expander/gate, and a compressor/limiter.

Standard operating modes are selected by five console status push-buttons, which direct the console's master logic to reconfigure the main signal paths throughout the system. A single switch turns on live, multi-track, and post-pro modes, with combinations of buttons providing variations of these basics.

Siegel 1100

Siegel Electronics Series 1100 image corrector incorporates a gen-

locked RS-170A sync generator for timing pulse re-insertion on output video. It includes comb filter separation of chroma from luminance, chroma-coring, horizontal, and two lines of vertical enhancement, picture coring for luminance noise reduction, RGB decoding and re-encoding for correction of optical color errors, and a built-in switcher-fader for adding camera titling. (\$4,000)

Hitachi V-353F

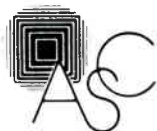
Featuring six ranges of time-base delay from one micron to 100 microns, this new scope also will delay the sweep, for selection and expansion of any portion of the displayed waveform. The scope has a 5.5 inch CRT with 5.2 kV acceleration potential, internal graticule and illuminated scale.

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VIDEO NEWS

by Mia Amato

CHARIOTS OF WIRE

It started as a dream and ended up as a co-production deal between an oil company, *Soviet Television*, the *BBC*, *Hearst/ABC's ARTS* cable channel, and *PBS*. The show is the *Seventh International Tchaikovsky Competition*, videotaped in Moscow by *Johnston Films*.

Executive producer *Robert Dalrymple* says it took him two years to arrange the Moscow videotaping of the solo pianists' event he terms "the Olympics of music." The project began with Dalrymple's company gaining the backing support of Occidental Petroleum magnate *Armand Hammer*. "Hammer was our *entre* into Russia," says Dalrymple. "His contacts go back as far as Lenin. With that initial support we were able to interest the *BBC*, *ARTS*, and *PBS*." (The show has already aired on the *BBC's* new fourth TV channel and will be simulcast on *PBS* in April; it's slated for numerous *ARTS* runs and will air on Soviet television, too.)

Director *Bill Fertik* used five video cameras supplied by Soviet TV and manned by British and Russian crews. The orchestra was binaurally miked with a solo spot mike used for the piano contenders. *Bob Mackenzie*, an independent audio engineer from Britain, supervised the sixteen track recording, which was later mixed down in London at *Trilion Video*. *Brent Hahn* at *National Video Center* did the final sweetening of the stereo sound.

The performances were live-switched by Fertik, just one part of the grueling month-long location coverage, which included interviews and wrap-arounds of many of the 250 pianists who performed during the course of the competition.

"The program was shot like a movie, not like a documentary," explained Dalrymple. "It unfolds, the tension is like a sporting event; the competition is really fierce."

The high drama of the finalist round built to a stunning musical and visual climax as huge crowds gathered outside the Conservatory, shouting and chanting the name of one of the finalists, permeating the concert hall with their din. Seizing the moment, Fertik ordered his crew to hoist some not-very-portable studio cameras outside to capture the crowd scene. But the wild audio was useless. Brent Hahn's solution was to create a number of loops out of the useable outdoor sounds and crowd noise. While watching the video monitor in the mixing room, he rode the loops up and down, adjusting the sound levels to correspond to the visuals which cut between a tense concert hall and frenzied fans outside. "The whole sequence takes a couple of minutes," recalls Hahn, "but since it is the climax, we worked on it about two dozen times before we got a mix that everyone was satisfied with."

The ambitious project of the Tchaikovsky Competition also netted Johnston Films two similar gigs. "The Russian broadcasters were so pleased with how it turned out they've asked us to produce the video of the Leningrad Ice Show next winter," Dalrymple says. "Although our next project, on March 28, will be taping of Saint-Saens' 'Carnival of the Animals' at the Kennedy Center for the Performing Arts, for a

90-minute PBS special."

ORGANIZATIONALLY YOURS

The *Visual Music Alliance* is compiling a directory, called *Interface*, planned as a comprehensive listing of all associated businesses working in the field. For more information write the VMA at 7237 Canby Avenue, Reseda, CA 91335.

The *National Association of Broadcasters* (NAB) will hold its annual convention and equipment exhibition in Las Vegas April 10-13. On the meetings' agenda will be reports on higher-definition television (HDTV) and the joint meeting between the NAB and Japanese broadcasters planned for late 1983. On the convention floor expect to see the newest products on the "audio" side (pay-radio equipment, etc.) and plan to try out the lightweight one inch portable VTRs which will be shown by *Bosch*, *Ampex*, and *Sony*. For more information call the NAB at (202) 293-3570.

FAX UPDATE

Unitel Video Inc. has expanded its fleet of production vehicles with the acquisition of *Starshows*, the mobile unit division of *TPC Communications*. The deal includes the Star-truck tractor-trailer studio which has been used for concerts throughout the Northeast for several years, and another smaller video van. *Unitel* has also brought on board twelve people from *TPC* to handle sales and engineer-

ing. The trucks and the people will continue to be based in Pittsburgh, PA.

