

DECEMBER 1982  
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THE RECORDING INDUSTRY MAGAZINE

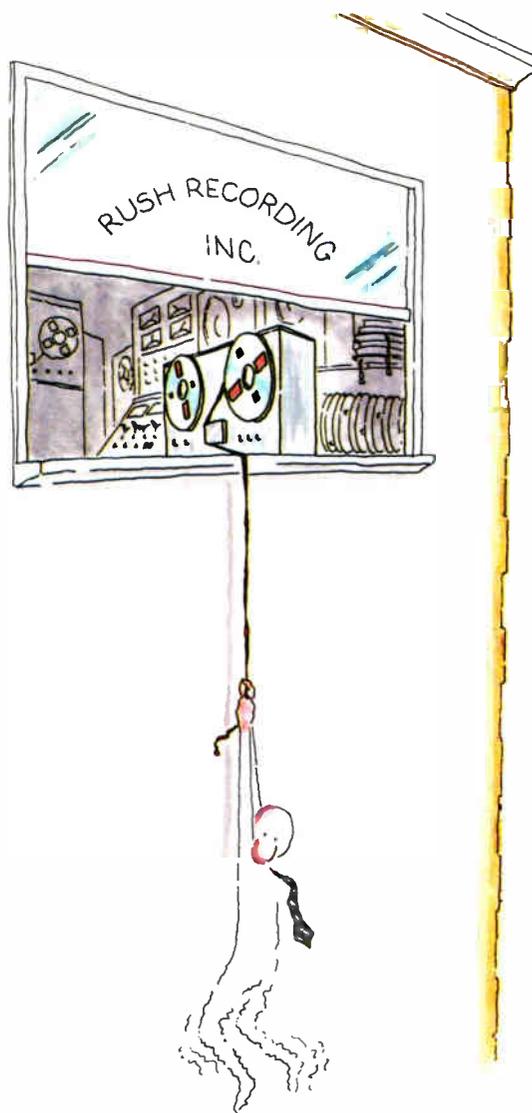
# Mix

Special Tape-To-Disk Issue

Listings:

- Mastering
- Pressing
- Duplication

Audiophile Labels  
Tape Duplicator's Forum  
Peter Mclan  
Record Restoration



## Audio engineers who try Maxell won't let go.

Maxell quality saves a lot of recording situations. Maxell meets your 1/4" 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.

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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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World Radio History



**Cover:**  
Masterdisk's tandem disk cutting room in New York City, equipped for 3M digital mastering session.

**Photo by:**  
Tim Fiat

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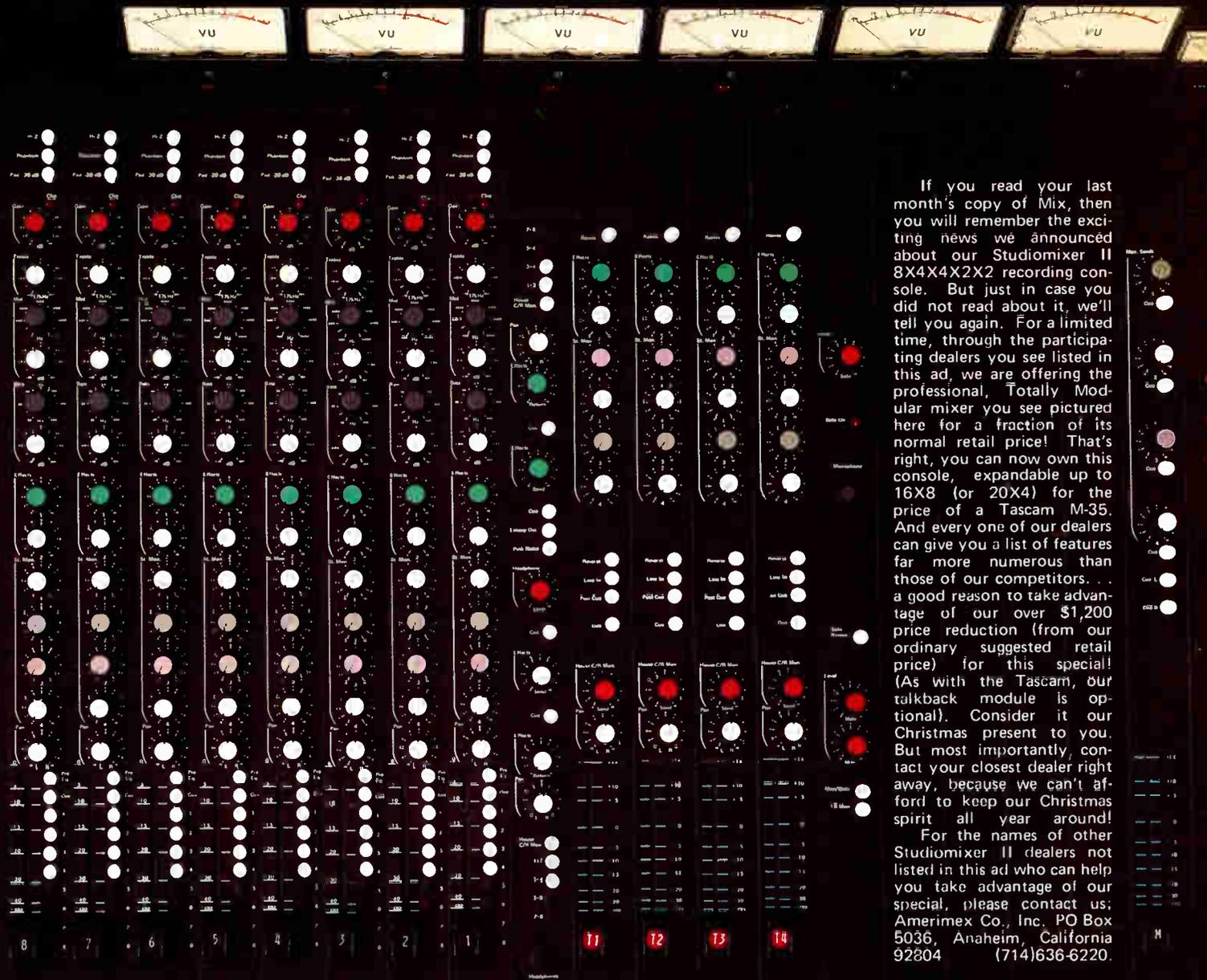
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If you read your last month's copy of Mix, then you will remember the exciting news we announced about our Studiometer II 8X4X4X2X2 recording console. But just in case you did not read about it, we'll tell you again. For a limited time, through the participating dealers you see listed in this ad, we are offering the professional, Totally Modular mixer you see pictured here for a fraction of its normal retail price! That's right, you can now own this console, expandable up to 16X8 (or 20X4) for the price of a Tascam M-35. And every one of our dealers can give you a list of features far more numerous than those of our competitors. . . a good reason to take advantage of our over \$1,200 price reduction (from our ordinary suggested retail price) for this special! (As with the Tascam, our talkback module is optional). Consider it our Christmas present to you. But most importantly, contact your closest dealer right away, because we can't afford to keep our Christmas spirit all year around!

For the names of other Studiometer II dealers not listed in this ad who can help you take advantage of our special, please contact us; Amerimex Co., Inc. PO Box 5036, Anaheim, California 92804 (714)636-6220.

# Studiometer II (Now for the price of an import)

Dear Mix,

First, my deepest thanks for running my Letter To the Editor (Feedback, Oct. '82) in its entirety. I am most grateful.

In that same issue you carried a news item ("Audio Coalition Established") announcing the formation of the Audio Recording Rights Coalition by the EIA, for the purpose of defeating any royalty tax on hardware and tape. As a distributor of recording hardware and software, but also a music publisher, occasional songwriter, and former broadcaster, in fairness I have mixed emotions about this most serious matter.

The first thought is to provide in the copyright law the public's right to make recordings for personal (non-commercial) use. But the record (audio) industry has already learned to its horror that consumers are avoiding purchase of records by making air-checks and by dubbing a friend's album. Can this be deemed a personal, non-commercial usage? I don't think so. Is this fair to the creator who relies on the sale of records for his livelihood (and for his ability to continue creating the works we want to hear)? I don't think so. Do you?

So the second thought is to "tax" tapes and/or recorders to compensate the creators (authors, publishers, producers, artists) for all of the supposedly non-commercial recordings we make of their "brainchildren." This very tax has existed for decades in Germany with so little public outcry that virtually none of us is aware that it's been going on. I feel that the tax will be modest and that this is the best way to meet *everyone's* needs. Don't forget, the alternative might be total outlawing of so-called home-taping. Perhaps the ARRC doth protest too much.

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

Dear Mix,

While reading my October copy of Mix I read with horror Larry Boden's misrepresentation of the facts concerning the "monitors" Frankford/Wayne (and such) uses in our cutting rooms. Over the years it has been a firm belief of mine that the client should be able to make a smooth "sound" transition from the studio to the mix room and finally to the disk mastering facility without any confusion or audiophile hype. Frankford/Wayne does indeed stay in the "mainstream of commonly used monitors" with NO audiophile type speakers to be found here.

The majority of our seven cutting rooms are equipped with stock JBL 4350/55 or 4343 bi-amped 4 way systems "Sonipulsed" and 1/3 octave equalized. Our other cutting room "standard" monitor systems include Big Reds, UREI 811 Time Aligns, JBL 4311's and 4330's plus the standard cube types of Auratone or ADS.

So PLEASE don't lump all New York mastering houses together. We do anything and everything with our clients interest in mind.

Sincerely,  
Thomas S. Steele  
Frankford/Wayne Mastering Labs, Inc.  
New York City

Dear Mix:

I am forced to write to correct several errors in the October, 1982 issue of the Mix. I am



quoted on page 12 of that issue concerning monitor speakers used at WFMT radio in Chicago. However, I am sorely misquoted and most of the model numbers and/or brand names are incorrect. Please be advised of the following:

The B&W 801 is used as the monitor speaker in our Control Room C, which operates the Music Performance Studio. The B&W DM6 is used in our Orchestra Hall control room. The Celestion SL-6 is used in our "on-the-air" Control Room A as a monitor, and also in our control room at Chicago's Civic Opera House for broadcasts of the Chicago Lyric Opera. The SL-6, however superb, is NOT the first speaker put into the main control room that we didn't throw out. We lived for many years with a pair of AR 10 Pi.

We appreciate your including WFMT in your survey. It is nice to be acknowledged in your fine publication. I hope this will clear up some confusion that may have been caused to your readers and the manufacturers involved.

Sincerely,  
Rich Warren, Producer  
WFMT  
Chicago IL

Dear Mix:

I've just finished reading Mr. Maloney's article in the October, 1982 issue of Mix Magazine on Industrial Show Sound Systems. You're a good writer, Mr. Maloney, and certainly entitled to your opinion. Now, I wonder if you would be so kind as to listen to mine.

I work for the company that produced that "typical" show for John Deere, and if you consider that show as being "typical," well then, you certainly are a seasoned veteran when we go into an immense place like the Superdome or the Silverdome or the Astrodome or Fumon Hall in Tokyo or the Las Vegas Convention Center or any other dome, hall, center in the world, we're smart enough to hire big room specialists.

There is nothing like an Industrial Show in the Entertainment world, so don't try to compare it. We may work on an Industrial for a year, but everything is put off to the last possible minute before it's locked in stainless steel. Why? Because our clients want their shows to be as current and up-to-date as this morning's news literally. There may be as many as a dozen different studios recording and re-recording messages that *must* be delivered and that change on a daily, semi-daily, make that hourly basis. That's why tape levels are different, and cuts are out of order. Because, that's the way it is. And as long as you took the liberty of mentioning our client in the

Superdome, something that is usually done only after permission is granted, we wish you would have mentioned the fact that he was extremely pleased with the result. Because he was. And that's what's important to us.

Best regards,  
David B. Dister, General Manager,  
Audio Services Group  
Maritz Communications Company  
Fenton, MO

Dear Mix:

Just thought that I'd speak my piece about something that bothers me just a little. True enough, home taping IS taking money from the artists' pocket. However, (and I could be wrong!!) it seems to be the middle men who are doing most of the screaming.

Anyway, what bothers me a whole lot more is the move to tax blank tapes and recording equipment. A horrible fate, I say. Might I remind you all recording is a right, not a privilege!!! Not everyone is taping albums, you know. For example, my company, Island Sound, is a small studio geared to the requirements of new, or just-starting-out-type artists as well as those hard-working veterans who need a demo to help them find work. They are America's future in music. Not only do they have to contend with economic survival on a day-to-day basis (some of these folks have families), taxes, inflation, and putting something aside to do some recording, they might now have to pay a surtax to already established artists. It is bad enough to have to compete for earspace with a known artist, but to pay him/her a fee for every copy of your OWN music is somewhat akin to unfairness. All this does is further reward those who are established and penalize others who also have a right to pursue the creative arts and be heard.

I'm not saying that nothing should be done. Why can't we legislate and tax EACH record rental? Or maybe something like that? I'm as appalled as you are, but the current proposal just isn't fair. So far, no one has risen to the defense of small artists, students, independent secretaries, and countless other non-abusing tapers. These folks run the risk of waking up one morning to the reality of just one more tax issue in which they had no fair representation.

I'd appreciate hearing from other concerned individuals

Thanks for your time,  
Charles Wolff, owner  
Island Sound  
Bainbridge Island, WA

# CURRENT

## In Case You Missed AES

by David Schwartz

I've been going to Audio Engineering Society Conventions for about ten years. They have always been enjoyable, informative, mind boggling, frustrating, grueling and generally delightful; however, this year's version was something very special and different. For starters, the complexion of the show has changed. No longer two shows per year, the event now alternates annually between New York and L.A. The L.A. venue has also changed from the downtown Hilton to the Disneyland Hotel. (It may sound funny, but it's a 1400 room extravaganza of a complex—though lacking in restaurant quality and noise isolation between rooms.)

The change was significant. After several years of depressed industry economy there seemed to be the emergence of a new spirit. There were few signs of the shellshock of recent gatherings, but more a determination by the survivors of the industry catharsis to cut the hype and make it work in the real world. Gimmicks seemed to be at an all time low; and quality, reliability and flexibility seemed to be the vogue.

Running from October 23 through 27, the 72nd AES housed 30,000 square feet of exhibit space representing 212 manufacturers and suppliers. Pam Davis, coordinator of the event estimated the attendance unofficially at 8,660.

There are four major components that interact to give AES shows their special sort of

character: technical papers, equipment exhibits, administrative pagentry and, of course, the parties. The technical paper presentations that seemed to generate the most interest this year dealt with the emergence of calculators and computers as indispensable tools in the design and analysis of sound systems and acoustic environments; and psychoacoustics, which has just recently come into its own as sophisticated techniques have been developed to allow better understanding of how sound is perceived and manipulated by the brain.

As exhibits went, perhaps the closest thing to a breakthrough was dbx's demonstration of their model 700 digital audio processor, a delta modulation system (as opposed to PCM) with 110 dB dynamic range, full audio frequency response using a 700,000 Hz sampling rate (!), and a price tag that dbx claims as being about one fifth of the competition's.

Other equipment that seemed to attract much attention included Studer's new A810, a four speed (3.75 to 30 ips) microprocessor controlled two channel audio recorder with center track SMPTE ability; their A808PCM digital eight channel recorder with sampling frequencies of 48 and 48.1 kHz and two analog channels for cueing and SMPTE code; Crown's Delta Omega™ 2000 Audio Amplifier which uses an analytical sensor to diagnose and compensate for anomalies in the circuit to the speaker; Nagra's VT-Audio series twin capstan recorders with a wide variety of speed modes and an available servo controlled editor that includes a built-in cutter; Yamaha's debut recording mixer, the RM 1608, with electronically balanced XLR mike inputs and unbalanced RCA jack tape inputs; Sansui's 14 bit PC-X1 TRICODE PCM processor that

interfaces with any VCR; the return of the API recording console in the form of Datatronic; and UREI's refined 8:3 B monitor system. On exhibit for the first time at AES were remote recording trucks including Le Mobile, Record Plant, Westwood One and Full Sail.

Most elaborate production by an exhibitor went no contest to Sony, whose Rick Plushner had assembled The Sony Digital Theatre. The elaborately detailed environment featured digital audio recorded action scenes from "Poltergeist," "Star Trek," "E.T.," and a Kenny Loggins concert which were cleverly edited and played back on a 100 inch video monitor and in four channel sound over JBL Bi-Radial monitor speakers. The Sony digital popcorn was something else not to be missed.

SPARS was quite active at the show as Record Plant's Chris Stone passed the presidential gavel over to Criteria's Mack Emerman, noting the growing responsibility of the organization as "the infant has turned into an industry." Emerman stated that the new board would "concentrate on increasing the value of the organization to the studios by emphasizing education and communication with an emphasis on the business and practical aspects." He also outlined upcoming SPARS activities including a January seminar session in Miami, an introductory event in Texas for April, a video production meeting in Chicago next June and a business seminar in New York prior to the next AES.

The Audio Engineering Society also celebrated the changing of the guard, with Thomas G. Stockham assuming the role of President and Raymond E. Cooke becoming President Elect.

As for the parties, we'll save that for another issue.

## notes

**Audio Kinetics, Inc.**, the American distributor for the Q-LOCK 3.10 audio synchronizer, has opened their new demonstration and training studio located at their North Hollywood main facility. For more information about the studio, contact Audio Kinetics, Inc., 4721 Laurel Canyon Boulevard, North Hollywood, CA 91607 (213) 980-5717... **Mort Fujii**, **Cetec Gauss** President, recently appointed **Tom Carlile** as President of Gauss Loudspeakers, based in Sun Valley, and **Hans Freytag** as European Sales Manager of Gauss Loudspeakers, based in England... Former marketing manager for Ampex Audio-Video Systems, **Richard Sirinsky**, has been appointed director of sales development for **Ampex Corporation**... **Dr. Thomas G. Stockham, Jr.**, founder and President of **Soundstream** for the past 7½ years, has resigned as President and has been appointed Chairman of the Board of Soundstream. **Robert B. Ingebret-**

**sen** has been appointed President and Chief Operating Officer of Soundstream... **Doug Moody**, Mystic Records, 6277 Selma Ave., Hollywood, CA 90028, has formed **DM Record Distributing**, an independent record sales office which will operate out of the Mystic Records and Mystic Sound Studio building in Hollywood... **Robert H. Lowig**, formerly with Beyer, has been appointed USA National Sales Manager for **Soundtracs Inc.**, the USA sales and distribution organization of Soundtracs International, Ltd... **Emil Handke**, Sales Manager of **Emil Handke**, Sales Manager of **Sound Workshop Professional Audio Products, Inc.**, has appointed **RMS Sound** as a full line dealership for Sound Workshop Products in the Northwestern United States... **Synergetic Audio Concepts, Inc.**, (Syn-Aud-Con) of San Juan Capistrano, CA, have announced their Winter/Spring 1983 seminar and workshop schedule: Sound Engineering Seminar: Jan. 18-20; TEF® Instrumentation

Workshop: Feb. 1-3; Microphone Workshop: Feb. 15-17; Concert Hall Design Workshop: Mar. 18-21; Microphones & Teleconferencing: Apr. 5-7; Financial & Management Workshop: Apr. 19-21; Loudspeaker Array Workshop: May 3-5. For further information write or call Syn-Aud-Con, P.O. Box 669, San Juan Capistrano, CA 92693... **Kent McGuire**, National Sales Manager of **Sound Technology**, has announced the appointment of **Sonny Funke**, principal of Funke & Associates, as Sound Tech's new Pro-Audio and Broadcast Representative for the states of California and Arizona... At **MXR Innovations**, **Debra Alley** has been appointed Marketing Manager, and **Bob Wilson**, MXR Export Sales Director, will assume the additional responsibilities of Domestic Public Relations... The **Professional Digital Audio Division of Mitsubishi Electric** has relocated to newer quarters at 110 New England Avenue West, Piscataway, NJ 08854, telephone (800) 631-5377 or (201) 981-1414.

# Why Beyer microphones give you more extraordinary performance for the most ordinary applications.



Beyer M 88



Beyer M 201



Beyer M 160

**There are other microphone alternatives when high sound pressure is a factor.**



As Sennheiser claims, the MD 421 undoubtedly stands up to extremely high decibel levels and has other features that have contributed to its popularity. But if you're already using the MD 421 to mike loud instruments or voices, we suggest that you investigate the Beyer M 88.

The Beyer Dynamic M 88's frequency response (30 to 20,000 Hz) enhances your ability to capture the true personality (including exaggerated transients) of bass drums, amplified instruments and self-indulgent lead vocalists.

The Beyer M 88 features a matte black, chromium-plated brass case for the ultimate in structural integrity. Beyer microphones are designed for specific recording and sound reinforcement applications.

**When you need a rugged and versatile microphone, consider the alternatives.**



For over 10 years, engineers have used mics like Shure's SM57 for the widest variety of applications in the studio. And we feel that one of the main reasons more engineers don't use the Beyer M 201 in this context is simply because they don't know about it. Those who have tried it in the full gamut of recording situations have discovered how it can distinguish itself when miking anything from vocals to acoustic guitar to tom toms.

The M 201's Hyper-Cardioid pattern means that you get focussed, accurate reproduction. Its wide and smooth frequency response (40 to 18,000 Hz) provides excellent definition for the greatest number of possible recording and sound reinforcement situations.

Each Beyer Dynamic microphone has its own custom-designed element to optimize the mic's performance for its intended use.

**You may not always need a condenser microphone for "critical" recording applications.**



Some engineers prefer condenser microphones like the AKG C 414 to accurately capture the subtle nuances of a violin or acoustic piano. But should you have to deal with the complexity of a condenser system every time this kind of situation comes up?

The Beyer Dynamic M 160 features a double-ribbon element for the unique transparency of sound image that ribbon mics are known for. While its performance is comparable to the finest condenser microphones, the M 160's compact size and ingenious design offers significant practical advantages for critical applications.

Beyer Dynamic microphones offer state-of-the-design technology and precision German craftsmanship for the full spectrum of recording and sound reinforcement applications.

**The Dynamic Decision**

**beyerdynamic** 

## NORTHEAST

At *Highland Studios* in Delmont, PA, *The Dog Run Boys*, nationally known bluegrass quartet, is recording their second album, produced by *Rick Malis* and *Mark Valenti* for Markisa Records, engineering by *Gary Popotnik* and *Dan Ferraro* . . . At *Fishtraks Recording Studio* in Portsmouth, NH: Portland-based *The Kopterz'* 45 will be released this month. Southern Maine's *Raven* finished mixing a couple of tunes headed for a vinyl release. . . *B.B. King* is recording his latest blues album at *M & I Recording* in New York, NY with some of the greatest blues and jazz musicians around. His album is being produced by his manager *Sid Seidenberg* for SASCO Productions, Inc., to be released on MCA Records. . . Recent projects at *Stillwater Sound Studio* in Stamford, CT include *Direct Drive* recording and mixing three songs with *Earl Valentine* producing, *Gil Kaufman* and *Danny Wilding* mixing a collection of home recorded material, and *The Romero Brothers* recording a live-in-the-studio set. All projects were engineered by studio owner *Dominick Costanzo* . . . *GRP Records* in New York, NY has begun major recording in their new in-house studio facility called the "Review Room." Just completed is *Dave Grusin's* soundtrack for NBC-TV's new series, "Saint Elsewhere." The soundtrack was mixed and recorded using SMPTE interlock for 24 track and video. . . At *Secret Sound* in New York, Japanese jazz artist *Shigeharu Mukai* of PMC International is recording his solo album with tracks being put down by such artists as *Omar Hakim*, *Anthony Jackson*, *Jeff Mironov*, *Manolo Badrena* and *Jorge Dalto*. *Jeremy Wall* is producing, *Jack Malken* engineering, *Warren Bruleigh* and *Nina Siff* assisting. . . At *Trod Nossel Recording Studios* in Wallingford, CT, *Plan 9* continued work on their second LP. *Steve Talevi* came in to cut two originals he wrote with his brother, L.A. session guitarist *Mitch Talevi*. *Mike Pozzato* hit a home run with his mix of "Baseball."

## SOUTHEAST

At *Audio Media* in Nashville, TN, *Ricky Scaggs* has produced three of his own albums—which included the number one singles "I Don't Care" and "Crying My Heart Out Over You"—and he was back this week producing the first major-label album project for his in-laws, the *Whites*, for Elektra Records. . . *Roger Whittaker* returned to

*Sound Emporium* in Nashville, TN to do an album of country and MOR standards for the Tembo label (distributed by RCA). It was the third big project this year for Whittaker and producer *Chet Atkins*. *Mike Poston*, who engineered the album, reports that it is now complete. . . At *Bullet Recording* in Nashville, TN, *Dottie West* and *John Schneider* in recording voices for an upcoming animated television special "The Raccoon and the Lost Star." The Canadian based producer *Kevin Gillis* will be returning in a few weeks to record tracks with the duo for the same special. Engineer on the project was *Jim Baird* . . . Currently at *Triiad Recording Studios* in Ft. Lauderdale, FL is bass player *Jaco Pastorius* (formerly with Weather Report), mixing a live album recorded on his most recent tour of Japan. *Peter Yianilos*, of Artisan Recorders, is engineering and *Vincent Oliveri* is assisting on the sessions, while *Michael Knuckles* is assistant producer for Mowgli Productions. . . Film star/songstress *Julie Andrews* was in *Sound Emporium* in Nashville, TN to record a double album for a British label. Grammy-winning Nashville producer *Larry Butler* produced, with *Harold Lee* engineering. *Gary Laney* and *John Abbott* served as assistant engineers. The project included many tunes written by Nashville writers and made famous by country entertainers. Ms. Andrews previously recorded at Sound Emporium in 1977. . . At the *Soundshop* in Nashville, TN, a joint effort by *Millie Jackson* and *Brad Shapiro* produced sessions for the R & B group, *The Facts of Life*, engineered by *Ernie Winfrey*.

## NORTH CENTRAL

At *Tantus Studio*, Detroit, MI, *Percy Hargrove* has just finished producing "Funk It Out," written by guitarist *Artie Anthony*, and featuring *Willie Wooten* on keyboards and *Randy Redlin* on drums. Also at Tantus, *Dennis Armstrong* and *Cane Creek* have just completed a 16 track recording which is headed for Nashville, entitled, "You and Me Together," featuring *Gloria Walker* . . . At *Studio A*, Dearborn Heights, MI, *The Incredible Mohawk Brothers* back in the studio working on rhythm tracks with *Eric Morgeson* producing and engineering. Detroit Symphony Orchestra cellist, *Dave Levine*, working on a self-produced project and producer *George McGregor* overdubbing vocals on a soon to be released single. *Probe II, Inc.* with executive

producer *John Maxey*; producers *Ivy Hunter* and *Greg Dokes*, have just completed mixing on the group, *Empluse*.

## SOUTHWEST

*Reelsound's* remote 24 track bus out of Manchaca, TX, just completed a busy schedule with projects in Texas. In San Antonio to record *Judas Priest* for D.I.R.'s King Biscuit Flower Radio Show. *David Knight* producing. To Dallas and Houston for Total Experience to record the *Gap Band* in concert. . . At *Rivendell Recorders* in Pasadena, TX, *Gene Scott* recently completed tracks on a single release for King Productions. *Lazar*, a Houston based band recorded a single with *Hilton Joseph* producing. *Paul Mills* has been engineering an EP for *Marcus Robinson* . . . *ACA Recording Studios* in Houston, TX, has completed an album and single for *Johnny Cantrell*, C & W artist, to be released on Challenge Records. *Clarice Gatlin*, gospel singer, has completed an album at ACA to be released on WABC Records. . . In Dallas, TX, veteran engineer-producer *Phil York* is ever busy recording the Texas music scene at area studios. Current projects include *The Road Rats*, the infamous *Bowley and Wilson*, *Vizion*, *Jerry Max Lane*, the *Snakes*, *Dena Kaye*, Canadian *Faye Stevens* and hot new rock singer *Jill Bradley*

## NORTHWEST

Action at *The Automatt* in San Francisco, CA includes *Whispers* recording an album for Solar Records with *Nicholas Caldwell* producing, *Leslie Ann Jones* engineering and *Wayne Lewis* assisting. . . At *High Plains Audio Recording Studios* in Denver, CO, "Cookin' with Flower," first LP from Denver's "Mary Flower," and "Strikin' It Rich," second LP from bluegrass band *Goldrush*. Both are due to be released by Jerry Hillyard's Bare Records. Both produced by *Jim Ransom* and engineered by *Peter Dockendorf*. . . At *Hyde Street Studios* in San Francisco, CA, guitar and vocal overdubs were recorded in Studio A for the soundtrack of *Planet of the Enchained Guitarists*, a sci-fi, heavy metal rock movie. *Bob Heyman* of Rock Justice produced. *Scott Church* and *Ricky Lynd* were the engineers. . . At *Fane Productions* in Santa Cruz CA, *The Chambers Brothers* recording new material with *Fane Opperman* engineering. *Mike Hand* finishing his newest single for Orphe-

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us Records with Opperman at the board... Recent activity with the *Bodacious Audio Inc.* remote truck out of San Mateo, CA, includes radio specials all recorded direct to the Sony digital mastering system. Produced by *Larry Yurdin* and *Herb Pallant: Asleep at the Wheel: Dave Haynes* engineering assisted by *Doug Dayson* and *Herb Pallant. Terri Gibbs: Brian Hauck* engineering, assisted by *Herb Pallant. Doc & Merle Watson: Brian Hauck* engineering, assisted by *Herb Pallant* and *Bill Ashley*... San Francisco, CA's *Bear West* owner and manager *Ross J. Winetsky* recently produced the new *Joanie Greggains* exercise LP with the president of Peter Pan records, *Martin Kasen*... At *Tres Virgos Studios* in San Rafael, CA, *Van Morrison* recorded a few new songs for his forthcoming album on Warner Brothers Records. Van produced this album. Engineering was by *Mick Glossop*, whose credits include Van Morrison's "Wavelength" and Frank Zappa's "Joe's Garage." *Robert L. Missbach* is the second engineer on the project.

The Music Group's *Danny Sheridan* is in cutting vocals on the new artist, *Cotton*, at *Unicorn Record's* 24 track in Santa Monica, CA, the Beach Boys' former studio. Sheridan, who also handles MTV's *Nina Blackwood*, has been co-writing with *Cotton* to develop the material and concept for an LP/video project... At *Larrabee Sound* in Los Angeles, CA, *Natalie Cole* currently working on a new CBS project with *Stanley Clarke* producing *Erik Zobler* engineering, assisting is *Judy Clapp*... At *Your Recording Studio* in Van Nuys, CA, *Celebrity Voices*, a company specializing in celebrity impersonation for telephone answering machines, has been in production since August this year. The response from the public is overwhelming. Each message is custom made complete with background sound effects. At *Soundcastle* in Los Angeles, CA, *Rita Coolidge* has been working on her new album for A&M records. *David Anderle* producing, *Joe Chiccarelli* engineering, and *Mitch Gibson* assisting... At *Gold Star Recording* in Hollywood, CA, *Gary Numan* in mixing with *Glen Feit* at the board... Recent projects from *K Disc Mastering* in Hollywood, CA cut by *John Golden*: A long awaited *Joni Mitchell* album for Geffen Records with mixmaster *Larry Hirsch*, two *Merle Haggard* albums and the soundtrack from a new *Clint Eastwood* film "Honky Tonk Man" with engineer *Ken Suesov*.

Studio A," *Roy Segal*, formerly CBS' and Fantasy Studio's general manager, takes over as executive V.P. of Fantasy Studios and the Saul Zaentz Co. Film Center. *Nina (Urban) Bombardier*, formerly of Chris Stone's Sausalito Record Plant, has joined Fantasy Studios as studio manager, and *Andrea Salter* continues responsibility of traffic manager of the Fantasy Studio office... *Guy Spellman* has joined *Reeves Sound Shop* in New York City as marketing director. In this capacity he will have overall responsibility for all sales efforts, advertising and promotion for the sound facility. Spellman served as a marketing consultant with Inner City Broadcasting's Apollo Theater Network and worked nine years with CBS, Inc. At CBS' Columbia Records he was a product marketing manager for two years, and, prior to that, a business development planning analyst... *Gail Sacks* has been named director of *Westwood One Recording*, a division of Westwood One in Culver City, CA, it was announced by *Norm Pattiz* president Sacks moves to Westwood One Recording from the Record Plant where she has served for the past two years as manager of the remote division. *Tom Jung* a New York-based record producer and engineer and owner of *Road 80 Inc.* recently acquired an X-80 Digital Audio recorder from Mitsubishi Electric Jung made the decision to purchase the unit after renting an X-80 from Mitsubishi for numerous recording projects over the past year... *Fedco Audio* in East Providence, RI, recently completed the installation of a Trident Series 80 console in their remote truck, which gives the truck a total of 56 m ke inputs available simultaneously. Recent projects include *Kool Jazz* at Carnegie Hall for National Public Radio... *Cetec Gauss*, manufacturer of high speed tape duplicating systems, announces the sale of its cassette duplicator systems to four companies. Acquiring the cassette tape systems are *Cassette Duplicators*, Salt Lake City, UT; *Jade Duplicators*, Bridgeville, PA; and *Record Technology*, Camarillo, and *ML Tape Duplicating*, Van Nuys, both in California.

## SOUTHERN CALIFORNIA

At *Artisan Sound Recorders* in Hollywood, CA, disk mastering engineer *Greg Fulginiti* recently mastered LP's for *Tane Cain* with producer *Keith Olsen* for RCA Records. *Randy Meisner* on Epic Records, produced by *Mike Flicker*...

## studio news

*Mountain Mobile Recording* in Tulelake, CA, is a new company specializing in remote recording. Located on the California-Oregon border, they plan to serve the entire Pacific northwest. The owners of this company are *Web and Karen Staunton*. *Web* is the Chief Engineer with numerous other engineers assisting. *Web* and *Karen* share the management position and *Karen* will be official Secretary... There's been a reorganization at *Fantasy Studios* in Berkeley, CA, along with the opening of their "all new

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New York City's *Skyline Studios*' co-owners **Paul Wicklife** and **Lloyd Donnelly** are proud to announce the installation of a Neve 8058 console and Studer A80/VU MK III 24 track and 1/2" 2 track tape machines. The Neve 8058 console includes custom modifications providing 40 inputs and 10 VCA subgroups... **Music Mill Studio** has moved to their new log cabin structure at 1710 Roy Acuff Place in Nashville, TN. The 24 track main studio and mixdown room features Trident TSM consoles and Studer tape machines... **Perfect Pitch, Inc.**, Cleveland OH, has opened with a new 24 track room. The room has a Neotek Series III-C 28 x 24 console, ADS BC-8 monitors and a Lexicon 224 V 4.4 reverb. This equipment was supplied by **Flanner's Pro Audio, Inc.** of Milwaukee, WI. This merchandise is complemented by a Studer A-80 MKII-24 track and a Studer B-67 2 track... **Luxury Audio Workshop** in Las Vegas, NV, has opened up Studio B. The new studio features a 24 x 24 Quad 8 mixing console, MCI JH114 24 track tape recorder, monitors by George Augsburger with JBL components. LAW has also added 2 Neumann U-67 tube mikes... **Evergreen Recording**, New York City, is proud to announce the total upgrading and expansion of its facilities. In addition to the re-designed and renovated control room, two new isolation booths have been built and the main recording area has been enlarged. Recent equipment acquisitions include a Harrison MR 3 console, an Ampex MM 1200 24 track, an Otari MTR 10 2 track, 24 channels of dbx noise reduction and an Ecoplate plate reverb... **Bearsville Studios**, Bearsville, NY, have announced the completion of a new control room for their Studio B. According to Studio Manager Griff McFee, the new room, acoustically designed by George Augsburger, features a top-of-the-line complement of analog recording equipment, including a Neve 8068 recording console with 32 inputs, Studer A80 Multitrack and 2 track, B67 2 track, UREI 813A monitoring, and outboard EMT 251... **Ron Rose Productions**, one of Detroit, MI's leading sound recording studios, is expanding its audio and video production services to include a fully computerized, 24 track, audio post-production studio. The new audio post-production studio, which allows producers to mix multi-channel sound tracks to 1 inch or 3/4 inch video tape, is a state-of-the-art system designed to meet the demand for increasingly sophisticated TV and video soundtracks... **New gear at Hyde Street** in San Francisco, CA includes an Ampex ATR 100 2 track recorder, a new Otari MTR-10 2 track and a Lexicon 224 digital reverb unit with all updated software programs... **Studio A** in Dearborn Heights, MI has recently purchased a 1936 seven foot Steinway B grand piano. Also added to the inventory is an Ursa Major 8 x 32 digital reverb with E4-1 software update and two AKG 451E microphones... **George Duke**, an L.A.-based musician and the producer of Sister Sledge, Taste of Honey, Rufus, and Jeffrey Osborne purchased a Mitsubishi Electric X-80 digital audio recorder. Duke has used the Mitsubishi system for a number of recording projects over the past two years, including his collaboration with bassist Stanley Clarke, "The Clarke-Duke Project" on Epic Records

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**by David Gans**

The last couple of years have seen a boom in audiophile records and tapes. New labels are springing up with reissues and original programming, and some of the major labels are releasing their own high-grade editions rather than licensing titles to outside firms. Half-speed mastered versions of older hits, new digital and direct-to-disk recordings, audiophile cassettes, digital cassettes... there's something for everybody, and everybody wants to get into the act.

As the prices of standard-issue records and tapes climb skyward, the \$16 or so you pay for an audiophile edition looks like more and more of a bargain. What you get for your money is more sonic information on vinyl that outlasts regular pressings, carefully prepared and packaged; cassettes are real-time dubs on superior tape stock in better shells than the conventional editions. For people who really care about high fidelity, the best available sound is the only sound worth hearing.

It's impossible to tell the whole story in the limited space available here. All the labels listed below take the utmost care in selecting, mastering and manufacturing their products; every style of music is available on one label or another. Most good-sized record stores have separate sections for audiophile recordings, and many stereo shops carry these products and use them to demonstrate systems.

Most of the labels listed will send a catalog and/or technical information upon request.

**Nautilus Recordings,**  
P.O. Box C,  
San Luis Obispo, CA 93406

Last year Nautilus introduced SuperCassettes, Maxell UD-XLII stock dubbed in real time from digital copies of two-track masters with Dolby B noise reduction. Titles include The Police, *Ghost in the Machine*; Tim Weisberg, *Tip of the Weisberg*; Elton John, *Greatest Hits Volume 1*; Linda Ronstadt, *Simple Dreams*; Quincy Jones, *The Dude*; Marcel Moise, *Mozart: Gran Partita*; and more, all also avail-

able on SuperDiscs (half-speed mastered at IAM, Irvine, CA; pressed on Teldec vinyl at KM Records, Burbank).



Nautilus produces original programming of its own in addition to half-speed remastered editions of other records. Two recent releases—Maynard Ferguson's *Tempest* and Spirit's *Reunion*—were recorded live on Soundstream's digital two-track, and the Moise title mentioned above was recorded live on Sony PCM1600 digital. Direct-to-disk titles include Victor Feldman, *Secret of the Andes*; John Klemmer, *Finesse*; Randy Sharp, *First in Line*; and others.

**Mobile Fidelity Sound Lab,**  
P.O. Box 919,  
Chatsworth, CA 91311

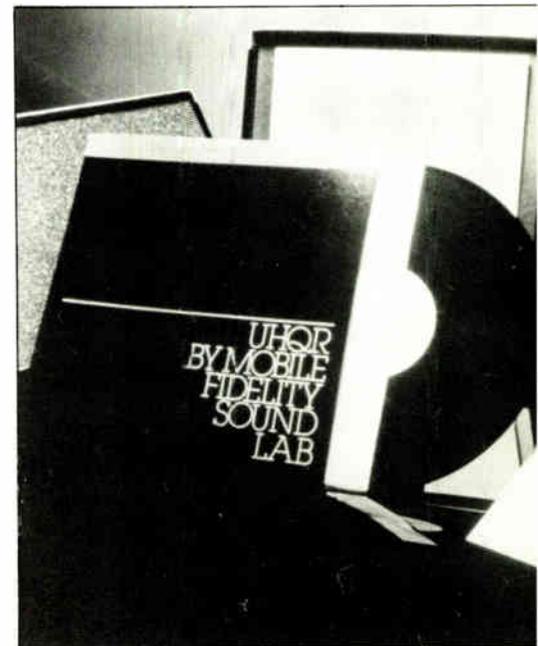
Mobile Fidelity has just released *The Beatles/The Collection*, a boxed set of all 13 Beatles albums in their original English editions enclosed in jackets with reproductions of the studio logs signed by the engineers who worked on the sessions. The package also includes a book of reproductions of all the album artwork, a numbered and signed Certificate of Authenticity, and Mobile Fidelity's "Geo-Disc" cartridge alignment device—all for a list price of \$325.

The UHQR series of ultra-high quality disks—a process developed by

JVC in Japan which is said to reach the theoretical limits of the vinyl-disk medium for S/N ratio, channel separation, surface vibration and distortion on a disk that weighs nearly twice as much as regular audiophile editions—includes Pink Floyd's *The Dark Side of the Moon*, Sir Georg Solti's *Holst: The Planets*, Earl Klugh's *Finger Paintings*, and other titles. At a list price of nearly \$50, UHQR isn't for everybody, but those who seek the ultimate platter are advised to check it out.

Mobile Fidelity now has digital audio cassettes, in beta format for Sony's PCM F1 Digital Processor and in VHS for Technics' SV-P100 Digital Audio Cassette recorder, available where the hardware is sold. Titles include *Dark Side of the Moon*, *Finger Paintings*, Supertramp's *Crime of the Century*, and more being made available each month at a retail price of around \$50.

Conventional cassettes (MFSL's are recorded in real time in BASF chrome stock) are not available in Dolby B and Dolby C versions. Titles include George Benson, *Breezin'*; Cat Stevens, *Tea for the Tillerman*; Genesis, *A Trick of the Tail*; *Kenny Rogers' Greatest Hits*; and many more, in-



cluding most of the titles mentioned above.

Upcoming releases include (disks) *Led Zeppelin II*; *Yes, Close to the Edge*; King Crimson, *In the Court of the Crimson King*; and (UHQR) The Beatles, *Sgt. Pepper's Lonely Hearts Club Band*.

**Sweet Thunder Corporation,**  
P.O. Box 11438,  
Beverly Hills, CA 90213

"A lot of half-speed remastered disks just aren't necessary," says Jackie Krost, Sweet Thunder's Vice President of A&R. The titles in the Audiophile Master Editions series are "benchmark recordings" which can benefit from the technical improvements gained in the audiophile mastering and pressing processes. "It's not good trying to make a great record better," says Krost. "We take something we know we can improve, so people won't feel bad paying \$16 for it."

Krost declines to identify the mastering room where Sweet Thunder's records are cut, for fear that the world will beat a path to its door. Pressing is by Record Technology (Camarillo, CA); Krost characterizes RTI's Bill Bauer as "a true perfectionist."

Audiophile Master Editions titles include Joe Cocker, *Mad Dogs & Englishmen*; *Frampton Comes Alive!*; Duke Ellington, *The Yale Concert*; Bernard Herrman, *Taxi Driver* original soundtrack; and others.

**Telarc Records,**  
23307 Commerce Park Road,  
Cleveland, OH 44122

A digital recording pioneer, Telarc's catalog includes Maazel/Cleveland Orchestra, *Tchaikovsky: Romeo & Juliet/Nutcracker Suite*; Ozawa/Boston Symphony, *Vivaldi: The Four Seasons*; Kunzel/Cincinnati Symphony, *Gershwin: Rhapsody in Blue/An American in Paris*; and more. A UHQR edition of Tchaikovsky's *1812* is characterized in the Telarc catalog as "digital dynamite;" the blurb concludes with a terse warning that the company "assumes no liability for damage to either the record or your playback equipment." (See the Mobile Fidelity section for information on UHQR.)

Telarc recently introduced *Omni-disc*, a boxed two-record audio and mechanical alignment aid. Side one has scales for adjusting cartridge, tone arm and turntable; the other three sides contain tones and noises which enable you to test wow and flutter, frequency response, room acoustics, etc. *Omni-disc* can be used with or without test equipment to tweak your system's performance and find out just how good your components really are. The instruction manual explains each step

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clearly and completely, providing some theoretical information as well as step-by-step procedures. The set sells for \$29.95.

**Sonic Arts Corporation,**  
665 Harrison St.,  
San Francisco, CA 94107

The Sonic Arts Lab Series includes Stephen Kates, cello, *Rachmaninoff: Sonata in G minor, Op. 19*; three volumes of *Midsummer Mozart* conducted by George Cleve; Ohyama/Cremona Chamber Ensemble, *Vivaldi: La Primavera*; Turk Murphy Jazz Band, *A Natural High*; San Francisco Swing Express, *Birth of a Band*; Warren Lubich, *Organasm*; and more. All of these are digital recordings except the Ohyama title, which is direct-to-disk.

The legendary Leo de gar Kulka masters nearly all of Sonic Arts' own titles in addition to cutting for outside clients. The Custom Services department offers mastering, pressing and printing for other labels or private recordings; satisfied customers include Ralph Records and Solid Smoke Records.

**American Gramophone,**  
206 S. 44th St.,  
Omaha, NE 68131

The *Fresh Aire* series by Mannheim Steamroller is AG's mainstay, along with a few titles by individual members of that group. Most of their records are recorded on 24-track and then mixed to digital on a Sony PCM 1610. The goal of the company, according to composer/performer/executive Chip Davis, is "to push the sonic limits" of the recording medium.

For Jackson Berkey's *Sunken Cathedral*, an analog recording was used to cue the cutting system while Berkey performed in perfect sync to cut a direct-to-disk master. This adventure was undertaken in order to avoid the use of limiters; by enabling preview of the program, the groove could be spread to accommodate variations in music levels, resulting in a much more dynamic recording.

**Clean Cuts, Inc.,**  
P.O. Box 16264 Roland  
Park Station,  
Baltimore, MD 21210

This label's latest release is a departure from the usual jazz fare. It's a novelty record featuring "Bruce Springstone" rapping about life in Bedrock and singing "Meet the Flintstones." The B side is "Take Me Out to the Ballgame," rendered with the same good humor and respect for the Boss as the A side, which is getting a lot of air-play everywhere Bruce is heard.

In a more serious vein, Clean Cuts offers *Dr. John Plays Mac*

*Rebennack* and Cedar Walton *Piano Solos*, two exquisite recordings by masters of the instrument. Other titles include Phil Woods Quartet, *Live Volume 1*; Jessica Williams *Rivers of Memory* and *Orgonomic Music*; and more on the way.

Dean Roumanis, who recorded the Dr. John album, is selling two-track dubs of the album to those who simply have to have the very best sound. Write to Clean Cuts for details.

**Sheffield Lab, Inc.,**  
P.O. Box 5332,  
Santa Barbara, CA 93108

Primarily a direct-to-disk label, Sheffield's catalog includes Tower of Power, *Direct*; classical guitarist *Michael Newman*; Harry James and

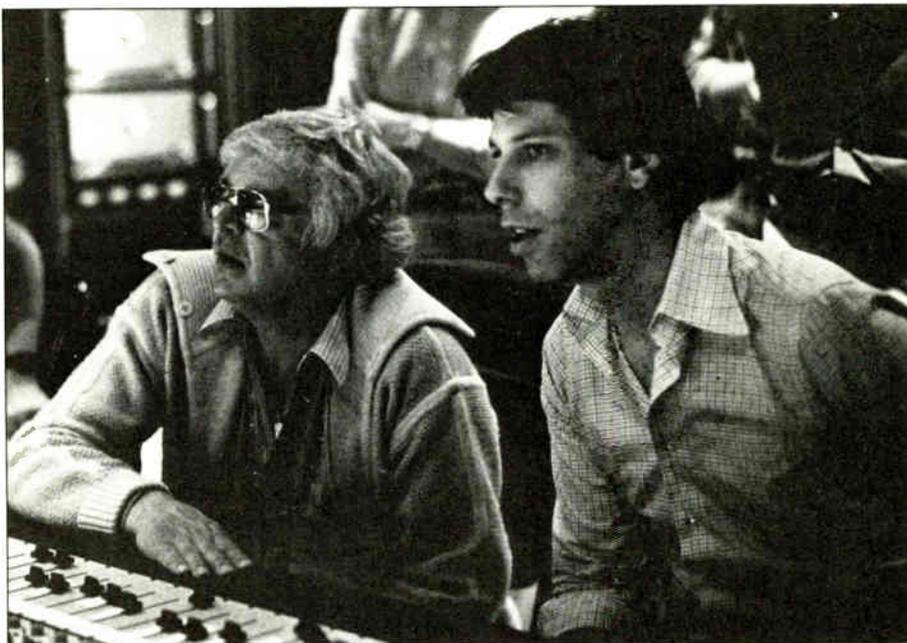
(Right) Sonic Art's Leo Kulka at the Neumann lathe

his Big Band, *Still Harry After All These Years*; Leinsdorf/Los Angeles Philharmonic, *Wagner* excerpts; and more. *The Sheffield Drum Record* serves as both enjoyable listening and a system test: these two seven-minute drum improvisations challenge cartridges, amplifiers and speakers with sizzling transients and deep bass-drum sounds.

**Miller & Kreisel Sound Corp.,**  
10391 Jefferson Blvd.,  
Culver City, CA 90230

M&K's RealTime label releases both digital and direct-to-disk recordings, some of which are available in

## Jeff Weber Audiophile Producer



Jeff Weber (right) with Maynard Ferguson (left) at Nautilus recording session.

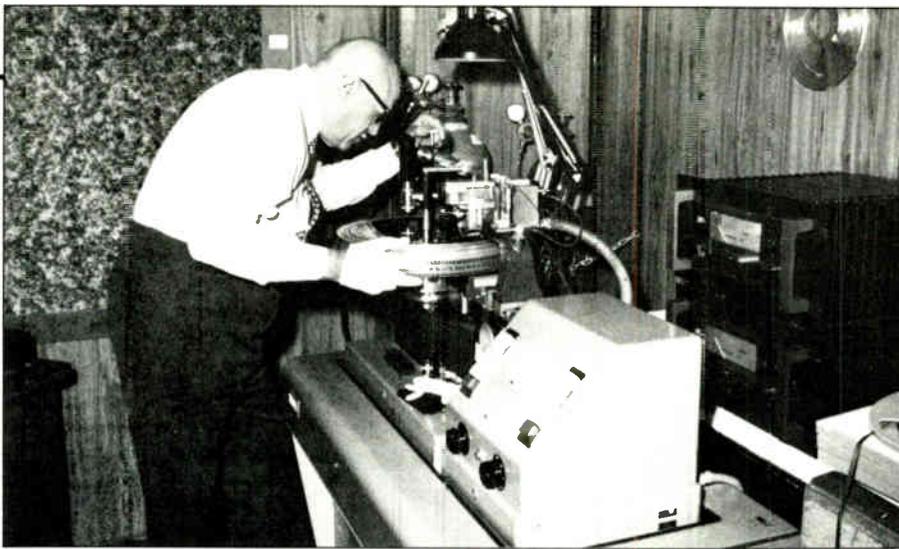
by Nina Stern

Traditional music lovers and demanding hi-fi equipment fanatics are discovering that the basic "no frills" studio techniques of old can produce some of the purest recordings on disk. Producer Jeff Weber (Sheffield Labs, Nautilus Recordings, Elektra/Musician) is a champion of direct-to-disk and live-to-track digital recording. He says his efforts to "achieve the ultimate goal of getting the listener and performer as close together as possible, sonically and emotionally" are highly regarded in the professional music community, and his projects "generally cost less than half what a multi-track session would,

and are completed in 90 percent less time." Still, Weber is having a hard time convincing the major labels to listen to his pitch.

"So many major label executives are convinced that multi-track recording is the only viable way to make records that my methods intimidate them," says Weber. "They are afraid that their artists cannot perform adequately unless they do a multi-track date, which allows them the forgiveness of mistake after mistake, and the technology to create an act where there was none.

"I'm not saying there's anything inherently wrong with multi-track;



it offers tremendous flexibility and excitement. But a lot of that excitement is only in terms of what you can do with technology."

Where Weber's approach differs from other producers' is in his emphasis on pre-studio preparation. "I do everything a 'normal' producer does, but in different stages," he says. "For me, the studio is the end result, not the beginning."

Weber works with artists for many months, generally "psyching them up" for the live recording session.

"Some artists, by the very nature of their insecurities, don't want to do it this way," he says. "But for the most part, I've found that by building their confidence for the live performance, we've created a fun project, not a chore. When everyone is playing together in the same room, they forget to worry about mistakes. Besides, we're not looking for technical perfection. What I want is to capture the raw emotion, and then transfer it onto disk."

Four recent projects which typify Weber's approach are two currently charting Elektra/Musician releases — Tom Scott's *Desire* and *Echoes of an Era II* (Nancy Wilson, Chick Corea, Stanley Clarke), and two original LPs on the Nautilus Recordings label—Lalo Schifrin's "Ins and Outs" and "Tempest" by horn player extraordinaire Maynard Ferguson. Each was a live-to-two-track digital disk recorded at Ocean Way Studios in Hollywood.

"Tom Scott took a big chance when we decided to go with my 'cockamamy' way of thinking, and he ended up having the most fun he's ever had. He said he now feels sorry for people who have to labor for months in the studio."

Weber credits Elektra/Musician chief Bruce Lundvall with having the creative insight and business sense to recognize the merits of live-to-two-track recording. *Desire* was recorded in two

days, on June 30 and July 1, 1982, and released on July 27.

"It's generally unheard of to put a record out less than a month after recording has been completed," Weber says. "Since there's no mixing involved, the artist has the immediacy of hearing his music in its final form as it is being recorded, and the label can enjoy a much quicker return on investment."

Weber says that Maynard Ferguson's big band ensemble was a natural for the live-to-two-track session format, although surprisingly the recently-recorded "Tempest" was Ferguson's first live studio LP. Both the Ferguson and Schifrin projects were finished in less than two days, and are due for release by Nautilus Recordings this fall. The Schifrin album was a particular challenge for Weber, since Schifrin is an extremely sought-after, multi-award winning film and TV composer. But Schifrin's roots are in jazz, and he came to this country from Argentina some twenty years ago to play keyboards in Dizzy Gillespie's band.

This was Lalo's first studio LP in many, many years," Weber describes, "so it meant long hours of practice for him before we recorded. We surrounded him with the players he most admires—Andy Simpkins (bass), Earl Palmer Sr. (drums), Sam Most (flute) and Paulinho da Costa (percussion)—and the results were magic.

"Shelly Manne has said that 'jazz is never the same way *once*' because it's all improvisational, and that's why I'm particularly attracted to the live process for this type of music.

"You might say that what we're doing is utilizing yesterday's techniques with today's technology," Weber concludes. "I'm not married to digital or to doing it 'live'—I just find that marrying all these elements results in performances which have the emotion and sincerity I'm after. And that's the way it was meant to be, wasn't it?" ■

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## Audiophile Labels

dbx-encoded form. Digital titles include Jack Sheldon, *Playin' It Straight*; Freddie Hubbard, *Back to Birdland*; The Biblical Gospel Singers, *Going Home*; and several recordings by Zoltan Rozsnyai conducting the Philharmonica Hungarica. Direct-to-disk titles include Earl "Fatha" Hines, *Fatha*; Ed Graham, *Hot Stix*; Felipe de la Rosa, *Flamenco Fever*; etc.

**Headfirst Records,**  
 9000 Sunset Blvd.,  
 Los Angeles, CA 90069

Specializing in jazz-fusion, the Headfirst catalog includes Software, *Marbles*; Brian Auger and Search Party, *Planet Earth Calling*; and albums by flugelhorn player Mike Metheny, *Allen Vizzutti*, and others.

**CBS Masterworks,**  
 51 West 52nd St.,  
 New York, NY 10019

Half-speed-remastered audiophile editions from CBS's vast catalog of great records include Simon & Garfunkel, *Bridge Over Troubled Water*; Carole King, *Tapestry*; Pink Floyd, *Wish You Were Here*; and more Digital titles include Zubin Mehta/New York Philharmonic, *Stravinsky: Petrouchka*; Bernstein/Israel Philharmonic, *Prokofiev: Symphony No. 5*; and many more.

Mastersound cassettes are not duplicated in real time, but CBS says they're copied at much lower speeds than the regular tapes, on chromium-dioxide stock in premium housings. Most of the LP titles are also available on cassette.

**MCA Audiophile,**  
 70 Universal City Plaza,  
 Universal City, CA 91608

MCA's audiophile editions are half-speed mastered at IAM and pressed at KM Records, same as Nautilus. Titles include Steely Dan, *Gaucho*; Olivia Newton-John, *Physical*; Spyro Gyra, *Catching the Sun*; *E.T.* Soundtrack; and more. MCA also distributes the Crusaders label.

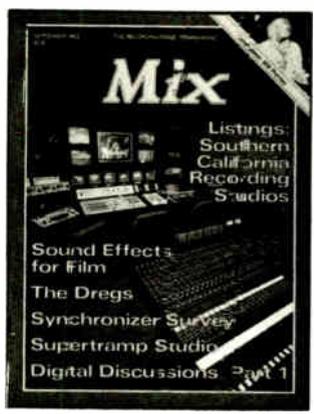
**Varese Sarabande Records,**  
 13006 Satcoy St.,  
 North Hollywood, CA 91605

Varese Sarabande distributes several other labels, offering a wide variety of classical titles and film scores as well as other kinds of music. One notable new release is Patrick Gleeson's *Computer Realization of Vivaldi's Four Seasons*, performed by a pair of Synclavier II synthesizers directly to digital two-track ■

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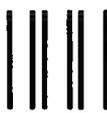


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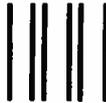


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# Artisan's Greg Fulginiti - A Lacquer Master



**Story and photos by Wolf Schneider**

Gregory Fulginiti, chief engineer and managing director of Artisan Sound Recorders, is busier than ever before in his career. In fact, a typical ten-hour work day for Fulginiti may include the cutting of three or four reference disks for his steady clients: high-power producers and labels like Keith Olsen (Fleetwood Mac, Foreigner, Pat Benatar, Rick Springfield), Mike Flicker (Heart, Randy Meisner), John Haeny (The Doors, Judy Collins), Geffen Records, Chrysalis Records, CBS Records, and RCA Records.

Fulginiti is blessed with a charmingly jovial nature which enables him to get along with many a high and mighty ego. Still, his personality is not the only reason that this 31-year old Italian from New Jersey is so popular. Fulginiti also delivers. His sixteen Grammy-nominated records include Pat Benatar's "Crimes of Passion," Rick Springfield's "Jesse's Girl," John Coltrane's "Bye Bye Blackbird," and REO Speedwagon's "Hi Infidelity." Fulginiti lays claim to twenty or so number one records. Artisan Sound Recorders, his refuge from the mean streets of Hollywood, has been responsible for mastering over ninety gold and platinum records during the past two decades. Cutting two-to-three hundred LP's and as many singles each year, Fulginiti has honed himself a fine reputation as well as a developed skill. Mentor Bob Ludwig, who taught him how to cut records at Sterling Sound ten years ago, is probably quite proud of the kid.

Fulginiti describes mastering as the final creative step and the first manufacturing process in the recording chain. Sound reproduction levels now possible on phonograph records are far superior to what was previous-

ly available, and the technology is continually improving, according to Fulginiti. He cites the higher-quality half-inch tape machine, offering cleaner, quieter, more transparent top end and strong low end response, which appeared on the market this past year; Capitol's improved new-formula Apollo lacquer; and John Bittner's Zuma computer for better utilization of space on a lacquer.

Artisan's cutting room is exclusively Neumann/Studer, with Sierra's latest design in two-way monitors. A recently-built recording studio also contains Studer tape machines and Sierra monitors, as well as a new SSL console and a vast array of microphones and outboard equipment. Fulginiti's tapes arrive in a variety of formats: digital or analog, two-track, quarter-inch or half-inch, with or without noise reduction. The quality of the engineering is much more important to Fulginiti than the format or equipment used. Using a Studer preview machine, he gives the tape a listen. There's no formula for the next step. Generally, he tries to cut as loudly as possible, matching up discrepancies from tune to tune, if that's the philosophy of the record, and altering the sound as little as possible. "It's also conceivable," he reflects, "to make a couple of hundred moves in a forty-five-minute record: boosting guitars, changing EQ, level changes every twenty seconds. . . most difficult to master are recordings that are highly sibilant, that have immense dynamic range, and very loud percussive sounds."

A Neumann SP77 console goes directly to two Neumann VMS lathes with Neumann 74 cutter heads. They cut grooves into the acetate of a twelve-inch reference disk. After the producer, artist, and/or record label approve the disk, the process is repeated onto a fourteen-inch lacquer,

which is shipped to the pressing plant of the label's choice. Fulginiti notes that the major record companies have become increasingly cost-conscious in recent years, and that quality control often depends on the power wielded by the artist, as well as on the expediency with which the label wishes to ship the record.

Fulginiti sees the mastering industry being continually refined, but not changing drastically over the next few years. Although he suggests that digital recordings will command a larger share of the marketplace, he feels that manufacturers are still developing the sound reproduction aspects to better reproduce the tone of the instruments and of the voice. He finds a quicker fatigue rate when working with digital recordings.

One definite emerging factor is the CD, or compact laser disk, says Fulginiti. "If the economy weren't so bad," he comments, "popularity of these disks would escalate much more rapidly." Of course he is quick to point out that phonograph records have one decided advantage over much of the new technology: their standardization all over the world, as well as from manufacturer to manufacturer.

The expensive cost of direct-to-disk recordings will prohibit their further growth, in Fulginiti's opinion. Time-consuming half-speed mastered disks will likewise remain an audiophile luxury, he predicts. Although they offer clearer transient response on percussive sounds, he feels that the bass aspect is lacking in punch.

"I really don't do this for the money, although I am very well paid," Fulginiti reflects. "My main attraction has always been the music, and I believe that fact makes all the difference in the incentive and the final product." Apparently, a lot of his peers agree. ■

# So You Want to Be a Recording Engineer



by Christian Haseleu

The success and star status within the recording industry of such engineers as Alan Parsons, Bill Szymczyk, Shelly Yakus, and Keith Olsen, just to name a few, has made the job of engineer/mixer seem both glamorous and financially rewarding. This in turn has helped to fill the job market with men and women hoping to break into the industry via engineering. Before anyone else decides to join the ranks of these job seekers, I would advise them to take a closer look at the market and the job. I would also advise them to scrutinize themselves in light of the demands made by this type of work. If they are still interested, they will then need to develop a concrete plan of how to find a job and land it.

Let's first look at the job market for studio work, although some of the things we talk about will also apply to similar work in sound reinforcement and/or broadcast sound. According to a recent survey in *Pro Sound News* the average number of employees (including receptionists, studio manager, maintenance staff, etc.) per studio across the nation was 5.1. The West

Coast and Northeast averages were a little higher and the South and Midwest regions averaged a little lower. This would lead us to believe that an average studio might employ two or three engineers. Let's average and say 2.5 engineers per studio. Now, how many studios are there? Using the listing in *Mix* and the *Billboard Studio Directory*, a fairly complete list of commercial audio recording studios can be gathered. There are, according to these two references, some 2000 scattered across the nation. At 2.5 engineers per studio that's about 5,000 jobs. How close to reality is this estimate? There are undoubtedly more studios than listed. From the facilities in corporate, educational and religious institutions, to studios belonging to publishers and artists; to the semi-pro studios and those who wish to remain anonymous; all would push up the total number of available jobs.

Now, as to how many of these jobs are available at any one time, there are no available statistics on the rate of turnover in studio personnel . . . but most industry professionals will tell you that it is small. As one studio manager told me, "you have to love the work to be good, and studios don't let good engineers go." Most vacancies seem to result from engineers going independent, becoming producers or moving up to become studio managers. New studio construction or expansion can create new positions, but the present state of the economy and current interest rates have put a damper on some of that activity. All in all, I believe it's safe to assume that the job market is very limited and will most likely stay that way.

Let's look now at the job itself, beginning with the material benefits. Studio managers and engineers can get very vague when it comes to money. If they are paying or making a lot, they don't necessarily want everybody to know; and if they are paying or making little, they don't like to admit it. However, some research has indicated that the entry level positions of assistant engineers or tape operators average about \$5.00 per hour. That will vary according to the size of the studio and/or market. As the career progresses, of course, the amount of money an engineer makes is limited only by his or her talent and ability to sell their services.

There are a few studios which engage in some form of profit sharing. This is usually in the form of a percentage of the studio rate for sessions worked. The range of other benefits varies widely. Some offer paid vacations, other just give time off. Some have health and retirement plans, others offer only the mandatory Workman's Compensation.

