AUGUST 1982
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THE RECORDING INDUSTRY MAGAZINE

Mix®

INTERVIEW: OSCAR PETERSON

Special Anniversary Issue

THE HISTORY OF RECORDING

THE EDISON YEARS...
EVOLUTION OF THE TAPE RECORDER...
THE BIRTH OF ROCK...
MULTI-TRACKS' REVOLUTION...
VISIONS OF THE FUTURE...
BILL PORTER: ENGINEERING ELVIS...
ASIA – 1982's ALLSTARS...
THE GRATEFUL DEAD TECHNOLOGY...
BEATLES' MIXING DESK...
RECORD REISSUES

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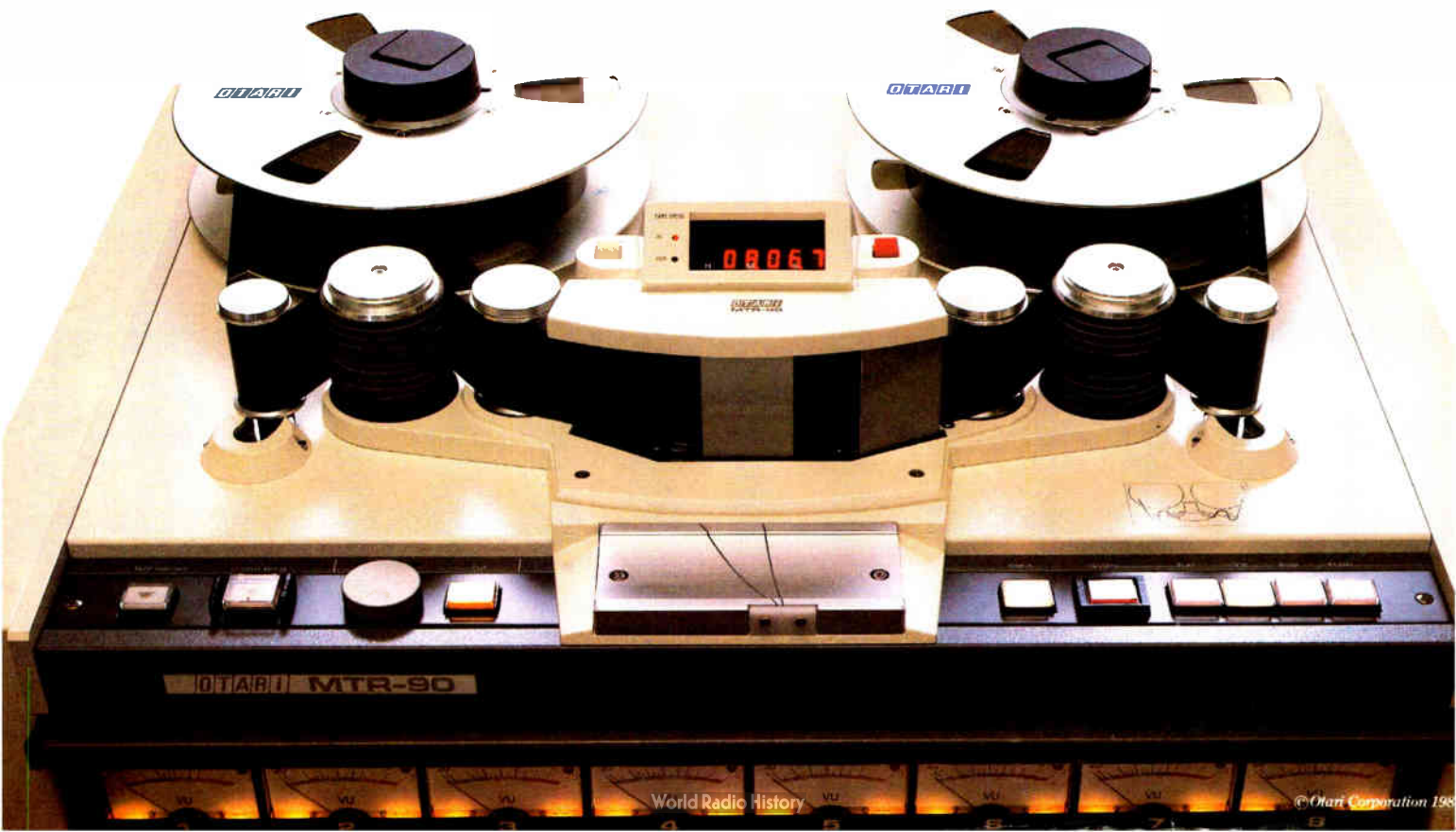

THE RECORDING INDUSTRY MAGAZINE

Mix

AUGUST 1982

Cover design by:
Tim Gleason

DEPARTMENTS

AUDIO

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VOLUME SIX, NUMBER EIGHT

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PUBLISHERS' NOTES

This is the fifth anniversary of Mix Magazine. It's been a big part of our lives and we have enjoyed sharing it with you. For this special issue we have departed from our usual format to deal a little more with the past and future of recording.

The Mix was born out of a need for communication and information. In our early days, as people actively involved with music and recording, we encountered many situations in which answers to our questions about recording services, techniques and facilities were not readily available. This lack of information inspired us to research and explore and, almost before we knew it, this search had progressed from a casual project to a full time obsession. From those first long, late night brain storming sessions, to the ear fatiguing days on the phone accumulating volumes of information, to the frantic deadline mentality of production of that first issue five years ago, we had little idea (except in our fantasies) that this labor of love would grow to become what it is today: the most widely read professional recording magazine, with readers in over forty countries.

The last five years have brought about many changes in the industry, as well as in the magazine. A continuing goal of ours has been to stay current with the rapidly changing technology, news and information of this dynamic industry and we have enjoyed the job of passing it along to others who find it useful in their professional lives. We also feel fortunate to have been in the position of putting together the kind of magazine that we like to read.

Right now we are witness to perhaps the most challenging period ever in the recording business. It is a difficult time for many. But it is also an exciting period of opportunity for talented people to pioneer the science and artform.

We will do our best to report this evolution, so please stay with us.

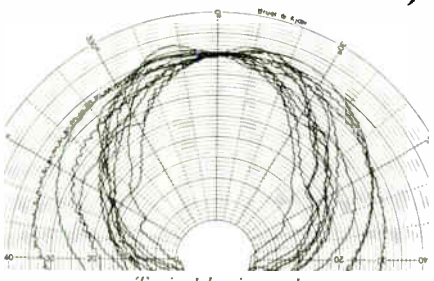
In doing our job, over the past five years, we've been lucky to have received the support and assistance of many great people. It has been a particular joy for us to work closely with our fine staff, each of whom we are proud to be associated with: Kathy Arnold, Victoria Boss, Susan George, Tim Gleason, Ellen Goldstein, Mary Holland, George Petersen, Hillel Resner, Debbi Russell, Mike Stevens, Jeff Turner and Ron Ward. And a special thanks to Rudy Hurwich for his continuing belief in us.

We also want to thank a few more special friends who have played an important part in bringing the Mix to where it is today: Peter Adams, Mia Amato, Dave Angress, Ken Baker, Ed Bannon, Dennis Bayer, Lou and Lindy Barrett, Janet Barribal, Russ Berger, Mary Jo Bezat, Larry Blakely, Susan Blakely, Augie Blume, Mr. Bonzai, Sam Borgerson, Dennis Buss, Sandy Cann, Steve Caraway, Fred Catero, Patty Collins, Ewald Consen, Brian Cornfield, Rose Cox, Bruce Dancis, Karen Dash, Chips Davis, Joe Davis, Norman Dayron, Don Dommer & Associates, Tom Donald, Clark Duffy, Jean Marc du Mouchel, Howard Dunbar, Thomas Edison, Dennis Erokan, Ken Fay, Michael Faulkner, Richard Fertell, Dan Forte, Jeff Freiberg, Martin Gallay, Paul Gallo, David Gans, Wendy Germaine, Pat Gleeson, Patty Gleeson, John Glodow, David Goggin, Sid Goldstein, Graeme Goodall, Frank Grygus, Bob Harder, Ben Harris, Jackie Harvey, Chris Haseleu, Larry Hayes, Annie Heenan, Wally Heider, Steve Hill, Bruno Hockstrasser, Bob Hodas, Russ Holdstein, Pete Horsman, Bones Howe, Carla Howell, Rich Jackson, Beatrice Jacob and family, Jerry Jacob, Marty Jacobs, Larry Jaffe, Kathy Kapps, Jim Keltner, Morris Klein, Lee Ann King, Steve Krampf, Leo Kulka, Christine Lacey, Bill Laski, Patty Lee, Erika Lopez, Mary Lowman, Tom Lubin, Walter J. Lunny III, Harriet Mack and family, Pat Maloney, Bobbi Marcus, Larry Marks, Phil Maselli, Jim McCullough, Susie McDannel, Jack McDonough, Skeeter McUmber, Lutz Meyer, Bob Missbach, Richie Moore, Ron Neilson, Judy Neldam, Marsee Nelson, Carol Oppenheimer, Curt Pickell, Bruce Pilato, Marty Porter, Vicky Resner, Allen Rice, Dale and Evelyn Riker and family, James Riordan, Jensen Roberts, the late Dr. Puddie Rodgers, Gale Rosenberg, David Rubinson, Andre Sala, Steve Salyer, Ralph and Eleanor Schwartz and family, Peter Scott, Roy Segal, J.D. Sharpe, Paul Smith, Beverly Sommerfeld, Nina Stern, Dave Teegarden, Vinnie Testa, Janice Thompson, Steve Thornton, Robin and Ginnie Yeager and family, Tom White, Keith Worsley, Larry Zide and a very sincere thanks to our readers who make up this exciting, creative, crazy and totally addictive industry. Keep up the good work!

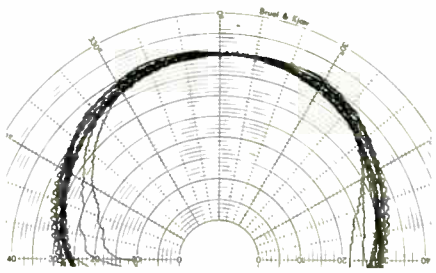
Penny & David

Before you invest in new studio monitors, consider all the angles.

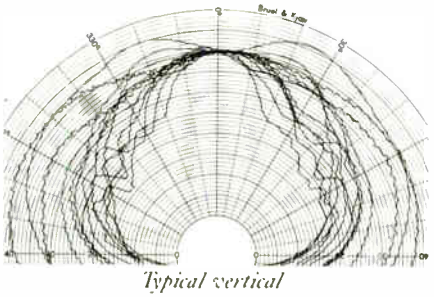
Polar response comparison of a typical two-way coaxial studio monitor and JBL's new 4430 Bi-Radial studio monitor from 1 kHz to 16 kHz.



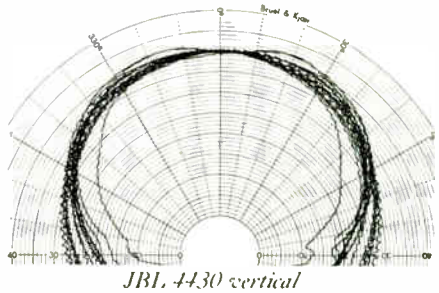
Typical horizontal



JBL 4430 horizontal



Typical vertical



JBL 4430 vertical

No one has to tell you how important flat frequency response is in a studio monitor. But if you judge a monitor's performance by its on-axis response curve, you're only getting part of the story.

Most conventional monitors tend to narrow their dispersion as frequency increases. So while their on-axis response may be flat, their off-axis response can roll off dramatically, literally locking you into the on-axis "sweet spot." Even worse, drastic changes in the horn's directivity contribute significantly to horn colorations.

Introducing the JBL Bi-Radial Studio Monitors.

At JBL, we've been investigating the relationship between on and off axis frequency response for several years. The result is a new generation of studio monitors that provide flat response over an exceptionally wide range of horizontal and vertical angles. The sweet spot and its traditional restrictions are essentially eliminated.

The key to this improved performance lies in the unique geometry of the monitors' Bi-Radial horn.[1] Developed with the aid of the latest computer design and analysis techniques, the horn provides constant coverage from its crossover point of 1000 Hz to beyond 16 kHz. The Bi-Radial compound flare configuration maintains precise control of the horn's wide 100° x 100° coverage angle.

1. Patent applied for.

And the Bi-Radial horn's performance advantages aren't limited to just beamwidth control. The horn's rapid flare rate, for instance, dramatically reduces second harmonic distortion and its shallow depth allows for optimal acoustic alignment of the drivers. This alignment lets the monitors fall well below the Blauert and Laws criteria for minimum audible time delay discrepancies.

But while the Bi-Radial horn offers outstanding performance, it's only part of the total package. The new monitors also incorporate JBL's most advanced high and low frequency transducers and dividing networks. Working together, these components provide exceptionally smooth response, high power capacity, extended bandwidth, and extremely low distortion.

Judge For Yourself

Of course, the only way to really judge a studio monitor is to listen for yourself. So before you invest in new monitors, ask your local JBL professional products dealer for a Bi-Radial monitor demonstration. And consider all the angles.

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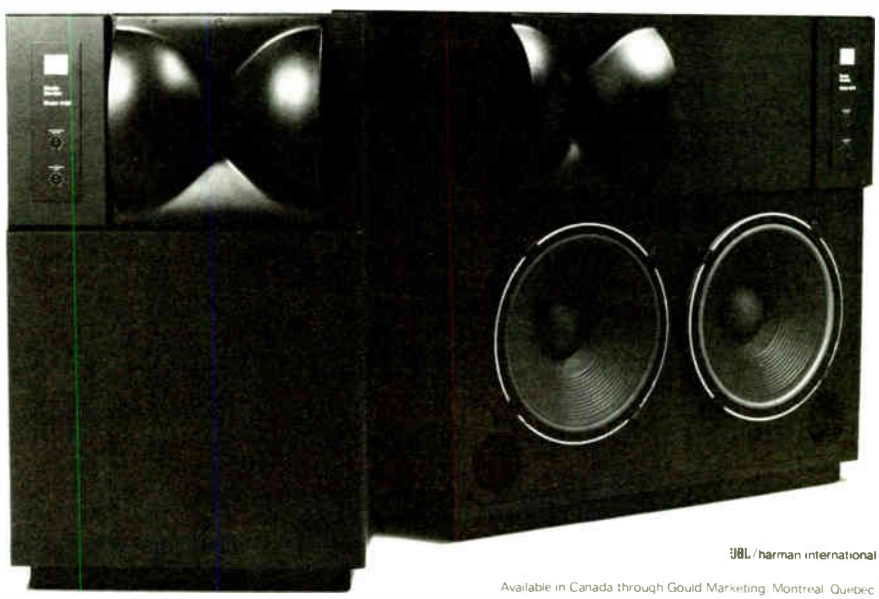

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CURRENT

Home Taping Coalition Forms

The economically-distressed record industry figures that it currently loses about 1 billion dollars annually due to home taping. The numbers of records released each year by U.S. record companies has declined steadily since 1978 (4100 new albums) to 2850 new albums in 1981.

This home taping problem is worsened by the increasing number of record rental businesses in the U.S. These shops are usually well-stocked with copies of the latest releases, records are rented for approximately two dollars for a 24 hour period. Not surprisingly, these stores often do a brisk business in blank cassette sales. It is obvious that record rental shops exist primarily to provide material for home tapers.

Statistics indicate that in 1980, tapers copied recordings with an actual market value of over $2.85 billion, the equivalent of 425 million albums. By comparison, in 1981 the recording industry sold the equivalent of 455 million albums. Thus, for almost every album sold, another album was taped.

The huge losses to the record industry have already reduced the diversity of music available to consumers by limiting the ability of many labels to invest in unproven artists and musical forms. Because home taping reduces the sales volume of records, production costs must be spread over fewer albums and higher costs are inevitable. As a result, those consumers who purchase records will pay more so that those who tape off-the-air or from borrowed disks can pay nothing.

Home taping affects everyone in the music business; from record company executives, to studio engineers, to session players, to the kid working behind the counter at the record shop. However, those hardest hit by this dilemma are singers, songwriters, music publishers, and bands who are seeking an outlet for their work. By displacing $1 billion in record sales, home taping deprives creators of their fair rewards and diminishes their incentive to invest time, effort and money in this high-risk business.

A solution to the home taping controversy in the form of legislation has been introduced into both the Senate and the House of Representatives which would relieve consumers from copyright infringement liability, and at the same time, make compensation to those whose works are being copied. This would be in the form of a royalty on the importers and manufacturers of blank tape and recording equipment.

This legislation is being opposed by blank tape and consumer tape recorder companies who have, in turn, lobbied for bills which would make the taping of music "free." "Free" in their terms means no compensation to the men and women who made the music.

The Coalition to Save America's Music is fighting for the House and Senate bills which would afford reasonable and fair compensation to the music industry. The coalition, headed by Beverly Sills, represents more than two million individual members and 1300 organizations from all segments of the American music community. You can contact the coalition at: 888 West Seventh Ave., 9th Floor, New York, N.Y. 10106 (212) 765-4330.

notes

The stockholders and officers of **Valley People**, Inc. announced the spin-off of their retail sales division into a separate corporation. **Bob Todrank** will be Owner and President of this venture. Todrank has chosen to reclaim the name **Valley Audio**, which existed before it's merger into Valley People, Inc. in 1980. They can be reached at their new address of 2821 Erica Place, P.O. Box 40743, Nashville, TN 37240-3111. Their new phone number is (615) 383-4732... **M.M. Hosoda**, President of **Otari Electric** has announced the establishment of a new Research and Development division for Otari Corporation (U.S. Headquarters). The new division will be headed up by **Steve Krampf**, appointed General Manager. **Tom Sharples** has been appointed Engineering Manager... **JRF Company**, recording head repair and sales specialists, recently moved to new and larger quarters in Hopatcong, N.J. They are now at: 17 Byram Bay Rd., Hopatcong, N.J. 07843, (201) 398-7426... The Supreme Court has granted **Sony Corporation of America's** petition seeking a review of last October's controversial ruling that found off-the-air home video recording to be a copyright infringement... **G. Hill and Company**, the Nashville based music production and jingle company has recently expanded its office and moved to 1232-17th Ave. So., Nashville, TN 37212, (615) 320-7141... After an April fire gutted the Filene Center Theatre, at Wolf Trap Park (Vienna, VA), a number of audio firms (**UREI, JBL, Electro-Voice, Clear-Com, Straight Wire Audio, Klipsch, Crown Int'l, Lexicon, Interface Electronics, and Industrial Research**) came to their aid with equipment donations. Thanks to their assistance, the summer season went on as scheduled... **Synergetics Audio Concepts**, (Syn-Aud-Con) of San Juan Capistrano, CA has announced their fall 1982 seminar and workshop schedule: Chicago Area: Sept. 8-10, 1982; Washington D.C. Area: Sept. 15-17, 1982; Nashville Area: Sept. 28-30, 1982; Orlando Area: Oct. 6-8, 1982. For further information write: Syn-Aud-Con, P.O. Box 669, San Juan Capistrano, CA 92693... **Donald F. Bogue** has been appointed director of business management for **Ampex Corporation's** Magnetic Tape Division, it was announced today by division vice president-general manager Stanley W. Faught... **Altec Lansing** Commercial Sales VP **Gary Rilling** recently announced the appointment of **Mr. Nick Boltz** as District Manager for Altec's Industrial/Professional Sound Product line in the Upper Midwest... **Jerome C. Smith** has been named **Cerwin-Vega's** Director of Digital Development and will be responsible for the development and marketing of digital products, primarily loudspeaker systems for both residential hi-fi use and recording studio monitors... The summer Consumer Electronics Show, **CES**, held in June, broke last year's attendance record by 19%, and totalled 72,472 attendees... **InterMagnetics Corp.**, has received a $10 million contract to construct a videotape and videocassette manufacturing plant in the United States, announced **Terry C.T. Wherlock**, president... A Broadcasting and Related Products Department has been created as part of **3M's** Memory Technologies Group, with **William H. Madden** as manager. This department includes International Tapetronics Corp., a 3M subsidiary; the former Professional Audio/Video Equipment Project and the Sound Products Project... **Ken Lopez** has been promoted to National Sales Manager for **James B. Lansing Sound, Inc.'s** Professional Division, it has been announced by Ronald H. Means, Vice President of Marketing and Sales for the division... **Nautilus Entertainment, Inc.** of San Luis Obispo, CA is entering the video software field with a maiden production effort for JBL. The twenty-minute-long promotional/sales support videotape stars Capitol recording artist Jay Ferguson... A group of Sacramento businessmen have created **Shire Road, Inc.**, a structure of companies designed to put Sacramento, CA on the music entertainment map. These companies include two recording studios, Copperwood Recording Studio in Sacramento, and proposed "Summit Sound" recording studio in Lake Tahoe; a production company, a publishing company, and also an entertainment company...

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With 24 tracks going, you don't have time to reach over and adjust for tape-induced level variation. You want to be able to forget about the tape.

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*1981-1982 Billboard Magazine Brand Usage Survey

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SESSIONS

NORTHEAST

New activities at **Unique Recording** in N.Y.C., include **Billy Robertson** producing 2 new singles for Polyrock, **Bobby Nathan** engineering. **Andre Booth** producing BBCS&A's next single, **Frank Heller** engineering... At E.A.R.S. (**Eastern Artists Recording Studio**), in East Orange, N.J., **The Shakes** and **The Numbers** are putting the finishing touches on tracks recorded by **Andy Wallace** in the studio for the new Dirt Compilation LP to be released this summer... At **Rose Hill Studios**, in Syracuse, N.Y., **Mark Doyle**, guitarist with Meatloaf, has returned from that group's European tour and is producing the **Todd Hobin Band**... **Jesse Bullitt**, New York-based rocker is recording a new group of original songs at **Electric Lady Studios**, in N.Y.C. Co-producing with Jesse is session guitarist **Steve Bill** who also penned final arrangements... At the Boogie Hotel in Port Jefferson, N.Y., Ex-Blue Oyster Cult drummer **Albert Bouchard** is recording a solo project titled Immaginos for CBS, with **Sandy Pearlman** producing and **Corky Stasiak** engineering... At Calf Audio in Ithaca, N.Y., **Paul Smadbeck** just finished an LP for accompanied & solo marimba, produced by Dave **Smadbeck**, engineered by **Alfred Grunwell**... At **Soundworks Digital Audio/Video Recording Studios, Ltd**, in N.Y.C., **Donald Fagen** doing overdubs for his upcoming Warner Bros. Record album with **Gary Katz** producing, **Roger Nichols** and **Daniel Lazerus** engineering, assisted by **Wayne Yurgelun** (digital)... At **Greene Street Recording**, N.Y.C., **Kurtis Blow** is rappin his way towards another completed LP for Mercury Records with **Rocky Ford** and **J.B. Moore** producing and **Rod Hui** engineering... At **The 19 Recording Studio** in South Glastonbury, CT, a new **Melba Moore** project for EMI Liberty Records. **Rahni Harris** producer, **Ron Scalise** engineer.

SOUTHEAST

Latest activity at **Triiad Recording Studios** in Ft. Lauderdale, FL, has seen recording artist **Sean Downey** and writer **Lloyd Schoonmaker** recording and mixing. Engineering chores were handled by **Michael Laskow** while **Vincent Oliveri** and **Robert Corti** assisted... At **Creative Workshop**, in Nashville, TN, **Buzz Cason** and **Austin Roberts** producing **Debbie Williams**, **Tod Cerney** engineering, **Ian Kimmet** producing **Freda Parton** for Bearsville Records, **Brent Maher** and **Lee Peterzell** engineering... The group **Orleans** is recording their new album for radio records at **International Sound Recording Studio** in Miami, FL. **Don Silver** is producing the group and **Ben Wisch** is engineering... Currently in production at **The Room** in Greenville, S.C., is the Platters former lead singer **Sonny Turner** recording a "beach music" LP for SandCastle Productions. Also **The Wheels** are recording a new LP produced by **Rick Sandidge**, engineered by **Eddie Howard**... Current studio activity at **Music City Music Hall** in Nashville, TN, includes: **Charley Pride** recording another album for RCA with producer **Norro Wilson** and engineer **Bill Harris**.

NORTH CENTRAL

At **Willow Wind Recording Studio** in Bartonville, IL, the **Winter Brothers** from Nashville in working on their new single. The sessions were filmed by cable channel 6 for broadcast... **American Artist Studios**, Minneapolis, MN, have completed recording **Andre Cymone** for CBS Records. The debut album, titled "Livin' in the New Wave" was produced by **Cymone**... **Trusty Tuneshop** in Nebo, KY, recently produced and duplicated 7400 cassette copies for The Alpha Project for handicapped children, a federally funded project, sponsored by the Hopkins Country School Board... Current studio activity at **Holy Trax!** in Livonia, MI includes: **Don Yabbs** self producing a demo project for a possible record deal, **Marty Curnett** producing, **Casey Baker** at the board... At **Solid Sound, Inc.**, of Ann Arbor, MI, **Dave Barrett** has just completed work on a new, soon to be released single, produced by **Will Spencer**... Recent recording activity at **Pinebrook Studios**, Alexandria, IN, includes: **Blanton-Harrell Productions, Brown Bannister, WORD Records** (orchestra tracks); **Don Marsh, Randy Hammel, and Benson Company** (orchestra/vocals for Christmas and choir projects)... Engineer/Owner, **Ric Coken and Mike Moats**, production dept. Manager Zenith/db Studios, Chicago have just completed a 1 hour radio show for TSR Hobbies, Inc. "Dungeons & Dragons," the game in national distribution, now features a radio pilot program based upon the game, produced and directed by **Gil Sorenson**, Chicago.

NORTHWEST

Power rock group **Traveler** just completing mixdown for 6 song LP with **Roadwest's** recording 24 track mobile unit at **Snowbird Resort Utah**. **Roy Jones** producing **Al Schultz** and **John Lopez** at the board. **Chick Buehner** assisting... Recent activity with the **Bodacious Audio Inc.** remote truck (San Mateo, CA) includes the **Paul Butterfield Blues Band, Bobby Bare, Lacy J. Dalton, Elvin Bishop, New Riders of the Purple Sage and Byron Berline** all recorded "Live" direct to the Sony Digital Mastering System for "Live" radio specials. **Herb Pallant, Larry Yurdin** producing with **David Haynes** engineering and **Doug Dayson** assisting... Recent sessions at **Madman Studios** in Berkeley, CA include the music and sound effects for the play "The Dream of Katimura." Original music and production is by **Michael Susaki**, engineering by **Bill Thompson**... At **Sound Smith Studios**, Portland, OR, hard rocker **Gary Hansen** recording 24 tracks for KGON Album demos. **Mitch Allee** and **Sam Pierce** in for recording and mix of their separate 16 track projects... Recent activity at **Heavenly Recording Studios**, in Sacramento, CA, **Perry Jones** is producing two new projects; A new album for **The Southern Empire Band**, and **Syvella's** new single for EMI with co-producer **Ray Pyle**. **Larry Lauzon** is engineering both projects... At **Different Fur Recording** in San Francisco, CA, producers **David Grisman** and **Herb Peterson** joined with **Vince Gill** and an all-star line-up of bluegrass musicians under the name **Here Today**. The tracks are soon to be released on an LP by Rounder Records. **John Haeny** engineered the project with assistance from **Howard Johnston**.

SOUTHERN CALIFORNIA

At **That Studio**, North Hollywood, CA, the **Sharks** have finished and have just released their LP "Alter Ego" produced by **Gerry Tolman** with **Rick Holbrook** engineering... **Bob Dylan** in at **Gold Star Studios** producing vocalist **Clydie King**, assisted by arranger **Jimmy Haskell** and engineer **Ed Epstein**... **Steve Miller** recently completed his new album titled "Abracadabra" in the newly remodeled **Capitol Studio 'B'**. **David Cole** engineering with **Jimmy Garza** and **Gary Hollis** assisting... **Bill Szymczyk** has been working with **Al Kooper** and **Jeff Baxter** on a super session album at **Rudy Records**, Hollywood, CA, both tracking and overdubs. **Jay Parti** worked as second engineer... Activity at **United Western Studios** in Hollywood, CA, includes **Barry Manilow** producing his "Live in London" LP with **Michael Delugg** engineering and **Gary Boatner** assisting. **Mike Chapman** mixing down the new **Blondie** LP, **Doug Schwartz** engineering, for Chrysalis Records... Recent projects at **Digital Sound Recording** in L.A., two albums for trumpet virtuoso, **Paul Cacia**, with Paul Cacia producing and **Van Webster** engineering. The debut album on **Digi-Comm Records, Inc.** of **The Lienkes** with **Van Webster** as producer/engineer.

studio news

Dawnbreaker Studio in San Fernando, CA, reopened after being closed while under **Michael Stockers** maintenance supervision. Also added Ampex 100 ½" mastering, and ajoining the studio a fully equipped rehearsal studio included with blocked booking... Studio Manager **Dennis O'Donnell** of **Celestial Sounds**, New York City, is proud to announce the purchase of a new Studer A80 24 track machine and a new Studer ½" mastering machine... Trident (USA) Inc. is

Taken for granted.

In most studios, the Studer B67 gets considerable use. But not much attention. It merely does everything it's supposed to do, with a minimum of fuss and bother.

True, most engineers appreciate the smooth performance and thoughtful features. The quartz PLL capstan drive and servo-controlled spooling motors. The three speed (15/7.5/3.75 or 30/15/7.5 ips) operation. Headblocks that plug in with no need for realignment. Fader start, dump edit, and a real time counter with plus or minus readout. Improvements on the new B67 MKII include locking tension sensor arms and better head access for easier editing, plus record drop-out by punching the "PLAY" button.

In the end, though, engineers mainly applaud the way a B67 does what they expect it to do... without doing the unexpected. Year after year.

In this uncertain business, it's good to have something you can simply take for granted. Studer quality. Contact us directly for details on the affordably priced B67 MKII.

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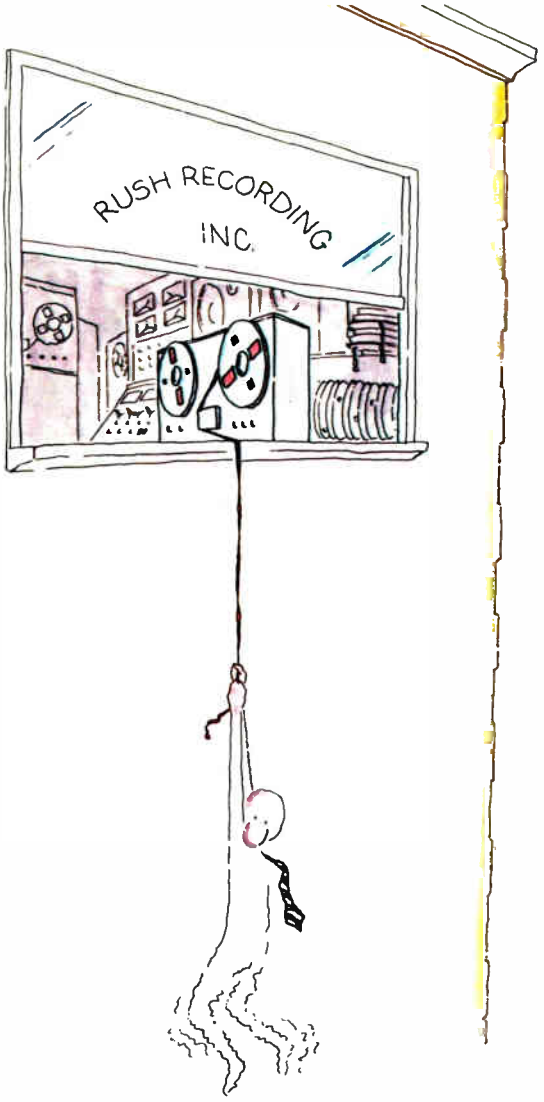

Audio engineers who try Maxell won't let go.

Maxell quality saves a lot of recording situations. Maxell meets your ¼" open reel and audio cassette needs, no matter how demanding you are. Because we're more demanding. We've developed a name that means unique quality all around the world. For example, Maxell cassettes give you a productivity boosting four-function leader with A/B side indications, directional arrows, non-abrasive head cleaner and five-second cue to set timing and level.

You can see Maxell excellence in the cassette construction and on the 'scope or meter. The physical construction is strong enough to meet all professional requirements. Maxell open reel tape and cassettes give you quality you can hear. And your clients can hear as well.