In Austin, *Third Coast Video* announced the installation of a *Grass Valley* 300-2B switcher and an *Ampex* ADO digital special effects system. . . . *ATI Video Enterprises* taped interview segments for its *Nightflight* series in New York's Ed Sullivan Theatre, recently refurbished and now run by *Reeves Teletape*. The segments featured *Devo*, the Plasmatic's *Wendy O. Williams*, *Adam Ant*, and songwriter *Doc Pomus*; *Stu Shapiro* directed for ATI.

Every six weeks or so, *George Rasmussen* and crew from Kentucky Educational Television make the trek to New York's *Sound Shop* for audio post on *Arts Express*, a new series for children about the performing arts. *Athan Gigiakos* is the mixer in charge of all promos, show opening and special effects—including the "voice" of an animated character, *Light*, created on the *Sound Shop's* ACCESS computerized effects editor.

Acappella/pop/fusion artists *The Toons* tapped *SFO Productions* to create the video promo for "Video Games" now in cable airplay. SFO cameraman *Robin Hirsch* used a 4.5 mm wide angle lens for some truly weird angle shots, including glimpses of the band from the game's POV, achieved by mounting an Ikegami HL-79DA inside the shell of a game machine. *Pacific Data Images* of Sunnyvale supplied original computer graphics; *Mike Certic* of *Positive Video* in Orinda edited the spot and added special effects. *Jeff Daly* directed for SFO. . . . The music track for a Kenner Toys TV commercial produced at *National Video Center* features the twangy sound of a mouth harp played by *Roy Yokelson*, the studio's senior music engineer. Producer *Jeremy Stone* thought the country music score needed something extra and coaxed Roy out to the other side of the mixing console. . . . *Harvey Berger* has joined *Vidtronics* (LA) as videotape editor, from NBC; his credits include *The Donny & Marie Show*, *Hot Hero Sandwich*, and *That's Incredible*.

NAMES BEHIND THE CLIPS:

The Bus Boy's "American Workers" done by *Richard Stachelek* for Arista. . . . Nazareth's "Dream On" directed by *Bryan Greenberg*. . . . Blancmange "Living on the Ceiling" filmed in Cairo by *Clive Richardson*, for Island Records. . . . Billy Joel's promo for "Allentown" directed by *Russell Mulcahey*. ■



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COMPASS POINT STUDIOS

State of the Art Meets the Blue Lagoon

by Lou CasaBianca

From the moment your flight passes over these mythical Atlantean waters and islands, you can feel the pressure drop. Heavy with the fragrance of tropical flowers, the Caribbean tradewinds are warm and relaxing as you exit your plane.

The Bahamian police look like sub-tropical royal guards in their meticulously pressed white tunic uniforms. You can feel a general relaxation of tension and a sincere desire to be helpful emanating from the citizenry at large. The tourist is overtly made to feel welcome—to relax and leave the high-speed mainland lifestyle behind.

The presence of fast food emporiums, including Dunkin' Donuts on Main Street, is inescapably predictable. The "old" downtown area is a definitive example of British colonial architecture and design. The Playboy and Paradise Island gambling casinos cater to the daytripping tourist and high roller alike. Snorkeling and sailing here are among the best in the world.

...

Compass Point Studios is near the airport on the opposite side of the commercial end of the island, far enough to get you away from civilization. Just down the road, facing the beach, is "The Travelers Rest," a restaurant and purveyor of the best fried conch and barbecued chicken on the island. On Sunday, all the young people come to drink and dance to Reggae music, and even Mick Jagger can have tea and chowder and relax.

...

What if you could design and build a world class recording studio anywhere in the world . . . Where would you put it?

Producer Chris Blackwell, chairman of Island Records, has created his answer to this fantasy "What if" by building the Compass Point Studios in Nassau, the Bahamas. Born in Jamaica, Blackwell is no stranger to the islands or to the studio. One of the

few creative/line producers running a major record label, Blackwell spends hundreds of hours annually in sound recording studios in England, Europe and the United States. His desire to create a haven for Island and other recording artists who want the stimulation of a magnificent climate and peaceful surroundings has produced two studios equipped with state-of-the-art gear, situated among the coconut palms near a secluded Bahamian tropical beach.

Compass Point was the brain-

ional 24 hours a day. Lorraine Fraser is the Studio Manager. In addition to booking and promoting the studios, Ms. Fraser manages the facilities adjoining: 3- and 5-bedroom houses and apartments which are provided with a fully-equipped kitchen, recreation/game area and maid service.

Slowly becoming a legend in their own time, the Compass Point "All Stars" are the highly successful and adaptable resident studio band. Sprung from the imagination of Chris Blackwell, the All Stars assembled as a ses-



Chris Blackwell (left), producer and chairman of Island Records at the board with Alex Sadkin, staff producer of Island Records

child of Chris Blackwell, and the experience of owning and operating studios in England (Island Studios at Hammer-smith and Basing Street) has proved invaluable in developing a studio complex that provides two of the finest sounding rooms and an almost perfect environment in which to work.