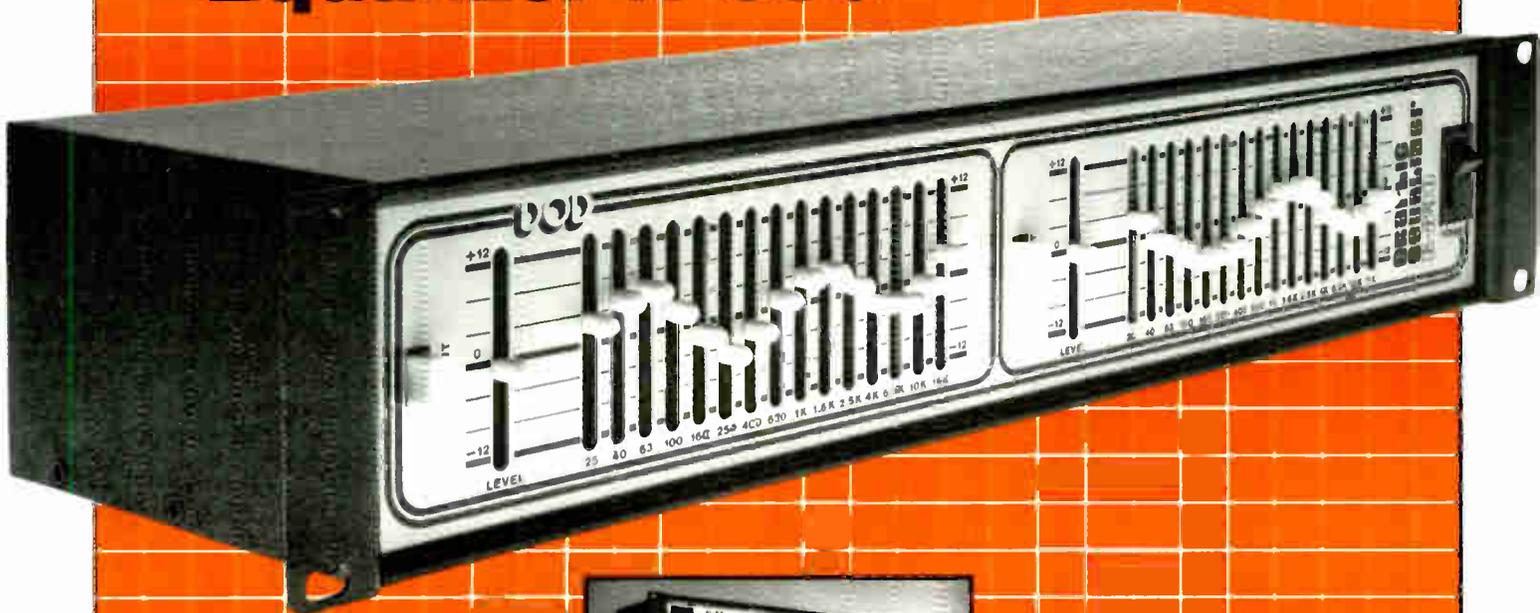
This brings us to working conditions. The engineer's hours are often erratic. Sessions can run into substantial overtime, into late evenings and over weekends, and studio work can be tough on social and home life. The job can run between periods of very high pressure and sheer boredom. The physical environment of the studio, while very often designed for pleasure and comfort, can be quite isolated from the outside world. A firm grasp on mental health is recommended.

Studio engineers must be prepared to establish friendly working relationships with a variety of personalities, while at the same time handling the many technical details of the job. An entry level engineer's functions may include keeping the tape deck aligned and track sheet up to date, keeping the producer's coffee cup full and ashtray empty, and doing whatever possible to keep the artist productive. If an entry level engineer is not available, all of the above may be part of the engineer's responsibility.

But, of course, it's all worth it for that chance to work with music in a creative environment, keeping in mind that the bread and butter of most studios does not make it to the pop charts. The jingle, the publisher's demo, the local gospel group are much more common than the platinum album session. The moments of creativity are interspersed with hours of "let's try it again" and tape copies.

To sum it up, there are few studio engineering jobs and fierce competition. The work is hard on both the engineer and his or her outside life. The material benefits can be limited and the working conditions can be less than desirable. If you're one of the people still interested in this kind of work, you're either being foolish or you have one of the qualities of a good engineer: perseverance. Either way, watch this column for more information on how to find and get an engineering job. ■

# 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:

Less than 0.01%

Signal to noise ratio:

95 db.

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.

I/O Connectors—Input

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:

3 1/2" x 6" x 19"

**Electronics Corporation**  
2953 South 300 West  
Salt Lake City, Utah 84115  
(801) 435-8534



# **SPECIALTY Records**

*(Above) The new 250,000 square foot record manufacturing and tape duplicating plant of Specialty Records Corporation is located in the Mid-Valley Industrial Park in Olyphant, PA.*

**by Jack McDonough**

To a record lover, getting a new record is like a kid getting tooth money under the pillow.

The kid doesn't care a whole lot about the technical means by which the wondrous exchange takes place. He accepts as fact that there's a Tooth Fairy and that the transaction is magical. He wakes up, and presto, there's the loot.

Likewise, most record lovers don't think too much about the technical means by which the wondrous wafer of music-laden, shiny-black vinyl, encased in its artful and colorful package, gets to them. Since the music itself is pure imagination—the very reason the listener is hooked on it—they may not give due consideration to the nuts and bolts necessary to bring a million or more duplicates of a record into the marketplace simultaneously.

That's how I used to be, too—

even though, as a result of working for a music trade magazine, I probably knew more than the average person about how records actually got manufactured.

But I realized pretty quickly that I had developed nowhere near the proper awe for the process until I had the chance in September, shortly before its first anniversary, to visit the new Warner Communications Inc./Warner-Elektra-Atlantic pressing plant, Specialty Records, in a little burg with the odd-sounding name of Olyphant, just outside my home town of Scranton in northeast Pennsylvania. WEA describes it as the most state-of-the-art plant in the country.

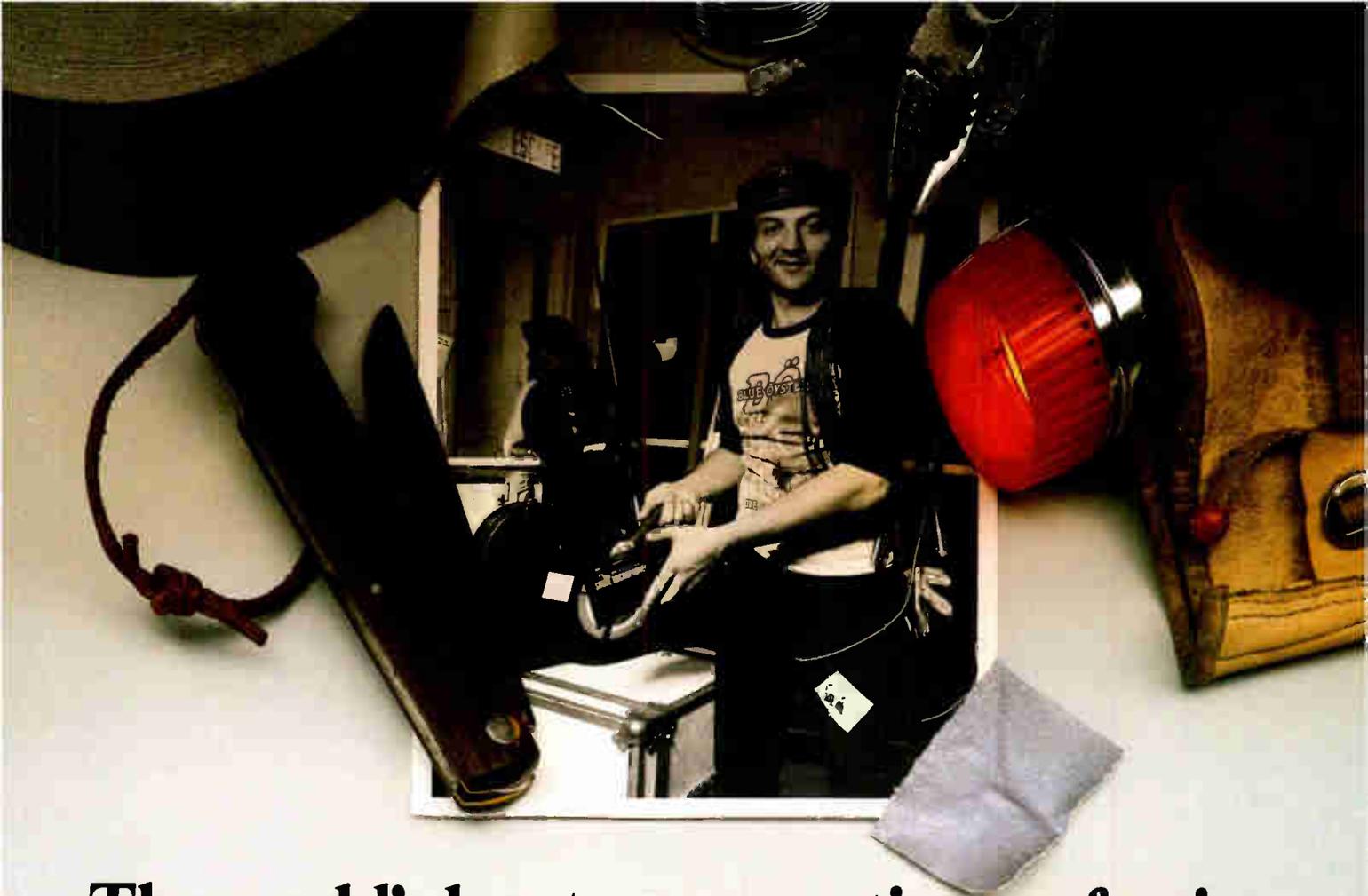
The huge (240,000 square feet) gleaming white plant sits on a hill a mile or so from the deteriorating core of downtown Olyphant. Finished in October of last year at a cost in excess of \$15 million (three years after WCI bought the 28-year-old family business), the plant is capable

of turning out a half million units per day in the three configurations of 12 inch LP, 7-inch single and cassette tapes.

However, because of the trends everyone in the business is familiar with, the plant (even though it runs 24 hours a day) is not running at full capacity for disks. It is, however, cranking out tapes so fast that operations chief Joe Helminski (who oversaw the construction of the building) says, "We are already at the level we thought we wouldn't reach until next year." This gains more perspective after seeing one of the duplicating machines work. The most modern of these babies can load a cassette in about five seconds.

As impressive as the machines are, however, the really awe-inspiring thing about the plant is its coordination of such a multiplicity of tasks, most of which require an exceptionally high degree of technical sophistication.

*(continued on page 25)*



## The world's least conservative profession has maintained one rigid tradition. The SM58.

In an industry that discards electronic products like ice cream wrappers, the SM58 and its close cousin, the SM57, have remained the overwhelming choice of rock, pop, R & B, gospel and jazz vocalists for the last 16 years.

Why?

Simply because there is no sound quite like the SM58 sound. Its punch in live vocal situations, coupled with a distinctive upper mid-range presence peak and fixed low-frequency rolloff, give it the trademark quality no other manufacturer can imitate, although others have tried.

And to protect that sonic perfection, the SM58 is extraordinarily tough. Even six-foot drops on hardwood floors won't faze it. Ask any roadie who has used—and abused—one.

Performers the world over favor the weight and balance of the SM58, especially in hand-

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The crispness of the closely related SM57 enhances musical instruments the way the SM58 handles vocals. Beautifully.

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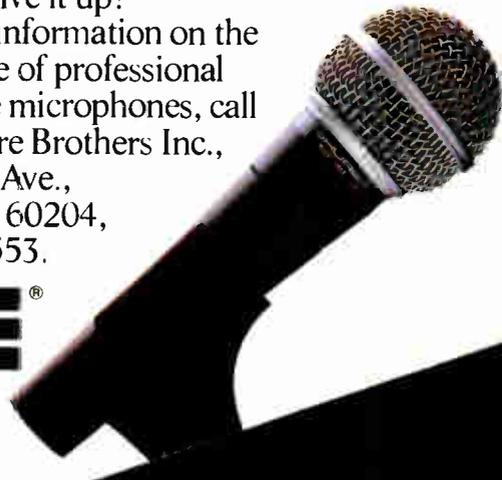
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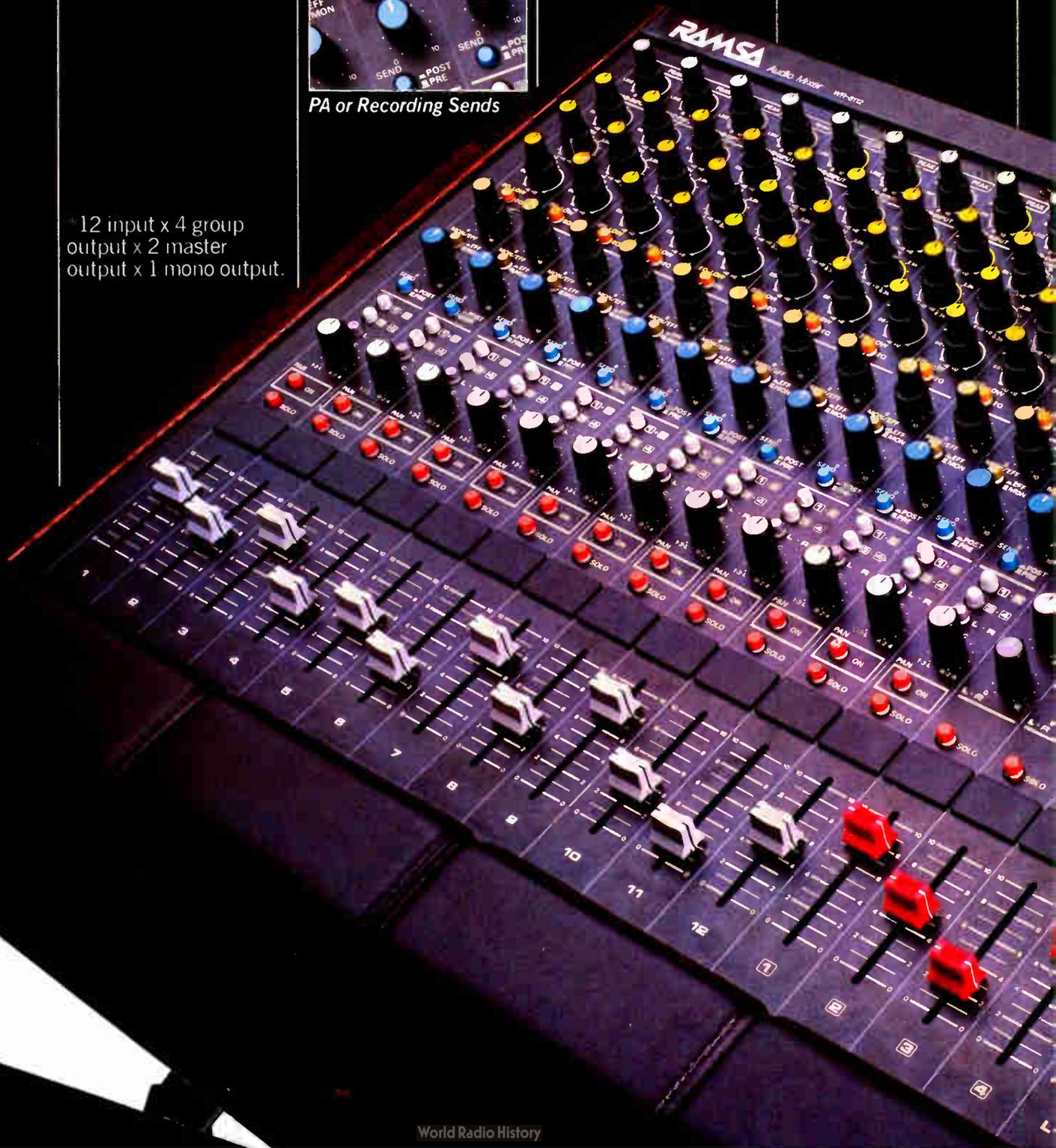
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Ramsa engineering. One set of circuits actually performs as two. Functions like stereo tape monitoring are switchable to become stereo

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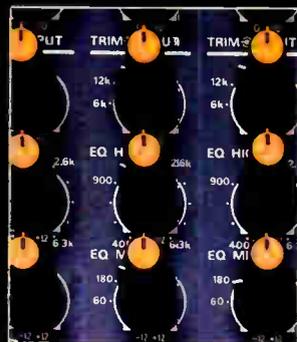
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\* 12 input x 4 group output x 2 master output x 1 mono output.



# RAMSA

frequencies for high and low EQ as well as continuously variable frequency for the midrange.



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*Versatile LED Metering*

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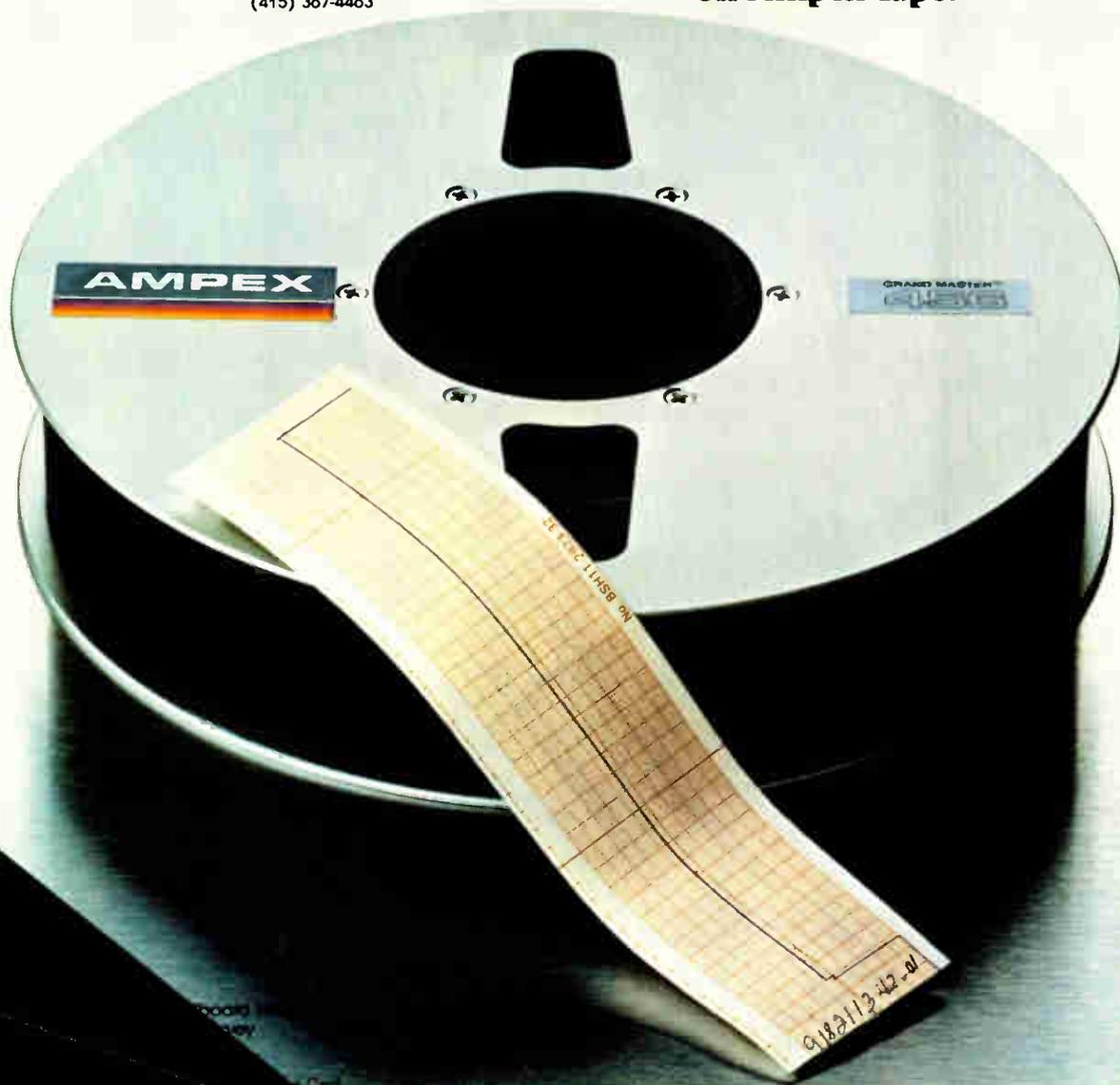
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on Ampex Tape.**



(continued from page 20)

The plant does absolutely everything that must be done to create a finished record once the studio work is done and the lacquer comes out of the mastering room. They check the master lacquer with a microscope to make sure it conforms to the master tape and that there is nothing in the grooves that would impair the quality of the manufacturing process. Then the lacquer goes through the highly complex plating process (including one step where it is sprayed with a paper-thin coating of silver) which ultimately results in the "mother" and the stampers which go into the machines and imprint the hot vinyl. The plant also must print all the labels and affix them to the records, a step with its own complex equipment for making sure everything is perfectly centered.

Then they must do the massive amount of non-machine, hands-on work involved in packaging: getting the disks and tapes into the sleeves and the covers; getting the shrink-wrap onto the package; getting the sealed units into boxes for shipping. The plant also handles fulfillment for the promotional/mailling lists of some of the labels, a step which includes imprinting the "For Promotional Use Only" notices that grace these albums as well as the addressing and mailing of these records. This was interesting, since as I walked through the plant I saw various new releases from Donald Fagen, Eddie Rabbitt, and Jesse Colin Young being pressed, and when I got back home to California a few weeks later packages with those albums were waiting for me. One hundred fifty people work in the finishing department alone.

To give you an idea from another angle on the size of the operation: the vinyl is fed into the pressing machines from seven silos, each of them thirty feet high. These silos can hold a *half-million pounds* of vinyl. On the pressing room floor are 52 machines for 12-inch records, and another 26 machines for singles. The machines for the singles are double-cavity; they'll spit out the 45s to either side, and neatly drop them into the envelope while doing it.

All of the plating equipment was installed in the plant brand-new, as was all the tape equipment. The 12-inch presses were moved from the site of the original Specialty plant since the company had just switched to the automatic press technology anyway.

Of all the functions Specialty performs, no doubt the one of most interest to studio personnel is the plating process, since it is there that

the crucial steps are taken to preserve the integrity of the studio-engineered sound. Quality-control throughout the plant is stringent (there are any number of people whose job it is to listen to records and tapes all day in a controlled environment and on sound systems that are exactly the same throughout the plant), but the controls in the plating department are particularly impressive.

All of the plating equipment comes from Europa-film of Sweden. The decision to go with that equipment, says Helminski, "was a matter of technical preference and opinion. We did a lot of checking by going to acknowledged leaders in that part of the industry. Sheffield Labs—which is now part of Warners—was one of the places we talked to. They did their own plating and had a fellow who is recognized as a top quality operator. He was using the Europa-film equipment and we were able to see it in operation. It maintains excellent purity of solution and the controls are very consistent.

"That sounds like opinion, but what backs it up is the equipment's ability to be used in digital duplication for both audio and video. Also, there's a new technique in mastering where

instead of mastering on lacquer they master onto a copper disk. The process is called Direct Metal Masters. It was perfected by Teldec in Germany and they used the Europa-film equipment. I believe it is the only equipment that can be utilized to make a stamper from the direct metal mastering process.

"All of that went into the decision in favor of that equipment, even though it was much more expensive. It gives us high quality plating at present along with the flexibility for the future of going into the digital audio disk, digital video and direct-to-disk mastering."

Production of video disks in both the mechanical RCA/Selectavision and Pioneer/laser formats are options for Specialty. "We are now looking," says Helminski, "into what kind of molds will be required for video," since the plant was built specifically with an eye toward eventual expansion into videodisk production.

The opening of the WEA/ Specialty plant continues a long history of the industry in the Scranton area. Specialty president Richard Marquardt—who succeeds his grandfather Frank and his father Roy in the  
(continued on page 71)

## EXR'S NEW MODEL IV... Total Versatility



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# The New Age Tape Duplicators

by George Petersen

*There is an extraordinarily wide range of tape duplication facilities in this country. Many companies specialize in training materials for education and industry, while others are advancing the state of the art in audiophile cassette releases for discriminating users. We talked to a variety of tape duplicators, both large and small, and found considerable differences concerning techniques, equipment, and philosophies about the current state and future of the business.*

**DAVE MICHAELSON**  
Bonneville Productions,  
Salt Lake City, UT

"We do mostly high speed, spoken word work here. We use Cetec Gauss 1200 duplicators with King 790 loaders. The Gauss system is excellent and we've been using it for about ten years."

ARE THERE ANY OVERALL TRENDS YOU'VE NOTICED IN THE CASSETTE DUPLICATION MARKET?

"I feel that chrome tapes have been coming on real strong in the high speed market. Also, some customers lately have been asking for slower duplication ratios. Most of our work here is 64:1, although we have been getting more requests recently for 32:1 and even 8:1 work."

IS THERE A SIGNIFICANT DIFFERENCE SOUNDWISE?

"I don't believe so. On many occasions we've duplicated sample materials at various ratios, and presented them to customers to try and identify one method over the other. No one's been able to successfully tell the difference."

**BILL RASE**  
Bill Rase Productions,  
Sacramento, CA

"Most of our work is educational, motivational, religious, or training material. We have King loaders and Magnefax bin loop duplicators. We usually do about 3000 cassettes a day. We have some older Telex duplicators which we use for small reel and cassette orders, but we usually use Pentagon machines for our in-cassette jobs. Our Magnefax system is one of their earliest models, and we're quite pleased with it. It's over five years old, and they've helped us with updates and improvements. I can't even imagine how many tapes were made on that machine."

"I started with a hand loader. Then I went to a Liberty semi-automatic, and then to Superscopes, which required pulling the leader out and placing them on. Now I have the King which is fully automatic. They have improved vastly and are marvelous. But, like anything else, you have to tune them."

WHAT TIPS DO YOU OFFER PEOPLE SUBMITTING TAPES TO YOU FOR DUPLICATION?

"We like clean tapes that are well timed. They should be accurately timed on a recorder with a synchronous motor, not a poole motor. Mark the box clearly as to what the formats are, and you can make your master up on either one or two reels, since we will re-master for the bin loop. Hopefully the customer will set up side one to be the same length as side two, to avoid the 'dead tape' at the end of a side."

**AVTAR KHALSA**  
GRD Real Time Duplication,  
Phoenix, AZ

"Almost all our work is real time.

We have a bank of Denon DR-F8 top of the line recorders. They're great. We've used others in the past that constantly gave us repair and consistency fluctuation problems. Since we got these we've been real happy. They have wide range, low distortion and perfect tape speed."

YOU DO SOME HIGH SPEED WORK THERE?

"Yeah. Something new we've gotten into is recording and duplicating conventions and seminars on-site here in the Phoenix area. We use a Cetec Copy-cassette II for the high speed work."

HAVEN'T CASSETTE RELEASES IN THE PAST HAD A BAD REPUTATION?

"Definitely. Cassettes were legitimately bad-rapped for a number of years, yet now we feel we've actually gone beyond disk quality with real-time duplication. While album sales are dropping, cassette sales are on the up-swing."

**BOB KRATT**  
Westape, Campbell, CA

"The bulk of our clientele, over 50% volume-wise, is digital recordings for Commodore, Atari Computers, and a series of home related games that are cassette tape-based."

DO YOU USE THE SAME EQUIPMENT FOR MUSIC AND SOFTWARE DUPLICATION?

"Yeah. We're using three Audio/Tek systems, 32 to 1 high speed. We use either 1/2" or 1/4" masters, depending on the job. We primarily use Ampex and BASF tape."

HAVE YOU NOTICED A TREND TOWARDS CASSETTE RELEASES OVER DISKS?

"With auto and Walkman-type systems, people are spending a lot of time away from their record players. We're doing a series of sports tapes now, which have music related to the sport you're in: tennis, jogging, skiing, hiking, whatever. With a handful of cassettes and a Sony Walkman, you can pack hours of listening in your pocket."

**RICHARD BERBERIAN**  
IAN, Boston, MA

"We have an Otari 4050-OCF. We like the Otari systems a lot and we're putting in a new Otari DP-1010 bin loop system around the first of the year. The quality is outstanding. We also do some real-time duplication with Nakamichi decks, and the quality is comparable, which is a hard claim to make when doing high speed duping."

DO YOU HAVE ANY SUGGESTIONS FOR MIXERS WHO ARE MASTERING FOR CASSETTE RELEASE?

"I like getting tapes which are as close to the original as possible. The original mixdown, with test tones, gives the best copies. If we get something

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that's three generations removed and we master it here onto a bin loop, that's four generations and the cassette will be fifth generation. The fewer the generations, the better the quality."

**RAY DURKEE**

**"Sunday at the Memories"**  
Denver, CO

"All of our duplication here is in-house reel duplication for our syndicated radio program, 'Sunday at the Memories.' We do about 300 to 400 reels a week on our Garner Industries five slate machine. I looked long and hard before I bought it, and tried differ-

ent machines, but the Garner had the best frequency response. After five or six years, I've never had any electronic or mechanical problems with it, except for occasional head changes."

**PAUL ADDIS**

**Master Digital, Venice, CA**

"We call our process cassette mastering, not cassette duplication. We designed our system to go from digital masters to cassettes. If a client brings in an analog master, we transfer it to the digital format, and thus avoid generation losses, or playing your master to death. We have a large number of Sony

TC-K777 decks, and we do post-production on cassettes for all the major labels. We also do all the cassettes for Nautilus Recordings."

**DO YOU THINK THAT BLANK CASSETTE SALES IN STORES HAVE HURT THE DUPLICATION BUSINESS?**

"I think we're helping out the industry in this regard. The consumer has gotten more sophisticated, and much of the product that's been out there has not been up to snuff. The nature of what we're doing now cuts down on home recording, because we're making such a fine product." ■

## Audiophile Cassette Duplication at Delos



*Keld Hansson, field service manager for Bang & Olufsen of America, who installed a bank of B&O Beocord 9000 cassette recorders at Delos Recording, Santa Monica, CA, at the audiophile record company's studios. Delos Records is using the Beocords for its new tape duplication division.*

**by Fran Dym**

Delos Records, a leading American audiophile record company, is using twenty computer-controlled consumer cassette recorders for commercial tape duplication. They also use the decks for editing purposes and in evaluating takes from digital recording sessions.

Amelia Haygood, Delos' president, said, "For some time we have been asked when we are going to come out with cassettes. We were waiting for the technology to advance to the point where we could match the quality of our records. The Beocord 9000, in conjunction with the use of TDK-MA-R metal particle cassettes, have given us the means to match the quality of our records."

The Bang & Olufsen Beocord 9000 incorporates a number of new technologies, including HX Professional and an automated calibration, or tape

matching, system which includes a measure of distortion. The Beocord features the following automatic measurement and adjustment functions: bias, left and right channels; recording equalization; sensitivity, referenced for current flow in the record head; and third harmonic distortion, referenced for PPM adjustment—with all the adjustments made automatically until the deck is optimally aligned for the tape being used.

HX Professional is a constant bias circuit developed by Bang & Olufsen and perfected in collaboration with Dolby Laboratories. It automatically delivers a constant, signal-controlled bias current to the record head regardless of varying signal strength or frequency content. As a result, every tape gains in signal handling capacity without increased distortion. The system operates independently from the Beocord's Dolby B and Dolby C noise reduction circuitry and functions inde-

pendently on both left and right channels. This allows the bias current to remain optimum for each channel even though the signal content present in each may be significantly different.

Delos is also using the cassette machine during digital recording sessions for making analog copies for the producer and/or artist to listen to the takes from the session and make editing decisions.

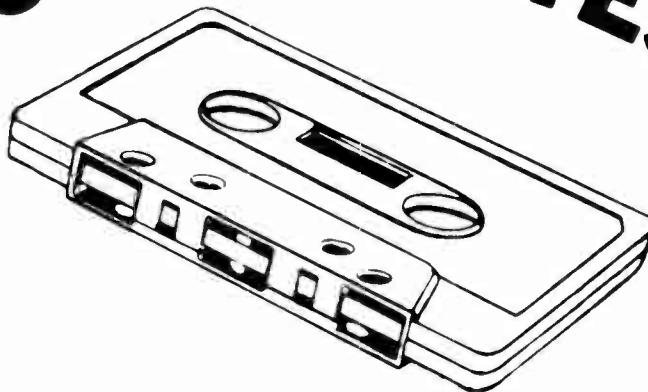
According to Ms. Haygood, some of the Delos' artists like to make their own editing decisions. "This involves listening to copies of the digitally recorded session-analog tape. Until now, this has been a question of giving the artist reel-to-reel copies of all the takes in the session," Ms. Haygood said. "The artist decides which take represents his or her musical intention and marks the score accordingly. With most companies this is a function which only the producer performs, but ours is a company which invites the artist into the music decision-making process.

"Pianist Carol Rosenberger, who has just recorded the Schubert B Flat Piano Sonata for us, is the first of our artists to try the new method. She has all of the takes on cassettes, recorded Dolby C and HX Pro on the Beocord 9000.

"She says that one of the problems in using the reel-to-reel analogs for making editing decisions was that by the time she changed reels, rewound or fast forwarded to a spot where a comparison take began, her memory of the exact musical shape of the first take had dimmed and she felt uncertain in some instances that she was making the right decision. With the cassette she simply notes the exact timing of all the takes with the computerized digital timer. For example, if she punches in 27:13 for take 7, listens to it, then punches in 18:31 for take 5, the cassette rewinds to the exact spot so that she can compare take 5 to take 7 while they are still fresh in her mind."

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# PART 1

# Sonic Restoration of Historical Recordings

by Michael R. Lane, of Lane Audio & Records

The sonic restoration of historical recordings is both science and art. The purpose of this article is to discuss in some detail, first, the basic requirements; secondly, problems and techniques at the edge of the art; and lastly, but most important, the overlooked problem of authenticity and of morality in sonic restoration. One must clearly distinguish between straight transfers, or copies (very well done by the HMV engineers in the 1940's), and sonic restoration, whose

objective is the recreation of the original performance to the most accurate degree possible. In either transfers or restorations certain basic requirements are essential.

## A. TURNTABLE SPEEDS AND PITCH

"78's" are not necessarily recorded at 78 rpm. They vary from

the low 60's to slightly over 100 rpm. Many restorations today are at the wrong speeds, with resultant shifts in pitch which completely destroy the integrity of the performance. A quality turntable and multi-speed strobe, or, better yet, digital speed readout, is mandatory. But the real problem is: how do you know what the speed



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Sizes of Styli	Radius in Mils		
	Larger	Smaller	
B. Transcriptions	2.0	by .7	A. Normal (Lateral Cut) Records
	2.4	by .8	
	2.8	by .9	
	3.3	by 1.1	
	3.8	by 1.2	
C. Hill & Dale (Vertical Cut) Records	4.75	by 1.5	
	6.0	by 2.0	
	8.0	by 3.0	
	16.0	by 5.0	

Figure 1

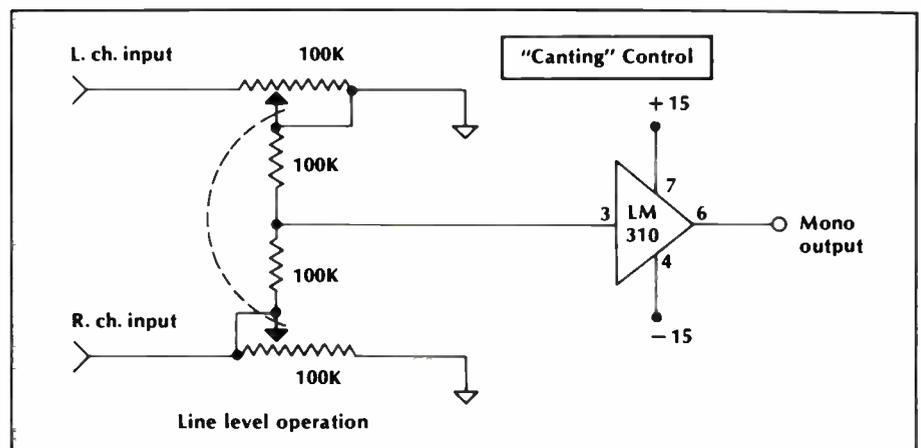


Figure 2

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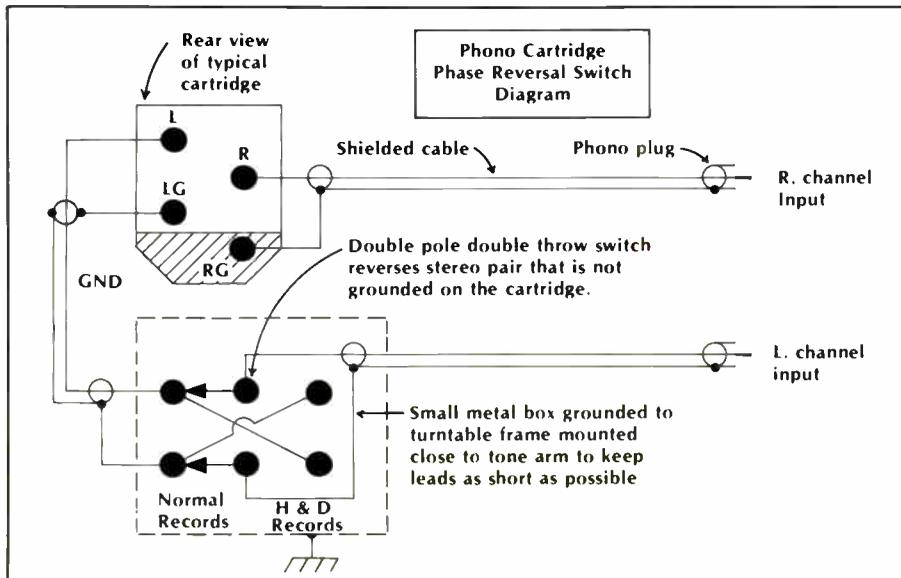


Figure 3

should be to get the correct pitch? Some 78's are marked on the label for speed but this is not always reliable. Certain guidelines are helpful. Generally the older records are at slower speeds. Victor acoustics (before 1925) are most often around 76 rpm, and many Victor electrics up to the early 1930's are also at 76 or 77 rpm. Many European disks tend to be about 80 rpm; Pathes will frequently be found to be about 90 rpm. All this is merely a general guideline with many exceptions. For piano or instrumental recordings of "standard" works, comparing the records against the music played on a piano will give a guide. With acoustic recordings (before 1925) the piano should be tuned low, since the generally accepted International Pitch at the time many of these records were made was A=435. Comparisons with modern recordings known to be at 33 1/3 rpm (some aren't) can be helpful. Singers are most difficult because of key transposition, and, despite the best efforts, the true speed of some recordings may never be known. The best criterion is the *experienced, musically trained* ear coupled with years of experience with historical recordings.

#### B. STYLUS SIZE

Currently, the best cartridge for 78's is the Shure V-15 IV (the V-15 V offers little, if any, improvement on 78's) and its VN-478E stylus assembly. The stylus furnished on the VN-478E (2.5 x .5 mil) is excellent for later 78's from the '40's and '50's, but it is too small for earlier material. Expert Pickups Ltd. (P.O. Box 3, Ashted, Surry, KT21, 2QD, England) does superb work in mounting special diamond styli on the VN-478E assemblies. The VN-478E assembly is very fragile, and just one blow will ruin it, but its high compliance will track

damaged records with a minimum of distortion. Figure 1 shows the sizes of styli that are useful in playing 78's. All should be elliptical and truncated (cut off on the bottom) as this minimizes noise pick-up from the bottom of the groove. Styli should always be made of diamond except possibly in the largest sizes where cost would be excessive. Many people believe that "hill-and-dale" records should be played with conical styli only, but with modern arms and cartridges they invariably sound better with elliptical, truncated styli.

The important criterion in choosing the optimum stylus size for any record is to use that stylus size which gives the *cleanest, least distorted* sound, not necessarily the lowest surface noise! Surface noise

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Figure 4

can be eliminated or substantially reduced (see Section E) but distortion cannot be removed with any currently available analog techniques.

### C. CARTRIDGE HOOK-UP

For best results in playing mono 78's, the cartridge should be connected in a normal stereo configuration and fed into a stereo preamp. Once the signal is amplified to line level, a "canting control" should be used (see Figure 2). A ganged 100K audio taper pot is wired so that the center point of rotation gives equal

amounts of left and right outputs, clockwise rotation gives more right channel, and counter-clockwise rotation gives more left channel. This is far better than the traditional A + B wiring for mono sound. As with this method, any phase angle between 0 and +180 or -180 degrees is possible. With many records the center point (equal left and right) is best, but all too frequently noise can be greatly reduced by some other mixture of left and right wall, possibly even all left or all right.

For hill-and-dale records a sim-

DR-101/LANE	INHERENT EQ SETTINGS			MANUFACTURER	SP-REPT	BASS (TURNOVER)	TREBLE (ROLL-OFF)	MANUFACTURER	SP-REPT
BASS (TURNOVER)	HZ	TREBLE (ROLL-OFF)	DB Down at 10KHZ						
				BRUNSWICK (EARLY)	78		X	EPIC	33
				BRUNSWICK BLACK & SILVER / LATER LABELS	78	X X	X X	RESOTER C	33
	1000		FLAT	CAEDMON (2)	33	X	X X	FESTIVAL	33
X	750	X	- 5	CAPITOL	45	X	X X	POLKWAYS (2)	33
X	500	X	- 8.5	CAPITOL	33	X	X X	GOOD TIME JAZZ	33
X X	420	X X	-12	CAPITOL	78	AES	AES	GRAMMOPHONE (5)	78
X X	400	X X	-13.7	CANYON CAPITOL-CETRA COLOSSUM	33	AES	AES	HANDEL SOCIETY RAYDN SOCIETY	33
X X	350	X X	-16	CETRA-SORIA COLUMBIA	33	X	X X	HARMONY (ACOUSTIC THRU AUGUST, 1929)	78
X X	300	X X	-17	COLUMBIA	45	X	X X	BIT OF THE WEEK	78
X X X	250	X X X	-18.5	COLUMBIA (USA)	78	X X	X X	RMV (3)	78
X INDICATES SWITCH IS DOWN									
MANUFACTURER	SP-REPT	BASS (TURNOVER)	TREBLE (ROLL-OFF)						
ALL RECORDS SINCE 1955	33 45 78	X	X	COLUMBIA (5) (EUROPEAN)	78	X X	X X	KING	78
CYLINDERS & ACOUSTIC RECORDS (BEFORE 1925)	78	X X X	X X	CONCERT HALL CONTEMPORARY CORAL	33	X	X X	LONDON (1)	33
RECOMMENDED SETTINGS FOR RECORDS MADE BETWEEN 1925 AND 1955									
TRANSCRIPTIONS (MANT)	33 78	X	X X	COOK	33	X	X X	LONDON PFRR	78
BANNER PATHE CAMBO PERFECT ORACLE ROMEO	78		INCONSISTENT	CORAL	78	X	X X	LYRICHORD (2)	33
ALLEGRO	33	X	X X	DECCA	33 45 78	X	X X	MAJESTIC	78
AMERICAN RECORD SOCIETY (1)	33	X	X X	DECCA (ENGLISH) PFRR	78	X X X	X	MERCURY	33 45 78
ANGEL	33	X	X X	DEUTSCHE GRAMMOPHONE	78	X X	X X	MGM MONTILLA	33 45 78
ATLANTIC	33	X	X X	DIAL	33	X	X X	MUSICRAFT	78
BACH GUILD BANNER	33	X	X X	DISC DIVA (SEE HARMONY)	78	X X	X X	NEW RECORDS OCEANIC OXFORD	33
BARTOK BOSTON	33	X	X X	ELECTRA (2)	33	X	X X	ODEON OREN PARLOPHONE (5)	33 78
BLUE BIRD (3)	78	X	X X	ELECTROLA (3)	78	X	X X	PERIOD	33
BLUE NOTE	33	X	X X	EMS	33	X	X X		

Figure 5

ple 2-pole, 2-throw toggle switch is mounted as closely to the tone arm as is practical (see Figure 3). This, combined with the "canting control" (Figure 2), is the arrangement used in our own DH-101/Lane preamp (Figure 4) and gives one the ability to tune any mono record (lateral or vertical cut) for minimum noise and best sound.

#### D. INHERENT EQUALIZATION

Most 78's are not recorded on the RIAA curve, and to reproduce them correctly, it is essential to have a wide range of variable inherent record equalization. The most flexible preamp in this regard was the justly famous McIntosh C-8, but it has not been available for many years, and its sound quality is surpassed by many modern preamps. Our own modification of the Hafler DH-101—the DH-101/Lane—was created to fill this lack, and offers the serious professional in restoration the required flexibility (see Figure 4). The inherent EQ chart (Figure 5) indicates what we have found to be optimum inherent EQ for most recordings made between 1925

IS VER	TREBLE (ROLL-OFF)	MANUFACTURER	SPL EQ	BASS (TURN-OVER)	TREBLE (ROLL-OFF)
	X X X	PHILHARMONIC	33	X X X	X X X
	NAB			AES	AES
	X X X	POLYDOR (5)	33	X X X	X X X
	AES		78	300	-8,5
	X X X	RACHMANINOFF SOCIETY	33	X X X	X X X
	NAB			LP	NAB
	X X X	RCA VICTOR VICTOR (3)	33	X X X	X X X
	NAB		45	800	-10
X	X X X	REDINGTON	33	X X X	X X X
	AES			NAB	NAB
X	X X X	RENAISSANCE	33	X X X	X X X
	-8,5			LP	AES
	X X X	SCHIRMER (4)	78	X X X	X X X
	NAB			1000	-24
X	X X X	STRADIVARI	33	X X X	X X X
	NAB			LP	NAB
	X X X	SUPRAPHONE	78	X X X	X X X
	-5			AES	FLAT
	X X X	TECHNICHORD	78	X X X	X X X
	-10			1000	
	X X X	TELEFUNKEN RADIOPUNKEN	33	X X X	X X X
	NAB		78	AES	FLAT
	X X X	URANIA (EARLY)	33	X X X	X X X
	-10			LP	NAB
X	X X X	URANIA (LATE)	33	X X X	X X X
	-5			AES	AES
	X X X	ULTRAPHONE	33	X X X	X X X
	NAB		78	AES	FLAT
	X X X	VANGUARD VOX WESTMINSTER	33	X X X	X X X
	NAB		78	LP	NAB
X	X X X	VELVET TONE (SEE HARMONY)	78	X X X	X X X
	AES			300	NAB
	X X X	VITAPHONE	33	X X X	X X X
	AES			950	-18,5
	X X X	<b>NOTES</b>			
	-14	(1) TREBLE TONE CONTROL TO -1 DB			
	X X X	(2) BASS TONE CONTROL TO +4 DB			
	NAB	(3) TREBLE TONE CONTROL TO -1 1/2 DB AND BASS TONE CONTROL TO +3 DB			
X	X X X	(4) TREBLE TONE CONTROL TO -6 DB			
	-8,5	(5) VERY LATE RECORDS MAY BE	78	X X X	X X X
	NAB			RIAA	P:IAA
X	X X X	(5) EARLY RECORDS OF THESE LABELS FREQUENTLY ARE	78	X X X	FLAT
	NAB			250	

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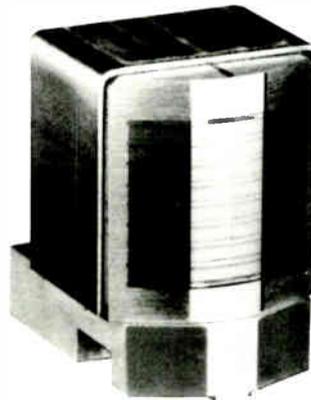
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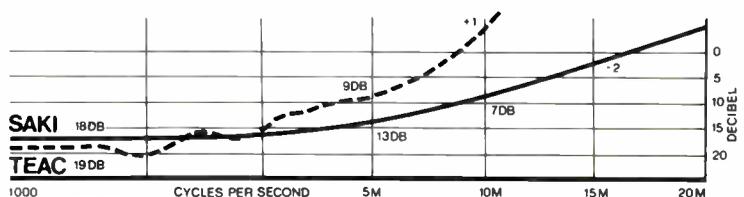
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(the end of the acoustic era) and 1955 (the widespread acceptance of the RIAA standard). The chart does not agree precisely with some of the published curves but instead indicates what 30 years of experience has taught us sounds most natural.

#### E. NOISE!

Noise reduction is the next major consideration. Most commercially available systems of an open-ended nature—which is essential for 78's—are nearly worthless! There are several notable exceptions; the finest are the superb Packburn units (see Figure 6). The Packburn has three noise reduction techniques: (1) "Switching," which selects the quieter of the two mono groove walls

when there is a significant difference; (2) "Blanking," which eliminates most clicks and pops as found in the REAL



Figure 6

world of historical recordings as opposed to artificially contrived demonstrations; and (3) it contains a continuous noise suppressor (gated high frequency filter) which does not damage the sound and can be adjusted to pass any transients without the "swish-swish" effect of previous similar systems.

The Packburn is best followed by our own modification of the Phase Linear 1000, Series II. The Phase Linear has an autocorrelator which passes high frequency harmonics *when* the fundamental information is present, and a gated low frequency noise reduction system which is very effective for eliminating rumble. It needs a few modifications to make it simpler to use for 78's, and to tone down its excellent expansion system which was designed to reverse the compression used on modern LP's and radio broadcasts; this degree of expansion is often too strong for material that was not compressed. Unfortunately, Phase Linear has discontinued this unit and they are becoming hard to find. With the Packburn/Phase Linear combination, surface noise, and clicks and pops cease to be a major problem on most historical recordings.

Theoretically, digital noise reduction could do a better job; however, that time has yet to come. The digital restorations on the current market are aimed primarily at sonic rebalancing, not noise reduction. Even in the field of sonic rebalancing they have not yet overcome the problem of distinguishing between the resonance of the recording horn and the normal ambient reverberation in the studio. By removing *all* resonance they end up with a dull, unlife-like sound.

#### F. SONIC REBALANCING

Sound rebalancing is best done with a multigraphic equalizer. A one octave equalizer is helpful, but a one-third octave unit is much better. Weak areas in the treble and bass can be boosted, and broad areas of unpleasant resonance can be minimized. The

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1616 Soldiers Field Road  
Boston, MA 02135  
(617) 254-2110

A Group Four Company

multigraphic equalizer is sometimes used in an attempt to correct an RIAA preamp to the proper 78 curve. This can work after a fashion, but is no substitute for proper inherent equalization. It has been widely believed that the frequency response on acoustic recordings is in the 150 Hz to 4 kHz range, but a bit of experimenting with a one-third octave multigraphic will show that the sonic range on acoustics is much wider—if the record is in good condition and has not had the higher frequencies literally scraped off! Fortunately, the highest frequencies, possibly into the 7 or 8 kHz area, may not be affected too much by the shellac surface noise, which is worst at about 3 kHz and at the highest frequencies tends to decrease somewhat. Hence, with acoustic recordings, when using proper noise reduction equipment, it is possible to boost and recover these frequencies in many cases. The result is a lifelike vitality which can only be believed when heard. After all, these acoustic 78's, as well as the later electrics, were *direct cut disks* and, despite their many and obvious limitations, a sense of realism is possible when they are *properly* reproduced.

#### G. STUDIO BALANCE

The overall audio system must, of course, be of the highest quality and *must* incorporate room/speaker equalization for *studio flat response*; otherwise, any sound rebalancing work which is done has no meaningful reference. The hearing of the restorer must be good, or correctable, and meaningful work is impossible if one has a cold or any other problem which degrades the hearing.

#### H. TAPE EDITING

Advanced skills are needed in tape editing to remove heavy clicks and pops which the Packburn can't totally eliminate. Since the Packburn blankers eliminate the high frequency component of even heavy clicks and pops, it is advisable to strongly decrease the bass and advance the treble when doing click and pop editing.

The blending of sides on multiple record selections (few 78's run over 4 minutes) takes practice. Splicing is best done on the *start* of a note, or possibly on the end of a note from the previous side, but never in the middle of a pause, as the shift in any background hiss would be very disconcerting. Diameter equalization (a gradual increase in treble on the inner grooves to compensate for the poorer

high frequency response on the inner grooves) is frequently inadequate or nonexistent on early recordings. A continuous and very gradual boost in treble on the inner grooves of 3 to 5 dB, followed by an immediate return to normal before the start of the next side, can eliminate this problem. For some difficult side splices a splicing block with a 2 inch long splice can be helpful in making the sound change more gradual. A few late 78 sets have a fade-out and fade-in at the end and beginning of each record. On these, and a few other problem cases, cross-fading is the best technique for side blending. Naturally, all tape editing must be done at 15 ips (or higher), employing quality recorders, tape and skills.

These, then, are the basic requirements for transferring and sonic restoration work. Unless these requirements are fully met, further considerations are of little value. Advanced techniques include resonance and parametrics, non-linearity and EQ gain riding, expansion, reverberation and selective frequency time delay. These, coupled with the standards of authenticity and artistic integrity (sonic restoration is both Science and Art), will be covered in future issues. ■

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# Tape to Disk

Listings of Mastering, Pressing and Tape Duplication Facilities Throughout the United States

The following listings of record mastering and pressing facilities throughout the United States were compiled from questionnaires returned to Mix by the various businesses. Mix claims no responsibility for inaccurate information supplied to us. We suggest that readers contact those listed to verify any essential factors. The next issue of Tape to Disk listings will be in December of 1983. We urge all mastering, pressing and tape duplication operations who we may have missed in this survey to get in touch with us for the next listings.

## Eastern

**ASR RECORDING SERVICES**  
TAPE DUPLICATION  
21 Harriatown Rd., Glen Rock, NJ 07452  
8960 Elton Ave., Canoga Park, CA 91304  
NJ: (201) 652-5600, CA: (213) 341-1124  
Contact: Bill Dawson, Vice President, Sales

**ALPHA RECORDS, INC.**  
PRESSING  
1400 N.W. 65th Ave., Plantation, Ft. Lauderdale, FL  
(305) 587-6011  
Contact: Dick Smith, President.

**AUDIO DUPLICATING SERVICE**  
TAPE DUPLICATION  
915 NE 3rd Avenue, Fort Lauderdale, FL 33304  
(305) 764-0333  
Contact: Mark Auld, Production Manager

**AUDIO MATRIX, INC.**  
PRESSING  
915 Westchester Ave., Bronx, NY 10459  
(212) 589-3500  
Contact: Bob Stillman, General Manager

**BESTWAY GROUP (Peerless Audiophile Div.)**  
MASTERING & PRESSING  
1105 Globe Ave., Mountainside, NJ 07092  
(201) 232-8383  
Contact: Paul Stevens

**BURLINGTON AUDIO TAPES, INC.**  
TAPE DUPLICATION  
106 Mott St., Oceanside, NY 11572  
(516) 678-4414  
Contact: Rudy Schwartz

**CENTRAL AUDIO VISUAL, INC.**  
TAPE DUPLICATION  
1212 South Andrews Ave., Ft. Lauderdale, FL 33316  
(305) 522-3796  
Contact: M. Lever, Vice President

**CRESCENDO RECORDERS**  
MASTERING  
125 Simpson St. N.W., Atlanta, GA 30318  
(404) 223-0108  
Contact: Hil. Ray



*CRITERIA CUTTING CENTER, Miami, FL*

**CRITERIA CUTTING CENTER**  
MASTERING, TAPE DUPLICATION  
1755 N.E. 149th St., Miami, FL 33181  
(305) 947-5611  
Contact: Marjoe Curry, Studio Manager  
**MASTERING**  
Cutting lathes: Tandem lathes, Scully LS 76 with O-tolon D SS 731 and 732.  
Console: Criteria design automated  
Tape machines: MCI modified 1/4" and 1/2"  
Monitor speakers: Custom designed Ed Long Time-Aligned, Yamaha MS 100, Auratones, Aroustat, Electrostal  
Signal processing: Scundie-h MES-430B EQ, Sourddeck DFC 200 dynamic range control. All available Criteria rcdg gear  
Engineers: Mike Fuller  
Rates: Custom cutting \$125/hr/Laquer 45's \$75/set LP's \$190/set  
Credits: Bee Gee's, Rod Stewart, Kenny Loggins, Barry Manilow, Eric Clapton, Eddie Money, Dionne Warwick, Franke & the Knockouts, John Cougar, Chilliwack, Pat Travers  
Other services: Full recording services available



*THE CUTTING EDGE, Ferndale, NY*

**THE CUTTING EDGE**  
MASTERING, PRESSING & TAPE DUPLICATION  
P.O. Box 217, Ferndale, NY 12734  
(914) 292-5965  
Contact: Paul Gerry, Owner and Chief Cutting Engineer  
**MASTERING**  
Cutting lathes: Scully Lathe with Westrex 3DII Cutterhead, Ransteel Audio 250 watt per channel cutting amps, video monitoring  
Console: Custom-built setup for direct to disk  
Tape machines: Ampex 351 specially modified for tape to disk transfer  
Monitor speakers: JBL 4311's, Auratones, Alter Voice of The Theatre  
Signal processing: Fairchild 670 compressor, Ashly Parametric EQ, dbx 1 & 2, Graphic EQ, Pultec EQ, UREI 1176N and miscellaneous gear  
Engineers: Paul Gerry  
Rates: 12" \$70/side, 45 \$40/side, many more services available  
Write for free brochure  
Credits: on request  
Other Services: Pressing and tape duplication  
**PRESSING**  
Presses (Mfg. and quantity): all 12" pressing work is audiophile quality by an outside facility  
Rates: on request  
Other services: Disc cutting and tape duplication  
**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): All tape duplication is handled by outside top quality tape duplicators

Method of duplication: In cassette and in bin loop depending on job specifications

Rates: on request

Other services: Record pressing and disk cutting

**DISC COMMUNICATIONS LTD.**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
743 Fifth Avenue, New York, NY 10022  
(212) 371-0390 or (212) 966-3185  
Contact: Jerry Bendich

**DISKMAKERS INC**  
**PRESSING & TAPE DUPLICATION**  
925 N 3rd St., Philadelphia, PA 19123  
(213) 627-2277

Contact: Paul Dony, General Manager

**PRESSING**

Presses (Mfg. and quantity): 10 presses Teacoy Val

Capacity: 80,000 wks

Vinyl used: Keser and Teranin

Rates: Write for price list

Other services: Mastering, plating and labels

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): Electrosonic 10-Line

Capacity: 40,000 wks

Method of duplication: Bin loop

Mastering equipment: Scully and Ampex

Tape used: CBS and AGFA

Shell used: Shape

Duplicating speed: 6-11

Type of loading: Kint

Packaging availability/etc: All types

Rates: Write for price list

Other services: Labels and insert cards

**DYNAMIC RECORDING**  
**TAPE DUPLICATION**  
2846 Dewey Ave., Rochester, NY 14616  
(716) 621-6270  
Contact: Dave Casperson, Owner

**ERH PRODUCTIONS**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
40 West 27th St., New York, NY 10001  
(212) 696-1550  
Contact: Bob Shavelson, Vice President National Sales

**EXECUTIVE RECORDING LTD**  
**MASTERING**  
300 W. 55th St., New York, NY 10019  
(212) 247-7434  
Contact: Gene Sayer, Boss

**THE EXXEL COMPANY**  
**TAPE DUPLICATION**  
250 West 34th St., Suite 2131, New York, NY 10119  
1907 Apple St., Oceanside, CA 92054  
NY: (212) 695-0006, Oceanside (213) 439-3020  
Contact: Bill Kottcamp, in Oceanside, Manager, Richard Burke, in New York, Account Manager

**EUROPADISK, LTD.**

EUROPADISK, LTD, New York, NY

**EUROPADISK, LTD.**  
**PRESSING**  
75 Varick St., New York, NY 10013  
(212) 226-4401; TWX 710 581 2034

Contact: James P. Shelton, President

**PRESSING**

Presses (Mfg. and quantity): Two Hamilton automatres two

Toolex Alpha automatres

Capacity: 12,000 LP's per day

Vinyl used: Teldex (Germany), Supravinyl (Japan), Vitec Quixex (US)

Rates: Three quality levels available: 1) Audiophile Classical imported virgin vinyl 2) Audiophile Classical virgin domestic vinyl 3) Commercial Classical domestic vinyl

Credits: All RCA digital releases, all Moss Music Group digital releases, Vanguard digital, Audioton, CHL Musical Heritage, New World Records

Other services: Audiophile quality central electroplating

**EVA-TONE SOUNDSHEETS, INC.**  
**MASTERING, PRESSING**  
P.O. Box 7020, Clearwater, FL 33518  
(813) 577-7000  
Contact: Jack Miller, Sales Manager

**FRANKFORD/WAYNE MASTERING LABS, INC.**  
**MASTERING & PRESSING**  
1697 Broadway, New York, NY 10019  
(212) 582-5473

Contact: Tom Steele, President, Norvell Miller, General Manager

**MASTERING (6 Cutting Rooms/Mastering Suites)**

Cutting lathes: 6 lathes total: 1 Neumann equipped with CompuDisk Computer, 4 Scully Banstole equipped with CompuDisk Computers, 1 Scully Banstole equipped with CompuVinyl computer, 2 Scully Banstole fully automated. Lathes equipped with the following cutting systems: 1 Neumann SX 74 SA1 74 with Tracing simulator, 4 Neumann SX 74 with custom Banstole Driver Electronics, 2 Westrex DJIAH RA 1700 drive system, 1 Orban DSS 74 with Banstole Driver

Consoles: 4 Banstole Auto custom consoles, 4 manually operated

Tape machines: 4 MCI JH 110MB, 1 Scully Banstole, 1 Orban TM, 2 Ampex ATR 102, 1 3M M64, 2 6 Technic, 1 FR-1520, 4 Ampex AG-440B

Monitor speakers: 4 JBL 4350B, 2 JBL 4443, 4 JBL 4430, 4 JBL 4411, 1 Altec-Maximo Lab, 4 ADS 400, 4 Air cone 50, 2 ROB Cables

Signal processing: EQs parametric (Orban), Dolby limiters Pro-Orban, limiters by Sontec, CBS Labs, digital processing by Ampex, AMS, Sony, custom cutting rooms and equipment by Banstole Audio

Engineers: Don Baines, Tom Coyne, Herb Powers Jr., Leo Gierhart, Tom Steele, Dave Cravotta, Don Grossinger, plus two studio lites engineer

Rates: Client Agreement: \$90 to \$160 per hour (depending on room and irregularity), LP Masters: \$100/side, 45 Masters: \$40/side, 12" Stereo Masters: \$75/side, LP Reissues: \$100, 45 Reissues: \$40, 12" Discs: \$60. Other prices upon request

Credits: Buddy Holly, Paul McCartney, George Th, rock and roll, Motown, Eazy-E, Koolha, Herbie Hancock, Grover Washington Jr., to name just a few. Plus approximately one-half of two weekly Bill board Discs, chart singles and LP's

Other services: Digital to Analog Transfers, Reissues in Frankfort Wayne, master complete in house, Sony Digital Pressing and system, 1 in house Sony format PCM 1600, 1510, PCM 100, PCM 10 or PCM 11, 2 two track facilities, direct to disc, package pressing plant, 11's or 45's, full press mastering facilities

**FRANKFORD WAYNE MASTERING LABS, INC.**  
**MASTERING & PRESSING**  
134 N. 12th St., Philadelphia, PA 19107  
(215) 561-1794

Contact: Lynn Steele, General Manager, Tom Steele, President

**MASTERING**

Cutting lathes: 4 Scully Banstole equipped lathes, 1 equipped with CompuDisk computer. All lathes equipped with Westrex DJIAH Banstole cutting systems

Console: Banstole Auto custom with full facilities

Tape machines: MCI JH 110MB, ATR 102, 3M M64, 2 Technic, 1520, Ampex Invenens, MCI JH 110M, 2 two track

Monitor speakers: 4 JBL 4430, 2 JBL 4443, 2 Altec-Maximo Lab

Signal processing: Ampex AD11 Digital EQ and limiters by Sontec, UREI Banstole

Engineers: Nimitz Sarkisian, Tom Steele

Rates: Client Agreement: \$90/hr, LP Masters: \$100/side, 45 Masters: \$40/side, Disco Masters: \$75/side, LP Reissues: \$100, 45 Reissues: \$40, Discs: D.E. Reissues: \$60. Other rates upon request

Credits: Don Williams, Leon Bawls, Robert Hazard, Today, Lonnie Young Blood, Sly & The Family Stone, The Sound of Philadelphia, Gamble-Huff, Bell

Other services: Digital to analog transfers (any format), Sony PCM facilities in house, including PCM 1600, 1510, PCM 100, PCM 10 or PCM 11, 2 two track mastering facilities, direct to disc, complete package pressing service for LP's or 45's

**GOLDEN CREST RECORDS**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
220 Broadway, Box 2859, Huntington Station, NY 11746  
Toll free (800) 645-5318; NY (516) 423-7090  
Contact: C.F. Galehouse, President

**MASTERING**

Cutting lathes: Neumann

Console: Gotham

Tape machines: Teletunken/Ampex ATR 100's, Sony Digital

Other services: Record pressing, tape duplication

**PRESSING**

Presses (Mfg. and quantity): All automatic

Capacity: any quantity

Other services: In plant jacket and label printing, Art facilities

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): Ampex

Capacity: Any quantity

Packaging availability/Fulfillment services: Yes

**IAN RECORDING & DUPLICATING**  
**TAPE DUPLICATION**  
76 Bellevue Rd., Andover, MA 01810  
(617) 475-4056

Contact: Richard Berberian or Paul Mandian

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): 4 Otari DP 4050

Capacity: 8-1

Method of duplication: Bin to reel

Mastering equipment: 2 Technics 1500, 1506

Tape used: Scotch, Ampex, AGFA

Shell used: Magnetics Media

Type of loading: Otari DP 2700, Kint, Otari Bin loop

Packaging availability/etc.: Complete packaging

Rates: Call for rate

Other services: Blank cassettes available

**SOUTHERN AMERICAN RECORD PRESSING CO., INC.**

**MASTERING, PRESSING & TAPE DUPLICATION**

305 11th Ave. S., Nashville, TN 37203-4086

(615) 256-2521

Contact: John Ivanic, President

**INTERNATIONAL RECORDING CO.**  
**MASTERING**  
49 Desmond Ave., Bronxville, NY 10708  
(914) 337-5726

Contact: Claire Rie, President

**THE MASTER CUTTING ROOM, INC.**  
**MASTERING**  
321 W. 44th St., New York, NY 10036  
(212) 581-6505

Contact: Randi Greenstein, Traffic Manager

**MASTERDISK CORPORATION**  
**MASTERING**  
16 West 61st St., New York, NY 10023  
(212) 541-5022  
Contact: Jill M. Dix, General Manager

**MIAMI TAP INC.**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
8180 N.W. 103 St., Hialeah Gardens, FL 33016  
(305) 558-9211

Contact: Carlos O. Garcia, President

**MASTERING**

Cutting lathes: Haeco

Tape machines: MCI

Monitor speakers: JBL

Signal processing: EQs parametric (Orban), Dolby dbx

Burwen, UREI limiters

Engineers: Jorge Garcia

Rates: On request

Credits: On request

Other services: Assembly, edit and copies. We also manufacture stampers

**PRESSING**

Presses (Mfg. and quantity): 15MT LP, 2 5 MT 45's, fully automatic

Capacity: 100,000 LP's & 100,000 45's monthly

Vinyl used: Kaiser

Rates: On request

Credits: On request

Other services: Complete litho services - jackets, label & artwork for record industry

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): Electrosonic Model 6000 4

slaves Model 4000 6 slaves

Capacity: 150,000 units monthly

Method of duplication: Bin loop

Mastering equipment: Electrosonic

Tape used: 8 track, CBS cassette, AGFA

Shell used: Elmar

Duplicating speed: 6-11, 12-1

Type of loading: 8 track, Electrosonic, cassette, D&D MK2000

Packaging availability/etc.: Full packaging

Rates: On request

**PETER PAN INDUSTRIES**  
**MASTERING**  
145 Komorn St., Newark, NJ

(201) 344-4214  
Contact: Al C. ... Sales Manager

**PRC RECORDING COMPANY**  
MASTERING, PRESSING & TAPE DUPLICATION  
422 Madison Ave., New York, NY 10017  
(212) 308-2300  
Contact: David A. Grant, Director of Marketing

**QUIK-CASSETTE CORP**  
TAPE DUPLICATION  
250 West 57th St., Room 1400, New York, NY 10019  
(212) 977-4411  
Contact: Mark Milchman, President

**RGH RECORD MANUFACTURING CORP.**  
MASTERING & PRESSING  
750 Eighth Ave., New York, NY 10036  
(212) 354-4336  
Contact: George Srolovits, President



**Computer Software Duplication**  
(Apple, APS, Heath, Radio Shack Commodore, Otari & Vic = 20)

*SOUNDARTS COMPANY, INC., Oakhurst, NJ*

**SOUND-ARTS COMPANY, INC**  
TAPE DUPLICATION  
5 Cindy Lane, Oakhurst, NJ 07755  
(201) 493-8666

Contact: Frank G. ...  
**TAPE DUPLICATION**  
Duplicator (Mfg. and quantity) ...  
Capacity: 120,000 wk.  
Method of duplication: ...  
Mastering equipment: ...  
Tape used: ...  
Shell used: ...  
Duplicating speed: ...  
Type of loading: ...  
Packaging availability etc.: ...  
Rates: ...  
Other services: ...