We'll give you all the technical information you need to form your own opinions. But if you're like just about every audio professional that tries Maxell, you won't let go. Remember, we warned you!

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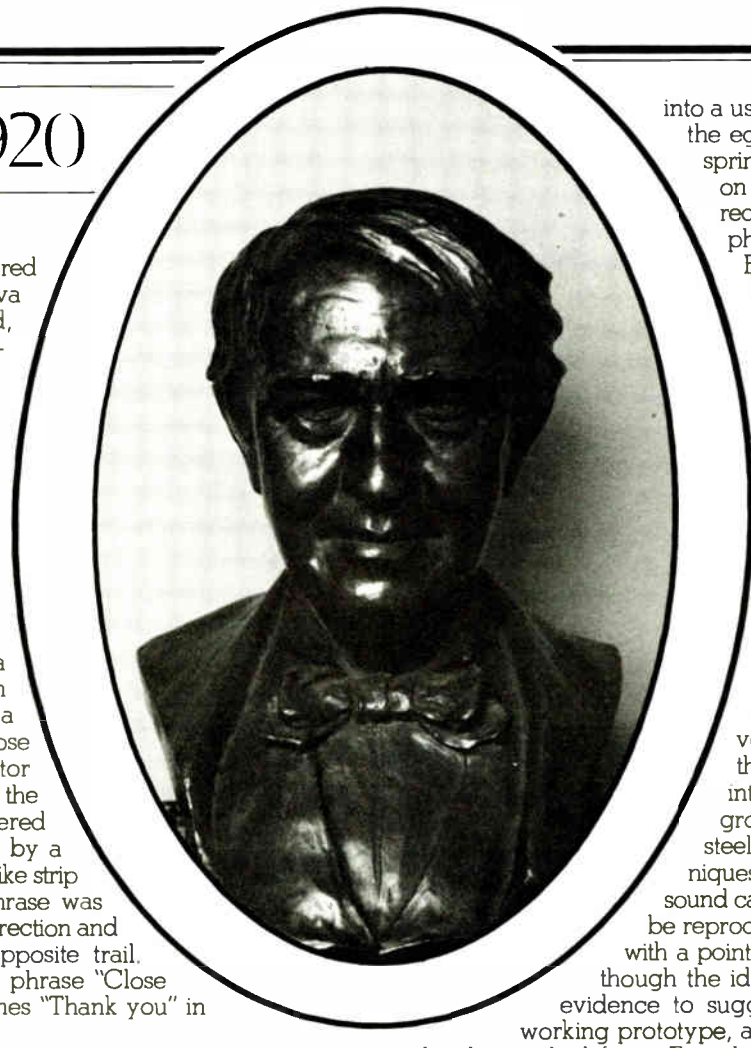
happy to announce the delivery and installation of a 32 x 24 Trident Series 80 console to **Nimbus 9 Recording Studio**, New York, N.Y. The console, the heart of the newly constructed studio, was custom modified by Trident to studio owner **Geoff Daking's** specifications... **Plum Studio** in Haverhill, MA, has updated from 8 to 16 track recording, adding a Scully 16 track recorder, Neumann condenser U-87 microphone, ¾" JVC video equipment, MXR Pitch Transposer, Studer/Revox B77 2 track and other goodies. Booking information is available from Richard Tiegen... **Robin Yeager**, partner, is pleased to announce that **Christa Corvo** has been named Studio Manager of **Tres Virgos Studios** in San Rafael. Christa, who's background includes almost ten years of experience in the music business was most recently manager of The Hyde Street Studios in San Francisco... **Allen and Heath Brenell USA Ltd.** of Stamford, CT, announces the delivery of its first C-2481R on stage monitor mixer to **Sound Smith Audio** of Indianapolis, IN, for use in their touring system. The board features 24 input channels and is capable of producing 9 independent on stage monitor mixes... **Sound Smith Studios** of Portland, OR, has completed the installation of a new custom made 32 x 32 mixing console in control room I. The 9½ foot long console features 8 panable, muteable sub-groups, a 300 point patch bay and a producer's desk... **Rainbow Sound Studios** in Hayward, CA, is pleased to announce three new additions to their engineering staff: **Paul Allen**, sound-man at the Great American Music Hall, **Dave Turner**, disc-mastering engineer (late of Fantasy Records) and acoustician, and **Leo Knapp**, late of Stars Guitars and presently with Leo's Music in Oakland... **E.A.R. Professional Audio**, Tempe, AZ, is pleased to announce installation of the first Soundcraft Series 1600 recording console in the continental U.S. a **Synchestra Studios**, Phoenix, AZ... Eastern Artists Recording Studio (E.A.R.S.), in East Orange, N.J., has recently added the following to their studio facilities: Dolby 24, UREI 813A monitors, Echoplate, PCM digital delay, Linn drum machine... **Frankford/Wayne Mastering** of New York's newest acquisition is a Sony Professional PCM 1600 digital system which is now available for in-house disc mastering or outside rentals. Frankford/Wayne is the first independent disc mastering facility on the east coast to purchase the Sony system. **Tom Steele**, owner, is just putting the finishing touches on his new Room "F" which he designed and built using the newest custom state-of-the-art equipment. Room "F" a completely digital disc mastering facility, is scheduled to open July 1st, with Steele at the controls... **The Outlook Recording Studio**, Bethel, Maine, upgraded from 8 track to 16 track recently with the addition of a Tascam 85-16. Other studio expansion includes a big new isolation room, renovation of several guest rooms and facilities.

The Mix welcomes press releases from all studios, large and small, for inclusion in the Session column. Send to: Sessions/Studio News, c/o Mix Magazine, 2608 9th Street, Berkeley, CA 94710.

The EDISON YEARS

1880 to 1920

by Barry Fox



It is now over a hundred years since Thomas Alva Edison, then 30 years old, filed details of his latest invention at the U.S. Patent Office. The patent that issued, USA 200521, was indexed under the title 'Phonograph or speaking machine." With that patent issue, recorded sound, and a whole new massive industry, was born.

The story of recorded sound begins much earlier than Edison. In the 1830's a traveller to China visited an ancient temple and hear a voice say (in Chinese) "Close the door, please," as a visitor entered and "Thank you," as the door was closed. He discovered that the sound was created by a pointer trailing over a comb-like strip so serrated that the one phrase was reproduced in one trailing direction and the other phrase by an opposite trail. Conveniently, it seems, the phrase "Close the door" in Chinese becomes "Thank you" in the reverse mode.

In this case, of course, the sound-generating serrations were cut by hand, presumably after much trial and error. The sound was produced rather than re-produced.

The beginning of sound reproduction must include Leon Scott de Martinville, who in 1857, designed the phonautograph, which traced the wave form of sound on a cylinder covered with lamp black. But Scott could not replay the sound he recorded. For many at the time it seemed that because the human voice and the sound of music are built up from such a profusion of separate vibrations, any attempt at mechanically capturing these and then reproducing them would be doomed to failure. On capture they reasoned, the mass of superimposed vibrations would merge permanently into a uselessly confused mixture, like the eggs of an omelette. But in the spring of 1877, doubtless spurred on by news from the USA of the recent invention of a speaking telephone by Alexander Graham Bell, the young French poet Charles Cros, turned his mind to the problem of recording speech. Essentially the Cros plan was to reproduce the traces captured by Leon Scott twenty years earlier. Cros deposited a sealed packet of documents at the French Academy of Sciences in April 1877, with instructions that the packet should not be opened until the beginning of December. This packet was duly opened as instructed, and was found to contain brief details of a scheme for converting the wave form trace on the smoke-blackened surface into a matching trace cut as a groove in tough material, such as steel, by photo-etching techniques. Cros suggested that the sound captured in such a groove could be reproduced by tracking that groove with a point attached to a diaphragm. Although the idea was workable, there is no evidence to suggest that Cros ever made a working prototype, and it was not until May 1878 that he applied for a French patent. By then Edison had patented his phonograph and demonstrated a working prototype. So Cros passed into history as the author of an incidental idea. Nevertheless, copies of the original Cros document started to circulate again during 1976, and the French marked the 1977 centenary of recorded sound by honouring Cros as the true inventor, instead of Edison.

Although the USA patent filed on Christmas Eve is popularly taken as the basic phonograph patent, this is very much an over-simplification. The Christmas patent explains how a cylinder with a helical groove cut from end to end (with a pitch of around ten grooves to the inch) and covered with soft metal, e.g. tin foil, is rotated with a sharp point

attached to a diaphragm tracking the spiral groove. As the diaphragm receives acoustic vibrations from the air it moves the sharp point, to make indentations of variable depth (so-called "hill-and-dale" or vertical recording) that bear a direct relationship to the sound received by the diaphragm. For replay, a slightly lighter diaphragm and point combination is tracked again through the groove. The indentations vibrate the diaphragm to create in the surrounding air a replica of the original sound. Legend has it that it was on 6th December, 1877, that Edison succeeded in recording and replaying 'Mary had a little lamb' in this fashion. More reliable as a reference is the December 22, 1877 edition of ***Scientific American,*** which carried a report of how Edison had recently come into the magazine office, placed what transpired to be a tinfoil phonograph on the editor's desk, and, on turning a crank, had it enquire after the editor's health.

Although working at Menlo Park, New Jersey, Edison filed some patent applications first in London, and the British and U.S. Patent Office files clearly show how Edison arrived at the technology for those December demonstrations. In July 1877, Edison had patented a system for making indentations in paper stretched over a disk or cylinder, to form a permanent record of a Morse-code-style telegraph message. This was then reproduced, and the message repeated by moving the indented paper beneath a circuit-breaker. This ties in exactly with the popular story of how Edison hit on the idea of recording sound after noting the curious noise made when the circuit-breakers were run fast over the paper indentations (like running one's finger along the teeth of a comb or a Chinese temple trail). It also explains why the original Edison Christmas patent is not limited to the use of metal foil as a recording medium: waxed paper is also suggested. This, along with other suggestions (for instance the recording could be made on a disk instead of a cylinder, and with a lateral, rather than vertical, stylus movement) is especially interesting in the context of later 'inventions' such as the wax cylinder, the disk, and the lateral-cut groove.

In the same month of the same year (July 1877) that Edison was patenting this Morse code recording system he filed another, much more lengthy, British patent application for a system of transmitting the sound of the human voice over telegraph wires. As a diaphragm moved, it varied the electrical resistance of a circuit. This July British patent (issued as No. 2909/1877) was destined to be a terrible legal headache for Edison. It was amended and re-printed a total of four times over the next five years, and the much shorter USA version did not issue until 1892. In recent disputes over what exactly Edison did first and when, attention is often drawn to the fact that buried in this much reprinted patent there is a sketch and description of a cylinder recorder. This has led some people recently to suggest that Edison had in fact invented the cylinder phonograph by July 1877.

But, closer study shows the documents filed in England in July contained only a very vague reference to the possibility of cylinder recording, and all the cylinder details and the sketches were not filed here until January 1878. Writing in the ***North American Review*** in 1888, Edison recalled he had "almost accidentally" discovered the Morse code noise effect. "I saw at once the problem of registering human speech, so that it could be repeated by mechanical means as often as might be desired, was solved," he wrote.

So the clear picture emerges of Edison progressing logically during the second half of 1877, from the speaking telegraph and Morse recorder to the phonograph or speech recorder.

In April and October 1878, he filed more application papers in England, which resulted in the issue of BP 1644/1878. This document, like all other British patents, is still available for reference or purchase and contains his description of sixty-seven drawings, the germ of virtually every phonograph idea that others subsequently re-invented and re-patented. The patent deals at

COLLECTING 'EDISONIA'

Clark Harris is a San Francisco businessman involved in the sale of office machines, and is a leading distributor of Sony's line of business equipment. His father, Ward Harris, essentially started the business in the early 1900's when he was a salesman for the Dalton adding machine company. As Clark tells it, "One day when my father was calling on a dealer in Butte, Montana, he noticed an Edison wax cylinder business Phonograph in the window. He became so enamored by the machine that he got on a train, went back to West Orange, New Jersey, and told the people at the Edison factory that he wanted to talk to the man that invented the machine. And lo and behold, Mr. Edison invited him into his office."

"He then became Edison's sales manager for the Northwest district and also developed a very dear friendship with Edison and his family. Occasionally Mr. Edison would give him a few items (my father always thought it would be a good idea to have what he called 'Edisonia') and, on Edison's death in 1931, Mrs. Edison asked my father if he would be willing to continue storing the Edison artifacts. He wound up with a fantastic collection of some 13,000 items that he housed in a beautiful vault in his home in Atherton, California. The collection consisted of the first phonograph, some of his first lightbulbs, early motion picture equipment (Edison invented the movie camera) and even a three-wheeled electric car that Edison had built for his own use.

"It's kind of interesting that when Edison invented sound recording he had in his mind what he thought would be the most important uses for his equipment. First, he thought, would be talking books for the blind. Secondly, it would be a business recorder for the busy businessman. Last and least, in his opinion, would be for home entertainment. He ended up having it all upside down."

length with disks as an alternative to cylinders and the use of all manner of wax-like materials as an alternative to tinfoil. It covers electro-magnetic recording and reproduction, a double-sided disk, a method of mass production by electroplating and pressing, and a compressed air amplification system.

A later source of immense legal difficulty to Edison was caused by his tardiness in filing a U.S. equivalent to the British patent claims. The U.S. application was refused, and many of those 1878 ideas of Edison's went unprotected in the USA.

More seeds for future disputes over the phonograph were sown in the winter of 1878 when Edison became involved with another project which he considered far more important: perfection of the incandescent or electric light. His plan was to light up New York and London, and by 1882 the Holborn Viaduct and Pearl Street generating stations were in action, supplying low-voltage DC. Eventually the high voltage AC system developed by Edison's rivals, Tesla and Westinghouse, was to take over. But for the time being at least, Edison was thought of as the man who had said "Let there be light," rather than the man who had said "Let there be sound."

While Edison developed his lighting system others, notably Alexander Graham Bell, working with his brother Chichester and Charles Sumner Tainter (using money awarded to Bell for his invention of the telephone), developed and patented a sound recording and reproduction system to rival the phonograph. It was christened the Graphophone and bore close similarity to the disclosures of Edison's 1878 British patent. But in practical terms, the mid-eighties graphophone scored over the original phonograph since it used, not tin foil, but waxed paper cylinders which could be removed and, in the words of Tainter, 'transmitted by mail with the same facility as an ordinary letter.' The Bell-Tainter graphophone and the Edison phonograph were, of course, incompatible; a recording made on one could not be replayed on the other. Hardly surprisingly, Edison took up the challenge, and there followed in 1888 the "perfected phonograph," a much improved machine which recorded on a solid wax cylinder with a tapered hole to fit on a tapered mandrel. The scene was now set for a commercial struggle between the graphophone and phonograph. In the meantime, however, another of Edison's basic ideas had been developed and repatented, this time by Emile Berliner, in 1887.

(USA 372786) was directed to an improvement of the 'well known

(continued on page 17)

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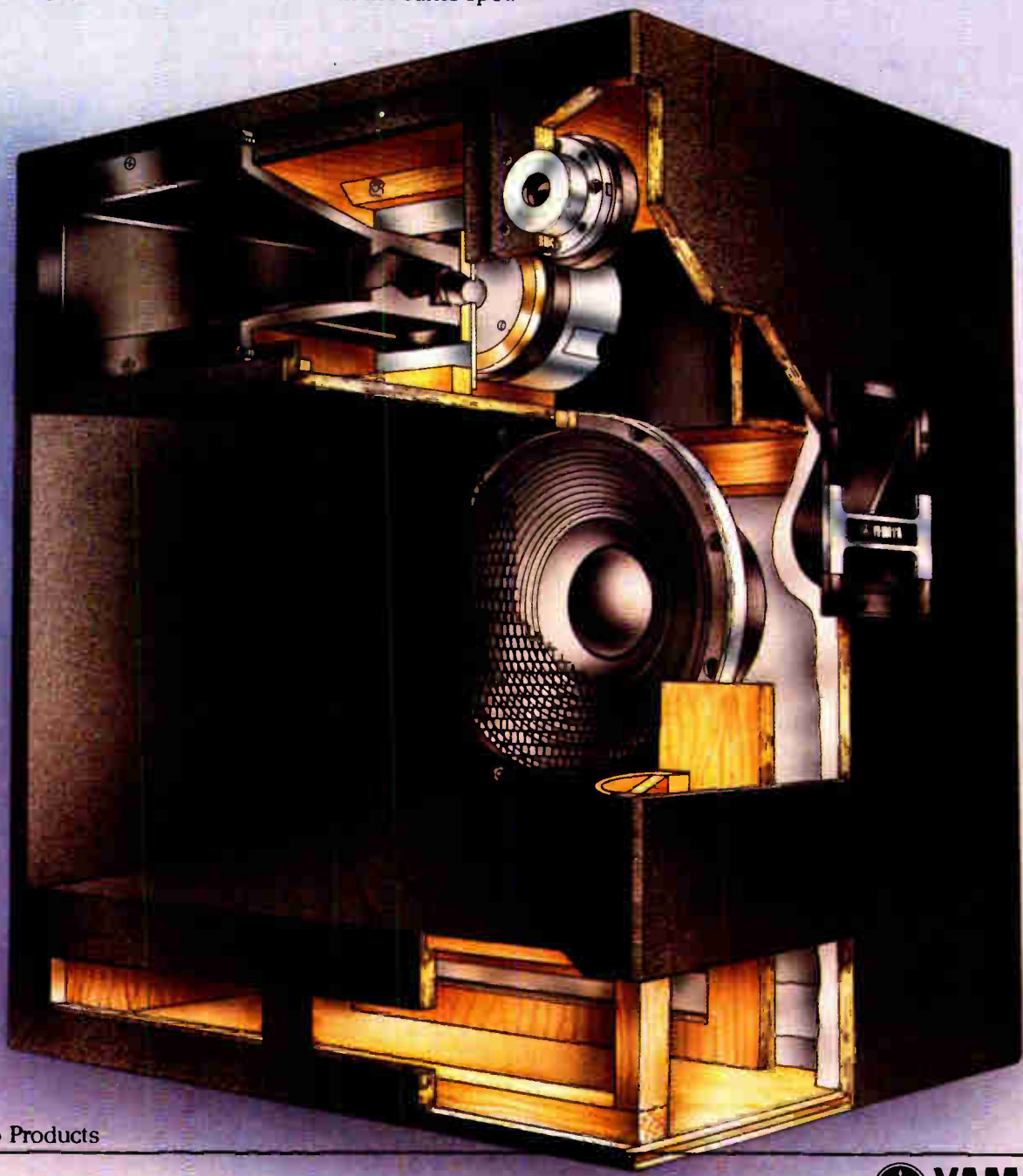

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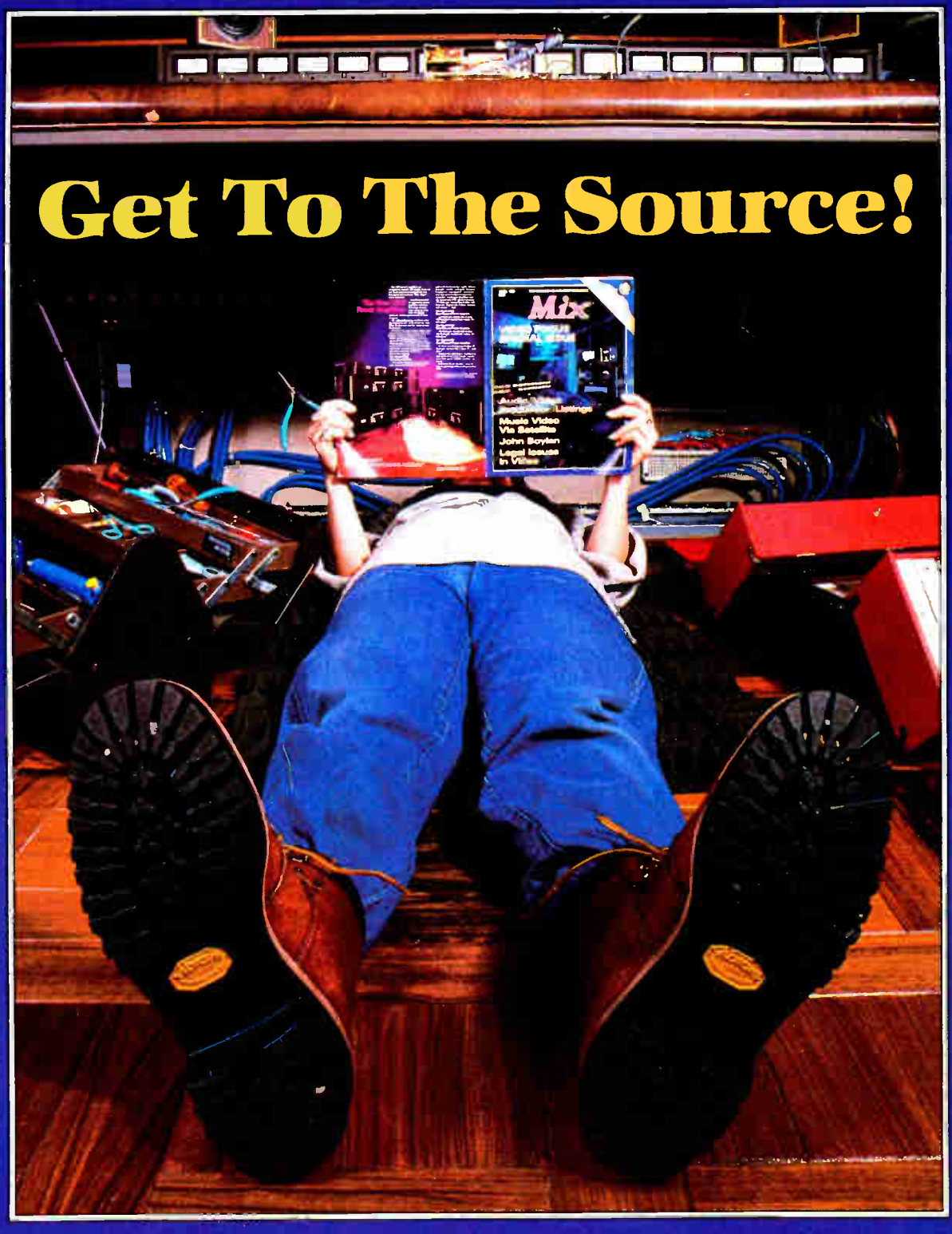

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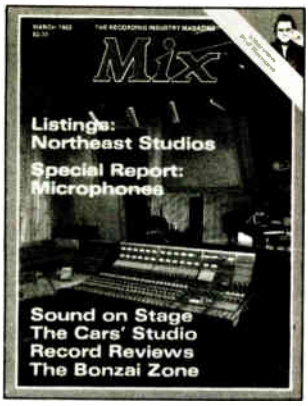

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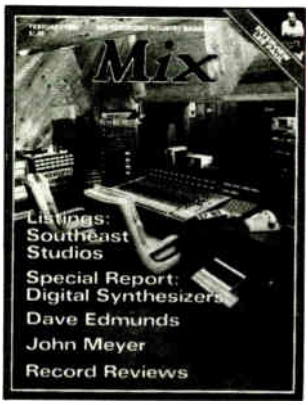

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(continued from page 14)

phonautograph by Leon Scott.' Although this document is traditionally cited as the birth of the mass-duplicated gramophone record, or disk, this is true only indirectly. Both Edison and Tainter had already patented the use of the disk as a recording medium. In any case the Berliner patent drawings show a sheet of recording material mounted on a cylindrical drum! By referring to the recording of sound via a ***laterally*** wavy line, rather than a series of indentations of ***varying depth,*** Berliner was again dating back to Edison ten years earlier. The same can even be said of his final suggestion, namely that the recording could be replicated by chemical deposition techniques.

Nevertheless, it was Berliner who actively pursued the idea of mass-producing disks and, in so doing, spelled-eventual doom for the cylinder which is, by nature of its construction, inherently far harder to duplicate. Hand-driven toy disk gramophones started to appear around 1890 but disk records were not widely available for sale until 1895.

There were still years of life left in the cylinder, which were a commercially viable proposition until the 1914-18 war. In fact cylinders were still being sold by Edison until 1929. Without doubt the blue celluloid Amberol cylinders that Edison produced around 1912 represented the pinnacle of cylinder perfection. Reproduced today on acoustic machines, they produce remarkable volume and quality of sound.

It is not widely realized the original exploitation of both the graphophone and phonograph cylinder machines was in the field of business. There is even some slender evidence to suggest that Edison never really wanted the phonograph to be used for entertainment.

In what turned out to be an immensely complicated legal and business tangle, involving one Jesse Lippincott and the patent and other legal rights to both the phonograph and graphophone, the North American Phonograph Company was formed in the late 1880's. The company's object was to exploit both types of machines throughout the USA by hiring them to businessmen as a then modern aid to dictation. The machines were rented, rather than sold (which is why so few survive today), and local companies were formed to handle maintenance of the machines out on hire. As one company was handling both the Edison phonograph and the Bell-Tainter graphophone (now being called a phonograph-graphophone), and some businessmen carried the machines round with them across state boundaries, from one maintenance company's area of responsibility to another, chaos very soon resulted. To add to the confusion, the graphophone proved very unpopular, for the simple reason that most of them did not work. In 1890, a convention was held in Chicago and attended by representatives of the 32 local service companies that by then existed. Much of what was said by the delegates at that convention sounds just as familiar in today's technology. "What is the use of having two machines?... Have but one machine, a good one, and get the best results you can, and the public will be satisfied... Just so sure as you show both machines at the same time, you will lose a customer," said one delegate.

But, even then, recorded sound as entertainment was already big business. One delegate spoke of a "crank" client who "sometimes has spent as high as a hundred dollars a week for musical cylinders." Another had earned $4,000 in less than a year, from nickel-in-the-slot machines installed in his saloons.

(continued on page 83)

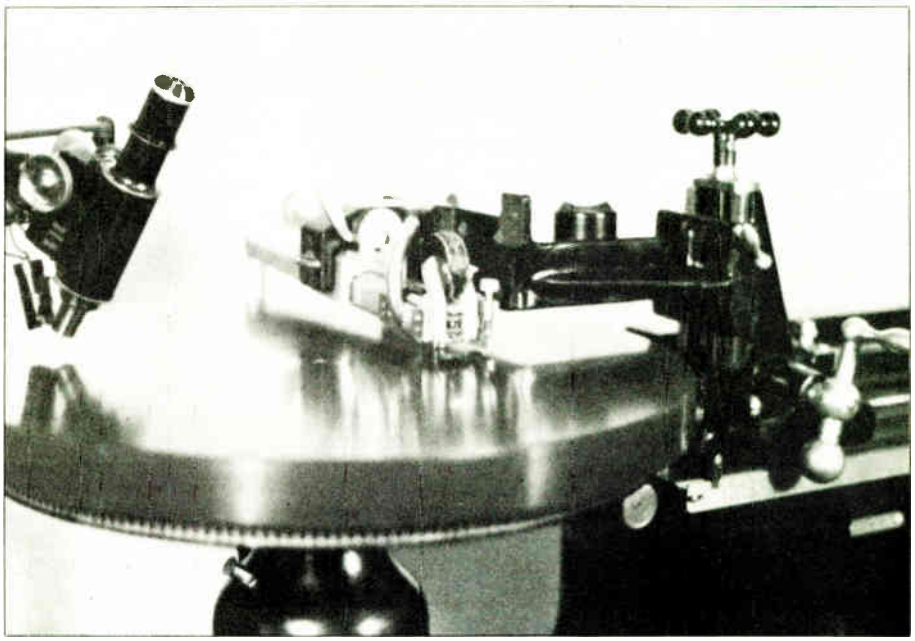
The Emergence of Electronic Recording

1920 to 1955

by John T. Mullin

From the humble beginnings of Edison's first phonograph to the posh Victrolas that graced the parlors of the early 1920s, all reproduction of recorded music can best be described as sounding like it was coming through a tin horn. Because of enormously irregular frequency response and complete absence of lower frequencies, the listener was denied the illusion of realism. But he didn't expect it. Here was the greatest entertainment medium ever conceived for the home, and after all, wasn't it a mechanical marvel, just as it was?

But in those same early 1920s radio was starting to invade that same parlor. It offered variety, and if one listened in earphones on even the simplest of radio sets, it sounded fully as good as the phonograph. Admittedly the horn loudspeakers of the first tube type radios sounded pretty bad, but there were young enthusiastic fellows working in some pretty sharp factories to improve these things and soon the phonograph was pushed into a corner or relegated to the attic. The word "radio" was not to be uttered, by decree, in the huge Camden plant of the Victor Talking Machine Company.



Turntable of "Vitaphone" lathe with electrical recording head and wax used to make 16 inch master recordings—1926.

By 1925 the Victor and Columbia companies were in dire straits. Fortunately the Bell Laboratories had for some time been applying their expertise in telephone transmission theory to the principle of "mechanical equivalents," in which mechanical vibrating systems could be analyzed in terms of electrical elements fully understood by such people. Friction was the equivalent of resistance, mass had its parallel in inductance, and springiness was the equivalent of capacitance. With these tools they had developed the beautifully performing condenser microphone and fine sounding loudspeakers.

And so the technique permitted the design of a device for engraving sound electrically into the surface of a blank phonograph wax. Electrical recording was thus born. The combination of the condenser microphone, the vacuum tube amplifier, and the electrical record cutter made the greatest step forward in the history of sound recording.

Not content with a new method of producing the record, the same organization designed a new phonograph to match the system. After all,

Les Paul :

"Today's musicians know a lot more about the tools of their craft," says Les. "They are more knowledgeable about their instrument, as well as sound and recording procedures. They are more aware! Today's musicians are curious, they are reading, they are in studios and around sound gear, and what they don't know they are finding out. They can go into a music store and find most anything that they like. Today's musicians can see performers on TV and in the movies or they can buy records and study the techniques of other musicians. With all of these aids they can learn much faster. Musicians today also have a wide variety of instruments as well as effects devices to expand their creativity.

"I ask today's musician to keep in mind that it's what you do with what you have. You should be a creator, and should know how to be a performer, producer, engineer, and a writer. Above all if you have a crazy idea, throw it out on the table. They will either laugh or use it, but don't be afraid to express your ideas."

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the new records would stand little chance of appreciation if played on the older tinny squawk boxes.

"Aha," I hear you say, "Since they were electrically oriented, they designed a machine with an amplifier and loudspeaker to reproduce the records."

Surprise! They did not! Bell developed an acoustic phonograph greatly resembling those that had gone before, but again employing mechanical equivalents in its design, instead of being derived empirically as its predecessors had been. Every element, from the tip of the steel needle through the diaphragm coupled to it, on to and through the folded horn which radiated the sound, was properly designed. For the first time in the history of the phonograph each element was matched to its neighbor.

The resulting sound was magnificent. It had an overall frequency response essentially flat from 150 to well over 4500 Hz. Radio didn't sound like that in 1925! The day of the phonograph had indeed not ended, once Victor agreed to allow all that new fangled stuff with all those radio tubes into its recording studios.

The Bell development caused a sensation in the market place when the new "Orthophonic" Victrolas were introduced, and Columbia announced their version of it, which they termed "Viva-tonal."

Meanwhile General Electric Co. had not been sleeping. They developed a competitive system and sold it to Brunswick. Initially it had some problems, mostly centered around a strange microphone that employed a vibrating mirror which modulated a light beam from a powerful lamp on its way to a photo-electric cell. Labels on records of the period state: "Brunswick Light Ray Recording."

For a reproducer GE designed an electrical pickup which fed a 1.5 watt amplifier driving a moving coil loudspeaker—indeed the very first of the moving coil loudspeakers, the basic design of which has remained with us almost universally to this day. This machine, which was called the "Brunswick Panatrope" was able to reproduce bass tones somewhat better than the Orthophonic Victrola, but as Bell had predicted, harmonic distortion and upper frequency response could not be controlled with the desired precision. All in all, however, the Panatrope produced a pleasing sound and it launched the era of the electrical reproducing phonograph.

Bell next turned attention to an obvious method of synchronizing motion pictures with sound. Camera and disk cutting lathe were interlocked by an electrical "Selsyn" system. This had been developed at the time the Panama Canal was built to provide synchronous movement of the gates on each side of the channel at each of the locks. The system had worked perfectly with the enormous interlocked motors built for the job by General Electric Co. and so the relatively tiny motors for interlock of camera and lathe were no problem.