The Compass Point technical staff is headed up by Moses Cargill, who manages a staff of resident engineers, keeping the studio fully opera-

tion team behind Grace Jones' first album. They are: Sly Dunbar, drums; Robbie Shakespeare, bass; Mikey Chung, guitar; Wally Badarou, keyboards; Barry Reynolds, guitar, and Stick Thompson, percussion. Because of Jamaican, African and European influences, the All Stars are developing a unique sound around such diverse artists as Grace Jones, Joe Cocker and Ian Dury.

In the last two years, the studio



Robbie Shakespeare (bass) and Sly Dunbar (drums) lay the foundation for many sessions at Compass Point.



The Bahamas: A Brief History

Discovered by Columbus, the Bahamas were called "Bajamar"—shallow sea—by Spanish explorers who abducted the original Arawak Indians for slave labor in the early 1500's. The population was totally eliminated, and the islands remained uninhabited for more than a century before the British began settling in the mid-1600's.

Pirate raids by Spanish and French buccaneers were a scourge through the late 18th century—before the Crown's sovereignty was established. The colony gained full independence from Britain in 1973. With some 700 islands and islets favored by fair winds and postcard-perfect beaches, the Bahamas have built a 600 million-dollar-a-year tourist industry, attracting 1.8 million visitors in 1981.

The Bahamas: Vital Statistics

The Bahamas, sprawling over 100,000 square miles of radiant Caribbean waters, are an archipelago of flat,

low-lying islands, fringed by white sandy beaches and coral reefs.

Climate: subtropical to tropical temperatures average 70°F in winter and 85°F in summer.

Area: 13,942 square kilometer (5,383 square miles)

Population: 210,000

Capitol: Nassau, New Providence

Government: parliamentary democracy (former British colony). Lynden O. Pindling elected Prime Minister 1967

Economy: tourism, banking, petroleum processing, pharmaceuticals, alcoholic beverages, salt, fishing, farming, sponges

PHOTO: CHRISTINE ROBIN

has been booked for albums by Dire Straits, The B-52s, AC/DC, Talking Heads, Grace Jones, Tom Tom Club, Black Uhuru, Marianne Faithful, Robert Palmer, Phil Lynott, Thin Lizzy, and Gwen Guthrie, among others. The Joe Cocker album *Sheffield Steel*, number one best seller on the recent Billboard LP charts, was a recent studio production. Producers Glynn Johns, Jerry Wexler and Mutte Lange have all recently completed projects at the studio.

Studio Facilities

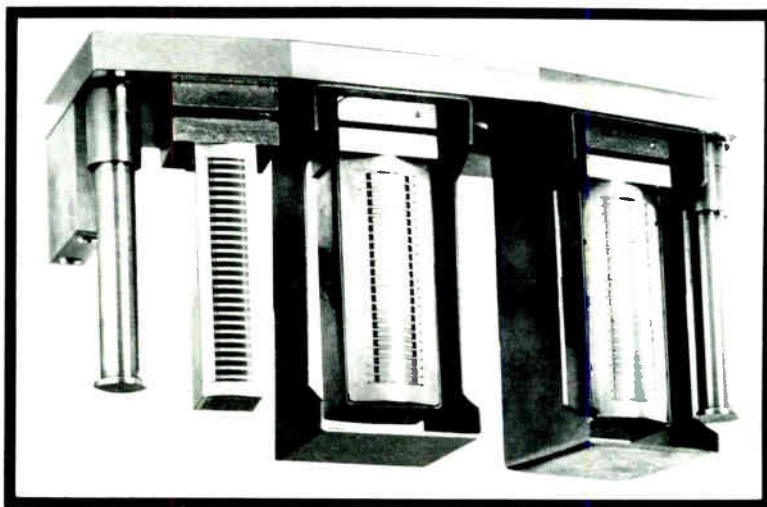
The main Studio A is 35' x 25' with 14' ceilings; Control Room A is 25' x 15'. Studio B: 23' x 30' x 14'; Control Room B is 23' by 19'. Consistent with the rest of the facility, the control rooms are designed for creature comfort and creative flexibility. Each control room has MCI consoles (JH-536) 36 in x 36 out with MCI automation. Interfaced MCI 24 track (JH-114) tape machines, with M-Series for multi track, Dolby 361 for 2 track, and dbx K-9 available on request.

The control room monitors are UREI 813 (Studio B) and Tannoy "reds" in Lockwood cabinets (Studio A). Studio A alternatives are JBL 4311, Altec Lansing Model 19, Auratones and Visonik 100, 502, and 803s.

A wide variety of delay and echo systems are available: EMT 250, 4 EMT 140 TS places with remote, 2 live 3.2 second chambers, AKG, BX20, Lexicon 224. Microphones include Neumann, AKG, Shure, Beyer, Sennheiser, Electro-Voice, Crown PZM microphones.

The studios feature an impressive array of outboard effects equipment: UREI limiters, Pultec equalizers, Kepex, Gain Brain, Eventide Harmonizer, Flanger and 1745M with Pitch and 3 outputs, Aphex Aural Exciter, Scamp gates and modules, Lexicon Prime Time, Orban De'esser and equalizer, Audio Design Vocal Stresser, Roland SVC 350 Vocoder and MXR effects boxes. A broad selection of studio instruments, keyboards, guitars, percussion, etc. are provided.

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