Sound Technique Inc. See listing on p. 40

**SOUNDWAVE RECORDING STUDIOS, INC**  
MASTERING  
50 West 57th St., New York, NY 10019  
(212) 582-6320  
Contact: Don Van ... Chief Engineer

**SOUTHERN AMERICAN RECORD PRESSING CO., INC**  
MASTERING, PRESSING & TAPE DUPLICATION  
305 11th Ave. S., Nashville, TN 37203-4086  
(615) 256-2521  
Contact: ...

**SPECTRUM FIDELITY MAGNETICS, INC**  
TAPE DUPLICATION  
49 Glenwood Ave., Lancaster, PA 17602  
(800) 441-8854, (717) 295-9275  
Contact: John O. ... Director Sales & Marketing

**TAPE DUPLICATION**  
Duplicator (Mfg. and quantity): ...  
Capacity: 40,000 wk.  
Method of duplication: ...  
Mastering equipment: ...  
Tape used: RASF  
Shell used: IPS  
Duplicating speed: ...  
Type of loading: ...  
Packaging availability etc.: Yes  
Rates: Upon request

# Tape to Mastering, Pressing and Tape Duplication Facilities Throughout the United States

**Other services:** ...

**STERLING SOUND, INC**  
MASTERING  
1790 Broadway, New York, NY 10019  
(212) 757-8519  
Contact: John Kirby, Studio Manager

**SUN PLASTICS CO., INC. - DYNAMIC LP STEREO RECORDS, INC.**  
PRESSING  
900 Passaic Ave., East Newark, NJ 07029  
NJ (201) 482-6749, NY (212) 349-0777  
Contact: Jerry Salerno, President

**SUNSHINE SOUND INC.**  
MASTERING  
1650 Broadway, New York, NY 10019  
(212) 582-6227  
Contact: Frank J. ... President

**SWEETSONG PRODUCTIONS**  
PRESSING, TAPE DUPLICATION  
P.O. Box 2041, Parkersburg, WV 26102  
(304) 489-2911  
Contact: ...

**TRACY-VAL CORPORATION**  
RECORD PLATING  
201 Linden Ave., Somerdale, NJ 08083  
(609) 627-3000  
Contact: James Miller, President

**TRUTONE RECORDS DISK MASTERING LABS**  
MASTERING & PRESSING  
163 Terrace St., Haworth, NJ 07641  
(201) 385-0940  
Contact: ...  
**MASTERING**  
Cutting lathes: ...  
Console: ...  
Tape machines: ...  
Monitor speakers: ...  
Signal processing: ...  
Engineers: ...  
Rates: ...

**VIRTUE RECORDING**  
MASTERING, PRESSING & TAPE DUPLICATION  
1518 N. Broad St., Philadelphia, PA 19121  
(215) 763-2825  
Contact: ...

## Central

**A&R RECORD & TAPE MANUFACTURING**  
MASTERING, PRESSING & TAPE DUPLICATION  
902 N. Industrial Blvd., Dallas, TX 75207  
(214) 741-2027, or 748-7460  
Contact: Vera McGraw, V.P. City Systems, Sales  
**MASTERING**  
Cutting lathes: ...  
Console: ...  
Tape machines: ...  
Monitor speakers: ...  
Signal processing: ...  
Engineers: ...  
Rates: ...  
Credits: ...  
Other services: ...

**PRESSING**  
Presses: ...  
Capacity: ...  
Vinyl used: ...  
Rates: ...  
Credits: ...  
Other services: ...  
**TAPE DUPLICATION**  
Duplicator: ...  
Capacity: ...  
Method of duplication: ...  
Mastering equipment: ...  
Tape used: ...  
Shell used: ...  
Duplicating speed: ...  
Type of loading: ...  
Packaging availability/etc.: ...  
Rates: ...  
Other services: ...

**AMERICAN SOUND CORPORATION**  
TAPE DUPLICATION  
25133 Thomas Drive, Warren, MI 48091  
(313) 539-2900  
Contact: Don Armstrong, Sales Manager  
**TAPE DUPLICATION**  
Duplicator: ...  
Capacity: ...  
Method of duplication: ...  
Mastering equipment: ...  
Tape used: ...  
Shell used: ...  
Duplicating speed: ...  
Type of loading: ...  
Packaging availability/etc.: ...  
Rates: ...  
Other services: ...



*ARDENT MASTERING, INC., Memphis, TN*

**ARDENT MASTERING, INC**  
MASTERING  
2000 Madison Ave., Memphis, TN 38104  
(901) 725-0855  
Contact: Larry Nix, Chief Engineer  
**MASTERING**  
Cutting lathes: ...  
Console: ...  
Tape machines: ...  
Monitor speakers: ...  
Signal processing: ...  
Engineers: ...  
Rates: ...  
Credits: ...

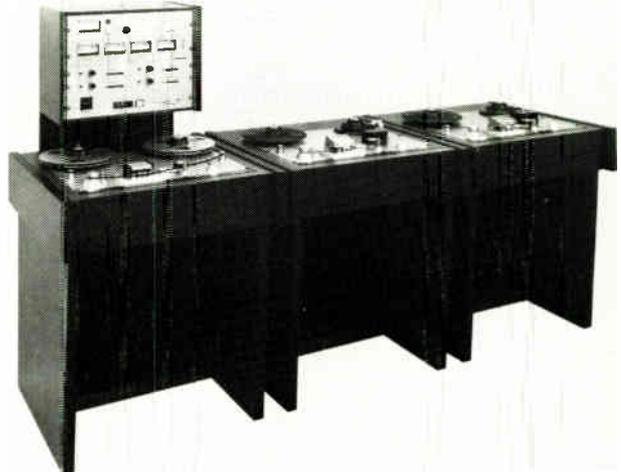
**AUDIO MIXERS RECORDING COMPANY, INC**  
TAPE DUPLICATION  
740 N. Rush St., Chicago, IL 60611  
(312) 943-4274  
Contact: ...

# AUDIO/TEK

## PRACTICAL Tape Duplicating Systems . . .

For more than 15 years AUDIO/TEK has proven the rewards of **practical** engineering . . .

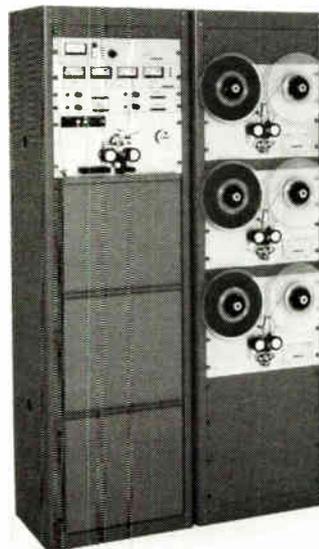
- Highest duplication quality
- Maximum reliability
- Cost effective tape production
- Most versatile duplication systems available
- Uncompromised quality at realistic prices



2000 RR4 REEL-TO-REEL SYSTEM



2000BL SYSTEM



1200B SYSTEM

Before you land on the "Rock" or get carried away with the blinking lights of microprocessors, check out the AUDIO/TEK line of professional duplicating systems . . . there really is a **practical** alternative.

**AUDIO/TEK** . . . the **practical** people.

502-D Vandell Way, Campbell, CA 95008 - (408) 378-5586 - Telex 172-230



SOUND TECHNIQUE, INC. New York, NY

**SOUND TECHNIQUE INC.**

**MASTERING**

130 West 42nd St., New York, NY 10036  
(212) 869-1323

Contact: Gladys Hopkowitz, President

**MASTERING**

Cutting lathes: Scully lathe with Capps Van Pitch and Van Depth computers

Console: custom

Tape machines: MCI JH 110M, Studer Revox PR 99

Monitor speakers: Danlquist DDM 9, Teefines SH 7000

Minimus II

Signal processing: Teletronix LA 4A, Dolby, dbx

Engineers: Gladys Hopkowitz, Sidney Feldman, Chief Engineer

Rates: LP \$95-45 \$40, Disco \$70/side

Credits: All types of music, ranging from classical through contemporary including jazz and reggae

Other services: 40 ips mastering, AV pulsing and HDKape 40 50 mastering

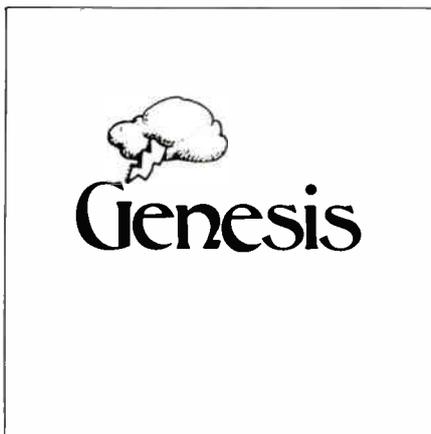
**BODDIE RECORD MFG. & RECORDING**  
MASTERING, PRESSING & TAPE DUPLICATION  
12202 Union Ave., Cleveland, OH 44105  
(216) 752-3440  
Contact: Tom Hoddie, President

**CENTURY SOUND & SLIDE**  
MASTERING, TAPE DUPLICATION  
1018 Busse Hwy, Park Ridge, IL 60068  
(312) 696-0675  
Contact: Al Tallman, Owner

**CUSTOM TAPE DUPLICATORS INC**  
TAPE DUPLICATION  
341 Hill Ave., Nashville, TN 37210  
(615) 256-1728  
Contact: Chl Tant, President

**ELECTRO SOUND TAPE SERVICES INC.**  
TAPE DUPLICATION  
2101 S. 35th St., Council Bluffs, IA 51501  
(712) 328-8060  
Contact: Marvin King, President

**ELEPHANT RECORDING STUDIOS**  
MASTERING, PRESSING & TAPE DUPLICATION  
21206 Gratiot Ave., East Detroit, MI 48021  
(313) 773-9386  
Contact: John Gaiser, Owner



GENESIS RECORDING, INC., Chicago, IL

**GENESIS RECORDING, INC.**  
TAPE DUPLICATION  
645 N. St. Clair, Chicago, IL 60611  
(312) 649-5711

Contact: Larry Root, President

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): Magnetax & Telex

Capacity: 2000 average per 8 hr shift

Method of duplication: In cassette, bin loop

Mastering equipment: Studer, Ampex, Scully

Tape used: Ampex & AGFA

Shell used: Magnetic Media

Type of loading: King Modified MK Series

Packaging availability/etc.: Bulk or individual packaging and shipping

Rates: On request

Other services: High speed 1/4" tape duplication, packaging and shipping

**INDEPENDENT PRODUCERS CORP.**  
TAPE DUPLICATION  
1609 McGavock St., Nashville, TN 37203  
(615) 244-4236  
Contact: Jerry Moore, General Manager

**INDUSTRIAL AUDIO/FILM SERVICES**  
TAPE DUPLICATION  
6228 Oakton, Morton Grove, IL 60053  
(312) 965-8400  
Contact: Lauren Leifer, Executive Vice President

**JOEY RECORDS INC.**  
MASTERING, PRESSING & TAPE DUPLICATION  
6703 W. Commerce, San Antonio, TX 78227  
(512) 432-7893  
Contact: Joey Lopez, President

**JRC ALBUM PRODUCTIONS**

**Tape to disk**  
Listings of Mastering,  
Pressing and Tape  
Duplication Facilities  
Throughout the United States

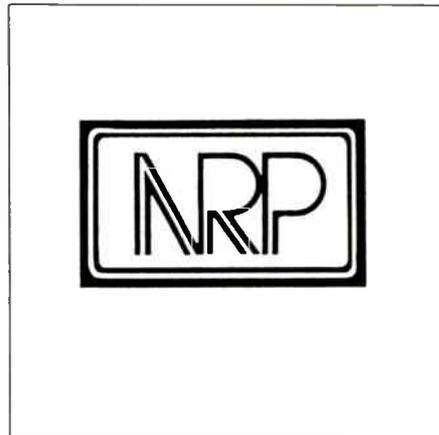
**(JEWEL RECORDING CO.)**  
MASTERING, PRESSING & TAPE DUPLICATION  
1594 Kinney Ave., Cincinnati, OH 45231  
(513) 522-9336  
Contact: Linda York, Vice President

**K&R RECORDING**  
TAPE DUPLICATION  
29111 Greenfield, Southfield, MI 48076  
(313) 557-8276 or 574-2080  
Contact: Bob Gajewski, Manager

**MASTERCRAFT RECORDING CORP.**  
MASTERING  
437 N. Cleveland, Memphis, TN 38104  
(901) 274-2100  
Contact: Howard Craft, Studio Manager

**MASTERFONICS**  
MASTERING  
28 Music Square East, Nashville, TN 37203  
(615) 327-4533  
Contact: Ken Perry, Studio Manager

**MASTERING**  
Cutting lathes: Room 1 (2) Neumann VMS-70 operated by Zuma computer, SAL74 amplifiers, SX74 cutter heads. Room 2 Scully lathe w/Capps computer. Westrex 3DIIAH cutter head, Westrex RA1700B amplifiers  
Console: Room 1 Neumann SF75. Room 2: Neumann SP72  
Tape machines: Room 1 Studer A80 preview machine, Studer A80H and B67 copy machines (2 track)  
Monitor speakers: Room 1 Modified Westlake TM 1's w/TAD drivers. Room 2 John Gardner cabinets w/JBL woofers and TAD high frequency drivers  
Signal processing: Custom-built EQ by Bill Isenburg, Sontec parametric EQ, Audiotronics 4-band EQ, API 550A EQ, Neve stereo compressor/limiters  
Engineers: Glenn Meadows, Jim Loyd, Brian Burr, Al Smith.  
Rates: Please call for rates  
Other services: Ampex ATR-102 1/2" 2 track for rent. Master Technologies offers JVC Series 30 digital 2 track rental, editing and mastering. Call Masterfonics for details



NASHVILLE RECORD PRODUCTIONS, INC., Nashville, TN

**NASHVILLE RECORD PRODUCTIONS, INC.**  
MASTERING, PRESSING & TAPE DUPLICATION  
469 Chestnut St., Nashville, TN 37203  
(615) 259-4200  
Contact: George Ingram, Co-owner

**MASTERING**  
Cutting lathes: Neumann & Capps computer two  
Console: Sphere & Neve  
Tape machines: Studer & MCI  
Monitor speakers: Super Reds & Electro-Voice Sentry 3's  
Signal processing: Parametric & graphic EQ, reverb, limit and compressor  
Engineers: Glen Bullard, Chief Engineer, John Eberle, Studio Mgr., Doug Lawrence, Engineer  
Rates: \$80/per side, 12", \$300/per side, 7"  
Credits: Sha-na-na, Tupperware, American Airlines, U.S. Govt., PSA, Sperry New Holland, Dnters, Bill Anderson

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Other services: Editing, reference acetate, 1/2 speed cutting, tape duplication, album packaging

#### PRESSING

Presses: (24) Southern Machine & Tool automatics, LPs and 45's

Capacity: 1 000 000 per month

Vinyl used: Lenahan

Rates: 57 LP's, 26 45's large runs per quote

Credits: Same as mastering

Other services: Same as listed above, printing record labels

#### PROGRAMMING TECHNOLOGIES, INC.

##### TAPE DUPLICATION

6666 N. Lincoln Ave., Lincolnwood, IL 60645

(312) 676-9400

Contact: Charles Farmer, Sales Manager

#### NORWEST COMMUNICATIONS

##### TAPE DUPLICATION

123 South Hough St., Barrington, IL 60010

(312) 381-3271

Contact: Mark Karney, Owner



QCA CUSTOM PRESSING, Cincinnati, OH

#### QCA CUSTOM PRESSING

##### MASTERING, PRESSING & TAPE DUPLICATION

2832 Spring Grove Ave., Cincinnati, OH 45225

(513) 681-8400

Contact: Keith Myers, Sales Representative

#### QUANTITAPE DUPLICATING INC.

##### TAPE DUPLICATION

311 W. Superior St., Chicago, IL 60610

(312) 853-0550

Contact: Dan Tynus, President

##### TAPE DUPLICATION

Duplicator (Mfg. and quantity): MTL System III

Capacity: 25 000 units/wk

Method of duplication: In cassette, bin loop

Mastering equipment: Scully, Mincom, Revox, Neve

Tape used: AGFA mastering tape, AGFA Ampex dupl. tape

Shell used: Magnetic Media Data Packaging

Duplicating speed: 64 | 32 | 16 | 8 |

Type of loading: Automated King

Packaging availability/etc.: Packaging, labelling, drop shipment

Rates: Brochure available upon request

Other services: Computer software dupl., floppy disc dupl., Reel/reel dupl., all formats

#### RAINBOW RECORD PRESSING

##### PRESSING

2737 Irving Blvd., Dallas, TX 75207

(214) 630-6401

Contact: Phil Kalan, General Manager

#### RANDY'S ROOST

##### MASTERING

30 Music Square W., Nashville, TN 37203

(615) 254-8825

Contact: Randy King, Owner

##### MASTERING

Cutting lathes: Neumann VMS 70/SX 74

Console: Neumann ST75

Tape machines: Studer A 80 MKII, Studer B 67 & B 77

Monitor speakers: Lockwood Universal Majors Auratones

Signal processing: Neve 2087 EQ, Neve limiter/compressor

EMT 156, PDM compressor, Revox B710 (2)

Engineers: Randy King, Lois Walker

Rates: Available upon request

Credits: Alabama, George Strait, John Denver, Elvis Presley, Roger Whittaker, Chet Atkins, Les Paul, Waylon Jennings, Christy

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(615) 259-4200

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Circle #027 on Reader Service Card

Lane, Alice Cooper  
 Other services: Studer 1/2" mastering  
**PRESSING**  
 Presses: Swedish Alphas, British EMI's  
 Capacity: 450,000/wk on 7", 850,000/wk on LP's  
 Vinyl used: Special compound  
 Rates: Available upon request  
**TAPE DUPLICATION**  
 Information available upon request

**RI-RECORD PRODUCTIONS - QUEEN CITY**  
**RECORD GRAPHICS**  
**MASTERING & PRESSING**  
 9745 Mangham Drive, Cincinnati, OH 45215  
 (513) 733-5533  
 Contact: Carl Burkhardt, President, Ian Ackley, Engineer  
**MASTERING**  
 Cutting lathes: Neumann AM-32 SX74 head  
 Console: Ortophone, solid state Neumann rack  
 Tape machines: MCI  
 Monitor speakers: Altec  
 Signal processing: Various Teletronic  
 Engineers: Ian Ackley  
 Rates: 12" mastering \$70/side 7" mastering \$35/side  
**PRESSING**  
 Presses (Mfg. and quantity): 4 Automatic  
 Capacity: 2800/8 hr  
 Vinyl used: Lenahan Pure  
 Rates: Subject to negotiation  
 Other services: Specializing in small runs for school bands, choral clubs and churches

**RON ROSE PRODUCTIONS/RECORDING STUDIO**  
**TAPE DUPLICATION**  
 29277 Southfield Rd., Southfield, MI 48076  
 (313) 424-8400  
 Contact: Don Wooster, Duplication Department Manager  
**TAPE DUPLICATION**  
 Duplicator: Telex, Magnafax  
 Capacity: 3,000 C-60 per day 2,500 reel to reels per day (3 min.)  
 Method of duplication: In cassette bin loop and reel to reel  
 Mastering equipment: MCI  
 Tape used: Ampex 456, AGFA 526, Scotch 226 & 176  
 Shell used: Mag Media, Kyrac  
 Type of loading: Two King loaders  
 Packaging availability/etc.: Labeling, boxing, expediting  
 Rates: Call  
 Other services: Computerized expediting 3 1/2" video editing

**SOUND OF NASHVILLE, INC./A Division of Southern**  
**American Record Pressing Co., Inc.**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 305 11th Ave. S., Nashville, TN 37203  
 (615) 256-2521  
 Contact: Martha Ivanits, Sales Manager

**SPECIAL RECORDINGS, INC.**  
**TAPE DUPLICATION**  
 3026 East Grand Blvd., Detroit, MI 48202  
 (313) 873-4655  
 Contact: Tony Caminita, Vice President & General Manager

**STREETVILLE STUDIOS**  
**TAPE DUPLICATION**  
 161 E. Grand Ave., Chicago, IL  
 (312) 644-1666  
 Contact: Cindy

**SUMA RECORDING STUDIO**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 5706 Vrooman Road, Cleveland, OH 44077  
 (216) 951-3955  
 Contact: Michael Bishop, Mastering Engineer

**TANTUS PRODUCTIONS, INC.**  
**TAPE DUPLICATION**  
 18461 W. McNichols, Detroit, MI 48219  
 (313) 533-3910  
 Contact: Mary Ann McGrath, Vice President/General Manager

**VOLUNTEER RECORD PRESSING, INC.**  
**PRESSING, TAPE DUPLICATION**  
 P.O. Box 956 - 1142 Haley Rd., Murfreesboro, TN 37130  
 (615) 890-3222  
 Contact: Jimmy Lenahan, President

**WOODLAND SOUND STUDIOS**  
**MASTERING**  
 1011 Woodland St., Nashville, TN 37206  
 (615) 227-5027  
 Contact: Glenn Snoddy, Manager

# Tape to disk

Listings of Mastering, Pressing and Tape Duplication Facilities Throughout the United States

**MASTERING**  
 Cutting lathes: Neumann (2)  
 Console: Neumann, Custom  
 Tape machines: Studer 3M  
 Monitor speakers: Westlake Klipsch MDM (4) Auratone  
 Signal processing: Various  
 Engineers: Denny Purcell, Hank Williams  
 Rates: On request  
 Credits: Willie Nelson, Barbara Mandrell, Ronnie Milsap, Oak Ridge Boys, Van Stephenson, Jimmy Buffet, Waylon Jennings, Brenda Lee, Jimmy Hall, Patsy Cline, Conway Twitty, Kansas, Neil Young, Larry Gatlin

## Western

**A&M RECORDS**  
**MASTERING**  
 1416 N. La Brea Ave., Hollywood, CA 90028  
 (213) 469-2411  
 Contact: Dennis Porter  
**MASTERING**  
 Cutting lathes: Scully (one), other with Ultrasonic for tape to cassette and A&M  
 Console: Custom, Neumann and EMI by ANM  
 Tape machines: MCI with ATH head, and modified ATH deck  
 Monitor speakers: A-semble by ANM with Tannoy and PV components with HoH amps  
 Signal processing: Muth-HUA EQ limiter in Filters, CS601 or in noiser in 1200. Studio equipment assembly ANM  
 Engineers: Bertie Grauman, Frank Lely, Bob Turpoe, Linda Clay  
 Rates: On request  
 Credits: Mahav, Jackson, Streeter, Denny Summer, Herb Alpert, Sly Stone, Brother Linn, Stevie Nicks, Quincy Jones, Garth Brooks, The Police, etc.

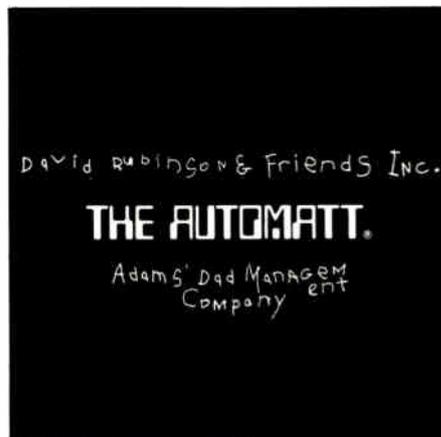
**ALSHIRE INTERNATIONAL, INC.**  
**MASTERING & PRESSING**  
 1015 Isabel Street, P.O. Box 7107, Burbank, CA 91510  
 (213) 849-4671, 843-6792  
 Contact: Al Sherman, President  
**MASTERING**  
 Cutting lathes: Neumann SAE 74 VMS 70 lathe SX74 cutting system  
 Console: Quad Eight Custom AB mastering console  
 Tape machines: MCI 4M 79  
 Monitor speakers: IBI, Custom  
 Signal processing: dbx, Dolby  
 Engineers: Lanky Lindstrom  
 Rates: Quoted on request  
**PRESSING**  
 Presses (Mfg. and quantity): Ten SMT automatic  
 Capacity: 150,000 weekly  
 Vinyl used: Keyser 600  
 Rates: Quoted on request

**ARTISAN SOUND RECORDERS**  
**MASTERING**  
 1600 N. Wilcox Ave., Hollywood, CA 90028  
 (213) 461-2751  
 Contact: Greg Fulginiti, Chief Cutter

**ASR**  
 Recording Services Inc  
**TAPE DUPLICATION**  
 8960 Eton Ave., Canoga Park, CA 91304  
 (213) 341-1124

**AUDIO ENGINEERING ASSOCIATES**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 1029 N. Allen Ave., Pasadena, CA 91104  
 (213) 798-9127  
 Contact: Bill Johnson, Sara Beck, General Manager

**AUDIO-VIDEO CRAFT, INC.**  
**TAPE DUPLICATION**  
 7710 Melrose Ave., Los Angeles, CA 90046  
 (213) 655-3511  
 Contact: Matt Hasen, Manager Tape Duplication



THE AUTOMATT, San Francisco, CA

**THE AUTOMATT**  
**MASTERING**  
 829 Folsom Street, San Francisco, CA 94107  
 (415) 777-4111  
 Contact: Paul Stubblebine, Mastering Engineer  
**MASTERING**  
 Cutting lathes: Scully/Westrex  
 Console: Custom  
 Tape machines: MCI  
 Monitor speakers: UREI 813, Rogers LS3/5A, IBI, Yamaha, Auratone  
 Signal processing: All types available  
 Engineers: Paul Stubblebine  
 Rates: 12" master \$110, 12" Ref \$100, 7" master \$40, 7" Ref \$40 EQ & Rndown \$125/hr  
 Credits: Blue Oyster Cult, Herbie Hancock, Con Funk Shun, Translator, Holly Near, Jane Fonda, Romeo Void, Cris Williamson

**AWARD RECORD MFG., INC.**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 11016 La Cienega Blvd., Inglewood, CA 90304  
 (213) 645-2281  
 Contact: Martin Amsoorian, President  
**PRESSING**  
 Presses (Mfg. and quantity): (4) Lined fully automatic  
 Capacity: 12,000 records/day  
 Vinyl used: Pure virgin Keyser Century KC 600 vinyl  
 Rates: Provided on request  
 Credits: Concord Jazz, Creative World, Sonic Arts, Capitol production music  
 Other services: Printing, mastering & matrix packaging

**KENNETH BACON ASSOCIATES, INC.**  
**TAPE DUPLICATION**  
 216 Montego Key, Novato, CA 94947  
 (415) 883-5041  
 Contact: Ken Bacon, President  
**TAPE DUPLICATION**  
 Duplicator: Otari C2 in cassette Alpha 21 and 41 in cassette  
 Accurate Sound bin loop, 1/2" 4 track staggered head, 5 slaves  
 Capacity: 1,500 C 60 per shift  
 Method of duplication: In cassette & bin loop  
 Mastering equipment: Otari MK 2 4 1/2" (2) Otari MX 5050B Aiwa cassette deck  
 Tape used: AGFA PEM 468 PE 611 PF 619—as required by job  
 Shell used: Kyrac, Magnet Media  
 Duplicating speed: 15 ips, 30 ips, 60 ips—as required by job  
 Type of loading: King, Otari, Audio  
 Packaging availability/etc.: Yes  
 Rates: Trade rates to recording studios  
 Other services: Custom computer and flat sheet labels, computer feed labels for 5" and 7" reels and reel boxes, blank label stocks, blank pre-loaded cassettes, boxes, inserts, shrink wrap, mailers, equipment and supplies division sells most equipment and supplies used by professional duplicators and master distributor AGFA Gevaert video, mastering and cassette tapes

**BAY AREA TAPE SALES**  
**TAPE DUPLICATION**  
 1059 Huckleberry Court, Sunnyvale, CA 94087  
 (408) 730-TAPE  
 Contact: Walt Neal, Owner

**BRANDT'S RECORDING STUDIOS**  
**MASTERING, TAPE DUPLICATION**  
 1030 48th Street, Sacramento, CA 95819  
 (916) 451-3400 or 451-7794  
 Contact: Charles M. Brandt or Edna Brandt, Chief Engineer & Owners



BONNEVILLE PRODUCTIONS, Salt Lake City, UT

**BONNEVILLE PRODUCTIONS**  
**TAPE DUPLICATION**  
 130 Social Hall Ave., Salt Lake City, UT 84111  
 (801) 237-2559  
 Contact: Dave Michelson  
**TAPE DUPLICATION**  
 Duplicator (Mfg. and quantity) Cass 1200 system (4 systems)  
 Capacity: 20,000 pieces/day  
 Method of duplication: Bin loop  
 Mastering equipment: Ampex ATH 104  
 Tape used: BASF  
 Shell used: Magnetic Media (5 screw)  
 Duplicating speed: 64 l  
 Type of loading: King 790s  
 Packaging availability etc.: Yes  
 Rates: Call for quote  
 Other services: Complete 24 track recording, three studios, video synchronization

**BUZZY'S RECORDING SERVICES**  
**TAPE DUPLICATION**  
 6900 Melrose Ave., Los Angeles, CA 90038  
 (213) 931-1867  
 Contact: Bill Shapiro

**CAPITOL RECORDS INC.**  
**MASTERING**  
 1750 No. Vine St., Hollywood, CA 90028  
 (213) 462-6252  
 Contact: Barbara Heim, Office Manager

**CHATEAU EAST SOUND PRODUCTIONS**  
**PRESSING**  
 1040-R N. Grove St., Anaheim, CA 92806  
 (714) 630-0145  
 Contact: Bill & Vicki Hahn

**CHATON RECORDINGS**  
**MASTERING**  
 5625 E. Nauni Valley Dr., Scottsdale, AZ 85253  
 (602) 991-2802  
 Contact: Marie Havenscroft

**COOKSOUND**  
**TAPE DUPLICATION**  
 6626 Hornwood, Houston, TX 77074  
 (713) 772-1006  
 Contact: Billy Cook

**CORY SOUND CO.**  
**MASTERING, TAPE DUPLICATION**  
 1255 Howard St., San Francisco, CA 94103  
 (415) 861-4004  
 Contact: Phil Markinson, Owner

**MASTERING**  
 Console: Tascam  
 Tape machines: Scully Technics TEA  
 Monitor speakers: B&O JBI  
 Engineers: Phil Markinson, Doug Wade  
 Rates: \$45/hr  
**TAPE DUPLICATION**  
 Duplicator (Mfg. and quantity): Liberty  
 Capacity: Unlimited  
 Method of duplication: In cassette bin loop  
 Mastering equipment: Scully, Technics, TEAC  
 Tape used: BASF, 3M, Ampex  
 Shell used: El Mar

# Tape to disk

Listings of Mastering, Pressing and Tape Duplication Facilities Throughout the United States

Duplicating speed: 16 l or depending on project  
 Type of loading: Automatic and manual  
 Packaging availability/etc.: Complete packaging complete fulfillment  
 Rates: On request

**THE CREATIVE WORD**  
**TAPE DUPLICATION**  
 17885 B-2 Sky Park Circle, Irvine, CA 92714  
 (714) 549-0138  
 Contact: Bryan Hill, President

**THE CUTTING SYSTEM, INC.**  
**MASTERING**  
 3307 W. Magnolia Blvd., Burbank, CA 91505  
 (213) 841-5884  
 Contact: Kevin Gray, President  
**MASTERING**  
 Cutting lathes: Neumann line w/ Custom amplifier SXT4 (real Class A transformerless cutting system)  
 Console: ICS, all electronics, Class A amplification, transformerless  
 Tape machines: Studer A80, Custom electronics  
 Monitor speakers: Coherent Audio HPD 125, Auratones  
 Signal processing: 4 band parametric EQ  
 Engineers: Kevin Gray, Chief disk cutter, Doug Sheppard, design engineer  
 Rates: LP Reels \$1,000, 1/2" masters \$100 (single side), Reels \$40 (single master), \$45 (double), EQ time \$1,200/hr

**DAVKORE COMPANY**  
**TAPE DUPLICATION**  
 510 S. Murphy Ave., Sunnyvale, CA 94086  
 (408) 739-7265  
 Contact: Chris Winters, Owner

**DCT RECORDERS**  
**TAPE DUPLICATION**  
 6414 Sunset Blvd., Hollywood, CA 90028  
 (213) 461-2841  
 Contact: Hank Wirtz



DIDASKO TAPES, Portland, OR

**DIDASKO TAPES**  
**TAPE DUPLICATION**  
 1519 S.W. Marlow Ave., Portland, OR 97225  
 (503) 297-8751  
 Contact: Bill Didasko

**FANFARE RECORDING STUDIOS**  
**TAPE DUPLICATION**  
 120 E. Main St., El Cajon, CA 92020  
 (714) 447-2555  
 Contact: Carol Compton, Studio Manager

#6 Grandview Pk. Dr., P.O. Box 92  
 Arnold, Missouri 63010 (314) 464-3013

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Circle #029 on Reader Service Card

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- To begin with, the Fairlight Computer Musical Instrument enables you to play just about any sound you can imagine. And you can reproduce any sound too, both polyphonically and in pitch.
- If your desired sound is not in the vast software library of sounds, you can create it by actually drawing a sound wave on the Fairlight video screen with the convenient lightpen.
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# make any at worth \$27,750?

- Create complex rhythms and music patterns on the interactive real-time composer. Your composition can even be edited as you play.
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New York, NY 10022

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



Circle #030 on Reader Service Card



**AWARD  
RECORD MFG., INC.  
11016 La Cienega Blvd.  
Inglewood, CA 90304**

**Phone:  
(213) 645-2281**

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COMPANY NAME \_\_\_\_\_ PHONE \_\_\_\_\_

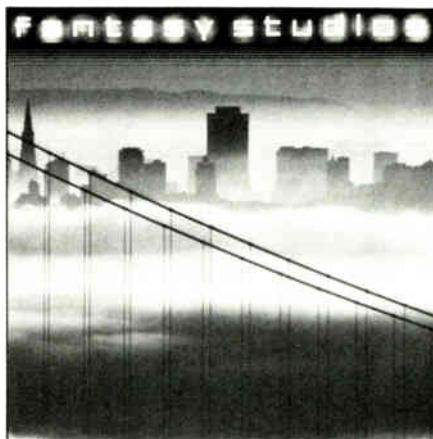
STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Send To:

**AWARD RECORD MFG., INC.**  
11016 S. La Cienega Blvd., Inglewood, California 90304

Circle #031 on Reader Service Card



FANTASY STUDIOS MASTERING, Berkeley, CA

**FANTASY STUDIOS MASTERING  
MASTERING**  
10th and Parker, Berkeley, CA 90028  
(415) 549-2500

Contact: George Horn Andrea or Nina

**MASTERING**

Cutting lathes: Neumann mastering system utilizing the Zuma audio computer

Rates: 11 lacouers \$105 side 45 lacouers \$45 side mastering room run down and EQ \$85 hr

Other services: Mastering from Mitsubishi digital master tapes



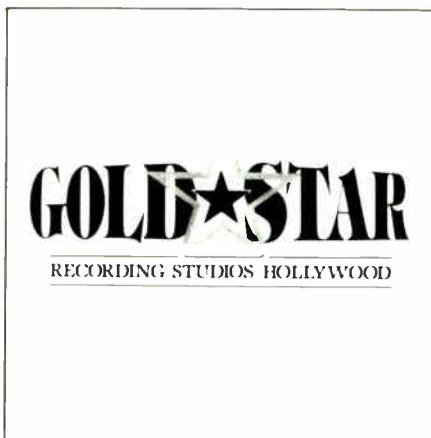
FUTURE DISC SYSTEMS, Hollywood, CA

**FUTURE DISC SYSTEMS  
MASTERING**

3475 Cahuengo Blvd West, Hollywood, CA 90068

(213) 876-8733

Contact: Gary Hilde or Steve Hill Owners



GOLDSTAR RECORDING STUDIOS, INC., Hollywood, CA

**GOLD STAR RECORDING STUDIOS, INC  
MASTERING, PRESSING & TAPE DUPLICATION**  
6252 Santa Monica Blvd., Hollywood, CA 90038  
(213) 469-1173

**Tape**

Listings of Mastering,  
Pressing **disk** and Tape  
Duplication Facilities  
Throughout the United States

**GRD PUBLICATIONS AND RECORDINGS**

**TAPE DUPLICATION**

376 E. Alvarado, Phoenix, AZ 85004

(602) 252-0077

Contact: Liv Singh, Owner

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): 51 Denon DR F8 Real Time recorders

Capacity: Orders up to 10,000

Method of duplication: Real Time 17 1/2 ips

Mastering equipment: Otari Denon Orban limiting, Lexicon reverb

Tape used: AGFA 611 AGFA chrome metal on request

Shell used: El Mar and Mag Media

Duplicating speed: 17 1/2 ips (Real Time)

Type of loading: Audico 751

Packaging availability/etc.: 4 color printing labels assembly shrink

Rates: C15 \$0.97 each, C30 \$1.04 each, C45 \$1.10 each, C60 \$1.19 each, C75 \$1.25 each, C90 \$1.91 each (all prices Real Time subject to change)

Other services: Record and produce relaxation tapes publish and distribute self improvement books High speed duplication for voice Custom wind blank tapes We will soon be winding video cassettes 1/2" and 3/4"

**GREAT TAPES NORTHWEST**

**TAPE DUPLICATION**

5722 Swan Creek Dr. E., Tacoma, WA 98404

(206) 472-2740

Contact: Dean K. Hart Sales Manager

**HI SPEED TAPE DUPLICATING**

**TAPE DUPLICATION**

940 Howard St., San Francisco, CA 94103

(415) 543-7393

Contact: John Trinidad Engineer

**H.R. PRODUCTIONS**

**MASTERING & PRESSING**

3099 Diablo View Rd., Lafayette, CA 94549

(415) 930-7573

Contact: Hillel Resner

**PRESSING**

Credits: H.R. Productions provides complete album packages including mastering pressing and jackets Album design and layout services are available

**IAMC**

**International Automated Media Condor Records**

**MASTERING & PRESSING**

17422 Murphy Ave., Irvine, CA 92714

(714) 751-2015

Contact: Debbie Jenkins Production Manager

**MASTERING**

Cutting lathes: Modified Neumann w/Technics drive and Sontec/Block computer

Console: Custom made, high speed, minimum electronics

Tape machines: Studer A80 Soundstream Sony and JVC available

Monitor speakers: UREI 813 Auratones

Signal processing: Sontec EQ, PSE limiters Dolby, dbx CX

Engineers: Richard Donaldson Bruce Leek, Jeremiah Snider

Rates: \$100 full speed, \$175 half speed for album sides EQ and setup \$110 hr Call for singles prices

Credits: Fleetwood Mac, Warner Brothers CBS Telarc A&M, Elektra Nautilus, and many others too numerous to mention

Other services: Half speed and Audiophile mastering Consulting for CX and dbx formats Digital cutting

**PRESSING**

Presses (Mfg. and quantity): 4 Alpha highly modified

Vinyl used: Teldec, Kaiser & custom blends

Rates: Please call for competitive rates

Credits: We specialize in high end and custom product DJ copies

Other services: Audiophile plating Complete matrix services available

**JVC CUTTING CENTER**

**MASTERING & PRESSING**

6363 Sunset Blvd., Hollywood, CA 90028

(213) 467-1167

Contact: Larry Boden, Chief Engineer

#### MASTERING

Cutting lathes: 2 Neumann VMS-70's with JVC quartz lock monitors

Console: JVC custom transformless

Tape machines: MCI with JVC custom electronics

Monitor speakers: Fostex LS 3's JBL 4343's

Signal processing: Scads of nifty boxes

Engineers: Larry Boden, Jack Hunt, Ron Lewter

Rates: Call or write

Credits: "Lone Rhino" Adrian Belew Joe's Garage Frank Zappa, Broadsword & the Beast Jethro Tull many others

Other services: Digital rentals, free sodas, test records great collee, cutting styli sales

#### K M RECORDS, INC.

##### MASTERING & PRESSING

2980 N. Ontario St., Burbank, CA 91504

(213) 841-3400

Contact: Jim Auchterlonie Mike Malan

##### MASTERING

Cutting lathes: Neumann VMS 70 Sontec Computisk with Technics quartz drive motor custom designed and built cutter electronics

Console: Custom designed and built

Tape machines: Modified Studer A 80 "4" "1/2" tape transport Soundstream digital recorder in room

Monitor speakers: UREI Time Aligned Model R38

Signal processing: All forms

Engineers: Bruce Leek

Rates: Upon request

Other services: Half speed mastering

##### PRESSING

Presses (Mfg. and quantity): Toolex Alpha (6)

Capacity: 12,000/day

Vinyl used: KC 600 and Teldec

Rates: Upon request

Credits: Nautilus Angel Moss MCA Discovery Varese Sara bande

Other services: In house metal processing, printing labels jacket covers and liners jacket fabrication

#### KDISC MASTERING

##### MASTERING & PRESSING

6550 Sunset Blvd., Hollywood, CA 90028

(213) 466-1323

Contact: John Golden Studio Manager Bonnie Kipper, Traffic Manager

##### MASTERING

Cutting lathes: Neumann

Console: Custom & Sphere

Tape machines: Studer, Ampex-ATH

Monitor speakers: Custom JBL, Ceteq Gauss

Signal processing: Neve API ITI-Sontec Sphere dbx Dolby

Engineers: John Golden Carol Hibbs Bill Lightner

Rates: Call for rates

Credits: Merle Haggard, Patrice Rushen, A Taste of Honey Friz Zell & West Burnto Bros Pat Boone Men at Work Tom Scott Clint Eastwood etc

Other services: Studer 1/2 2 track preview machine and Ampex ATH 102 1/2" 2 track record machine

##### PRESSING

Presses (Mfg. and quantity): SMT presses (5) 12 presses and one dual cavity 7' press

Capacity: 12" 4,500/day 7" 1,500/day

Vinyl used: Keycor vinyl

Rates: Available upon request

Other services: Polywrap complete printing services Matrix

#### KENDUN RECORDERS

##### MASTERING

619 S. Glenwood Place, Burbank, CA 91506

(213) 843-5900

Contact: Jeff Sanders Chief Cutter

#### LIGHTNING CORPORATION

##### TAPE DUPLICATION

2802 Walker Drive, San Diego, CA 92123

(714) 565-6494

Contact: Mike Larsen President

##### TAPE DUPLICATION

Duplicator (Mfg. and quantity): Wollensak 13M 10

Capacity: 26 cassettes run (8,000 C#0 14)

Method of duplication: In cassette

Mastering equipment: Ampex Oran 2 and 4 track reel, to reel BIC & Superscope cassettes

Tape used: BASF DPS

Shell used: Manier Mex. (5 screw) white or black

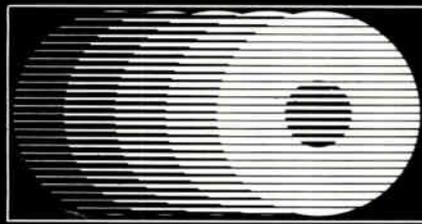
Duplicating speed: 30 ips (16:1)

Type of loading: King

Packaging availability/etc.: Complete albums boxes labels shrink wrap

Rates: C#0 \$1.00 C#0 \$1.15 C#90 \$1.40

Other services: Voice studio remote recording video taping 1/4 and 1/2", multi media slide shows and sound tracks



## H.R. Productions

### THE PERSONALIZED ALTERNATIVE

If you're an independent producer or small studio, and planning to release an album, you want the manufacturing of your record to be handled with the

same care and attention that went into recording it. Because we specialize in small LP projects, H.R. Productions may be the answer for you.

#### We do it all:

- Album design and printing
- Mastering, plating, and labels
- Top-quality pressings
- Friendly, personalized service

We offer low package prices especially tailored to the independent on a tight budget. Call or write us for more information.

#### H.R. PRODUCTIONS

3099 Diablo View Rd., Lafayette, CA 94549

(415) 930-7573

## MCA WHITNEY RECORDING STUDIO, INC. DISC MASTERING 24 Trk. Facilities

### Neve Consoles Three Live Studios High Speed Duplication

studios (213) 245-6801

Tape Duplication (213) 245-0181

1516 W. Glenoaks Blvd., Glendale, CA 91201

**MASTER DIGITAL INC.**  
**TAPE DUPLICATION**  
 202 Main St., Venice, CA 90291  
 (213) 399-7764

Contact: Paul Addis, Vice President, Sales

**TAPE DUPLICATION**

Mastering equipment: Sony 16 bit digital, Studer B67, Sony TK777 decks

Tape used: Maxell, TDK, BASF, Sony

Duplicating speed: Real-Time only

Packaging availability/etc.: Color J cards, labels, typeset

Rates: Call for rates

Other services: On location digital recording. Full film and video productions. Digital audio soundtracks with SMPTE lock-up



MCA WHITNEY RECORDING STUDIO, Glendale, CA

**MCA WHITNEY RECORDING STUDIO**  
**MASTERING & TAPE DUPLICATION**  
 1516 W. Glenoaks Blvd., Glendale, CA 91201  
 (213) 245-6801

Contact: Frank Kejmar, Studio Manager

**MASTERING**

# Tape to Mastering, Pressing disk and Tape Duplication Facilities Throughout the United States

Cutting lathes: 2 Neumann VMS 70, Tandem w/Zuma computer

Console: Neumann w/custom electronics

Tape machines: Studer A80 w/custom electronics, ATR-100, Hitachi D2200M

Monitor speakers: UREI 813

Signal processing: Sontec parametric

Engineers: Steve Hall, Dave Hernandez

Rates: Upon request

Credits: Blondie, Pat Benatar, The Knack, Berry White, Love Unlimited Orchestra, Aretha Franklin, Andrae Crouch, One Way, E.T., Crusaders, Tanya Tucker, Suzie Quatro, etc

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): 12 Ampex reel to reel, Otari cassette

Method of duplication: In cassette

Tape used: BASF Pro 1

Shell used: Magnetic Media

Duplicating speed: 8:1

Packaging availability/etc.: Labeling, insert card, delivery

Rates: Upon request

Other services: Professional 24 track recording

**ML TAPE DUPLICATING**

**TAPE DUPLICATION**

P.O. Box 2442, Sepulveda, CA 91343

(213) 988-2737

Contact: Bill Bail, Owner

**MOTHER DUBBERS INC.**

**TAPE DUPLICATION**

13626 Gamma, Dallas, TX 75234

(214) 980-4840

Contact: Arnett Peel, President

**MASTERING**

Console: Tapco-EV 12 x 4 x 2 x 1

Tape machines: Ampex 440, Crown Pro 800 2-track, Revox A77, TEAC A-7300

Monitor speakers: ADS 810's

Signal processing: UREI LA-3A, Crown EQII, dbx 157, UREI 565

Engineers: Russell Smith, Rebecca Ratliff, Paul Jolly, Arnett Peel

Rates: \$40/hr studio mastering, \$25/hr editing

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): Infonics 12 C-60 on a pass (3 minutes), Magnefax bit loop

Capacity: How many would you like? We'll meet your deadline!

Method of duplication: In cassette & bin loop

Mastering equipment: Ampex, Crown Revox, UREI, dbx

Tape used: AGFA PE 611, 811 for music and Mac Media for voice

Shell used: Magnetic Media

Duplicating speed: In cassette, 10:1, bin loop, 45:1

Type of loading: Automatic King model 770's

Packaging availability/etc.: Labeling, cassette binders, Poly & Norelco boxes, shrink wrapping—full package—service available

Rates: Call (214) 980-4840 and ask for A PEEL

**MOTOWN/HITSVILLE STUDIOS**

**MASTERING**

7317 Romaine St., Los Angeles, CA 90046

(213) 850-1510

Contact: Diane Martin, Studio Manager

**MASTERING**

Cutting lathes: Neumann SAL74 with block/Sontec disc-computer

Console: Neumann

Tape machines: Telefunken/Magnetophon 715A and Sony PCM 1610

Monitor speakers: JRE: Time Align

Signal processing: All types including digital and 1/2"

Engineers: John Matoušek

Rates: Digital included with mastering

**OUTBACK STUDIOS**

**TAPE DUPLICATION**

489 1/2 Cavour St., Oakland, CA 94618

(415) 655-2110

Contact: Wilson Dyer, Owner/Engineer

CLINT FRIZZELL AND WEST  
 TENNESSEE ERNIE FORD  
 CLINT EASTWOOD  
 DUKES OF HAZZARD  
 TANYA TUCKER  
 ROY ROGERS  
 SHIRLEY BASSEY  
 PATRICE RUSHEN  
 PORTER WAGONER  
 JONI MITCHELL  
 BELLAMY BROTHERS  
 JIM STAFFORD  
 STEVEN SOULES  
 PAUL ANKA  
 JOHN SCHNEIDER  
 ROBERTO CARLOS  
 STEPHANIE WINSLOW  
 TOM SULLIVAN  
 BJ THOMAS  
 MANY

FRANK ZAPPA  
 MERLE HAGGARD  
 PATRICE ROBERTSON  
 REX ALLEN  
 TOM SCOTT  
 BURRITO BROTHERS  
 SARAH OSBOURNE  
 SARAH VAUGHN  
 PORTER WAGONER  
 LENNY WHITE  
 PETER McCANN  
 SILVER BEATLES  
 BURRITO BROTHERS  
 CON HUNLEY  
 TEENA MARIE  
 SUSIE ALLANSON  
 SHARKY'S MACHINE  
 TOM JONES  
 ONE FROM THE HEART  
 PURE PRAIRIE LEAGUE  
 BLADE RUNNER  
 NI MITCHELL  
 APP

**Kdisc mastering**  
 6550 Sunset Boulevard, Hollywood, CA 90028 (213) 466-1323

ER  
 PAT BOONE  
 DAVID FRIZZELL  
 DJ ROGERS  
 ROGER WILLIAMS  
 WOODY HERMAN  
 SUBRAMANIAM  
 HAL GALPER  
 MERLE HAGGARD  
 TOMMY TUTONE  
 SHIRLEY BASSEY  
 BARONE  
 TROJAN BAND  
 ONE FROM THE HEART  
 PURE PRAIRIE LEAGUE  
 BLADE RUNNER  
 NI MITCHELL  
 APP

Circle #033 on Reader Service Card

**PRECISION LACQUER  
MASTERING**  
1008 N. Cole Ave., Los Angeles, CA  
(213) 464-1008  
Contact: Kate Emerine, Manager

**MASTERING**  
Cutting lathes: Compudisc Cybersonics Ortolon  
Console: Custom NTP  
Tape machines: Ampex  
Monitor speakers: Altec 604E K&H, Auratone  
Signal processing: NTP, UREI Ortolon, LA J/A Stephen's ears  
Engineers: Stephen Marcussen  
Rates: Call for information  
Credits: Stevie Wonder, Fleetwood Mac, Rod Stewart, Pointer Sisters, Stevie Nicks, Pia Zadora

**PROJECT ONE A/V  
TAPE DUPLICATION**  
6669 Sunset Blvd., Hollywood, CA 90028  
(213) 464-2285  
Contact: Maria or Dalton Owners

**TAPE DUPLICATION**  
Duplicator (Mfg. and quantity): 20 TEAC CXRX, Alpha 41 Otan  
Capacity: Real Time 500-1,000/shift Hi speed 1,000+/shift  
Mastering equipment: Ampex ATR 102 A Type Dolby dbx full EQ  
Tape used: AGFA 611, Maxell UD UDXL, XLS, TDK, SAX, ADX  
Shell used: Mag Media, Maxell, TDK  
Duplicating speed: 1 1/2 ips up to 30 ips  
Type of loading: King  
Packaging availability/etc.: Fifteen different colors of labels. Inserts  
Rates: Call for price catalogue or quote  
Other services: The most complete mastering tape store in L.A.  
AGFA Pem 468 Ampex 456 406-407 Scotch 250 226 All widths at wholesale prices. We also make safety copies 15 ips to 15 ips 30 ips to 30 ips

**RAINBO RECORDS  
MASTERING & PRESSING**  
1738 Berkeley St., Santa Monica, CA 90404  
(213) 829-3476

Contact: Cita/Jane, Steve/Jack, Production/Information  
**MASTERING**  
Cutting lathes: We select the mastering studio according to time and job  
Rates: 12" \$77/side; 7" 45 rpm \$43/side, plus \$15 for EP  
Credits: A&M, Capitol, Motown, JVC Mastering Lab MCA Whitney, Western Recording, K Disc, Allen Zentz, Gold Star, etc.  
Other services: Provide or suggest studios, artists for layout and paste-up for labels, sleeves and albums  
**PRESSING**  
Presses (Mfg. and quantity): 20 Lened automatics complete units, four picture presses  
Capacity: 15M to 25M/day, depending on changes and quantity  
Vinyl used: Keycor virgin #600, Vitec Quix virgin. All colors and shapes  
Rates: Phone or write for Rate Card 12" 100 to 10,000 64 to 50, 7" 100 to 10,000 36 to 22  
Credits: 43 years of servicing virtually every major account, creator of plastic picture records, shaped records and micro plastic records  
Other services: All services related to the production and creation of records, inserts and album jackets. Artwork, composite negatives, etc.

**BILL RASE PRODUCTIONS, INC.  
MASTERING, PRESSING & TAPE DUPLICATION**  
955 Venture Ct., Sacramento, CA 95825  
(916) 929-9181

Contact: Bill Rase, Owner  
**MASTERING**  
Console: Custom built (two control rooms and studios)  
Tape machines: Ampex 440 B 440-4, 440 2 (2) 4 Ampex 351, etc.  
Monitor speakers: JBL  
Engineers: Music Tom Matthews, A V Production Ester Marcroft, Radio TV Ray Wakamoto  
Rates: \$46/hr \$40 after 3 hrs  
Credits: National radio spots Pircadilly stores  
Other services: Manuf Records, EvaTone Sound Sheets video production and duplication, mass audio cassettes and reel duplication  
**PRESSING**  
Presses (Mfg. and quantity): Manuf in Los Angeles  
Capacity: Any amount  
Vinyl used: 100% pure  
Rates: Variable according to amount-type cover, etc.  
Credits: Specialize in religious, folk, jazz and commercial music  
Other services: Full art department

**TAPE DUPLICATION**  
Duplicator (Mfg. and quantity): Magnelax (bin loop) Others Telex (in cass)  
Capacity: 2,000/day - 4 different systems (reel as well)  
Method of duplication: In cassette, bin loop

Tape used: Scotch  
Shell used: Magnetic Media  
Duplicating speed: bin loop 90 ips  
Type of loading: King load-ers  
Packaging availability/etc.: Yes - every type  
Rates: Variable  
Other services: Full art department - printing, etc.

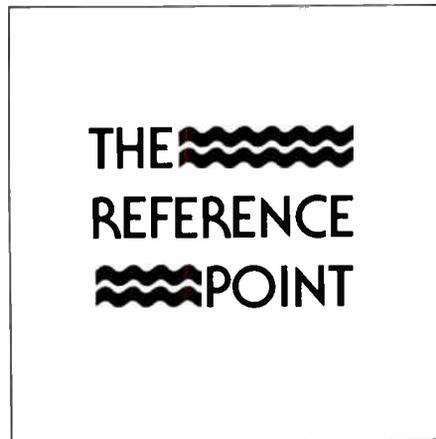
**REAL TO REEL RECORDING & DUPLICATION  
TAPE DUPLICATION**  
3064 D<sup>12</sup> Road, Grand Junction, CO 81501  
(303) 434-3102  
Contact: Bill Yorty, Owner/manager

**RECORD TECHNOLOGY, INC.  
PRESSING & TAPE DUPLICATION**  
486 Dawson Dr., Camarillo, CA 93010  
(805) 484-2747  
Contact: Bill Bauer, President

**RECORDING ETC.  
TAPE DUPLICATION**  
663 Cowper St., Palo Alto, CA 94301  
(415) 327-9344  
Contact: Dennis Reed, Owner/Operator

**RECORTEC, INC.  
TAPE DUPLICATION**  
475 Ellis St., Mountain View, CA 94043  
(415) 962-0220  
Contact: Ed Wong, Vice President

**REELTIME DUPLICATING  
TAPE DUPLICATION**  
2563 S. El Camino Real, San Mateo, CA 94403  
(415) 345-7335  
Contact: Japri Singh or James Ray, Owner/Manager



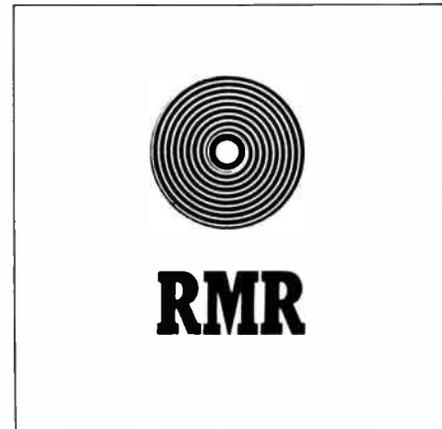
THE REFERENCE POINT, Burbank, CA

**THE REFERENCE POINT  
MASTERING & PRESSING**  
4020 W. Magnolia Blvd., Burbank, CA 91505  
(213) 845-5184  
Contact: Richard Simpson, Owner/Engineer  
**MASTERING**  
Cutting lathes: AM 32B with SX 68 cutting head, VG66 amps  
Tape machines: MCI JH 110M 2-VP  
Monitor speakers: JBL 4315 Little Reds, Auratones  
Signal processing: Orban parametric EQ's 622B, Inovonics compressor/limiter  
Engineers: Richard Simpson  
Rates: 1,000 7" 45's \$495 includes mastering, plating (full process), labels and sleeves  
Credits: John Denver, Elvis Presley, Johnny Mathis, Henry Mancini, Mac Davis, Bill Withers, Willie Nelson, Leon Russell, Glen Campbell, movie sound track "10," numerous projects for major as well as small independent labels and artists  
Other services: Also cassette duplicating

**ROCKY MTN. RECORDING  
MASTERING & PRESSING**  
8305 Christensen Rd., Cheyenne, WY 82009  
(307) 638-8733  
Contact: Georgia Alexander, Sales

**RPM  
MASTERING & PRESSING**  
2225 Milton Court, San Diego, CA 92110  
(714) 275-6050

Contact: David Olson, Account Executive  
**MASTERING**  
Cutting lathes: Scully w/modified Westrex 3D stereo cutter head  
Console: Custom  
Tape machines: Ampex, Otan, TEAC/Tascam, Sony  
Monitor speakers: JBL, AR, KHL, Auratone  
Signal processing: Dolby, dbx, Soundcraftsman, Pultec, UREI, linear tracking reference tables  
Engineers: Nayqunton Reed, William Moore  
Rates: Complete record manufacturing packages only 7" 45's, 7" 33's, 10" 33's, 12" 45's, 12" 33's Call or write for current prices in quantities of 100 to 100,000  
Credits: A&M, Atlantic, Bell, Buddha, Caytronics, CBS, CTI, Dale, Epic, Harmony, Motown, RCA and Warner Bros  
Other services: RPM takes great pride in putting out a highest quality controlled record. Turn around time (after test approval) is usually under 5 days for 7" singles and 10 days for 12" record packages



ROCKY MTN. RECORDING, Cheyenne, WY

**SEACOAST RECORDING  
TAPE DUPLICATION**  
926 Turquoise St., San Diego, CA 92109  
(714) 270-7664  
Contact: Jack Elliott, Owner

**SHUR-SOUND & SIGHT, INC.  
TAPE DUPLICATION**  
3350 Scott Blvd., Bldg. #5, Santa Clara, CA 95051  
(408) 727-7620  
Contact: Glenn L. Cardon, Vice President

**SONIC ARTS CORP./THE MASTERING ROOM  
MASTERING, PRESSING & TAPE DUPLICATION**  
665 Harrison St., San Francisco, CA 94107  
(415) 781-6306, 957-9471  
Contact: Gordon Whiting, Custom Service Manager; Leo de Gar Kulka, President  
**MASTERING**  
Cutting lathes: Neumann, fully automated and computerized VG66 amp w/Neumann SX cutting head  
Console: Custom  
Tape machines: Neumann, Telefunken, 3M, Inovonics, Ampex  
Monitor speakers: Altec 604 w/JBL woofers  
Signal processing: Parametric and graphic EQ, Inovonics, Dolby A, and dbx noise reduction, UREI and Inovonics limiters, AKG echo chamber.  
Engineers: Leo de Gar Kulka, Kenneth Lee (asst.)  
Rates: \$20 per 1/4 hr, plus materials 7" \$30/side, 12" \$40/side  
Credits: Solid Smoke, Ralph Records, Concord Jazz, DDG & Phillips  
Other services: Half speed mastering, digital mastering  
**PRESSING**  
Vinyl used: Keycor, Teldec  
Rates: Call or write for brochure  
Credits: Faye Carol, Nicholas, Glover, & Wray, Stomp Off Records, SF Swing Express, Turk Murphy jazz Band, Midsummer Mozart Festival, Walt Tolleson Big Band  
Other services: Jacket, label and poster printing, colored vinyl, promotional buttons, stickers, matchbooks, and T-shirts  
**TAPE DUPLICATION**  
Mastering equipment: 3M  
Tape used: AGFA PE 611  
Shell used: Data packaging  
Packaging availability/etc.: Album art reproduction, labels  
Rates: Call or write for brochure.