Twenty four frames per second was established as proper film speed. A standard roll of film 1000 feet in length would run for eleven minutes. A sound record would therefore have to run for that period. Again a study was made and the conclusion was drawn that the disk should run at 33⅓ rpm and be 16 inches in diameter. Thus, in 1926 was born the speed at which our records run today.

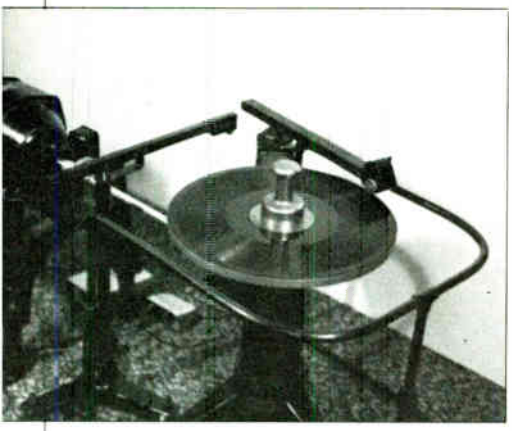
Sound on film recording was developed in parallel with the disk

Mary Bell (Schwartau):

"We were doing so many different things at NBC in the early Forties that not one day was the same. Sometimes I worked on the Bell Telephone Hour inserting musical cues while simultaneously recording the entire presentation. We were recording 16" disks at 33⅓, but some of the musical inserts were recorded at 78. On the old Scullys, in order to do pitch change, we changed the gears manually.

"I felt like a ballet dancer when we set up the room to do 1 minute spots. I would have 4 machines set up, lock the groove on one, disengage the second, respot the third while the fourth was spinning. Obviously there had to be space between the spots, and if you were really good you could get 12 spots on a disk.

"One day an engineer became sick during a session, and I volunteered to run the tape machine. Of course they were hesitant, not knowing that I had already worked with tape, but I did well and proved myself. They never kept me out of the tape editing room after that."



Transcription turntable as employed in radio stations to play 16 inch, 15 minute programs. Apparatus adapted from "Vitaphone" theatre apparatus. Lateral pickup shown on the record, early vertical pickup is the smaller unit—1931.

system but the disk system was the first to be commercially successful, being introduced by Warner Brothers as the "Vitaphone."

The 16 inch disks for film use had a coarse groove pitch to assure that no cross-overs would occur while recording dialog or sound effects. It was soon found that a finer pitch would enable a record to run for a full fifteen minutes. By 1930 nearly every radio station in America was equipped to play quarter hour pre-recorded radio shows which were prepared on 33⅓ rpm 16 inch disks. Full time affiliates of the major networks were not in this category (networks had a strictly live program policy) and the oft heard words of the announcer: "The following program is electrically transcribed" were heard far and wide. The syndicated radio show was born.

Although saved from extinction in 1925 by electrical recording, the phonograph business again fell on hard times and in 1928 RCA bought the Victor Company, converting its factory to the manufacture of radios and a restricted number of radio-phonograph combinations.

To stimulate sales of records and machines RCA Victor introduced its "Program Transcription" records in 1931. These were plastic records running at 33⅓ rpm and having a relatively fine groove so that a 12 inch record could contain over 15 minutes per side. So you're surprised again? Perhaps you thought the long playing record was introduced by Columbia in 1948. The RCA record was short lived, mostly because of inadequate low speed drives and heavy pickups which tore the plastic records mercilessly. The project was abandoned after a few months, to lie dormant until the inexpensive rim drive turntable was developed and light weight pickups were practical.

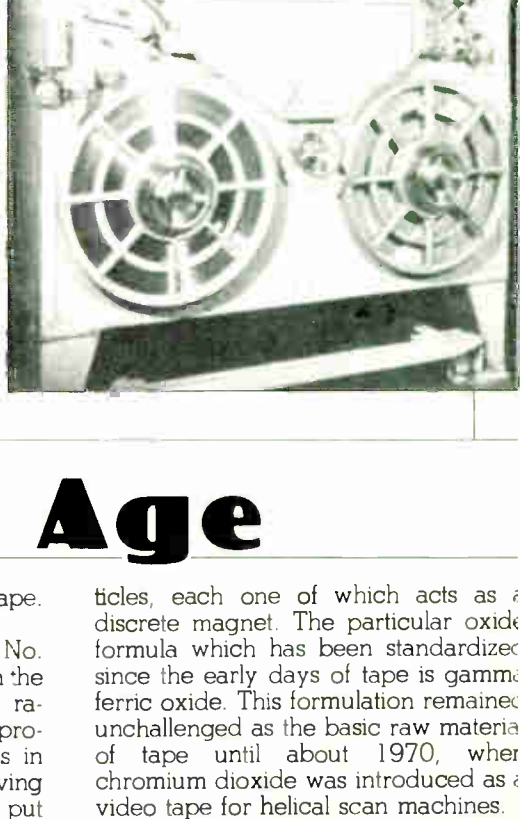
In 1929 the Edison organization suspended manufacture of all records and machines. Edison had always employed vertical modulation of the record groove, whereas the disk business had been built on lateral modulation. There was some smug rejoicing among the retirees of the Edison organization, therefore, when Bell Labs developed a vertical recording system for use in radio broadcasting and motion picture sound. It had the advantage of providing higher levels on the record without crossover problems, used plastic disks, and thereby greatly improved the signal to noise ratio, but it was bothered by undesirably high second harmonic distortion. It was widely accepted in syndicated program service and provided the original source material for Muzak.

Ready for another surprise? Perhaps you thought the single groove stereo record so common today was invented in 1957? At the 67th Convention of the Audio Engineering Society in November 1980 Mr. A.C. Keller played some modern stereo LPs that were transferred from records produced, again by Bell Labs, in 1931 and 1932!

They were originally recorded by coupling two of their lateral cutters together mechanically so that one moved the cutting stylus vertically while the other moved it laterally. By simple resistor matrixing, one of the stereo input signals was applied to both cutters to result in a 45 degree motion. The other input similarly caused 45 degree motion at right angles to the first, an end result identical to what we employ today.

It was a noble and very successful experiment. Why didn't it become a commercial success at that time? Those were depression days. No one in their right mind would have proposed that one should buy another amplifier and loudspeaker as well as the special pickup one would require to play these novel records.

Heard today, the quality of these test records is unbelievably fine. No equipment in the average home at the time they were recorded could have done justice to them. Yet somewhere in those early 1930s the term "High Fidelity" began to creep into the conversation of those enthusiasts who found that, by building one's own apparatus out of available high class components, far better reproduced sound could be enjoyed than could be had from commercial radio-phonographs. Jensen speakers, Audax and Astatic pickups, 2A3 amplifier triode tubes, a pair of which delivered the enormous power of 12 watts—all these were exciting to the home



The Marconi-Stille steel tape magnetic recorder as used by the BBC in late 1930's and during the war. Signal-to-noise ratio was less than 40 dB.

Tape Comes of Age

by Delos A. Eilers
(Audio Technical Service Manager, Magnetic Audio/Video Products Division, 3M)

It is common to equate today's better quality audio recording to improvements in equipment. Though recording gear has seen many evolutionary changes over the past decade, equally significant improvements in tape technology have occurred as well. Much of what is yet to come can also be attributed directly to tape.

In 1947, an American company, the Brush Development Company, marketed a non-professional sound recording machine and 3M introduced the first commercially acceptable magnetic sound recording tape, "Scotch" brand No. 100 magnetic tape, made of black iron oxide coated to a paper backing.

Continuing to apply its expertise in precision coatings, binders and tape dimensioning, the company a year later launched "Scotch" No. 111 tape, a far superior recording tape with a much more durable backing of acetate. The tape utilized a form of red iron oxide commonly used in the red paint that brightens barns in the nation's farmyards.

Simultaneously, John T. Mullin had perfected his Magnetophons and succeeded in convincing Bing Crosby to pre-record his network radio show on tape. Producers of the show had been recording on disks, then editing from disk to disk with severe losses in quality. This, in addition to the troublesome technical problems that were being encountered in this procedure, led the Crosby organization to try tape. It was an instant success.

In 1948, new "Scotch" No. 111 tape met a new challange when the American Broadcasting Company radio network delayed 17 hours of programming each day for 22 weeks in order to untangle the daylight saving time change snarl. Programs were put on tape, then replayed later to accommodate the requirements of the various time zones.

In 1954, polyester tape backings were introduced. Although the cullulose acetate-based tapes in use at the time had good properties, they would eventually deteriorate. Polyester films proved to be an excellent tape base, stronger, less susceptible to humidity changes, and had greater long-term stability than acetate.

Tape binders (the "glues" which attach the magnetic particles to the base) have also made significant contributions to the evolution of recording tape. The binder determines how well the tape will last, avoiding rub-off, flake-off, or abrasive damage to the recorder heads. The evenness of the coating is important for smooth frequency response and prevents drop outs. Lubricants have also been incorporated into binders for ease in sliding over fixed surfaces, such as recording heads.

The ultimate performance quality of any tape depends on the magnetic particles applied in the binder. Today, most are in the magnetic oxide family.

Ferric oxide (in the one form known as rust) is stable and reliable, and can be crystalized into small particles, each one of which acts as a discrete magnet. The particular oxide formula which has been standardized since the early days of tape is gamma ferric oxide. This formulation remained unchallenged as the basic raw material of tape until about 1970, when chromium dioxide was introduced as a video tape for helical scan machines.

CrO_2 tapes soon came into the audio field as a slow speed cassette tape. CrO_2's advantages in improved signal to noise ratios and extended frequency response are suited to slow speed tape where capacity for greater packing density is useful. This advantage disappears at speeds of 7½" ips or more.

Since the introduction of CrO_2 other oxides made of gamma ferric oxide modified with cobalt have been used. These have the same basic properties as the "chrome" tapes, but offer greater sensitivity.

Another tape has a visible special property applied to the backing on the non-magnetic-coated side of the film (3M calls this a controlled wind coating). This backing has a slight texture, analogous to the tread in a tire resulting in smoother winding by allowing orderly dispersion of the air cushion between layers. The texture also gives a better surface for the recorder's drive capstan and pinch roller to grab. This permits a slip-free motion of the tape past the recorder's heads. Virtually all mastering tapes have this backside coating.

In high-quality, high-performance tapes, the magnetic-coated side is often treated to make it smoother. This often takes the form of polishing

constructor and paved the way for people like Avery Fisher to achieve fame.

By 1934 RCA was listing the new Victor monthly releases as "Higher Fidelity" records. How exciting, but what a disappointment some of them were. The original electrical recording specifications called for constant groove modulation amplitude below 250 Hz and constant velocity above. This was changed to around 600 Hz. This put high frequencies on the record at a higher level, thus reducing the level of scratch noise. A coarser groove pitch was sometimes employed to permit even higher amplitude. At times this led to running in to a very small diameter in order to attain the required playing time. In these cases all three factors resulted in intolerable distortion. Fidelity had been higher when it wasn't Higher Fidelity.

Another record manufacturer sinned in other ways. There seemed for a while to be no concern with frequency response. The writer has employed a graphic equalizer to render one of the 78 rpm records of those times tolerable to the ear by today's standards, with the following corrections necessary in dB: 62 Hz plus 4; 125 Hz plus 4; 250 Hz plus 4; 500 Hz zero; 1 kHz minus 12; 2 kHz minus 12; 4 kHz plus 6; 8 kHz plus 10.

During this reign of terror period the original equalization standards were far more rigidly adhered to in Europe. Needless to say, the Hi Fi enthusiasts were very partial to imports. At the termination of World War II, the English Decca Company introduced its "Full Frequency Range Recordings" (FFRR). They sounded very fine indeed and led other manufacturers to experiment with various curves, a situation that was only finally

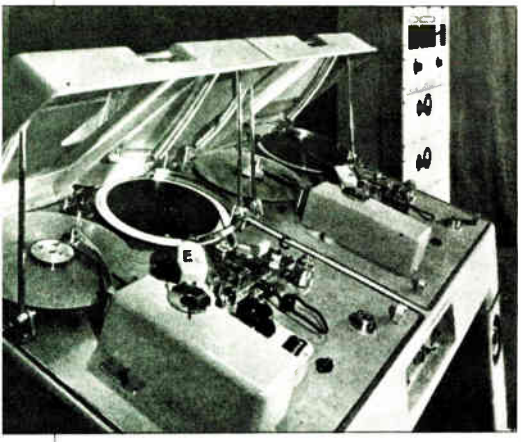
The smoothness enhances the contact between the magnetic particles and the recording/playback head, which improves output levels and high frequency response. (As a result of these two developments, the old rule "shiny side away from the recording head" is no longer true with some tapes. Most mastering tapes on the market have a magnetic side that is shinier than the controlled wind backside.)

Digital audio tape looks like a shiny version of mastering tape. It is thinner however, because of both reduced oxide coating and backing calipers. The magnetic coating has been highly polished and surface conditioned to make certain it is free of flaws that can cause digital drop-outs. The magnetic properties of the oxide coating are also special so a maximum output level is obtained when recording the high density digital data. This tape is not compatible with standard ("analog") audio recorders. Neither is it compatible with normal computer tape systems. It has been designed especially for the extremely high information densities that are required to record digital audio information.

Improvements in tape formulations have made sweeping changes in the videotape medium as well since 1956, when the first black and white recorders were introduced. The video industry has moved from the half-mile long, 22 pound roll of two inch tape, used by broadcasters to record an hour of programming, to color taping of the same length program with a tabletop recorder using a video cassette scarcely larger than the box that holds a reel of ¼" audio tape. ■

resolved in the 1950s with universal acceptance of the Recording Industries curve (RIAA).

Early recording was all done on wax plates which were electroplated to generate a metal master. In the 1930s the lacquer disk was developed. This was (and still is) a sheet of thin aluminum coated on both sides with a special compound that can be cut like wax, yet is hard enough to be played without serious degradation. It can also be plated like wax. It circumvented a lot of temperamental problems associated with wax masters and opened the door for home recording and for practical delayed



A pair of Philips-Miller machines. Sound was engraved in surface of special film and played back optically.

radio broadcasting and air checks.

An interesting side light comes to mind. Aluminum was in short supply during the war so sheet glass was used as base material in these records. There were many traumatic experiences of important program material winding up as bits of shattered glass on the recording room floor, or in the bottom of a record sleeve.

The quest for ever better fidelity led one man, James A. Miller, to pursue an idea which incorporated many of the advantages of both disk and optical recording while avoiding some of their disadvantages. He employed reels of special film about 7mm wide, on which was coated a transparent gelatine. Over this was coated a thin layer of black dye. A mechanical cutter was employed, having a very flat "V" shaped stylus which was driven up and down by the signal to be recorded, thereby gouging more or less through the dye and into the transparent under coat, cutting it away to reveal a double envelope variable area sound track. This could be played back immediately by methods identical to those used for optical motion picture sound tracks.

Philips of Holland built his apparatus which was therefore named the Philips-Miller system. It found application in a limited number of radio stations in this country but was more widely accepted in European broadcasting. It was reputed to provide the best sound recording method of its day. Perhaps it would have found wider application but for the upheavals of wartime and the awakening of "The Giant of the Long Snooze."

One of two Magnetophons employed by the author to record the Bing Crosby radio show in 1947. Electronics panel at rear was made up of American components following German circuits.

In 1899 Valdemar Poulsen demonstrated that sound could be recorded magnetically on a moving steel wire. Because of impracticalities, it remained scarcely more than a curiosity well into the 1920s when one man, Kurt Stille, in Germany, promoted developments including the use of steel ribbon rather than wire, which made it acceptable to a limited degree for music recording. The end results, however, were not as good as the sound from a shellac 78 rpm phonograph record. Steel tape was very expensive, awkward to handle, and uneditable. "Vicalloy," a metal tape developed by Bell Labs during this period cost about a dollar per foot!

Scarcely envisioning, at the time, the significance of his invention, Fritz Pfleumer coated a ribbon of paper with magnetizable powder in 1928, thus shattering the high cost of the medium. By 1935 the AEG Co. in Germany started manufacture of a reasonably good machine they named the "Magnetophon." It employed Pfleumer's improved tape in a well designed mechanism and introduced a new concept in magnetic heads, the so called "ring" head. Music reproduced from these machines was notic-

(continued on page 26)

Bill Robinson :

"In 1945 we went overseas. I was stationed in the Pacific where I served in Saipan, Guam, Iwo Jima, etc. We were doing live radio broadcasts and recordings of actual combat. These were for radio programs such as "The Army Hour" to help the war effort. General Arnold (General of the Air Force) needed these programs to promote the sale of war bonds, and also for Congress and the people out there to know that there was an Air Force. There were several teams like mine making these recordings. They were done on the first General Electric wire recorder. When you spliced the wire it was cut with a razor blade or scissors. Then you tied it in a square knot and used the heat from a cigarette to weld the wire together. It made a little bump and a slight signal drop out when it went over the head. The musical quality was atrocious, but it had good voice quality and that was all we were using it for.

"Toward the end of the war, I made a recording of an eye witness account of the atomic bomb being dropped on Hiroshima, Japan. After we made this we realized that we were sitting on the biggest story of the entire war and we must get back to Guam to transmit it back to the States. When we were in the process of landing, a gust of wind blew the plane into a pile of coral, flipped the aircraft, and the plane crashed. I was on a hospital ship with broken bones and on the way back to the States when I heard the war was over. The all important roll of wire with the eye witness account was lost somewhere in the plane crash."

(continued from page 24)

ably better than other recorders, but it still was not better than the shellac record, if as good. And so the Giant slumbered on,—until—Walter Weber of the German Broadcast Service, experimenting with ideas on how to reduce the offensive background noise inherent in the system, accidentally fed a very high frequency into the record head while recording some program material and noted an enormous improvement in the fidelity of reproduction. All machines in the broadcast service were immediately converted to incorporate this newly discovered "high frequency bias" and the Magnetophon overnight became the world's finest recording system, serving well the German cause in broadcasting throughout the war.

Ironically the advantage of high frequency bias had been discovered in the U.S. as early as 1921, in the days when no one was particularly interested and it was soon forgotten. It was reinvented during the war, in this country, by Marvin Camras, and applied to military wire recorders adequate for radio interception monitoring or voice recording but not pretending to be capable of high tonal quality.

Only the Magnetophon had the combined essentials necessary to assure its superb performance. These were: 1) A good low flutter drive suitable for music, 2) The "ring" head, 3) Good, inexpensive, editable tape, and 4) High frequency erasure and bias.

At war's end the Giant of the Long Snooze was suddenly awakened with a jolt, when this great achievement was exposed to the outside world. May I take you along one such channel of exposure?

In 1946 two basic high noise Magnetophons were sent home as souvenirs of war by the writer. He modified them in accordance with circuitry of the German Broadcast service using American electronic components and demonstrated them to Bing Crosby, who immediately wanted them to be used for recording, editing, and playing his prerecorded weekly radio show which was presented on the full American Broadcasting Co. radio network. Simultaneously arrangements were made for the machines to be studied in the small laboratory of tiny Ampex Corp., thereby assisting this small company to become the first to manufacture a professionally acceptable mastering recorder for radio and phonograph studio application.

Ampex' first machines were delivered to the writer after he had completed 26 Crosby shows on the

Magnetophons, in April of 1948. ABC was next fully equipped and professional tape was on its way in America. There were, of course, other manufacturers who worked feverishly to introduce fine apparatus at about this same time since the Allied Commissions of the U.S. government made all information free to American business, because Japanese and German patents were declared invalid.

The speed of Magnetophon tape was almost exactly 30 inches per second. It was soon found that better heads could be constructed and the speed reduced to 15 inches per second without significant degradation of fidelity. In machines intended for home use this was halved to 7½ ips and with further developments 3¾ ips became practical. Eventually 1⅞ ips provided fair quality for the thrifty minded.

Glowing predictions of the demise of the 78 rpm phonograph record were heard far and wide. All would give way to tape in the home. After all, at 7½ ips a seven inch reel ran uninterrupted for a half hour with uniform quality from start to finish and without that infernal record scratch. But just when things were most promising the phonograph underwent another great change for which the time had finally come. The Long Playing (LP) record was introduced by Columbia, to be followed shortly by RCA's introduction of the 45 rpm disk. This was in 1948. Record sales at first fell off sharply as a confused public worried about which system would become the standard. When Columbia and RCA mutually agreed to produce both forms in 1950 record sales soared as never before. The future of tape in the home seemed doomed.

There were a few more dark years for tape in the consumer market, then a glimmer of hope as demonstrations to the public of stereophonic sound excited new interest. Record manufacturers had been prudently recording most master tapes in both mono and stereophonic versions since the early 1950s. Two track tape was the logical method of providing stereo in the home. Even though a stereo tape of a symphonic work cost $18.95 versus $3.98 for the mono LP version, the future looked bright. Alas! The LP disk triumphed again with the reintroduction of the monogroove stereo record.

Would tape ever find full acceptance in the hands, hearts and ears of the consumer? ■

Armin Steiner :

"When I was 15 my dad took me to Radio Recorders, which was the basis for most of the engineers of an era. It was the only place that you could get a total and fundamental background in the recording business. They had 35 engineers and it was the largest recording studio at the time. This was before the studios of RCA Victor of Decca or any of the major labels. All of the independents and major labels were handled by Radio Recorders and they had the monopoly. And so, with the advent of the tape recorder in about 1947, Radio Recorders had the first 200 Ampex recorders and the tape business was launched on a large scale. It was an enormously fantastic organization with an almost father to son relationship between the older engineers and the younger people coming in. I haven't seen that kind of program duplicated anywhere in the industry. It was a great fraternity of learning and you just couldn't help but learn."

GOLD★STAR RECORDING

A Masterful Partnership

by Winn Schwartau

In today's economy buffeted recording industry, two things are difficult to imagine: One is a studio whose success and popularity has steadily grown for over 30 years, consistently avoiding the pitfalls of modern business and the wayward music industry tendencies which all too often swallow studios alive. The other is a working, non-violent partnership which endures past the first few months when a glimmering glint of success is on the horizon. Even more unimaginable is the combination of the two; a partnership which grows by creating strength for the entity it built. Such a rare example is presented by Dave Gold and Stan Ross, owners of Gold Star Recording, in Hollywood, California.

MIX: First off, how do two partners of 30 years stay together, successfully, without being at each other's throats all the time?

STAN: Both of us are into separate identities. There's no competition between us. Some of the things Dave does I couldn't do, and some of the things that I do, Dave wouldn't want to do. We work together for a single purpose.

DAVE: You see, I'm into electronics. I was interested in sound recording many years ago, before there was an industry as we know it today, and Gold Star afforded me the chance to play. Also, I like to specialize in disk recording, Stan doesn't.

MIX: How did it all start?

STAN: We've been friends since we were kids. It was a friendship that developed into a partnership, rather than the other way around. That's part of our 31 year success. While Dave was in the service, the job office sent me to a recording studio on an interview, and I spent four years there, as sort of an apprentice (1946-1950). When I left, it was like graduating college.

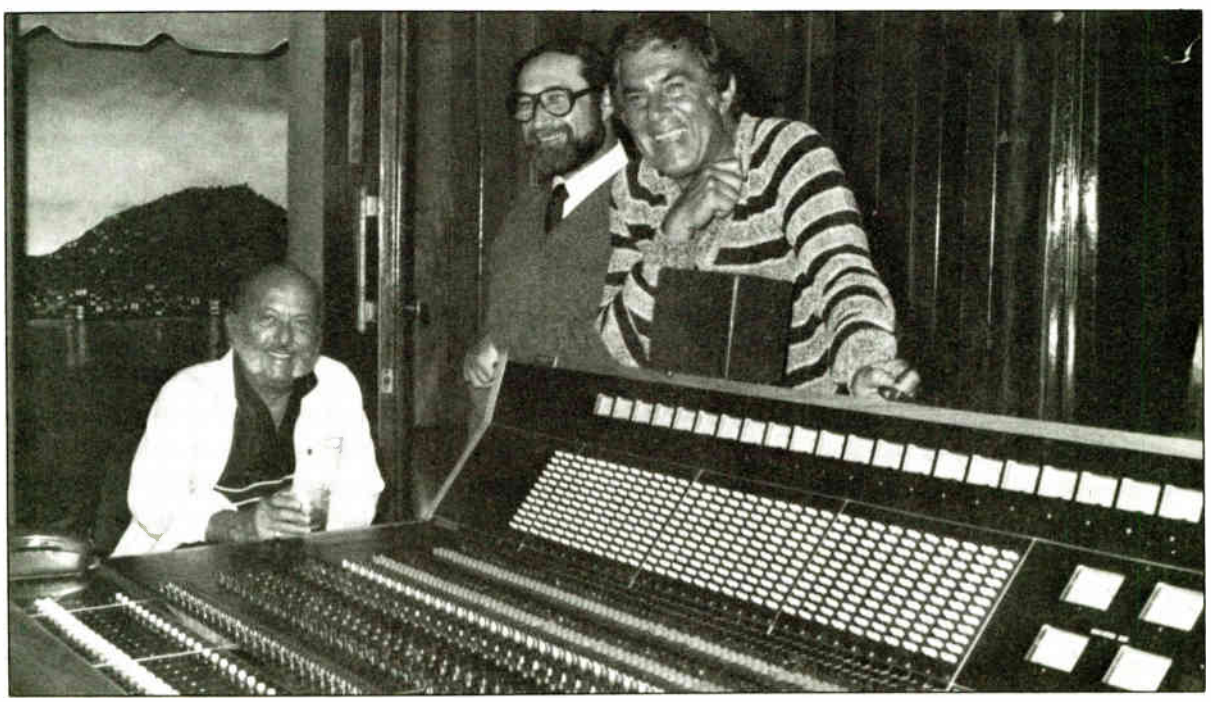
DAVE: To trace the beginnings, you'd have to go back to when I was a teenager the tinkering type. But it really began in 1943 when I walked into a pressing plant and I learned what it took to press a record. I learned about the many problems one could encounter even at that stage. I've found that experience extremely valuable.

STAN: We were friends, and lived only five blocks from each other. We got together socially once in awhile, and sometime in 1949 began discussing going into business together. By then, I was running the studio I had apprenticed at.

MIX: This was direct-to-disk recording?

STAN: Of course! Mono and direct-to-disk. Tape had just come along after the war, and the owner of the studio didn't want to spend the dollars on a large professional reel-to-reel machine, so he bought a cheap 7½ ips recorder. Tape at that time was basically a backup for disks, or used as a safety if more copies (of disks) were needed. We did air checks, and the like. In fact, we had four lathes, two pair of tandems. But for air checks, tape quality was good enough. [Laugh].

MIX: And you got together...



Left to Right: Arranger Don Ralke, Owners David Gold and Stan Ross.

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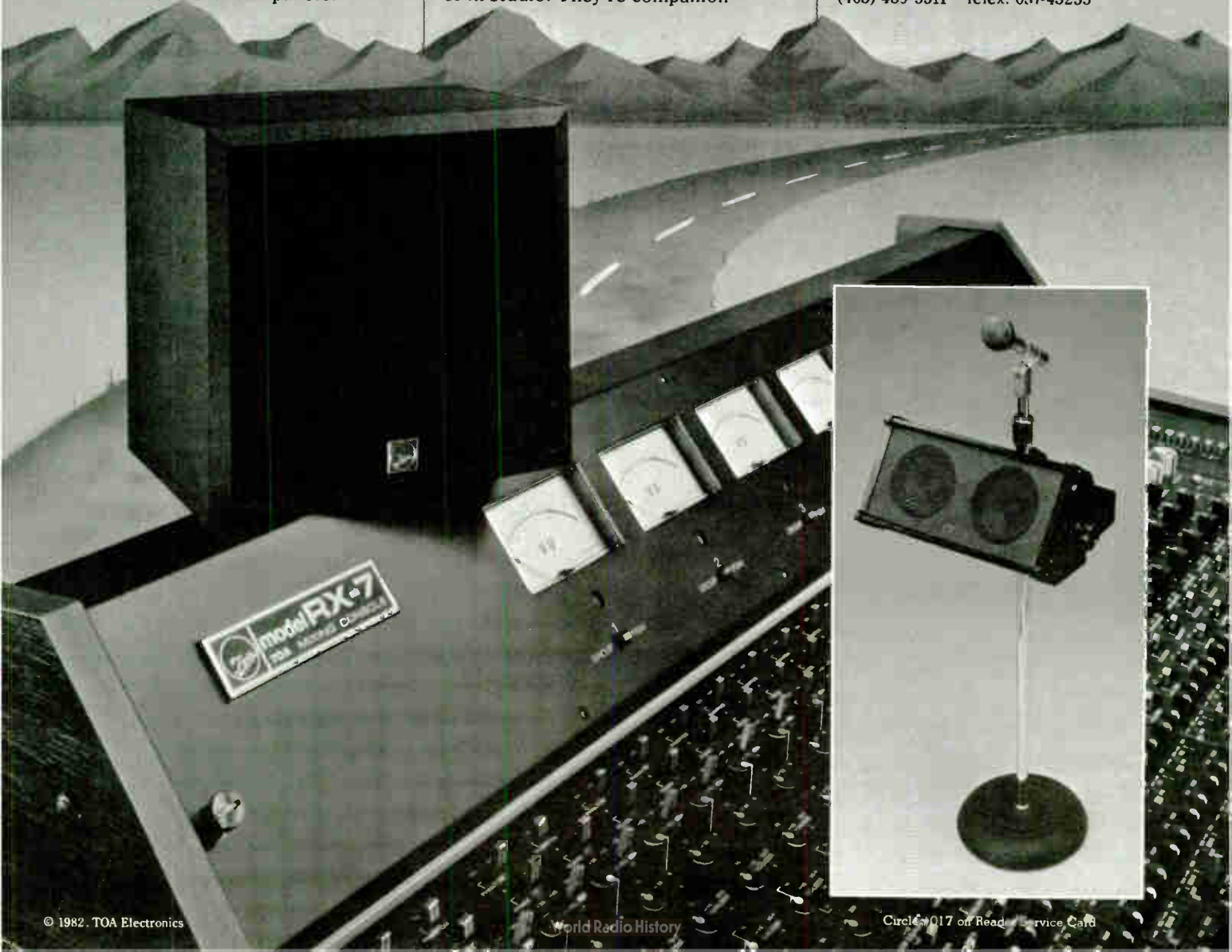


GOLD★STAR

STAN: We kept talking in 1949, and did some record hops—ancient discos! We recorded weddings, background music, and the like. Dave built the electronics for our first tape machines. We did all this before we even opened Gold Star in June of 1950.

MIX: Where?

DAVE: Right here! For all 32 years we've been on Santa Monica Boulevard in Hollywood.

MIX: What did you do for equipment?

DAVE: Well, you have to remember that at that time there was no such thing as a recording industry or equipment manufacturing as we know it now. There was very little information around on how to put things together, or how to use them. No magazines or books. Broadcast was our only backup, and that was pretty limited as far as information was concerned. It took a lot of research to find data about equalizers, etc. We built our first board, it had six inputs, and one mono master output.

MIX: What about mics?

DAVE: We couldn't afford much else, so we used ribbons: RCA 6203's, 44-BX's. The 44's are still good mikes today for certain effects.

STAN: There were no overdubs. Everything was live. All at once.

DAVE: Then we got another tape machine.

MIX: So you could overdub. In the true sense of the word.

DAVE: That's right. It's a lot different than sel-syncing. You had to learn what an instrument would sound like after 7 or 10 generations of bouncing and adding new instruments on top of thers, never mind taking care of tape hiss!

MIX: How did you learn about recording, Dave?

DAVE: By trial and error. Pure experimentation. Little was written on the subject of disk recording. The rest was research.

MIX: Who did what when Gold Star opened?

DAVE: Stan's the mixer...

STAN: ...and Dave made everything work.

DAVE: I used to be in the lathe room, when we did a session. There had to be two of us around. That got to be a pain, so we had to invent a way of automatically lowering the head on to the disk for each take. That way, Stan could take care of most of the session himself from the control room.

MIX: What kind of recording was being done in the early 1950's?

STAN: The independent studio was a novelty. Most of the majors (labels) had their own studios, so we were kind of unique with the concept of the demo studio. An act could come in and just try out ideas without the worry of the studio budget or the studio honchos breathing down their necks.

MIX: Did you grow with the number of tracks?

STAN: Sure. We made all the steps. 2, 3, 4, 8 track. We even considered 10 tracks, and... our board grew, too. Our 3 track console lasted through 16 tracks!

DAVE: There was very little equipment available... consoles weren't something you could buy off a shelf. So, like everybody else, we designed and built most of our own equipment.

MIX: How did you get out of the demo work?

STAN: What happened was that groups and producers realized that working at Gold Star relieved them of the pressures of going to the major studios. The rates were cheaper; and they got to experiment with new ideas. If the recording came out good, it became a demo. If it came out great, it became a master. A lot of tapes that started out as demos became finals and were released.

MIX: Did the rock n' rollers help a lot?

STAN: If you call the '50's rock n' roll... a lot of unsigned acts, new writers, and independents would record at Gold Star, like Phil Spector. Phil came in as a kid, and we just happened to make a couple of smashes here, so he kept coming back. He called me from New York one day, and said he wanted to come in and record a group called the Crystals. That was the beginning... Zippety-Doo-Dah, Bobb B. Soxx and the Blue Jeans, He's A Rebel... those days. Phil then, of course, went on to make hits for Tina Turner, the Righteous Brothers, and so on.

MIX: So Phil Spector's "Wall of Sound" was created here?

DAVE: Yes. In the beginning, we used to use the hallways as echo chambers.

STAN: A speaker and a microphone at the other end...

DAVE: ...and we were constantly playing around with new ideas for echo, springs, etc. We couldn't afford some of the more sophisticated echo devices available on the market. We even played with large bowls of jello to make echo!

STAN: It worked, too!

DAVE: But it wasn't real echo, so we went ahead and built two live chambers, and that lead to "The Wall of Sound."

STAN: It was actually an accident. Phil had booked the studio, and had forgotten how large, or actually how small, the studio was. He had 5 guitars, woodwinds, brass, percussion, drums, and so on. It was a lot of players. The band began to play, and it sounded like they were playing in a small, jammed up room. So we got the idea of making them sound larger, and we put echo on every other guitar, every other horn, the drums leaked in, etc. That was the beginning of the Wall of Sound. If the studio had been bigger, the Wall of Sound wouldn't have happened. At least not this way. We just needed the echo to make the room bigger.

MIX: I guess that was the end of the demo business for you?

DAVE: Demos were the beginning of the recording business. All the unknowns had a chance to make a record, and it was a lot of fun. And it still it, that's why we still do it.

STAN: Tape was a big change for us, as for a lot of others. We grew with the times, but there were a couple of mistakes. Instead of 4 track I think it should have been 5 track. Although we listened in mono, always, we balanced 4 sections: rhythm, background vocals, strings, horns, on separate tracks. You needed a fifth track for lead vocals. Instead you had to decide which track to put the strings on.

DAVE: We treated mixing differently

(continued on page 81)

THE DAWN OF ROCK

by Jack McDonough

1955-1965

Ralph Waldo Emerson once wrote that the fortunate person is the one who gets to live in revolutionary times, when the old and the new can confront each other directly and force the birth of something new.

Though Emerson himself long predated the advent of rock and roll, it is abundantly clear that the rise of rock more than adequately bears out the larger truth of his perception.

The ten year span from 1955 to 1965 was revolutionary, on the most elementary level, simply because rock and roll went on to become a juggernaut of unimaginable proportions, gathering into its vast maw everything it found digestible in every other form of music it came in contact with and spreading like a wild new virus over the earth, so that today rock is worldwide cultural esperanto, a form of communication to be found in almost every nook and cranny of the globe.

But the significance of the rock revolution that occured from 1955 to 1965 goes beyond its size and its power and its magnetism—or rather, it goes directly to the fact that those three elements were so integrally tied in with so many other cultural, social, political and economic forces that were at work in the world then.

Everything that rock grew out of was already lying latent in various niches of American culture and the American psyche before 1955; and by 1965 rock had prefigured almost everything it might possibly ***have*** become—in all the years to follow.

Because the history has been recounted so many times, most of us recognize the musicial idioms that were lying around loose waiting to be force-fused by the great synthesis of rock and roll. Basically, rock sprang from an amalgam of what we now might call the early "soul" music of both the black singers and the white singers: on the one hand, the raw, heady, sexual rhythm and blues of the black culture, the "race music" that simply could not be sectioned off and suppressed any longer; and the sad, dramatic, story-telling soul of what was then known either as country and western, or (in a benignly generic urban application of the name) "hillbilly music."

The latter term was one I became familiar with in an unexpected way. Like all kids, I used to pretend once in a while that I was sick so that I could take an extra day off from school. One of the reasons I liked to stay home from school was so that I could listen to the radio, which even at that age had a strange hold on me. The city I grew up in—a medium-sized mining/industrial city of Northeastern Pennyslvania—had a country and western station, which at that time, in the early 1950s, played Hank Williams and Patsy Cline and Ernest Tubbs and Hank Snow and all the other people that a commercial country station of the day would play. This was the station I listened to. Tucked away in my little bed with my bogus bellyache and my mother tending to me with soup and ginger ale and toast, I'd listen for hour after hour. My mother could not figure it out at all. Over and over she'd ask, "Why are you listening to that awful hillbilly music?" And to tell the truth, I couldn't figure it out either. At least not until a few years later, when in the full glory of my adolescence I went off to the big world of junior high school, at precisely the same moment that Elvis Presley came out of the gate. Then it all added up. I was ***ready*** for Elvis.

In any event, this amalgam of black with white, of R&B with hillbilly that created rock and roll (and of which Elvis was the first and most influential representative) meant something very important. It meant all bets were off. It meant that anything could happen. All the options were open. Nothing was off limits, since no one knew what the limits were (that being part of the very nature of the beast); and since no one could predict what would work and what wouldn't, they tried everything. And since, despite the revolution in style, the music was still recorded quite simply and directly, with the technology not

"The ten year span from 1955 to 1965 was revolutionary, on the most elementary level, simply because rock and roll went on to become a juggernaut of unimaginable proportions, gathering into its vast maw everything it found digestible in every other form of music it came in contact with and spreading like a wild new virus over the earth, so that today rock is worldwide cultural esperanto, a form of communication to be found in almost every nook and cranny of the globe."

leading the music until much later (the refinement of multi-track came in the late 1960s and the development and acceptance of solid state and then digital in the 1970s and 1980s), this meant that the entire focus of this experimentation was on the human forces.

The extent to which anything could happen, and that all things were possible, can be verified by a quick look at the charts for these years. In 1955, the Number One record for the entire year was "Cherry Pink and Apple Blossom White" by Perez Prado. In 1965, it was "I Can't Get No Satisfaction" by the Rolling Stones. What more need be said?

The early years of rock contained within them the development of, or at least the prefiguring of, almost every trend that has surfaced since or that is in evidence today. The whole panorama of cultural, social and political forces at work in 1955, kept injecting its influence into those forces, so that by 1965 we had an entirely different culture and society. Both of these areas—can be illustrated simultaneously by a wide range of examples.

One of the most obvious, the acceptance of black music and the consequent elevation of black consciousness (and all the legislation and turmoil that implied) throughout the 1960s. On the purely psychocultural side, the melding of black rhythms into white music brought out the expected phobias; the term "rock and roll" itself was drawn from the black argot, where it was a particularly apt euphemism for the sexual act, and the lyrics, rhythms and movements of the black singers—brought to a fiercely pneumatic conclusion and projected unabashedly by Elvis—had preachers and parents throughout the land totally distraught. It suggested the horrifying possibility that if white kids reacted too physically to the dark force, then black people and white people might actually end up in bed together.

On the musical side, this meant a big change in the musical marketplace. As Charlie Gillett explains in his fine study of the rise of rock, ***The Sound of the City***: "Whereas during the forties and early fifties there were rarely as many as three black singers simultaneously in the popular music hit parades, after 1956, at least one-fourth of the best-selling records were by black singers. Before rock and roll the black singers tended to sing in variations of the white crooning style; afterward, they usually sang in their own cultural idiom." Thus the early days of rock saw such glorious performers as Chuck Berry, Little Richard, Fats Domino, Clyde McPhatter, Ray Charles and many others come to the fore. By 1959 Berry Gordy was ready to launch Tamla Records in Detroit. A year later he had his first hit with Barrett Strong's "Money." By 1965 the Motown Sound, led by the Supremes, was known and loved the world over. By the 1970s Stevie Wonder had gained a stature as a composer roughly equal to that earned by Duke Ellington in his day. And by this very year of 1982, Wonder and Paul McCartney—who as a member of the Beatles had helped to reintroduce the black roots of rock to a mass American audience—concocted the perfect footnote to the entire progress with a song called "Ebony and Ivory."

This surge of interest in black music had a corollary effect for the music business. Gillett again: "The large radio stations, which at first had resisted the broadcasting of records by black singers by suggesting that the words of the songs were corrupting America's youth, were obliged to play their records or give up their audience to the smaller companies that did play the records. The major record companies, which had recorded black singers with white styles, or white singers with black songs, yielded to smaller independent companies that recorded black singers with their own songs and styles."

This meant that the five or six existing corporate record behemoths had to start giving up their stranglehold on the public's musical tastes. This in turn spurred a flood of creativity on the part of small regional labels like Chess, King, Specialty, Imperial, Aladdin, Savoy and—most important—Sun and Atlantic. As early as the first major year of rock, 1955, Jerry Leiber and Mike Stoller signed what probably was the first independent production deal of the rock age (with Atlantic) which led to hits by McPhatter, the Coasters, the Drifters, Ben E. King and others. Though most of the aforementioned small companies died along the way, they clearly prefigured today's rash of production/custom label arrangements as well as the growth of fiercely independent homegrown-independent-label action all across America.

The rise of rock also meant changes in the formats and sizes in which records would be sold to the public. Since the young audience greatly preferred the lightweight,

"Because of rock and roll, America radio, frightened by TV and uncertain what to do about it, was transformed from a sleepy, soft music/serial melodrama medium into a snappy, boisterous, aggresive and captivating cultural giant."

Sam Phillips :

"The bands in the late 40's, back during the War, got down where they could only carry 12 or 13 pieces where they had carried 18 or even 25 pieces [before]. Well, lo and behold, the smaller the band, usually the more rhythmical the thing sounded. They had to do more things better. They would do some quintet numbers and the band would just kind of drop out and let the rhythm section get with it as part of the stage show. I heard things in rhythm that were being covered up by too much instrumentation, even in the 12 or 13 piece combos. They just sparked a real thing in me. I guess it went back to the old days when I saw the black person get more music out of one instrument than any race or person in the world.

"Rock 'n' roll and rhythm and blues tended not to be something you wanted to copy exactly. You wanted to feel it. It's like the Beatles. I've read that they were great admirers of rock 'n' roll in America, especially of a number of the Sun artists and the Sun sound, but they did not intentionally try to copy it. They tried to get in the general bag of it and hope that it was successful. We never wanted to copy anybody. There were enough copyists. We did not want to copy Nashville and the good singers they had there."

easy-to-handle big-hole 45 rpm records, the 78 rpm disk suffered its last and fatal blow. It was the mass rock audience which also brought widespread acceptance of the stereo LP.

Concomitant with the boost it gave to black consciousness, rock and roll had a similar effect on a far broader plane, since it symbolized so dramatically the ever-troublesome rift between generations that was starting to boil up in America. One of the reasons that rock succeeded, of course, was that it had, ready and waiting, a mass audience of kids ("the baby boom") who had been born in the rush of national euphoria that followed World War II. These were kids born into general prosperity and with a sense of grand and unlimited horizons—attitudes foreign to their Depression-era parents. Rock gave this generation a flag under which to declare their loyalties; and the domestic cold war was on. Elders attacked this new religion. The more violent the attacks, the more zealously did the kids rally round the flag. All of this came to a minor climax in 1959 with an utterly fatuous government probe into payola; and it came to a major climax in the late 1960s when rock and roll became the soundtrack for a nation brought almost to the brink of civil war over Vietnam.

PHOTO: BOBBY BANK

Phil Ramone :

"In the early sixties people didn't do multi-track the way we take for granted now—everything was done at once. Everything had to be quick and everything had to be worked within the budget. An engineer's chops had to be far brighter and quicker than they have to be today. An engineer had to , within the confines of the room, be able to work with an unnatural balance and create the balance.

"Also about that time there began a philosophical change in popular recording. What was changing was the relationship between the artist and the engineer in the studio. The rock and roll groups had begun to resent the typical producer sent by the record label to preside over the recording sessions. There was a rebelliousness toward him, his coat and tie, and often his business priorities.

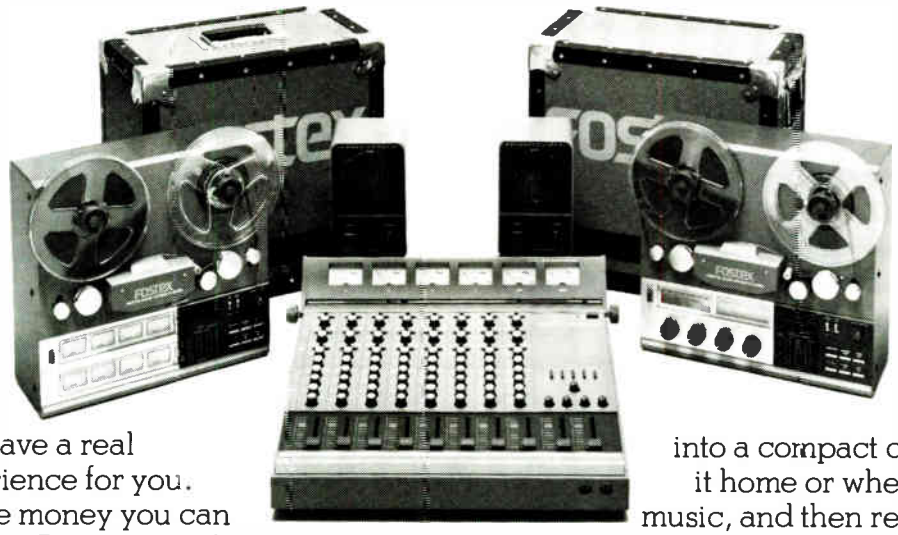
"On the other side of the coin, some engineers were becoming sensitive to the special situations and desires of the musicians and weren't opposed to spending a couple of hours experimenting to find a novel guitar sound, for instance. That guy became the musician's friend and it was the beginning of an important era in recording. I decided to join that group of people because I realized that I wasn't going to be satisfied until I could make records that the artist and I believed in."

The government subpoenas for radio disc jockeys in 1959 had an ironic aspect, since it had been only a few years previous—i.e., before rock and roll came along to change it completely—that radio was wondering whether it was even going to be able to survive. Because of rock and roll, America radio, frightened by TV and uncertain what to do about it, was transformed from a sleepy, soft music/serial melodrama medium into a snappy, boisterous, aggressive and captivating cultural giant. It became a medium almost entirely dependent upon music—particularly this new music—and so was born the peculiar symbiosis between the American radio industry and the American record industry which persists, and perplexes people, to this day. Disk jockeys—Alan Freed was the avatar—assumed a startling amount of power, and some, like Murray the K, became cultural icons themselves.

In addition to delivering to the people the music they wanted, radio began turning handy profits by advertising to this new audience a bewildering array of leisure-time products, most of which any sensible person could do without. This approach pandered, of course, to the postwar affluence of the kids; and thus did rock become irrevocably identified with the Eternal Youth/Technicolor Trash culture of America. This was only natural, since rock and roll, like advertising itself, is true folk art.

Even in its early days, rock and roll—despite the predominance of its

We'll give you 48 hours of 8-track recording for about $3 an hour.*



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dissemination via radio—proved right away it could cut it on television, which itself was establishing its stranglehold on American society at the exact same time. This meant for an entirely different symbiosis: Elvis could not have stirred up nearly so much lust and controversy if we did not have a medium available to let everyone in the country ***see*** him as well as ***hear*** him. So in 1957—one year after Elvis' Ed Sullivan appearance (and the same year Buddy Holly recorded his first and biggest hit, "That'll Be The Day")—Dick Clark's American Bandstand made its national debut. It proved to be critical for the careers of dozens and dozens of performers; and by the end of the decade, in 1964, the Beatles established the alliance between rock and television with their appearance on Elvis's old forum, the Ed Sullivan show. All the continuing efforts to lucratively link rock and video—including today's feverish activity on videocassette, videodisk and cable—are but an extended footnote to events that happened between 1955 and 1965.

This triad of rock and roll, radio and television meant something else: it established the truly awesome, insatiable and mystical myth-making, fame-generating power of American society. There is probably nothing else besides this neurotic need to deify our popular performers that so perplexes the rest of the world. This should give us pause. Consider Elvis and the overwhelming, almost infinite amount of fame and attention that was bestowed upon him. How is it possible that one person could be so adulated? Whatever the answers as to why we do these things, the best clues will be found in the years from 1955 to 1965, when Elvis, Dylan and the Beatles—the three most influential forces in the history of rock—were subject to canonization, ultimately at great cost to their mental well-being. And whatever the dynamics of such deification, it has led in time to today's general level of across-the-board mega-stardom, fed by the ever-more-pervasive image-making apparatus of the 1980s.

"There is probably nothing else besides this neurotic need to deify our popular performers that so perplexes the rest of the world."

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So much for the larger issues. Let's look, in conclusion, at some of the wide variety of styles conjured up in this decade and how they prepared us for some of the trends we have today.

For one thing, the 1955-1965 decade gave us not only hot pop female vocalists like Connie Francis and Brenda Lee and Lesley Gore, but also the fabulous girl groups like the Supremes, the Shirelles, the Crystals and so many more. This set us up for today's long-awaited ascendance of the true woman rock-and-roller—Chrissie Hynde, Pat Benatar, et al.

The folk of Theodor Bikel, Pete Seeger and the Weavers led to the contemporary folk of the Kingston Trio, Dylan, Joan Baez and Peter, Paul & Mary; and, by 1965, to the incandescent fusion of folk with rock, the true electric poetry that eventually led to psychedelia, David Bowie and a hundred other things.

In 1958 Don Kirshner and Al Nevins founded Aldon Music in New York and nurtured the careers of Carole King, Gerry Goffin, Barry Mann, Cynthia Weil, Neil Sedaka and others—the songwriter/journeymen for the rock era. In time this led to the singer/songwriter phenomenon of the early 1970s, when Carole King began making her own hit albums and other writers like Jackson Browne, Tom Rush, etc. became famous in their own right after penning tunes for others.

The instrumental hits of the early rock era, by such performers as Duane Eddy, Dave "Baby" Cortez, Johnny & the Hurricanes, the Ventures, the Champs and others, preserved the abstract side of rock as well as the sense of pure joy in new and dazzling instrumental sounds. The guitar predominance of these records prefigured to some degree the later rise of the true guitar hero, notably Jimi Hendrix; and the sense of unabashed exhilaration in instrumental textures is still seen in today's preoccupation with synthesizer rock.

The almost blinding succession of dance crazes in the decade—the jitterbug, the frug, the swim, the fly, the walk, the stroll, and the granddaddy of them all, the twist—manifested the pure physical exuberance that lies at the heart of all rock and roll. "The Twist" by Chubby Checker even became the only record in history to reach number one on the charts in two different years (1960 and 1962). This zest for body movement resurfaced again in gaudy, giddy grandeur in the mid-70s disco craze. Since rock and roll is built upon the beat, it goes without saying that crazes like the Twist and disco will continue to reoccur with reg-

PHOTO DAVIS BARBER

Ron Capone :

"There have been a lot of changes in recording since I started my career almost thirty years ago. Today it's more competitive, more technical, it requires more capital, more professionalism. But perhaps the biggest change is that it's now a much more ***serious*** business.

"I can remember engineering sessions years ago with Jerry Lee Lewis—it was the "Memphis Roots" album—and in the control room there must have been twenty drunk people. There were another twenty drunk people out front on the floor while the session was going on.

"Well we cut the session, and at the end of the night Jerry Lee came up to the studio owner Jerry Williams and said, 'There was too many drunk people in this control room tonight. I don't want them in here tomorrow night! I'm gonna give you a list and tomorrow night I don't want anyone in here who's not on that list.' Well, the next night we had two security men at the door with the list. And you know what? We wound up having the same 40 drunk people in the studio that were there the night before. But Jerry Lee never said another word. He was satisfied because they were all his own people.

"I guess the music business has matured a little since those days... but, maybe somewhere along the way we've lost just a little bit of the fun."

by John Trechak

More on Ron Capone coming in the December Mix.

ularity, and that some form of dance music will always be a major form of rock.

Surf music, the ultimate regional music, made Americans as glassy-eyed about California as they had been about Presley. The West Coast came alive with its own sound. Before it was over the San Francisco bands had the world firmly under their spell and the entire record industry had moved lock, stock and barrel to Los Angeles, entrenching the Southern California sound as one of the most stable components of world pop. The airy, wide-open harmonies and orchestral bent of Brian Wilson and the Beach Boys in some ways presaged the New West melodrama of the Eagles, and the West Coast wall-of-sound created by Phil Spector (starting in 1958) is still regarded as one of the great achievements of rock. It may seem strange to think it now, but in the beginning rock was almost exclusively an East Coast phenomenon.

Steve Douglas, the great session saxophonist who started his career in 1956, went to high school with Phil Spector. He reflects briefly on the West Coast action: "Spector changed a lot of things. He was the first guy I know of to take three hours on one song. That was an approach picked up on by a lot of people, especially Brian Wilson. Brian became a leader in experimenting. He was the first to use classical setups, woodwind quartets and so forth. But a lot of times you couldn't hear what he'd done because he was deaf in one ear.

"With Spector I'd be doing 12, 15, 18 dates a week. We knew we were making hits. That was what was so exciting about it. And of course the West Coast exploded during that time, and then the record business started to get huge."

Just as it is difficult to think of a time in rock when the West Coast didn't matter much, so it is equally difficult to envision a time when English bands didn't matter much. But it was only toward the close of this decade that the British invaded. When they did, it was with a vengeance: the top five positions on Billboard's April 4, 1964 chart were all held by the Beatles. That same year the Rolling Stones had their first U.S. hit, "Time Is On My Side"; Peter Townshend of the Who first smashed his guitar on stage; the Animals had a Number One hit with "House of the Rising Sun" (provoking Dylan to begin working with a rock band); and Elton John began his musical career as a weekend pub pianist in London at one pound per night. Elton went on to become the Beatles of the 1970s; the Stones are still the top draw in rock; the Who still make great records; and Paul McCartney is still on top of the charts.

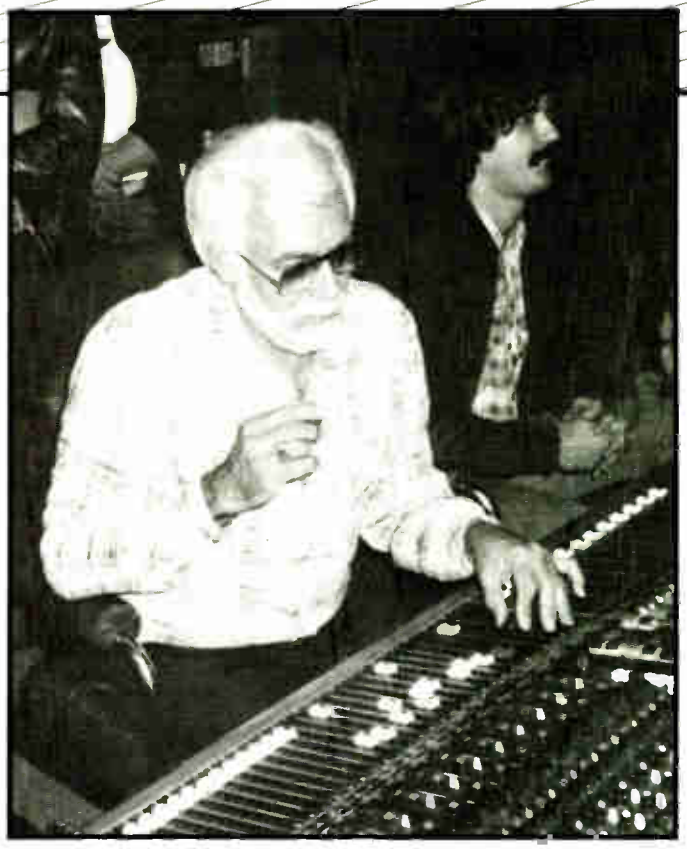
Frankie Avalon, Bobby Rydel, Fabian and Bobby Vee—the principal entrants in the furious and much bewailed after-Elvis-went-into-the-Army sweepstakes—became the forerunners of todays "Adult Contemporary" mainstream pop/rock. Best represented by Barry Manilow and Kenny Rogers, Adult Contemporary has become significant because it appeals to all the original rock and rollers who are now approaching middle age and who now constitute the largest and most affluent "demographic" for radio.

And as a last—and perhaps most timely—example, let us pay homage to the country and rockabilly styles that infused much of early rock. As Gillett notes, Hank Williams recorded 11 songs for MGM that each sold a million copies or more between 1949 and 1953; King Records produced four million-sellers for two of its acts, Cowboy Copas and Moon Mullican; Imperial was as successful with Slim Whitman. In that period from 1949 to 1953, a total of 49 records in the country and western style sold a million copies. This style was seized upon and pumped up to new proportions by the vastly influential Sun label owned by Sam Phillips of Memphis, who recorded Elvis, Johnny Cash, Carl Perkins, and Jerry Lee Lewis. The power of country music melodrama in rock has hardly abated since. It gave rise, in the late 60s to early 70s, to fresh experiments by the Byrds, Gram Parsons, the Burrito Brothers, Poco and the Eagles. Today country music is the largest single sub-segment of American recording, with Nashville a constant buzz of activity. Today rockabilly is revered and practiced by dozens of "New Wave" artists. And Slim Whitman has a whole new television-mail-order career.

So: you ask *yourself*: If they sent you to a desert island with music that could be chosen from only one ten-year span: Wouldn't you pack up your records from 1955 to 1965? Good Golly, Miss Molly, I know I would. ■

"... the top five positions on Billboard's April 4, 1964 chart were all held by the Beatles."

PART 1
BILL PORTER: ENGINEERING ELVIS



by Larry Blakely

A creative and exceptional sound engineer, Bill Porter has mixed over 7,000 recording sessions and has 300 chart records, 54 top ten and 37 gold records to his credit. Among these records are such classics as "Stuck On You," "Are You Lonesome Tonight" and "Return to Sender" by Elvis Presley, "Pretty Woman" and "Crying" by Roy Orbison, "Last Date" by Floyd Cramer, "Cathy's Clown" and "Dream" by the Everly Brothers, and nearly half of the golden oldies still being played. Bill is also a pioneer in the field of high quality sound reinforcement and was noted as one of the first who could create sound in a live performance, that could equal the sound of a record. At the request of Elvis Presley he mixed the sound for all the Elvis concerts from 1970 until the time of Elvis' death.

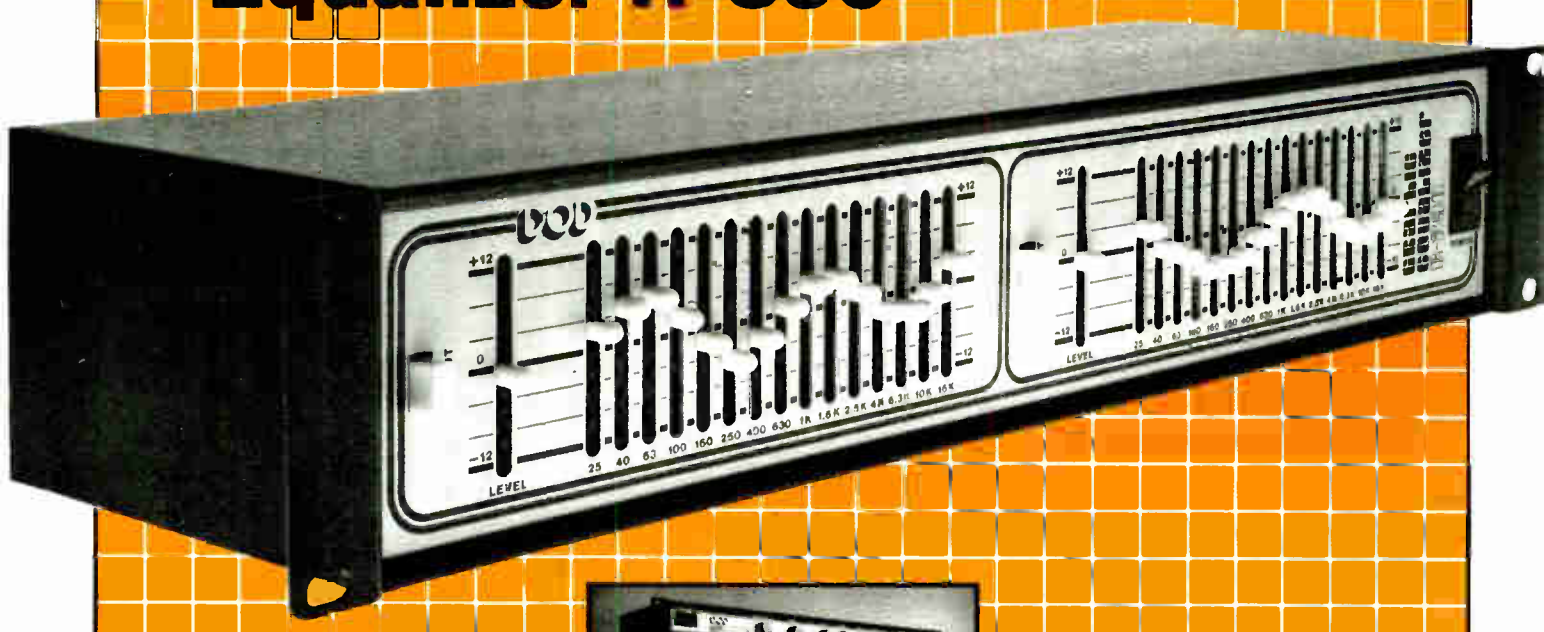
"In 1960, I had 15 songs on the Billboard "top 100" in one given week and it was my second year at RCA," notes Porter. "I did a lot of country recording, but I was really into the pop sound and I wanted clean sounding records. I first worked with Elvis in 1960 after he had gotten out of the army. I found out later that they had brought him to Nashville because I was making a name for myself, and at this time they wanted everything in their favor. I didn't know I had made that big of an impression on anybody, but apparently I had. I knew who Elvis was, but I wasn't impressed; he was just another artist to me, although I did respect his talents. When Elvis arrived he talked about things that happened while he was in the army, demonstrated karate and told me about movies he would make. When he was introduced to me, he said 'hello' and that was about it. As I started getting a balance on the first tune there was an unusual feel in the room. I couldn't figure out quite what it was. So I looked behind me and right over my shoulder was Chet Atkins, Steve Shoales (Chet's boss from New York), Colonel Parker and a VP from RCA. They were all standing there like they were going to grab me if I made a mistake, and they stayed right there until the first song was done. The tension was so thick that you could cut it with a knife. The song we recorded was 'Stuck on You.' We did this tune in 5 or 6 takes, which took about 45 minutes. Then we did a tune called 'Fame and Fortune.' Elvis worked all night long until about 8:00 the next morning.

"When we recorded 'Fame and Fortune' I was using U-47 microphones on vocals. Elvis tended to 'pop' the microphone with 'p's' and 'b's' and he had popped the mike 3 or 4 times on this tune. We didn't have anyway to remove it as there were no roll-off filters, etc. Anyway, most of the record players in those days wouldn't reproduce low frequencies like that. I stopped Elvis several times when he popped the microphone and the last time I did he said 'What the hell is wrong now?' This of course made me a little nervous about stopping him. If you listen to 'Fame and Fortune' you will notice the first 'F' is kind of lost because he was gun shy. He did pop the mike a couple of times but I let it go through, keeping my fingers crossed, hoping that it wouldn't cause a problem in mastering.

"The Elvis sessions were hard and we would work all night long. They would usually bring in greasy hamburgers about 2:00 in the morning and we would all take a half hour break. The musicians used to lay out on the studio floor and flake out for awhile. Meanwhile I would playback their songs and they would say 'Yeah man, it sounds great!' I cut the biggest record that Elvis ever had, 'It's Now or Never' which sold about 4 million copies."

"Elvis came to Vegas in 1969. The International Hotel (now the Las Vegas Hilton) had opened with

Dual 15 Band Graphic Equalizer R-830



Description

The DOD R-830 is a solid state dual 15 band graphic equalizer which is designed for mounting in a standard 19" rack. The DOD R-830 is intended for acoustic and room equalization to minimize unwanted resonance and compensate for specific frequency sound absorption.