**SOUND IMPRESSIONS BY THE DAYSPRING CO.  
TAPE DUPLICATION**  
115 N. 85th, Seattle, WA 98103  
(206) 783-1844  
Contact: Tom Rhodes, Sales Manager, Ian Allen Lund, Owner

NEW 16 PAGE CATALOGUE & FREE AGFA AUDIO & VIDEO TAPE OFFER

# KENNETH A. BACON ASSOCIATES

216 Montego Key, Novato, CA 94947 (415) 883-5041 (direct to office)

Or call toll - free Message Center - Operator 751  
from California, 800 - 852 - 7777; from AK & HI, 800 - 824 - 7919; from all other states 800 - 824 - 7888

EVERYTHING FOR THE CASSETTE PRODUCER AND USER



SOUNDMASTER AUDIO VIDEO RECORDING STUDIOS,  
North Hollywood, CA

**SOUND MASTER AUDIO/VIDEO RECORDING STUDIOS  
MASTERING**

10747 Magnolia Blvd., North Hollywood, CA 91601  
(213) 650-8000

Contact: Barbara Incalovsky, Studio Manager  
**MASTERING**

Cutting lathes: Cybersonics with Ortofon cutting amplifiers and head

Console: Cybersonics

Tape machines: MCI and Ampex

Monitor speakers: House

Signal processing: Everything

Engineers: Brian Incalovsky, Joe Benitez, Ken Incalovsky

Rates: On request

Credits: Elton John, Olivia Newton John, Joe Cocker, many others

Other services: 24 track audio, mastered recording studio and full production video complex

**STANISLAUS AUDIO VISUAL**

**TAPE DUPLICATION**

1431 Kansas Ave., Modesto, CA 95351  
(209) 529-2700

Contact: Emma Willis, Office Manager

**STOUGHTON PRINTING CO**

**JACKET & LABEL PRINTING**

130 N. Sunset Ave., City of Industry, CA 91744  
(213) 961-3678 or (213) 686-2753

Contact: Andrew J. Stoughton

Other services: Sleeves in 1000's of sizes

**STUDIO MASTERS**

**MASTERING**

8312 Beverly Blvd., Los Angeles, CA 90048

(213) 653-1988

Contact: Larry Wood, Executive Vice President

**MASTERING**

Cutting lathes: Neumann VMS 70 with SAI 74 electronics

Console: Neumann SP 27, with FMT PDM compressor/limiter

Tape machines: Studer A 80's and 4 formats

Monitor speakers: TM 1

Signal processing: Orban Paramound parametric EQ, Orban

Sibilance controller

Engineers: Chief engineer, Don Blake

Rates: Call for rates

Other services: State of the art complete service studio, live recording, mix, mastering, d.b. edit



TAKEDA RECORD SERVICE, North Hollywood, CA

**TAKEDA RECORD SERVICE  
MASTERING, PRESSING & TAPE DUPLICATION**  
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**MASTERING**

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Console: Custom

Tape machines: MCI and Otari

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Signal processing: Dolby A dbx, JREI LA4, Ortofon Treble

Limiter, Fho Plate reverb

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Call for rates

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(415) 834-6912

Contact: Walt Lee, Owner



TAPELOG, Chatsworth, CA

**TAPELOG**

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10511 Keokuk Ave., Chatsworth, CA 91311

(213) 882-4433

Contact: Don Hollingsworth or Kristin Crissall

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): Hi speed, Orban, 1 slaves Real

Time, JVC (audio), Panasonic and Sony (video)

Capacity: Hi speed, 1000/day / Real Time, 5000/wk

Method of duplication: In cassette

Mastering equipment: Sony TEAC (audio), JVC (video)

Tape used: TDK, Maxell, Magnetix Media

Shell used: Magnetix Media

Duplicating speed: Real Time (audio and video), Real Time (audio)

Type of loading: PCF, semi-automatic loader

Packaging availability/etc.: Labeling, albums, shrink wrap

Rates: Call for rates

Other services: Video editing

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**TAPE DUPLICATION**

1135 Pearl St. Ste #7, Boulder, CO 80302  
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Contact: Mickey Hertz

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6540 E. Lafayette Blvd., Scottsdale, AZ 85217

(602) 994-5528

Contact: John A. Michaelson, President

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**MASTERING & PRESSING**

P.O. Box 6037, 1745 W. Linden, Phoenix, AZ 85005

(602) 252-5644

Contact: an Account Executive

**MASTERING**



WAKEFIELD MFG., INC., Phoenix, AZ

Cutting lathes: Neumann VMS-70, SM 74 head SAI 74B electronics, Zuma computer  
 Console: SP 172  
 Tape machines: Studer A-80, Otari MTR-10  
 Monitor speakers: UREI 8135  
 Signal processing: Sontec parametric EQ, Dolby dbx, Neumann EQ  
 Engineers: Tim Hinds, Roger Seibel  
 Rates: Contact an Account Executive  
 Credits: ECM, Pro Arte June Appal Titanic  
 Other services: Digital mastering, Sony BVU 200B and PCM-1610  
**PRESSING**  
 Presses (Mfg. and quantity): SMT automatics and Barnett manuals  
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 Rates: contact an Account Executive  
 Credits: Angel Records, ECM Records, Pro Arte Records, Rounder Records, American Gramophone  
 Other services: Complete tape-to-disk manufacturer. All printing (labels, jackets, stickers, inserts, etc.), complete matrix department



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 TAPE DUPLICATION  
 504-E Vandell Way, Campbell, CA 95008  
 (408) 379-0870  
 Contact: Nancy Kelly, Sales Representative  
**TAPE DUPLICATION**  
 Duplicator (Mfg. and quantity): 4 Audio Tek duplicators  
 Capacity: 450,000 months  
 Method of duplication: Bin loop  
 Mastering equipment: Ampex etc.  
 Tape used: AGFA BASF Ampex  
 Shell used: Magnetic Media  
 Duplicating speed: 1/2  
 Type of loading: King 790 loaders  
 Packaging availability/etc.: Total printing available  
 Rates: On request  
 Other services: Printing and graphic arts production

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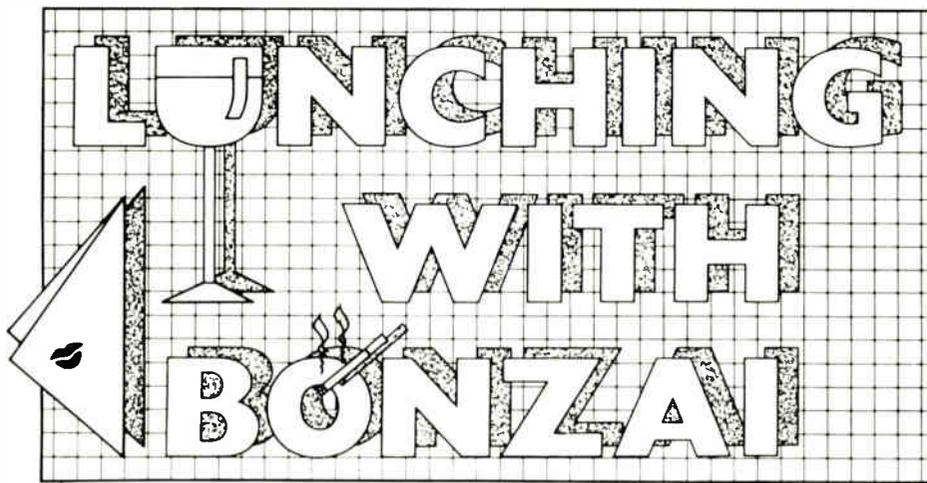
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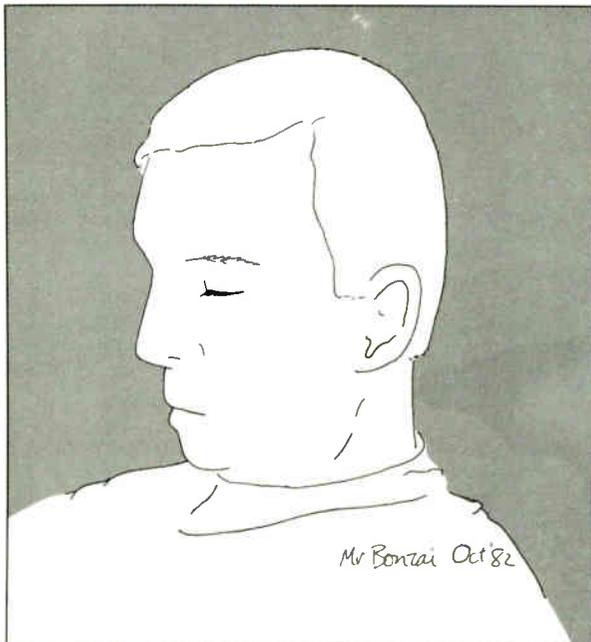
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# An Eccentric British Gentleman at Home in Hollywood IAN WHITCOMB



by Mr. Bonzai

This lunching began unusually early—before nine A.M.—at KROQ, Los Angeles' thrusting, outrageous, and very successful progressive radio station. Ian Whitcomb was winding up his Saturday morning novelty show which, in addition to the station's required dose of "New Music," included his own variety of ragtime records, protest songs from the Sixties, a selection of his own imaginative recordings, and some vintage R&B supplied by a guest, "Big Steve." The control room was plastered with hundreds of bumper stickers, printed graffiti, posters of Elvis Presley, the

Pretenders, and a chaos of rock memorabilia.

I sat down next to Ian's German shepherd, Beefy, and observed quietly as he continued his show and graciously delivered a few enthusiastic plugs for Mix magazine. From the bio packet Ian had sent me I already knew that he had recorded 18 albums and was best known for his 1965 hit, "You Turn Me On." He has a degree in history from Trinity College in Dublin and is the author of "After the Ball — Pop Music from Rag to Rock," is an instructor at USC in modern music, has written for television in America and Britain, produced Mae West's album "Great Balls of

Fire," scored the movie "Bugs Bunny Superstar" and composed "Hands," which was recorded by Debbie Dawn and is known as the first "massage parlor song."

After Ian rapped up his show and said goodbye to his listeners, he invited me to join him at Kern's, a deli-restaurant in Altadena where we brunched on turkey sandwiches and began by chatting about the radio station:

The station is very high in the charts, but I don't think it's because of me. I think it's incredibly lucky for me to get a show on a station that is so popular now, but of course I joined them when they weren't in the ratings at all.

WHAT DO YOU THINK OF THEIR REQUIRED MUSICAL PLAYLIST?

Well, I like it. It's no secret that I don't know much about today's music. I really don't know a Soft Cell from A Flock of Seagulls. I like what they play on KRPO because it's music that goes back for me. The songs they program are quite short, they're jolly, they're novelty sounds, they're funny, they're bouncy, they're what rock and roll was like in the early Sixties before underground radio and all that dreadful stuff. I couldn't stand rock from about 1966 when the Beatles got pretentious. I don't like the whole introduction of seriousness and "poetry" that Dylan brought to rock. Rock and roll is a good time, is novelty—it's an ice cream sundae; it's not a fine French meal.

I grew up in the classic era of rock and roll and once you grow up like that, everything that comes after is not as good. It's like being around when Christ was teaching. Nobody can ever be as great as Elvis Presley, Gene Vincent, Little Richard, or Jerry Lee Lewis. All these people were splendid individuals who happened to come around at a time when they could be their own crazy selves. There was no corporate rock at the time. They just recorded this crazy stuff and they weren't shackled with men telling them what to do. When Elvis Presley began he was just completely wild, and that's what I love.

YOU'VE MADE A FEW RECORDS YOURSELF SINCE THOSE DAYS — ALL SORTS OF RECORDINGS...

Well, they're all linked up by my rather assertive personality. I happen to like many styles of music. I love American Pop from ragtime, through Country and Western, western swing, tin pan alley. The great mistake they make in this country is to play around with the word ART. Americans do not under-

stand art; they don't know what it's about. They are great at Pop. I'm making a very rash generalization, but I feel very strongly about it. Americans are wonderful at being impulsive. They're wonderful at doing things without thinking. The Western and the comic book and the hot dog and the blue jeans and rock and roll and jazz are all things done emotionally from the gut. Whenever they start to think like Europeans they fall down. The "thinking man" is the curse of America.

**SO DO YOU THINK WE SHOULD LEAVE IT TO YOU GUYS?**

As far as eggheads are concerned, leave it to the Europeans. Europeans make fine art, but I've never had any interest in it at all.

**HOW DO YOU VIEW YOUR OWN BRIEF ENCOUNTER WITH SUPERSTARDOM?**

America made me a rock and roll star. I had no intention of becoming one. I was a student before I had a hit and I was a student afterwards. If there is anything I take seriously as hard work, it is writing books. I'll have had five books published by next May so I can just about call myself a writer. I'm sounding very pretentious, but I always do when I

come off my airshift. At this time of day I'm grouchy, so I'm probably sounding extremely reactionary.

**WHO DO YOU LIKE TO LISTEN TO?**

The man I currently like very much is James Booker, a New Orleans pianist. He's an amazingly good player, but he has problems with the drugs, I'm afraid. Excuse me, I just have to get my dog — I'll be back . . .

**IAN RACED OUT THE DOOR AFTER BEEFY AND AFTER A FEW MINUTES RETURNED BREATHLESS. HE CONTINUED:**

I've always liked Jelly Roll Morton, Walter Donaldson who wrote such songs as "How You Gonna Keep 'Em Down on the Farm?" and "Carolina in the Mornin'," and I like Irving Berlin.

**YOU'RE KIND OF AN ANACHRONISM, AREN'T YOU?**

You mean I live in the past? That's only because American music has not yet been accepted as a classical form. If you called an expert on Beethoven an anachronism because the composer is dead it wouldn't apply, would it? In this country they're not yet ready to accept the fact that their real classical music is Irving Berlin, Walter Donaldson,

ragtime, rock and roll, the blues. Forget about Copeland, that's just crap—again, guys trying to be European. Classical music hasn't had anywhere to go since about 1910. The result is Stravinsky and so forth—absolute rubbish. They'd run out of chords and sounds, except city sounds—the real music. What the true musicians were doing— Beethoven, Bach—well, the torch was always popular music. Everyone hummed the latest Beethoven. It's the most terrible sin of this century that there had been this division between art and what's popular. I've always gone for the music of the street— popular sound.

**DO YOU ENJOY RECORDING?**

I love recording. The ideal situation would be to have a studio in my house, because I can't afford to make many records. I have them financed by outside sources, which are drying up. I'm not actually struggling, but I thank god that there are specialty labels. "Stomp Off Records" is a jazz label run by Bob Erdos, who's doing a wonderful job. He happens to like what I do. They don't sell much, but he likes them. As the classical composers did, I have to look for patrons. Jerry Dennon has a label in Seattle called "First American" and he seems



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to like what I do.

#### WHAT IS THE MOST FRUSTRATING ASPECT OF RECORDING?

Mixdown time. What sounds good in the studio doesn't sound the same when you get it home. I've always found it's best to mix down on very small speakers, because you get fooled by those huge studio blasters. I go through euphoria on the first playback in the mix, then I get depressed when I get home and friends say they can't hear the vocal. Then if I bring up the words, you can't hear the backing. I always appreciate the engineers—the studio technicians. I never try to do what they do. I don't understand how these things work. I know the sound I want to get, so I explain to the engineer and he does it and often comes up with ideas of his own.

#### IF YOU WERE STRANDED ON A DESERT ISLE, WOULD YOU BE CONTENT TO WRITE AND PERFORM FOR YOURSELF?

No, I probably wouldn't bother. Someone like me lives for applause, for whatever illogical reason. I don't feel I was deprived as a child, but for some curious reason I need to go on the stage. One of the reasons I per-

form is because off the stage, off the microphone, I'm nervy and introverted and I stutter.

#### THAT IS STRANGE—YOU DIDN'T STUTTER ONCE WHEN YOU WERE ON THE AIR THIS MORNING...

No, I never stutter when I'm performing. So I record and I write the books because I want to make sense of the world. When I'm off mike I feel like a complete mess, and fortunately, I'm allowed to occasionally write books and make recordings and perform. The only important things to me are friends and my escape, which is music. If I was alone I would probably play the piano for myself, but I'd rather have a few friends there to play for. My dog is a great fan of mine, especially when I feed him.

#### WHAT BRINGS ON THE INSPIRATION TO COMPOSE?

I'm only inspired to write a song by deadline. I just wrote eleven songs in England for my next album. I never think "God, I must write this song" out of the blue. I don't suddenly get a message from the gods; I get a message from a record company. Of course I had been thinking of these songs for years.

#### WHAT DO YOU THINK OF LOS

#### ANGELES AND HOW HAS IT CHANGED YOUR LIFE?

I've been coming to Los Angeles since 1965 and I've always loved it here because it's a huge supermarket. You can get anything you want here, any type of cuisine, any books you like, crude sex—everything from literacy to illiteracy. It's truly a manmade city. They managed to pipe the water down from the north and the desert became lotus land, and now we have valley girls. Careerwise, L.A. has been very good to me. I've never broken into film but I would love to.

#### WHAT ROLES WOULD YOU PLAY?

Well, I'd probably play comedy for a start—a British type. I admire John Cleese enormously... and George Sanders.

#### DO YOU REMEMBER HIS SUICIDE NOTE?

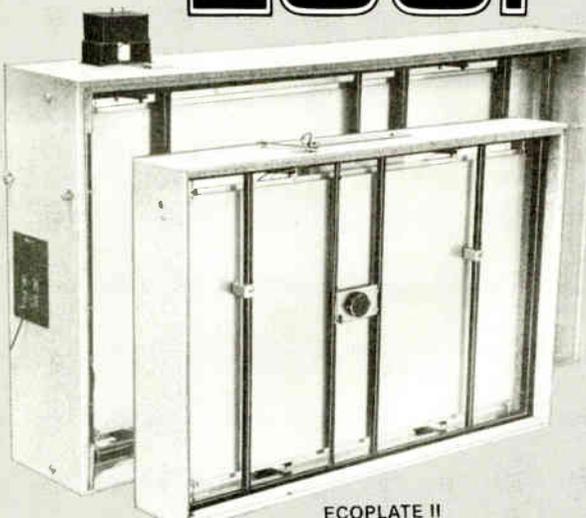
He was very bored with life, wasn't he?

#### HE JUST WROTE "I'M BORED." DO YOU EVER GET BORED?

No, I've never been bored. I can't understand that. I'm still very excited about life—not about the future, I have no interest in the future, but I love the past. ■

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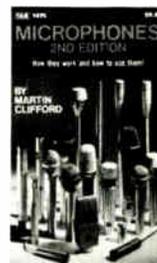
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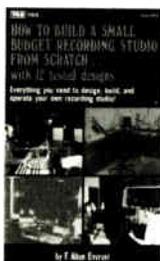
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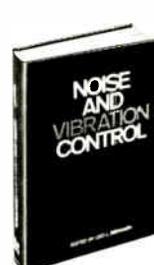
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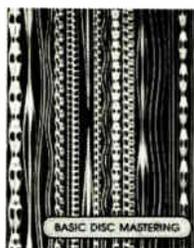
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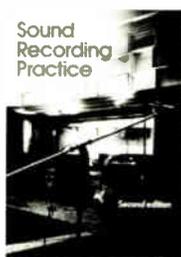
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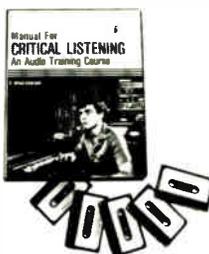
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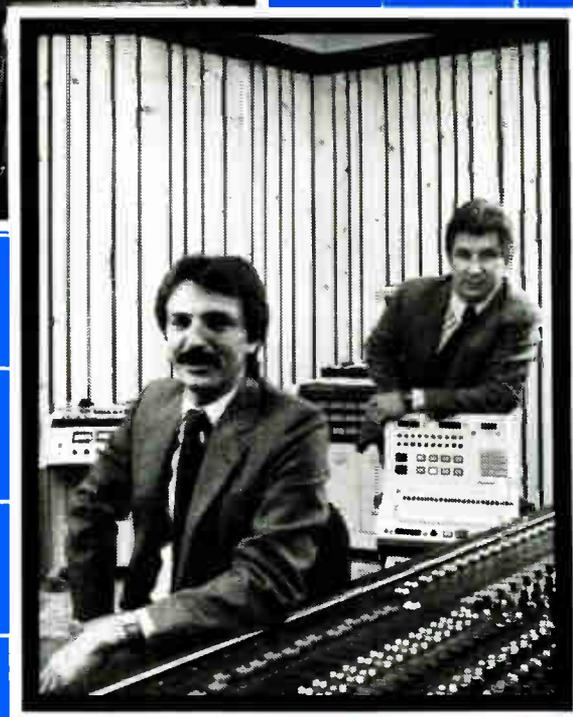


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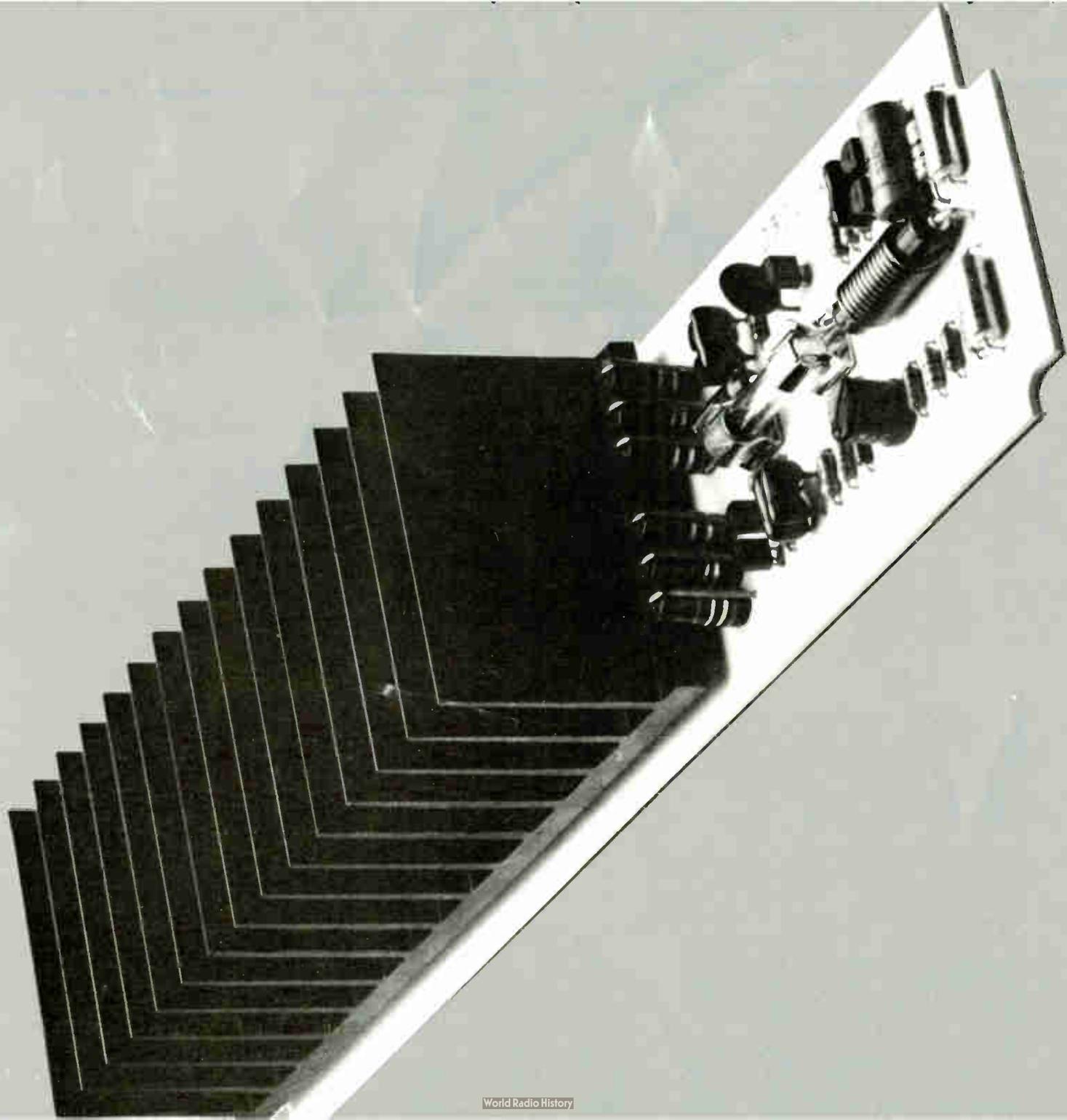
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# DISCUSSIONS

## PART IV

# THE TTL FAMILY

by Ken Pohlmann

Some people in the audio business still question the use of analog integrated circuitry in the signal chain. They point out that op amps are sometimes noisy, have output offset voltage problems, lack foolproof output stage short circuit protection, exhibit unsatisfactory bandwidth and phase margin performance, never seem to have good enough slew rates, and are either oscillation-prone, or so heavily compensat-

ed that the high frequency loop gain is insufficient to provide enough feedback for tolerable high frequency distortion specs. Of course, all of those arguments unfortunately have considerable merit.

In the computer business no one has any such doubts about digital integrated circuits. While the charm of primitive devices is still appreciated, users also keenly understand the utility (that is, profit) of more modern systems. Actually, computer people have had lit-

tle choice—computers have evolved so drastically that older models are always soon rendered virtually useless. The first generation of modern computers used electro-mechanical relays to realize flip flops and logic gates—with respect to reliability, power consumption, and size, they probably represented the worst of all possible digital worlds. The second generation of computers used vacuum tubes—legend has it that roller skaters were employed to speed through one machine's corridors to replace the constant stream of burned-out tubes; despite their heroic efforts, down-time usually prevailed. Discrete transistor designs changed all that—reliability increased tremendously, and power and size requirements decreased to pragmatic proportions. But it was the advent of the integrated circuit in the early 1960's which truly set the stage for the digital revolution.

Whereas one logic gate used to double as a convenient paperweight, the integrated gate is virtually invisible to the naked eye, and from its humble origins of one gate per chip, bipolar monolithic fabrication densities now permit beyond a hundred gates per chip at very little extra manufacturing cost. Improved techniques of monolithic construction soon evolved Small

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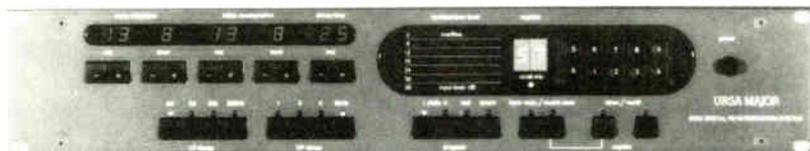
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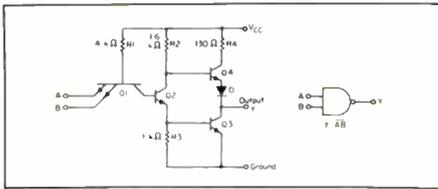
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**Fig. 1—Schematic diagram & logic symbol for SN54/74 TTL NAND gate**

Scale Integration, Medium Scale Integration, and Large Scale Integration. A plateau of versatility, economy, and reliability was reached with the resulting off-the-shelf devices. One long-enduring family of operational circuits built on these fabrication scales is the transistor-transistor logic, or TTL family. Using integrated flip flops and logic gates as its internal building blocks, it offers packages incorporating functions such as: decoders, multipliers, FIFO, RAM, ROM and PROM memories, latches, arithmetic elements, counters shift registers, data selectors, multivibrators, clock generators, buss transceivers, bipolar bit-slice elements, and even microprocessor controllers.

In the neighborhood of logic families with such types as direct coupled transistor logic (DCTL), resistor-transistor logic (RTL), resistor-capacitor-transistor logic (RCTL), diode-transistor logic (DTL), and emitter coupled logic (ECL), the TTL family is the most popular. All of the logic families perform identical logic functions, but the methods of their technologies are quite different. Because it offers a favorable compromise between switching speed and power dissipation, TTL remains the logic workhorse. Its four groups, standard, high-speed, low-power, and Schottky-diode-clamped, cover most application needs.

The elemental beauty of TTL can be seen by a quick review of its operation as illustrated by the simple TTL NAND gate, shown in Figure 1. The gate consists of four integrated transistors; Q1 and Q2 accomplish the NAND function and Q3 and Q4 comprise the totem-pole output circuitry. Input transistor Q1 has two emitter inputs; when the voltage at either or both inputs is low (less than 0.2 volts) the base-emitter junction is forward biased. Q2 and Q3 are turned off and Q4 conducts, resulting in a logical one (greater than 3.0 volts) output. The magnitude of current flowing out of the input emitter of Q1 is determined by VCC and R1; Q4 acts as an emitter-follower source driving current into the load in the logical one state. When the inputs are at logical one, transistors Q2 and Q3 conduct, Q4 is turned off, and the output is brought to the logical zero state, a level determined by the saturation resistance of Q3 and the current it sinks. This Q1 collector-Q2 base junction

configuration enables the gate to change logical states relatively quickly; the propagation delay time from logical one to logical zero is typically 7 nanoseconds and propagation delay time from logical zero to logical one is typically 11 nanoseconds. These relatively fast switching times are purchased at the price of higher power supply demands; standard TTL has a relatively large current draw. Under static DC conditions, the typical current draw per gate is 3 mA (logical zero) and 1 mA (logical one). Also, a power supply current spike occurs during the switching transition when Q2, 3 and 4 are all momentarily on. The sudden current draw depends on switching speed and loading capacitance; dissipation can be

as high as 10 mA per gate.

Simple combinational gates are available in TTL chips fabricated with SSI techniques; for example, the SN7400 contains quadruple 2-input NAND gates. Using these elemental gates, more complex circuits may be constructed. In fact, in theory any digital circuit may be designed from NAND and NOR gates. In practice, this would be very tedious and uneconomical because of the large package count.

To accommodate more complex designs, the majority of the TTL family is made from MSI fabrication techniques which permit up to 99 gates per chip. Thus it is economical to build entire subsystems on a chip to provide for the easy design and increased reliability.

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bility of the required circuit. This philosophy is illustrated by the decoder chips in the family. Since the most common decoder designs call for matrices of basic gates, their construction on single chips is inherently practical. Also, with additional gates, the data or strobe input may be accommodated to form a demultiplexer. The latter point is an important one—the TTL family is extremely versatile. Important intermediate functions in each integrated subsystem are brought out on pins such that the intended operation of the chip may be modified—sometimes quite dramatically. In general, the mark of a good digital designer is his ability to utilize these TTL subsystems in unique and imaginative ways.

An example of an MSI decoder is the SN74154 chip, shown in Figure 2. In complexity, this is a low-echelon chip, containing only a matrix of 24 gates, plus one enable gate. However, the chip is still quite versatile. It doubles as a 4 line to 16 line decoder, or a demultiplexer. When both the data and enable inputs are low, the 74154 decodes the four binary inputs into one of 16 mutually exclusive outputs. By using the four input lines to address the output line, data is passed from the data input to the selected output when the enable is low, thus accomplishing a demultiplexer function. Such a chip could be incorporated in memory addressing or rate multiplying schemes. For ultra-high speed systems, the

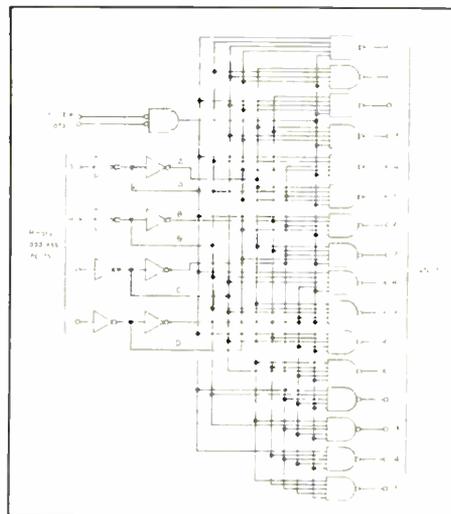


Fig. 2—Logic dia. for 4-to-16 line decoder/demultiplexer SN54/74154

SN74S138 and 74139 are recommended.

In addition to the combinational gates, the primary building block of the TTL family is the ubiquitous flip flop. Flip flops appear in their pristine beauty in such chips as the SN7470 J-K positive edge-triggered, SN74H101 J-K negative edge-triggered, SN7473 J-K master slave, SN74L71 R-S master slave, and SN7474 D positive edge-triggered. With only slight changes, flip flops also may be made into D latches such as those found in the SN7475 and 74100. Flip flop chips may be used to construct magnitude comparators, synchronizers, single pulse or clock burst generators, one-shots, and of course, shift registers of all sorts. But in the same way that TTL manufacturers supply flip flop chips prefabricated rather than force designers to construct them themselves with NAND or NOR chips, many of these flip flop applications are specially available. In fact, aside from the simple gate chips, flip flops are present in the majority of all other digital chips—such is the utility of the simple bistable in a binary system.

An example of a middle-echelon chip is the popular SN74193 synchronous 4 bit binary up/down counter as shown in Figure 3. This chip has an equivalent complexity of 55 gates and includes four master slave flip flops which change state with a positive transition on the input count. Choice of count inputs determines the direction of the count. The unused clock input must be held high. The flip flops are clocked simultaneously with steering logic to permit synchronous operation, thus eliminating ripple-through spikes. All four counters are fully programmable, such that the outputs may be preset by parallel loading the data while the load input is low. The outputs conform to the presets independently of the count

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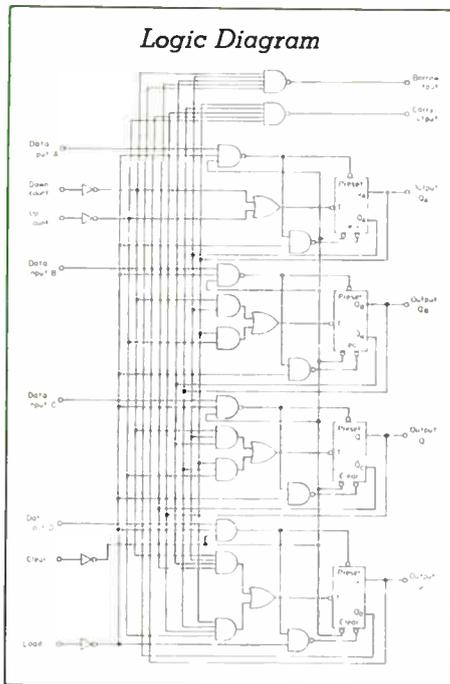


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**Fig. 3-SN54/74193 synchronous binary counter**

pulse. A clear input forces all outputs to a low level. The counter can be cascaded without external circuitry; both carry and borrow outputs are available

to signal overflow and underflow conditions. Cascading is completed by connecting the carry and borrow outputs to the count-up and count-down inputs of the succeeding counter. The counter can also be used as a modulo-N divider by using the preset inputs to vary the count length.

Finally, a far cry from the lowly SN7400 quad NAND chip are the top of the line LSI chips such as the SN74S438 controller and buss driver. This chip provides peripheral control capabilities for interfacing I/O devices and memory with the 8080A microprocessor. A bidirectional eight bit buss driver isolates the 8080A buss from the memory and I/O buss by providing one port (D0 - D7) for the 8080A and another port (DB0 - DB7) for the system devices. The microprocessor can thus operate more efficiently with slower memory, and the TTL system drivers provide increased fan-out with a lower impedance for higher noise margins on the system buss. Status latches and a control decoding array on the 74S438 provide for implementation of single-level interrupt vectors or multiple-byte call instructions for higher level interrupts. At the initiation of each machine cycle, six status latches receive data from the 8080A buss indicating the

type of operation to be performed. The decoding array in turn generates memory and I/O read/write commands and an interrupt acknowledgement.

The TTL family is a versatile one. The Schottky-clamped chips can be clocked at rates up to 125 megahertz, and the low-power chips subsist on a power consumption of only one milliwatt per gate. TTL provides the designer with an opportunity to optimize system cost and performance for a tremendous variety of digital applications. Every professional recording studio in the country houses at least a few TTL circuits. They might appear as transport control in a tape machine, command logic in an auto-locator, multiplexers in a console automation package, or as special effects circuits in the peripheral rack. With enough perseverance one could even design a fairly sophisticated computer system purely from TTL. To make that task a little more reasonable, there are even TTL arithmetic logic units available (74181/381). However, such a project would push the practical application of even this family a little too far. There exists another family of integrated circuits which more ably takes up the task of processing data. Next month we'll take a look at those tiny number-crunchers. ■

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provide compensation for the creators of music and records. The coalition has blamed home taping for the decline in record sales over the past few years.

This solution has been opposed by the Audio Recording Rights Coalition (ARRC) who feel a tape royalty would impose a burden on the large number of tape users who never make copies of prerecorded material. The ARRC also feels that home taping has been unfairly blamed for reduced record sales, since new video technology (video games, VCRs, video disks), lower vinyl quality, and the general state of the economy have all taken their toll on the industry.

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## The Home Taping Controversy:

# **BOTH SIDES NOW** A Look at the Yankelovich Survey

by George Petersen

The issue of home taping of pre-recorded music strikes an emotional (and economic) chord in almost everyone in the music industry. All parties concerned agree there is some sort of problem caused by consumers who tape copyrighted material from borrowed or rented tapes and disks, or from radio. The involved parties have, however, disagreed completely on several major points, including: the actual effects of home taping on the market, how widespread the problem really is, and what solution would be appropriate.

The solution proposed by the Coalition to Save America's Music is a royalty on blank tape and recorder sales. [See August 1982 MIX] The money collected would then be used to

In an effort to provide legislators with another perspective on home taping (to counter the 1980 Warner survey on the subject), the ARRC commissioned "Why Americans Tape: A survey of home taping in the United States." This study was conducted by the independent research firm of Yankelovich, Skelly and White, Inc. in September 1982. Curiously, both the ARRC and the Coalition to Save America's Music have stated that the survey supports their opposing viewpoints. Here are six major points concluded by the survey.

1. **More than half of all home audio taping does not involve prerecorded music.**

The survey indicated home tapers recorded something other than

prerecorded music on more than half (52%) of all audio tapes they made in the previous three months. Taping activities other than duplicating prerecorded music included recording: music performed by respondent, family and friends; educational notes and lectures; children and family occasions; dictation; computer programs; and telephone and business uses. 23% of those responding to the study use recorders for these purposes only and do not tape music.

2. **Home taping often leads to purchases of records and prerecorded tapes.**

While a majority (55%) of home music tapers say they often or sometimes buy a record after they have taped all or part of it, this also indicates a significant percentage do not. The survey did find on the average, owners of large collections of home-recorded tapes owned 2.9 times as many records and 3.2 times as many prerecorded tapes as owners of small collections of home-recorded tapes.

3. **Home tapers tape primarily to put together their own programs of selections.**

Seven out of ten of those who tape music and listen on their home stereo system say making their "own program of selections on a home-recorded tape" is a "very important" reason for using home-recorded tapes rather than records. About two-thirds of the average music taper's home tape collection contained only selections, rather than entire albums.

4. **Tapers also seek portability, convenience, quality and availability through home taping.**

The fact a "tape can sometimes be played in the car or elsewhere that a record cannot" is cited as a "very important" factor by 75% of those who tape music and listen on their home systems. The longer playing time available on home-recorded tapes was "very important" to 51%. Approximately one-third of the respondents indicated the greater durability and higher quality of home tapes was "very important" in choosing them over prerecorded tapes. The non-availability of some albums in cassette form was also mentioned as a reason for home taping.

5. **Cost is not the primary motive for home taping.**

31% of those who sometimes listen to home recorded music instead of records listed only non-cost factors as reasons for that preference. While 55% of home tapers cite cost as a "very important" reason for using home tapes over prerecorded tapes, virtually all tapers who mention cost reasons also list other reasons (selection recording, quality, longer playing time) as well.

6. Half of all home tapes of prerecorded music are made from the taper's own collection of records and tapes.

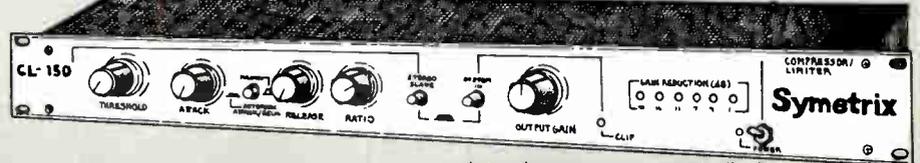
Over half (51%) of all music tapes made at home were made from the taper's own collection of records and prerecorded tapes. This also would indicate a significant percentage of home tapes originate from source material outside the taper's collection (i.e. borrowed or rented tapes/disks, radio, etc.). The survey also revealed that home tapers recorded all or part of 61% of the records they purchased during the first six months of 1982, indicating recording from one's own collection is a major factor in home taping.

The Yankelovich study "Why Americans Tape: A Survey of Home Taping in the United States" seems generally unbiased and well documented (its statistical methodology is outlined at the survey's conclusion). It gives a fairly accurate picture of home taping activity. While the survey does not give all the answers to the problem of the economic effects of home taping, it does contain much useful information, and is an important step towards finding a solution to the dilemma. ■



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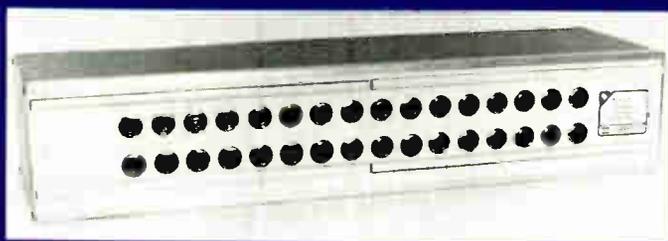
## GAUSS SERIES 2400 HIGH SPEED TAPE DUPLICATOR

Cetec Gauss has introduced the Series 2400 high speed duplicator, which includes the capability to duplicate music on microcassettes and music on metal particle and chromium oxide cassettes.

Features of the system include adjustable dual capstan servo system, front access modular electronics, an efficient tape loading system, unique hub locks, precision tape packer arms, replaceable tape cleaner cartridge, and advanced circuit technology. The Series 2400 can be utilized for either cassette, 8-track cartridge, microcassette, and reel-to-reel (1/4") duplication. The duplicator can be easily interfaced to other Cetec Gauss high speed duplicating systems, including its popular Series 1200. It includes the 10 MHz bias system and duplication ratio speeds of up to 128:1.

The Gauss Series 2400 high speed tape duplicating system consists of a master reproducer and endless tape loop bin, comprising the master playback system and slave recorders.

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## SESCOM PB-1 PATCH BAY

The PB-1 is primarily designed for use in the four and eight track studio. The 3 1/2" rack mount unit features sixteen pairs of phone plug patch points and two designation strips on the front panel. The front sixteen pairs of patch points are in a normaled configuration, and are connected to sixteen additional pairs of phone plugs on the rear so that pre-made cables may be used to connect tape machines, mixers, and outboard equipment to the PB-1 without soldering.

The PB-2 is the same as the above unit except it is wired in a non-normaled configuration.

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## PEAVEY MD-SERIES MIXERS

The Peavey MD-Series Mixers are available in 8, 12, or 16-channel versions. Each channel features low Z balanced and high Z unbalanced microphone inputs, input sensitivity gain controls, 3-band active EQ, three monitor

seros, post reverb/effects send, stereo pan control, calibrated level slider and send and return jacks. The master section of the MD-Series features assignable LED ladder displays, stereo send jacks with level controls, SUM output, independent monitor mixing capability, complete patch panel, high quality internal reverb and reverb/effects sends to monitor busses.

The new Peavey MD Series™ Stereo Mixing Consoles represent the best combination of the latest technological advances performance, and versatility available in a moderately priced stereo mixing console.

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## MELKUIST EVENT SELECTOR/ SYNCHRONIZER

The Melkuist event selector has been designed as both an intelligent peripheral for the Melkuist GT800 mixing console automation system and a stand alone unit for synchronized sound in video post-production.

The unit comprises up to 32 changeover relay contacts, which are programmable to control all external sound effects. Synchronized by an SMPTE timecode, any combination of contacts can be programmed as up to 250 cue points.

Comprehensive 'Freeze' mode facilities are included for the entry and modification of events by engineers who prefer not to work direct with SMPTE code.

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## AIWA 1/4 TIME DUBBING CASSETTE DECK

AIWA America, Inc. has introduced the world's first deck with one-touch "Synchro Dubbing" and simultaneous copying of both sides (A and B) of a cassette at double speed, reducing recording time to 1/4 of the conventional method.

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The AIWA AD-WX110 carries a suggested retail price of \$430

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## BASF CHROME LOOP-BIN RUNNING MASTER TAPE

BASF Systems Corporation has introduced the world's first chromium dioxide loop-bin running master for high-speed duplication which, it is claimed, will produce cassette slaves of a quality previously found only in slow and costly one-to-one duplication. The new 1" and 1/2" format masters reduce tape noise by as much as 6 dB and greatly increase high frequency output. Since its bias is only about 1 dB greater than equivalent ferric oxide masters, it is said to be compatible with 99 percent of the mastering equipment in use.

The dynamically superior chrome cassette is limited by the high noise and low retentivity levels of the ferric run-

ning master. In the past, the only way to take advantage of the low noise and premium output of chrome cassettes was to increase the recording speed of the master—often to 7½ ips or 15 ips.

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## SOUNDCRAFT 400B CONSOLE

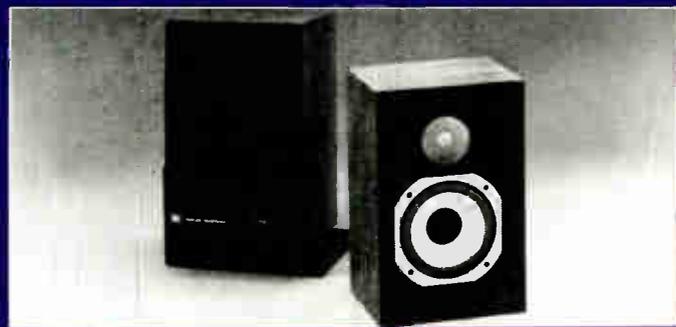
Soundcraft USA's Series 400B is a new series of competitively priced general purpose mixing consoles, available in two formats and two sizes. Both formats are fully modular, include phantom power supply and feature 4-band sweep-frequency EQ.

The Standard format, available with 16 or 24 inputs, features 4 auxiliary sends, 8-track monitoring, sub-grouping, a set-up oscillator and 100 mm ultra-smooth faders.

The Monitor format, also available with 16 or 24 inputs, features 8 discrete mixes for on-stage monitor-mixing with a master channel level control which can be assigned via a pan control to a stereo mix buss for side-fills or front of house mix.

Prices are \$5,500 for 16 input models and \$7,500 for 24 inputs versions.

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## ULTRA COMPACT JBL STUDIO MONITOR

James B. Lansing Sound, Inc. has introduced the Model 4401, whose compact dimensions and newly developed 6½" low frequency driver offers clarity, wide dynamic range, and high efficiency.

Its size makes the 4401 ideal for use as a main playback system in applications where space is at a premium, or as a console-mounted secondary monitor. The low frequency driver has been specially designed for optimum performance in a compact enclosure. To achieve high frequency accuracy and definition, the 4401 is equipped with JBL's specially designed 1" dome radiator, formed of a lightweight phenolic material coated with a microscopically thin layer of aluminum.

To simplify wall or console mounting, the 4401 may be ordered with optional steel cradle mounts. Its wood enclosure panels are veneered in American black walnut. The speaker is rated at 60 watts continuous and has a frequency response of 70 Hz to 18 kHz.

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## AGFA INTRODUCES NEW DUPLICATION TAPES

Agfa-Gevaert introduced a new chrome bulk cassette tape at last month's AES show. The tape PE 627 for C-60, and PE 827 for C-90 combines the delicate high frequency response associated with chromium dioxide and the mechanical precision associated with other high quality Agfa-Gevaert tape products. PE 627/827 uses a pure chromium formulation, not a gamma ferric equivalent, for truly low noise and exceptional consistency. PE 627/827 is wound onto the Agfa-Gevaert patented stack hub, in lengths of 8,200 feet for C-60 and 11,500 feet for C-90.

Also unveiled at AES was Agfa's PEM 356, a 1 mil version of their successful PEM 526. The new tape has all the characteristics of PEM 526 including the high frequency stability which assures the last cassette transfer will sound as crisp as the first, even after thousands of passes through the bin. The obvious advantage of the 1 mil tape is that a longer tape length can be accommodated in the bin, thereby permitting duplication of long length programs. It is available in lengths of 3,600 feet on hubs in ½" and 1" widths.

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## HEAD DEGAUSSER FROM NORTRONICS

Nortronics has unveiled their Model PF-208 Professional Head Degausser designed with a super High-Flux coil-core to demagnetize heavy duty 2" tape heads and guides. The peak magnetic field strength of 1000 gauss positions the new Nortronics model as the most powerful hand-held degausser currently available.

Other features included in the PF-208 are an auto-reset thermal protection device which prevents coil burn-out damage by maintaining a safe operating temperature; a positive snap action on-off switch for operating convenience, and a Kraton thermal plastic/rubber covered probe tip to prevent scratching delicate heads. The PF-208 has a \$39.95 list price.

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## STUDIOMASTER STUDIO 4

The Studio 4 from Studiomaster is an integrated 6 input mixer/4 track cassette unit. The compact recorder features 5 band equalization and 2 aux send on each input channel. The Studio 4 offers a highly portable and economical method of multitrack recording.

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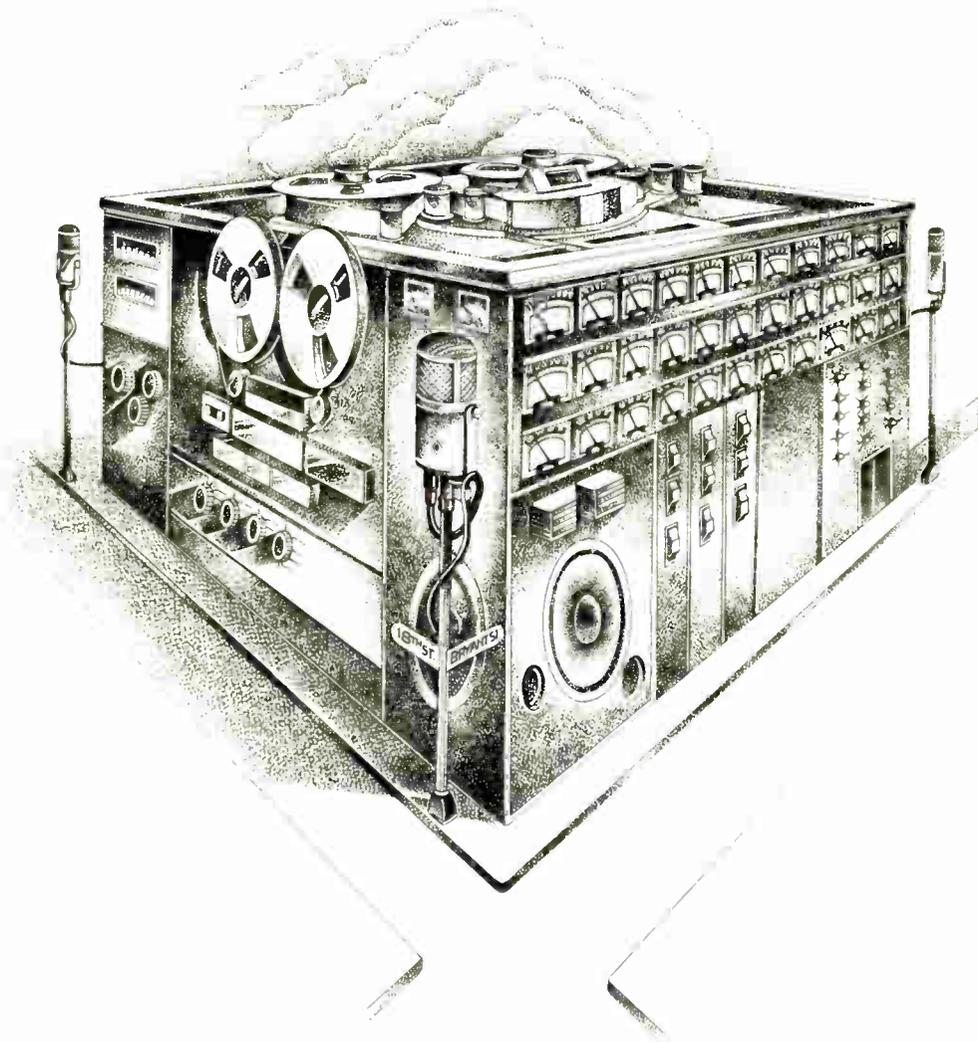
## THE LOFTECH TS-1 AUDIO TEST SET

The LofTech TS-1 introduces an entire new concept for basic audio alignment, calibration and testing. The TS-1 is a \$249 multi-purpose audio test set that incorporates an audio oscillator, decibel (dB) meter, and frequency counter in a single, compact unit.

Alignment and calibration procedures can be easily performed by the user. Historically, this has not been practical as several pieces of expensive equipment have been required which are often difficult to understand and operate. The TS-1 combines all of the basic audio test equipment together into one small, functional, accurate, easy to operate and low cost package.

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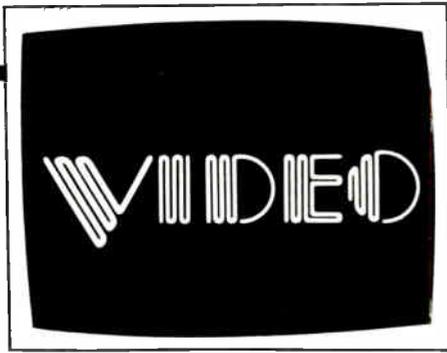
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**INTERFACE**

# STARTING OUT IN VIDEO: a survey

by N.I. Weinstock

All right, let's start at the beginning. The word: video. Assuming the reader is an audio recording studio owner, producer, or engineer, this word has probably been inhabiting his/her brain for a while now, continually swelling towards the frontal lobe where it now attaches to many a business idea. There are as many ways for an audio business to get into video as there are audio businesses, but there are only two reasons to do so: 1) You are so entranced by the medium that you simply must enter it; and 2) You think that you can make money in it because it seems a natural outgrowth of certain things being done by your firm in audio.

The second of these two is undoubtedly the more sound reason, but just as many of us got involved in audio in the first place for Reason Number One. It may prove the most common way into video as well. And, in these hard '80s, video puppy love may prove an even more common way out of video than ever was the disease of amateur enthusiasm a fatal

one in audio.

If Number One is your reason, the antidote against the crib death of your video ventures is to think like a Number Two. There is a most obvious direction to take towards becoming the next Ted Turner, and it is different in every case. As businesses evolve, there are typically several marginal growth areas that present themselves as "next steps." Video is now a blanket word for many of these next steps—but the steps are different and can lead in very different directions. If a studio is unsure about a first video step, one way to judge may be to talk with the producers who are using the studio. Rather, this is the most obvious way—and in fact may guide the studio decision-maker's future falsely. Many video/audio studios are audio studios that already have made the plunge, and most of these report that their client list has changed drastically. Inter-related though they are, video and audio are still two different businesses.

Exploiting that inter-relationship may involve emphasizing one's expertise in audio. Is there a TV station or video producer anywhere who ought

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not to be approached by a good audio studio in the neighborhood, with a pitch emphasizing better sound at lower end cost? When audio studios do make the move towards full A/V, their current strength in audio—relative to video production facilities' usual lowest-common-denominator TV sound—is what differentiates them from the rest of the TV production pack. In the last few months, this column has tended to concentrate on pointing out just where the differences lie, between album sound and sound for film and video. In the next few months, we'll cover the practical steps involved in the metamorphosis to a complete services studio.

Getting a fix on what video producers are looking for in a studio is a beginning. (We said *video* producers, not just the audio guys you've most likely been shooting the breeze with regarding moves into video.) Getting the help of someone experienced in marketing video services to the local TV industry as well as to producers, is another step. You will probably find that the market is right for only a limited move right now, but now is the time to set strategies for the future so you're not locked into a no-

growth direction.

Example: Spend all of your capital on the currently hot technology, the buzz-word stuff that's on everyone's lips when they describe what they're looking for in a state-of-the-art video studio, and you may find that you're out of date in a couple of years. Technology gets superceded quickly. It's the infrastructure that all those lovely gadgets get hooked into that should be the centerpiece of your planning. The right people and the right rooms will keep the customers coming in enough to use all that wundertech.

Another example: The New York studio that, seeing the explosion of the cable market, tried to expand into everything at once. While getting their wonderful act together, productions got used to being made elsewhere, and money tightened, and for a studio that would have done everything at once there wasn't much left to do.

So let's say you've made a plan that can be realized, and can pay off, one step at a time. Only thing is, expansion in video, even step by step, is much more costly than the audio business. Your rich uncle may not suffice for capital needs, as in the past.

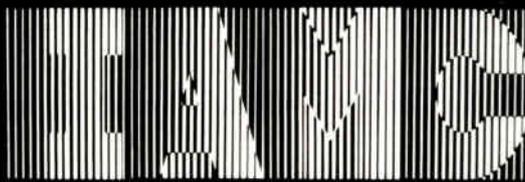
A proper presentation to the bank is a part of the whole video experience that few of us can afford to miss. And we will go into some depth about just that next month.

Video recording is a business that's very much up in the air right now. That makes for plenty of room to enter, but little certainty about success. (So, just as an investor will take your forecasts with a grain of salt so large as to make your expansion plans possibly unpalatable and unbankable, so we take any forecasts we may be making with a like quotient of doubt. Actually, we'll skip the forecasting problem by sticking to true and recent histories from inside the heart of video.) Lots of producers now are talking about video's being at the stage where we're all searching for the new 45—the hit video single to power an industry. Or is the new 45 the video game, and we on the recording side have all been passed by? There is a melding going on between standard video programming and the interactive computer animation of the games. Music is a big part of both, but is there any place here for the recording studio? In a few years—probably. We'll cover that at the end of this upcoming five-parter. ■

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(continued from page 25)

business—recounts the history as having begun sometime around 1915 when the Edison company of New Jersey, in need of greater production capacity, contracted with a button-making company in Scranton to make the records, since, as Marquardt explains, "The technology of molding a round flat button was similar to that for a round flat record. And there probably were not very many molding companies then anyway." One fascinating sidelight is that the Edison disks were ten inches in diameter, and the button company already had molds capable of making five and six-inch buttons. God only knows what anyone did with a six-inch button. "I wish I had one to show you," quips Marquardt.

Grandfather Frank, a superintendent at the button company, was assigned to set up the new record division, and the company then became known as Consolidated Molded Products. Eventually the record company was sold off as a separate entity and renamed American Records. American then decided to set up operations in Bridgeport, Connecticut; Roy went up to become plant manager there while

Frank stayed with the Scranton plant. The Bridgeport plant was quickly bought by Columbia, with Roy becoming plant manager.

After Frank died of cancer, Roy came back to Scranton (in 1940) where five years later the plant was bought by Capitol. In 1950 Roy set up his own company, Specialty, specializing almost exclusively in 45s. After LPs became the overwhelming dominant force in the industry, Roy, not desiring to become any more heavily involved in the business, turned operations over to Richard and went on to become the president of a local savings and loan.

Thus, as Richard notes, "Three of the largest record companies in the pressing business—Columbia, Capitol and now WEA—all have links to Scranton. Indeed, the Capitol plant became a highly important part of the generally depressed local economy in the 60s when the plant was turning out millions of Beatles records. The irony was apparent: regardless of the low opinion the largely Catholic, blue collar parents of the city might have had about the mop-tops, the boys were putting the bread on their tables.

Despite the size and complexity of the plant, the family style of run-

ning a business had been maintained at a comfortingly high level. The extremely amiable Helminski knows dozens and dozens of the plantworkers by name and chats with them animatedly and without reserve. In turn, they obviously do not look upon him as "the Boss" so much as they admire him as the man who makes it all flow and who is therefore responsible for them being able to make their livings under pleasant conditions.

Two interesting final notes. One of the plant's projects during the year was the duplication of a quality-control standards tape now used by all WEA personnel. The tape, derived from "ideas and examples contributed by the quality-control departments of all the labels, plus our own department," contains audio examples and definitions for such terminology as "pre-echo," "print-through," "scuff," "ocean roar" and "orange peeling." Andy Rooney or William Safire might have fun with this. I can see Andy Rooney asking in his favorite quizzical manner, "What's *scuff*????? What in the world is *orange peeling*???"

Also: the house sound system at Specialty: Pioneer amplifier; Technics turntable; Nakamichi cassette deck; JBL monitors. ■

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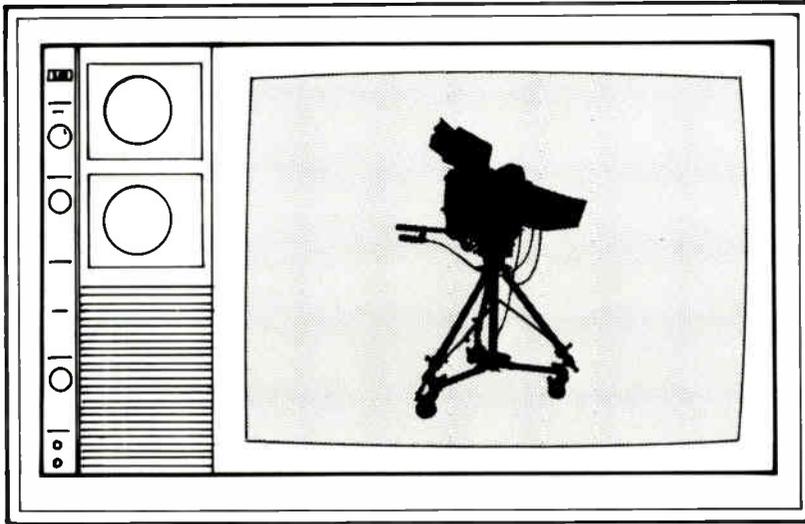
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# VIDEO NEWS



by Mia Amato

## More Than a Movie. . .

The first interactive videodisk "game" bows this month from Vidmax, a Cincinnati firm. *Murder, Anyone?* is a live-action mystery movie with sixteen possible "whodunits" which the user can "solve" using the search, freeze-frame, and random access features of the laser format videodisk players.

At this writing, the game disk is being custom-pressed at Pioneer's Osaka plant and should be in stores around Christmas at a price of \$29.95.

The program, with a privately funded budget of \$210,000, was produced for Vidmax by *Marty Perlmutter* and directed by *Philip Goodman*. It was shot on 3/4" tape and mastered for disk on one-inch.

"We shot filmstyle, trying for a noir mystery look," says Perlmutter. "The program opens with a dinner party which introduces all the characters and the victim, a nasty millionaire who manages to give everyone a motive for murder. . . *'Sissy, that diamond necklace you were admiring. . . it was supposed to go to Jessica after my death. Tomorrow I'm giving it to you. . .'* Then later he gets killed. The following sequences were shot several times, in different versions, with a dozen different murderers and about sixteen different weapons. The show is a lot like

the old board game, Clue™ although it is perhaps more related to adventure games on computers."

Audio makes the key sequences work. Using the stereo capability of the optical format, Perlmutter prepared two different audio tracks for several scenes. By selecting one or the other, the player makes a "branching" choice that affects the game's outcome. Careful dubbing by the actors and actresses was shepherded by technical director *David McCaul*, who used the facilities of *Music Consultants* (Westboro, MA) for the final mix. Video postproduction was done at *John Sullivan Associates* in Boston.

"One of the most difficult jobs was getting the script, which was written by Hi Conrad, into a shootable form," Perlmutter says. "The first script, with all the different variations in audio and voiceover, was as thick as a Manhattan phone book. We computerized it, ending up with a printout that noted dual soundtracks for each scene."

In the course of the game, a player can call up a variety of room searches, suspect interviews, and other "clues." Some, such as lab reports and incriminating letters, take up only a single disk frame, and were shot on slides and transferred to video. Perlmutter explained that the whole program had to be "shoehorned" into that portion of a half-hour disk side that would guarantee frame-accuracy.

*Murder, Anyone?* is the first of five mystery disks planned, according to Vidmax president *Eric Nowlin*. Nowlin said the firm has no connection with Magnavox nor Pioneer, which manufacture the optical disk players. He did say that Pioneer had bought outright a large number of the first pressing "to sell in stores where they sell their players."

Vidmax is also working on some esoteric interactive programs, namely art disks commissioned by the Guggenheim Museum and the National Gallery. Nowlin, who previously worked as a consultant on RCA's disk launch, estimates the optical disk population at 80,000 machines. He says the company's goal is to reach a quarter of that market.

## Blues on Tape

A trio of videotapes tracing the musical history of the American South, produced by southern videographers, appeared at *The Kitchen* in New York this fall. *Beale Street*, by *Alexis Krasi-lovski*, is a black-and-white documentary on the Memphis blues scene featuring *B.B. King*, *Bobby Blue Bland*, *Rufus Thomas*, and *Prince Gabby*. A performance tape uniting *Allen Toussaint* and *Toots Washington* with the late *Professor Longhair*, called *Piano Players Rarely Ever Play Together*, is a polished piece done in New Orleans by *Stevenson J. Palfy*. A bit of video verite, *Up from the Cradle of Jazz*, produced by *Jason Berry* and *Jonathan Foote* focuses on two southern musical families, the Lastis (*Wild Tchoutipoulas*) and the *Neville Brothers*. The show was curated by the Kitchen's *Tom Bowes*, who plans to distribute it as a group show to museums, galleries, and art centers.

## Rock and Roll Heaven on HBO

I've often chided *Home Box Office* on these and other pages for acquiring the most unimaginative rock music programs. Occasionally the nation's leading pay television service makes a tentative step towards more exploratory work. A notable effort is *When The Music's Over*, a special on the lives and influence of *Janis Joplin*, *Jimi Hendrix*, *John Lennon*, *Buddy Holly*, and other departed rock heros.

The show, basically an assemblage of old film clips, is being produced in-house by HBO and will air some time in 1983, perhaps as a simulcast. Director *Chris Bolton* is handling the construction job of what should be, at the very least, archivable nostalgia.

The quick demise of *CBS Cable's* cultural pay TV channel surprised no one in the industry, though some are mourning the loss of an outlet

for classical music programs. Cause of death? "Network arrogance," commented at least one cable pro. The service was reportedly \$60 million in the red when it folded; what is verifiable are huge cost overruns on virtually all in-house produced programs—budgets blown despite the use of non-union staff.

Many of the programs that were produced for CBS cable are now being repackaged for distribution to foreign TV.

Cable operators as a group have been wary of the broadcast networks and their entry into the field, perhaps justifiably. Less than a week after dropping its cultural pay service, CBS announced a teletext deal with AT&T—the cable industry's arch rival in federal deregulation battles in Washington.

### **Cable Markets Across the Sea**

Ours is not the only country with cable TV. In fact, the percentage of "wired" homes in some countries is much higher. And in a few years, a cable market for American-made programs may begin to emerge.

The more progressive cabled countries tend to be mountainous—poor reception being an impetus to hook up. In Switzerland, for example, an esti-

mated 67 percent of the homes have cable—as opposed to 25 percent of homes in the U.S. Over a thousand cable operators, each with a tiny franchise of a few thousand homes, carry Swiss television—no foreign programs are allowed. In Belgium, however, where 20-channel systems deliver French, German, English, and Dutch TV feeds to approximately 80 percent of the country's homes, local origination has begun to bloom. About a quarter of the Belgian systems are privately owned, purchased programs for their "local" channels. These are supported by advertisements; business has been brisk enough to warrant a study by **A.C. Nielson & Co.**

While efforts to launch a pay channel have been stalled in France and England, West Germany recently launched an ad-supported pay TV service. **Helsinki Television** regularly purchases foreign programs for its cable viewers in Finland—including some from the U.S.S.R. In South America, **Cablevision S.A.** and **Video Cable Comunicaciones S.A.** in Argentina are purchasing Spanish language programs. Other nations moving into cable TV are Australia, Spain, Austria, and New Zealand. Well-established systems can be found in Canada and Japan. ■

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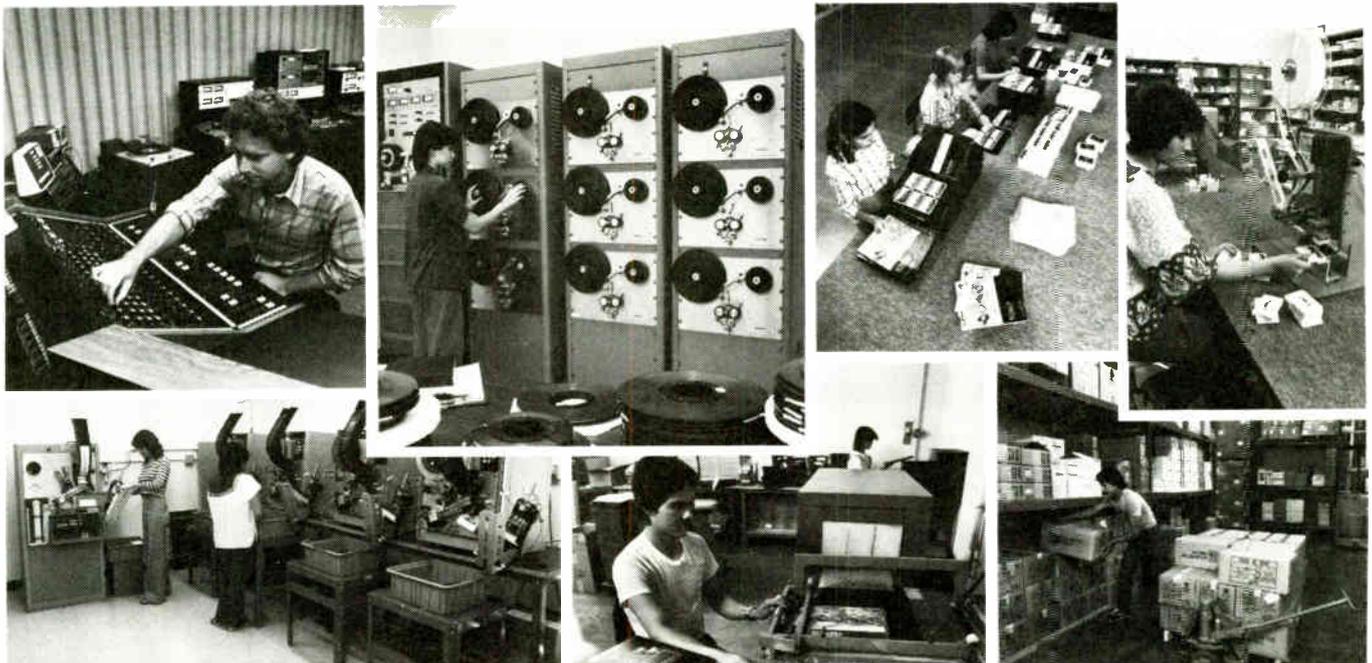
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# PRODUCERS-DESK

## Peter Mclan

by James Riordan

Peter Mclan has attained success as a producer in what many would consider a very unlikely situation: as an American producer in Australia. Despite his foreign background, Mclan and his artists, Men At Work, have recently created the biggest selling Australian album ever by an Australian band.

"I started as a player (keyboards) in a Chicago area band," says Mclan, "and then went to work for Mercury in A&R. Later, I left Mercury to manage a recording studio because I missed working in the studio. I had no idea at that time that I really wanted to be a producer. The first thing I did in the studio was produce my own band, Jambalaya, which signed with A&M. After the band broke up I stayed in L.A. and wound

up writing source music for television shows. Erik Scott, who co-produced the last Alice Cooper album and plays bass for the group, and I would write these "disco killers" which they used on "Charlie's Angels," "Starsky and Hutch," "Vegas" and some other shows."

One thing led to another and Peter was signed to CBS as a solo artist. His production on the solo album led to an offer from Epic to produce Frannie Golde.

"CBS Australia heard Frannie's album and they had an artist named Sharon O'Neill that they wanted me to do. I went to Australia to do Sharon's album and I wound up getting involved with Men At Work and staying two years instead of six weeks.

"I went to see the band with the A&R director for CBS Australia, Peter

Karpin, and until then I was planning on leaving after I finished Sharon's album. At the risk of a cliché, it was just magic. There was something so original and vibrant about Men At Work that it really got to me. I would have been a fan even if I hadn't gotten involved, and that's a nice feeling. I heard great songs, a great singer, and a great band. I have a natural producer's suspicion of liking acts I hear live because a lot of songs that work great live don't work at all in the studio. Even with that natural suspicion, I knew that night in The Manzil Room in Sydney that I wanted to work with them."

The differences between the American and Australian record business are many and go beyond the population differences, according to Mclan. "The live appearances are terrifically important. In Sydney or Melbourne, for example, there are 40 or 50 pubs in each city that hold between 300 to 2,000 people. The bands there are able to build a large following because there are so many opportunities to play. A lot of these bands play over 300 dates a year. From a music standpoint it's very exciting because Australian audiences don't go for Top 40 or cover material. The bands are all doing original material and they are constantly developing because there is so much competition that any band who is standing still is actually moving backwards."

A national tour of Australia can mean playing ten days in each of the major cities. A band playing the ten top pubs in each major city can reach the bulk of the Australian market. Mclan elaborates on the role of the pub in that country. "The pub has been a core element of Australian tradition all the way down the line. In the early days, the pub was pretty much the only refuge from a somewhat harsh existence. As a result, the pub has naturally evolved into the entertainment center of the Australian culture. Musically it's a very rock oriented scene. Singer/songwriters have a tough time there, which is a shame because a lot of them are very talented. Sharon O'Neill's album eventually won a Countdown Award (Australian equivalent of Grammy) but it was hard in the beginning. The pub scene has produced a music that is

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have a chance of being heard, even though they may be perfectly viable. Other avenues such as video are getting a lot of exposure through MTV (Music Television) and other outlets. MTV sells a lot of records proportionate to their audience, whereas traditional AM radio has not been selling records very well for the past two or three years. Video has been a tremendously important part of marketing records just about everywhere else in the world. Radio has tended to become a background for other things while something like MTV is being watched for the music content."

McIan believes some radio stations, like L.A.'s KROQ for example, are a powerful exception. "The reason KROQ, for example, has done so well is because they are playing things that motivate people. That creates a loyalty to the station. If other stations sound alike the loyalty element can't really be there. That isn't to say that the other stations aren't providing music that people want to hear because obviously they are, but the point is the audience is changing."

At the moment the Australian record industry is experiencing a sales slump for the same reason as their American counterparts. "New bands

are having a much more difficult time of it than they did two years ago when I first went there. The effects of a sales slump can be seen more quickly there because the industry is so much smaller. The result is that the next wave of Australian bands is probably a little ways off, but the positive side of their industry is that those bands will probably still be playing the clubs and staying alive."

Working as a producer/engineer in Australia is also very different from working in the U.S. Much of this difference is related to the booming live scene. "The bands work so much that you have a definite fixed time period to record the album. Record companies there don't pay advances so you can't remove a band from playing for more than six or eight weeks without it really hurting financially. As a result you learn to work quickly. Budgets are about a third of what they are here, but studio costs are comparable so that also forces a faster recording process. I usually spend two to three weeks in pre-production and rehearsal with the band. We work out all the changes and suggestions there so we go into the studio with a pretty clear direction."

There are also a few drawbacks to Australia being 12,000 miles from the U.S., as McIan describes. "There are maybe three or four world class studios in all of Australia and those studios are booked flat out all the time. The other studios are trying to get as much business as they can and it's tough on the lower echelon. On the upper echelon the studios are often booked so solid that maintenance often takes a back seat. So you have things breaking all the time and the parts are not always available. Maintenance is the biggest problem in working there."

As far as new projects go, McIan has just finished work on the second Men At Work album which probably won't be released here until after January. "I'm going to New York soon to work with an artist named Michael Bolton for CBS. He's a really strong songwriter with a great voice. Then I'm heading back to Australia to work with another band I'm very excited about called Dear Enemy. I'll take a new band that I believe in over an established act any day of the week because that's what I enjoy. A producer's job is to act as an interpreter. If there's a band you can really sink your teeth into, one that you really feel you'd be a fan of, then the job of interpreting becomes a joy. You realize you're acting as a conduit for the audience. In Australia you really have the opportunity to do that and I find that exciting."



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by David Gans

## THE GANS-JONES RULE OF ECONOMICS

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### US FESTIVAL FOOTNOTE

Last month's Us Festival report included an account of Bill Graham's run-in with the Kinks when that band showed up late for their set in hopes of performing after dark. After witnessing an onstage exchange of sarcasm, several writers assumed that the Kinks' absence from the giant video screens that flanked the stage was ordered by Graham in retaliation for the band's misbehavior. Graham pointed out that the Kinks had asked not to be magnified and noted that he would never punish the fans for the actions of a performer.

I've since gotten to the bottom of another unfortunate heap of journalistic logic regarding Graham's actions at the Labor Day weekend event. To those who witnessed the backstage clashes between Graham's production staff and Unuson Corporation personnel, it would be plausible to presume that the playing of Frank Sinatra's recording of "I Did It My Way" after Fleetwood Mac's Festival-closing show was an intentional slap at the "Let's work together" platitudes on which the Festival's marketing campaign was hung.

Contacted in his San Francisco office, Graham insisted that the self-serving ditty was not played at his request. "That's Fleetwood Mac's music, not my company's," he said. I called Judy Wong at Fleetwood Mac's business office in Los Angeles, and she confirmed that the Mac sound crew has been playing "My Way" at the end of shows on their current tour. "I can assure you that it was not Bill Graham's choice," she said. And I can report that the song was played on the PA at the end of the Mac's show at the Oakland Coliseum October 20.

Graham has gotten enough bad press over the years that I figure it's only fair to set the record straight when he's been bum-rapped. He may have gotten a kick out of hearing the song Unuson's literature calls "a ME song" after hassling with psychobabbling Ph.D.s for a month, but it seems clear that this is one tune he didn't call.



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TEAC's V-4RX cassette deck

NE, Redmond, WA 98052... Fender has introduced the *String Stretcher*, a clever little device designed to enable rapid breaking in of guitar strings. It lists for \$3.98 and comes in two models: S for steel strings, N for nylon... Korg's *SDD-3000 Programmable Digital Delay* offers up to 1023 milliseconds of delay without the use of an expand-

Suggested retail price: \$430... ADA Signal Processors has combined several time-domain devices into one rack-mounted, footswitch-controlled package called the *TFX4*. The Flanger section is an improved version of ADA's floor-box version, with a shorter minimum delay time, a higher sweep and frequency response to 15 kHz; the Chorus's delays range



ADA's TFX4

er module; 20-17,000 Hz bandwidth at all delay settings; true stereo capability; triangle, square and random LFO waveforms; external and envelope control of VCO; footswitch connections for program up/down, delay bypass and hold; four-position low- and high-cut filters in the feedback loop; etc. Unicord, 89 Frost St., Westbury, NY 11590... The *V-4RX cassette deck* from TEAC

from 11.4 to 30 ms, the Doubler's from 30 to 70 ms; the Echo's distinct repeat echo and reverb effects range from 50 to 200 ms. Other features include FET switching, LED Clip indicator, input and output level controls, and multi-colored LEDs indicating effect modes and phase inversion. Complete with 20-foot cable, the TFX4 lists for \$499.95. ADA, 2316 Fourth St., Berkeley, CA 94710. ■

# SOUND ON STAGE

## Remote Recording & The Concert Sound Engineer

by Pat Maloney

If you're a live sound mixer employed by a club or PA company, I'll bet you are somewhat less than thrilled whenever you hear that the evening's concert is to be recorded. After all, things are usually difficult enough without having to deal with studio engineers, fancy mikes, and transformer splits. When the occasion arises, however, it would behoove the live sound mixer to be aware of what is generally involved and expected.

To get some ideas of how to best interface with the needs of the recording crew, I contacted the folks at Bodacious Audio, a remote recording outfit based in San Mateo, CA. According to vice president Herb Pallant and chief engineer David Haynes, the Bodacious crew always tries to be as transparent and non-disruptive of the concert as possible. Their actual level of involvement and subsequent interaction with your normal setup depends on whether the artist wants album quality recordings, demo quality, or just a very basic recording of the set that they can use for evaluation purposes.

Actually, the latter situation might be something you could provide from the house console. As you know, simply recording the output of the PA board generally sounds pretty dreadful, so resist the temptation and don't do it! If, however, you have an extra delay line lying about, you can make a fairly decent reference cassette by delaying the mix from the board until it matches the signal from a mike in the room and then blend these two signals together on a cassette recorder with mike/line mixing capabilities. Attempting to do anything more complicated than this from the house mix console (with or without David Clark headphones!) is suicide. Recording companies like

Bodacious Audio exist for this purpose and the job is best left to them.

"We use our own split box and take our signals directly," Haynes points out. "We therefore provide the grounds for the instruments and the phantom powering for our mikes. The PA gets a transformer isolated split." But what if the PA company insists on the same thing for the same reasons? "Well,

we've done it both ways," David explained. "It's often up to the producer to decide if the emphasis is going to be on the PA or the recording. Given a choice however, there is just something that makes you feel safer about using your own equipment!"

In the event of a large music festival, however, most of the equipment will be supplied by the PA company,

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since there usually isn't enough time between sets for a recording crew to put up separate mikes and cables for the group they want to record. In such a situation Bodacious will accept a split from the sound company. "There should be ground switches on each split," advises David, "and the transformers should be high quality, such as those made by Dean Jensen."

Bodacious Audio's specialty is recording direct to two track using the Sony Digital system with VHS and Beta recorders, so they are just as aware of the special needs of live mixing as is the house sound engineer. "Communication with the sound mixer is the most important thing," stresses Haynes. "We will always make sure that he knows there is going to be a recording *before*

we show up. We want him to know what equipment we're bringing in and how it might change his system, and we'd also like to find out what he has available that we might use. We will generally cable the whole stage ourselves because we know our cables are good and I don't want to lose one during the show." They will usually not provide all the mike stands, however, nor 'generic' mikes like Shure SM-57's and 58's if they are available from the house and in good condition.

"The only time we could run into a problem is in choosing microphones with a wider pattern than the sound mixer would like to use from a feedback standpoint," Haynes explained. "And since feedback is a big problem in live recording I will sacrifice a microphone

selector: any time to keep it to a minimum."

Communications *during* the show is just as crucial as before the event, so it's important that the house mixer, monitor mixer, and recording crew can communicate with each other at a moment's notice in the event of a problem. In addition to having each position linked via a common intercom system, a microphone assignment sheet is a necessity. This sheet should list all instruments, their respective microphones, snake input numbers and appropriate input channel assignments on the house, monitor and recording consoles. Bodacious Audio completes such a sheet prior to every recording and passes it out to all concerned. If the recording company you deal with doesn't have a similar sheet, be sure to make one up yourself. "Everyone has to think the same during the show," David stressed. "You can run into big problems if you think the bass is on channel four and I think it's on channel five!"

If you've been in the PA business for any length of time, you know that an inexperienced recording crew can completely ruin a live show for the house mixer. "The first thing you have to establish is confidence in each other," Haynes suggests. "Our first reaction in dealing with any PA company is one of question: Are they worth a damn? Their reaction to us should rightfully be the same if they've never dealt with us before." So psyche out the recording company and see if they know what they're doing. Call up someone who's used them before so you'll know what to expect when they arrive.

The recording crew will most likely want to start setting up earlier than you normally would for a show. Getting there early is as much to your benefit as it is to theirs, however, since you can use the extra time to sort out the ground loops and buzzes that may show up. "We often have to go through the house's monitor system and clean up the hums and buzzes that may be acceptable to them during a normal show but stick out like sore thumbs during a recording," David says. Therefore it would save time for everybody if you went through all your equipment and replaced bad drivers, isolated those intermittent cables, and traced out that elusive ground loop in the effects rack *before* the day of the recording. You might as well do it ahead of time and avoid all the headaches at the last minute. Sort of like cleaning your house the day before the party, not just as you hear the guests walk up the stairs.

And even if the recording isn't exactly a party for you, it doesn't have to be a huge hassle either. Often as not, it can increase the excitement of the performance and make for a memorable night for all involved – and a good one at that! ■

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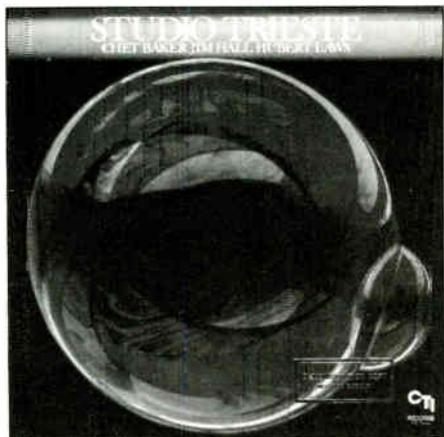
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**STUDIO TRIESTE: CHET BAKER;  
JIM HALL; HUBERT LAWS  
CTI 9007**

*Produced by Creed Taylor; engineered by Rudy Van Gelder at Van Gelder Studios*

Creed Taylor's rejuvenated CTI label has released a lovely, laid back jazz album featuring trumpeter Chet Baker, guitarist Jim Hall and flutist Hubert Laws that is ideal for late night listening. Rudy Van Gelder's immaculate recording does justice to the subtle colorings of the music which consists of attractive extemporizing on themes and melodies from such diverse sources as Lecuna's "Malaquena," John Lewis' "Django," Tchaikovsky's "Swan Lake" and Miles Davis' "All Blues."

Don Sebesky supplied the basic framework of these performances with arrangements that offer luminous tonal textures, sinuous Afro-Latin rhythm and a striking interplay between acoustic and electric instruments. Baker once one of the eminent musicians in the 50s cool jazz scene, makes a strong comeback here, playing with warmth and assurance. His gift of melodic inventiveness is clear and unmistakable with a sensitivity to tonal beauty that has not dimmed. His work is first class all the way—from the almost casual development of "Malaquena's" melodic patterns to the tight, elegant handling of "Django" to the diffuse Miles-like lines on "All Blues."

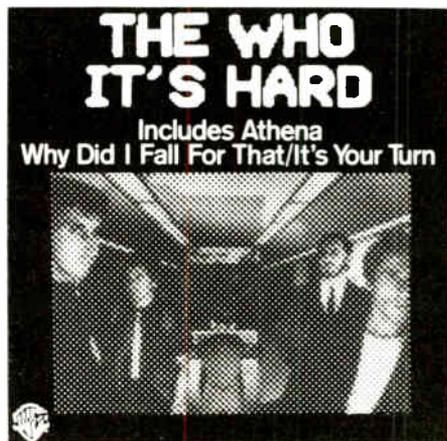
Keyboard men Kenny Barron and Jorge Dalto are brilliant throughout with airy, dancing solos on electric piano. Barron is a neat, tidy performer whose crisp playing is adroit and inventive on "Swan Lake" and "Django." Dalto, a studio

musician new to this reviewer, offers agile solos that have a bright, fluid quality. Someone on synthesizer (no liner notes are offered) contributes penetrating washes of tonal color that blend with the overall texture of each piece.

The veteran guitarist Jim Hall is at the top of his form in this recording, working most of the time with single note lines and chords that give his solos balance and dramatic impact; his delightful, relaxed playing is consistently characterized by a natural tone. Flutist Hubert Laws, whose cross-over excursions into disco and funk have made him one of the most successful jazz musicians in the business, is a reassuring, often mesmerizing player with a warm, clear, full-bodied tone.

Van Gelder's CTI recording, with its lustrous resonance, brings out the glowing qualities of the music. This album is highly recommended.

—John Lissner



**IT'S HARD  
The Who  
Warner Bros. 23731**

*Produced and engineered by Glyn Johns (no recording studio listed)*

Leave it to The Who to deliver the best rock and roll album of 1982. Just when many had written the band off—especially in the wake of several solo hits by Townshend and Daltrey—The Who have bounced back with a powerful and cohesive effort: the work of a band and not merely of four soloists recording together.

What makes *It's Hard* such a compelling work is the passion and energy that radiates from it in nearly every aspect. Townshend's solos on this record are the Who's best since *Who's Next*

What is astonishing about this is the fact that the band rehearsed and worked out the tunes with *another* guitarist, Andy Fairweather-Low, while Townshend was away recovering from his bout with alcohol! You'd never know it since the group sounds like they were never apart.

Opening with the infectious yet un-Who like "Athena," the album progresses through myriad styles and rhythms. The band had retained much of their hard edge (which they admit they abandoned on last year's *Face Dances*). "I've Known No War," which kicks off side two, has the potential to be a successor to "Won't Get Fooled Again" with its blaring raw guitars and Daltrey's angered vocals.

The most powerful all-out rockers on the album are, surprisingly, those contributed by John Entwistle. If Townshend is the Lennon-McCartney of The Who, then Entwistle has certainly been its George Harrison; one song per LP and an occasional B-side of the singles. *It's Hard*, however, shows Entwistle coming into his own right both as a songsmith and an actual shaper of the band's sound.

Entwistle was the member most instrumental in getting Kenny Jones as Keith Moon's replacement, and the two are as solid a rhythm section as you'll hear on any contemporary hit album. On the album's closer, "Cry If You Want" and on Entwistle's ominous rocker, "Dangerous," he and Jones provide a wall of crisp bottom that supports the more lucid guitar work of Townshend.

Credit must also be given to Daltrey and Townshend, who are singing their best in The Who since the early 1970s. Daltrey is singing with the conviction that he displayed on *Quadrophenia*, yet without as much strain. Townshend, who only handles lead vocals on a few tracks (possibly an effort to keep the record sounding different than his solo albums), retains that unmistakable Who harmony throughout, but especially on "Athena" when singing, "She's just a girl, just a girl."

The production on the album is the perfect complement to the songs and the group's performance. Producer Glyn Johns, who has worked with the band since the late 1960s, has kept the sound crisp and clean and the gimmicks to an absolute minimum. He is a master of clarity, especially on "Athena" where the acoustic guitar cuts through the band's powerful instrumentation and never sounds out of place.

Johns, especially on the uptempo tracks has made a point of mixing Entwistle's razor sharp bass guitar extremely hot. On some songs, in fact, it is the most dominating instrument on the recording, yet that's okay. Somehow, it works.

The Who have recently embarked on their farewell tour. They claim they'll only play live on special occasions and in limited engagements. They have, however, repeatedly said they will continue to record together. Although many of their fans are disappointed by their announcement to stop touring, I don't think we have any thing to worry about. *It's Hard* is physical proof that The Who still have it together, and beside, look at the music The Beatles made after they stopped touring.

—Bruce Pilato

**Blues/Rockabilly Revival**  
by Jack McDonough

Most observers of our current musical trends are aware that a blues/rockabilly revival is thriving under the roof of the general department store of new wave.

The principal force behind the phenomenon is simply that the whole punk/new wave movement was born of the need to reassert the same wildness and brashness that rock and roll had first shown twenty years earlier; and, after burning through a few ferocious years on their own, the kids began taking a closer look at the original raw materials. What they found was a music that in its spareness, simplicity and seat-of-the-pants cleverness reflected the values they wanted their music to have.

There are some paradoxical elements, however. The vicious and self-mutilating outrage of the punks, for instance, has very little to do with blues. You can play the blues as loud and fast as you want, and you can wail and despair and complain as mightily as you want, but it's a whole different brand of passion, an entirely different level of anger.

And of course the entire synthesizer-crazed wing of new wave (while perhaps just as "minimalistic" in its constructions) is, with its arch and quirky lyrics and rhythms and sounds, entirely at odds with the totally straightforward emotions and rhythms of rockabilly and blues.

Whatever the forces at work—and it may be nothing more profound than a matter of honest music that you can dance to—blues and rockabilly are having a heyday.

George Thorogood is the prince of the movement, having solidified his position with both opening shots on the Stones tour and exciting 50-States-On-50-Consecutive-Dates tour when he and the Destroyers blitzed the country in a Checker cab.

Now Thorogood and long-time label Rounder have scored a deal with EMI which will make his records much more readily available to the fans, and he has responded with his best

album to date, *Bad to the Bone* (EMI ST-17076). The production work rings bells, George sounds poised and raucous at the same time, and the LP strikes a perfect balance between straight boogie and sweet blues. Perhaps my favorite is "Blue Highway," where the Destroyers hit a nice, medium Allman/Clapton-like roll, and they also do a fine job on the classic "As the Years Go Passing By," showing off Hank Carter's sax. To most of the other tunes you can shake all night.

Hailing from the same Washington, D.C./Maryland/Delaware area as George, and coming up close behind him, are the Nighthawks, who already have had a series of fairly successful albums. Now Adelphi (Silver Spring, MD) has released *Times Four* (AD 4130/35), a two-record set of "previously unreleased material": a live disk, with side one cut at Toronto's El Mocambo, side two at D.C.'s Psyche Dilly in 1976-77; and a studio disk taken from sides cut at Track Recorders in 1977-78.

The Hawks, like the Destroyers, is a four-man team, but most similarities stop there. The Destroyers have a name star up front, with all the crispness and charisma that implies. The Hawks are more of a traditional blues ensemble. All four sing; they use harp rather than sax; and they'll stretch out like an old slipper, going to nine and a half minutes on Otis Rush's "Double Trouble," which closes out the live disk. Side one, however, proves they can be real economical too, as they lay down Elvis Costello's "Mystery Dance" in one minute forty. The liner note on the tune is useful: "The Blue Wave meets the New Wave. The *other* Elvis tune seemed a natural for The Hawks rocking sound. Rockabilly stands as the common ground between the hardcore blues purists and full-tilt New Wavers." The studio material includes "Claudette" (written by Orbison, recorded by the Everlys), "Mystery Train" and Elmore James' "You've Got to Move," the fourth James tune the Hawks have cut. The album is satisfying throughout.

Another homeboy for George is Billy Hancock, who backed people like Gene Vincent

and Dale Hawkins during 20 years of bar gigs and reactivated the Aladdin label in D.C. in the mid-70s. In 1978 Ripsaw records asked him to make a rockabilly label, and last year Solid Smoke of San Francisco licensed and released the widely variegated assortment of 14 sides from the rockabilly dictionary, most of it squarely in the Sun style. Some of it works, some not, but the spirit is there. (Rico Tee at Solid Smoke also tells us that the Dynatoners, who are more on the R&B side and who last year did an LP with Charlie Musselwhite featured, will be cutting an album of their own.)

Also squarely in the Sun style, but: entirely different altogether, are the Stray Cats from England, a trio of very young players who, rather than reviving old titles, have made a fast study of the style using hollow-body electric, standup bass and small drum kit and applied it to a bunch of excellent originals written by guitarist Brian Setzer. The result is an extremely effervescent album, *Built for Speed* (EMI ST-17070), buttressed by highly knowledgeable production by Dave Edmunds on five cuts and the Cats and Hein Hoven on the rest. They do conclude the set with one item from the era in question, Johnny Burnette's "Baby Blue Eyes."

Almost as effervescent, and definitely more offbeat than the Stray Cats is Peter Miller & the Wildcats, who have an LP on San Francisco's .22 label titled *Pre-CBS*. The title, with its reference to the CBS purchase of Fender guitars, symbolizes the golden age before the corporations got their hands on rock. Like Setzer of the Cats, Miller writes his own originals, most of which stay Sun-side but a few of which *really* drift into the shade, e.g., a reggae/rockabilly "Rude Boy," a good-naturedly satiric take of the movie theme "High Noon," a frantic, synthesizer-pumped "Go Away" and a concluding mini-medley titled "The King of Beretania" and "Rhyadda," which combines a fractured fairy tale with a fractured folk song. The Wildcats also use stand-up bass and include one vintage number, Buddy Knox's "I Think I'm Gonna Kill Myself." Press material says

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Miller began his career in the early 60s British pop band Peter Jay and the Jaywalkers.

Finally we have the Blasters, represented by a brand-new six-song live EP title *Over There* (23735-1B), which Warners is distributing via its deal with Slash. Recorded at the Venue in London on May 22, the feisty and energy-charged album represents another side to the Sun era, i.e., the completely wild streak as perfected by Jerry Lee Lewis and Little Richard. Gene Taylor lays on the piano and Lee Allen and Steve Berlin blast away on saxophones, while guitarist brothers Phil and Dave Alvin keep things cooking up front. This is a strong album, and available at a midline price because of its brevity.

.....

In response to my records column in the August/5th Anniversary issue, which mentioned Epic's *Endless Beach*, a two-record set of music made popular at Carolina seashores and colleges, we got a letter from Mark Leviton at Warner Records Special Products. Writes Mark: "I wanted to let you know that some *serious* beach compilations are available, since Columbia's LP was a shameless rip-off of our *Ocean Drive* sets, three volumes, each containing two LPs, available in Record Bar outlets in the Southeast. A two-record compilation is also for sale through television mail-order only." Mark sent this mail-order compilation, and I must agree that it shuts down the Epic collection fairly handily. Almost every track is a beauty: "Girl Watcher" by the O'Kaysions; "Stay" by Maurice Williams; "It Will Stand" by the Showmen; "Sixty Minute Man" by the Dominoes; "Tighten Up" by Archie Bell; "Give Me Just A Little More Time" by Chairmen of the Board; "What Kind of Fool" by the Tams; "Just One Look" by Doris Troy; and 22 others just as choice.



**DONALD FAGEN**  
**The Nightfly**  
Warner Brothers 23696-1

Produced by Gary Katz; digitally recorded and mixed at Soundworks Digital Audio/Video Recording Studios, New York City; Village Recorders, Los Angeles; and Automated Sound, New York City. Engineered by Roger Nichols, with Daniel Lazerus and Elliot Scheiner. Mastered by Bob Ludwig at Masterdisk, N.Y.C.

It would be impossible to review this

Donald Fagen album without comparing it to any one of Steely Dan's prior seven disks. The often enigmatic, yet catchy Steely Dan sound quickly became the mainstay of FM rock during the 70's. The subsequent release of *AIA* and *Gaucho* represented a seemingly uncappable pinnacle in terms of musical craftsmanship. Where could one go from there?

For his first solo effort, Fagen (S.D. lead vocalist, keyboardist, and musical co-conspirator) has chosen a personal motif which echoes his dreams as a teenager growing up in the late 50's and early 60's. The opening cut "I.G.Y. (International Geophysical Year)," ironically tells how the future will look by 1976: undersea high speed railroads, buying tickets for space travel, solar powered cities, and a just and compassionate computerized government. Fagen's synthesized harmonica solo gives the song a unique blend of old and new, while the lyrical hook "What a beautiful world this'll be, what a glorious time to be free" mirrors the unguarded optimism of a pre-Vietnam America.

The key to the success of *The Nightfly* lies in the consistency of quality which Mr. Fagen, producer Gary Katz, and engineer Roger Nichols have infused into the work. The customary lineup of over thirty top-notch studio sidemen is another factor in achieving that same degree of excellence.

And yet, *The Nightfly* still breaks new ground, taking chances whenever possible. For the first time in my memory Fagen sings a cover tune, by modernizing "Ruby Baby," an old R & B tune recorded by Dion in the early 60's. Fagen's arranging talent is showcased here, as he brings the song to new life. Another nice touch is "The Goodbye Look," a bouncy calypso number which features spry guitar work by Larry Carlton, and a finely layered mix which deftly sprinkles Starz Vanderloket's nimble percussion bits over the song. While "Walk Between Raindrops," a 40ish swing tune, seems somewhat incongruous in this setting, it nicely concludes the album like a glass of fine cognac after a meal.

Although I have been aware of the digital aspects of this project since last spring, upon listening to this album for the first time I did not notice any apparent digital-ness. I listened a second time, critically, and all I heard was clarity, sonic transparency, and believability at all frequencies. Better put this one on your gift list.

—George Petersen

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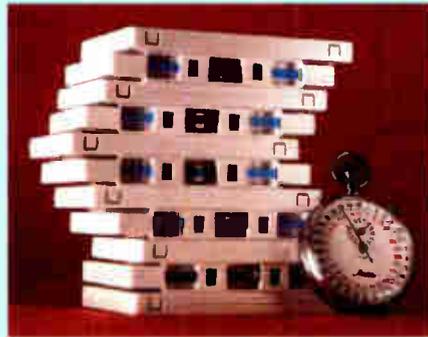
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Interview: Hal Blaine

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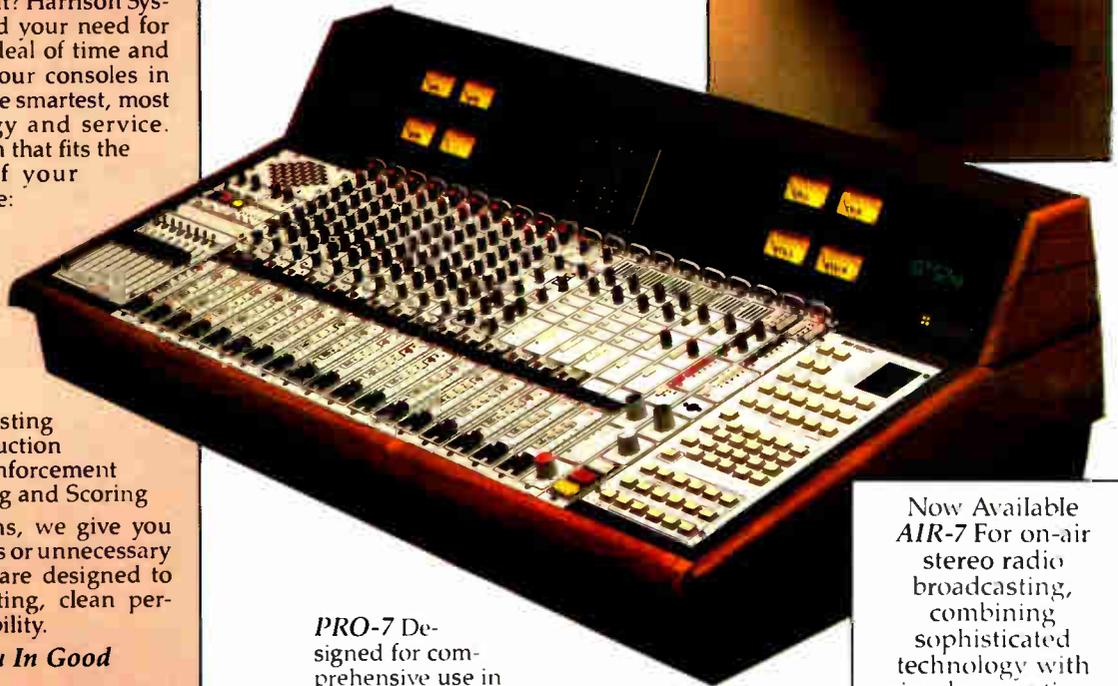
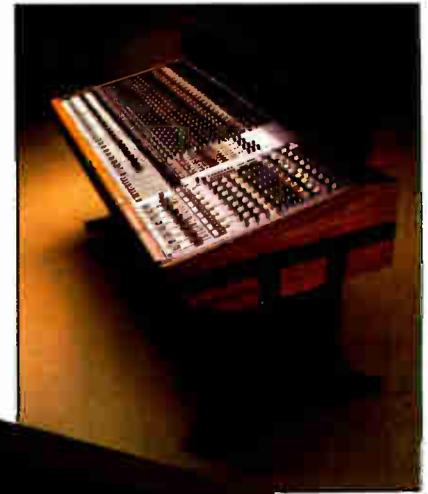
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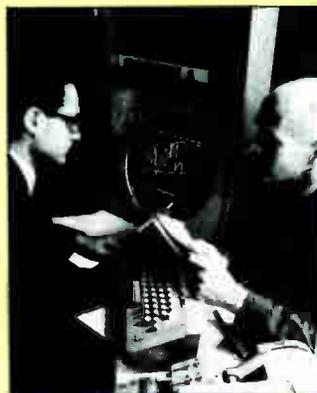
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Top:  
Fantasy Studios Mastering  
Berkeley, CA  
Photo by: Phil Bray

Bottom:  
Rolling Out the CD  
Photo courtesy Polygram  
and Ron Foreman



With all the amazing electronic keyboards today, most of us almost take the notion of music synthesis for granted. In "Music From Mathematics," writer Larry Oppenheimer examines how the many accomplishments from Max Mathews and the Bell Labs team have influenced music over the years. Page 16.

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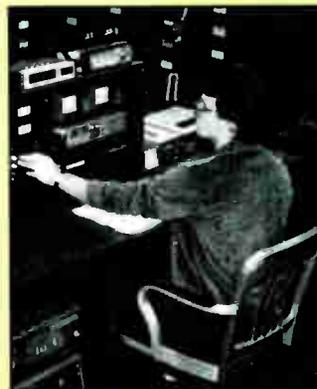
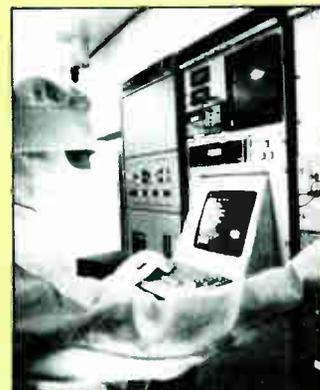
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## MUSIC

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While still in its infancy, the Compact Disc is now beginning to show signs of becoming a potent force in the industry. Greg DeTogne tours the new CBS/Sony CD plant, page 42. Ken Pohlmann chats with Emiel Petrone of the Compact Disc Group on page 49; and on page 32, several top L.A. disk mastering engineers talk about the CD with Tony Thomas.



This issue features our annual listings of mastering, pressing and tape duplication facilities, which begin on page 68. The cassette medium is now more popular than ever, and George Petersen checks in on this growing industry on page 54, while Blair Jackson talks to label executives on the vinyl vs. cassette issue on page 64.

The times have changed, and sounds have changed as well for Texas roots-rocker Joe Ely, who recounts how computers and music synthesis changed his outlook for *Hi-Res*, his recently-released fifth album. Anthony De Curtis' conversation with this self-described "digital hillbilly" can be found on page 124.



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Dear *Mix*:

Having just returned, exhausted, from the AES convention, I would like to mention a small problem that I encountered with some of the technical exhibits. I came to this convention with some specific equipment interests in mind, and, for the most part, found the displays and exhibit personnel very informative. However, when attempting to evaluate certain pieces of gear (digital reverberators, as an example), I was rather disappointed, and occasionally annoyed, at the demonstration material provided. In most cases, input to the reverbs came from either a cassette or reel tape—and often from a live microphone. This is perfectly acceptable. However, the **content** on some of these demo tapes was often nearly useless.

The most common problem was that the tapes did not contain musical material that reflected what users normally send to their reverb units! In a few cases, there were no percussive sounds available. In other cases, the drums were recorded as a full kit—an unlikely composite signal for a multitrack studio's reverb to see. Some tapes had no (or very poor) vocal selections, and others had no orchestral music. Still others had segments with different sounds panned to each side, or with tracks that obviously contained leakage from another source. Worst of all, one major manufacturer had tapes with audible distortion on some tracks.

If manufacturers are going to demo their wares to potential customers, the demo should be **applicable** to what those customers will be doing. Certainly I would not choose a reverberator solely on what I heard on the convention floor—an imperfect environment at best. But based on what I heard, I would eliminate some units from my evaluation, and rank others quite highly, and I cannot clearly tell whether this is due to the quality of the unit, or the quality of the demo!

My suggestion would be to follow the example of one manufacturer (remaining nameless) whose reverb units I found to be very pleasing. This company used headphones for their demos—probably the best choice in the noisy convention environment. Their display had an open mike available at each unit.

And, their demo tape contained a wide variety of clean, interesting, and **pertinent** tracks. Undoubtedly some of my positive impression was due to the quality of their device. But the quality of their demo unquestionably highlighted the strengths of their product. It was easy to tell if their unit would suit my needs!

It is to each exhibitor's advantage to assemble a demonstration of this calibre. It need not be expensive, just useful. If the company does not employ someone who can do this, then I suggest a consultant be hired. I know one such consultant personally . . .

Sincerely,  
Eric Wenocur  
Roar Productions  
Columbia, MD

Dear *Mix*:

I have just finished reading your article about the making of the film **Stop Making Sense** by the Talking Heads. I enjoyed the article very much, however, I feel I must write in to correct a few discrepancies. First of all you refer to Warner Hollywood Studios' re-recording mixer Steve Matlow. The correct spelling is Steve Maslow, one of the hottest music mixers in town, having won two Academy Awards in a row, for **The Empire Strikes Back** and **Raiders of the Lost Ark**.

Also the article mentions that Westlake Audio supplied a Magna Tech 9-F. In reality, Westlake did not supply the 9-F. Westlake supplied the BTX Shadow synchronizing equipment as well as a lot of customer support, help at a moment's notice and good vibes.

The 9-F was actually supplied by Alex Jepson of Entertainment Technology, who is Magna Tech's representative in Los Angeles, and assisted with the lock-up signal flow.

I would like to thank Chris Carey and John Sacchetti for all their help. Other names that should be included for team assistance in the project are John Bonner, chief engineer at Warner Hollywood Studios, Serge Gravel and James Lucas, both from BTX.

Sincerely,  
David "Doc" Goldstein  
Warner Hollywood Studios

# CURRENT

## Mix Establishes Pro Audio Awards

The publishers of Mix Magazine announced at the recent AES Convention the establishment of an annual awards program to recognize excellence in the professional audio industry. From the results of an industry-wide balloting procedure, Mix will present more than 50 Technical Excellence and Creativity Awards to individuals and/or organizations who have made outstanding contemporary contributions to the professional sound industry.

The Mix Magazine "TEC" Awards ceremony will be held in New York in October, 1985. In addition to the awards ceremony, a Professional Audio Hall of Fame will be announced with the names of the first 25 inductees, also to be selected from industry nominations.

Three divisions for "TEC" Awards have been established: Outstanding Technical Achievement, Outstanding Creative Achievement and Outstanding Institutional Awards. Within the first division, Outstanding Technical Achievement, there are six awards categories: Audio Recording, Film Sound, Acoustics, Sound Rein-

forcement, Broadcast Sound and Musical Instrument Technology. The second division, Outstanding Creative Achievement, includes the following awards: Recording Engineer, Recording Producer, Mastering Engineer, Film Sound Engineer, Recording Session Musician(s), Recording Session Vocalist(s) and Sound Reinforcement Engineer (live sound).

The third division, Outstanding Institutional Awards, includes awards for these categories: Recording Studio, Mastering Facility, Sound Reinforcement Company, Record Company, Recording School or Program and Remote Recording Facility.

Details on the selection of industry panel participants, nomination and voting procedures, and award time period are to be announced in subsequent issues of Mix.

## PTA Urges Record Rating

The National PTA has called for all recording companies to voluntarily label records, tapes and cassettes featuring lyrics some consumers might consid-

er to be profanity, sex, violence or vulgarity. A letter sent to record companies by National PTA president Elaine Stienkemeyer asks them to "protect consumers' right to know what they are buying" by rating audio material and labeling accordingly.

The PTA is suggesting recording companies establish panels of consumers and industry representatives to determine what language might be considered objectionable to some consumers. Stienkemeyer said the PTA would willingly assist in any way it can, but would not attempt to make such determinations for the industry.

## DASH Format Reaffirmed

The three manufacturers of digital audio recorders who last year agreed on one common stationary head recording format, Matsushita Electric, Sony Corporation and Willi Studer, met at the October AES Convention to reaffirm their commitment to the format and to worldwide digital audio equipment compatibility. Allaying fears that there was a split in the camp, the DASH committee announced an agreement on a revised symmetrical track geometry, "a move designed to increase the format's universality." According to Studer's Roger Lagadec, "The equipment from the different manufacturers features a healthy diversity in engineering solutions, but the prime objective of compatibility has still been maintained and achieved."

## NARAS Offers Plaques for Grammy Studios

Recording Studios involved in Grammy-winning recordings may now display a special plaque noting their contributions to the award, according to a new program announced by the National Academy of Recording Arts and Sciences. The award plaques can be ordered from NARAS, 303 N. Glenoaks Blvd., Suite 140 MEZ., Burbank, CA 91502.

## notes

*Quad Eight/Westrex* has moved into their new International Headquarters at 225 Parkside Dr., San Fernando, CA 91340, phone 818/898-2341 and has also announced the opening of their Eastern Sales office at 2400 Crestmoor Road, Suite 327, Nashville, TN 37215, with *David A. Purple* as director of sales. . . . *Applied Research and Technology, Inc.* has been formed with many of the former engineers and managers of the now defunct MXR corporation. ART has purchased the MXR brand name and will be located at 215 Tremont St., Rochester, NY 14608. . . . *Flanners Pro Audio*, based in Milwaukee, WI, has opened a Chicago branch office headed by *Joe Stopka*; phone 312/451-1440. . . . *Gary J. Stanfill* has been appointed president of *Cetec Vega*. . . . *Sam Chavez* has been given the title of Cinema Products Administrator at *Dolby Laboratories*. . . . *Hy James—The Audio Professionals* re-

cently held a pre-AES product preview where over 400 attendees witnessed over 30 manufacturer demonstrations. . . . A three day recording studio design workshop, sponsored by *Synergetic Audio Concepts* was held at Acorn Sound Recorders in Nashville, September 11 through 13 centering on LEDE acoustical technology. . . . The San Francisco chapter of the *National Academy of Recording Arts and Sciences* will be holding "Television Stereo: An Audio for Video Workshop" on December 15. Call 415/777-4633 for more details. . . . *Philip J. DeSantis* has joined *Sony's* Professional Audio Division as national sales manager. . . . *Paul Berliner* has been appointed teleproductions manager at *Ampex Corp.*. . . . *The Nashville Music Association* is presenting this year's Master Award, to honor studio musicians and vocalists to *The Jordanares*. . . . ■

# TAKE A CLOSER LOOK AT APPROPRIATE TECHNOLOGY



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# SESSIONS

## NORTHEAST

*Loose Ends*, a talented group from London, whose first album went platinum, was in at *Alpha Studios* in Philadelphia working on their second project. At the board were *Bruce Weeden* and *Al Albertini*, assisted by *Remo Leomporra* and *Richard Welter*. Jazz guitarist *Stanley Jordan* recorded his debut album for Blue Note/Capitol Records at *Songshop Recording* in New York City. *Al DiMeola* produced with *James Farber* engineering, *Kenny Florendo* assisting. At *Planet Sound* in New York City, *Gwen Guthrie* is recording her next project for Island Records, produced by Guthrie and *Steve Stanley* with Stanley at the board and *Tom Durack* assisting.

Recent activity at *Skyline Studios*, New York City, included producers *Alan Nichols* and *Ralph Shuckett* recording a soundtrack for Robert Altman's new film *O.C. & Stiggs*. Engineer *Stephan Galphus* was assisted by *Francis Manzella* and *Mario Rodriguez*. Also, British chart-busters the *Bronski Beat* recorded tracks for Polygram Records with producer *Mike Thorne*. *Carl Beatty* engineered with assistance from *David Young*. At New York City's *Unique Recording* producers *Mark Liggett* and *Chris Barbosa* cut tracks and mixed *Shannon's* second album for Emergency Records. *Peter Link*, owner of *Westrax*, New York City worked on some of the tracks for songs he has written for the new *Jenny Burton* LP on Atlantic Records. Recent happenings at Arthur Baker's studio *Shakedown Sound* in New York City included funk veteran *Juni Morrison*, formerly with the Ohio Players and P-Funk doing the final mixes of his new album *Evacuate Your Seats*. Also, *David Bowie's* 12-inch "Dancing With the Big Boys" was remixed by *Arthur Baker* and edited by the Latin Rascals *Tony Moran* and *Albert Cabrera*. Singer/songwriter *Matthew Singh* was in at *Inner Ear Recording*, Queens, New York, upcoming Christian-rock release. Also there were producers *Simino-Natale*, recording their new project *Just One More Time* due for independent release in January. *The FIXX* took a break from their American tour to return to *Workshoppe Recording Studios* in Douglaston, New York to work on some new material with engineer *Bob Bengston*. And producer *Marty Pekar* and engineer Bengston finished mixing the *Jive Five's* latest LP *Way Back* for Rounder Records.

*Normandy Sound* of Warren, Rhode Island celebrated one year of having at least one hit record on at least one Billboard Chart for 52 consecutive weeks (Tom Browne: *Rockin' Radio*, Steve Smith: *Vital Information*; Jeff Lorber: *In the Heat of the Night*, and congratulated their affiliated companies, Arnold Freedman Management and Oasis Productions, for John Cafferty & the

Beaver Brown Band's album *Eddie and the Cruisers* going platinum. At *Secret Sound Studio* in New York City, *Suzy Sloane* completed tracks and was mixing for MCA Records. *Sundance* and *Dana Thomas* produced with *Warren Bruleigh* behind the board and *Jim Lyon* assisting.

## SOUTHEAST

Recent activities at *JBS Studios* in Atlanta included *Duane Hoover* finishing his solo double album to be released on an independent label. At *Music Mill* in Nashville *Stan Silver* did some mixing on *Donna Fargo's* next single with *Jim Cotton* engineering and *Alabama* was in laying tracks for their new album with *Jim Cotton*, *Joe Scaife* and *Paul Goldberg* engineering. This is a *Harold Shedd/Alabama* production. *Glen Campbell* was in Nashville's *Woodland Sound Studios* for Word Records with *Ken Harding* producing and *Rick McCollister* and *Ken Cribblez* engineering. *Neil Young* was also in laying tracks with producer *Elliott Mazer* and independent engineer *Gene Eichelberger*. At Atlanta's *Songbird Studio*, *Ricky Keller* is writing and producing the soundtrack for *Summertime Blues*, a William Olsen production. *Rich Head* is engineering the sessions. And *Frank Fabiszewski & Hurricane* finished laying tracks for a demo. At *Morrisound Recording* in Tampa, Florida, 20th Century Fox came in to record and mix part of the soundtrack for the movie *Cocoon* directed by Ron Howard and filmed in St. Petersburg. *Tom Morris* engineered. Air City recording artists *Unique Blend*, and *Ken Caincross* of HamStar Records completed single releases at the *Sound Room* in Fort Oglethorpe, Georgia. Other projects include *Jeff Day*, *Tourist*, *Tina Powers*, and *Perry Hodges*. The sessions were all handled by *Steve Mullinix* engineer/producer. Recording at Island's *Compass Point Studios* in Nassau, The Bahamas in October were RCA recording artists the *Eurythmics*.

## NORTH CENTRAL

Recording activity at *Studio A*, Dearborn Heights, Michigan included *Dave Levine*, cellist for the Detroit Symphony Orchestra, cutting a self-produced track, and guitarist *Rick Rouse* continuing work on an EP, *Jim Vitti* behind the console. *Ambience Recordings* of Farmington, Michigan successfully completed projects, both locally and nationally during recent months, with chief engineer, *Gerard Smerek*. Working in conjunction with West Coast studios, *Ambience* recorded

overdubs for *Bob Seger's* "Understanding" used in the soundtrack of *Teachers*, as well as working with Bob on his upcoming album to be released soon. Also, final edits on the first *Flash Kahan* album, which was partially recorded at *Ambience*, were completed. At *TSI Recording*, Newton Falls, Ohio, the *Bob Yazz Band* completed tracks for his upcoming EP. *Mike Talanca* and *Joe Hudek* engineered and produced the project. The tracks were mixed at *EDR* Beachwood, Ohio. *Five Mighty People* recently did a remix of their tune "Love Don't Take at 3001" at *3001 Recording Studios* in Columbus, Ohio. The mix, for their upcoming video, was produced by *Jeff Gastineau* and guitarist *Ernie Lowther*. At *Chapman Recording Studio* in Kansas City *Ray Heard*, and the group *West Point* finished up their latest LP, *High Steppin*. *Larry Lacy* produced the LP, *Mike Frazier* engineered. *The Blue Wisp Big Band* of Cincinnati was in recording their fourth studio album at *QCA Recording Studio*, *Ric Probst* engineering. *Champaign* completed their third album for CBS Records at *Creative Audio* in Urbana, Illinois. It was produced by themselves with *Jonathan Pines* engineering. At *RMJ Recording Studio* in Detroit, Michigan *Thomas Whitfield* was in producing a new album on *Vanessa "Bell" Armstrong* for the Benson Company as a follow-up to her Grammy nominated album with *Warren Woods* at the board. Also at *RMJ* Capitol Records recording artist *Maze* were in doing tracking for their forthcoming album with *Frankie Beverly* producing and *John Jaszcz* engineering with *Sparky Lawson* assisting.

## NORTHWEST

*Transparent Recordings*, of San Francisco, California, spent the month of August in Colorado, recording the Telluride Chamber Music Festival. An LP entitled *Music From Telluride* was released this fall on the *Transparent Recordings* label. *Lolly Lewis*, *Ed Chenoweth*, engineered. The action has been around the clock at *Starlight Sound* in Richmond, California recently and most of the heavy metal variety. *Dammaj*, *Dirty Looks*, *Castle Blak* and *Paris* were all in the midst of loud and nasty album projects. On the slightly lighter side were projects from the *Marin All Stars* produced by *Mike Blakeman* and *Gayle Marie* with talented keyboardist *Mary Watkins* producing. At *Avid Productions* in San Mateo, California were blues greats *Deacon Jones* (of the John Lee Hooker band) and *Ken Baker* (of the Mark Ford band) cutting sax tracks for an album project. The tracks quest star *Elvin Bishop* on slide guitar. At *Russian Hill Re-*

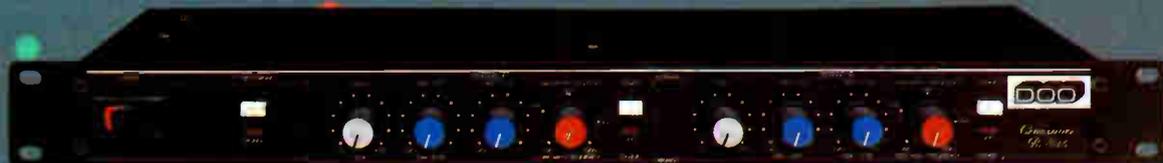
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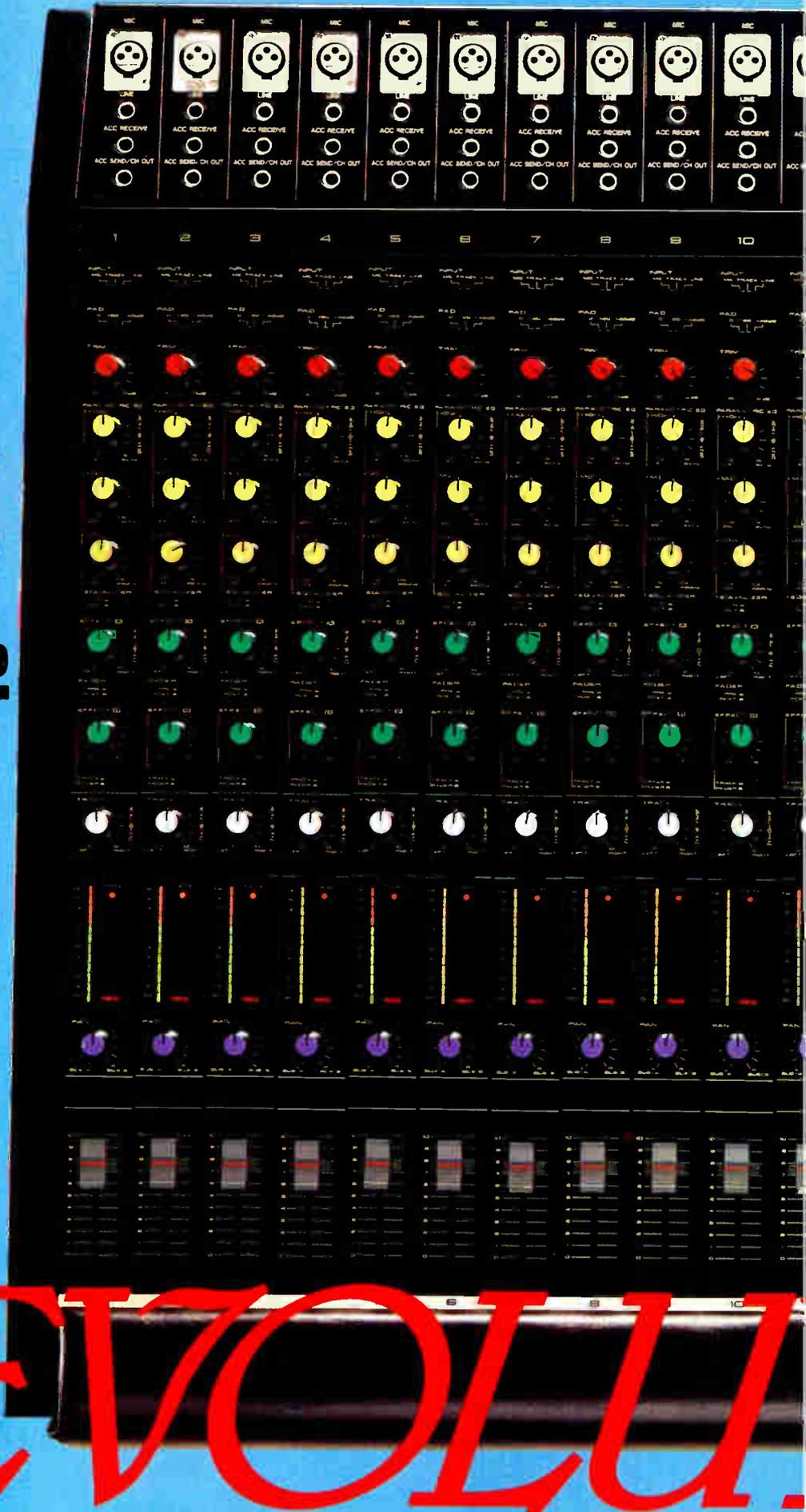
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### Announcing the Mix Technical Excellence and Creativity **AWARDS**

This is your opportunity to recognize, nominate and vote for those people, products and institutions which, in your opinion, represent the highest levels of Technical Excellence and Creativity in the professional audio industry.

The "TEC" Awards, to be presented at a ceremony in October of 1985 in New York City, will be a result of your voting. We are asking you to give serious consideration to those who, in the past year, have influenced and positively affected your work and professional life in the industry.

Awards will be given in the following categories:

#### **Outstanding Technical Achievement**

- Recording Technology
- Film Sound Technology
- Acoustic Technology
- Sound Reinforcement Technology
- Broadcast Sound Technology
- Musical Instrument Technology

#### **Outstanding Creative Achievement**

- Recording Engineer
- Recording Producer
- Mastering Engineer
- Film Sound Engineer
- Recording Session Musician(s)
- Recording Session Vocalist(s)
- Sound Reinforcement Engineer

#### **Outstanding Institutional Achievement**

- Recording Studio of the Year
- Mastering Facility of the Year
- Sound Reinforcement Company of the Year
- Record Company of the Year
- Recording School or Program of the Year
- Remote Recording Facility of the Year

Please make your opinions heard. Watch for further details and the nominations ballot in your January issue of Mix.