The R-830 is mounted in a rugged, extruded aluminum case with heavy top and end panels to resist warps and dents.

Two sets of 15 bands on 2/3 ISO centers with 12 db of boost or cut . . . in-and-out switch which does not disturb the balance condition . . . level control with 12 db of boost or padding . . . 1/4" balanced and unbalanced input and output jacks . . . illuminated power rocker switch.

Specifications

Frequency Response:
10-40 KHz.
Total Harmonic Distortion:
Less than 0.01%.
Intermodulation Distortion:
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Signal to noise ratio:
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Maximum Output Level—Balanced:
20 dbm (ref: 1mW/600 ohms).
10 Vrms into 10K ohms.
Maximum Output Level—Unbalanced:
17 dbm (ref: 1mW/600 ohms).
5 Vrms into 10K ohms.
Output Impedance—Balanced:
940 ohms.
Output Impedance—Unbalanced:
470 ohms.
Maximum Input Level:
+20 dbm (ref: 0.775 V).
Input Impedance—Balanced:
66K ohms.
Input Impedance—Unbalanced:
33K ohms.
EQ Control Range:
±12 db
EQ Center Frequencies:
15 bands on standard 2/3 octave.
ISO centers (25 Hz 16 kHz).
Level Control Range:
±12 db.
In/Out Switch:
EQ bypass, does not disable balanced input and balanced output.
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One 1/4" phone jack (balanced)
One 1/4" phone jack (unbalanced).
I/O Connectors—Output:
One 1/4" phone jack (balanced).
One 1/4" phone jack (unbalanced).
Dimensions:
3½" × 6" × 19"

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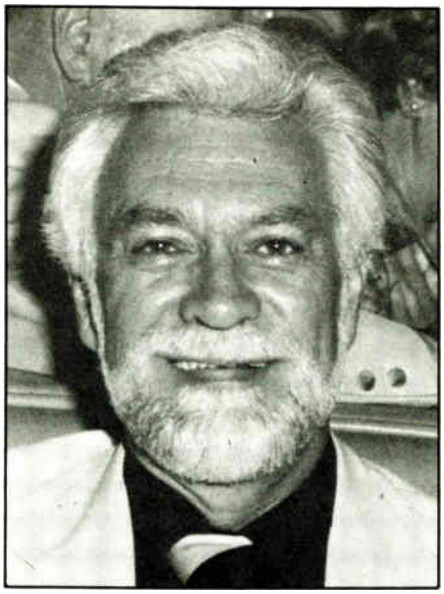
Printed in USA

Barbara Streisand as their first act. Elvis was the second act and came out in August and brought an 8 track master with a tune on it called "Suspicious Minds." The producer (Felton Jarvis) brought this tape to my studio and wanted to add some horns to it but Elvis didn't come. I stopped over to see part of the show one night at the International Hotel and was quite impressed with what they had going. I had not seen Elvis since 1967, when I was working at the Dunes Hotel. When I saw him at that time, I had asked him if he remembered who I was and he said he did, and that was the extent of our conversation.

"Elvis called me in December of 1969 and said he was coming back to Vegas again in January of 1970. He asked if I could help him out and do his live sound. I told him I didn't know much about live sound and he said he was not pleased with what he had before, and felt I could do a better job. He said he couldn't hear himself, and he just wanted to see what I could do. So I went over to the hotel and saw the stage monitors hanging about 18 feet over the stage. There were three of them and only one was working. It came time for Elvis to rehearse and the monitors still weren't fixed. Elvis said he couldn't hear anything and wanted to know what I was going to do about it. I was kind



of caught in the middle, I was working for Elvis and I also sold equipment to the people at the hotel. So I called back to the studio and asked them to bring over some Shure Vocal-Masters and some amplifiers. The Vocal-Master had just come out and it was ***the*** thing in portable P.A. systems. I took two of the Vocal-Master speakers (which were about 5 feet high) and laid them down on the stage and propped them up so they focused the sound at Elvis's head. I plugged his mike into the Shure power amplifier/mixer and took a feed from this mixer into the house console. I got the gain set so he could hear himself and he was excited. Next I did some checking on the house system and made some adjustments and changes on it. By the time I was through it sounded pretty decent. It was time for the show and Elvis wanted me to mix the show for him each night. And although I didn't know how to mix live sound, I did it just like I would mix records. It sounded good and I learned about feedback in a hurry. Elvis had gotten a lot of compliments from artists and movie stars who had come by to tell him how good it sounded. They told him it sounded just like a record.

"As a result, Elvis told me I had a steady gig and he wanted me to mix every show for him. He said there would be some touring, and some work in Vegas. I wasn't sure I really wanted to do that. But I tried it and started touring a little, mixing the house sound. When we first started touring we would contract different sound companies in different cities. It was a zoo because the equipment was always different and I was in charge of trying to make all concerts sound the same. After using several sound companies, I found that I preferred Clair Bros. and we worked out a deal for them to furnish the sound equipment on an exclusive basis. Bruce Jackson had built a fantastic stage monitor system, it was good and loud and could knock you down. The first year we did only a couple of tours and worked in Vegas twice a year for one month periods. We then started doing more tours which would last from 15 to 18 days. One tour we did 15 cities and 25 shows in 18 days. During those tours all you saw was the airport, the hall you were working in and your hotel room if you had time to stop. We worked in some of the worst halls. (One in Denver had a 9 second delay at 300 Hz and at other frequencies there were delays of 5 to 6 seconds.) We played in a couple of pretty good rooms too; one of the best I have ever seen was in Atlanta, Georgia (The Omni) that held 25,000 people and it sounded just like we were working in a studio. We usually used an overhead hanging speaker system for the house sound.

"Elvis would always play tricks

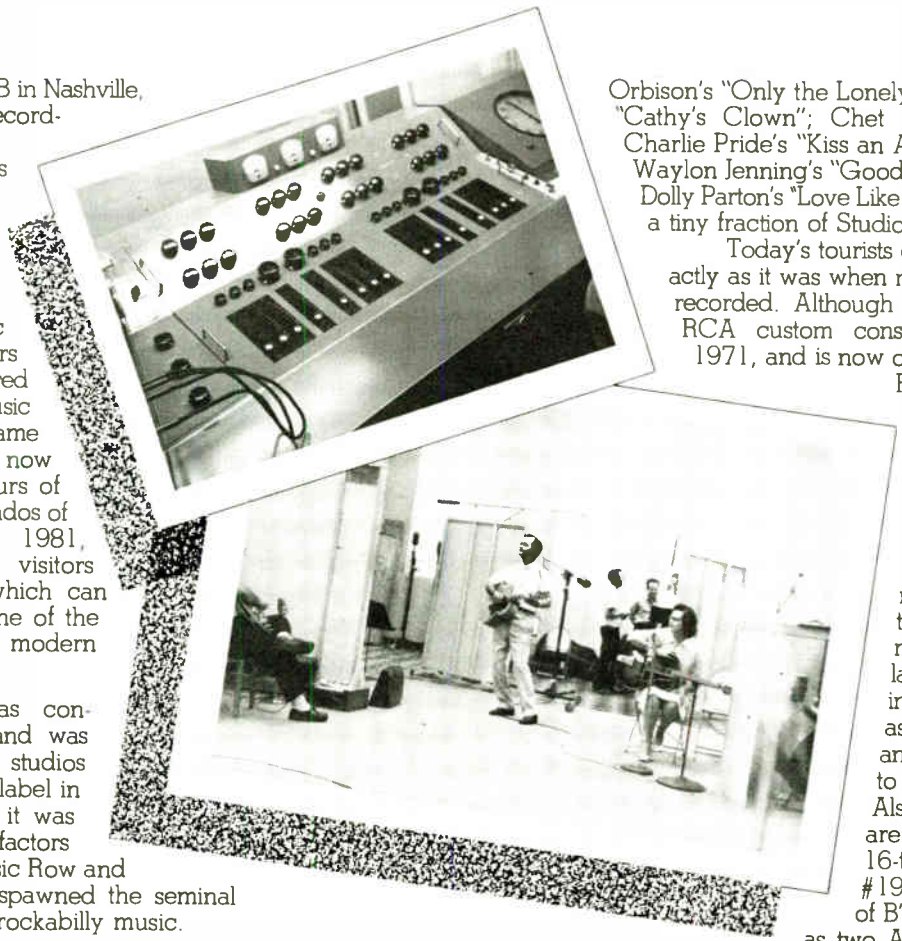
on me to see if I was on the ball. He would take the mike and point it directly at the speaker and sometimes I would catch him and get the level down before it did. Then all of a sudden he would do it real fast and sometimes it would squeak; then he would laugh and say that he caught me. I toured with Elvis for seven years. I was changing planes in Boston on the way to his Portland, Main concert when I heard about his death. It was about 9:00 at night and I was paged as I got off the airplane. I was asked to see the ticket agent and was given a phone number to call. The man who answered was my daughter-in-law's step father. Nobody else was there so I asked him why they wanted me to call. He said he didn't know but it might have been to tell me that Elvis had died. I told him he must have meant Elvis' father because he was really sick. But he said that it was Elvis. I didn't believe him. When I walked out of the booth, the Delta girl said she knew what it was, but she didn't know how to tell me. I was stunned. She asked me what I wanted to do and I said that I wanted to go on because everyone else was there. It really hit me while I was on the plane. Elvis was a personal friend as well as an employer." ■

The Bill Porter story continues in the September Mix.

RCA'S STUDIO B

by Larry Thomas

RCA's Studio B in Nashville, where Bill Porter recorded Elvis Presley in the 1950's, today has the unique distinction of being one of the only studios anywhere operating as a full-time museum. When the historic facility closed its doors in 1977, it was acquired by the Country Music Foundation Hall of Fame and Museum, which now conducts guided tours of the studio for aficionados of country music. In 1981, more than 80,000 visitors toured Studio B, which can justly claim to be one of the birthplaces of the modern country sound.



Studio B was constructed in 1957, and was one of the very first studios opened by a major label in Nashville. As such, it was one of the important factors in the growth of Music Row and for twenty years it spawned the seminal hits of country and rockabilly music.

Under the management of Chet Atkins (a country music great in his own right), Studio B hosted not only RCA's artists but those recording for numerous other labels as well. Their combined output during the 50's and 60's reads like a discography of the "Nashville Sound." Cut within the walls of Studio B were Elvis Presley's "It's Now or Never," and "Are You Lonesome Tonight?"; Don Gibson's "Oh Lonesome Me" and "I Can't Stop Loving You"; Jim Reeves' "Four Walls"; Roy Orbison's "Only the Lonely"; the Everly Brothers' "Cathy's Clown"; Chet Atkins' "Yakety Yak"; Charlie Pride's "Kiss an Angel Good Morning"; Waylon Jenning's "Good Hearted Woman" and Dolly Parton's "Love Like a Butterfly"—to mention a tiny fraction of Studio B's staggering credits.

Today's tourists can view the studio exactly as it was when most of its big hits were recorded. Although the original 3-channel RCA custom console was removed in 1971, and is now on display in the Hall of Fame Museum, the 24 x 16 board (also RCA, designed in New York) remains in the control room, and is used now to play back some of the historic tapes. Engineers will appreciate the fact that every meter on the console is labeled, to designate the instrument customarily assigned by Bill Porter and the other engineers to each of the channels. Also on view and in use are the Ampex MM-1000 16-track recorder (Serial #194) on which so many of B's hits were cut, as well as two Ampex 440's. If you're looking for outboard gear, however, you won't find much of it; this studio dates back to when engineers got their sound by judicial placement of microphones and the careful riding of faders!

There's one other interesting thing about Studio B that will no doubt raise the eyebrows—or perhaps bring tears to the eyes of today's cost-conscious studio owner: the studio was built in 1957 at a total cost cost of $39,000! Eat your hearts out fellas...

ABOVE PHOTOS: Hank Lochlin session at RCA in 1962; inset is the RCA custom 3 channel console.

THE BEATLEBOARD - REDD 37, SERIAL #58121A

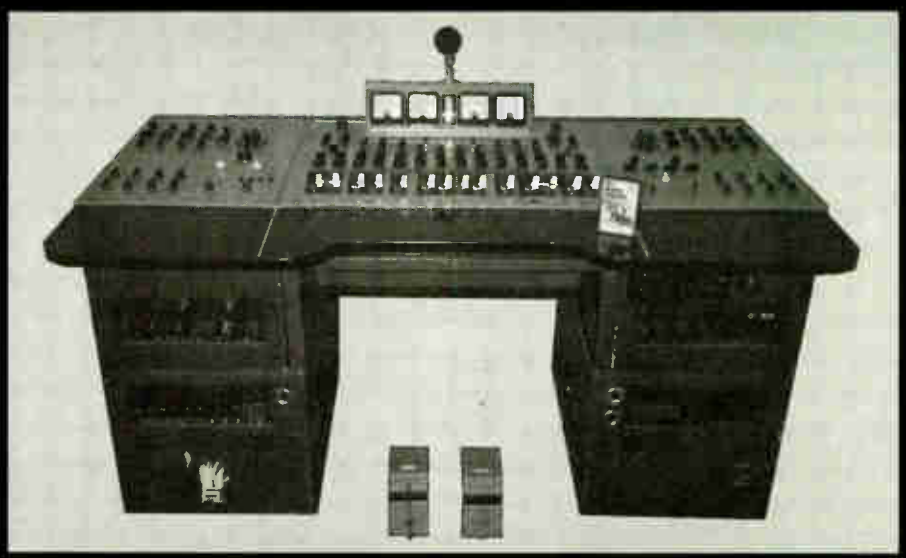
LOOKING FOR GHOSTS IN THE MACHINE

by Patrick Maloney

We deal with machines a lot in this business. Some work, some don't. Some work for 90 days. The degree to which they *do* work is a measure of the integrity of the creative ideas behind them, of the validity of the designer's intentions. A piece of equipment is, in fact, an actual material manifestation of someone's creative thoughts and ideas. It also contains all the actions of the people that put it together—just ask an Englishman the meaning of V.A.T. or Value Added Tax! Furthermore, just as the designers and fabricators contribute to the existence of a machine, so too does one's subsequent interaction with it. This interaction is in fact designed into the object and is part of the original idea or concept. When you drive a car you better believe you are an integral part of that machine's design and function. Your interaction is part of the basic idea in the first place. The price of non-participation behind the wheel is obvious and often rather unpleasant!

In a business such as ours, what we can accomplish is to a great extent dependent upon our interaction with the equipment we come into contact with. How *well* we interact has as much to do with the overall usefulness of the particular piece of gear—i.e. whether it was a good idea or not—as it does with our own ability to utilize it effectively. Take an audio mixer for example: just as a guitar with poor action can hinder the artistic output of a talented musician, so too can an audio console without submasters (or *with* short throw faders!) limit a mixing engineer's creative contribution. What it can or can't do has a direct bearing on the quality and complexity of the sounds passing through it.

So in a very real sense the console becomes a participant, an integral part of the creative process. The console/engineer interface is as imporant to the overall sound as a conductor's presence is to a symphony orchestra.



All of which leads up to The Beatles. Or more to the point, to the significance of the recording console they used throughout most of their career. Housed in a private residence in the San Francisco bay area, the mixer was recently purchased by Dan Alexander, owner of Hyde Street Studios in S.F., and Chris Solberg, a local guitarist who has performed with Santana, Eddie Money, and several other bay area bands.

Joined by recording engineers Chris Michie and John Cuniberti, the five of us gathered around said console one night to discuss it's impact on the music industry. Born in Oxford, England, Chris worked at George Martin's Air Studios in the early 70's and John is presently engineering at Dan's studio in the city. The following comments have been somewhat ruthlessly condensed to its historical and—dare I say it?—emotional significance.

SOLBERG: "It's great to observe people when they first see the board. Everyone has an entirely different reaction! The technically minded might be impressed with the quantity and quality of the transformers for instance, while others react to it on a totally artistic or emotional level—some people actually go down on their knees!

"When we picked it up at the airport one of the customs agents came up to me and said "Do you mind if I touch one of those faders before you go?" The biggest thing he'd done up 'till then was to bring in the wax statue of Prince Charles and Lady Di! He just couldn't believe this was the Beatles' console and simply had to experience it first hand."

• • •

Dan came across the board recently while scouring the countrysides of Europe for old microphones. A small newpaper ad took him to the town of Soest, Germany where he discovered the console sitting in the living room of a former Abbey Road engineer, Richard Huggett. Apparently the console had been warehoused after being moved out of the studio for use of the ***Let It Be*** sessions and was subsequently purchased by Mr. Huggett. Photos of the console can be seen on the ***Let It Be*** album as well as throughout George Martin's book "All You Need Is Ears."

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Take the Otari MX5050 Mark III half inch eight track, with features like dynamic braking and microprocessor controlled transport logic, negative and positive zero search with real time L.E.D. display, automatic monitor switching, single button noiseless punch-ins, a complete session controller that lets you tuck the machine away,* and the reliability and consistency that have made Otari famous.

*The CB-110 Session Controller is optional.

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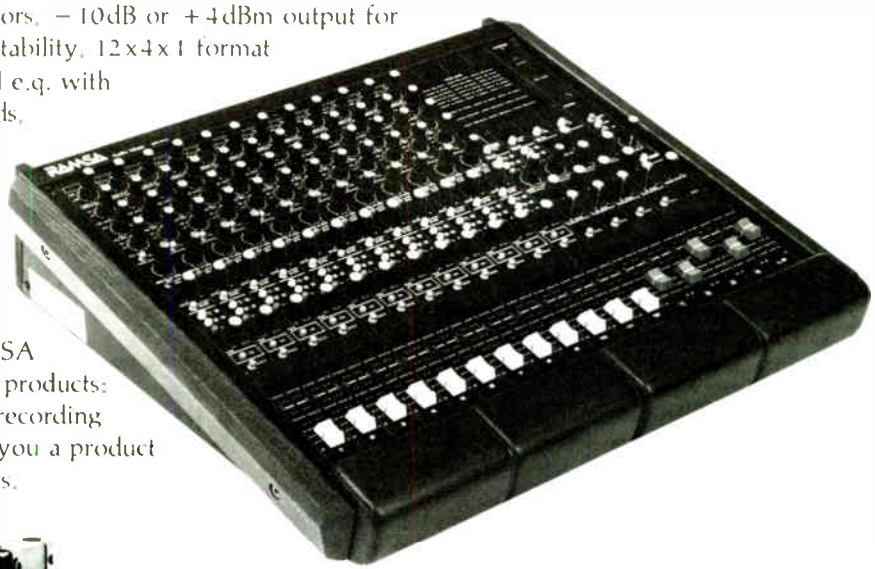

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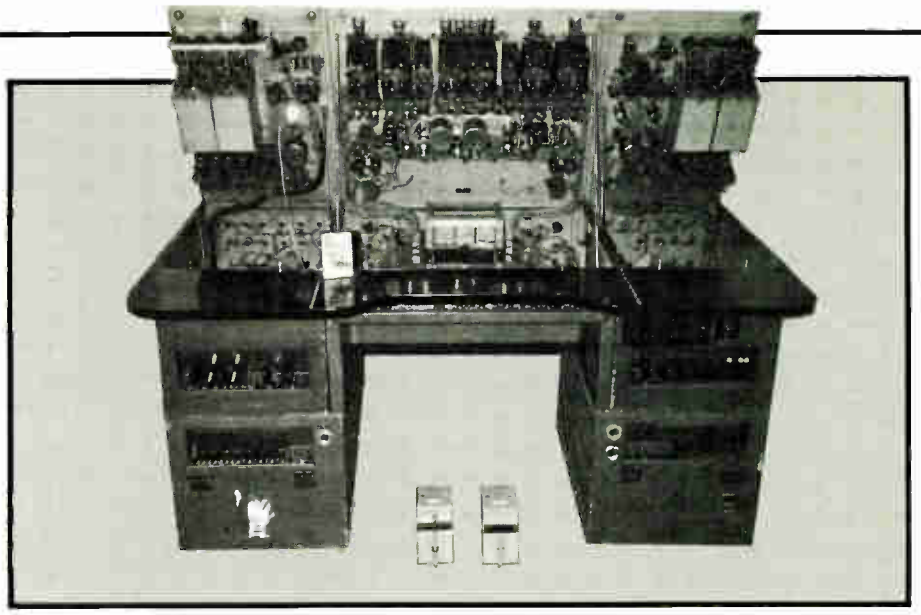
staff engineers in the late 50's, the desk was named the "REDD 37" and was actually one of two identical machines built for the EMI studios at Abbey Road.

ALEXANDER: "Ken Townsend, the present manager at Abbey Road, recently sent me a letter stating that he could definitely say this board—Model REDD 37 Serial #58121A—had been installed in either Studio 1 or Studio 2 at Abbey Road and was used on sessions by The Beatles as well as by many other EMI artists. I belive this console represents the pinnacle of technological development at that time. In 1957 they were building the best tube equipment that had ever been built! The classic years people think of in connection with great tube microphones, equalizers and limiters was that period from 1957 to 1962. Shortly after this board was built it was time for solid state."

• • •

So it appears that the Beatles were using one of the best boards in existance at the time. Built at a reported cost of about $125,000, the 8 in x 4 out console was designed to handle a wide range of musical styles and recording situations.



SOLBERG: "The unique thing about this console is that it is portable, entirely self-contained and carefully designed in a very military-like manner. It is composed of five interconnecting modules and weighs about 945 pounds! However, each module can be quickly separated and easily moved by two or three people in very little time."

All the modules mechanically mate together via large screw-type connectors which are permanently attached to the inside of each module. The same connecting hardware contains the mating pins for all the interconnecting electronic circuits as well, so no patch cords or multi-cables are necessary to link the units together. All the connectors and hardware are precision engineered and were apparently hand-tooled for

this specific piece of machinery. Actually its color and rugged design reminded me more of a battleship than a recording console!

MICHIE: "Well, it *is* the perfect colour, isn't it! This grey is very military spec and British traditionalist. You have to see this not in the context of a room with a red carpet like this, but in the surroundings of a British recording studio during the early Sixties. EMI was like an electronics factory where everyone walked around in white coats and carried slide rules. You'd walk down the corridors and bump into people with tea trolleys! When Air Studios opened it had EMI style colouring as well—it was just bland! Such a contrast with the kind of swinging LA studios of the Seventies—you know, carpets and hot tubs in every room. And EMI maintained that style for quite a while. So it's very authentic and really is the perfect colour! And for doing four track work you really couldn't do any better at the time."

• • •

Of course, there were other boards around, but the single most important factor that makes this particular console stand out from all the rest is neither its cost nor its superior design not its color nor a hundred other valid reasons. It's because it was used by ***The Beatles.***

SOLBERG: "When they had a new concept or wanted to try out a different technique, when they sought to create a new piece of music or just add another sound to an existing one, they knew that one of the biggest modifiers to the realization of their ideas was ***this*** console! It was the necessary link between their creative minds and the sounds coming out of the monitor speakers. A lot of creativity went through this board!"

That creativity, as we were all to find out, was to have a major impact on the future of the recording industry. ***Sgt. Pepper*** alone inspired many an engineer to explore the potential of multi-track recording although that album was done on just two four-track recorders—and this console. Without stretching the limits of credibility too terribly much I would venture to say that this particular piece of equipment was ancestral to the success and advancement of the industry as we know it today. Perhaps not as culturally significant as the wheel or the flush toilet, it nevertheless directly or indirectly affected the lives of many of us now in the industry.

SOLBERG: "We're going to have to

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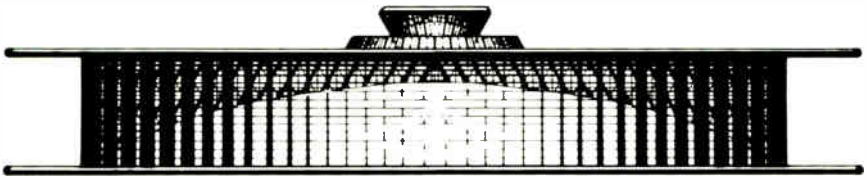


MULTI-TRACK Revolution

1966 to 1982

by Larry Blakely and George Petersen

The recording industry from 1966 to the present has seen dramatic changes. The number of professional recording studios has exploded from under one hundred to thousands. The past sixteen years have produced an equipment revolution. Major changes were brought about by the public's demand for stereo disks and the development of multi-track technology.

Prior to 1966, most records were made by recording all of the performers at one time. A perfect recording required a simultaneous perfect performance by the artists, as well as a flawless mix by the engineer. Mixing consoles had a relatively small number of inputs (typically 6-12), with little or no EQ. Microphone selection was limited. There was no room for error, and engineers worked under considerable pressure.

In 1966, rock and roll was beginning to take hold of the industry and a new breed of musicians, engineers and producers came with novel ideas for sounds and the utilization of recording equipment. Many old timers looked at rock and roll as a threat that would change the "quality" and "methods" which built the industry and made it great. In any case, it was a time of changes, both good and bad. Few people at the time realized the scope of the coming revolution that would "rock" the entire recording industry.

Multi-track recording has played the biggest single part in this change. In 1966, the only multi-track recorders used by the industry as a whole were either 3 or 4 track machines, although a small number of custom built, larger recorders were in use.

Rock musicians in particular loved the multi-track machines because they could record music in building blocks. After laying down a rhythm track, musicians, producers and engineers could build upon it by adding additional instrumental and vocal tracks. Of course, this process required more studio time, which studio owners loved.

Although one could now separate the vocals and instruments

Wally Heider:

"I like to spend money on maintenance. Many studio managers, particularly accountants or absentee studio owners or whatever, feel that maintenance is a drag because you can't write up a work order for maintenance and charge the client for it. Maintenance is something you've got to eat. By the same token, if the session starts well from a maintenance standpoint, chances are it's going to end well. If it starts with a problem, sometimes you can do a 3-or 4-hour session and, between takes you're trying to have a maintenance man sneak in and correct the situation, and that's a drag. We had one client about five years ago who always recorded in Studio 3 because the headphones always worked. That's a small item, but apparently the guy had been messed over badly in various situations by headphones that didn't work. I feel sorry for the studio that doesn't have a strong maintenance set-up. Nobody in maintenance has ever asked me for a piece of test equipment or permission to work overtime or whatnot—and this applies to remote maintenance—that I've ever denied. In the long run, money in that direction is well spent."

PHOTO LESTER COHEN

onto individual tracks, there was always a shortage of tracks. "Ping-pong," or track bouncing, became a popular method of effectively obtaining more than 4 tracks on a four track machine. Technical problems in these early machines were many: frequency response in sync mode was poor, "punch-ins" and "punch-outs" were accompanied by audible thumps, and there were no automatic sync or remote functions.

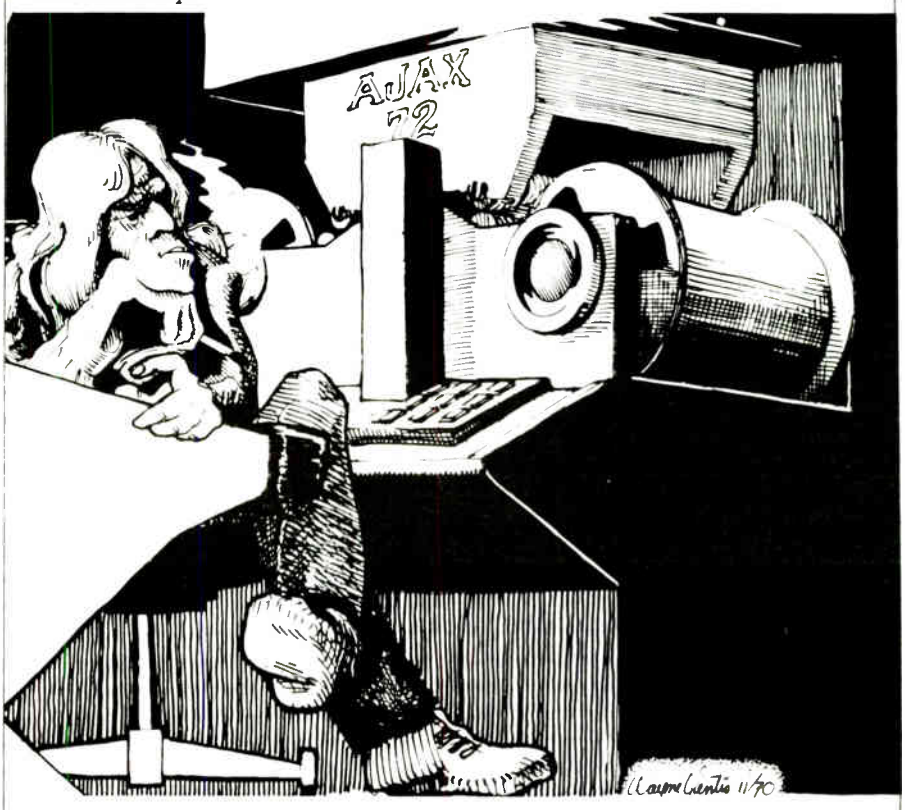
About 1968 the first Ampex eight track recorders were available. The machine was in two parts; the transport, and a rack nearly six feet high of eight AG-350 electronics. To overdub, you would have to get out of your chair, go to the rack, and set each channel for either safe, ready, or sync. When it was time for playback, it was back to the rack to switch each control to safe. Wiped tracks were not unusual in this confusion of jumping to change modes while attempting to creatively mix music.

After continual complaints by engineers, the manufacturers began to find solutions for the problems with these early machines. Sync frequency response was improved, and punch-in/out noise was eliminated. One day in 1968, Dale Manquin came into Hollywood from 3M with a remote control unit designed for the sync functions of their eight track recorder. This device unquestionably made history in multi-track recording.

Back in 1966, the only professional tape recorder manufacturers with industry dominance were Ampex and Scully. 3M soon entered the market with a line of mono, stereo, four and eight track machines. However, a short time later, producers felt that eight tracks weren't enough and the 16 track recorder was introduced. Scully tried another format; the 12 track recorder (on 1" tape). During this time MCI, a small company in Fort Lauderdale, appeared with a line of professional tape machines. Not many people know that one of the very first 24-track machines built was actually a joint effort on the part of Tom Hidley and Jeep Harned using MCI electronics. Mr. Hidley at that time was part owner and chief engineer for TTG Recording Studios in Hollywood, CA. The 24-track machine was installed in TTG in 1968.

Studer, the Swiss manufacturing firm founded in 1949 by Willi Studer, also emerged during this time to become a leader in the production of top quality analog multitrack recorders. Another firm, Stephens Electronics, began recorder production and later became well known for their 40 track recorder (utilizing 2" tape). The standard two inch, 24 track recorders followed, produced by several major manufacturers, and synchronizers which allowed two or more machines to operate together to increase the number of tape tracks became available. The demand for tracks kept growing and studios with 46 track capability are not uncommon today.

As early as 1970, when 16-track was a relative rarity, *RECORDING engineer/producer* magazine predicted the need for greatly expanded production track requirements, with material such as this cartoon by Wayne Yentis, which appeared in the November/December 1970 issue of *R-e/p*.



...TRACK 68, ECHOED COWBELLS; 69, DRIPPING WATER LEFT; 70, DRIPPING WATER RIGHT... NOW WHAT ABOUT TRACKS 71 AND 72??

The mid-sixties also spawned a new consumer tape format: The compact cassette. Few people at the time (save the foresighted engineers at Philips) saw the enormous potential in these tiny, stereo/mono compatible tape cartridges. From the time when the first Philips/Norelco Carry-corders hit the market, public acceptance of the easy-to-use (no threading!) cassettes was phenomenal. Advancements in tape emulsion and noise reduction technology were welcomed into the cassette medium, and by the mid-70's, these tape recorders were capable of impressive performance. The phrase "send me a cassette" is an often-echoed testament to the cassette's strong influence on the music recording industry.