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# Mix

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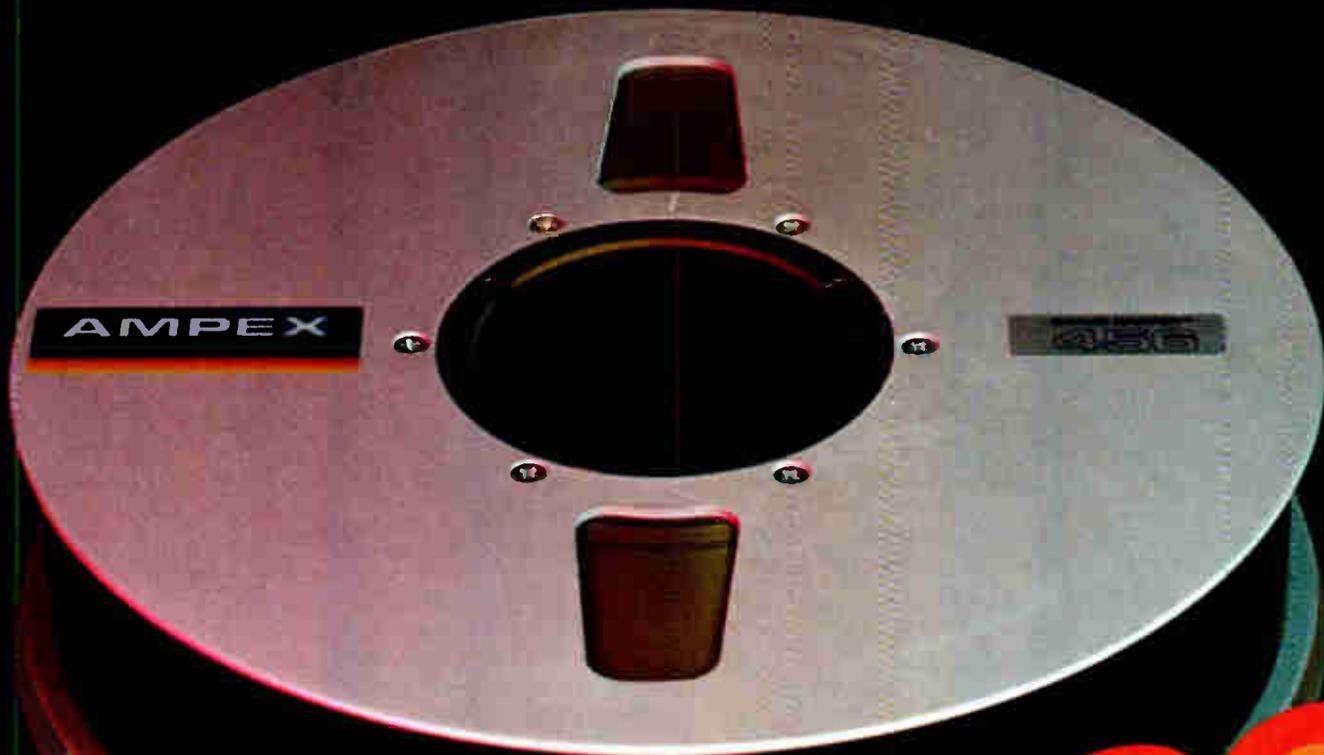
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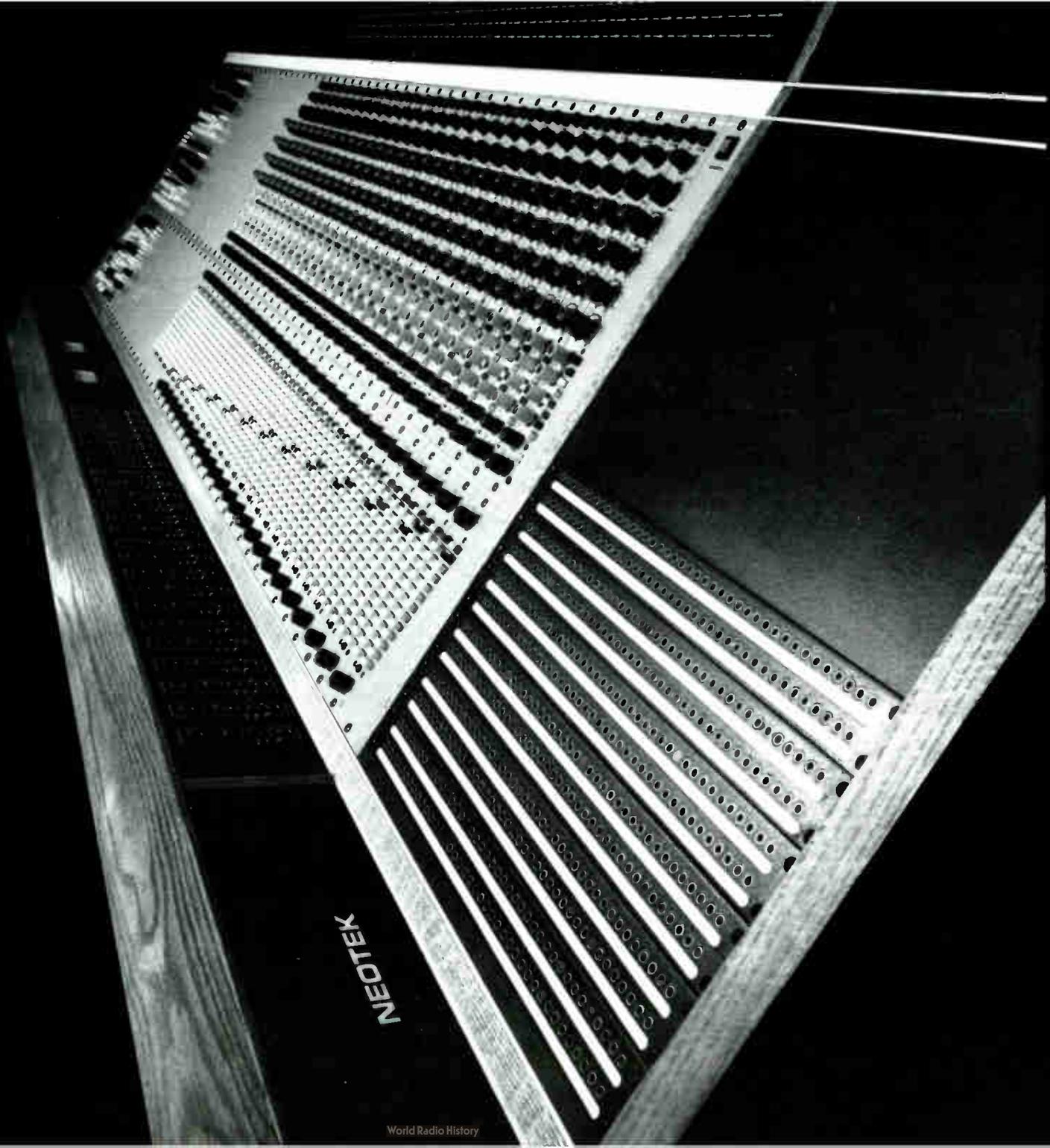
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**NEOTEK**

# a pretty face

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**Minimum path design** NEOTEKs employ more complex circuit designs than other consoles, yet they end up with fewer components in the main signal paths. Their state variable equalizers are highly sophisticated, yet critical parameters are less sensitive to component variations than in simpler designs, they are just as quiet, and they are far more stable; the result is better sound at only slightly higher cost. Compared to a Series III, one comparable console when recording and mixing passes a track of audio through 53 more op amps, 49 more unbypassed electrolytic capacitors (none in the NEOTEK), and wastes over 106dB more excess gain. Of course the NEOTEK sounds better!

**High speed circuits** The rule for circuit speed is 1 volt/microsecond for each peak signal volt. NEOTEK consoles are the only ones which come close to this figure; others trade adequate speed for lower parts cost. The real trick is to achieve high speed without slew limiting, but since NEOTEKs use circuits with power bandwidth in excess of small signal bandwidth, they can never be forced to actually slew. Full output bandwidth from mic preamp input through equalizer and fader to bus out is over 40 kHz, and high frequency squarewave response shows purely exponential signal rise and fall without a trace of slewing, ringing, or other instability. The result is absence of TIM or SID, greater stability, and the clear, sweet high end which distinguishes NEOTEK consoles.

**Solid state switching** The Series III uses FET switches for master status control, but fear not. They are a unique design using discrete devices driven from a separate high voltage supply. At the last AES show, an internationally famous audio critic and recordist guessed that a B&K mic demo was made direct to digital two-track; it was actually made on a Series III . . . now that's transparency. The ramped FET mix mutes silently lift channels completely off the stereo buses. They are far more quiet than VCAs, relays, or mechanical switches, and leave the unweighted output noise below -96dB.

**Logic controlled mutes** NEOTEK consoles provide full professional features without requiring an automation system or VCAs. Series IIIs provide two logic groups for the channel mutes. There is an in-place solo mode in addition to stereo and PFL solos, and it can effect either or both groups. Another logic system sets up a limitless number of grouped mute/unmute events to be enacted by a single switch.

**Subgrouping without VCAs** VCA grouping is an unnecessary added cost for the Series III. Switches on each input allow panning to eight stereo subgroups while adding eight additional auxiliary buses to the standard six. The subgroup masters, which also serve as stereo line inputs, have auxiliary sends, logic mutes, and individual echo returns. Unlike VCA subgroups and automation, this system allows use of a stereo compressor on the entire group. This subgrouping system coexists on automated NEOTEK consoles.

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# Music from mathematics

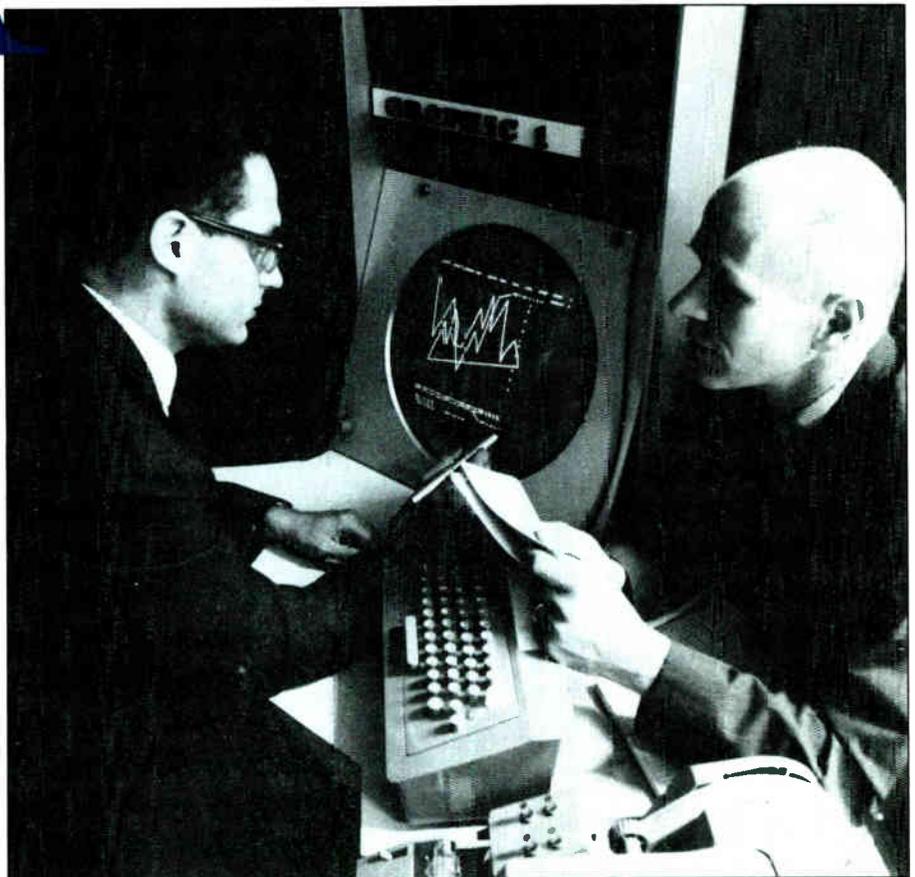
## THE CONTRIBUTIONS OF BELL LABS' MAX MATHEWS

by Larry Oppenheimer

You sit in wonder as you listen to your digital synthesis system run through a final 24 track playback of the composition you just finished storing onto disk drive B. Not only is it exactly the way you wanted it to sound, but you are getting the thrill that comes with knowing that you and your instrument have taken another step along the cutting edge. You ponder the synthesizer in front of you and recall that you have only had it for a few years, and it was only put on the market a year or two before that. The question forms in your mind: How long have people been making music with computers? I mean (you think), when did it first occur to someone to hook a speaker up to a computer?

In 1957, actually. But it didn't happen at some progressive university. Not in some inspired hacker's basement, either. At the time, the only computer in the world which was both powerful enough to do the job and reasonably accessible was located in a display window at IBM World Headquarters on Madison Avenue in New York. So Max Mathews rented some time on the IBM 704 in the window, took the idea which had occurred to him, and crunched some historic numbers in full view of any who cared to watch.

In 1984, he is here in Murray Hill, New Jersey, in the same AT&T Bell Laboratories building he worked at then, with an anorexic-looking violin held (and played) cello-style, between the legs. He smiles and sits in wonder as he listens to his digital synthesis system run through a small segment of a score which has been prepared as a demonstration of his current musical interest: interfacing personal computers with real-time digital



*Lawrence Rosler and Max Mathews (c. 1966) of Bell Laboratories compose computer music using a new graphical language they developed. The new language enables a composer to draw a musical score directly on a cathode ray tube with a light pen.*

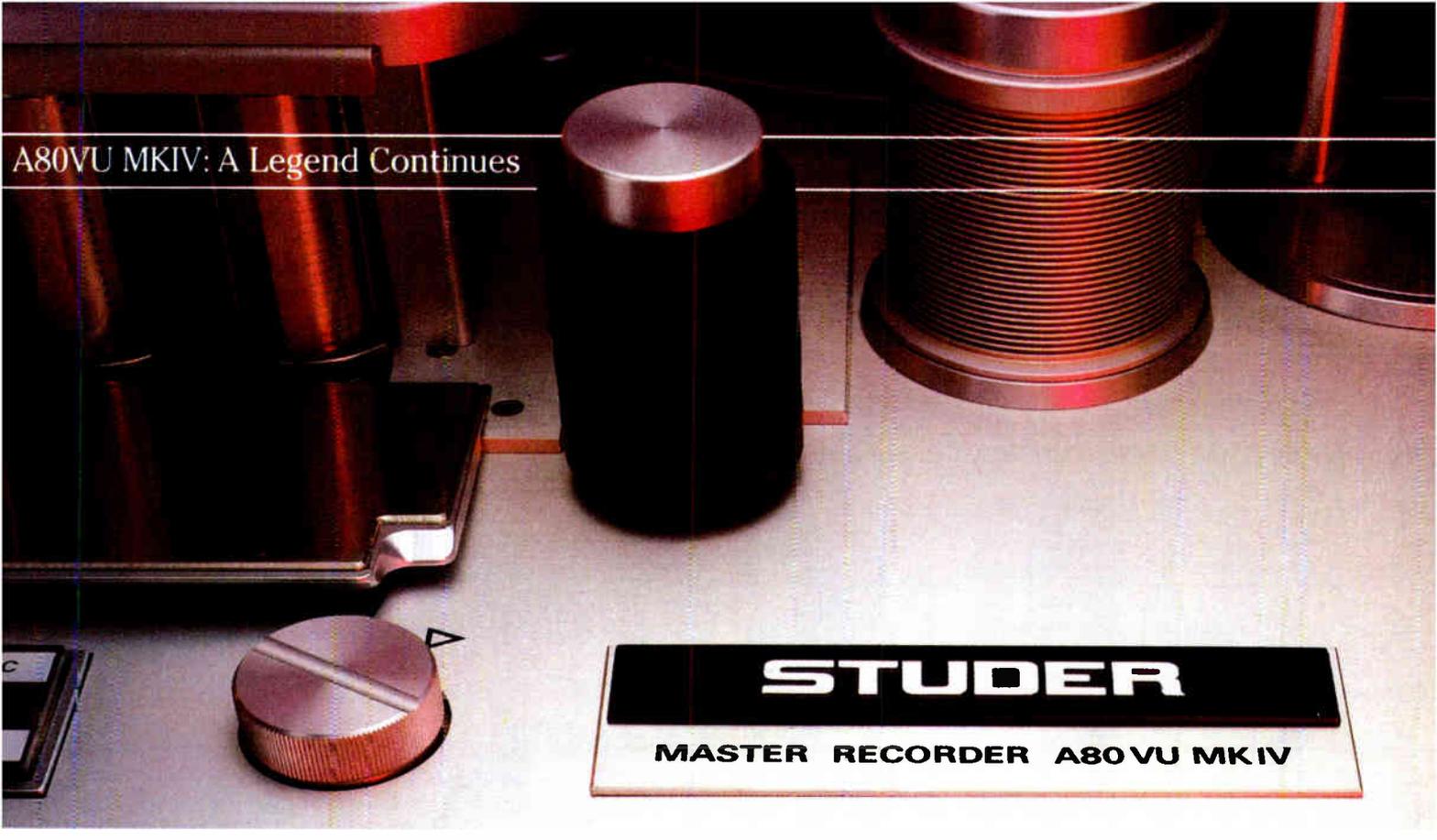
synthesizers. Racks and shelves of computers, audio gear, and objects which in one way or another resemble musical instruments fill the majority of the available space, giving the impression that the small room can't decide whether to be a research laboratory or a recording studio. Here, he is at home, after nearly 30 years of evenings and weekends spent in this room and others like it.

Max V. Mathews arrived at Bell Laboratories in 1955, straight out of graduate school at MIT. He walked into a world where the halls were no longer filled with students, but with Nobel laureates and similarly celebrated scientists. Bell Laboratories has long been recognized

as one of the world's leading research facilities, having consistently discovered new directions in telecommunications technology and virtually every conceivable related field. Often, work done at Bell Labs has uncovered ideas that go far beyond a project's original scope. Stereophonic sound, for example, was invented at Bell Labs in the '30s.

Mathews went to work under John Pierce, whom he describes as "probably the most brilliant and famous engineer alive in the world today," developing methods of encoding speech in the digital domain. "Those were the days when digital computers were first becoming powerful enough to use for inter-

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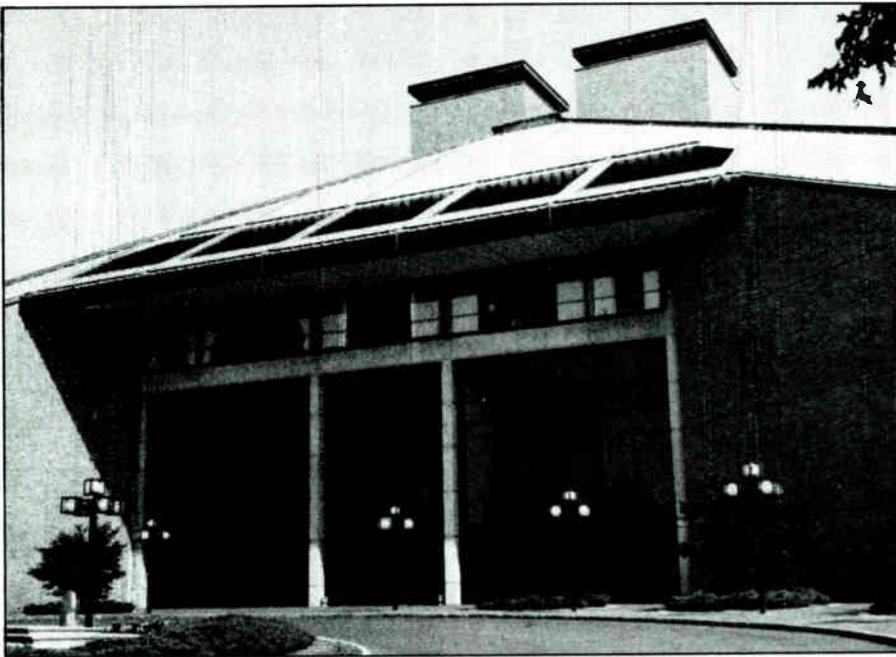
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AT&T Bell Labs in Murray Hill, NJ.

esting problems," Mathews relates. "I figured out ways to use the digital computer to simulate speech coding. The computer was just wonderful because we could study encodings in a month or two which would take us years to build the electronics to do, and you could do things that were just unthinkable to do in any other way." This was the beginning of the digital speech processing systems which now carry an increasing share of the world's speech transmissions every day.

"The computer music was an outgrowth of what was originally speech technology. The reason that it is related to speech technology is that what you need is ways of converting sound into numbers, and numbers back into sound: digital-to-analog converters and the kind of tape drives and output apparatus that will put out these numbers as a continuous stream. The technology to flow those numbers through a D/A converter and turn them into sound cleanly and without any pauses was what was interesting and difficult in those days. Nowadays, it's completely routine. **Almost** completely routine.

"Once the equipment had been made for these purposes, which was the primary thing Bell Labs was interested in, it became clear to John Pierce and I that the very same equipment could be used to synthesize music. All we had to do was write the right musical program, and this, then, was a musical instrument."

The first attempt at a music program resulted in the musically useless but experimentally valuable Music I. This program featured one voice with a triangle waveform, and three variable parameters: pitch, amplitude, and duration. A few other people, notably Lejaren Hiller at the University of Illinois (UI),

had also begun to think about applying computers to music, but these efforts were in the direction of computer-generated or -assisted composition. Music I was the first attempt to actually synthesize music with a computer. Music II followed about a year later, with four voices and a choice of 16 waveforms.

Meanwhile, over at the RCA Laboratories in Princeton, Harry Olsen and Herbert Belar were working on their second-generation analog machine, the RCA Mark II Synthesizer. The Mark II was the cat's meow in analog synthesis until 1964, when Robert Moog revolutionized the field with his introduction of the voltage-controlled synthesizer, leading to the synthesizer's ascent into the public consciousness and musical mainstream. Although analog synthesizers flourished and multiplied throughout the '70s, dominating the electronic musical instrument market, digital synthesis is coming on strong in the '80s, as digital integrated circuits become cheaper and more powerful. The great step for digital synthesis, however, came four years before Moog showed a few of his "modules" (as he called them) on a small table at the New York Audio Engineering Society convention.

"The real breakthrough was in Music III, where all sorts of concepts came along," Mathews remembers. "One concept was Unit Generators as building blocks for instruments. Unit Generators were sort of the equivalent of the Moog modules—there were oscillators, attack and decay units, mixers, adders, and, in addition, things like multipliers which were generally not available in the analog devices. The concept of the score as a sequence of notes, which is almost too obvious to be a concept, also

was introduced at that time. A note is a sound object where you specify the starting time and the ending time of a sound, along with timbres, pitches, and whatever else you wanted." This concept continues to play a large role in many digital synthesis systems, and languages based on these concepts are becoming available for microcomputers: CMusic (written in the C language) from the University of California at San Diego (UCSD) being a prime example.

Mathews and Bell Labs colleague Joan Miller rewrote Music III to run on the newer computers that were arriving at Bell Labs, and in 1963 they released Music IV. By this time, Mathews' music programs were starting to bear fruit: several pieces of music had been composed by Mathews, Pierce, and Newman Guttman (a psychologist), and some of these had been collected and released as a record, *Music from Mathematics* (Decca DL 79103). Mathews also published an article in *Science* magazine, "The Digital Computer as a Musical Instrument," which caught the imagination of a Stanford graduate student named John Chowning, who visited Bell Labs shortly thereafter and spent a month or so observing and "absorbing the technology." Researchers at Princeton and several other institutions started writing versions of Music IV to run on their own systems. James Tenney, a composer who had been studying with Hiller at UI, took a temporary job at Bell Labs at Pierce's suggestion, and started to work with the music programs. When composer/physicist Jean Claude Risset arrived in the mid-'60s as a foreign visitor with funding from the French government (one of the few people to receive funding for work done out of the country), it became clear that computer music at Bell Labs was gathering momentum.

Up to this time, the programs were all written in low-level assembly language, necessitating a complete rewrite of the program every time a new computer came along. In 1963, when Music IV was released, the IBM 7094 was the machine of choice at many institutions, including UI where one F.R. Moore was exploring computers in music. Moore, who worked with Mathews at Bell Labs for a number of years and now is director of the Center for Music Experience at UCSD, relates what led up to his first collaboration with Mathews:

"Max wrote Music IV in assembly language on the 7094. In those days, Bell Labs was trying to export Music IV, and since there were a number of other 7094s in the world, there was a potential that other people could run this program. But Music IV used the very extensive macro facilities [another concept which was new at the time] of the BSYS VII operating system, which was the Bell Labs operating system for the 7094, and in or-

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der to get the program to work you not only had to load in the program, but you had to load in the entire operating system. So they [Bell Labs] were actually in the business of giving away the Music IV program along with BSYS VII to anyone with a 7094 who was willing to face the prospect of trying to make it work. That was sufficient motivation to try to rewrite the music synthesis program in these new-fangled high-level languages. So we tried rewriting Music IV in the latest, hottest language of that day, which was FORTRAN IV. Music V was that program."

Moore, Mathews, and Joan Miller each wrote one segment of the program over the course of 1967 and '68. Because it was a much more "portable"

program (able to run on a number of different computers), it proved to have the most utility, and has seen the most use. Music V, the last of the music synthesis programs produced at Bell Labs at that time, has not only set trends in synthesis approaches, but even in music programming approaches. The bulk of the program (including most of its complexity) was written in FORTRAN as described above, but the Unit Generators were still written in assembly language. This was because the Unit Generators were computationally simple, but used often and ran fastest in assembly language. Although the Unit Generators still needed to be rewritten for different machines, they were the easiest part of the program

to write, the tough stuff all being in FORTRAN. This made adapting Music V to different machines a reasonable proposition. It is now a common programming technique to put complex control software in a high-level language and simple, repetitive software in assembly language.

With the advent of Music V, even greater numbers of composers and researchers around the globe began taking notice of computer music and the staggering possibilities that this new tool presented. Many came to Murray Hill to investigate the new instrument that Mathews and his colleagues had given birth to. The immense but inspiring task of harnessing this musical power and putting it to use fell largely onto the able shoulders of Risset. In addition to writing FORTRAN versions of the Unit Generators and producing a number of compositions, Risset conducted two major projects with Music IV and V. Perhaps the most enduring of these contributions were his studies of musical instrument tones. Previous research efforts at studying the phenomena of timbre had concentrated on the frequency spectrum of the steady-state portion of the tone. With the computer, Risset was able to study tones more completely, including the important attack transient characteristics. He used a method called "pitch-synchronous analysis," developed several years earlier by Mathews, et al, in which the tone is analyzed backwards, from the end to the beginning, as a series of individual pitch periods with a Fourier analysis of each one. Having performed this analysis, Risset used Music IV to reconstruct the sound, which could then be aurally compared to the original. By changing various aspects of the Music IV resynthesis, a determination could be made of what factors seemed to be significant in instrument recognition, and what factors were relatively irrelevant.

Risset's work (which centered on studies of trumpet tones) provided a new perspective on timbre, and was inspirational to many others in the field of perceptual studies, strongly influencing later work such as John Grey's doctoral dissertation at Stanford (See *Mix* June 1984). Around the same time as Risset's trumpet studies, Mathews, Miller, Pierce and Tenney did a similar analysis-by-synthesis (as Mathews called it) of violin tones, using an analysis of the string's physical motion (as captured by high-speed photography) instead of the pitch-synchronous analysis of Risset's study.

If Risset's timbral studies, published in 1966, were an attempt to qualify some of the salient points of instrument recognition, then his "Introductory Catalog of Computer-Synthesized Sounds" was intended to do much the same thing for the Music V program. The catalog illustrated the use of Music V by giving examples of sounds in music notation along

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with the Music V scores to realize them. An accompanying record contained the sounds themselves. Unfortunately, the catalog was never published, but has circulated in computer music circles as a sort of "working document."

Although Music V was (and is) quite powerful, it did have some drawbacks; primarily the tediousness of working with it. The input process was long and slow, and computing time for a few minutes of sound could easily stretch overnight. The compositional method employed with Music V was less intuitive than composing with traditional instruments, due to the lack of immediate feed-

back from one's actions. Mathews worked for a while on graphical input schemes, but never developed one with the same degree of flexibility as the language itself. Clearly, Music V's limitation was its lack of interaction with the composer. This was the next problem to be tackled.

"Just about the time we were finishing up Music V," recounts Moore, "we started talking about the possibility of making a real-time computer music system. At that time there was no real feasibility of making sounds digitally in real-time, but we had a considerable amount of analog sound gear, and the Moog synthesizer was becoming quite

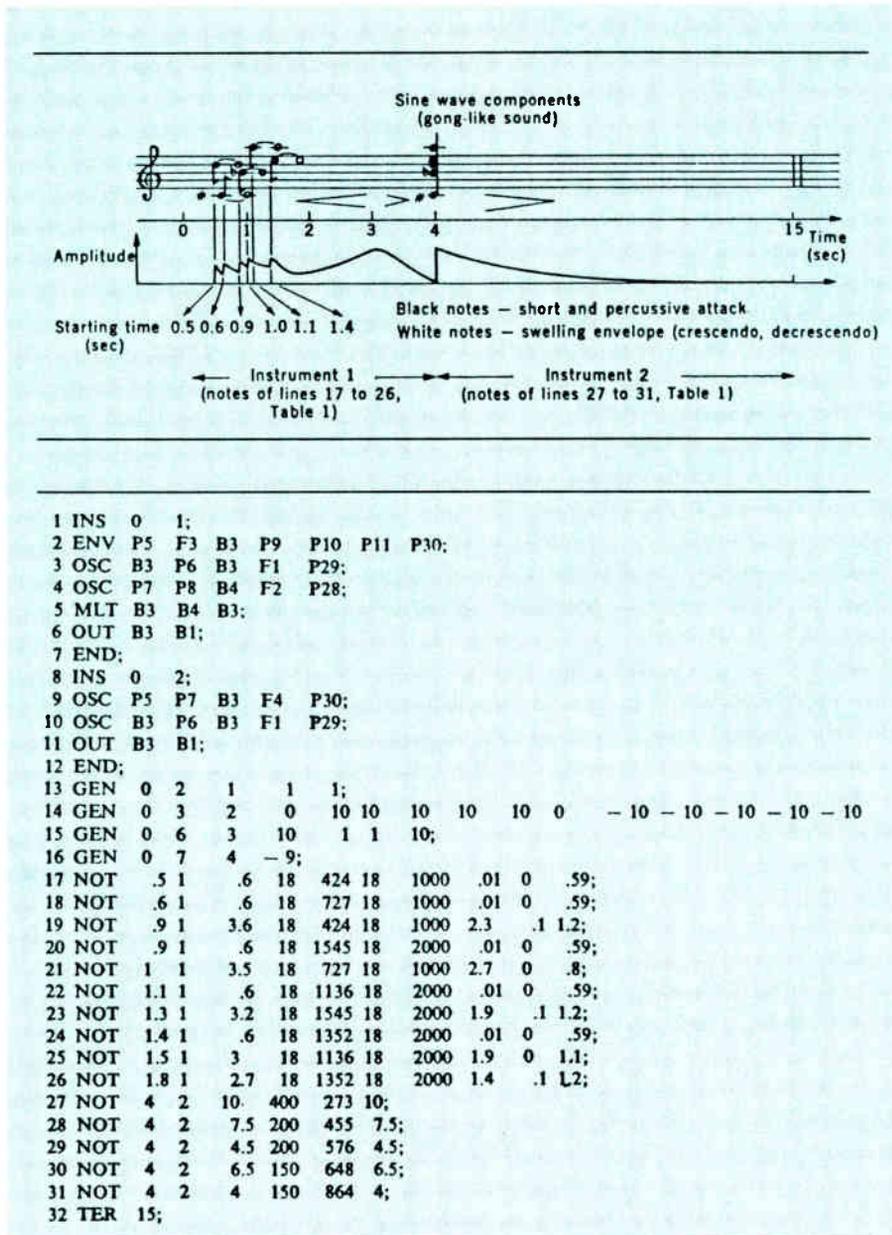
well established. It seemed like a voltage-controlled synthesizer and a bank of digital-to-analog converters was a reasonable way of getting real-time control from a computer. So we sat down and scratched our heads and that was the next main project that we worked on, which eventually became known as GROOVE."

The GROOVE system was based around a Honeywell DDP 224 minicomputer which had been connected to 12 eight-bit and two 12-bit D/A converters in order to study speech synthesis. To this was added 16 computer-controlled relays, plus input devices and the analog synthesis system. The input devices consisted of a 24-key organ-type keyboard, four rotary pots, and a three-dimensional wand. The synthesis system was largely homebrew (mostly by Mathews), supplemented at different times with some Moog modules, Wavetek laboratory oscillators, and, eventually, ARP modules. The initial configuration consisted of 12 voltage-controlled oscillators, seven voltage-controlled amplifiers, and two voltage-controlled filters, plus 72 discrete (not IC) operational amplifiers to perform various other functions and signal conditioning (such as exponential conversion of control signals). All of the equipment terminated at a large patchbay which had removable patchboards, so that each user could come in at the beginning of a session and slide their own patchboard into place, thus quickly configuring the system for their choice of "instruments."

Once the synthesizer had been patched, the input devices could be used to "play" it. The computer would store all the gestures which were made, and had extensive editing software to allow any of the gestures to be modified independently of anything else. This performance could be played back and interacted with in real-time. For the first time, a computer musical instrument could actually be played and improvised on.

A number of composers worked on the GROOVE system between 1968 when it went on line and 1979 when it was finally dismantled. Moore, Mathews, and Laurie Spiegel all did a reasonable amount of work, but probably the most active user of the GROOVE system was Emmanuel Ghent. Pierre Boulez came over from France in the mid-'70s and worked with Mathews on a program known as the Conductor program, which treated the GROOVE system as an 'orchestra', and the user as a 'conductor' who did not control the content of the score which was being played as much as its interpretation. Mathews developed graphical displays of the functions stored with GROOVE, so that composers could interact with the system at a visual level in addition to the aural.

GROOVE was not, of course, without problems. "The analog synthesis



An excerpt from the Introductory Catalog of Computer-Synthesized Sound. The numerical code listed is the Music V score used to realize the passage shown. Each line consists of a number of "Pfields" in a specific order. Each pfield defines one parameter value.

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equipment, particularly the oscillators, would tend to drift with time," tells Moore. "Almost any session working with GROOVE consisted of anywhere between a half-hour and an hour of calibration time, and then perhaps as much as a half-hour or an hour of working time before you had to recalibrate because of the drift of all those oscillators. I wrote a considerable amount of software which was designed specifically to allow the computer to tune the oscillators itself. It would output the minimum and maximum values, figure out the range, try different values in between, measure the pitch through an A/D converter, and make up its own table. It would take forever to tune itself up. We finally decided it was probably faster just to tune it up by hand.

"GROOVE went through two major versions; in one we attempted to design a composing language that would allow people who didn't really know much about computers to sit down and use the system. What we found out from that was that that's probably a waste of time, because every single person who used the system wanted to use it in a slightly different way. So eventually I rewrote the entire GROOVE software and separated the service routines from things which could be written in the still-choice high-level language, which was FORTRAN."

The DDP 224 itself presented problems, also. As is typical of all his musical work, Mathews viewed the problems from the artist's point of view. "The limitation to GROOVE primarily was that it ran on a big computer in the laboratory. It was not mobile; you couldn't imagine moving this computer and synthesizer to a musical stage and giving a performance with it. Well, the laboratory, in truth, is not a very inspiring place in which to make music. Although a number of composers came in and worked hard here, in the end it turned out that people didn't really want to come out into the lab and use this facility, and I think that they were quite correct in their feelings."

Finally, the stupendous rate of technological growth in the '70s caught up with the DDP 224, and it just plain got old. Moore returned to Bell Labs in the late '70s after a four year hiatus to do graduate studies at Stanford in digital signal processing, and found the situation quite different than when he had left:

"The atmosphere was one in which the DDP 224 was on its last legs. That machine was made of discrete germanium transistors, and if the temperature rose two degrees in the machine room, the machine would stop. It was getting impossible to maintain it, and things like VAX's [a more recent mini-computer] were on the horizon. The main reason that Bell Labs finally got rid of it was that it kept breaking all the time, and you couldn't get parts for it any-



PHOTO: LARRY OPPENHEIMER

*The Sequential Drum.*

where; it was like having a Tin Lizzy on your hands. So the main real-time system was being dismantled just as I was arriving there, and Manny Ghent was working furiously just getting out his last few pieces from the system. He literally worked up until the last night before it was dismantled. I think they just retired the machine and replaced it with a chip or something. Vladimir Ussachevsky [of Columbia-Princeton Electronic Music Center] tried to get the DDP 224. He could have had it for free, until I explained that 'free' meant spending \$25 to \$30,000 for air conditioning alone, and that didn't include getting it repaired."

In 1969, shortly after GROOVE had gone on line, MIT Press released *The Technology of Computer Music*, a book authored by Mathews, with some contributions from others working at Bell Labs. The book detailed in technical terms Music V and everything else that Mathews had found up to that time. It became the definitive text on the subject, and remains essential reading for anyone seriously interested in computer music. Another record was released in 1970, called *Voice of the Computer* (Decca DL710810), which quite aptly demonstrated how far computer music had come in a little more than ten years. Although it had certainly become accepted by some of the musical community by that time, it would be yet another ten years before computers would start to figure heavily in the commercial music world. By that time, Mathews would already be working on the next step—electronic instruments that go beyond organ keyboard-type synthesizers.

"I don't consider myself a composer, I consider myself an instrument maker," Mathews reflects, and so it is

hardly surprising that his work in music has gone far beyond programming. One of his pet projects has been developing his Electronic Violin, a natural interest considering his high school studies and subsequent hobby of playing the violin. Several versions of this idea have been built, but Mathews seems fairly satisfied with the latest. The violin has strings, fingerboard, and weight that approximate acoustic violins, but the resemblance stops there. There is no body on Mathews' violin, and he plays in a vertical position with the order of the strings reversed from the norm. It is his theory that it is more physically comfortable to play the instrument in this fashion than with the traditional horizontal method which forces the player to twist the left wrist in order to finger the neck. On the bridge are mounted four ceramic microphones, one for each string, which are kept electronically separate to avoid intermodulation distortion effects. Mathews' earlier studies of violin tones had indicated that the major difference between a good sounding violin and a poor sounding one was in the strength and placement of resonances. He found that about 30 resonances could approximate the peaks found in a good violin, but this was rather a large number to try to deal with in a simple electronic fashion.

While trying different methods of dealing with this problem, Mathews delivered a paper in Stockholm in which he mentioned the Electronic Violin in the context of discussing analysis-by-synthesis. At the same conference, a paper on singing and timbre was delivered by Johan Sundberg, which pointed out a technique often used by male singers wherein they add a group of resonances at about 3 kHz (a frequency which the

ear is quite sensitive to) in order to increase projection. Mathews tried using this "singing formant" on the strings of his Electronic Violin and found that with proper tuning, this formant alone was sufficient to provide a pleasing violin sound. His current instrument takes the sound from each string, passes it through the "singing formant" filter, and recombines it with the original sound. This combined response is then passed through a low-pass filter and sent to one of two speakers (alternate strings go to alternate speakers, i.e. the G and A strings go to one a speaker, and the D and E strings to the other); another scheme designed to avoid intermodulation effects between strings. Thus, the electronics have been kept to a reasonable level of complexity, and the result is that all the electronics (including filters, power amplifiers, speakers, and power supply) can fit in an aluminum attache case. Mathews is currently seeking someone who might be interested in manufacturing the instrument.

Another new instrument which Mathews has developed recently is called the Sequential Drum. This is a type of XYZ percussion controller, meaning that it outputs a trigger when the drum is struck, plus information on where the drum was struck and how hard. When connected with a computer-controlled synthesizer, this information can be applied in many different ways, such as controlling parameters of a score which the computer/synthesizer system actually plays. With some of the burden of technical execution lifted, a player can concentrate on the interpretation of a piece. A typical setup would be to have the trigger initiate the next event in the score (whether it be a single note, a chord, or a sequence of other events), the Z or amplitude signal control the loudness, and X and Y control the timbre in some fashion. The number of ways that these signals can be used is primarily limited by one's imagination and ability to write software.

Much of the development in the uses of the Sequential Drum came during an extended visit which Mathews made after the demise of GROOVE to Institut de Recherche et Coordination Acoustique/Musique (IRCAM) in Paris. Working with Curtis Abbott (now of LucasFilm), Mathews interfaced an earlier version of the drum with IRCAM's digital synthesis system, which is based around a DEC PDP 11/34 minicomputer and the 4C digital synthesizer. The current version of the drum resides here in Mathews' laboratory/studio, and is interfaced to a small Z80-based system which runs his latest software project: R-T SKED.

R-T SKED is a control program for a personal computer-controlled synthesis system which maintains the flexibility of Music V-like parameter specification, but gives real-time control of tim-

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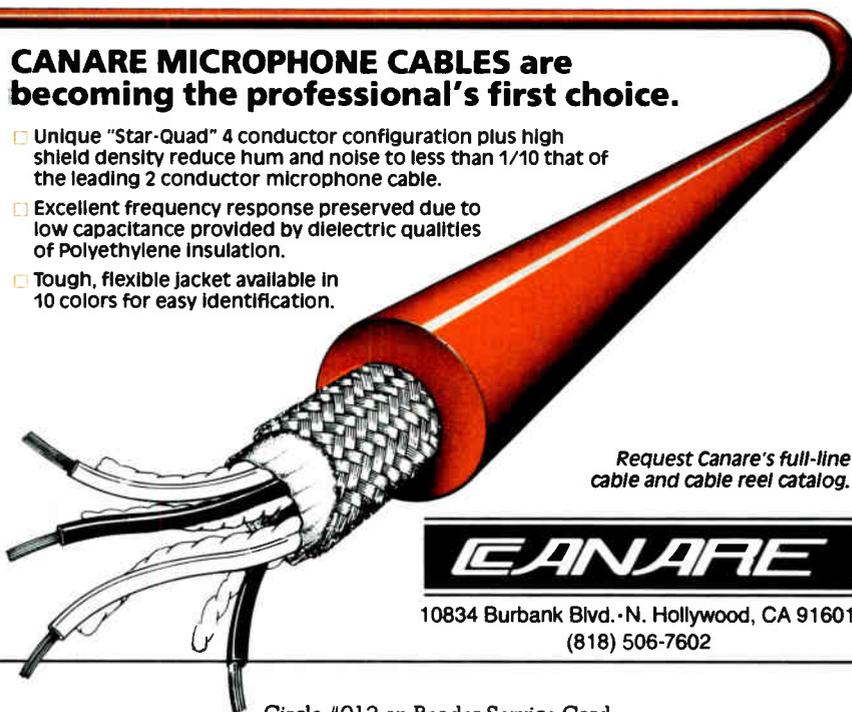
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*Max Mathews in front of his current digital synthesis system.*

ing. This is achieved by borrowing a concept developed by Abbott called "scheduling."

"A schedule has a bunch of lines, and each line has commands that the computer executes, and each line ends with a Wait function," he says. "What the computer does is conceptually execute all these commands instantly and then wait for the Wait function to be satisfied. Then it executes the commands in the next line and waits for its Wait function. This way, all the timing information is controlled by the Wait functions, and what the computer does is controlled by the commands; so you get a clean separation between time and commands."

The Wait function is the key to this scheme, as it can come from a previously determined score, or be dependent on some source outside of the schedule (such as a trigger from the Sequential Drum, or even another schedule). The ability to create interactive or nested scheduling presents the potential for a good deal of complexity in applying the system. Mathews' goal with this system is to combine the versatility of Music V, the real-time control of the GROOVE system, and increase availability and affordability of personal computers and digital synthesis systems. He is striving to make powerful digital synthesis accessible to the general populace.

There is no denying the importance of Mathews' contributions to music, but they take on even a greater stature when it is realized that none of the music work done at Bell Labs was ever an actual project of the Bell System (or AT&T Bell Laboratories, which is now a unit of AT&T). "Computer music never has been an official activity at Bell Laboratories," emphasizes Moore. "Max Mat-

thews, for all his contributions to the field, has always done these things, as we always used to recount, in the evenings and on the weekends out of a personal interest; but that was never an official activity at Bell Labs."

"That's alright," says Mathews, "it's made life very, very interesting. Most musicians spend 18 hours a day working anyway." His "day job" is being the director of Acoustical and Behavioral Research at AT&T Bell Labs. "The acoustic research, now, is primarily concerned with computer speech processing; automatic recognition, synthesis, and—still—efficient encoding of speech, privacy and secrecy techniques, some acoustic questions like hearing aids and microphone arrays to pick up sounds in conference rooms and auditoria, and some fundamental work in how the ear hears things. The behavioral area concerns, first, teaching techniques; originally how to effectively teach people who were part of the Bell System to use and maintain telephone equipment. Nowadays, since AT&T is separated, the problem is how to teach both AT&T people and our customers to use the things we sell, whether they be computers or communications switches.

"Another area under behavioral research is the human engineering of telephones and computers. We now manufacture a line of personal computers, and I think that whether the computer succeeds or fails will not depend on the particular chip that does the computation, but rather on the programs and the instruction books that go with the programs which will determine whether it will be easy or hard for people to learn to use the computer."

Computer music may never

have been an official activity, but Bell Labs certainly allowed and even promoted these efforts. If there wasn't a lot of money in it (and there obviously wasn't), why would the phone company let their facilities be used? It sounds odd to say that they're just nice folks, but this is what it boils down to. "The support that Bell Labs and the Bell System gave to this work was based on the fact that the musical possibilities were a very important byproduct of the work that we did in communications, and that with very little additional support the Bell System could make this byproduct available to anyone who wanted to use it. They thought this was a socially desirable thing to do, and so they encouraged me in this work," reports Mathews.

In addition to these humanistic concerns, it is likely that Bell Labs had other reasons which may have been more practical, if less direct. It is often the case that people with highly trained and inquisitive minds function best when given some creative space. Bell Labora-

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## The musical possibilities were a very important byproduct of the work that we did in communications.

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tories depends heavily on the ability of its people to discover and invent, and this, in turn, is heavily dependent on their ability to see the world with wonder and ask questions about it. "They let us play," is the succinct description given by Vincent DeRossi, a current Bell Labs employee. Richard Moore has an excellent example of this which concerns Hal Alles, another brilliant engineer who came to Bell Labs in the mid-'70s and worked for a while on music synthesis.

"Alles was interested in digital circuit design—making digital devices to do various things with sound. The first thing that he built as a sort of practice project was a second-order filter which was time-multiplexed by 32, and he did the most amazing thing with it. I went back to visit Bell Labs while I was at Stanford, and Max [Mathews] took me immediately to Alles' lab and said, 'Look at this,' and there was this huge heap of wires on the lab bench. He said, 'Now push this button,' and so I pushed the button, and it started playing 'Frere Jacques.' 'Well, I said, 'that's very interesting. It's a 'Frere Jacques' synthesizer.' 'No,' he says, 'it's a 128 pole (or however many it was) digital filter with its poles and zeroes

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# The Computerized Adventures of Bob Bralove in Wonderland

by Elizabeth Rollins

*If Stevie wonders, Bralove scratches his head, figures out how to do it, then, Stevie does it.*

**W**onderland must indeed be enchanted—it's the place where Stevie Wonder creates. From the outside, it's an old, somewhat down-at-the-heels Los Angeles warehouse. Inside, however, it's filled with nearly every kind of advanced toy for tinkering with hit tunes: at the moment, at least six different types of digital sampling systems—of that, six PPG's alone and an array of other digital and analog addenda. Miraculously enough, in Wonderland if you talk to these machines, chances are they'll talk back.

This is not magic of course, but the combined efforts of some of the most innovative minds in both the music and computer industries: Ray Kurzweil, Sydney Alonso, Dennis Klatt and Harry Mandell to name a few. But there is one person whose job is to coordinate all computer-related projects in Wonderland.

Bob Bralove has been Stevie Wonder's in-house computer specialist

for a little more than a year. Before that he'd been writing Stevie's software for a couple of years while he was working at Osborne Computers in Hayward, California, and studying for his master's degree in film scoring at San Francisco State. "When Osborne started having trouble—he picked me up," says the soft-spoken 29-year-old Bralove.

Teaching Stevie Wonder to be self-sufficient, and thus, more fluently creative at operating all computer-interfaced equipment is one part of his job. Making sure Stevie gets any piece of hardware or software he could possibly want is another responsibility. So Bralove is in fact working on making those synthesizers talk because speech cuing is one system design that can enable his blind employer to use machines that normally send visual signals to the musician. The blink of a light becomes the exclamation of a voice to indicate what mode the Synclavier might be in.

It's a strange mix of special needs and special abilities that Bralove designs for. How many people can say this about their bosses? "He's the fastest learner I've ever met. It's really impres-

sive... Stevie has an intuitive understanding of machines that's hard to fathom. It's also impressive considering he's someone who's never seen a CRT."

Never seen a computer or instrument keyboard, a potentiometer or a software menu. Yet check the list of synthesizers on the soundtrack album, *The Woman in Red*: The Kurzweil 250, the Synclavier, the PPG, and Harry Mandell's custom system.

## SYNTHETIC SPEECH

**T**he Fairlight, the Synclavier, the custom-designed sampling system from Harry Mandell, and the PPG are all digital synthesizers that are meant to be used with a CRT (video screen display.) The PPG can also use an LCD readout, as does the Kurzweil 250 (often called the Electric Piano) at Wonderland. Bralove has been working closely with Ray Kurzweil and New England Digital's Sydney Alonso to come up with a way to reroute the information that is now translated visually, into a signal that a voice synthesizer can read out loud.

Nine years ago Kurzweil invented the first reading machine for the visually impaired which takes a page of text, digitizes it, then sends it through a speech synthesizer which then reads the page aloud. This invention kindled a relationship between Stevie and Kurzweil, who is himself an accomplished pianist. Years later when he'd invented the celebrated "Electric Piano" Kurzweil gave one to his pop-star friend to see how he liked it. Bralove says Stevie likes the sounds, but that to make it easier for him to use by himself, they need to continue with a plan to put a switch at the MIDI port to convert it to RS-232 and then directly feed that signal into a speech synthesizer. Plan "B" is to use a computer interface to translate the signal.

With Sydney Alonso's Synclavier II, Bralove is already hearing the

—PAGE 150



Stevie Wonder trying out the DECtalk system.

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# DISK MASTERING ROUNDTABLE



by Tony Thomas  
All photos by Tony Thomas

*Joe Gastwirt at custom console and lathe which features a JVC quartz-lock motor and proprietary JVC cutter head. The JVC cutting system features 800W/channel threshold amps—JVC Cutting Center.*



The disk mastering business currently hangs on the precipice of uncertainty, especially considering the fact that cassettes have already surpassed the analog disk in unit sales and the CD is attempting to obliterate it entirely. In view of the precarious situation surrounding the phonograph record, *Mix* decided to talk with some of LA's hottest mastering engineers about the future of analog mastering and what can be done to improve vinyl product in the meantime. The engineers that we consulted represent a good cross-section of the industry, from the cutters of the hottest commercial product, to those who routinely cut audiophile disks—from the grand old men of the business to the up-and-comers. They are:

**Bernie Grundman, president, Bernie Grundman Mastering:** Bernie is currently one of the hottest mastering engineers in the country. His work reportedly included roughly 30 percent of a recent *Billboard* chart, and at one time in the not so distant past, four out of the five top hits in the nation. An alumnus of A&M Records, he started his own mastering operation less than a year ago. His credits include Michael Jackson (including *Thriller*, the largest selling record in the history of recorded music), Lionel Richie and Prince.

**Doug Sax, president, Mastering Lab:** Doug is the owner of the Mastering Lab, which is perhaps the oldest independent mastering operation on the West Coast. He is also one of the best and most respected mastering engineers in the business. His other company, Sheffield Lab, is one of the largest producers of audiophile recordings. His disk mastering credits are extensive, including such artists as Linda Rondstadt, Toto and Ambrosia, to name but a very few.



Jack E. Hunt at custom console and lathe—Mobile Fidelity Sound Lab.

## Holding the Line Against the CD

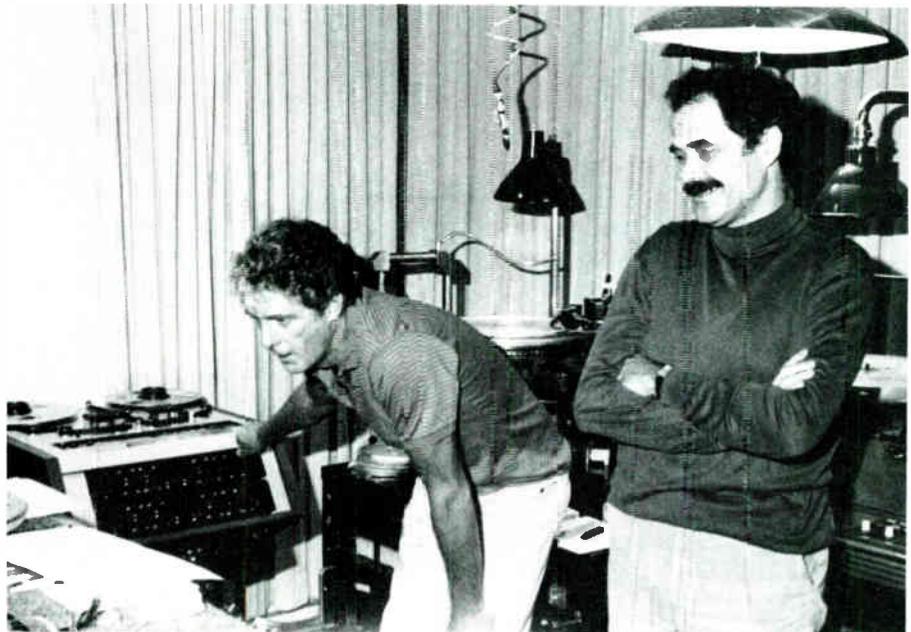
**Gregory Fulginiti, disk mastering engineer, Artisan Sound Recorders:** Greg started his disk mastering career at Elektra Records working with Jac Holzman. His mentor was Bob Ludwig (now at Masterdisk in New York), with whom he worked at Sterling Sound. He is regarded as one of the hottest rock and roll cutters on the West Coast, with credits that include Pat Benatar, REO Speedwagon and Rick Springfield.

**Joe Gastwirt, chief disk mastering engineer, JVC Cutting Center:** Joe, who also worked with Bob Ludwig, claims to have worked at more mastering facilities than anyone else in the States. At various times, he has cut for Masterdisk, Kendun, CBS, Artisan, Media Sound and Frankford/Wayne. His credits include Paul McCartney, the Isley Brothers, and Meco.

**Jack E. Hunt, senior disk mastering engineer, Mobile Fidelity Sound Labs:** Jack is a long-time veteran of the disk mastering business, having worked previously for JVC Cutting Center, TTG Recording Studios and the Record Plant. His credits include many of the highly acclaimed half-speed reissues in the growing catalog of Mobile Fidelity Sound Labs.

—PAGE 35

Doug Sax and Mike Reese—Mastering Lab.



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**Mix:** *What is the state-of-the-art of disk mastering? Where is it headed?*

**Fulginiti:** I think the analog disk is approaching doom. I don't think there are many more years for the analog disk as we know it. Whether cassettes, Compact Discs, or some other form of technology will supplant it, nobody really knows.

**Sax:** I don't think disk mastering at this time is any different than it was ten years ago. The only area in which there has been an improvement has been in the computers for the lathes. Across the board, the good houses can cut a longer side at a full level than anyone could five years ago. As for the future, I don't know where the LP is headed. Cassette sales are ahead of record sales. I *do* know there has been a slow improvement in pressing.

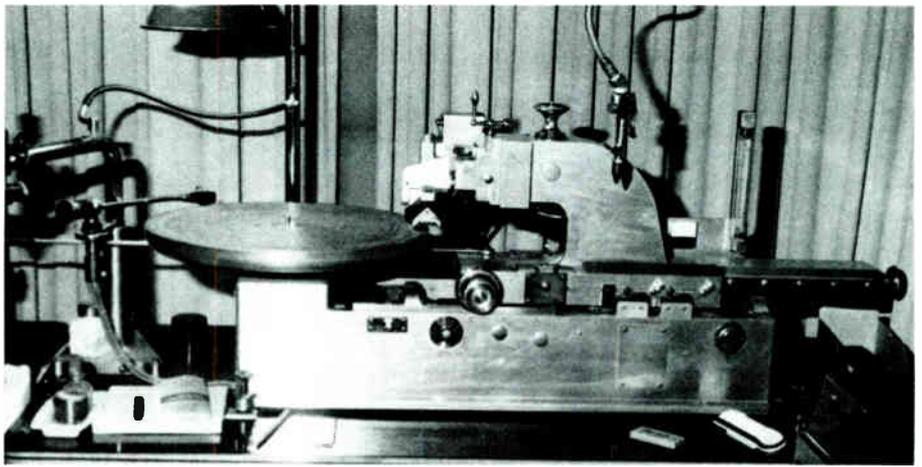
**Gastwirt:** There are a lot of good mastering studios and, in my opinion, only a few great ones. In the future, the middle of the road studios will slowly but surely be eliminated. Only the people that have had the money to buy digital equipment and who have been updating their rooms constantly will survive.

**Grundman:** I think that we've reached the limit in a few areas. With the new computers, I don't see how we can get anything more on the disk. Unfortunately, the more space we can save, the louder they want it which increases the inter-groove distortion and creates a dirtier disk.

**Hunt:** I feel that the state-of-the-art of disk mastering is roughly where it should be at this stage of the game. I think that it can go further if everyone involved gives more attention to detail. Optimally, I feel that the tape should be put on the preview machine and cut flat, taking into consideration the limitations of the equipment. I feel that the analog record is still the best method of distributing quality analog music to the consumer. But care must be taken in the choice of the equipment and the way it is maintained.

**Mix:** *Can current analog disk technology be improved to the point that it can thwart the takeover of the Compact Disc?*

**Sax:** I still feel that a well made disk is sonically superior to the same product on CD. It's interesting that digital technology is the most controversial thing in the industry. You could line up ten engineers and five would love it and the other five would say its terrible. There was a test done by a design engineer for Harmon-Kardon, and he found some people could detect the tiniest amounts of distortion and other people could not tell the difference between an undistorted and highly distorted signal. Maybe that's



*Lathe with custom tube electronics—Mastering Lab.*

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why there is this divergence on digital. I still perceive it as being more distorted, particularly on complex material.

**Grundman:** I don't think the public, generally, is that quality conscious. In defense of the analog disk, they have cut a lot of corners on the players and the CD is not as good as it could be. I've done comparisons and the analog disk is usually better than the CD version of the same material. It's very hard to buck the trend because the high-fidelity magazines are highly touting it. I think that it will eventually catch on, provided the price comes down. The cassette is already more popular than the analog



*Bernie Grundman*

disk, and the analog disk sounds better. Why, then, would anyone want a CD? You can't record on it.

**Fulginiti:** Unfortunately, the record business is a business, a matter of economics, and the demands of the industry sometimes sidestep the quality for the quantity of produce to be issued. They are capable of making pressings in this country which are far superior to those currently made. It takes more time, more money, and a longer wait for the records to get into the stores. Certainly Direct Metal Mastering would be a great advantage in insuring that the sound is given the best possible opportunity. That is an expensive process and with the uncertainty surrounding the analog disk, and the people that have disk mastering facilities have to have some reservations about laying out that kind of money in an industry that has no guarantee of a future.

**Hunt:** Right now a well made analog disk is a threat to the CD, if for no other reason than the frequency response. In the current CD machines, there is a brick wall filter at 20 kHz which makes the sound very unmusical. The current sampling rate is way too low. I feel the minimum it should be is 250 kHz with maybe a 20 bit format. Ideally, it should be 500 MHz.

**Gastwirt:** If you want to talk business, no. If you want to talk about what can be done technically to make a record sound better, I don't think it would offset the CD, but it would prolong its life a little bit.

**Mix:** What special techniques do you use to improve the tape-to-disk process?

**Grundman:** A lot of our techniques have to do with the equipment we have built. We have really tried to build a system that doesn't alter the sound. It is really possible that when we play the tape on this system, those who made the record will hear it cleaner than they have heard it before. In our equalizers, we can punch in only those frequencies we need. Our tape electronics have step-attenuators to control the top end so you don't even have to use the board if you don't need it, except for a line amplifier.

**Gastwirt:** Since way back, I've been a believer in cutting very hot records so that the signal is way above the noise level of the disk. You don't want to cut it too hot, however, so it distorts. In doing this, you're actually making more work for yourself because you have to make a lot of test cuts to see how hard you can push it before it distorts.

**Hunt:** We are committed to half-speed mastering because it works. You cannot use a regular system, though, and cut half-speed. The equipment has to be set up for half-speed. The system we use, the Ortofon DSS-731 cutter head was de-

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Greg Fulginiti—Artisan Sound.

signed for half-speed CD-4 cutting. I have done work on the cutter amps to improve the bass response. All of the tape-electronics are solid state class A discrete and designed for half-speed. It takes a special type of person to do half-speed, however, because it is so time consuming. We don't use any limiters. The dy-

dynamic range on the tape is what goes on the disk.

**Sax:** If one disk mastering room has an edge over another it would be a combination of having better electronics in their chain—in the tape machine, better EQ in the board, and what ability they have to correct tape problems for disk.

What the mastering rooms really do is what I would call two track mixdown. There is only one tape in 50 that the producer and engineer would be happy with if you did an accurate transfer to it. If you have better electronics, then you can get more off the tape than another room could. We've just developed new electronics that we just completed the new To'to album on, which are all tube. When they are placed into permanent service, we will be *all* tube. When tubes are done right, I think they are superior devices. They have more punch, more dynamic range, more listenability and they're better on complex material. I've spent a fortune to develop these things and they're never worse than solid state, depending on the tape, and on complex tape they're dramatically better than anything I've heard on solid state. A mastering room is like a race car. You spend a lot of money for a very small increase in quality. Whether or not our race car is perceived as better, time will tell.

**Fulginiti:** It is the way that I do what I do. If I were to attempt to translate it into what I do or how I do it, I wouldn't be able to give you an explanation, I couldn't do it. It's my gut feeling, the way I interact with people and the music and where we take it. I have no secrets. If anyone wanted to ask me what I did on a record, what EQ I used, I would tell them with no hesitation.

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**Mix:** How can the producer and engineer produce a master tape that's easy to cut?

**Gastwirt:** The producer and engineer should keep their eyes on phase problems, they should listen to their mixes in mono, especially if it is going to be played on the radio, to make sure that there is as little loss as possible. They should also watch out for left and right separated bass, which is almost impossible to cut.

**Sax:** The number one disk problem is the same today as it was 30 years ago, and that's sibilants. It's also the number one problem in recording. If the engineer mikes well and controls the sibilants, there's no problem in cutting anything. But if there are big, splattery essences, you're in trouble.

**Fulginiti:** The one thing that the producer and engineer must remember is that the levels that they put on tape must equate to levels that the disk can handle. Granted, there is a better S/N ratio achieved by pushing tape to a certain level, yet they must be forever aware that there are always limitations in transferring from one medium to another. You can't put high, sharp transients on tape at +3. There are limitations on dynamic range and velocity of sound. The way that the human voice is recorded poses problems, especially in the area of sibi-

lants. I try not to use a de-esser or a high-frequency limiter and only do so when there are no other options.

**Hunt:** I think that the mixers should understand that with 1/2-inch tape, just because the tape is wider, that doesn't mean that they can put more level on it. There should be an oscilloscope on each tape machine and the mixer should watch it for saturation. The tones on the tape should be respected. I personally feel that each mixer should start out in the cutting room learning what the limitations of the disk are. Center bass is important and the mixer should remember that the average transients, on percussion instruments particularly, are anywhere from 14 to 20 dB above the level on the meter. I think that every mixer should mix with the scope, because then they would see the polarity problems.

**Grundman:** The #1 enemy to the disk cutting system is excessive sibilants. It's very hard to do good de-essing on the final mix. If they would just use a de-esser on the vocal channel during mixing, it would solve a lot of problems. With the new computers, we can cut left and right separated bass very easily. It may be difficult to matrix and press, but we can cut it.

**Mix: Where do you think you'll be in ten years?**

**Grundman:** I have the feeling I won't be behind the board all the time. We may begin to market the equipment we designed because we have already received inquiries about our equalizers from recording studios. We may also put a cutting room in some other city, like New York.

**Fulginiti:** I think you can speculate, dream and guess where you're going to be, but it's hard to say. All I can say is I focus one day at a time on what I'm doing, and I try to do the best I can, develop my craft, learn all I can about it and prepare myself for when the technology changes to be right there and be ready to grow with it. What that means and where I'm going to be in five or ten years, I don't know.

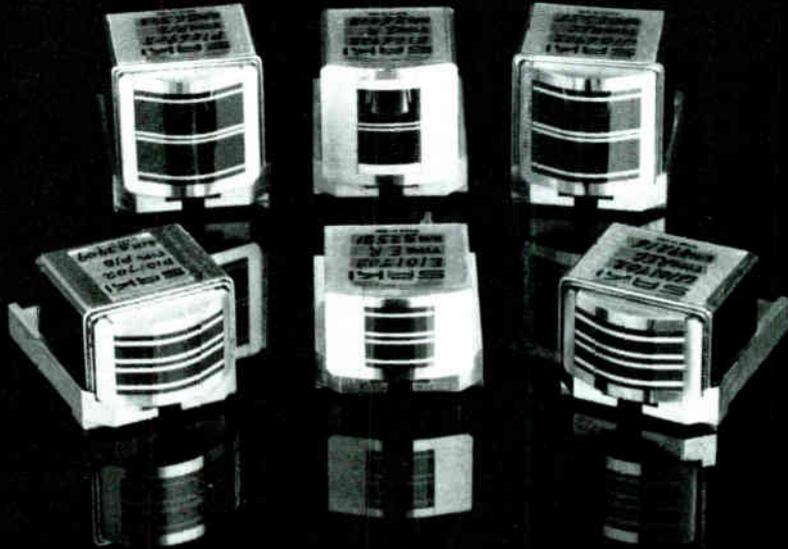
**Gastwirt:** I think that there may be a few mastering rooms left. I think that the analog record may not totally disappear. I may be totally off base, but I do believe that in some quantity, there will still be analog records. I also believe that the third set of the ears that the mastering engineer provides will still be needed, no matter what the medium.

**Hunt:** Living a very comfortable life, as we are moving our headquarters to the clean air of Northern California. I do want to say that the analog record is *not* dead, especially if care is taken to produce it.

**Sax:** I hope I'm retired living at 7,000 feet watching television and reading a book. ■

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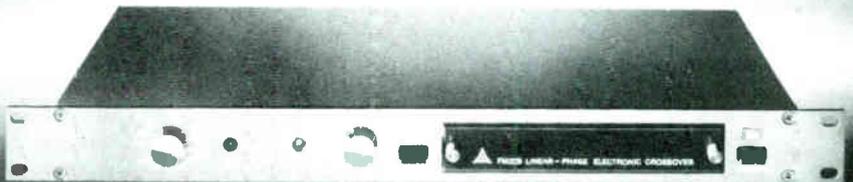
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# Start the Presses! CBS/Sony

by Gregory A. DeTogne

Before I got onto the plane for Terre Haute from Chicago's O'Hare Field, I was told that the event I would soon be witnessing was destined to be a milestone in Indiana's history. Even greater in importance in fact, than last year's release of the "Little Pink Houses" video by John Cougar. Once in the air though, as I looked down at the flat, agricultural no man's land that lies between northern Illinois and Hoosierland, I began to have serious doubts that anything of social importance could actually be generated in such a region.

After an hour's flight my feet hit the tarmac at Terre Haute's Hulman Field. I immediately made my way toward the airport bar, which looked like it would have been more at home in somebody's basement rec room next to the ping-pong table. It was here, while I sat slugging down a glass of orange juice with a local rustic who was nurturing an early morning beer, that I realized I was becoming involved with something that was indeed truly important.

"Hey, you look like you're from outta town," my newfound acquaintance mumbled from his suds, trying to strike up a conversation. "Whatya here for, business?"

"I'm here for the opening of the new CBS/Sony Compact Disc manufacturing facility," I answered. "You heard anything about the place?"

"Heard about it," he shot back. "Of course I've heard about it. That plant



Opening on September 21, 1984, Digital Audio Disc Corporation (a subsidiary of CBS/Sony) became the first manufacturer of Compact Discs in the U.S.

is gonna mean jobs and international recognition for this town. Hell, someone told me the governor himself is going to show for the opening ceremonies today . . . This is a *first* in the country, for Chrissakes . . ."

I paid the bartender and headed for the door, thinking all the while that I had been dead wrong in my airborne assessment of the situation. It was plainly obvious to me now however, after having talked to someone who was aware of the CBS/Sony Compact Disc venture

even though he probably kicked sheep all day for a living, that the opening of this new pressing plant represented something that would make September 21, 1984 a significant date in the history of audio reproduction.

In order to inform the world about the opening of their new Compact Disc pressing plant, CBS/Sony commanded their New York City PR firm to orchestrate a carefully-controlled media event that would include a tour of the facility, which is appropriately named Digital Audio Disc Corporation. According to my plans of participation, all I had to do on the day of the grand opening was hang out at the Terre Haute airport and wait for a chartered jet to land that contained other journalists, an assortment of CBS/Sony execs, and the usual huddle of PR minions. Once they were on the ground, I would join the happy group, and together we would be herded onto two buses that would take us to the plant. It sounded easy—just sit back and enjoy the ride, listen to the obligatory speeches, go on the tour, attend a press conference, then have a press kit jammed into my hands and split. Isn't that what responsible journalism is all about?

As could be expected, the char-

(Left) Compact Disc manufacture starts with a specially encoded tape copy prepared in one of two identical control rooms.



# Terre Haute CD Plant Opens

ter jet was late. Time was dragging by, and I was seriously contemplating going back to the bar to get pocked with the native Hoosier I had met earlier. Eventually, before I could slip into debauchery, the jet landed, and a swarm of people spilled out onto the runway. On cue, I gathered up my belongings and clamored aboard one of the hired buses that was spreading its diesel stink through the air as it idled in a nearby parking lot.

Our air-conditioned transports dumped us off on the sidewalk in front of Digital Audio Disc Corporation a short time later. A huge circus-like tent had been set up for the hoopla on the front lawn to protect us from the sun while we listened to the dedication speeches by the likes of Indiana Governor Robert Orr, Sony's Norio Ohga, and CBS/Records' Walter Yentkoff. The speakers took their respective turns proclaiming that it was a "great day for Indiana" and a "giant leap forward in the history of audio engineering." At the conclusion of the speeches, there was the traditional ribbon-cutting ceremony, followed by more talk, and then we were told that the tour would begin.

Before being allowed to enter the sprawling complex, we were divided into groups of 15, and given white booties to slip over our shoes to keep from contaminating the sterile environment. Smiling employees dressed in blue smocks and brown shoes with special dust-resistant soles were on hand to spew out answers to our questions. I'd like to delve right into the details of what we



*Sony's Compact Disc Master Code Cutter produces a glass master by exposing a glass plate with a photo-resistant layer to a laser beam.*

were allowed to see inside, but it may be useful for clarification's sake to provide a few background notes first:

CBS/Sony was the first manufacturer to begin producing Compact Discs in Japan. After making an investment of more than \$20 million to finance the creation of Digital Audio Disc Corporation, the two audio giants also became the first owners of a major Compact Disc pressing facility in the United States.

Representing one of the most important advances in sound reproduc-

tion since electrical recording first came onto the scene, current forecasts predict that between 200,000 and 250,000 CD players will be sold in the U.S. by the end of 1984. The CD player relies upon a low-powered, solid-state laser that "reads" encoded information directly off of a single-sided plastic coated disk that measures 4¾-inch in diameter. Since the laser never physically touches the surface of the disk, there is no wear on the recording, and the coating insures that

—PAGE 44

## Sony Gets Nod for Videodisc Replication Plant

An Urban Development Action Grant of \$650,000 from the U.S. Department of Housing and Urban Development has enabled Sony Corporation of America to issue industrial revenue bonds to build a videodisc replication plant in Terre Haute, Indiana.

Construction of the new plant will begin in 1984 and will be completed in the fall of 1985. The project represents an eventual investment of more than \$15 million for Sony and will employ more than 100 people in Terre Haute.

According to J. Philip Stack,

president, Sony Communications Products Company, "there is a growing need for laser disks in video and data storage applications." Stack estimated that 300,000 laser videodisc players will be in use by the end of 1984, with the market expected to grow to more than one million players by the end of 1987.

Sony's optical videodisc system is primarily being sold to business, industrial, government and educational institutions for use in computer-assisted interactive training.

One client that Sony is watching closely is the U.S. Library of Con-

gress which has begun conversion to disk of an optical videodisc program that will preserve the library's collections of prints and photographs while making them available to the public for research and reference.

The library will eventually place on videodisc 97,000 photographs from various collections, including motion pictures, motion picture publicity stills, network newscasts from the 1976 Bicentennial, paper prints of news events from the early days of motion pictures and the library's priceless collection of glass plate negatives. ■



*(Above) After injection, a very thin layer of aluminum is placed over the disk's pitted surface that reflects the CD player's laser.*

*(Right) Quality control tests are directed by a CBS/Sony-developed computerized inspection system.*

*(Below) Stacked on spindles, finished CDs are placed into individual trays which are then packed into clear cases.*



foreign particles and fingerprints have no effect on the quality of playback.

Sony's CD player is microprocessor controlled, which allows certain models to be programmed to play up to 99 different selections or passages in any order. Pause, repeat, and skip-track commands are standard equipment, along with a high-speed search mechanism that is perfect for locating favorite parts of songs. Read-outs on the front of the unit detail elapsed and remaining disk time, and the track selection in play. For the habitually indolent, a remote control is also available.

Audio specs for the CD player currently being produced by Sony exceed even the most advanced analog playback systems. Dynamic range easily surpasses 90 dB, while frequency response is dead flat from 20 to 20,000 Hz. As a final kicker, harmonic distortion is almost nil, and wow and flutter are unmeasurable.

Over an hour of uninterrupted music can be packed onto the disk, with the sound being stored in "pits" of digital information. After hearing the system, most agree that the CD's clear, noise-free reproduction beats the hell out of its analog brethren . . .

Now that you're armed with the necessary background info, here in a nutshell is what's going on behind the carefully guarded walls of Digital Audio Disc Corporation:

The actual manufacturing process turns out Compact Discs in a fashion similar to that used in analog recording. However, upon first observation of the plant, the most notable difference is in the cleanliness of the environment. Since the CD deals with such small tolerances and dimensions to achieve sonic accuracy, it is absolutely essential that everything remains spotlessly clean and free of contaminants.

At the outset of manufacture, a musical recording is prepared in a digital format. Specially encoded taped copy is prepared in one of two identical control rooms that feature highly sophisticated editing equipment that plant engineers are reluctant to talk about. For mastering, a device called the Sony Compact Disc Master Code Cutter is used. Basically, the system is made up of a PCM processor, CD encoder, and a laser cutter. It produces glass masters by exposing a photo-resistant layer on a glass plate to a laser beam. This is where the aforementioned "pits" are cut which form the basis of information which will later be translated into music. Glass masters are then processed into metal masters via a matrix operation that utilizes a high-speed rotary plating system designed by Sony. After this electroplating process is complete, metal mothers and stampers are produced.

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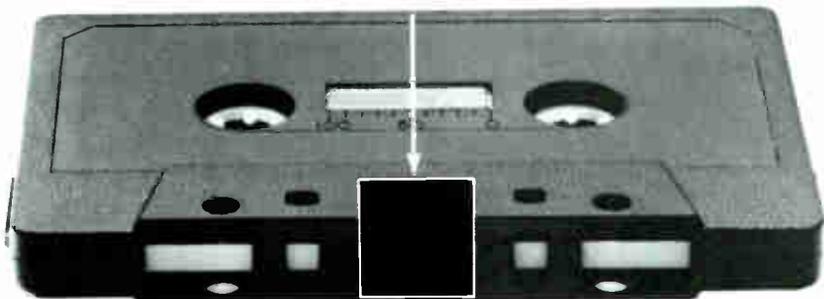
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The stampers are placed into injection molding machines, which utilize a polycarbonate resin to mold a transparent Compact Disc.

With the molding complete, the clear CD is then placed into a vacuum chamber. While in the chamber, a thin aluminum layer is placed over the molded pits on the surface of the disk. This layer allows the player's laser beam to reflect off of the disk surface and reproduce the sound stored in the pits. An ultraviolet curing resin is then applied atop the aluminum layer for protection, and the disk is sent on to the final phases of production.

To complete the ordeal, individual labels are silk-screened onto each disk before they hit quality control. A variety of inspections are all handled by computerized robotic networks that pick out the duds before final approval. Finished CDs are placed in trays and lugged over to a group of employees who hand-package them in various formats that include shrink-wrapping and blister packaging.

CBS/Sony claims that their new plant is capable of pressing approximately 300,000 disks per month, with the possibility of doubling that figure as market demand increases.

By the end of 1983 (the CD's first year on the U.S. market), over 550 titles were introduced, and more than 1.7 million disks sold. Two thousand or more titles are predicted to be available by the end of 1984, and CBS/Sony expects this increase to generate a corresponding sales boom of between eight and nine million disks. According to their marketing surveys, the average CD consumer will collect a minimum of 25 disks each year in the not-so-distant future.

The possibilities of the system are already being expanded, which promises to stretch the CD's importance far beyond its current applications for home and professional audio. By the time you read this, Sony will have begun marketing the industry's first personal portable and car CD players. Visionaries are already imagining home CD recording, too.

My tour of Digital Audio Disc Corporation ended with a hands-on demonstration and listen to the plant's first disk, Bruce Springsteen's *Born in the U.S.A.* With a set of headphones wrapped around my ears, and the volume set at an extremely amplified level, it's readily apparent that this new technology will indeed have a bright future with the audiophile set. In fact, CBS/Sony are so sure of themselves that they have begun to herald the system as "already an audio tradition." Old ways die hard, but if this is indeed a new tradition in the making, I think you'll be seeing quite a few people pitching their old LPs into the weeds in favor of the new Compact Disc. ■



In the early evening of Sept. 17, 1973, Jay Barth was at the wheel of a 22 ft. utility truck that was loaded with sound equipment. Just south of Benton Harbor, MI an oncoming car crossed the center-line; fortunately Jay steered clear of the impending head-on collision. Unfortunately, a soft shoulder caused the truck to roll two and one half times. Exit several Crown DC-300A's through the metal roof of the truck's cargo area.

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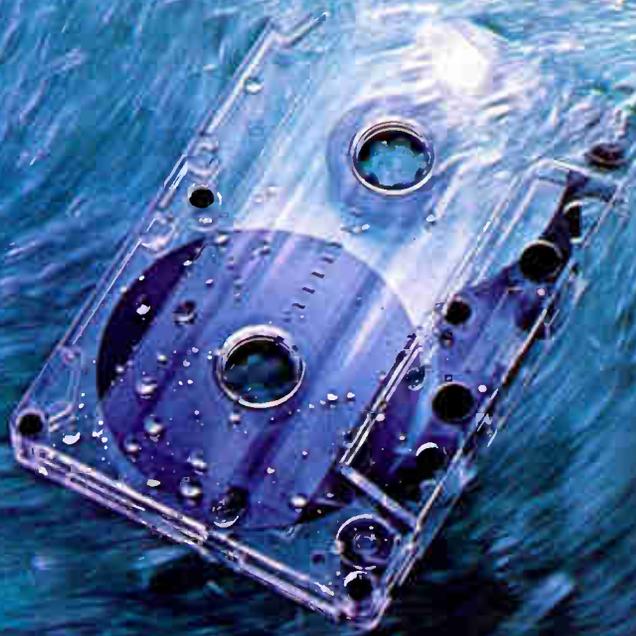


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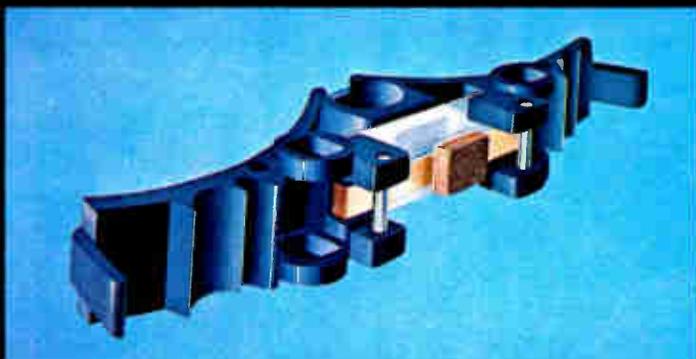
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# AUDIO APPLICATIONS

**“W**e are astonished by the reaction of consumers, and astonished by how quickly the market is growing. Because of the player’s simple operation and the increasing availability of software it has taken a very strong foothold in the market.”

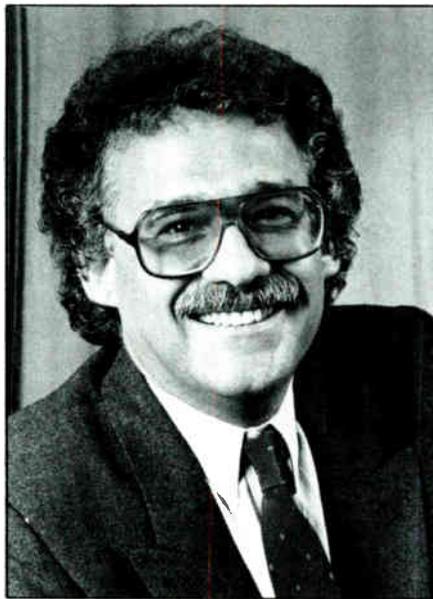
## Interview with Emiel Petrone CHAIRMAN OF THE COMPACT DISC GROUP

by Ken Pohlmann

**T**he Compact Disc is busily reshaping the business of recorded music; the entire production chain from control room to living room is adapting to the new medium. Just as any message is influenced by its dissemination medium, recorded music will undergo distinct transformations as the Compact Disc accounts for larger percentages of purchased music. Quality of recording and production, timed length of albums, and perhaps even style and content of the music itself could be affected as the CD retrains our expectations, and ears; the consumer’s perception of recorded music will be subtly altered as the medium embodying the music changes. For an insider’s account of the CD’s short history, and some educated guesses as to its future, I turned to Emiel Petrone, the chairman of the Compact Disc group and senior vice president, Compact Disc, for Polygram Records.

**Mix:** Could you tell us a little about your background?

**Petrone:** I joined Polygram Records in the ‘70s as sales manager and ran the



*Emiel Petrone, senior vice president, Compact Disc, Polygram Records.*

Polygram marketing company until 1980. In 1980 I became vice president of marketing for Polygram Soundtracks, and in 1982 became senior vice president of the Compact Disc division for Polygram Records. And I am concurrently chairman of the Compact Disc group.

**Mix:** How does the Compact Disc group fit in with Polygram?

**Petrone:** The CD group is involved not only with Polygram, but with every major company manufacturing either Compact Disc hardware or software. The group was a brainstorm of several individuals, basically to establish a forum among two industries which had never sat down together for the introduction of a new product and a new technology into the U.S. marketplace. Some inquiries were sent out and the idea was received overwhelmingly well by both industries. We now have membership of all companies involved with the CD, including the major hardware manufacturers and record labels, as well as accessory people.

**Mix:** The purpose then, is to coordinate the marketing of hardware and software.  
**Petrone:** Yes, but specifically to coordinate the introduction of the new product, and achieve awareness of its potential on the part of the American consumer.

**Mix:** That implies that the CD group has a finite lifespan . . .

**Petrone:** That’s very possible, but with technology changing as quickly as it has been, we see the need for hardware and software to talk more often than in the

past, and so we see the group remaining in existence for awhile.

**Mix:** Do you intend to get involved in questions of format and standards?

**Petrone:** No, we are basically marketing people. Our parent companies are involved in the technical end, and they can introduce the products. Of course, when there is music involved, we would like to maintain the relationship we have developed with our counterparts in the hardware industry. In the case of the Compact Disc, it seemed like a natural because of the simultaneous standardization of hardware and software systems.

**Mix:** Just a point of clarification—the CD group is an American organization, with American interests?

**Petrone:** The CD group is incorporated in New York City, and its official name is The Compact Disc Group of America.

**Mix:** Let's talk about marketing. It's been about a year since the Compact Disc has been available in quantity in the U.S. How does it look so far?

**Petrone:** It looks very, very healthy. We are astonished by the reaction of consumers, and astonished by how quickly the market is growing. Because of the player's simple operation and the increasing availability of software, the CD

has taken a very strong foothold in what we call the "audiophile" segment and "trend-setter" segment of the market. We feel very strongly that by the end of 1984, beginning of 1985, this will definitely be a mass-market product.

**Mix:** What are the numbers of players and disks sold so far?

**Petrone:** In 1983 there were approximately 35,000 machines, and one-and-a-half million disks sold in the U.S. In 1984 there will be between 200,000 and 250,000 machines and approximately four to five million disks sold.

**Mix:** What are your future expectations?

**Petrone:** For 1985 we figure about 650,000 machines, and about 20 to 25 disks per purchased player.

**Mix:** That's about 15 million disks. . . Say! That reminds me—I saw an interview with Jim Rogers, a Wall Street trader who started with \$1,500 and retired at age 37 with \$14 million. He said he's recently had his eye on the Compact Disc. . .

**Petrone:** The growth potential looks phenomenal at this time.

**Mix:** Let's talk about prices.

**Petrone:** Many consumers are under the misconception that the players all cost \$1,000. The hardware industry has

introduced a tier price structure among different manufacturers and different player features. Thus a \$300 machine can be purchased, or an \$800 machine, or a \$1,500 machine depending on the brand concept or feature concept. All machines have microprocessor control and programmability, higher-priced models include remote control, etc.

**Mix:** What convinces people to buy a CD now?

**Petrone:** Ease of usage is a strong point, as is durability of the disk, and availability of titles. . .

**Mix:** Are there enough titles to persuade people?

**Petrone:** Well, we started in 1983 with under 500 titles, now we're up to 2,000 titles. And we are expecting 5,000 titles in 1985. Most major software companies are committed to selling it. And with the awareness programs we now have going, for example, the MTV campaign, the American consumer is feeling the push. Of course, each manufacturer is also pushing its own competitive edge, in its own unique fashion.

**Mix:** What's in store for disk prices?

**Petrone:** Prices are dropping at the wholesale level, to approximately \$10. You can see them retailed for \$12.98 or more typically \$14.98. Prices will diminish a little in 1985, but not as much, because the record business operates differently than other mass-produced product industries. With the CD hardware, for example, costs are amortized as volume increases, thus the manufacturing cost drops. With records, contract negotiations with the artist and other factors result in a more complicated formula. We'll be seeing retail disk prices in the \$10 to \$12 range, with further downward movement after 1986.

**Mix:** In other words, from a manufacturing standpoint, volume alone wouldn't lead to a staggering cost reduction in CDs.

**Petrone:** Right. The same thing is true with LPs.

**Mix:** Let's shift gears. Do you own a CD system?

**Petrone:** Absolutely!

**Mix:** Are you happy with it?

**Petrone:** I'm thrilled with it. It's difficult for me to listen to records or tapes anymore.

**Mix:** In the early days, at least, there was some severe criticism of the CD standard in terms of sampling rate. Did you ever have any doubts?

**Petrone:** Not really. For a while a 48 kHz sampling frequency was considered for compatibility with that of the professional

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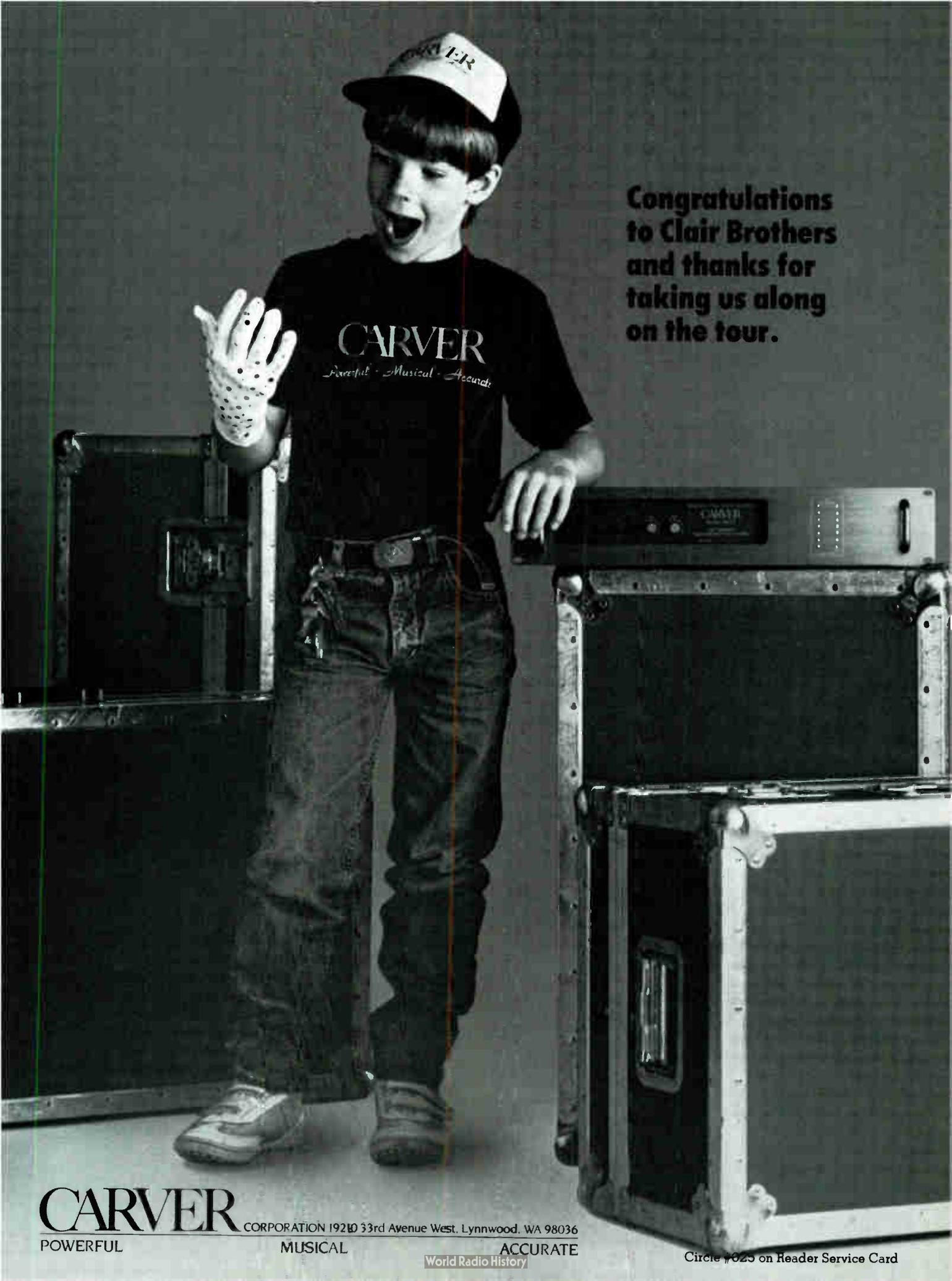
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standard, but this would have reduced the playing time of the Compact Disc. The ramifications of having a vehicle capable of carrying 60 to 70 minutes of music on one side was important. We decided that 48 kHz was suitable for recording, and 44.1 kHz for suitable for reproduction.

**Mix:** How is the quality control on disks? Do you have any numbers for returned disks?

**Petrone:** Defect disks from the consumer has been 0.3 percent. For LP's I'd say it averages around 5 percent.

**Mix:** That speaks well for the CD, considering that most current buyers are critical listeners.

**Petrone:** The quality control is an amazing breakthrough. There's nothing tricky

change it if he wants to. We guarantee that nothing happens except literal transfer.

**Mix:** I've heard a few horror stories about mistakes in the transfer, such as improperly decoded noise reduction on tapes, etc.

**Petrone:** I can't sit here and tell you there have never been mistakes; I've heard some people's questions, but I can tell you that quality control, such as that here at Polygram, is designed to specifically catch such gross mistakes. Maybe in the early days, some operators didn't realize what transfer was all about.

**Mix:** Are you happy with the disks you purchase?

**Petrone:** I have no problem with them. I haven't had a defective disk yet.

is delivering. I can get as emotional with a Compact Disc as I can with any other sound carrier.

**Mix:** Let's move on. When can we look forward to CD players in our automobiles?

**Petrone:** It was launched in Japan in September. The Sony prototype was introduced at last summer's Consumer Electronics Show. You should see it in quantities at automobile/audio specialty shops very soon.

**Mix:** Do you feel confident about potential problems such as vibration, warpage of disks left in the sun, etc?

**Petrone:** Yes. For example, we've tested the disk from a heat standpoint—you can test it yourself by putting one in boiling water, then observing correct playback. Likewise vibration testing has worked out very well. When Sony puts its product on the market, it will have the problems licked.

**Mix:** How about CD ROM?

**Petrone:** Compact Disk read only memory is limitless. There will be new markets in entertainment and publishing; at Polygram we concentrate on music, but with other manufacturers and custom pressers, we're ready for it and looking forward to it. It's the greatest data storage vehicle to be introduced in this century. As you know, a CD has data capacity equivalent to that of 1,000 floppy disks.

**Mix:** In the September issue of *Digital Audio* magazine, it was reported that IBM had contracted to purchase 1.5 million CD players for use in its personal computer. Can you confirm this?

**Petrone:** I'm not in a position to confirm that. But I'll say this—it's compatible with their system, and they certainly perceive the storage capacity, and the fact that it is already a standard is powerful persuasion. I see a bright future in the business, that is, non-musical applications of the CD.

**Mix:** Any other future developments such as double-sided disks?

**Petrone:** Not double-sided disks, but maybe a concept similar to that of a 45 rpm, or an EP, in which the total time capacity is not used. The price would drop substantially. Such a disk would also probably have graphics and lyrics for viewing on a television.

**Mix:** In conclusion, how about a prediction: When will the sales of CD's surpass that of LP's?

**Petrone:** We expect that in 1990, the worldwide sales volume of both CD and LP will be around 550 million disks each, and within five years after that, the LP will largely disappear. ■

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**“It's precisely the comparison between LP and CD that sells people on it. At this point, the audiophile has accepted it; the black vinyl business will be no business soon.”**

---

involved, one merely has to master a new technology. You know, as we speak, the (Sony) Terre Haute plant is being opened, which will allow American companies without Japanese or European affiliations to press domestically.

**Mix:** Players and disks have been out for a few years now. Have any long term problems occurred, unforeseen in the laboratory?

**Petrone:** Not to my knowledge. It's here to stay.

**Mix:** One of the long-standing debates with the CD is this: When a disk sounds bad, is it the fault of the recording, the transfer, or the disk itself?

**Petrone:** Well, there's nothing tricky in the transfer, from either an analog or digital master. Whatever we receive is what you get. All tapes delivered to us undergo technical quality checks; of course, a contemporary recording is different from a 1954 Stan Getz. Once those checks are made, we don't fool with the sound or the production in any way. Whatever the artist or producer gives us, is what he gets back. There's no high-ending or low-ending or anything like that. At Polygram we have a number of technical checks between original master and first pressing to reveal mistakes; the producer is given the opportunity to

**Mix:** Will recording engineers have to adapt their techniques to the Compact Disc?

**Petrone:** They will probably develop a new sensitivity, and be much more critical of technical phenomena which were covered up on the LP.

**Mix:** How about those who compare the CD to the LP, and conclude that the LP sounds better?

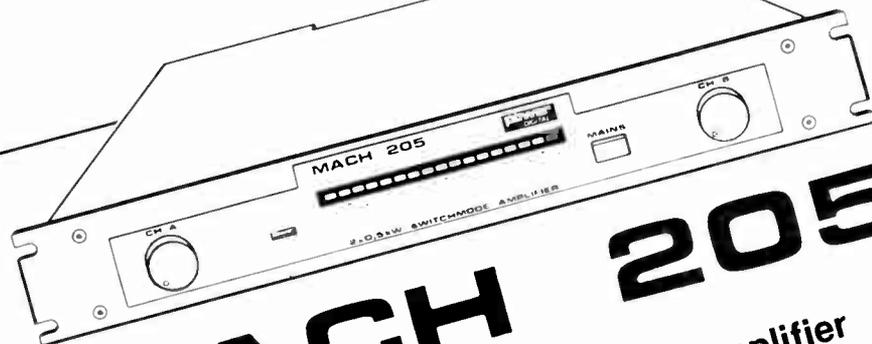
**Petrone:** Maybe they have cotton in their ears. I've done A-B listening and my results are the opposite. You can hear the crispness of a CD over a radio broadcast. Many people call in, and ask why it sounds so phenomenal. It's precisely the comparison between LP and CD that sells people on it—that's true in every hi-fi store. At this point, the audiophile has accepted it, the black vinyl business will be no business soon.

**Mix:** How about another bugaboo: those who say the CD prevents them from getting "emotionally involved" with the music?

**Petrone:** Maybe they should see a psychiatrist. The emotion that is expressed by an artist in an artform, and communicated to each individual person who experiences it, is not dependent on whether the carrier is black vinyl, cassette or laser disk. It is the message that the artist

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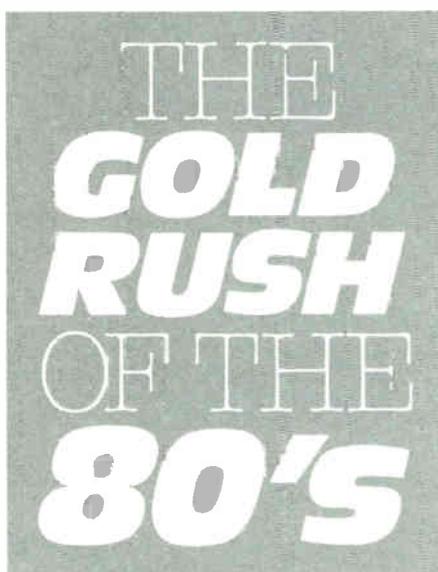
# CASSETTE **D**UPLICATION

by George Petersen

After two decades of existence, the once-lowly cassette tape (which began as the "toy" tape format for the early Philips/Norelco Carry-corders) has become a giant in the industry, especially with tape sales exceeding that of albums on many major label record releases. Of course this didn't happen overnight, as many factors—simplicity of operation; mono/stereo compatibility; improvements in tape emulsions and electronics, notably noise reduction technology; the demise of the eight track cartridge as a competitive force; a general worsening of vinyl record quality; and the current popularity of auto and personal stereo systems—have contributed to the cassette's rise to the top.

Today, with the almost universal acceptance of the cassette medium for a plethora of applications, ranging from music and educational programs to music software, the need for quality duplication is at an all-time high. To meet this need, cassette duplication firms and manufacturers of both hardware and software (C-zeros, raw tape, packaging/labeling supplies, etc.) for the industry are constantly striving to keep up with the demand for better product.

Yet the eventual introduction of new forms of competition for the medium, such as the digital compact cassette, automobile and Walkman CD players, erasable Compact Discs, and other innovations yet to be unveiled, seem to pose no threat to the cassette's dominant position in the marketplace. New duplication facilities spring up seemingly



*(Above photo) Technician Chris Keith monitors a few of Resolution's 400 NAD cassette decks during a real time duplication session.*

overnight, while other businesses, such as recording studios and pressing plants, are taking advantage of the possibilities of offering cassette duplication as a lucrative sideline.

However, in spite of all the new operations now on line, there seems to be

plenty of work available in this growing industry. We polled a few of the duplication firms from those listed in this issue, inquiring as to whether this current bubble of prosperity was about to burst. None of them thought so—that is, not in the foreseeable future. And until the RIAA begins certifying million-selling cassette releases, we would have to say that the present rush for the financial gold in the cassette business is very real indeed.

Steve Sheldon, of Rainbo Records, a custom record pressing plant in Santa Monica, California, sees a bright future ahead in the duplication field. In fact, a few months ago his company installed an Audio Tech high-speed bin loop system capable of doing up to 7,000 cassettes per shift. Commenting on the jump into cassette work, Sheldon says "... it was a natural step for us. Most of our album customers also want to release tapes, say 1,000 records with 500 cassettes. Now we can offer pressing, as well as duplication, printing and packaging. It's a one stop service."

Rick Schaumberger, owner of Midwest Custom Record Pressing in Arnold, Missouri, agrees: "Tapes now account for over 25 percent of custom music releases, and offering both pressing and duplication has given us a distinct advantage since we began doing cassettes in 1982." Midwest Custom uses an Electro Sound 1/2-inch bin loop system with a capacity of 25,000 tapes per day, and although tape duplication is a viable sideline, Schaumberger feels that the pressing business will remain strong for

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Precision automatic control, monitoring and diagnostics are integral parts of the system.

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quite a while, because, "there's a 'mystery of vinyl.' Anybody can put out a cassette, but having a record is a status symbol for groups doing a custom release. Also, the number of pressing plants gets smaller every day, while cassette plants are on the increase." One of the ways Schaumberger deals with the growing pressure of competition from other cassette duplicators is to buy short end rolls of duplicating tape from major manufacturers. "It's quite a savings," he notes.

Best known for their Sound-sheet flexible records, Eva-Tone, of Clearwater, Florida, is another record manufacturer which has recently added tape capability by installing a Gauss 2400 high-speed system with seven slaves and Dolby HX Pro. A Telex 6120 in-cassette system was also put on-line for short runs. Company spokesman Larry

Johnson said the move was intended to supplement, rather than replace their Soundsheet business. "A lot of our customers, especially musicians, manufacturers and publishers, are interested in having both cassettes and Soundsheets, so we felt this was a good time to add tape duplication services." Eva-Tone is now also offering one-, two- and four-color printing for cassette inserts ("J" cards) and retail packaging.

David Porter, owner of Music Annex Recording Studios in Menlo Park, California sees the cassette's market position as remaining strong through the 1980s and into the early 1990s, when other storage media such as the digital cassette will become commonplace. Until then, he expects the audio cassette will continue as a dominant force, and the Annex has begun a duplication division,

having installed an Otari DP 80 380 ips bin loop system. The idea, Porter explains, is to cater to "independent and intermediate sized labels who need high-end music reproduction" and require runs in the 5,000-piece range, although his Otari system can handle up to 100,000 tapes per month. Not forgetting their short run clients, the Annex is now putting in a 16:1 1/2-inch bin loop system based on modified Ampex and GRT components.

The established cassette duplication firms have also been doing quite well, as a whole. Richard Berberian, president of IAN Communications in Wilmington, Massachusetts, reports his business is growing about 400 percent per year, and they have just added 5,000 square feet of space to their facility. IAN has now also expanded into floppy disk and video duplication and hopes to eventually offer CD mastering. One trend Berberian has noted is a greater awareness of quality on the part of his clients, who now usually bring tapes in with a full set of tones so the mastering deck can be aligned for the best reproduction. Another growing area is the use of digital masters for tape duplication, either brought in by the client, or made on the premises from the customer's two track analog master and copied on IAN's Nakamichi DMP 100 digital processor which uses the Sony FI format.

An increase in customer quality awareness has also been noted by John Campbell, a spokesman for Bonneville Media Communications (Salt Lake City, Utah), said to be the largest duplicator in a 12 state area. Two full-time quality control workers are kept busy monitoring the 40,000 tape/day output of Bonneville's Gauss system, and the acquisition of a Studer 1/2-inch mastering deck has attracted more music duplication business. The firm has also been offering a free "test cassette" (which Campbell says is the tape equivalent of a test pressing) so clients can determine any possible mastering changes before duplication. This service has been especially popular with their growing number of music duplication customers, who now comprise nearly 20 percent of Bonneville's clientele.

"Business is absolutely phenomenal!" says Duane Lundeen, president of Media International in Chicago, a high-speed duplication company which also has both 16 and 24 track recording studios. Lundeen says the outlook for the cassette industry is rosy, and he expects to triple his duplication business (currently at three to four million tapes per year) over the next twelve months. While most of the company's work is in the duplication of tapes for AV clients, they have been getting more and more music work of late from publishers and small labels, who usually request chrome (high bias) tapes.

## Master Digital: Diversity in Duplication

Staying at the forefront of digital audio applications and keeping pace with the industry have always been goals of Master Digital, a progressive company which started out as a real time cassette duplication facility and has now diversified into several other growth areas in the industry. The company, best known for their cassette work for audiophile labels, now offers videophile duplicating, Compact Disc master preparation, video and film production, location digital recording, complete packaging and promotional services, and pre-release cassettes for major record labels, such as CBS, RCA, Columbia, Capitol and Warners.

Paul Addis, Master Digital vice-president, sales, explained the process of producing the limited quantity, high quality pre-releases: "We're the first to get the masters, right after they are finished being mixed in the studio. We transfer them to 16-bit digital for duplication, and do the complete packaging and loading for the tapes, which are sent to A & R and promotion people for advanced airplay and other uses. These pre-release orders usually range from 300 to 1,000 pieces, depending on the act and the label."

While somewhat out of the realm of most duplication houses, Master Digital has also been active in putting together audio marketing packages for companies such as Kenwood car stereo, Maxell tape,

Saab automobiles, Sony auto sound and Radio Shack. These projects can be quite complex, involving music licensing, editing, packaging, and the creation of artwork, as well as providing quality real time duplication of the digital masters each project generates.

Master Digital's latest expansion is into the field of videophile duplication, handling either one-inch or 3/4-inch stereo masters to be duplicated onto Hi-Fi VHS and Beta tapes. Their present client list ranges from advertising agencies and record labels to film and video companies. Not surprisingly, the company has again taken their duplication capability one step further, as Addis explains: "We also do complete editing, assembly and duplication of hi-fi video products used in numerous dance clubs across the nation, including the Black Angus chain, Marriott Hotels, the Red Onion, and so forth. Every month, we select the top 15 to 30 music videos, and edit and assemble them together, adding computer-generated graphics for the heads and tails with the client's logo tag. It's almost like a monthly video magazine for them."

All of this activity has not only kept Master Digital busy, but also overcrowded, so two months ago they moved to a new location in Santa Monica, California which is four times larger. Addis summed up the secret of Master Digital's success in simple terms: "We stress the fact that we're a service company. We deliver what we say, we're state-of-the-art, and we do a good job. We're very diversified, and we try to think that we're fairly unique."

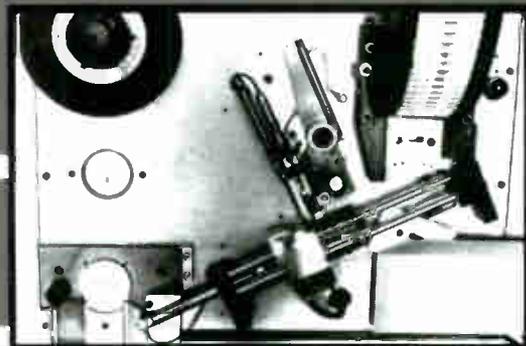
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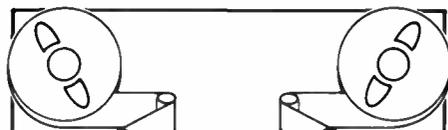
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The future for realtime duplicators also seems secure, according to Liv Khalsa of GRD in Phoenix, Arizona. His 175 recorders (mostly Denon with some Tascam) are kept busy twenty hours a day. Although real time duplication can outperform high-speed duplication systems, Khalsa is quick to point out that achieving optimum results can only be achieved by "being meticulous and constantly checking results. Real time is a very high maintenance business," he warns. "It's replacing 150 tape heads every four months, and you can't do real time right unless you're using three head machines."

William Schubart, president of Resolution (Burlington Vermont) believes his company may be the world's largest real time duplicator, with 400 customized NAD recorders available. Like Khalsa of GRD, Schubart says that quality is of the utmost importance, but added that "delivery means as much to clients as quality. When we are at capacity, we have a policy of turning away work. This gives our clients an exact shipping date we can stick to. Our clients can depend on that."

Imperial Tape, of Santa Monica, California, offers a variety of services, including both real time and high-speed duplicating, and sales of Sony in-cassette duplicators, but the main part of their business involves supplying custom length audio and video cassettes. Owner



*High speed duplication system at Bonneville Media.*

Howard Ganz is very concerned about the future of the duplication industry. "It's not a real healthy situation right now, because many people are more price rather than quality conscious. Duplicators need to spend more time with clients to educate them on the pros and cons so they can make an intelligent decision as to choices regarding tape and C-zeros. Duplicators would rather use a good tape like Agfa or BASF chrome, and cheap tapes aren't calendared (polished) as well and can be highly abrasive. This can hurt both the client and the duplicator in the long run. But I'm an eternal optimist. I feel there will always be clients—especially music oriented people—that appreciate quality, even though the financial pressures are on. It's disappointing when people don't look farther down the road." ■

## **Independent Cassette Releases— Putting It All Together**

by Diane Sward Rapaport

Sales of prerecorded cassette tapes have been increasing dramatically since 1976. According to the 1984-85 *Billboard International Buyers Guide*, shipments of prerecorded cassettes in 1976 totaled \$146 million and record shipments (both LPs and singles) close to \$2 billion. In 1982, record shipments were still close to the \$2 billion mark, but shipments of prerecorded tapes had risen to a total of \$1.4 billion. And that figure is still rising steadily. At the time of this writing, many chain record stores are beginning to claim that sales of pre-

recorded cassettes have overtaken record sales. Independent labels are also reporting major increases in the sales of prerecorded cassettes, and some have given figures as high as 25 to 35 percent of total sales. A new trend, cassette-only labels, is also rapidly emerging, and with it, magazines devoted to cassette releases alone.

The chief reason for this tremendous growth is increased consumer demand—a demand inextricably linked with the growth in sales and accessibility of cassette-playback equipment and improvements in the fidelity of cassette tapes. People wired to their headphones and portable cassette equipment are found jogging, boating, fishing, driving, hiking, bicycling—or working at their offices on their new personal computers.

At the same time, overall record sales are not showing commensurate increases. The reasons attributed to this include increased sales of prerecorded cassettes, the home taping of music from records or radio, bootlegging, and the appearance of the Compact Disc, which delivers audio excellence with the compactness, durability, and portability of the cassette. Deteriorating quality control in record manufacturing is also cited

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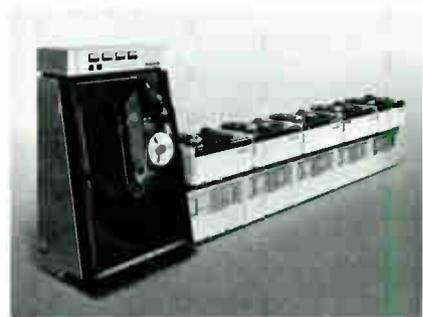
If you've been delivering marginal, 60's-quality cassettes to your customers, it's time to look at some new numbers for the 80's. Doubling the master speed means increased frequency response and dynamic range. It also means you can take full advantage of other new tape technologies: Extended range CRO<sub>2</sub> formulations and the Dolby\* HX Pro headroom extension process. Without these, you may soon find your customers looking elsewhere.

The DP-80 system offers other im-

pressive numbers too: 144 C-45 s/hour/ slave, 2800 C-45 s/hour with a 20 slave maximum. These are real-life figures from a machine built for the real world. You won't find any unnecessary bells and whistles on the DP-80, just solid features for day-in, day-out production:

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*The DP-80 Master Reproducer and Slave Recorders.*

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as an important reason.

The increase in sales of prerecorded cassettes has been good news for the independent. In almost all cases, the manufacture of cassettes is cheaper than that of records, thereby requiring less initial outlay of funds and increasing the possibility for profit. With cassettes, the independent isn't committed to producing a minimum run of 500 or 1,000 copies as is common for the manufacture of records; quantities of 50 or 100 cassettes can be cost effective and profitable.

### DUPLICATION PRICES

Prices for tape duplication have become extremely competitive. In 1982, real-time duplication was, without exception, double or triple the price of

high-speed duplication; the higher the speed ratio, the lower the price. And premium ferric tape was significantly cheaper than chrome.

In mid-1984, however, at least two duplication facilities offered lower prices for real-time than high-speed duplication. Prices for all ratios of high-speed duplication varied widely, and in a few cases, notably large centers of recording activity, salespeople in duplication facilities were unwilling to send out price lists and preferred that you tell them what you wanted so that they could make a bid, much as construction firms do. In quantity, premium ferric tape and chrome tape were only cents apart in price.

When researching prices, a good method is to call the duplicator and

ask for the sales representative. First describe the type of music you are reproducing in terms of its dynamic range and frequency range. You don't have to be technical: you can simply say, for example, that the music contains a lot of bass information or lots of cymbals and bells. Tell the person what type of master you are delivering (½ track; cassette, etc.), what the total running time is, and how many copies you want. Then ask the following questions:

► What kind of machines do you use for duplication?

► Do you use the in-cassette or bin-loop system?

► What type of tape would you normally use for my kind of music?

► At what speed are you duplicating (if not in real time)?

► At this speed, what are the tape's frequency response and dynamic range likely to be for my type of master?

► What type of noise reduction do you use?

► What is the price and what will it include?

If the sales rep can't answer these questions, ask to speak to a technical person or an engineer.

Here is a range of prices encountered in mid-1984 for 1,000 C-60 cassettes duplicated from a two-track master tape: Real Time, \$1.35-\$3.50; High speed (8:1), \$1.30-\$1.75; High speed (32:1 or 64:1), \$.90-\$1.50.

To add to the confusion, some prices include labels and boxes; some offer the added attraction of four-color two-panel inserts including color separations, and so on. Where a bin-loop system is used, most manufacturers will charge you a one-time fee for copying the material onto the bin-loop master.

### GRAPHICS AND PACKAGING

As with album covers, an attractively designed cassette package draws attention to itself and encourages sales. Poorly designed graphics lead to suspicions that the music may also be inferior.

The most common cassette package is a shrink-wrapped box containing a labeled cassette and a four-panel insert. The insert's front and back panels, visible through the box, contain the necessary information, while the reverse sides are commonly printed with supplementary information. More elaborate cassette packages contain six- or eight-panel inserts.

Another kind of cassette package is now finding its way into the market. The boxed cassette (with insert) is being repackaged in a transparent plastic bag, approximately 4-inches by 12-inches, which can be hung from a pegboard. The larger size enables the record company to include more materials, such as a flyer, business card, postcard order form, and so on.

## Electro Sound '84 Seminar: Quality is the Issue

During the latter part of August of this year, nearly 100 representatives from record labels, tape duplication firms, and manufacturers met for a seminar on cassette quality hosted by Electro Sound, a maker of high-speed duplicators. The two-day event, which was co-sponsored by Agfa-Gevaert, Athenia, BASF, Capitol Magnetic Products, Columbia Tape, Digital Entertainment Company, Dolby Labs, E.I. DuPont, Hercules, ICM, IPS, JRF, Pfizer, Saki, Shape, and Studer/Revox America, was organized by Electro Sound president Robert Barrone and focused on improvements in every aspect of the cassette medium, from tape particles to finished product.

Frank Diaz of Capitol Magnetics opened the "Magnetic Media" session with an explanation of the basics of tape manufacturing, covering options in base materials, magnetic coatings, binders, slitting and lubricants. Capitol's Joe Kempler talked about the company's new CS-1 duplication tape. Gerhardt Hartmann of Agfa-Gevaert stressed the need for material consistency by improving quality factors such as handling and personnel, and Klaus Goetz of BASF spoke of the advantages of using chrome tapes for bin masters. Donald Winqvist of Hercules explained the need to look at tape particles from a price/performance standpoint. John Hudson of DuPont spoke of the widespread acceptance of chrome tapes, and their future potential for computer, digital and other high density storage applications; and Alan Lundquist introduced Pfizer's 2040-D medium coercivity duplication tape.

Saki president Gene Sakasagawa opened the "Heads and Shells" ses-

sion with a discussion of tape head manufacturing, and announced Saki's new ferrite heads formulated for high-speed chrome and metal tape duplication. Rolf Sager of ICM Limited and Willaim Prechtel of IPS stressed the importance of using quality shells, especially under the forces of high speed loading and on-cassette printing.

The session on "Master Production" included Ken Gundry of Dolby Labs explaining how the Dolby HX system works with masters of various speeds; Fred Lane of Studer/Revox talking about the Studer A80-MR mastering deck; and Tore Nordahl of Digital Entertainment Company (Mitsubishi) noted the advantages of making bin masters directly from digital tapes. He added that the future possibilities of high speed digital bin masters are still a long way off, although the DAT (Digital Audio Tape) cassette is a much more likely possibility in the next few years.

The "Electro Sound Approach" session included speakers from that company's engineering staff: Bob Wortsman emphasized the need for more industry-wide standards and better quality control; Clark McCoy focused on the need for regular maintenance, explaining how a small investment in the proper test gear can really pay off; and Robert Langevin spoke of the technical problems of developing a system with a duplication ratio of above 64:1.

The final session, held on the second day, featured audio consultant Mike Jones on "Future Directions" of the duplication industry. Here, a lot of the points of the first day's session were brought up, but with an outlook towards how tomorrow's duplicators could benefit from them. One of Jones' concluding points was to reiterate the need for quality control, especially in light of digital audio's effect on raising consumers' awareness of audio quality. ■

Just because a cassette insert is smaller than an album cover doesn't mean it will cost less to design. Creating effective graphics on a small scale makes challenging demands on a designer's skill: he or she has much less space in which to deliver a potent message. As a result, you can expect to pay the equivalent of album cover design prices to achieve good results.

You can help your graphic designer greatly by providing at the very beginning all the words to be included in your package. The graphic designer will have to design, size, and integrate the words aesthetically to make the information easy to find and read.

You can also help your graphic designer by asking the firm that will be printing the inserts to provide him or her with the layout specifications. This will ensure that the artwork is properly sized for printing.

The following checklists of information are labeled mandatory for information that must be included on your cassette package, and optional for supplementary information that can be included when and if you feel you have the extra room.

#### Cassette Label: Mandatory

- ▶ Cassette title
- ▶ Your name (or your group's) if different from the title
- ▶ Record company name
- ▶ Record company logo
- ▶ The letters "A" and "B" or the words "Side One" and "Side Two"
- ▶ Tape playback information: type of tape; EQ setting required if different from that normally associated with the type of tape used; type of noise reduction used, if any; stereo or mono indication. Example: "High Bias Chrome, 120 EQ, Dolby, Stereo."
- ▶ Copyright notice for the songs
- ▶ Copyright notice for the cassette
- ▶ ASCAP or BMI affiliation

#### Cassette Label: Optional

- ▶ Song titles in sequence
- ▶ Lengths of songs
- ▶ Total length of playing side
- ▶ Address of record company
- ▶ Name(s) of song publisher(s)

#### Cassette Insert: Mandatory

- ▶ Front cover: Cassette title; your name (or your group's) if different from title.
- ▶ Spine: Cassette title; your name (or your group's) if different from title; name or logo of record company; cassette catalog number.
- ▶ Back cover (and/or reverse of panels): Song titles; sequence of songs; name(s) of composers; name(s) of publishers(s); names of primary musicians and instruments played; copyright notices for the songs; copyright notice for the cassette; copyright notice for the cover design;

ASCAP or BMI affiliation; tape playback information.

#### Cassette Insert: Optional

- ▶ Name and mailing address of your label (although this is not mandatory, it is extremely important if you are an independent)
- ▶ Mail order price
- ▶ Credits for other musicians, vocalists, producer, engineer, arranger, graphic designer, photographer, illustrator, recording studio, manufacturer, printer
- ▶ Biographical material or information about the music, lyrics and musicians
- ▶ Lyric sheets
- ▶ Other records or books you might have for sale
- ▶ Mail order form
- ▶ Cassette dedication or special thanks

Fortunately, in contrast to design prices, the cassette's smaller format does mean lower printing costs for cassette labels and inserts compared with album covers. Generally speaking, the majority of cassette-duplication firms usually quote duplication prices that include label printing (one color only) and the box (but not shrinkwrapping). Some firms also include the printing for a two-panel insert with color on the front and black and white on the back. Here are some average prices when printing prices are quoted separately.

- ▶ Cassette labels (one color): 10 cents label/side
- ▶ Shrinkwrap: 7 cents/box
- ▶ Inserts (black and white): \$90 to \$125 per 1,000

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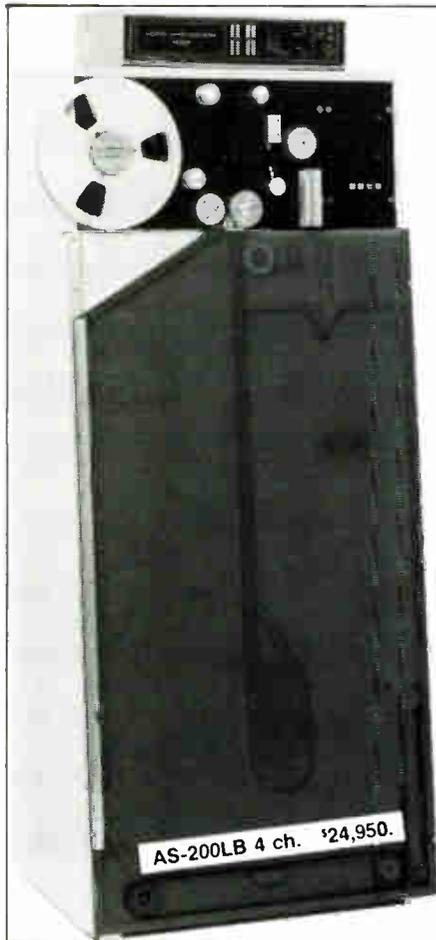


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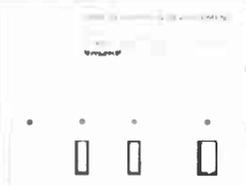
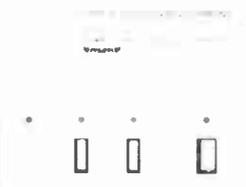
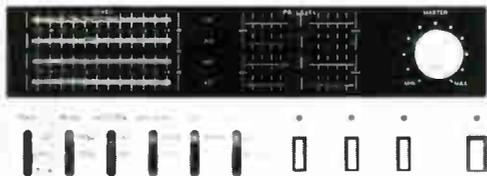
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► Inserts (full color front, black and white back, includes color separation): \$300 to \$350 per 1,000

Assembling inserts and cassettes into boxes is usually included in the price for printing and/or duplication.

Because pricing and services are highly competitive, be sure you are clear about what you will be paying for. A good method for asking for printing price quotations is first to describe the desired quantity, color, and size of insert, and then to ask the following questions:

#### Black and White

(or one-, two, or three-color printing)

- Price per thousand?
- Charge for half-tones (black-and-white photographs that need to be converted for printing)?
- Charge for additional ink colors?
- Charge for set-up, if any?

#### Full Color

- Price per thousand?
- Price for color separations and/or stripping?
- Additional charges?

As with the duplication of the tape, request samples of printing, particularly if you are printing in full color.

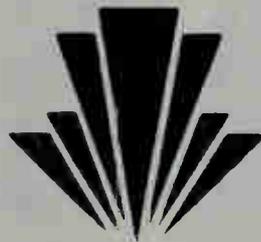
#### PRODUCT PRICING

Most independent cassettes are priced according to the length of the music, the amount of money spent for both recording and duplication, the type of tape, and the target market. At the time of this writing, most major record labels are asking that 45-minute cassettes retail for \$8.98. This is the standard against which you will be competing. Remember: you, not the retail store, decide on the retail price.

As an incentive for both the store and the consumer to buy, some independents sell cassettes to stores at slightly below the price commonly asked by distributors. They also use the lower prices to bargain for key display space or in-store play of the music.

Once you have set your retail price, the next step is to decide what your store wholesale price will be when you sell to record stores directly, and at what price you will sell to distributors. At this time, most distributors sell to stores at approximately 55 to 65 percent of the retail list price (or between \$4.75 and \$6.00). Distributors buy from record companies at approximately 25 to 40 percent of the retail list price (or between \$2.30 and \$3.50).

*The preceding article is an excerpt from the revised and expanded fourth edition of How to Make and Sell Your Own Record by Diane Sward Rapaport. The book is available through Mix Bookshelf (see page 119), or at your local book or music store. ■*



AWARD

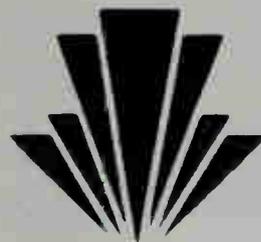
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# ALBUMS CASSETTES & CDS

## RECORD LABELS STRUGGLE TO KEEP UP IN AN AGE OF CHANGE

by Blair Jackson

When the great prognosticators first looked into their crystal balls several years ago and saw the eventual demise of the phonograph record, many people were skeptical. After all, virtually everyone owned records of some sort and, of course, the music business economy, based on these slabs of polyvinyl chloride, had mushroomed into a multi-billion dollar business. Cassettes were still considerably inferior to albums and weren't seen as much of a threat to the conventional LP, and the Compact Disc—with its technology involving digital recording and lasers—seemed like the stuff of science fiction to most, strictly James Bond stuff. The LP's only serious threat in the late '60s and early '70s—the eight track cartridge—died a slow, painful death, no doubt convincing many of the invincibility of the record.

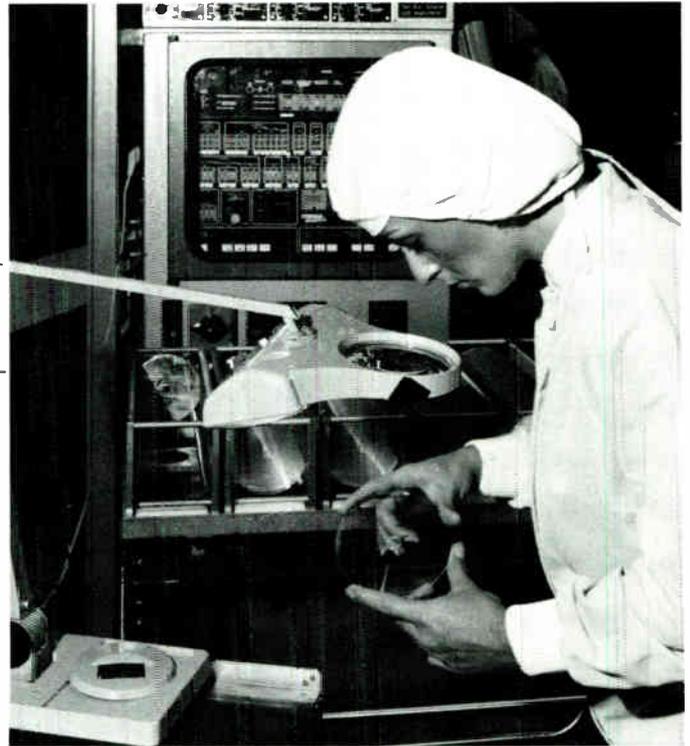
But in the last few years a number of factors have conspired to strip the

*Cassette loading operator at Bonneville Communications, Salt Lake City*



plastic record of its once supreme position. Cassettes and cassette decks (for both home and car) have improved dramatically and dropped in price while records have become more expensive and, many would argue, the number of defective disks has increased. Fifteen years ago, the record industry did not really foresee the time when most cars would be equipped (either at the factory or subsequently) with cassette players, surely a major factor in the cassette's ascendancy. And, too, the personal cassette player craze has shown no signs of abating a couple of years after the introduction of Sony's Walkman player. In a mobile culture, portability is a premium, and in that regard the conventional record has nothing to offer, relegated as it must be to the living rooms, bedrooms and basements of America. And while the Compact Disc is still in its relative infancy, there seems to be little question that its impact on the music business will be enormous and long lasting. Now, when experts like Emiel Petrone say "The black vinyl business will be no business soon" (see interview in this issue) it's time to start taking the issue of the record's eventual extinction seriously.

Record companies have seen the handwriting on the wall for a number of years, mainly because they've had to. They've seen cassette sales jump year after year. This year alone, the RIAA reported that for the first six months of '84, cassette sales jumped an unprecedented 36 percent in dollar volume, while LP sales declined about 6 percent. There are now numerous artists who sell more cassettes than albums, and it's expected that the next several years will see CDs finally making a significant statistical dent



*An inspection point at the injection compression machine in Polygram's Compact Disc plant in Hanover/Langenhagen, West Germany.*

in both cassette and album figures. This is a wide open time in the record business, to put it mildly. Recently, we spoke with representatives from Warner Bros., Columbia and the independent fusion label GRP to find out about some of the trends they're seeing in this area, and to learn about how the companies keep up with the ever-shifting patterns of sales.

Warner Bros. Records is currently enjoying a banner year, after a bit of rough sledding the past couple of years. Two of the best selling records of the year are on Warners, Van Halen's *1984* and the smash, Prince's *Purple Rain*. According to Warners, both records are selling better as cassettes currently than albums. This is no surprise in the case of Van Halen, as heavy metal fans have long preferred cassettes by a small, but significant statistical edge. (You can't blast an album out of your Trans Am.)

According to Lou Dennis, vice president of sales for Warner Bros., the business of deciding how many records to press versus cassettes to manufacture has evolved into a meticulous science. "It's hard to predict in advance," he says. "We look at past sales history on an act, but that won't tell you everything. Many acts are now selling 1:1 albums to cassettes. Prince sells more cassettes. For our ECM line, we sell more albums than cassettes, but the ratio is getting smaller. Pat Metheny, for example, now sells 3:1, albums to cassettes. He's very

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World Radio History

popular. Someone like Jack DeJonette, who doesn't have quite the following, is still mainly albums.

"The record business is not a formula business, despite what you may hear. You can't predict what will be a regional hit a lot of times. When we have an album coming out, we send out suggested initial orders for albums and cassettes to our branches and then they can raise it or lower it, depending on the specifics of their market. You have to stay loose about it. One record may be happening in Detroit but not in New York. Madonna broke in New York, then became a hit on the West Coast, but it was quite a while before she sold *anything* in the Midwest. Then you'll find that record that's popular in Omaha and they don't care about it in New York."