• • •

A great many of today's recording studios began as small, 4 track basement or garage operations. Improvements in electronics, transports and tape coatings led the way for smaller, less expensive recorders which put more tracks on narrower tape. TEAC introduced ¼" 4 track sync machines in 1969, and opened the era of the affordable multi-track. Other companies, such as Dokoder, Otari and Fostex followed suit with similar machines and today home demo studios are commonplace. Otari has since become a major manufacturer of professional gear. Going

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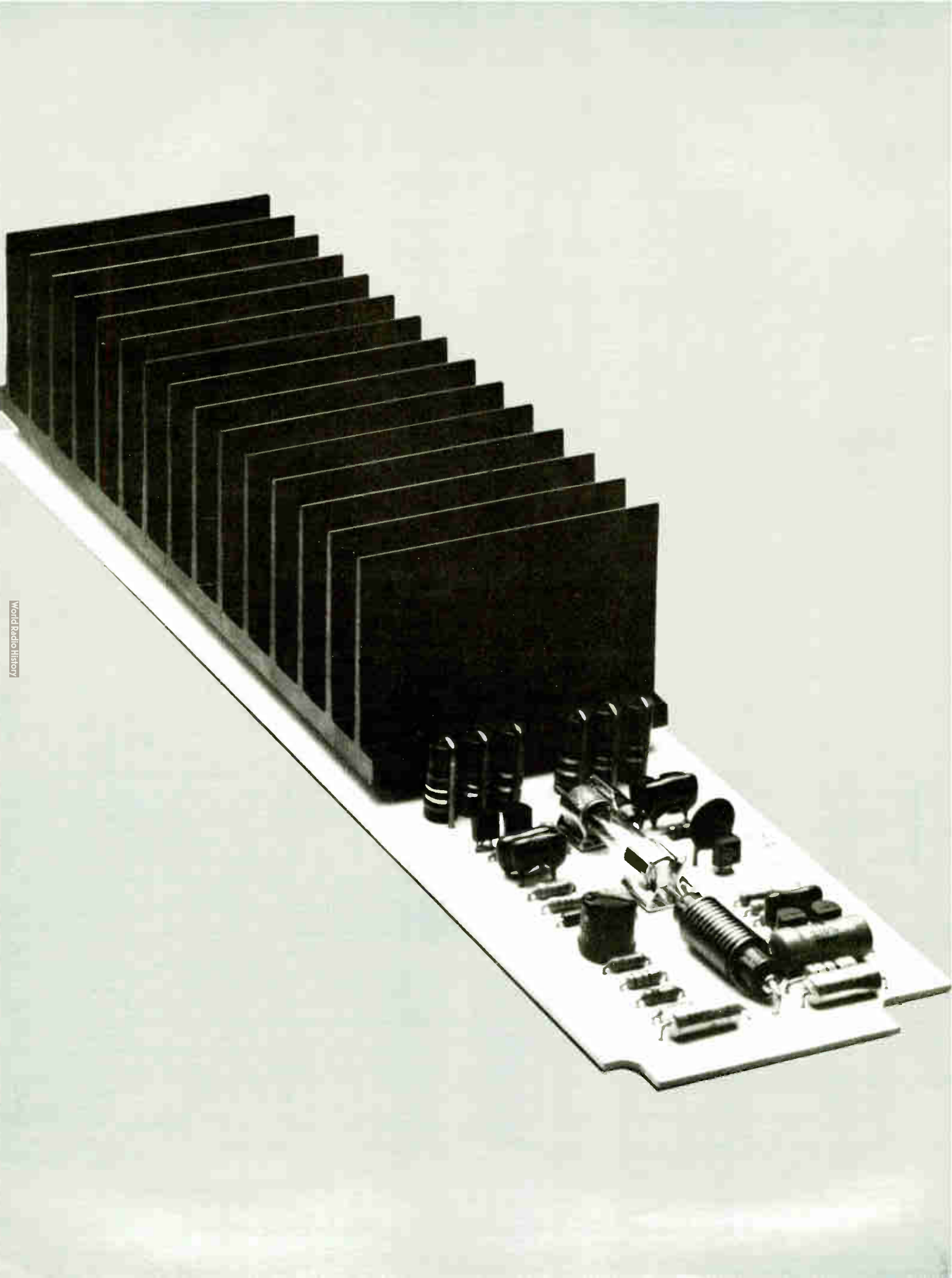

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SPECTRA SONICS

Circle #029 on Reader Service Card

Chris Stone :

"At the time we started the studio, I was the national sales manager for Revlon Cosmetics and I used to come over to the studio on my lunch hour to do the paper work. Gary (Kellgren), having worked all night, would very often be out cold on the couch, with Jimi (Hendrix) still in the studio glaring through the haze at the speakers. They would sometimes go three and four days without stopping. Out of those sessions came "Electric Ladyland," the Record Plant's first record. Other people have taken credit for the record, but about ninety percent of it was done in Studio A in New York with Gary and Jimi. I think the reason for our success is that Gary and I were diametrically opposed and, between us, covered both sides of the road. My whole background was creative audio.

"Gary was an institution. He single handedly was responsible for changing studios from what they were—flourescent lights, white walls and hardwood floors—to the living rooms they are today. His feeling, more than anyone else's, was that a studio should be a comfortable place to record. He was the one who first thought of the diversions, like the jacuzzi he built in 1969. In those days that was unheard of. The only reason he built it was that I wouldn't agree to an olympic size swimming pool in the parking lot. The jacuzzi was Gary's compromise—and quite a surprise to me! Of course today there are probably a hundred studios with jacuzzis."

(continued from page 47)

one step further, the TEAC Portastudio, an integrated 4 channel cassette sync mixer/recorder, debuted several years ago, and has proven quite popular with amateur musicians and songwriters.

• • •

Until the late 1960's, most mixing consoles had been custom designed and were built either by console manufacturers or by individuals. Such mixing boards were typically constructed of plug-in tube amplifiers by companies such as Altec, Langevin and others. If you wanted a console you had to shop around to find someone with good ideas who was competent to design and construct the product you desired. This method was often the source of many problems and arguments. Sometimes consoles were delivered without schematics or parts lists, and many buyers would still be waiting for their console months after it was to be completed. The classic scene was a studio full of musicians, a screaming producer, mixer and studio owner standing over the console builder who was still soldering in the last few components.

During the late 1960's Electrodyne introduced a new approach to console circuitry. These radical mixers were comprised of a series of plug in modules which utilized solid state components rather than tubes. This concept has changed the face of the industry: Spawning the proliferation of complex and versatile mixing consoles by such manufacturers as API, MCI, Quad Eight, Harrison and Trident, all designed for top performance and maximum flexibility in meeting the demands of modern multitrack recording.

The demands of multi-track producers also had a significant impact on console design, since prior to this time most consoles had neither cue nor headphone sends, nor a separate monitor section. It was typical to use a console input position for each previously recorded track while overdubbing. This left even fewer inputs for recording the additional tracks. Cue and phone feeds were usually obtained from a combination of output busses or the control room monitor feed. It was difficult for musicians in the studio to hear a mix other than that heard in the control room. When consoles with these specialized features appeared, studios were eager to purchase them.

Due to the tremendous growth in console complexity, operators

(continued on page 52)

found they didn't have enough hands or fingers to efficiently perform an intricate mix. Automation of the faders was inevitable, which required a gain control element such as VCA (voltage controlled amplifier). The early automation systems were made by Allison Research, Automated Processes, and Neve. The Neve system was unique since it used motorized faders that actually moved by themselves.

The use of large numbers of tracks required the use of much more outboard equipment. Instead of one or two compressor/limiters in a control room, several were now required to use on different tape tracks simultaneously. Multi-track brought the sounds of specific instruments and vocals into microscopic detail. This also focussed critical attention to the quality of signal processing gear. Equalizers were de rigueur for each input, and needed more frequency bands with greater amounts of boost and cut. In the 1970's, new forms of equalization (parametric and sweepable types) were available, and once-exotic outboard gear such as phasers, flangers, and multiple audio/video synchronizers became firmly ingrained in the industry.

• • •

In 1966 Ray Dolby demonstrated his "A" type noise reduction system at the AES convention. Although controversial at the time, the Dolby "A" system became accepted and widespread in use after a few years. Burwen, dbx, and Telefunken followed with their own systems, but by the end of the 1970's, the only contenders in the professional noise reduction market were dbx and Dolby Laboratories.

The selection of types, styles and sizes of microphones has increased dramatically over the past fifteen years. The number of mike manufacturers has likewise multiplied from a dozen or so in 1966 to scores of companies today. Developments in electronic miniturization made electret condenser microphones with built-in preamps possible. Although manufacturers differ widely in design concepts, there has been a general trend over the years to make smaller, more compact units. One radical departure from "standard" microphone design is the pressure zone microphone (PZM) first marketed by Crown in January, 1980. The PZM was conceived by Ken Wahrenbrock after he read a Syn-Aud-Con Tech Topic and Newsletter and attended a Syn-Aud-Con graduate meeting in which Don Davis attempted to duplicate a microphone technique that he thought Ron Wickersham and Ed Long were using in their exceptional PRP recordings. The PZM utilizes a

Doug Sax :

"The producers are the heart of the industry. They're the guys that eat the cold pizza and they are the only guys who will fight to get their record mastered where they want. And if you open up another option to these guys, so they could come out the door with better quality on a project they have worked so hard on, they'll fight for it.

"I served on the NARAS committee to nominate the best recordings for the Grammy Awards. We listened to 177 records—these were records off the shelf—and it was absolutely revolting! On some of these records we couldn't even play the first cut. The were so warped, and any quiet passages in the music just came at you in a sea of garbage. I was just incensed that people were paying $8.98, and yet you can go down and get a Deutche Grammophone classical record of a full symphony orchestra, imported, duty paid on the entire production cost, for $5.98, and you open up that sleeve and it's jewelry. Something has got to be done here."

hemispherically-patterned mike capsule mounted on a flat plate which is placed at the boundary of direct and reflected sound.

Monitor speakers also encountered changes during this period. In 1966, there was no question that Altec controlled most of the monitor market. In the early 1960's, JBL started a professional division and introduced their 4310 and 4320 monitors. By the mid-70's, JBL had surpassed Altec in control room usage. Other companies have made similar efforts. Westlake Audio made quite a mark with their large all-walnut speaker systems. UREI has also gained much headway into recording studios with their Time-Aligned monitor systems.

The main types of reverberation used in the mid-sixties were either live chambers or EMT plates. Both were expensive and took up a lot of space. In the '70's, AKG marketed the BX-10, a sophisticated spring unit housed in a large wooden cabinet. MICMIX, Sound Workshop, Orban, and other firms introduced lower-cost, high quality spring systems also. One topic often heard in studios during the late 1960's was the desire for a high quality reverb in a compact rack-mount package, and this is a reality today.

Digital technology began to play an important role in the recording industry by the late 1970's. First came digital delay lines. High powered digital reverberation systems made by EMT and Lexicon made quite an impact. Later came digital delay lines with flangers, phasers, and reverberation capabilities. Of course this was just the beginning for digital.

In 1975, Soundstream started recording high quality digital tapes with a machine and design of their own. The Soundstream digital editing system became the model for many other manufacturer's electronic editing approaches. 3M was the first company to sell professional digital tape recorders in this country. JVC, Mitsubishi, Sony, and Studer have since shown digital recorders, and Technics recently introduced a consumer digital cassette machine. The advantages of the digital system (no generation losses, editing flexibility, etc.) are many, but the adoption of compatibility standards remains a must for this new medium to flourish.

• • •

The evolution of the recording industry over the past 16 years has brought exciting changes. But these innovations are only a small indication of what lies ahead. The compact digital disk is just around the corner, as is stereo television, and the fusion of audio and video into an integrated unit. Without a doubt, the changes we will see in the next 16 years will be even more significant than those of the past. ■

Joe Tarsia :

"Disco has taken a bad rap and the term is a dirty word today But the beginnings of disco were really good music that was danceable. Unfortunately with the formula that appeared, you could have recorded the national anthem with a heavy bass drum sound. People grew tired of that. Good dance music is still selling. From my conversations with marketing people I am told that the so-called black market is holding up better and is less affected by the current depression in the record business than any other area. It is certainly feeling its lumps too, but it is not as affected by trends as other forms of music. While I believe that we are a competent sound recording studio that can do every type of music, we have this reputation as an R&B studio—which sits well with me. We know how to make those kinds of records. We know how to please that portion of the market. Without trying to specialize, apparently we have."

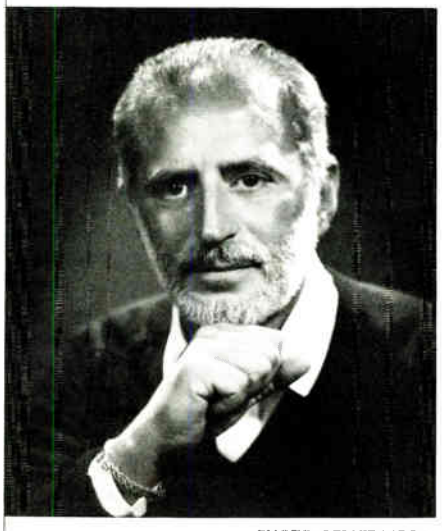

PHOTO BERNIE MOSER

THE GRATEFUL DEAD

PHOTO: RICHARD MCCAFFREY

ROCK'S PROGRESSIVE TECHNOLOGISTS

by David Gans

No history of recording would be complete without mentioning The Grateful Dead, a band which rarely does anything conventionally but always comes up with interesting results. From the start the Dead have fostered innovation, both musically and technically; among the outgrowths of their experimental bent are Alembic, Meyer Sound Labs, Furman Sound, Hard Truckers Speaker Cabinets, and other companies—and perhaps most importantly, an obsession with excellence in sound reproduction. Acousticians, musicians, logicians, electricians and magicians all have used The Grateful Dead and its devoted audience to test ideas.

The Dead were the first people to record live on 16 tracks back in 1969. "We had the Ampex 16-track with serial number 3," says Betty Cantor-Jackson, who has been a member of the Dead's creative family since the late '60s. "We recorded *Live Dead* without a console—just plugging 16 microphones into the Ampex. Boy, those were the days—just drag the deck up the stairs and record an album."

Eleven years later, things were a good deal more complicated. Cantor-Jackson, Dan Healy (who has mixed the house sound, designed electronic equipment and recorded the Dead since the beginning) and

their associates developed an elaborate system for live recording, combining ambient and close-miked sounds and minimizing the electronics between microphone and tape. They recorded 15 shows (each consisting of an acoustic and two electric sets) at San Francisco's Warfield Theater, using two 24-channel Neve consoles, a Studer 24-track and 16-track as well as four Ampex 4-track recorders, all synched with SMPTE time code. Then they packed up the entire mess and trucked it from the Warfield across the country to the Radio City Music Hall for eight more gigs (and both venues required ad hoc remodeling to fit everything in).

Equalization, combining networks and the like were avoided as much as possible, Healy says, to maintain phase accuracy and keep the signal paths as short and undisturbed as possible. Mike placement was a critical factor; Healy took the time to move them a centimeter at a time rather than use electronics to alter the sound on tape.

The 38 tracks of 2" tape were used for the conventional stage mikes, while each of the four-track machines was fed signal from one of four clusters of microphones suspended at various depths in the theater. At mixing time, the SMPTE codes from certain tapes were fed through a delay line, enabling the engineers to adjust the time relationship between stage and room sounds. "I listened to the stage in one ear and the room in the other," explains Cantor-Jackson, "and I adjusted the delay until the sound was balanced right."

Of course, nobody agreed on which songs or performances from the 23 recorded shows should go onto vinyl, but the pair of double albums which eventually came out—***Reckoning*** (from the acoustic sets) and ***Dead Set*** (electric), are an impressive sonic document and a credit to the inspiration and perspiration of the people who made it.

The only common denominator among the 40 or so albums released by the Dead and the various members since 1966 is the attitude of experimentation. Something new is going on at one level or another—or several—in everything the Dead do. They've recorded in dozens of studios (their own "studio without walls" is described in the January '82 ***Mix***), with and without outside producers and engineers; they've done 'em fast and they've done 'em slow—and all concerned will readily acknowledge that the Dead have never captured anything in any studio which approaches the magical psychic

(continued on page 92)

OSCAR PETERSON

...IN THE ELECTRONIC AGE

by Derk Richardson

. . . at the keyboard of the Synclavier II digital synthesizer.

PHOTO JONATHAN E. SA'ADAH

"I know what's going to happen. There are going to be some listeners who'll say, 'Whaaat?!' when they hear it." Oscar Peterson, long considered the peerless technical master of modern piano, is anticipating the audience reaction to his first live public performance with synthesizers. "Others are going to be interested and some will be intrigued because they're already exposed to it," he continues. "But I find there is a normal curtain dropped with some people because they associate this with one type of music—rock music—and they say, 'Oh, come on.' But as we know, there are some very sensitive and very marvelous things done on them and I think that's where it's going."

On an early June afternoon, relaxing in his suite in San Francisco's Fairmont Hotel, Peterson discussed the applications and implications of new keyboard technology with the quickness and confidence usually associated with his dazzling acoustic piano work. Before him, on a coffee table, sits a portable Gleeman synthesizer hooked up to a Fostex four track cassette deck and a pair of Archer 100 speakers. In the far corner stands a more complex Chroma keyboard.

Although he will continue to perform with the same quartet with which he was working the Fairmont's plush Venetian Room, guitarist Joe Pass, bassist Niels-Henning Orsted Pedersen and drummer Martin Drew, soon Peterson will introduce pre-set and improvised synthesized sounds into his concerts. It will no doubt become as evident in performance as it was in the interview that Oscar Peterson is not merely dabbling in the latest electronic gadgetry.

The Canadian born Peterson gained widespread attention in the U.S. and Europe in the early 1950s as a regular pianist with the touring ***Jazz at the Philharmonic*** concerts produced by Norman Granz. With his phenomenal mastery of the keyboard, Peterson was quickly recognized as a virtuoso in the jazz tradition of Earl Hines and Art Tatum. While his talent as a composer has earned wider acclaim over the past 15 years, it is almost taken for granted that Peterson's many albums and concerts will be dominated by his prodigious pianistics. But now there is even more to contend with. "The piano is a giant instrument," Peterson says, "and you can make a lifetime of it. But at the same time I react to the textures that I hear on these instruments."

"I started fooling around with synthesizers years ago with the old ARP 2600," Peterson explains. "Then I dropped it for a while because to me there was a lull. Later I had a CS-80, then I had a four-voice Oberheim. With all the shifting modules, ***that*** drove me up the wall. And I had a Prophet 10 at one point."

What initially attracted Peterson to synthesizers was their capacity for multi-layered sounds and textures. "My first reaction when I really got into them and started listening to what I was playing, was orchestral. And I realized there was a need there somewhere to work this way."

Before long, however, Peterson found the advanced electronics met a variety of needs. The latest and most sophisticated addition to his arsenal is a Synclavier II, which includes among its features the ability to print out musical scores as they are played on the keyboard. For the types of composing Peterson has been doing over the

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OSCAR

years—jazz suites, film scores and classical works—this has been a godsend. "I started out doing the handwork and I'm not a notation artist," Peterson admits "I hated that. Then I wrote the whole ***Royal Wedding Suite*** on the Jupiter 4 and sent Rick Wilkins the tape and he transcribed it. But I feel guilty, because it's wrong to take someone who has that kind of arranging talent

and ask him to do it. So with the advent of the Synclavier, I've been dancing on the ceiling. I'm actually learning to write my books on it. It's just one motion. You go over to the keyboard and write it, and if you play it well enough you don't have to do anything else, just print it out and send it to the publisher. You can't beat that."

In recent years, Peterson has been commissioned to write scores for such films as "The Silent Partner" (available on Pablo Records). For this type of composition, he values the efficiency of the Synclavier. "Again, not to push the particular instrument," he says, "but that instrument is set up so whether you want 16 frames or 35 frames, it will do any of that. And with the advent of the 16-track digital recorder, it's so flexible that it's almost mind-boggling." During his afternoons at the Fairmont Hotel, Peterson was working on a sacred mass for the Minneapolis Orchestra and Chorus, quickly recording ideas on his portable unit. "When I get home," he explains, "I can expand it, put it on the Synclavier, and print it out."

Peterson introduced himself to the Synclavier because he was "fed up" with 4- and 8-track machines for writing and because he wanted to make "the big jump" of installing a complete 24-track studio in his Toronto home. "I couldn't find an instrument which was big enough to do the things I wanted to do," he says, "and I'd been reading about the Synclavier. Finally, I called them up and said I was interested and they were interested in me. I've been working with them very closely on the instrument ever since. Once I found out what the instrument would do, I built the studio with that in mind."

Designed as a "dual purpose" studio, Peterson's custom arrangement has a composing center connected to the control room. "I have an 8-track for composition that sits next to the instruments," he elaborates, "so I can record my initial tracks. Once I get about eight tracks down it's pretty well into the composition and I can just transfer them through the big (MCI) board, onto the big (MCI) 24-track and continue from there. So I can work by myself."

Peterson was not immediately won over to the new technology, for he is used to running his fingers over the most responsive pianos in the world. "The only real beefs I've had against synthesizers have been the keyboards," he says. "Except the Yamaha, which had a magnificent keyboard. These are terrible," he exclaimed, slapping at the portable Gleeman on the coffee table. "If I played these for two months and then went back to play a solo concert on a Bosendorfer, I just couldn't do it. They give you an ***illusion*** of playing. It's not really playing. For what I do on a piano, you need to have the kind of response a wooden key delivers where it comes back at you and there's some pressure."

Asked if the Synclavier reacts as quickly as his formidable fingers can fly, Peterson replies, "Yes, it does. All of them do, but it's a mental thing. You have to preset your mind to realize that you're not playing a real keyboard. It's very hard to describe," he offered, "but they're aware of it and Synclavier is finally changing their keyboard, thank goodness."

As deeply as Peterson is into the science of synthesized music, doing his own programming and patching, constantly taking lessons to further his mastery of the technology, he is not about to show up on stage garbed in gold lame and ensconce himself within a space age control center of synthesizers. "No," he says reassuringly, "I'm not going to get too far into it. I'm just going to write some things that will come in and out as we play. I hate piled up keyboards," he adds, "it's abnormal to me. I don't think it's a natural playing position." How far will he go? "I will probably be using some preset sequen-

ces along with some live weaving in and out of the group, playing against Joe (Pass) and Niels (-Henning Orsted Pedersen). So it should be fun."

But Peterson will not tamper with the pure and magnificent sound of his Bosendorfer piano by treating it with any synthesizer process. "Because of my feeling about that particular instrument, I've been a purist," he cautions. "I would be very reluctant to do something like that, knowing what the piano can produce on its own." Accompanied by bassist Niels-Henning Orsted Pedersen, Peterson travelled to the Bosendorfer factory in Vienna to pick out the piano for his home. "Mine has the best sound, I have to say this, of all of them," he says proudly. After playing every piano in the room, Peterson chose the only instrument that, unbeknownst to him, had been constructed with the aid of a voice print machine. "They adjust it as they are building it," he explains, "to take out all the spurious harmonics on each string. And what a sound!" So even Peterson's acoustic pride and joy has been touched by the hand of modern technology.

Just as he will protect the integrity of his piano, Peterson will be judicious in the introduction of programmed music into his concerts. "I think interfacing live with this, or this with live, is a very interesting aspect," he says, because it's still a matter of prethought music in a lot of ways—the backgrounds, the cushions and the sweetening, they're all pre-thought. In the jazz medium, you cannot lose sight of the essence of what the medium is all about... improvised music. If you lose that then you're out of jazz and you're into something else. Now, I'm not saying there isn't room for several media but in the jazz medium that's the way I would like to operate."

Consequently, Peterson will use his synthesizers as both orchestral and solo improvisational devices in performance. "For instance," he explains, "on ***African Suite,*** there is one selection called 'Watering Hole' that has an awful lot of synthesized animalistic sounds and the piano moves through just a very small part. And I did a jazz ballet recently and part of one movement is ***all*** synthesizers and it cannot be produced any other way."

Peterson sees the major creative problem with synthesizers as technology racing ahead of itself. "These instruments have been growing so fast," he worries, "that we haven't produced young players who have really developed a relationship with their in-

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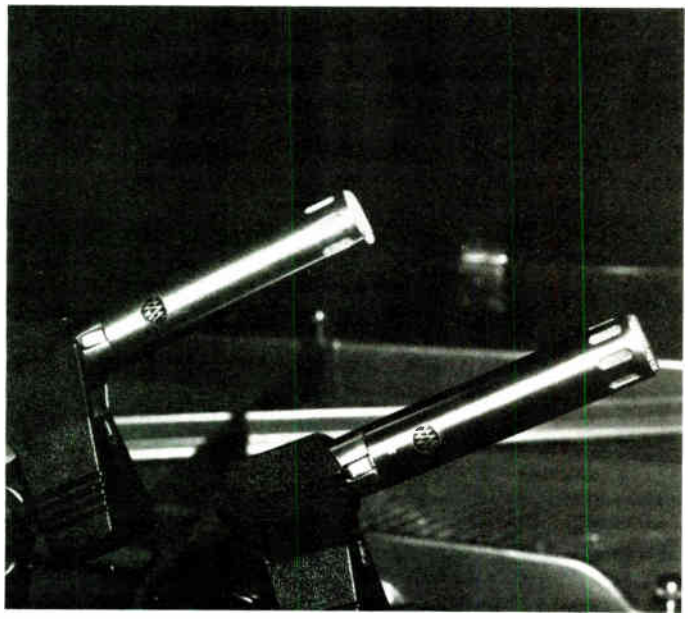

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strument, because they buy this and two months later there's an updated version that works in a different way. Years ago you'd say tenor sax and you'd say Lester Young or Coleman Hawkins, or you'd say alto sax and you'd say Charlie Parker. You say Oberheim today and you don't get too many names." Peterson's favorite synthesist is David Sancious. "I think he's a monstrous talent and I'm really chagrined that he's not doing more."

Now that the industry seems to be reaching a consensus on certain aspects—velocity and pressure sensitive keyboards, digital processes—Peterson believes that "all of this sophistication has added to the gradual settling. Instead of working on new instruments, they're all working on improving the innards for better sound. They're not as involved in the cosmetic aspect of moving things around."

He is also concerned that nascent musicians will be too easily contented with the fascination of technology. "The advent of all these smaller systems which write music for you," he warns, "gives people the idea that you can sit at home, no matter who you are, and write music. I think that's a shame because it's not that easy."

If some people are playing the machines rather than the music, Peterson recognizes how the machines can help the musician play more music more efficiently. "I think the good thing about the advent of all these home studios," he waxes enthusiastically, "is that musicians are able to go to their craft any time they want and produce something. Even for the travelling musician, it gives you the opportunity of getting to your craft right away. With this

PHOTO GERMAN HASENPATZ

Oscar Peterson with Hans Georg Brunner-Shwer.

new technology, if used properly, we're going to see a whole new breed of musicians/synthesists who will be able to meld both musical formats together well."

Given his impeccable musicianship and his relentless pursuit of excellence, Oscar Peterson, even as he enters his 58th year, will be one of that "new breed." He has a record producer, life-long associate Norman Granz of Pablo Records, who "is interested in recording anything an artist wants to do, whether or not he approves." And he has an audience which he believes will accept adventurous new directions. "They'll get used to it," he says with the confidence that comes with recording and performing for over 40 years. "The same thing happened in another vein when I had the original trio—bass, piano and guitar. For six years

PHOTO PHIL STERN

everything was Ray Brown, Herbie Ellis and Oscar Peterson. Then finally when Herbie decided to settle on the coast, we decided to go the other way and put drums in the trio and everyone said. 'Huh? What's he doing?' Because people become comfortable with certain things. But there should not be a total comfort zone for an artist." ■

"I feel happier," says Steve Howe flashing one of his rare smiles, and in what seemed to be a sigh of relief. "That's what music's supposed to do to you. So it's better that it makes me happy... over responsibly happy." Howe, guitarist extraordinaire, formerly of Yes and now with the incredibly successful Asia, was referring to his current musical state of mind. The pressure of being the soloist in the spotlight is now off; he's just a member of a rock and roll band. Although many agree that Asia is much more than just another rock group , the members would rather keep the profile ***off the band and on the music.***

by Bruce Pilato

ASIA SUCCESS STORY OF 1982

When word started getting out in late 1981 that Steve Howe of Yes, Carl Palmer of Emerson, Lake & Palmer, Geoff Downes of Yes and The Buggles, and John Wetton of King Crimson and countless other British progressive rock groups, were forming a band called ***Asia***, music critics and industry insiders alike began sharpening their knives. The word "supergroup" had become synonymous with "dinosaur," especially at a time when the last of the great bands (ELP, Led Zeppelin, Yes, Doobie Bros., Eagles and Steely Dan) were splitting up for what seemed to be the coming age of the solo artist. Indeed, Asia's timing seemed very wrong.

What many were predicting would be the biggest mistake since Blind Faith, actually turned out to be the greatest musical success story of 1982. In a depressed industry where established artists found themselves on the radio for barely an instant, playing small half empty halls, and releasing albums that ended up in cut-out bins six months later, Asia landed on these shores and conquered everything.

Four weeks after its release, the group's debut album on Geffen Records reached the #1 spot on the Billboard chart; the group sold out every date on their initial American tour; and in addition to being one of the few instant platinum albums of 1982, the record did the near-impossible feat of getting four of its ten songs in heavy rotation on the ultra-tight AOR radio playlists.

Was it the previous achievements of the members that launched the band's colossal American success? The answer is yes and no. Although many of their fans are familiar with Yes and ELP, most know little, if any of King Crimson, Roxy Music, U.K., Atomic Rooster, The Buggles, Wishbone Ash and the other groups that the members have been in. Asia's rapid rise to the top is less due to their past fame and more because of the careful construction of its songs, and of course, a sophisticated marketing approach.

Although the album is good, it certainly isn't great. Critics have generally panned it and have, according to John Wetton, been "dramatically unfair to the band." But the bad reviews, despite their viciousness, have had little effect on the consumption of Asia by the music masses. And that's just fine with Howe, Wetton, Downes and Palmer.

The AOR radio tipsheets are calling Asia the greatest thing since sliced bread. In his report to Billboard, KTXQ's music director Drake Hall in Dallas, Texas wrote: "Asia is what radio has been waiting for. This is great stuff—the talk of the industry."

Upon listening to the album, it seems apparent the group and their producer, Mike Stone, kept the tastes of AOR radio heavy on their minds when they were producing it. "I really don't know anything about that, to be honest," said Howe. "I mean, when I'm here (in the States) I get into these AOR expressions and it doesn't exist in my world. Really!"

(continued on page 66)

PROGRAMMABILITY, THE POWER OF THE 80's!

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The album was done in London at Marcus Studios and Virgin Townhouse Studios and took five months to record and mix. The group toyed with the idea of producing themselves, but soon abandoned that and brought in Stone, who is best known for his work in the studio with Queen, Journey and Foreigner.

"We were just looking for producers and we met a few American producers and then," Howe paused to grin," we realized we were looking for somebody who was English. So, we didn't have to go through a whole lot of breaking down, cultures and things like that.

"When we met Mike it was really instantaneous. You know, we didn't even have to say much. We just knew he could do it; it was the chemistry we were looking for."

In February, 1981 Howe's manager from Yes, Brian Lane, set up a jam session for Howe and John Wetton. Wetton had just completed a solo album ***Caught In The Crossfire*** (released in Europe only) and was marking time with Wishbone Ash. Howe had just finished an exhaustive year with a radically different Yes (without their trademark vocalist Jon Anderson) and was tired of carrying on that tradition.

Wetton and Howe began rehearsing together on a regular basis and decided it was time to form a new group. Lane also contacted Carl Palmer who was about to embark on a solo career. It is reported that Rick Wakeman was the original choice for keyboards, but for some reason his presence in the band never materialized. Eventually, Geoff Downes, who has also been in the final Yes line-up and who was in the middle of the second Buggles album, joined the other three.

The group wanted to start off modestly, however, their publicist made the mistake of releasing a formal announcement to the British music press, who then descended on the group like a swarm of killer bees. It was for that incident that no announcement was made in America until the album was released.

The group rehearsed until midsummer of 1981, when they began the album. According to Howe, from the onset, the group decided that "strong songs were going to be the most important thing about Asia." The sound of the band was constructed from there.

Since each member had built their reputations in progressive British rock bands that concentrated on lengthy, intricate musical epics, many people were surprised when the album appeared with a slew of 3 to 4 minute pop songs.

"Well, it was better," said Howe throwing out claims from critics that Asia is a quick sell out for its members. "It meant we could use more material, which meant there was more involvement from everybody. If we'd done four tracks and they were each 10 minutes long, then it wouldn't seem to have much interplay."

Everyone in the band contributed to the writing and the arrangements on the album, with Wetton and Downes forming what may be one of the stronger songwriting partnerships in recent rock memory. The two are responsible for "Heat Of The Moment," "Only Time Will Tell" and "Soul Survivor," the three album cuts which have received the best response from the public.

Despite their legacies as some of the greatest soloists in the history of rock, as Wetton says, Asia "is trying to avoid self indulgence like the plague." That is not to say that the group, both on record and onstage are void of solos and intricate musicianship. It is just that this time around everything is tastefully con-

structed around the solid base of each song and nothing is overdone.

The same can be said for their record production. Although heavy on consistency, the sound the group has achieved on record is a far cry from the "scrambled eggs" style that Yes and ELP employed. "This little or streamlined production we got is what we wanted," said Howe of the first album. "It was simpler than other things, but then again, I wanted everything that we did slightly different than anything I'd done before. So, using a producer itself was different because Yes was more a co-produced group. And his (Stone's) approach in the final stages of the mix was very effective. He added certain things that, without his contribution, would have made the album underproduced. We were really going for a pretty basic sound and he sort of talked us out of that and eventually laid the things on the mix which made that little bit of extra, which we do now appreciate."

On the same day the group began recording the album they secured their record deal with Geffen, a maverick label that has scored an incredible roster including John & Yoko Lennon, Elton John, Donna Summer, Quarterflash, Peter Gabriel and Sammy Hagar. For Asia, there wasn't ever a second consideration.

PHOTO: ROB CONN

Steve Howe—lead guitarist.

"We were predicting going with Geffen," said Howe matter-of-factly. "We are friends with the people in the A&R end, mainly John Kalonder. He was friendly with everyone in the group and

was very excited that it was coming together. He sort of nutured us, so we didn't really go anywhere else. We felt like we were going into a family thing. Going with Geffen was a nice step for us."

With the barage of touring nearly over, Howe is looking forward to doing the second Asia album. There are four songs left over from their first album sessions, as well as several they wrote together during the first tour. Despite the overwhelming success of the debut album, Howe doesn't expect a repeat performance.

"No, it just depends on what music is available from everyone. Based on the new songs we've got, it just might take on a different form or it might not. There isn't really a music 'formula.' There are certain rhythm & blues, you know, 12 o'clock formulas, but rock, especially acid rock, isn't really trapped into a music formula."

The group plans to continue working with an outside producer, even though they've all had extensive previous studio experience. "What I do mainly," said Howe, "is produce myself at home. I've got an eight track studio and I do a lot of recording there. I even did recording while we were making the first Asia album because I just felt that Asia was a relatively easier project and therefore I could also put time in at home. I've got a lot of demos."

The group members are committed to keeping the Asia project afloat for an extended period of time, however, that is not to say they are forsaking their solo careers. Geffen Records has brought Wetton's solo album for American release, however, Wetton himself doesn't want it out until at least after the second Asia LP is off the charts.

Howe also feels solo albums are still a very strong possibility for him in the future. "I'd like to do that differently from my other tunes, so what I've been doing is trying to find a niche to settle into. It's like putty. It could be a solo acoustic guitar, more of that sort of work, or an album of music which I haven't gotten into as of yet."

"I'm looking to expand. I wouldn't say 'I'll do this til I'm 75.' I'll try to do this until the moment comes when I become a solo guitarist without this (Asia) around, which might be in five years time or something."

Since both Yes and Emerson, Lake & Palmer stayed together for more than a decade each, will Asia have that same kind of staying power? "Well," says Howe, then stopped for a moment to collect his thoughts. "I definitely see we're going to work on quite a few albums together. So it's not a one album thing. But there again, who can every say how long it will be?" ■

VISIONS OF THE FUTURE

Brave New Studio

by Ken Pohlmann

Future forecasting is a risky business. As various philosophers have noted, the past is completely predictable, but the future is a tricky question of cause and effect, or fatalism, or eternal recurrence, or simple absurdity, depending on the philosophy employed. Sometimes it's hard to know what to expect. You probably should have signed that lifetime offer of studio time for $25 per hour. You probably should have listened to the agent who wanted you to buy into that group from Liverpool. You probably shouldn't have sold those old tube-type U-47's for $50 apiece. You probably shouldn't have invested a year's salary in all those expensive quadraphonic decoders. And I definitely shouldn't have left my convertible's top down, now that it's started to rain. As they say, only hindsight is 100% accurate.

But if a retrospective of the recording industry can teach us one lesson, it's that we should anticipate rapid and ever-accelerating evolution, occurring through seemingly unprecedented breakthroughs. Since its origin a hundred-odd years ago, the recording industry has matched the expansion and progression of the life-scene of the technological world community itself. In general, the recording industry is a supremely contemporary industry. It has to be—because its supreme purpose is to sell fantasy and escape—of whatever varieties are currently most popular.

At the risk of predicting a sunny day, and having all of you leave your tops down, I might venture into the future and speculate on how things might be; if the year is 1992 and you've picked up this mildewed magazine, then the joke is on me. Be that as it may, I predict that the nature of tomorrow's recording hardware and much as the rest of the industry, will become, in a word—monolithic. And I think that prediction is easily justified.

Not so many years ago (as the rest of this issue aptly illustrates) equipment in the recording studio was relatively simple (by today's standards) and its use was straightforward. Then in the 1970's studio hardware followed NASA and the electronics industry in an upward trend in sophistication. A tape machine, mixing desk, and a few other boxes were replaced by greatly expanded versions, and supplemented by entirely new devices. And the philosophical nature of the equipment changed; mixing desks which formerly had input, output, and monitor sections now integrated those functions into redundant modules. Tape machines multiplied their tracks, and grew counters, return-to-zeros, and autolocators. Peripheral equipment rapidly expanded the horizons of signal procesing and filled rack after studio rack. The studio became a womb-like, cockpit enclosure obviously reminiscent of a space capsule, with an elaborate arsenal of life support systems of its own. In a contemporary studio there is a control knob for every audio parameter. And yet, perhaps the apogee of that concept has now been reached.

The problem is those knobs and buttons have simply become too much—no one can realistically handle them all. A typical session requires two, or three, engineers and a producer or two to supply enough eyes for the meters, fingers for the knobs, and ears for the music. It seems analog equipment has evolved to the point where its expedient operation is being burdened under its own complexity. In this highly technical era where profits are equated with streamlining, that is a dangerous burden. Automated analog consoles were a step in the right direction—but didn't go far enough. Like a reindeer who must shed his antlers, analog equipment must shed its—analog-ness. Perhaps in the future we will return to a simpler concept, in which a studio once again contains only a few, and maybe only one, piece of equipment. And as you might imagine, it will be digital equipment. The simple fact is digital devices can be operated faster, and easier because of their inherently computer-aided nature. To be maximally cost-effective, we would expect a recording studio of the future to be wholly computerized. That one piece of equipment—that monolith—will be the studio computer.

The newly-introduced digital consoles such as the Neve DSP/CCR perhaps illustrate this most effectively. They have abandoned that old analog concept of redundancy; all of those I/O modules have been replaced by a single multiplexed control through which all those functions placed on one module, and similarly repeated on all the other modules, are now singly controlled. A video-based graphic display is your window into the system status—past and present, and future, for that matter. The computer digitally processes and routes audio and control data so the need for peripheral equipment is gone. In the case of the DSP/CCR, equalizing, filtering, compressing, limiting, fading, mixing, channel assigning, are all accomplished in digital PCM format. And of course the digital console can be interfaced directly to a digital tape machine. Actually there is no need for separate units—eventually some kind of storage such as tape or hard disk, or laser memory could easily be incorporated into the console. We can easily envision the final step—a digital microphone goes in, and digital loudspeaker comes out; it is an elegant, monolithic studio.

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Visions of the Future

Along the same monolithic lines, our way of doing business might undergo some extreme consolidation too. Perhaps the days of the numerous, independent record companies and studios are almost over. Certainly the increasing sophistication must dictate fewer suppliers. Where an old lathe and a press can constitute a record company now, how many garages will be able to manufacture the incredibly sophisticated and complex digital disks? And that elegant studio computer described above—how many of those will you find in those warehouse district studios—the ones with blankets and egg cartons nailed to the walls?

Furthermore, the entire distribution establishment might face its own armageddon rather suddenly. Historically, people have thought of recordings as the records, or tapes, which embody them. But of course it's not the medium which concerns us at all, it's the content, the software itself. What could be more archaic than mass producing millions of plastic things and sending them all over? Why not a monolithic system, incorporated into a mass distribution hook-up, to bring that software into your home. When you want to hear the Beatles just type their library number into the system. Or if it's 4 a.m. and you can't sleep—ask the music channel to play you Brahms' Lullaby. It's all possible, an enormous random access music library, available to you through your home sound system—for a small monthly charge, of course. Don't laugh, American Telephone and Telegraph (talk about monoliths) is readying just such a system; rumor has it that the mysterious sharp (#) sign that's been on your telephone all this time is the nucleus of this long-planned mass communication music system; it's a system ready to make things like records and tapes obsolete forever.

If you review my forecasting in 1992, you'll probably see that I'm all wet. Things indeed always do change, but never in the way we would expect. And yet, one thing is probably true, if you wander into a recording studio ten years from now, or you ask a salesgirl for the new hit single—you might not recognize what they show you. Clearly, if the recording business wants to prosper, it will have to continue to change as fast as everything else. ■

Home Entertainment

by Mia Amato

Zooming in: the sun drops down behind the city skyline in some dim living room of the future, as the host flips the switch of the home entertainment center. The clink of ice in glasses gives way to stereo sound accompanying a pulsating, large screen video image. What are we watching? A music videocassette "single?" A 24-hour entertainment channel dedicated to rock, country or soul? A baseball game beamed from the stadium across town?

Perhaps the most significant contribution of the video industry to the music business will be the development of true stereo television. Stereo TV, already commonplace in Japan, will become a reality in the U.S. by the end of the decade.

Stereo TV programming, however, will not be broadcast. The massive adjustments to both FCC regulations and to the existing broadcast hardware now serving millions of mono TV sets make broadcast stereo transmission an economic impossibility. Instead, stereo sound will be fed to the home via cable television wires. Warner-Amex currently provides two stereo services to cable viewers: MTV and an all-movie channel. Proposed channels such as the Nashville Channel also promise stereo delivery.

On the home front, 1982 saw the first stereo home videocassette recorders and players, as well as stereo videocassettes to play on them. The new VCRs, like videodisk players, plug into consumer high-fidelity set ups. Television sets with audio-out jacks anticipate the day when the home screen is just one component in a complex information/entertainment home terminal.

Fade to: the audio sweetening

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room of a modern yet modest-sized studio. Stereo television—via cable—begets, inevitably, stereo TV commercials. The two-channel audio capability already available in ¼-inch and one-inch videotape *will* expand creatively as the demand for better sound on video grows. Mixing to picture will become an art form in both advertising and programming; complex sound panning, aural puns, theme music layering, and bilingual sound editing will fill out the sound-sweetening repertoire. Studios such as Sound Shop in New York and Omega Audio in Dallas have already computerized their sound effects. Simpler synchronizers and other new equipment will make post-production easier, too.

The professional audio production studio of the future is likely to be located in or near a video studio. Expertise—and expenses—will be shared. In the audio studio, the mixing console may not include a video editor but may include a small video switcher for routing various feeds. There will probably be a common patch board. Producers and engineers will speak the common language of time-code; artists will understand it too.

Experimentation in digital will continue to advance, although the studio of the future which does not master digitally will hold its own by either owning or renting interface equipment. The same hold true for sophisticated video gear: studios will rent. Certain kinds of video equipment, however, will become indispensable: synchronizers, time code generators and readers. Today's U-matic VCRs will remain the most useful format for sound mixing for video.

Pan to: the musical artist of the future, completely at home before camera and microphone. Whether grinding out a taped "commercial" to promote the new tour, or gearing up to a live performance by satellite, the artist has a new tool to express the mood of the music: as lyrical, abstract, satirical or historic as that music may be.

We've seen certain musicians take the lead in linking image to sound: David Bowie, Brian Eno, Todd Rundgren and the Grateful Dead, among others. The technology exists today, and the economic necessities of video integration are just now becoming apparent to the music industry. ■

the Threshold of Technology

an interview with Smilin' Deaf Eddie

by Mr. Bonzai

[redacted] recently returned to Ryan Recording, the studio I managed for so many years, to speak with ace engineer Smilin' Deaf Eddie about the future of the recording industry. Eddie's career spans several decades and he is regarded as one of the true geniuses of our business. The interview took place in his modest workshop, Eddie wearing his familiar solder-stained bathrobe and insulated rubber boots.

MR. BONZAI: Eddie, you are one of the giants of modern recording...
EDDIE: No—I'm no giant. I'm just a mere mortal pygmy toiling in the fields of science.

MR. BONZAI: But your inventions have radically transformed our technology.
EDDIE: Yes, that's true.

MR. BONZAI: As you look to the future, what do you envision?
EDDIE: Well, right now I am trying to alter and amplify human perception by taking the technology into the brain itself. It's already been proven that music in the form of electrical impulses can be sent through the spine and interpreted as music, totally bypassing the aural structures. So far I have only a rudimentary device which rests on the skin on the back of the neck, but my "Backpack™" is already

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VISIONS OF THE FUTURE

achieving amazing results. By employing a sub-carrier I believe we will be able to actually modify the processing programs of the brain, creating a biological mixing console. As yet we have only had success in increasing the sexual desires of young women, but at least it's a step in the right direction. The "Backpack™" is about the size of two packs of Camels, but I hope to eventually get it down to the size of a small wart.

MR. BONZAI: What about microphones—will we always be stuck with these expensive and delicate devices?
EDDIE: Old stuff. I am now building a microphone which will eliminate the old problems and variables. This new mike picks up sound with virtually infinite accuracy because it is based on an entirely different principle: the Quantum Effect. Analysis of sound can only go so far before it reaches the Quantum level, what is known as the Level of Uncertainty in physics. Beyond that there is no accurate measurement possible. The Quantum microphone measures the uncertainty, instead of the sound vibrations. This value is then subtracted from the total value One and what remains is the acoustic information. Placed in a room, the microphone detects all of the Quantum uncertainty energy and then with a simple computer program subtracts the detected value and the result is absolutely complete audio accuracy.

MR. BONZAI: Will this be an expensive item?
EDDIE: Not really, when you consider this Quantum leap forward. It will start at about $200,000, but we'll get the price down.

MR. BONZAI: What about the problems of recording tape—drop-outs, dust, dirt, and the need for elaborate error correction?
EDDIE: It really is very primitive, isn't it? A bunch of molecules sliding by on plastic... but I am experimenting with a new recording concept. I am using what is known as the Strong Force, as opposed to electromagnetism, to record on pure gold which seems to be the ideal element. In layman's terms, we actually jerk the nucleus of the gold molecule slightly out of alignment and this shifting registers the audio data. The gold itself has great durability and flexibility with the use of Meson glue (a Meson is a subatomic particle) and the gold ribbons are only two molecules thick.

MR. BONZAI: What about the battle of the speaker manufacturers for the perfect speaker?
EDDIE: The whole debate will be academic because new technology will guarantee pure and standard audio values. The information will be sent directly to the brain via the "Backpack."

MR. BONZAI: But people like to hear sound in concert halls and social situations—real sound.
EDDIE: What could be the value of "real" sound if this new way of hearing is superior? If you are a producer or artist you want everyone to hear the perfect mix, the perfect balance, the perfect reproduction. The further advantages of bypassing the ears will be the ability to hear beyond the normal human range, since the process is not subject to the limitations of the ear drum channel. By entering the control part of the brain we will be able to hear twice our normal range. In addition, by broadcasting directly to the neural system we will eventually be able to receive visual information as well, and even invisible frequencies from infrared, ultraviolet, and X-rays.

MR. BONZAI: You mean X-ray vision?
EDDIE: Yes, with stereo sound. Just as the computing power of ANIAC, one of the first tube computers, is now available in personal computers, it won't be long before the "Backpack," the Quantaphone, and Gold Meson tape are familiar items in the recording studio which is really quality conscious and has a few million to invest in our state-of-the-art. ■

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

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future views

William G. Dilley
Founder and Principal
Spectra Sonics

Over the past twenty years the recording industry has exhibited continued growth, and an ever increasing measure of stability. This growth has been, largely, the result of an increased sophistication of the general public, as well as the professional audio field. Recording equipment availability has increased dramatically, and has been dictated by procedural techniques rather than technology—with an attendant increased price tag for admission to the multi-track fraternity. However, the ever expanding market areas for the recording industry have made possible the price of increased recording capability. The future of the recording industry is unchanged from that of twenty years ago. It is in the hands of the participants. With emphasis on enthusiasm, education, standardization and good solid business practices, the recording industry should be a stable and viable industry (recognized as such by bankers) irrespective of any changes wrought by technology or procedure.

G.C. Harned
President
MCI/Sony

The next five years will continue the pattern of constant change in our industry and as in the past, we will see the new technology embraced gradually by artists, producers, and studio owners.

Most of everything that we are doing today is to develop the professional equipment necessary to support the Compact Disc, since the CD has set the world standard for digital

ISIONS OF THE FUTURE

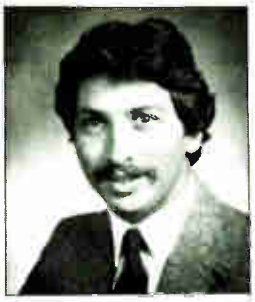
audio from a disc. This means that any professional digital recorder will be required to interface easily with the CD format, without special control line signal conversions, or unnecessary D to A or A to D conversions. The all-digital console will arrive... some are even manufactured today, but it will be sometime before a digital board with all the signal routing and creative flexibility of its analog counterpart can be delivered at a cost which makes sense to the average studio owner.

The conversion to digital will not happen overnight—what we will see first is "hybrid" facilities, perhaps a three room studio offering one room which features an all digital system and rents for a price to match, and two other rooms with analog multitrack gear and a digital two track for mixdown. Since all clients may not have production budgets necessary to pay for all-digital, these hybrid studios will offer economical alternatives... and many artists and producers have already discovered that recording their newest project on digital does not guarantee a hit. In time, the hybrid studio will convert one room at a time to all digital-while carefully watching their cost recovery. There will continue to be more and newer facilities built as the world-wide demand for recorded music of all types increased, and there will still

VISIONS OF THE FUTURE

be room for the "little guy" in what really has always been a specialized small business. Some of these new facilities will offer video and sound recording services, some audio-only. Our industry has always been one of specialization, and the guys who choose to concentrate on good sound, and prove that they can deliver it consistenly will succeed.

MCI is currently engaged in the largest scale development program in its history. Now a part of the Sony Corporation of America we can draw upon their considerable technological resources to make certain "dream products" possible. In the near future the first of these new products will be ready for market, and coupled with the predicted economic recovery for that time, will set the stage for MCI's continued leadership of an industry we helped to create.



Steve Krampf
General Manager, R&D
Otari

I hope that the technology will be more responsibly employed to yield more reliable, better supported products that increase productivity. These types of tools can increase productivity. These types of tools can increase artistic attention in the production process.

More importantly, I hope for a significant change in the people responsible for managing and marketing our wonderful product—Music. A more effective job can be done.

We know that in order to reinstate music to it's natural position as a generic part of our lives there must be suitable financial justification. We also know that we must find manageable ways to justly compensate that right people for their contributions so that the industry can get paid for their work.

While the music industry does not have a "Beatles" at this time, we do have more great music by more great musicians in need of more management than ever before. Those involved know this.

The market for music is now broader, less lifestyle oriented and much more competitive. It's size is dependent on promotion. Even with the changes in technology, the 'free' recording problems, and the poor economy; the industry can grow and it can grow now, if it makes the push.

My suggestion to the music industry power base is to get more competitive. There will be others for which the market will be large enough and very attractive.

To paraphrase Mssrs. Felder, Henley and Frey, "You've stabbed it with your steely knives, but you just can't kill the beast.

Bruno Hochstrasser
President
Studer Revox America, Inc.

In these times, it's difficult to say what the future of the recording industry will be. Realistically, I expect the industry will be somewhat stagnant in the immediate future. For example, I see a slow acceptance of Digital multi-track recorders. The problem is not so much the technology itself or the lack of tape interchangability, but more one of hard economics. Most studios cannot justify the investment that Digital multi-track demands. However, I do see a healthy growth in acceptance of two-track Digital machines for mastering. I also expect considerble studio upgrading; we already feel an increasing demand for more sophistication in analog recorders, especially in the operational capabilities. When stereo TV arrives, we can expect increased growth in audio-video facilities, but I don't think video is essential for a studio to survive. I believe the ***quality*** audio recording studio is here to stay

Gary Margolis
Director of Sales
UREI

Even though music is basic to humanity, consumption patterns are in transition. With the proliferation of video arcades absorbing much of the discretionary cash formerly spent on albums and singles, plus the increasing penetration of video disks, VCR's, cablecasting and future direct broadcast satellites, the glory days (and excesses) of the recording business are over for good. Well-run studios which can adapt to audio recording for video and film will prosper; others will disappear. Digital multitrack recording's immediate impact will be limited because of the extraordinarily high cost of the equipment and the limited production budgets available. The relatively reasonable cost of

(continued on page 92)

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   2. Male
4. **# of Years in Industry.**
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   B. 1 - 3
   C. 4 - 7
   D. 8 - 12
   E. 13 or more
5. **Trade Shows You Attend.**
   1. AES
   2. NAB
   3. NAMM
   4. CES
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   6. SPARS
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008	028	048	068	088	108
009	029	049	069	089	109
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011	031	051	071	091	111
012	032	052	072	092	112
013	033	053	073	093	113
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GOLD★STAR

(continued from page 31)

from other people, too. I don't like the idea of saturating a tape for level. It loses the feeling the artist intended. I much prefer to get a balance, and put that balance on tape. Monitor mixing can get you into too much trouble.

STAN: With Phil, for example, a 7½ ips rough mix, as it was being recorded onto multi-track, would become a master if he loved the feel of it.

MIX: Dave, since you're more the disk cutter, what sort of changes have you noticed in the last 30 years?

DAVE: That there is less communication between the mixer and disk recordist, as well as between disk recordists and matrix plants. I am concerned about the tendency of many mixers to over-equalize frequencies over 10 kHz. I suspect that much of this is due to poor monitoring systems in their mixing rooms and possibly over-use of equalizers which offer extended high frequency EQ especially in the 15 kHz -20 kHz range. This upper range requires the record amplifiers and heads to handle tremendous amounts of power due to the RIAA recording curve. I believe that many engineers have lost varying amounts of their hearing in this range due to the loud levels that they listen to. I can tell a great deal about a mixer by listening to his tapes, and they would do well to learn what problems they cause the mastering engineer.

STAN: It's pushed high end. Not natural. Sibilance is one of the big offenders. The tapes are actually saturated with it.

DAVE: Disk cutting, within itself, though, hasn't really changed. There has been no significant change or improvement in the disk mastering process, nor in the material on which we cut. In fact, the disk we cut on today is worse than it was years ago, probably due to mass production. The equipment has improved somewhat, variable pitch, depth, computer sampling for groove economy, etc. The sophistication has been focused mainly on the record heads. Our early heads were limited to a band width of about 8 kHz. But, ooh, were they ever clean! Gold Star progressed through the changes... starting with Olsen, Grampian, and then Westrex heads. But the same Scully lathes, modified with pitch and depth, are still used today.

STAN: And then there is the lack of competition to manufacture good quality disks. There were a number of lacquer manufactures in the 1950's, but today there only two majors; Transco and AudioDisc.

DAVE: In Europe you don't have the Government agency we do, OSHA. It regulates pollutants that affect the environment and so on. In Europe they don't worry about them as much. So they make a better disk than we can because they can use better materials which unfortunately are polluting. We can't use them. Also, we increase the speed of our record press cycles for mass production. The vinyls can't heat and cool properly, so you get noise, from improper fill, etc. Simple. It's not that we can't make a good disk, our hands are tied by OSHA and the economics of mass production.

MIX: How can the studio and the mastering engineer help?

DAVE: Only by getting the master lacquer from the lathe into the bath as fast as possible. Groove curing, which causes noise, will be reduced. Groove collapse and pre and post echo will be minimized. The grooves collapse with time and temperature changes. We should keep the disks cool before hitting the baths, and their temperature should be carefully monitored, too.

MIX: So you think we could make a better disk?

STAN: Sure we could. *If*, and only if, the industry cared. There's a need for craftsmanship. ■

(continued from page 45)

rope it off pretty soon because everyone who sees it wants to touch it and play with it, just like we're all doing right now! Everyone turns its knobs and pushes its faders to experience how it *felt* to record *The Beatles*! It really draws you in and makes you wonder what they were doing during the recording of a song like 'Yesterday'..."

ALEXANDER: "Really, this thing ought to be in the Smithsonian Museum, like Lindbergh's airplane! That's how I see it. It didn't hit me at first, but after talking to several people about the console and noting their reactions to it, it soon became apparent that this is truly a unique and—dare I say—*valuable* item! It's as though we had Beethoven's piano. It's as though we had the instrument that great music was created on!"

• • •

Well, it was and they do. So what's to become of it now? Is it to remain unplugged and inoperative in an undisclosed location somewhere in the San Francisco area, hidden away for the private enjoyment of a small group of Beatle fanatics and the occasional extremely fortunate and grateful writer?

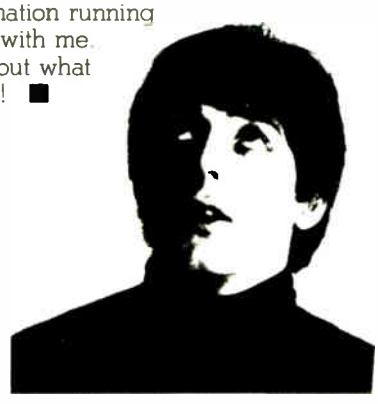
ALEXANDER: "I think that this historic piece of equipment should be in a fairly unique environment like a technological museum or even a "Beatles Museum." Obviously we attach a great deal of importance to it and are very concerned with its future."

SOLBERG: "We'd like to record something on it first! And then sell it to someone who will respect its significance and integrity. I'm just glad it's in the San Francisco bay area music community at the moment. It's almost like a hand-me-down of a certain artistic tradition we all went through."

CUNIBERTI: "I hope whoever eventually gets it doesn't decide to take it apart! You know, like 'Hey, these curved faders would look great on my Model 10!' Personally, I'd love to put some state-of-the-art equipment at both ends of it and listen to what it sounds like. I believe we could actually hear it. After all, we know what the mikes sound like, we know what the room sounds like, and we know what the tape machines and monitors sound like. If we could insert this in the signal chain I think we'd be better able to appreciate whatever it did or didn't contribute to the sound of the Beatles."

• • •

There was little question among those present that the sound of this board was a common denominator which ran throughout most of the Beatles early recordings. The only question was: what exactly was that sound? How much impact did the board have on the growth and development of the Beatles music? Whatever its contribution, it is evident that the music which passed through it and the creative energies focused upon it have given it a distinct personality. It definitely has, as Dan said, *"charisma!"* You can still feel the energy, emotions, and creativity that flowed through its tubes, resistors, and capacitors. That hibernating energy hit me like a warm ton of bricks when I first entered the room. I felt like Indiana Jones when he discovered the Ark of the Covenant in the movie "Raiders of the Lost Ark!" Then again, it could have been a case of my imagination running away with me. Ahh, but what a ride! ■



(continued from page 17)

By 1893 the rival machines were compatible.

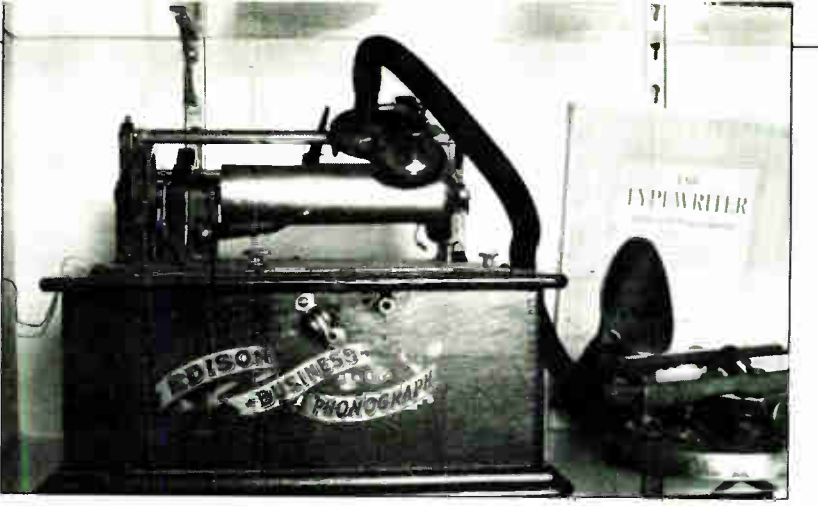
Growth of the cylinder as an entertainment medium was due largely to an Italian, Gianni Bettini, living in New York. He was using a phonograph to record vocal music almost as soon as Edison had perfected it in 1888. From then onwards there was an increasing number of entertainment recordings available from various sources. But a batch of indentical recordings could only be made by having the vocalist sing into a batch of simultaneously operating machines; or by copying from one cylinder machine to another, with inevitable degradation of quality. Although Edison, among others, had patented ideas for commercial pressing systems many years before, molded cylinders did not come onto the open market until the turn of the century.

By the early twentieth century specialist audio magazines were booming and full of correspondence on the burning disputes of that time. While Edison clung to the concept of grooves cut in vertical, or hill-and-dale, fashion, others favoured the lateral, or needle, cut. Even today, many people believe Edison was right. A vertical-cut groove can produce high levels of sound purely acoustically, whereas a lateral-cut groove is physically incapable of generating comparable quantities of energy unless the widely undulating grooves are so widely spaced that the recording is very short in duration. The clear fact also emerges from those early magazines that Edison was immensely loyal to his supporters and vice-versa. All new Edison improvements were applicable to old Edison machines.

Doubtless with reluctance, Edison himself contributed to the final downfall of the cylinder, by launching, in 1912, a disk phonograph. This was despite his continuing and justified conviction that the cylinder was the ideal recording medium. Unlike the disk, there is no gradual reduction of stylus-to-surface velocity as the recording progresses.

Disks were pressed from all manner of materials, starting with vulcanite or hardened rubber (they sounded terrible), through chocolate (they also sounded terrible but tasted good), and finally shellac, which persisted on through to the final demise of the 78 rpm disk.

Acoustic recording and reproduction gave way to electronic equivalents in the mid twenties. Again, Edison was responsible, but here quite unwittingly. In 1883/4 he stumbled on and patented the so-called "Edison effect," whereby a current can be shown to flow between electrodes in a vacuum. Edison saw this effect only as an incidental aspect of his incandescent electric light. In 1904 John Ambrose Fleming, of University College, London, England re-patented the Edison effect as a radio rectifier. In the USA between 1906 and 1907 Lee de Forest modified Fleming's diode valve by incorporating a third electrode, to make it a triode, or 'audion' as he called it. Finally in 1912, also in the USA, Edwin Howard Armstrong (who was in 1933 to invent FM radio) used the audion to amplify incoming radio signals and helped pave the way for electrical recording.



Another surprise from the patent records were the early experiments in stereo sound which were underway even before the demise of acoustic (non-electrical) recording. As early as 1881, Clement Ader in Paris had shown how the transmission of two-channel sound and headphone reproduction produced a remarkably realistic effect. A two channel system of recording, which combined both lateral and vertical cuts in the same groove, was patented by Samuel Waters of Washington in 1920. Although the foundations for stereo reproduction were laid down during this time, it is unfortunate that public acceptance of stereo disks would not occur for another forty years. ■

INTERNATIONAL R

Thunder Road Studios
by Mark Holden

Thunder Road Studios, in Calgary, Alberta, Canada is a "multi-media" facility consisting of a 24 track recording studio, an 8 track film mixing theatre, and a 16/35 mm motion pic-

Thunder Road Studios

ture processing laboratory.

The 35' x 40' main room of Studio "A", designed by Tom Hidley, is the third largest of its kind in the world. The control room is 25' x 25' and includes a Neve 8108, 32 x 24 console, a Studer A80 24 track recorder and Studer 2 tracks. The outboard gear includes such things as a Lexicon 224 Digital Reverb, 2 Lexicon Prime Times, ADR Vocal Stresser, Eventide Harmonizer & Flanger, 2 Echo-Plate reverb units and the usual host of expanders, limiters, gates, etc.

Thunder Road has recently completed work on a new Glenn Yarbrough Album, The Victory Group, based out of Vancouver, Pretty Rough of Edmonton, and are presently working on projects for Lewis Levin, Dan Lowe, and Modern Minds.

International Music Expo Slated For Fall— Essen Fair, Germany

"Sound & Musik '82," the International Autumn Exhibition of Musical Instruments and Festival, will take place from September 9 to 13, 1982 in the Essen Fair. Right in the middle of Europe's most densely populated area, the Rhine-Ruhr area, "Sound & Musik" will reach everybody who likes to do music: amateurs and professionals, soloists, and members of bands or orchestras.

The program of "Sound & Musik" includes seminars and workshops along with international offers of musical instruments being presented by manufacturers, wholesale dealers, importers and trade dealers, and an international festival with well known groups and soloists.

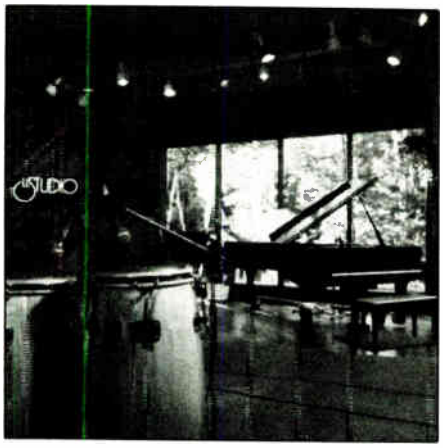
The "Sound & Musik '82" will continue along the lines of the initial success of the first exhibition of musical instruments last year which was attended by approximately 18,000 music enthusiasts.

Le Studio: Resort Recording
George Petersen

Le Studio, located on a 250 acre estate in Morin Heights, a resort village nestled in the Laurentian Moun-

tains near Quebec, is one of the world's most beautiful recording facilities. While the studio is hardly large by today's standards (32 foot diameter hexagonally shaped main room), the intimacy of the state-of-the-art complex is seen as an asset by their renowned clientele. Combined with its lakeside setting and nearby 15 room guest mansion, Le Studio offers an ideal environment for creative expression.

Le Studio was designed in 1976 by its owner, producer Andre Perry with the idea of providing a world class facility in a serene and tranquil atmosphere. However lovely to look at, the beauty of the complex is matched by the quality of its recording gear. Le Studio now boasts having twin Studer 24-track recorders interlocked by an Audio Kinetics Q-Lock. The mixing console is an automated 72 input Solid State Logic Master System SL-400E with floppy disc mix storage, ultralocator intelligent high speed tape locator, and a video display/printout of levels, cues and lists. Four Studer 2-track machines are available for analog mixdowns, and a



Le Studio

JVC BP-90 digital 2-track is a recent acquisition for artists who prefer digital mastering. A wide range of monitors and outboard equipment is available.

Like other studios, video also looms in Le Studio's future, as they have recently purchased four Ampex VPR 2B 1" VTRs, a Ross 514 switcher, an Interactive System ISC 31 editor, and other gear to complete their broadcast-quality video production capability.

Andre Perry's environmental studio concept is obviously appreciated by many artists, judging by Le Studio's customers such as: Chicago, The Police, Roberta Flack, Cat Stevens, Billy Preston, and Phil Ramone. Rush, a repeat client, returned this June to record a new album to follow their ***Exit... Stage Left*** live LP which was digitally mixed there. The studio album was recorded on 46 tracks and a digital mix was planned at press time. Asia, produced by Mike Stone, will record their eagerly-awaited second album at Le Studio later this year.

The Little Mountain Sound Studios—Vancouver, Canada

by Mary Harris

Little Mountain, one of Canada's top studios, operates 24 hours a day with three control rooms, and can accommodate an 80 piece orchestra. Its homey atmosphere (it even

has a full kitchen with home cooked meals!) belies the professionalism and high quality equipment: Neve consoles, UREI monitors, Lexicon 224, the new ½" 2-track Studer machines, 4 EMT plates and additional reverb rooms, as well as being fully equipped for video and motion pictures. The studio attracts international attention and finds favor with such producers as Mick Ronson, who just recently completed the newest Payola album, and Bruce Fairbairn of Prism and Loverboy repute.

Little Mountain Studio

Having the space and staff to offer excellent service to a great variety of users, from rock and roll bands to advertising agencies, and from audio visual film tracks to major motion picture scoring, has helped Little Mountain Sound prosper in less-than-propitious times. The studio is fortunate to have on staff creative people who write and produce for almost any type of production and has access to top quality talent, arrangers, and engineers.

Transamerica Recording Studios—Brazil
by Oswaldo Malagutti

Four years ago, Transamerica Radio, a Brazilian broadcast network, opened three recording studios in Rio de Janeiro. These 16, 24 and 32 track, Tom Hidley—designed facilities were available to local artists, major record labels (Warner, Ariola, CBS), and were also used for jingle/radio spot production. The success of these studios prompted the need for another, the Transamerica Recording Studio in Sao Paulo, Brazil, South America's largest city.

Construction of the studio began in September 1981, and special attention was paid to RF interference problems since a 50 Kw radio station transmitter was nearby. The solution came in the form of 4½ tons of copper foil which was used in shielding all the internal partitions of Transamerica's double walled construction. The inner wall was floated and isolated from the outside with neoprene rubber.

The 36' x 27' main room will have live and dead areas. The control room will be equipped with an automated Harrison console and two Studer 24 track recorders. Three noise reduction systems (Dolby, Telcon, dbx) are to be installed so customers will have several options from which to choose. Plans also call for a large selection of outboard gear from top manufacturers: UREI, Kepex, Orban, Eventide, EMT and Lexicon. At press time, the owners were also considering incorporating live reverb chambers into the studio. Westlake and Auratone monitors, and Neumann, Schoeps, Beyer, Sennheiser, AKG, and Shure microphones will be used.

A live 24' x 18' string room was designed with curtain-controlled variable acoustics. The control room lies between the string room and the main room so the recording engineer can watch both rooms during a session through large glass window ports.

Completion of the facility is expected by the end of this year.

Rock Music In A Welfare State
by Tom Cunningham

West Berlin, known internationally for "the wall," is becoming famous for another reason: rock music. ***Deutsche Welle*** bands—they play new wave with German lyrics—can be found in every corner of the Federal Republic of Germany, but Berlin rock musicians have an advantage: they are generously underwritten by the city government. A million deutschmarks (about $435,000) worth of tax money was spent for the furtherance of rock music in 1981 alone.

The most visible program is an annual contest for unsigned bands called "Berlin Rock News." Last year the ***Senator Fuer Kulturelle Angelegenheiten*** (Department of Cultural Affairs) received 225 demo cassettes, which were evaluated by a jury of music business pros. Ten lucky bands won four days of 24-track time. In addition they were invited to appear in a special concert promoted by the ***Senat***, which was taped for a later television broadcast.

Berlin's municipal rock program doesn't end there. Several 8 and 16-track studios have received grants of up to $8,000, the stipulation being that inexpensive studio time be made available to local artists. A couple of rock clubs were helped financially with renovation and soundproofing; even the "SO

(continued on page 88)

COMPASS POINT. HIGH-TECH. LOW TENSION.

A combination of the very latest in high technology recording equipment and the peaceful beauty of the Bahamas makes recording at Compass Point very special indeed.

Technically, there's probably no better studio in the world. Atmospherically, there's the magic of coming out of the studios and strolling through the coconut palms onto the open spaces of tropical beaches. It's an irresistable partnership that's been highly productive for the many artists who've come here over the last two years.

NASSAU

The Bahamas are made up of a number of small islands, situated off the coast of Florida. The temperature never moves far from the 70's and 80's. Nassau, itself is on the small island of New Providence. It's easy to get around by road; although a speed limit of 45 m.p.h. is some indication that the pace of life is fairly slow.

There's no problem getting here. There are direct flights every day from London and New York and you can also fly direct from Los Angeles and several European cities such as Frankfurt.

What's more, Nassau is only half an hour by air from Miami and there are numerous flights every day of the week.

And it's not just air communication that's good in Nassau. You can dial direct to the States and there are excellent telephone connections to Europe. So, while we do our best to get you away from civilisation, it's never really very far off. It's largely this combined with its unquestionable political stability and its tax concessions, that's made Nassau an important financial and banking centre.

COMPASS POINT

The studios are situated near a lovely secluded beach, called "Love Beach." While you're using the studio, you'll stay in the adjoining houses and apartments which look out across the ocean. They're all luxuriously furnished and decorated in relaxing pastel shades.

Entertainment isn't far away either. Just a short drive away are the restaurants, club and casinos of Nassau and Paradise Island.

INSIDE THE STUDIO

There are two studios equipped with the most up-to-date equipment. One is 875 sq.ft. and has a control room measuring 375 sq.ft. The other is 610 sq.ft. with a control room of 437 sq.ft. Both studios have 14 ft. ceilings.

The consoles are MCI JH-S 36 in/36 out with automation.

The tape machines are 24 track MCI (JH 114). The 2 track machines are also MCI (JH 110A). There's a tie-line between both studios which means they are fully wired for 46 tracks.

All noise reduction throughout the studio complex is taken care of by Dolby 'A' or DBX.

For monitors, Studio 'A' uses Tannoy Reds in lockwood cabinets and Studio 'B' uses UREI 813 time align monitors.

But, as we know, every producer has his own likes and dislikes, there is other monitoring equipment available: JBL 4311, Auratones, Altec 19 visionick modules 100, 502, and 803.

Echo and reverberation is handled by an EMT 250, and 4 EMT 140 TS machines with remote control. There is also an AKG BX20 and two line 3.2 second chambers.

Finally, on the technical side, the following outboard equipment is available: Equalizers by UREI, Pultec and Scamp; Limiters by UREI, DBX, Scamp and Allison Research; Effects by Eventide clockworks, AMS and Lexicon.*

All the equipment is regularly maintained and serviced by our resident engineers so that it's fully operational 24 hours a day.

All the engineers have considerable studio experience and should anything go wrong MCI are close at hand with their headquarters in Southern Florida.

There's a fully equipped recreation room with pool table, bar football and pinball, and a kitchen which, while it may not reach great culinary heights, can turn out one of the best hamburgers on the island.

As far as musical instruments are concerned. Everything you could want is readily available and a Yamaha Grand Piano is included in the rate for the studio.

One more thing that the studio has to offer is its staff. They're helpful (always), happy (generally), and should provide the right sort of atmosphere that makes for great recording.

THE TRACK RECORD

Since it started two years ago, the studio has been involved in many highly successful albums.

The studio was the brainchild of Chris Blackwell and it's still personally run by him today. His experience setting up and running the Island Studios in England in the early 70's has proved invaluable in developing a studio that's 100% efficient all the time and where valuable time is not lost because of technical hitches.

"We certainly pride ourselves on our track record. We've never had a real problem with any of the artists who've come over.

*This information about the equipment is correct at time of printing. We are of course continually looking to improve it still further.

I think the most exciting and productive aspect of working here is the contrast that's achieved between the pressure when you're in the studio and the total relaxation once you're out."

In case you think Chris, himself, might be slightly biased on the subject, here are just a few of the things people who've worked at Compass Point have to say about it:

A.C./D.C. – "We travelled 6,000 miles for perfection and we weren't let down. We finished right on time."

Robert Palmer – "Totally flexible recording, accurate and realistic mixing. Ideal environment for concentration."

Mutt Lange – "It's a very charming, well equipped and maintained studio with an atmosphere as friendly as its staff."

Glyn Johns who has produced a number of albums at Compass Point – "Great studio. The most perfect environment in which to work. It's got one of the finest sounding rooms I have ever worked in."

Phil Lynott of Thin Lizzy – "Compass Point is a fantastic studio if you can drag yourself away from the fabulous sunshine and idyllic beaches. I enjoyed my time recording there, the sound was great and I hope to go again."

Jerry Wexler – "I would expect nothing less than first class facilities from my old friend Chris Blackwell. Had a wonderful time recording 'Communique' with Dire Straits. The room sound was exceptional and the environment perfect."

BOOKINGS

If you'd like to have a look at our rate card, make a booking or just have a chat about the place, call Lorraine Fraser at Compass Point Studios, P.O. Box N – 4599, Nassau, Bahamas. Phone (809) 327 8282. Telex No: COMPT 20-302. Or get in touch with Denise Mills in London on 01-741 1511 or Barbara Cuddy in New York on (212) 355 6550.

COMPASS POINT STUDIOS

P.O. Box N – 4599, Nassau, Bahamas

Circle #067 on Reader Service Card

(continued from page 86)

36," Berlin's mecca of punk, got money for new lights. Rehearsal space is scarce, so the ***Senat*** rented an old vacant building in a working-class district, christened it "Rock House Spandau," and provided ten bands with practice rooms. If your band wants to tour but can't afford a p.a., the ***Senat*** will help. Same thing if you need to soundproof the basement so that the neighbors don't call the cops when you crank the amps up to ten: see the "Minister of Rock" down at city hall.

Herr Manfred Fischer, press representative for the program, says, "The city of Berlin has always been a cultural center, and has traditionally supported the arts. We have more rock bands here than in any other German city—and in my opinion, they are more versatile and creative—but due to our geographical position it's difficult for them to tour; and because of the housing squeeze practice halls are very hard to come by. We feel that rock music is an important form of artistic expression for our young people, and that it deserves to be financed as much as, say, the opera, or anything else." There ***are*** worse things to be done with tax revenues.

Tom Cunningham is a recording artist, songwriter, and producer who has lived in Berlin for over eight years.

Studio Activity in Australia
by Comrie Bucknell

As this article is being written there are, in Sydney alone, a number of major installations underway. At Paradise Recorders the country's first Harrison MR-2 is being put in. The console is configured 40 into 48 and feeds a Studer A-800 24 track, which was the first of that breed to come to Australia. Paradise has been open a few years and is one of the best studios in the country. They have a very extensive range of outboard equipment and microphones installed in a Hidley designed studio and control room.

Meanwhile, less than a mile from Paradise, Rhinoceros Recording has changed over to a Solid State Logic SL 4000E console coupled to MCI recorders. The SSL is the first to come to Australia. Again there is a full complement of peripheral equipment. The facility has three rooms linked to the control room and differs from Paradise in that it is quite a deal larger, and the acoustics are designed by Sydney-based Richard Priddle and has a live-end-dead-end control room.

Apart from the two above-mentioned studios there are a number of others that do have excellent facilities. EMI's Studios 301 is a world class facility in the centre of Sydney with two studios, an automated mixdown suite and disk mastering rooms featuring Neve consoles and Studer tape machines.

Studios 301

To the south, in Melbourne, there are a number of facilities that are as good as any elsewhere. One of that city's best is AAV Australia. This operation is multifaceted and is involved in audio and video recording and post production work using some of the latest equipment available as well as their own in-house designed gear. Other Melbournian studios that are among the best are Richmond Recording, Crystal Clear and Allan Eaton Sound. The latter studio late in 1981 installed an MCI JH-652-52LM console which is reported to be the largest console in Australia. Coupled to the console is a comprehensive array of tape machines and outboard equipment.

Both Melbourne and Sydney have traditionally been the major centres for recording activity in Australia but there has been a trend in recent times for other centres to build larger and better studios. One of the reasons for this move has been that bands and other artists have realized that it is not essential to go to one of our best studios' to get good sound on tape. As a result of this there has been increased band recording activity in cities such as Perth, Adelaide and Brisbane, the capitals of Western Australia, South Australia and Queensland respectively. Perth for example has a number of studios but the two majors are Planet and Sound—West. Both of these are automated with Planet having one of the South Pacific region's first Quad-Eight-Coronado consoles in a 24 track facility, while Sound-West has two rooms, the larger being 16 track, MCI and Ampex equipped.

Pepper Studios in Adelaide is probably that city's best studio with an automated Harrison board that found its way to Australia when Los Angeles' Village Recorders had their recent update. This studio is one of the more recent additions to the list of updates to major studios in Australia.

To the north of Sydney, Brisbane has recently seen a lot of studio building activity. Suite Sixteen has been completed in the last six months and features an Auditronics console (Allison automated) and Studer multitrack in an original designed control room that combines near-field monitoring and live-end-dead-end (L.E.D.E.) acoustics.

The other major development in Brisbane has been the building of Star Sound adjacent to television station QTQ-9's major production studio. A Neve 8108 console with Necam 2 automation features in the LEDE control room. This console is the first 8108 in Australia. Particular attention has been paid to communication between the two control rooms in this project as the audio rooms are often in use in conjunction with the existing studio.

Outside of the major, capital-city studios there are a number of studios that deserve mention for one of a number of reasons. The far North coast of New South Wales has Music Farm Studios. As the name implies the studio—fully MCI equipped—is situated on a farm and provides not only studio facilities but also living quarters with a full time staff of eight to cater to the artists. Tamworth, Australia's country music capital features a couple of larger studios the better known being Eric Scott's Hadley Records. The studio is one of Australia's busiest country music recording studios and has produced a very large number of records, many of which have been successful not only on the country and western but also the Top 40 charts. An Otari MTR-90 24 track recorder is fed by a custom designed and built console. The acoustics are simple in nature, conforming to no particular philosophy.

It is important to remember the price of studio time in Australia is remarkably cheap. The most expensive studios, for audio-only operation, are less than half that for the most expensive in the U.S.. For example, the very top rates here are still less than A$130—current exchange rates would translate that to approximately US$125. Competition within the studio industry is very strong, and it is sometimes difficult to understand how a studio can remain economically viable. The costs associated with running a studio are essentially the same in both countries with the major difference in costs associated with establishing a studio being that of the real estate that the studio is situated on. Real estate in Australia is still considerably cheaper than in the U.S. but the gap is closing.

The continuing economic viability for many of the studios has been questioned for some time, especially when consideration is taken into account of what happened in the U.S. recording scene in the latter months of

(continued on page 90)

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(continued from page 88)

the 70s and continued for some time. Fortunately for us, we have not been subjected to extreme downturn in the industry yet but there are a number of studios owners who are not re-investing profits into the studios but rather into more secure ventures. Surely that is an indication that we may be headed for recession.

Of particular interest is the very careful planning being undertaken by certain studios in Sydney following the expansion of—especially the number of smaller twenty-four track-studios throughout the country. What was once the cream for some of the studios is now the bread and butter for the other centres' studios. Yet despite this preparedness there is an ever-present air of continued optimism.

Mushroom Studios—Vancouver, Canada

Mushroom Studios, of Vancouver, Canada, boasts a large 50' x 30' main room, and was constructed in 1966 using the consulting services of Dr. Howard Tremaine, author of "The Audio Cyclopedia," the standard reference text of the audio industry. The design also incorporates stereo acoustical echo chambers with hard concrete surfaces.

The control room effectively combines old and new technology. The 48 in x 22 out custom console utilizes 30 tube preamps with 8 VCA groups, offering wide dynamic range with lower noise than many solid state devices. Twin SMPTE synchronized Studer recorders allow up to 38 track capability. A large selection of outboard gear is available, including their latest acquisition, a Lexicon 224 Digital Reverb.

Lindsay Kidd, Mushroom's chief engineer, has worked for a wide variety of international recording acts, ranging from the Paul Mauriat Orchestra to Black Sabbath. Mushroom Studio's recent clients include Loverboy, Trooper, Long John Baldry, and Doug and the Slugs, among many others.

Manila's World Class Studio

AD & AD Recording Studios, in Manila, the Philippines, offers their clients the latest in recording technology. The complex consists of three recording rooms (the largest of which can accommodate a full orchestra), each equipped with Rupert Neve mixing consoles. Studio "A" employs a model 8158 desk with NECAM automation.

Each studio is additionally equipped with Ampex MM1200 or ATR 100-102 recorders, McIntosh power amps, and UREI, JBL and Auratone monitors. Available outboard equipment includes Dolby noise reduction; Aphex Aural and EXR exciters; ADR Vocal Stressers; Eventide Harmonizers; and delay/reverb systems by Delta, Lexicon, AKG and EMT. A large microphone selection is also available.

Studios A and C make extensive use of Sonex acoustic foam wall coverings, while Studio "B" uses heavy drapes for acoustical treatment. A large assortment of instruments are available, including: Wittenberg grand pianos; Rogers and Ludwig drums; Ludwig timpani; Synare and Syndrums; Musser chimes and vibes; Rhodes, Wurlitzer, and Novatron electric pianos; and ARP, Polymoog and Hohner synthesizers; as well as a variety of guitars, reeds, brasses, strings and percussion.

Besides having a complete record mastering/pressing facility available for both 45's and albums, AD & AD Recording Studios has their own marketing and advertising arms to promote and distribute their products and services as well as radio stations to disseminate their daily program and advertisement activities. ■

off the record

by Jack McDonough

In keeping with the general themes of this fifth anniversary issue, The ***Mix***, for this month only, dispenses with its usual routine of reviewing albums one at a time to take a look at a number of collections, reissues and "resurrections" that have been released over the recent months and bear upon much of the history discussed in the major features of this special issue.

Most of these records are either in the genre of R&B/soul or country and western (the two rivers that flowed together to create the ocean of rock and roll, and which remain today as the two most important subsegments of the pop/rock charts), and most have been issued by CBS, the company with not only the best vaults but also the marketing brains and muscle to be able to create and sell well-researched and well-packaged sets.

While the order in which we'll talk about the records has nothing to do with their quality or appeal (all of the records are worth having), let's begin with Epic's three-volume ***Lost Soul*** series [PE 37730-31-32]. The albums live up to the claim of the brief liner note that accompanies all three volumes, i.e., that while there are a few hits on the albums, the music exquisitely evokes the era from which it came, 1966-78, although most of the sides are from the first half of the 70s. Listening to these records is like reading a fine history, but concentrating on the informative footnotes rather than on the main text.

Several artists—Gwen McCrae, Bobby Womack, Brenda & the Tabulations—are represented on more than one disk, with McCrae showing up on all three. The best disk, as might be expected, is volume one, highlighted by Z.Z. Hill's fabulous rendition of "This Time They Told the Truth" as well as by tracks like "Crying in the Chapel" by the Staples, "You're A Man of Words, I'm A Woman of Action" by Betty LaVette (who is right now getting some well-deserved attention for her recent album) and "Personally" by Jackie Moore, the same song that Karla Bonoff is now on the charts with. In fact, discovering Moore's version of "Personally" on this disk was a bit of a revelation, since I had immediately fallen in love with Bonoff's version but couldn't figure out why a white girl would be using such an unlikely phrase as sending her love "by your next of kin." Now I know. Favorite selections from the other two volumes are the ultra-sultry "Relax, It's Just Like Dancing" by Essence and "Soon As I Touched Him" by Fontella Bass.

Another highly commendable three-record soul series (referred to by the label as the "Last Gasp Series") is Solid Smoke's just-released reissues of the Esquires and the Marvelows (both on one album titled ***Chi-Town ShowDown*** [SS-8017], the Flamingos' ***Golden Teardrops*** [SS-8018] and the Van Dykes' ***No Man Is An Island,*** [SS-8016]. As one might assume from their album's title, both of the former bands hail from Chicago, as did the Flamingos (who recorded ten years earlier, in the first half of the 50s). These albums definitely represent more of an acquired taste and true historical interest than ***Lost Soul.*** Whereas almost all of the material on ***Lost Soul*** boasts contemporary instrumentation and arrangements, the weight on all of the Solid Smoke albums is carried by the classic street-corner harmonizing of these multi-male groups.

These three albums represent another important step for the San Francisco-based Solid Smoke, which specializes in finding the best old soul and R&B material and licensing it either from the owner label or the original producer. Like all the previous Smoke reissues, these boast dandy photos and comprehensive and informative liner notes that detail the recording and studio histories of the groups. And in each case the labels on the records themselves duplicate the color schemes of the cover art.

While speaking of street-corner harmony, we should note the four-record series put out earlier this year on the Ambient Sound label, distributed by CBS. These albums, by the Capris'***There's A Moon Out Again,*** [FZ37714], Randy and the Rainbows' ***C'mon Let's Go,*** [15], The Mystics' ***Crazy For You*** [16] and the Harptones'***Love Needs the Harptones*** [17], all are issued under the rubric "An As Is Production: The Sound of Human America" and all were recorded in a direct and simple manner meant to recapture the feeling of the hits these groups originally had in the early sixties. Indeed, the groups do variations on these hits, e.g., the Mystics do "Hush My Darling" (the hit was "Hushabye"); the Capris do "There's A Moon Out Again" ("There's A Moon Out Tonight" became a number one hit in 1961, three years after the Capris first recorded it). These groups are also multi-male aggregations, save for the Harptones—the only black group among the four—who had a woman, Linda Champion, as part of the quartet. Like the Solid Smoke records, this is nicely-done nostalgia, albeit from groups that were a little better known to the pop audience.

Another excellent nostalgia item—particularly for me, since I lived in North Carolina for four years where this music is king—is ***Endless Beach*** [Epic EG 37915], a double-record compendium of evergreens that college kids in the Southeast (particularly around Myrtle Beach, the Southeast's Santa Monica) danced The Shag to. The selections range from Major Lance's 1963 "Mama Didn't Know" to Tyrone Davis' 1980 version of "How Sweet It Is To Be Loved By You." Included along the way are several numbers each from the Tymes, Robert John (including 1968's "If You Don't Want My Love," produced by David Rubinson before he relocated West) and even Tower of Power. See, the music doesn't have to ***come*** from the Southeast; they just have to be able to dance to it there. The album has a good, strong, steady feel to it, and serves as a nice reminder that disco is not the only dance music. However: any "Beach" collection that does not include material from the Tams and Maurice Williams & the Zodiacs (as this one does not) is seriously flawed.

If you are interested in Western music, Epic (again!) also has the three-volume (all double-record) ***Rockabilly Stars*** series, of which volume three [EG 37984] has just arrived. This fine set covers everyone from Johnny Cash ("Walking the Blues") to Carl Perkins (three songs, including "That's All Right," the Arthur Crudup song that was the first tune Elvis recorded for Sun) to John D. Loudermilk ("Tobacco Road") to Rose Maddox ("Hey Little Dreamboat") to Little Jimmy Dickens and the Collins Kids. Perhaps most noteworthy are two previously unreleased tracks, "That's the Life I Have to Live" and "If Her Love Isn't True," cut in 1955 by the Everly Brothers.

These Rockabilly sets boast some absolutely beautiful hand-tinted photos, including one knockout shot of the Everly's (in black blazers with silver-grey piping) sitting on the porch with their guitar-strumming father.

Finally—and appropriately so—let us give praise to the two true "resurrection" albums of our lot, since they both manifest so inspirationally the power of native American blues forms as they stretch across the years: ***The Glory of Alberta Hunter*** [Columbia FC 37691] and ***Sippie*** [Atlantic SD 19350] by Sippie Wallace with Jim Dapogny's Chicago Jazz Band and Bonnie Raitt. Each of these women, now in her 80s, made her first important recordings in the blues heydays of the 1920s, and both, still singing wonderfully and well, now get the chance to reach out to contemporary audiences. In fact Hunter, under producer John Hammond, has now done three albums since her return to the scene five years ago.

Alberta's record, as one might guess, is the more sophisticated of the two, with the edge slightly to the jazz side of the blues, while Sippie's is more boisterous and downright cantankerous, with the edge very clearly on the Dixieland side of the blues. Sippie's material includes a great duet with Bonnie on "Women Be Wise" as well as "You Got To Know How" and "Mighty Tight Woman." Alberta offers a very unusual version of "The Glory of Love," a Yiddish/English "I Love You Too Much," and my own favorite, "You Can't Tell the Difference After Dark," all sandwiched between opening and closing religious numbers, "Ezekiel Saw the Wheel" and "Give Me That Old Time Religion."

VISIONS OF THE FUTURE

(continued from page 80)

two-channel digital recorders will allow classical labels to take advantage of the technology, and digital mixdowns of analog multi-track sessions will probably be common. With the exception of digital time and pitch modification, audio signal processing will probably remain analog until significant advances in the state of the digital art are made.

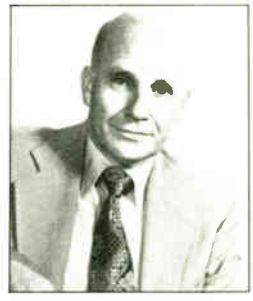
Ronald H. Means
Vice President, Marketing and Sales
JBL, Professional Division

JBL has been investing much of our design and engineering time toward the development of new products for the audio recording market. We have justified this because we feel there is growth potential in this industry through the next five years. Those reasons come from two areas:

1. Expansion of the market through the integration of audio with video, i.e. television, film, and audio visual/multi-image all are using a higher quality audio mix and have required more sophisticated audio each year.
2. A look at the demographics shows that there are now two major record markets as opposed to one, as was the case five to ten years ago. One market is the 15 to 25 year old age group. This age group was the major "rock and roll" market of the 60's and 70's. These people grew up with music and are now a major buying force that comprise the second market of 25 years and older. This buying group is not today being exploited as is the current 15 to 25 year old group, which has decreased in size.

In short, we have two markets instead on one; the combination of the two markets are larger than one was; and we are not yet taking advantage of the older market group.

I believe the combination of these factors, demographics and further integration of high quality video and high quality audio will present a major uplift for the audio recording market in the next five years.



Stephen F. Temmer
President
Gotham Audio Corporation

The recording industry is obviously in a period of flux. The next five years will tell us something about our future. No one can guarantee our survival. One thing is sure: there will always be a need for audio—likely more in the form of "follow video" than in the form it has taken till now.

Digital technology will, I believe, drain too much money out of our industry—money which the consumer is unwilling to pay for the final product which is *Music*. Quality improvement is always welcome; higher prices are not.

The next five years will find more and more inexpensive but servicable equipment taking over from what used to be called "professional equipment." As always, competition will concentrate on the ability of people not equipment!" ■

THE GRATEFUL DEAD

(continued from page 55)

linkage which they and their audience achieve quite regularly in concert. "I don't know why," says guitarist Bob Weir wearily. Perhaps bassist Phil Lesh offers a clue when he says, "If I never had to set foot in a studio again I'd be a happy man."

If I had to list only a handful of Grateful Dead albums to exemplify their open-minded approach to writing, performing and recording, I guess it'd be these: ***Anthem of the Sun*** [1968], a resoundingly psychedelic collage of live and studio material in a rainbow of musical styles and orchestrations, spliced, overdubbed, and crossfaded to amusing and amazing effect; ***Workingman's Dead*** [1970], a straightforward collection of some of the band's best songs, well-performed and sparingly recorded; ***Live Dead*** [1970], a nonstop performance demonstrating the range of music at their disposal and the gestalt mentality that makes their improvisations work; Bob Weir's ***Ace*** [1972] and Jerry Garcia's ***Garcia*** [1971], each in its own way a masterpiece and the sources of some of the Dead's strongest stage material; ***Europe '72***, flawed recordings but great playing and fine songs and jams; ***Blues for Allah*** [1975], a little short on ambience but very ambitious in composition; and ***Reckoning*** [1981], a technical pinnacle and damn friendly collection of songs. But that's just today's version of the list; ask me again tomorrow, or ask any of a half-million Deadheads, and you'll get a different list. "It's definitely, truly and authentically a new experience every time," says Jerry Garcia, "and that's not bullshit." ■

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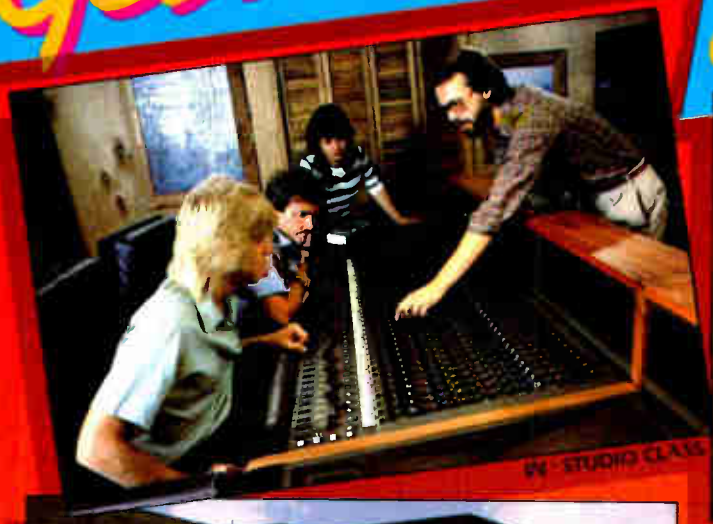

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