And then there's the problem that companies dream about: having a record that is so successful that everyone has to work overtime just to keep up with the demand. Such was the case with *Purple Rain*. Over at Columbia, that might have happened with Bruce Springsteen's blockbuster *Born in the USA*, but Springsteen's LP was a sure-fire hit and so the company was ready, a good thing since it sold more than a million albums and cassettes in its first week of release.

Because home taping is still a

### Preparing record blanks at Transco in Linden, New Jersey.

significant factor cutting into sales of records, increasingly bands and their labels are offering buyers incentives to purchase the pre-recorded cassette of a record (rather than a blank and then taping a friend's record) by including material that doesn't appear on the LP. In the case of the new Talking Heads live album, *Stop Making Sense*, for instance, several of the songs on the cassette are longer than the album versions. But according to Dennis, "So far we can't find too much effect. The ratio of albums to cassettes has stayed about the same, which is not quite 1:1. It's the same with the Pretenders."

Warners has moved somewhat tentatively in the area of CDs, though they have two of the medium's hottest releases, *Purple Rain*, which has sold well over 15,000 (miniscule compared to the millions of cassettes and albums) and Fleetwood Mac's *Rumours*, which has now shown legs as an audiophile record and a CD seven years after its release. According to Dennis, Warner Bros. is making its decision of what to put on CD "through a combination of the act's



potential and, really, whether the sound of the record lends itself to that." And that's why an artist like Rickie Lee Jones, who makes records of incredible clarity and definition is ideally suited to CD, even though her album sales don't compare with Warners stalwarts like ZZ Top and Van Halen. RCA Records has shown its commitment to the new technology by offering to pay extra money for many ar-

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tists to record digitally, so that the end product will be better suited to eventual release as a CD. That, of course, is good news for digitally equipped studios, too.

At New York-based GRP Records, an independent label (once affiliated with Arista) that specializes in fusion jazz, label founders Larry Rosen and David Grusin (himself a popular recording artist and film scorer) have seen the future of the business and they believe it is the CD. They have converted much of their past product of the label to CD, and now all of their releases come out simultaneously as a record, cassette and CD. (In addition, GRP recently signed an agreement with Nakamichi licensing the Japanese giant to release some GRP titles as audiophile cassettes. "These are absolutely the finest cassettes available," Rosen crows.)

"The kind of product we're making," Rosen says, "is perfect for Compact Disc because you've got a whole body of listeners who like and have actually come to expect, state-of-the-art sound. We've been recording almost everything digitally for the last five years. Jazz is perfect for CD because it takes advantage of the dynamic range and the quiet passages so beautifully. With rock and roll, if you have clicks here and there and a little noise on the record, most people don't even notice. But in a lot of jazz, which can be very open sounding, you have to have that clean background, and CD is as clean as it gets. I'm a firm believer in the Compact Disc. I just can't imagine that it's not the wave of the future."

Rosen says that many of the GRP's releases have fared well as CDs, noting that their Glenn Miller *In the Digital Mood* CD is second only to Michael Jackson's *Thriller* in CD sales domestically. Rosen says that for most of their artists they'll produce relatively few CDs initially, but on recent releases by Grusin and Dave Valentin, the company ordered 4,000 and 7,000 respectively. GRP uses three CD plants to fill their orders, the CBS/Sony plant in Terre Haute, Indiana, and Sanyo and JVC operations in Japan.

Rosen bubbles with enthusiasm for the CD, noting that new Sony players for cars and the imminent introduction of Walkman-style CD players will help open up the blossoming CD market. "When the consumer goes and buys an analog record and then transfers it to cassette at home to play in their car, they're going to be spending as much or more than if they bought a CD for \$12.98, which could then be played on CD players at home, or in their car, or jogging around. It's really getting exciting."

Bob Altschuler, vice president of press relations at Columbia, and also a big booster of CDs, says that CBS is necessarily more cautious in its CD release

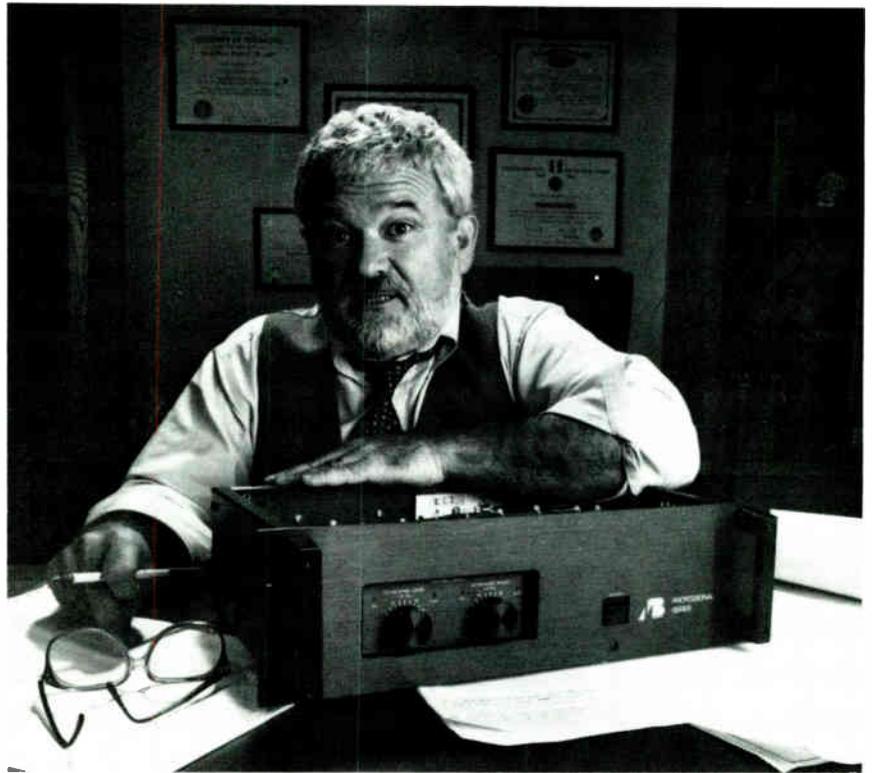
schedule. "Sales for even the most popular CDs are still very, very small by record standards," he notes, "so it's really not feasible for a company with as many acts as we have to spend the money on every single title to have it mastered for CD format. Really, the public will determine how many records we see come out as CDs by their acceptance of it."

"I'm quite optimistic. I'm a real CD aficionado, with more than 500 of them myself, mainly jazz and classical. One good sign is that the other day I was in my favorite record store [in midtown Manhattan] and there was actually a line of people waiting to go through the CD section! That tells me that the acceptance is increasing."

Altschuler remarks that Columbia, too, is finding that cassette sales are

way up, even in traditionally LP-heavy areas like jazz and classical. "Everyone's making better cassettes than they used to, and certainly there's more good cassette playback equipment available now than there ever has been before." Still, Altschuler isn't willing to seal the vinyl disk in a coffin yet.

"People still love albums, I think. When a new record comes out, we've found that in many cases, the initial sales are dominated by record buyers and that it's the second, third and fourth wave of buyers who push the percentage of cassettes so high. An album is still more of a collector's item, with the big graphics and all. A cassette is a convenient little carrier but it just doesn't have the mystique of the LP. I'm sure the LP will be here for *many* years to come." ■



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130 West 42nd Street (Room 552), New York, NY 10036  
(212) 221-6627  
Contact: Fred Vargas, owner

**ALPHA RECORDS, INC.**  
PRESSING  
1400 N.W. 65th Ave., Plantation, FL 33313 or  
PO Box 15011, Ft. Lauderdale, FL 33318  
(305) 587-6011  
Contact: Dick Smith, president

**AMERICAN MULTIMEDIA, INC.**  
MASTERING & TAPE DUPLICATION  
Rt. 8, Box 215-A, Tucker Street Ext.  
Burlington, NC 27215  
(919) 229-5559  
Contact: Tim Mallard, plant manager

**MASTERING**  
Tape machines: JVC Digital; Otari; Studer; Ampex  
Monitor speakers: UREI 813, JBL 4430  
Signal processing: Aphex; EXR; Prime Time, Super Prime Time,  
224, 224X

Engineers: Several  
Rates: Call for quotes  
Credits: Upon inquiry  
Other services: Complete video production, multi-track mix-downs, Grass Valley Digital Video Editor, Chyron Graphics Generator, complete assortment of UREI, ORBAN, dbx Processors.

**TAPE DUPLICATION**  
Duplicator: Electro Sound 8000, Gauss, Otari, total 107 slaves  
Capacity: 10,000 per hour  
Method of duplication: Bin loop  
Mastering equipment: JVC Digital; Sony 1610; dbx 700; Sony PCM-F1; Studer A80, Otari MTR 10, Ampex ATR 100  
Tape used: Upon customer request  
Shell used: Upon customer request  
Duplicating speed: 32 1, 64 1, 128 1  
Type of loading: 36 King 790 types  
Packaging availability/Fulfillment services: (4) complete 11-seman packaging lines, (4) Apex printers  
Rates: Please call  
Other services: Complete in-house printing facilities with (4) Heidelberg six color presses

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TAPE DUPLICATION  
307 W. Main St., PO Box 14, Maple Shade, NJ 08052  
(609) 667-1667  
Contact: Gerald Tyson, vice president

**ANGEL SOUND, INC.**  
TAPE DUPLICATION  
1576 Broadway, New York, NY 10036  
(212) 765-7460  
Contact: Sandy Sandoval, president

**APEXTON RECORD MFG. CORP.**  
PRESSING, MASTERING, TAPE DUPLICATION  
44-27 Purves St., L.I.C., NY 11101  
(212) 937-4038  
Contact: Derek Ropiak, manager

**APON RECORD COMPANY, INC.**  
MASTERING, PRESSING & TAPE DUPLICATION  
P.O. Box 3082 Steinway Station  
Long Island City, NY 11103  
(212) 721-5599  
Contact: Andrew Poncis, manager

**PAT APPLESON STUDIOS, INC.**  
TAPE DUPLICATION  
1000 NW 159 Dr., Miami, FL 33169  
(305) 625-4435  
Contact: Pat Appleson, president

**ASR RECORDING SERVICES, INC.**  
TAPE DUPLICATION  
21 Harristown Rd., Glen Rock, NJ 07452  
(201) 652-5600  
Contact: Larry Block, vice president sales

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Contact: D. Richard Kraus, president

**AUDIO CRAFT CO.**  
MASTERING, TAPE DUPLICATION  
2701 E. Sunrise Blvd., Suite 401  
Ft. Lauderdale, FL 33304  
(305) 563-0553, Toll Free 1-800-432-0405 (FL.)  
Contact: Joe Smith or Mark Auld, managers

#### MASTERING

Tape machines: Nakamichi digital processing, Otari, Revox, Technics  
Signal processing: EXR, Burwen, UREI, Orban, dbx, Dolby, Symetrix, Thompson, Techniques, Crown  
Engineers: Mark Auld  
Rates: Upon request  
**TAPE DUPLICATION**  
Duplicator: TEAC, MCI, Sony, Reel-time Duplication, bin-loop  
Capacity: Growing  
Method of duplication: Cassette, bin loop  
Tape used: Agfa, 1612 BASF, Chrome  
Shell used: Magnetic Media  
Duplicating speed: 1-7.8-64 1  
Type of loading: King  
Packaging equipment/Fulfillment services: Yes  
Rates: Upon request  
Other services: Video Duplication, VHS & Beta Hi-Fi Duplication

**AUDIO DIGITAL INC**  
(DIV. STUDIO MAGNETICS GROUP)  
TAPE DUPLICATION  
12 Long Island Avenue, Holtsville, NY 11742  
(516) 289-3033  
Contact: Paul Glantzmar, sales manager

**AUDIO DUPLICATING SERVICE**  
TAPE DUPLICATION  
915 NE 3rd Avenue, Fort Lauderdale, FL 33304  
(305) 764-0333  
Contact: Jody Clawson, production Manager.

**AUDIO MATRIX, INC.**  
MASTERING  
915 Westchester Ave., The Bronx, NY 10459  
(212) 589-3500  
Contact: Robert Stillman, service manager

**AUDIO VISUAL COMMUNICATIONS INC.**  
MASTERING, TAPE DUPLICATION  
435 Crooked Lane, King of Prussia, PA 19406  
(215) 272-8500  
Contact: Frank Matys, production manager

**BEE-VEE SOUND, INC.**  
TAPE DUPLICATION  
211 East 43rd Street, New York, NY 10017  
(212) 949-9170  
Contact: Bruno Vines, owner

**BELL & HOWELL**  
COLUMBIA PICTURES VIDEO SERVICES  
TAPE DUPLICATION  
505 Fifth Avenue, Suite 600, New York, NY 10017  
(212) 697-7355  
Contact: David C. Cuyler, vice president, entertainment sales

**BESTWAY GROUP (Peerless Audiophile Div.)**  
MASTERING & PRESSING  
1105 Globe Ave., Mountainside, NJ 07092  
(201) 232-8383  
Contact: Paul Stevens

**BURLINGTON AUDIO TAPES**  
TAPE DUPLICATION  
106 Mott St., Oceanside, NY 11572  
(516) 678-4414  
Contact: David Schwartz, director of marketing

**CASSETTE CONNECTION**  
TAPE DUPLICATION  
41 Music Square East, Nashville, TN 37203  
(615) 248-3131  
Contact: Karen Irby

**CASSETTE PRODUCTIONS, INC.**  
TAPE DUPLICATION  
109 Prospect Place, Hilldale, NJ 07642  
(201) 666-3300  
Contact: Julius A. Konins, President, Wendy M. Konins, Vice President, Kevin Yatarola, General Manager, Paul Anteparo, Plant Manager  
**TAPE DUPLICATION**  
Duplicator: 6 custom-designed Dubbings high speed duplicators with 14 slaves each  
Capacity: 100,000/wk  
Method of duplication: Bin loop  
Mastering equipment: Ampex  
Tape used: BASF CrO2, BASF LHD and Ampex 406/407  
Shell used: Various  
Duplicating speed: 16 1, 31, 11

Type of loading: King 790, TTL  
Packaging availability/Fulfillment services: All forms.  
Rates: Write for price list.  
Other services: Mastering from digital source (PCM-F1)

**CENTRAL AUDIO VISUAL, INC.**  
TAPE DUPLICATION, MASTERING  
1212 South Andrews Ave., Ft. Lauderdale, FL 33316  
(305) 522-3796, FL Toll Free 1-800-432-3756  
Contact: Sheila Henderson, marketing director

**DICK CHARLES RECORDING**  
MASTERING & TAPE DUPLICATION  
130 West 42nd Street, New York, NY 10036  
(212) 819-0920  
Contact: Dick Charles, president

**COMMERCIAL AUDIO**  
TAPE DUPLICATION  
77 South Witchduck Road, Virginia Beach, VA 23462  
(804) 497-6506  
Contact: Alan Sawyer, manager

**COOK LABORATORIES, INC.**  
MASTERING, PRESSING & TAPE DUPLICATION  
375 Ely Ave., Norwalk, CT 06854  
(203) 853-3641  
Contact: Emory G. Cook, president

**CREST RECORDS, INC. & GOLDEN CREST RECORDS, INC.**  
MASTERING, PRESSING & TAPE DUPLICATION  
220 Broadway, Huntington Station, NY 11746  
(516) 423-7090  
Contact: Mack Wolfson, vice president

**CRYSTAL CITY TAPE DUPLICATORS, INC.**  
TAPE DUPLICATION  
48 Stewart Ave., Huntington, NY 11743  
(516) 421-0222  
Contact: Frank Russo, president  
TAPE DUPLICATION  
Duplicator: Otari DP7500 bin loop system.  
Capacity: 12,000 pieces per shift, per day  
Method of duplication: In cassette, bin loop  
Mastering equipment: Otari MTR-12 2-track; Otari MTR-10 4-track, with Dolby HX  
Tape used: CBS.  
Shell used: Data Packaging, IPS.  
Duplicating speed: 16:1, 32:1, 64:1  
Type of loading: King, Electro Sound.  
Packaging availability/Fulfillment services: Shrink wrap, custom packaging.  
Rates: Please call for rates.  
Other services: Apex on-cassette printing; cassette labels, inserts; specialists in computer software duplication

**CUE RECORDINGS, INC.**  
MASTERING, PRESSING & TAPE DUPLICATION  
1156 Avenue of the Americas, New York, NY 10036  
(212) 921-9221  
Contact: Mel Kaiser, president  
TAPE DUPLICATION  
Duplicator: ElectroSound (5)  
Method of duplication: Bin loop.  
Mastering equipment: Scully  
Tape used: Columbia  
Shell used: Sonic seal and screw type.  
Duplicating speed: 120 ips  
Type of loading: ElectroSound 1800.  
Packaging availability/Fulfillment services: Full packaging  
Other services: Custom duplicating in Manhattan

**CUSTOM RECORDING & SOUND, INC.**  
TAPE DUPLICATION  
1225 Pendleton St., Greenville, SC 29610  
(803) 269-5018  
Contact: Jere Davis, general manager

**THE CUTTING EDGE**  
MASTERING, PRESSING & TAPE DUPLICATION  
P.O. Box 217, Ferndale, NY 12734  
(914) 292-5965  
Contact: Paul Gerry, owner and chief cutting engineer.  
MASTERING  
Cutting lathes: Scully Lathe with Westrex 3DII Cutterhead; Ranstelee Audio 250 watt per channel cutting amps; video monitoring.  
Console: Custom-built, suited for direct to disk  
Tape machines: Ampex 351 specially modified for tape to disk transfer.

Monitor speakers: JBL 4311's, Auratone, Altec Voice of The Theatre.

Signal processing: Fairchild 670 compressor; Ashly Parametric EQ, Graphic EQ, Pultec EQ, UREI 1176N, Dolby A&B, dbx I and II and Apex Exciter, Symetrix Noise Reduction, UREI 550 Filter, Fairchild Conax HFL, & other misc. outboard gear.

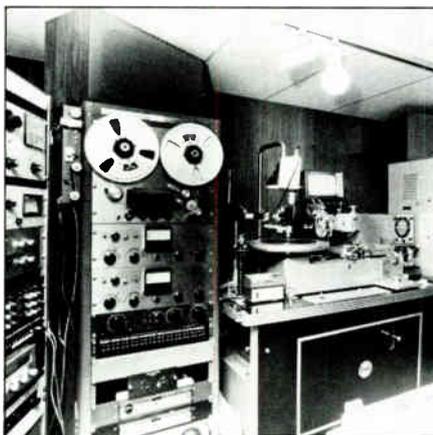
Engineers: Paul Gerry  
Rates: 12" \$90/side, 7" \$40/side, client attendance \$65.00 per hour, other services available—write for free brochure.

Credits: List available on request  
Other services: Direct to disc, plating, pressing, tape duplicating, sleeve and jacket production

**PRESSING**  
Presses (Mfg. and quantity): All 12" production is audiophile quality by an outside facility if needed

Rates: On request—also included in brochure  
Other services: Labels, design, and jacket production, printed sleeves—7" and 12"

**TAPE DUPLICATION**  
Rates: On request—also included in brochure.  
Other services: Packaging, and art work, label and insert design



THE CUTTING EDGE  
Ferndale, NY

**DEE-BEE RECORDING SERVICE**  
TAPE DUPLICATION  
704 9th Avenue, South, Myrtle Beach, SC 29577  
(803) 448-8091  
Contact: Stan Deppen/Pat Gerrick, partners

**DELTA RECORDING CORP**  
TAPE DUPLICATION  
16 W. 46th St., New York, NY 10036  
(212) 840-1350  
Contact: J.P. Clemente, Grand Clone Master

**DISC COMMUNICATIONS LTD.**  
MASTERING, PRESSING & TAPE DUPLICATION  
1776 Broadway, New York, NY 10022  
(212) 246-6696  
Contact: Jerry Rendich

**DISKMAKERS, INC.**  
PRESSING & TAPE DUPLICATION  
925 N. 3rd St., Philadelphia, PA 19123  
(215) 627-2277  
Contact: Paul Deny, General Manager

**PRESSING**  
Presses (Mfg. and quantity): 10 presses Tracey-Val.  
Capacity: 80,000 wk  
Vinyl used: Keser and Lenahan  
Rates: Write for price list

Other services: Mastering, plating and labels  
**TAPE DUPLICATION**  
Duplicator: ElectroSound 10 slave.  
Capacity: 30,000/wk

Method of duplication: Bin loop.  
Mastering equipment: Scully and Ampex.  
Tape used: CBS and AGFA  
Shell used: Shape  
Duplicating speed: 16:1

Type of loading: King  
Packaging availability/Fulfillment services: All types  
Rates: Write for price list.  
Other services: Labels and insert cards

**DYNAMIC RECORDING**  
PRESSING & TAPE DUPLICATION  
2846 Dewey Ave., Rochester, NY 14616  
(716) 621-6270  
Contact: Dave Kaspersan, owner

**EASTERN STANDARD PRODUCTIONS, INC.**  
TAPE DUPLICATION  
26 Baxter St., Buffalo, NY 14207  
(716) 876-1454  
Contact: Mark S. Mekker, vice president

**EUROPADISK, LTD.**  
PRESSING  
75 Varick St., New York, NY 10013  
(212) 226-4401; TWX 710 581 2034  
Contact: Wolf Hutson, production manager  
**PRESSING**  
Presses (Mfg. and quantity): Two Hamilton automatics; three Toolex-Alpha automatics  
Capacity: 12,000 LP's per day.  
Vinyl used: Teldec (imported from Germany)  
Rates: Three types available: Ultimate Audiophile, Audiophile, and Europa-Classical. Prices range from 59c to \$1.2; depending on type and quantity.  
Credits: All RCA digital and 5 Series; Moss Music Group digital Telarc; Vanguard Digital; CRI; Musical Heritage digital; the Franklin Mint (classical product).  
Other services: Central plating, internationally renowned, audiophile quality.



EVA-TONE INC.  
Clearwater, FL

**EVA-TONE INC.**  
MASTERING, PRESSING & TAPE DUPLICATION  
P.O. Box 7020, Clearwater, FL 33518  
(813) 577-7000, call 1-800-EVA-TONE  
Contact: James Dunne, vice president marketing/sales

**EXECUTIVE RECORDING LTD.**  
MASTERING  
300 W. 55th St., New York, NY 10019  
(212) 247-7434  
Contact: Gene Sayet, the boss

**FORGE RECORDING STUDIOS, INC.**  
TAPE DUPLICATION  
P.O. Box 861, Valley Forge, PA 19481  
119 Great Valley Parkway, Malvern, PA 19355  
(215) 935-1422 or 644-3266  
Contact: Warren R. Wilson, president

**MASTERING**  
Machines: Ampex ATR-104; Scully, 3M 8 track 1" Console: Audionics.  
Tape machines: Ampex ATR 102 ¼" & ½"  
Monitor speakers: JBL.  
Signal processing: Valley People noise gates; Graphic EQ; AKG reverb; all type noise reduction, dbx limiters.  
Engineers: W.R. Wilson  
Rates: \$35/hour plus tape-reel & box.  
Other services: Label printing and packaging.

**TAPE DUPLICATION**  
Duplicator: 2-MTI  
Capacity: \$10,000 per day.  
Method of duplication: Bin loop 64:1, 32:1 ½".  
Tape used: AGFA, Ampex, CBS, BASF, Mag Media.  
Shell used: Mag Media, IPS, Elmar, MTI, Shape  
Duplicating speed: 64:1, 32:1.  
Type of loading: King 790.  
Packaging equipment/Fulfillment services: All packaging and drop shipping services.  
Rates: Upon request.



**tape duplicator** \ 'tāp \ 'd  
(y)ü-pli-, kāt-ər \ *n*:

**1** : a machine for making copies of audio material on magnetic tape **2** : look under **Magnifax** for a complete description of what such a machine should be.

**WE WRITE THE BOOK ON DUPLICATORS**

**magnifax**

International, Inc.

Route 1, Box 764 Rogers, AR 72756 USA Phone (501) 925 1818

—PAGE 70

Type of loading: Semi automatic and fully automatic (Otan DP2700 & King 790)

Packaging availability/Fulfillment services: Automatic labeler/graphic at & printing

Rates: Upon request, please call.

Other services: Complete studio production available for recording, editing, and creating the original program material. Special packaging (binders, mailing containers, etc.) Mailing service available.



**GEORGE HEID PRODUCTIONS**  
701 WASHINGTON ROAD  
PITTSBURGH, PA 15228

GEORGE HEID PRODUCTIONS  
Pittsburgh, PA

HMC PRODUCTIONS  
5457 Monroe Rd., Charlotte, NC 28212  
(704) 536-0424  
Contact: Hank Poole, chief engineer

**EUROPADISK LTD.**

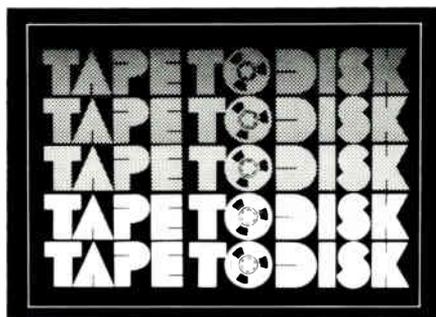
**CUSTOM RECORD PRESSINGS**

**AUDIOPHILE QUALITY AT COMMERCIAL PRICES:**  
AS LOW AS **59¢** FOR TELDEC,  
IMPORTED GERMAN VINYL  
PRESSINGS MADE IN OUR  
STATE-OF-THE-ART  
EUROPEAN EQUIPPED PLANT.  
TOOLEX-ALPHA PRESSES  
AND EUROPAFILM PLATING.

CALL FOR OUR BROCHURE  
AND 'WHO'S WHO' CLIENT LIST.

Europadisk Ltd.,  
(212) 226-4401  
75 Varick St.,  
New York, NY 10013

Circle #039 on Reader Service Card



Listings of Mastering, Pressing and Tape  
Duplication Facilities Throughout the  
United States

## Eastern

HUB-SERVALL RECORD MFG. CORPORATION  
Cranbury-South River Road, Cranbury, NJ 08512  
(609) 655-2166

Contact: Barry Ruegg, vice president sales; Jean Stembel,  
director customer relations

### PRESSING

Presses (Mfg. and quantity): (11) 12" Tracy-Val Presses with  
Hamilton Automation, (7) 7" Automatic.

Capacity: 25,000 per day for 12", 20,000 for 7"

Vinyl used: Keyson, Vitec

Rates: Upon request.

Credits: Arista, JEM/Passport, Savoy, SON, Shanachie, Musical  
Heritage, Capitol, RCA, Bruno Dean, Moss Music, Pickwick, Col-  
umbia.

Other services: Plating, jackets, labels, DJ services, distributor  
shipping

AUDIO, VIDEO, COMPUTER PRODUCTS & SERVICES

IAN COMMUNICATIONS GROUP, INC.  
Wilmington, MA

IAN COMMUNICATIONS GROUP, INC.

### TAPE DUPLICATION

10 Upton Drive, Wilmington, MA 01887  
(617) 658-3700

Contact: Richard Berberan, president

### TAPE DUPLICATION

Duplicator: Otan DP-7000 system; Dolby HX-PRO.

Capacity: 8,000 units per day.

Mastering equipment: Otan MTR-10-4; Otan MTR-10-2;  
Nakamichi DMP-100 digital.

Tape used: AGFA 611, 619, 612 Magnette, 627 Chrome;  
BASF PRO-II Chrome

Shell used: IPS and Shape.

Duplicating speed: 32:1 and 64:1

Type of loading: AVA 2001 computerized loader

Packaging equipment/fulfillment services: Fully automated  
labeling, boxing, cartoning, shrink wrapping, drop shipping and  
warehousing

Rates: Quotation for larger run, rate card for small run (up to  
5,000 units)

Other services: In-house graphics/typesetting and color print  
shop for labels and inserts. Wholesale blank audio and video  
cassettes, custom lengths. New England's largest distributor of  
AGFA mastering and cassette tapes. Catalog on request.

INNER CITY COMMUNICATIONS

### TAPE DUPLICATION

52 Midwood Street, Brooklyn, NY 11225

(212) 469-1655

Contact: Roy A. Philips, II, engineering director

INTERNATIONAL RECORDING CO.

### MASTERING

49 Desmond Ave., Bronxville, NY 10708

(914) 337-5726

Contact: Claire Rie, president

JAN PRODUCTIONS

### TAPE DUPLICATION

106 Mott St., Oceanside, NY 11572

(516) 678-4414

Contact: Ian Schwartz, president

LION RECORDING SERVICES, INC.

### TAPE DUPLICATION

1905 Fairview Avenue, NE, Washington, D.C. 20002

(202) 832-7883

Contact: Richard Lion, sales manager

### TAPE DUPLICATION

Duplicator: Audio/Tek, 12 slaves, 8 mono, 4 stereo.

Capacity: 15,000 per day.

Method of duplication: Bin loop.

Mastering equipment: Studer

Tape used: AGFA, BASF.

Shell used: Magnetic Media.

Duplicating speed: 32:1

Type of loading: TTL.

Packaging equipment/fulfillment services: Shrinkwrap.

Other services: Labeling, boxing, packaging and shipping.

LORANGER ENTERTAINMENT

### DIVISION OF LORANGER MFG. CORP.

### MASTERING & TAPE DUPLICATION

10-48 Clark St., PO Box 948, Warren, PA 16365

(814) 723-8600

Contact: Robert T. Loranger, president; Paul E. Berger,  
marketing services

MAGNETIX CORPORATION

### MASTERING, PRESSING & TAPE DUPLICATION

770 W. Bay St., Winter Garden, FL 32787

(305) 656-4494

Contact: John Lory, president

MARK CUSTOM RECORDING SERVICE

### MASTERING, PRESSING & TAPE DUPLICATION

10815 Bodine Road, Clarence, NY 14031

(716) 759-2600

Contact: Vincent S. Morante, president

THE MASTER CUTTING ROOM, INC.

### MASTERING

321 W. 44th St., New York, NY 10036

(212) 581-6505

Contact: Fandi Greenstein, traffic manager

MASTERDISK CORPORATION

### MASTERING

16 West 61st St., New York, NY 10023

(212) 541-5022

Contact: Jill Dix, general manager

MIAMI TAPE INC.

### MASTERING, PRESSING & TAPE DUPLICATION

8180 N.W. 103 St., Hialeah Gardens, FL 33016

(305) 558-9211

Contact: Carlos C. Garcia, president

### MASTERING

Cutting lathes: Haeco computerized

Tape machines: MCI JH 119.

Monitor speakers: JBL.

Signal processing: Orban parametric, Dolby, dbx, Burwen,  
UREI limiters.

Engineers: Jorge Garcia.

Rates: On request

Other services: Assembly, editing and copies. Also manufacture  
stampers.

### PRESSING

Presses: 4 5MT LP 25MT 45's fully automatic

Capacity: 100,000 LP's and 100,000 45's monthly.

Vinyl used: K user.

Rates: On request

Other services: Complete litho services; jackets, labels and art  
work for record industry. Also color separations.

#### TAPE DUPLICATION

Duplicator: ElectroSound 8000 and 4000  
Capacity: 150,000 units monthly  
Method of duplication: Bin loop.  
Mastering equipment: ElectroSound  
Tape used: AGFA and BASF  
Shell used: Elmar C.O  
Duplicating speed: 64:1 and 32:1  
Type of loading: (2) King MK2000.  
Packaging equipment/Fulfillment services: Full packaging  
Rates: On request.  
Other services: Direct cassette printing. Also manufacture 8-track. Dolby encoding

#### MUSICAL RECORDS CO.

MASTERING, PRESSING & TAPE DUPLICATION  
770 W. 27th St., Hialeah, FL 33010  
(305) 887-2638  
Contact: Alba V. Eagan, general manager

#### MUSICAL TAPES, INC.

MASTERING & TAPE DUPLICATION  
770 W. 27th, Hialeah, FL 33010  
(305) 887-2638

#### MUSICPEOPLES' STUDIOS AND TAPE SERVICE

TAPE DUPLICATION  
932 Woodlawn Rd., Charlotte, NC 28209  
(704) 527-7395  
Contact: James Harden, manager/owner

#### MUSIC SQUARE MFG. CO.

(FORMERLY MANDRELL/GRAY, INC.)  
MASTERING, PRESSING & TAPE DUPLICATION  
50 Music Square West, Suite 205, Nashville, TN 37203  
(615) 242-1427  
Contact: James E. Gray, sales manager



## NATIONAL CASSETTE SERVICES, INC.

NATIONAL CASSETTE SERVICES, INC.  
Front Royal, VA

#### NATIONAL CASSETTE SERVICES, INC.

TAPE DUPLICATION  
PO Box 1280, 613 N. Commerce Avenue  
Front Royal, Virginia 22630  
(703) 635-4181  
Contact: Ed Helvey or Mike McCool  
MASTERING  
Console: Tascam Model 5  
Tape machines: Technics RS-1500, Revox A-77.  
Monitor speakers: Mesa.  
Signal processing: dbx limiters, Graphic equalization, audio/visual, sync-pulsing.  
Engineers: Craig Laird.  
Rates: \$40 per hour  
TAPE DUPLICATION  
Duplicator: Magnelax, Intonics, Pentagon, Recordex, Technics.  
Capacity: 25,000/week/shift  
Method of duplication: In cassette, bin loop.  
Mastering equipment: Technics, Revox.  
Tape used: Aqia, Mag Media, Certron, Studio Magnetics.  
Shell used: Mag Media, M.T.I.  
Duplicating speed: 24:1, 16:1, 12:1, 10:1, 1:1  
Type of loading: King Automatic.  
Packaging equipment/Fulfillment services: Soft poly boxes, Norelco boxes, vinyl cassette albums, labels, inserts and shrink wrapping  
Other services: Complete inventory, mail order fulfillment and dropshipping, custom loaded blank cassettes, in-cassette duplication

—LISTING CONTINUED ON PAGE 74

# RESOLUTION

VIDEO AUDIO AND FILM PRODUCTION

The Country's Largest Audiophile  
Cassette Manufacturer

Innovative Engineering in Both Digital  
and Analogue Domains

Obsessive Quality Control with Lab  
Standard Instrumentation

On Time Delivery

Competitive Pricing

Resolution manufactures cassettes for some of the most demanding audiophile labels in the country; all in real time, all on time. Call or write for our free brochure and price list.

Resolution, 1 Mill St., Burlington, VT 05401-1514  
(802) 862-8881

Circle #040 on Reader Service Card

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MASTERING IS IN  
HAWORTH, NEW JERSEY...**

THE CUT IS CLEARER.  
THE AIR IS CLEANER.  
THE STAFF IS TOP  
NOTCH AND OF  
COURSE THE  
EQUIPMENT  
IS STRICTLY  
STATE OF  
THE ART.



Let us prove it to you, mention this ad and get one hour complimentary studio time with your first 4 hour booking. Manhattan chauffeur service. Custom pressing packages also available.

**TRY US...THE COUNTRY'S  
NEVER SOUNDED BETTER!**

Trutone Records Disc Mastering Labs,  
163 Terrace Street, Haworth, N.J. 07641 201-385-0940

Circle #041 on Reader Service Card

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tion equipment sales and services, 1/4" full-track mono and two-track stereo high-speed duplication for the broadcast industry. Studio and editing services.

**NATIONAL RECORDING  
TAPE DUPLICATION**  
460 W. 42nd St., New York, NY 10036  
(212) 279-2000  
Contact: I. Kaufman, chief engineer

**OMNI TAPE CORP.  
TAPE DUPLICATION**  
11 Teaneck Road, Ridgely Park, NJ 07660  
(201) 440-8846  
Contact: Peter D'Antoni, vice president

**PETER PAN INDUSTRIES  
PRESSING**  
145 Komorn Street, Newark, NJ 07105  
(201) 344-4214  
Contact: Al Cohen, custom pressing sales manager

**PRC RECORDING  
PRESSING AND TAPE DUPLICATION**  
422 Madison Ave., New York, NY 10017  
(212) 308-2300  
1600 Rich Rd., Richmond, IN 47374  
(317) 962-9511  
Contact: David Grant, president

**PROGRESSIVE MUSIC STUDIOS  
TAPE DUPLICATION**  
2116 Southview Ave., Tampa, FL 33606  
(813) 251-8093  
Contact: Ken Veenstra, owner/manager

**QUIK CASSETTE CORP.  
TAPE DUPLICATION**  
250 W. 57th St., New York, NY 10019  
(212) 489-7354  
Contact: M. Milchman, president

**RANSTEELE AUDIO, INC.  
MASTERING**  
1697 Broadway, New York, NY 10019  
(212) 265-5563  
Contact: Thomas Steele, owner

**RECORDED PUBLICATIONS LABORATORIES  
MASTERING & TAPE DUPLICATION**  
1100 State Street, Camden, NJ 08105  
(609) 963-3000  
Contact: Ernest W. Merker, vice president engineering



**RESOLUTION, INC.**  
Burlington, VT

**RESOLUTION, INC.  
TAPE DUPLICATION**  
1 Mill Street-Chace Mill, Burlington, VT 05401  
(802) 862-8881  
Contact: Ty Atherholt, duplication manager



Listings of Mastering, Pressing and Tape  
Duplication Facilities Throughout the  
United States

**TAPE DUPLICATION**  
Duplicator: NAD/resolution-400-The World's Largest.  
Capacity: 4,000/day, 20,000/week  
Method of duplication: In cassette.  
Mastering equipment: PCM-F1, PCM-701 ES, all formats; MCI JH110 B (2), Scully 1/4 track  
Tape used: Agfa Gevaert 611/811, 612/812, 627/827  
Shell used: The best domestic made black, white or all clear  
Duplicating speed: 1:1, real-time  
Type of loading: King 680, King 780  
Packaging availability/Fulfillment services: Label and J-card printing, shrinkwrapping, shipping  
Rates: Very competitive with high-speed rates  
Other services: Drop-shipping, digital mastering, editing, 16 track studio

**RGH RECORD MANUFACTURING CORP.  
MASTERING, PRESSING & TAPE DUPLICATION**  
750 Eighth Ave., New York, NY 10036  
(212) 354-4336  
Contact: George Srolowitz, president  
**MASTERING**  
Rates: Call for prices  
**PRESSING**  
Capacity: 20,000  
Vinyl used: B 600  
Rates: Call for prices  
**TAPE DUPLICATION**  
Capacity: 20,000  
Rates: Call for prices

**SERVISOUND, INC.  
TAPE DUPLICATION**  
35 West 45th Street, New York, NY 10036  
(212) 921-0555  
Contact: Chris Nelson, vice president

**SMITH & SMITH SOUND STUDIOS  
MASTERING & TAPE DUPLICATION**  
828 Orienta Avenue/Box 130  
Altamonte Springs, FL 32701  
(305) 339-6487  
Contact: Mr. Hillary (Mel) Smith, owner

**SOUND-ARTS COMPANY, INC.  
TAPE DUPLICATION**  
5 Cindy Lane, Oakhurst, NJ 07712  
(201) 493-8666  
Contact: Frank Gspann, vice president  
**TAPE DUPLICATION**  
Duplicator: Otari DP-85, Otari DP-7000, DP 405G (26 slaves)  
Capacity: 30,000/day  
Method of duplication: In cassette, bin loop  
Mastering equipment: Otari MTR-10's, Otari MX-5050, Scully  
Tape used: Agfa, Columbia, BASF  
Duplicating speed: 480 ips, 240 ips, 64:1, 32:1, 8:1 ratios  
Type of loading: King 790's  
Packaging availability/etc.: Shrink film, etc.  
Rates: On request.  
Other services: Computer software duplication, cassette and disk

**SOUND INVESTMENT RECORDING STUDIO  
MASTERING & TAPE DUPLICATION**  
Rt. 3, Box 702, Covington, GA 30209  
(404) 267-8771  
Contact: Steve or Linda Marcum, engineer

**SOUND TECHNIQUE INC.  
MASTERING**  
130 West 42 St., New York, NY 10036  
(212) 869-1323  
Contact: Gladys Hopkowitz, president

**SOUNDWAVE RECORDING STUDIOS, INC.  
MASTERING**  
2 West 45th St., Suite 903, New York, NY 10036  
(212) 730-7366  
Contact: Carol Baker, president

**STERLING SOUND INC.  
MASTERING**  
1790 Broadway, New York, NY 10019  
(212) 757-8519  
Contact: John Kubick, studio manager

**STUDIO 44  
MASTERING & TAPE DUPLICATION**  
44A Broadway, Mantua, NJ 08051  
(609) 468-5772  
Contact: Fhi Vitale or Arne Can, owners

**STUDIOWORKS  
TAPE DUPLICATION**  
1018 Central, Charlotte, NC 28204  
(800) 438-5921  
Contact: Wayne, owner

**SUN PLASTICS CO., INC.  
DYNAMIC LP STEREO RECORDS, INC.  
PRESSING**  
900 Passaic Ave., East Newark, NJ 07029  
NJ: (201) 482-6749; NY: (212) 349-0777  
Contact: Jerry Salerno, president

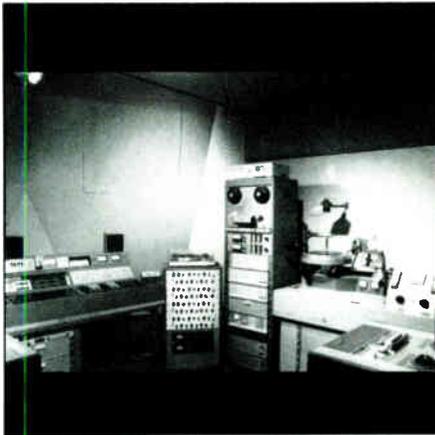
**SUNSHINE SOUND INC.  
MASTERING**  
1650 Broadway, New York, NY 10019  
(212) 582-6227  
Contact: Frank J. Trunaro, president

**SUPERIOR RECORD PRESSING CORP.  
PRESSING**  
900 Kennedy Blvd., Somerdale, NJ 08083  
(609) 784-6600  
Contact: John H. Dunn, president

**RIK TINORY PRODUCTIONS  
MASTERING, PRESSING & TAPE DUPLICATION**  
180 Pond Street, Cohasset, MA 02025  
(617) 383-9494  
Contact: Rik Tinory, president

**TRACY-VAL CORPORATION  
RECORD PLATING**  
201 Linden Ave., Somerdale, NJ 08083  
(609) 627-3000  
Contact: James Miller, president, Joan Miller, sales manager  
**PLATING**  
Presses (Mfg. and quantity): 32 high speed rotary plating positions  
Capacity: Masters, mothers and stampers—200 per day.  
Rates: On request.  
Credits: Arista, Passport/EM, Savoy, Sine Qua Non, Capitol, RCA, Columbia, Pickwick, Vox, Tommy Boy, Streetwise.

**TRUTONE RECORDS DISK MASTERING LABS  
MASTERING, PRESSING & TAPE DUPLICATION**  
163 Terrace St., Haworth, NJ 07641  
(201) 385-0940  
Contact: Adrienne Rowatt, Prod. Coordinator.  
**MASTERING**  
Cutting lathes: Neumann VMS-70, Scully w/Capps Vampitch II.  
Console: Neumann & Custom  
Tape machines: Studer A-80, Studer B-67, Ampex ATR-102, MCI JH-210E.  
Monitor speakers: UREI 813A, JBL, Auratone  
Signal processing: UREI, Fultec, Neumann  
Engineers: Carl Rowatt, Phil Austin, Steve Robb.  
Rates: Upon request.  
Credits: Upon request.  
Other services: High quality short run pressing and cassette duplication



**TRUTONE RECORDS DISK MASTERING LABS**  
Haworth, NJ

**VARIETY RECORDING STUDIO**  
MASTERING, PRESSING, TAPE DUPLICATION  
130 West 42nd St., Room 551, New York, NY 10036  
(212) 221-6625  
Contact: Warren Allen Smith, president

**VCA TELETRONICS**  
231 E. 55th St., New York, NY 10022  
(212) 355-1600  
Contact: Will Roth, vice president sales/marketing

**VIRTUE RECORDING**  
MASTERING, PRESSING & TAPE DUPLICATION  
1618 N. Broad St., Philadelphia, PA 19121  
(215) 763-2825  
Contact: Frank Virtue, president

**WEA MANUFACTURING INC.**  
PRESSING & TAPE DUPLICATION  
P.O. Box 321, Olyphant, PA 18447  
(717) 383-2471

**WILDWOOD ENTERTAINMENT, INC.**  
MASTERING, PRESSING & TAPE DUPLICATION  
Box 114, Plank Road, Berlin, NY 12022  
(518) 658-2444

**WINKLER VIDEO ASSOCIATES, INC.**  
TAPE DUPLICATION  
248 E. 48th St., New York, NY 10017  
(212) 753-9300  
Contact: Henry Schwartzberg

**WORLD CLASS TAPE**  
TAPE DUPLICATION  
Box 7611, Ann Arbor, MI 48107  
(313) 662-0669  
Contact: Patrick or Donna, managers

## Central

**A & F MUSIC SERVICES**  
MASTERING & TAPE DUPLICATION  
2834 Otsego, Pontiac, MI 48054  
(313) 682-9025  
Contact: Frank Merwin, manager

**AARD-VARK RECORDING SERVICE, INC.**  
TAPE DUPLICATION  
335 S. Jefferson, Springfield, MO 65806  
(417) 866-4104  
Contact: Bill Jacobsen, president

**ACME RECORDING STUDIOS**  
TAPE DUPLICATION  
3821 N. Southport, Chicago, IL 60613  
(312) 477-7333  
Contact: Les McReynolds, studio manager

### TAPE DUPLICATION

**Duplicator:** Technics transports w/custom transformerless electronics  
**Capacity:** 1000 C-30's per day  
**Method of duplication:** In cassette  
**Mastering equipment:** Technics 1500 1/4 trk/1/2 trk, dbx Type I; dbx compressors; Teleguipment scope, ADC spectrum analyzer and equalizer; E-V Sentry 100A monitors, NAD amp, Sony & JVC quality control decks.  
**Tape used:** The current state-of-the-art  
**Shell used:** Shape (transparent) and Mag Media  
**Duplicating speed:** Real time only  
**Type of loading:** King  
**Packaging equipment/Fulfillment services:** Typesetting, printing, insertion, shrink wrap in house  
**Rates:** Please call for rates and samples  
**Other services:** High quality printing of small runs of labels (from 25 to 1,500 in-house), mastering EQ and compression, EQ'd copymasters, custom packaging for small runs of cassette releases. 24 hour turnaround time available, the best sounding cassettes in the business!

**AMERICAN SOUND CORPORATION**  
TAPE DUPLICATION  
25133 Thomas Drive, Warren, MI 48091  
(313) 536-9100  
Contact: Don Armstrong, sales manager

**ARC ELECTRONIC SERVICES INC.**  
TAPE DUPLICATION  
2557 Knapp N.E., Grand Rapids, MI 49505  
(616) 364-0022  
Contact: Ron Harkai, president

**ARDENT MASTERING, INC.**  
MASTERING  
2000 Madison Ave., Memphis, TN 38104  
(901) 725-0855  
Contact: Larry Nix, Chief Engineer  
**MASTERING**  
Cutting lathes: Neumann VMS-70 with Zuma digital computer control  
**Console:** Neumann  
**Tape machines:** MCI 1/2" 2 track available



**ARDENT MASTERING, INC.**  
Memphis, TN

**Monitor speakers:** JBL.  
**Signal processing:** Limiters: Neve, EMT; EQ's: Neve, Neumann; Proc: Outer Ear, EXR; Noise reduction: Dolby, dbx.  
**Engineers:** Larry Nix, Al Smith  
**Rates:** On request.  
**Credits:** Bar-Kays, Amazing Rhythm Aces, Jessie Winchester, Robin Tower, Charlie Rich, ZZ Top, Staple Singers, Paul Butterfield, Con Funk Shun, Memphis Horns, Issac Hayes, Point Blank, Tony Joe White.

**AUDIO ACCESSORIES CO.**  
TAPE DUPLICATION  
38 W. 515 Deerpark Road, Batavia, IL 60510  
(312) 879-5998  
Contact: John Maloney, sales manager

# New From Eva-Tone . . .

**Unless You Fill Out This Coupon, You'll Never Know If Eva-Tone Can Be Competitive On Your Next Cassette Duplication Order.**

If you order 100 custom-duplicated cassettes or more at a time, you really should include Eva-Tone on your bid list.

We're the people who've been producing high quality, low cost Soundsheets for more than 20 years. Now we've added high speed, high quality audio cassette duplication to our line, along with custom printing, complete mailing services, and computer list maintenance.

If you want an answer faster than through the mail, call us toll free at 1-800-EVA-TONE. (In Florida, call 813-577-7000.) You're going to like what you hear.

### TELL ME MORE ABOUT EVA-TONE:

Soundsheets  Cassettes  Printing  Mailing

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Organization: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

**EVA-TONE** 4801 Ulmerton Road  
P.O. Box 7020-M  
**SOUNDSHEETS** Clearwater, Florida 33518-7020

Circle #042 on Reader Service Card

**AUDIOGRAPHICS**  
**MASTERING & TAPE DUPLICATION**  
 13801 E. 35th St., Independence, MO 64055  
 (816) 252-5010  
 Contact: Jerry Hiegle, director, Dennis Kaleikau, production manager

**AUDIO MIXERS RECORDING COMPANY**  
**TAPE DUPLICATION**  
 20 East Huron St., Suite 200, Chicago, IL 60611  
 (312) 943-4274  
 Contact: Studio Manager

**BODDIE RECORD MFG. & RECORDING**  
**TAPE DUPLICATION**  
 12202 Union Ave., Cleveland, OH 44105  
 (216) 752-3440  
 Contact: Louise Boddie, vice president

**CASSETTE DUPLICATING, INC.**  
**TAPE DUPLICATION**  
 3801 South Sheridan Ave., Tulsa, OK 74145  
 (918) 664-2216  
 Contact: Chuck Loop, marketing manager  
**PRESSING**  
 Presses: Various  
 Capacity: 20,000/day  
 Vinyl used: Various  
 Rates: Various  
**TAPE DUPLICATION**  
 Duplicator: 21-Electrosound 8000, and others  
 Capacity: 60,000 C-60s/day  
 Method of duplication: Studer mastering, Dolby, Time Compression, Lexicon, Noise gates, etc  
 Tape used: Various  
 Shell used: Various  
 Duplicating speed: 64:1 or 32:1  
 Type of loading: 18-King 790  
**Packaging equipment/Fulfillment services:** Apex printer, Islemenn inserter and skin wrap, Islemenn labelers, ITI labelers, L-sealer.  
 Rates: Call for quote  
 Other services: Total packaging service, artwork development

**CENTURY SOUND & SLIDE**  
**MASTERING, TAPE DUPLICATION**  
 1018 Busse Hwy, Park Ridge, IL 60068  
 (312) 696-0675  
 Contact: Al Tallman, owner

**CHARLIE & CO. INC.**  
**TAPE DUPLICATION**  
 5500 B Crestwood Blvd., Birmingham, AL 35212  
 (205) 592-3601  
 Contact: Charles Colvin, president

**CHUMLEY PRODUCTIONS, INC.**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 2802 Foster Avenue, Nashville, TN 37210  
 (615) 833-6184  
 Contact: P E Chumley, president

**CONCEPT PRODUCTIONS, INC.**  
**TAPE DUPLICATION & PACKAGING**  
 2984 Triverton Pike, Madison, WI 53711  
 (608) 271-2606  
 Contact: Dan Geocans

**CREATIVE SOUND**  
**TAPE DUPLICATION**  
 9000 Southwest Freeway, Suite 320, Houston, TX 77074  
 (713) 777-9975  
 Contact: Edward Smith, President

**TAPE DUPLICATION**  
 Duplicator: Otari bin loop (3 slaves), Infonics (2 slaves)  
 Capacity: 2500 per shift  
**Mastering equipment:** Ampex 2 track & 4 track  
**Tape used:** Agfa 611/811, Magnetite 12, Chrome 627/827, Ampex 607/608, 609/610, Capitol Q18  
**Shell used:** Data Pak Pathfinder 5-screw, IPS 5-screw  
**Duplicating speed:** 16:1 & 32:1  
 Type of loading: King automatic loaders  
**Packaging availability/Fulfillment services:** Custom labels, full-color caseliners, shrink  
 Rates: Call for quotations  
 Other services: Custom bulk tape loading to any length w/Ampex AGFA, Capitol Catalog available upon request



Listings of Mastering, Pressing and Tape Duplication Facilities Throughout the United States

## Central

**CUSTOM TAPE DUPLICATORS, INC.**  
**TAPE DUPLICATION**  
 341 Hill Ave., Nashville, TN 37210  
 (615) 256-1728  
 Contact: Cliff Tant, president



**DISC MASTERING INC.**  
 Nashville, TN

**DISC MASTERING INC.**  
**MASTERING**  
 Thirty Music Square West, Nashville, TN 37203  
 (615) 254-8825  
 Contact: Randy Kling, president  
**MASTERING**  
 Cutting lathes: Neumann VMS 70 lathe with SX-74 head  
 Console: Neumann SP75 console with Neve 2087 custom equalizers  
**Tape machines:** Studer A-810, Studer A-80 MKII  
**Monitor speakers:** Tannoy Super Reds (Lockwood Cabinets); Tannoy Titan system; Tannoy broadcast monitor 8s, Quad 405 amplifier  
**Signal processing:** Neve 2087 EQ, Neve limiter/compressor, Neumann SAL 74B cutting amplifier  
**Engineers:** Randy Kling  
**Rates:** Available upon request.  
**Credits:** Alabama, Chet Atkins, John Denver, Leon Everette, Elvin, James Galway, Mickey Gilley, the Glen Miller Orchestra, Vern Gosdin, Waylon Jennings, The Kinks, Christy Lane, Loretta Lynn, Barbara Mandrell, Charly McClain, Willie Nelson, Dolly Parton, The Platters, Jerry Reed, Joe Stampley, George Strait, Jimmy Sturr, Jimmy Swaggart, Sylvia, The White Animals, Roger Whittaker. Digital projects on Charley Pride, Moe & Joe, and Porter Wagoner. Studio president Randy Kling was named 1984 Country Mastering Engineer of the Year by *Pro Sound News*.  
**Other services:** Distributor for Quad products & Tannoy pro and home speakers.

**DIXIE RECORD PRESSING**  
**PRESSING**  
 631 Hamilton Ave., Nashville, TN 37203  
 (615) 256-0922  
 Contact: Greg Gann, production manager

**ELECTRO SOUND TAPE SERVICES**  
**TAPE DUPLICATION**  
 2101 S. 35th St., Council Bluffs, IA 51501  
 (712) 328-8060  
 Contact: Marvin King, president

**ELEPHANT RECORDING STUDIOS**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 21206 Gratiot Ave., E. Detroit, MI 48021  
 (313) 773-9386  
 Contact: John Gale, owner

**HANF RECORDING STUDIO**  
**TAPE DUPLICATION**  
 1825 Sylvania, Toledo, OH 43613  
 (419) 474-5793  
 Contact: Jim Thomson, general manager

**HIGH FIDELITY**  
**MASTERING**  
 1059 Porter, Wichita, KA 67203  
 (316) 262-6456  
 Contact: James Stratton



**HIX RECORDING CO., INC.**  
 Waco, TX

**HIX RECORDING CO., INC.**  
 1611 Herning Ave., Waco, TX 76708  
 (817) 756-5303  
 Contact: David Hix, president, Homer Hix, vice president

**INDEPENDENT PRODUCERS CORP.**  
**TAPE DUPLICATION**  
 1609 McGavock St., Nashville, TN 37203  
 (615) 244-4236  
 Contact: Jerry L. Moore, vice president, or Gail Pollock, production-coordinator

**INDUSTRIAL AUDIO/FILM SERVICES**  
**TAPE DUPLICATION**  
 6228 Oakton, Morton Grove, IL 60053  
 (312) 965-8400  
 Contact: Lauren Leifer, president

**INFONICS, INC.**  
**TAPE DUPLICATION**  
 PO Box 1111, 238 Highway 212, Michigan City, IN 46360  
 (219) 879-3381  
 Contact: Carol Lant, president

**JRC ALBUM PRODUCTIONS**  
**(JEWEL RECORDING CO.)**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 1594 Kinney Ave., Cincinnati, OH 43231  
 (513) 522-9336  
 Contact: Linda York, vice president

**K&R'S RECORDING STUDIOS INC.**  
**MASTERING & TAPE DUPLICATION**  
 28533 Greenfield, Southfield, MI 48076  
 (313) 557-8276  
 Contact: Bob Gajewski, manager

# GRD GIVES YOU THE HOT SOUND OF REAL-TIME EVERY TIME

PHONE: (602) 252-0077

WRITE: REAL-TIME BY GRD  
P.O. BOX 13054, PHOENIX, AZ 85002



## **CONSISTENCY**

GRD sets the standards for high quality cassette duplication. Our in-house maintenance and repair department works 2,000 hours a year making absolutely sure each Real-Time cassette is perfect. Personal attention is given to each tape as it is duplicated. We listen in on each tape to maintain super-standard quality and consistency.

## **DIGITAL REAL-TIME**

A Digital Master duplicated in Real-Time sounds incredible! There is no comparison to a Real-Time Digital cassette. GRD's Digital Mastering Service is only \$38.00 per album.

## **HIGH-TECH EXTRA**

The GRD Real-Time system is wired with Audiophile low-capacitance cable. Your punchy projects will stay clean and punchy. Our recorders sound great. We use Denon DR-F8's and Tascam 122 studio recorders exclusively. All our Real-Time Recorders are 3 head, top performance machines.

Circle #043 on Reader Service Card



MX

## Magnetics

Audio & Video Tape Manufacture  
12 Years of Proven Service  
to the Audio Industry

Custom Loaded BASF  
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C-60 as low as \$.69 1M  
C-90 as low as \$.95 1M

Custom Cassette Bin Loop  
High Speed Duplication

3/4" U-Matic Video Tape  
Loading Re-loading

Custom Cassette Label &  
Liner Printing

### "Reel Cassettes"

**3M® & AMPEX®** Reel Tape  
Our Low Overhead & High Quality  
Workmanship can provide your  
Studio with the Highest Quality  
for the Lowest prices.

**FREE** Brochures Available  
Upon Request.  
Please Write or Call Collect  
(817) 756-5303.

**Hix Recording Co., Inc.**

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**HRC Magnetics** 1611 Herring  
Waco, Texas 76708  
817-756-5303

Circle #044 on Reader Service Card

# USE

# ZERO



Sonic  
Sealed  
Screw type  
Tabs-out  
Tabs-in  
Black & white

**C-Ø Cassettes**  
**11.5¢**  
INCLUDING FREIGHT

Immediate  
Delivery  
Meets all  
Standards  
Provides High  
Reliability

Also Available: Blank-Loaded  
Cassettes and Cassette Boxes

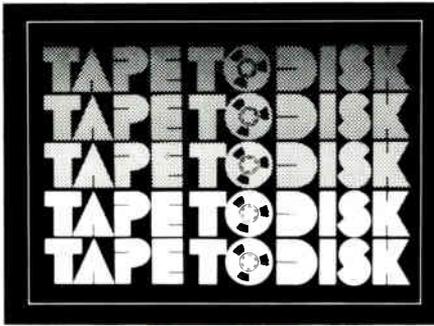


## PLANTRON

(206) 854-3366

PO Box 58971 • Seattle, WA 98188

Circle #045 on Reader Service Card



Listings of Mastering, Pressing and Tape  
Duplication Facilities Throughout the  
United States

## Central

**KIDERIAN RECORDS PRODUCTIONS**  
MASTERING, PRESSING & TAPE DUPLICATION  
4926 W. Gunnison, Chicago, IL 60630  
(312) 399-5535  
Contact: Ray Perk, president

**KING SOUND**  
TAPE DUPLICATION  
532 Michigan Ave., Manistique, MI 49854  
(906) 341-6533  
Contact: Keith Polkinghorne, owner/engineer

**THE LACQUER PLACE**  
MASTERING  
50 Music Square West, Suite 201, Nashville, TN 37203  
(615) 329-4951  
Contact: Nancy Westbrook, office manager

**MAGNETIC STUDIOS, INC.**  
TAPE DUPLICATION  
4784 N. High St., Columbus, OH 43214  
(614) 262-8607  
Contact: John Fippin, president

**MASTERCRAFT RECORDING CORP.**  
MASTERING, TAPE DUPLICATION  
437 N. Cleveland, Memphis, TN 38104  
(901) 274-2100  
Contact: Howard Craft, owner manager



**MASTERFONICS, INC.**  
Nashville, TN

**MASTERFONICS, INC.**  
MASTERING  
28 Music Square East, Nashville, TN 37203  
(615) 327-4533  
Contact: Glenn Meadows, president

**MASTERING**  
Cutting lathes: Room 1 (2) Neumann VMS 70 operated by  
Zuma computer; SAI.74B amplifiers, SX74 cutter heads Room 2.

Scully lathes w/Capco computer; Westrex 3DIIAH cutter head,  
Westrex RA1700B amplifiers.

Consoles: Room 1, Neumann SP75. Room 2: Neumann SP72  
Tape machines: Room 1: Studer A80 preview machine; Studer  
A80R and B67 copy machines (2 track)

Monitor speakers: Room 1 Modified Westlake TM-1's w/TAD  
drivers Room 2: John Gardner cabinets w/JBL woofers and TAD  
high-frequency drivers.

Signal processing: Sontec parametric EQ; Neve stereo com-  
pressor/limiters, Sontec DRC 200 compressor/limiter.

Engineers: Glenn Meadows, Jim Loyd, Brian Burr.  
Rates: Please call for rates

Other services: Ampex ATR-102 1/2" 2 track for rent Master  
Technologies offers JVC Series 90 digital 2 track rental, editing  
and mastering. Call Masterfonics for details.

**MASTER MARKETING CORP.**  
MASTERING & TAPE DUPLICATION  
3801 S. Sheridan, Ste. 156, Tulsa, OK 74145  
(918) 627-5772  
Contact: Jeff Katschuck



**MASTER MIX**  
Nashville, TN

**MASTER MIX**  
MASTERING  
1808 Division Street., Nashville, TN 37203  
(615) 321-5970  
Contact: Carol, traffic manager

**MASTERING**  
Cutting lathes: Neumann VMS 70 with Technics quartz direct  
drive & Zuma audio preview computer, Neumann SAL 74B  
transformerless cutter rack, SX 74 cutter head  
Console: Neumann SP-77 transformerless console.  
Tape machines: Studer preview machine, 1/2" and 1/4", Studer  
copy machine  
Monitor speakers: John Meyers and Rogers powered by Times  
One & Haller amplifiers.

Signal processing: Sontec & Neumann equalizers, Sontec and  
NTP compressors, Dolby and dbx available  
Engineers: Hank Williams

Rates: Call Carol

Credits: Joe Greenwood, Deborah Allen, Eddie Rabbitt, Earl  
Thomas Conley, Statler Bros., Ed Bruce, Sandi Patit, Bill Gaither  
Trio, and Al Green

Other services: Neumann II, Otari equipped remix room



**MEDIA INTERNATIONAL, INC.**  
Chicago, IL

**MEDIA INTERNATIONAL, INC.**  
**TAPE DUPLICATION**  
247 E. Ontario, Chicago, IL 60611  
(312) 467-5430

Contact: Duane Lundeen, president

**TAPE DUPLICATION**

Duplicator: Ampex, Grandy, Magnetax, Telex (6 lines total)

Capacity: 75,000 units per day

Method of duplication: In cassette, bin loop

Mastering equipment: Studer & Ampex

Tape used: Agfa, BASF, Capitol, Ampex, Columbia

Shell used: Elmar, Sorco, Mag Media

Duplicating speed: From 4:1 to 64:1 depending on product

Type of loading: High speed King

Packaging availability/Fulfillment services: Shrinkwrap, custom boxes, cartons, albums, etc.

Rates: From 21 unit

Other services: Duplicating & AV equip sales, services, design, installation—new, used, reconditioned (Low cost financing avail on some equip.)

**MEMPHIS COMMUNICATIONS CORPORATION**

**MASTERING & TAPE DUPLICATION**

1381 Madison Ave., PO Box 41735

Memphis, TN 38174-1735

(901) 725-9271

Contact: Scot Berry, production

**MIAMI VALLEY RECORDING**

**TAPE DUPLICATION**

3777 Crow Road, Tipp City, OH 45371

(513) 698-5933

Contact: David S. Mohler, owner

**MIDWEST CUSTOM RECORD PRESSING CO.**

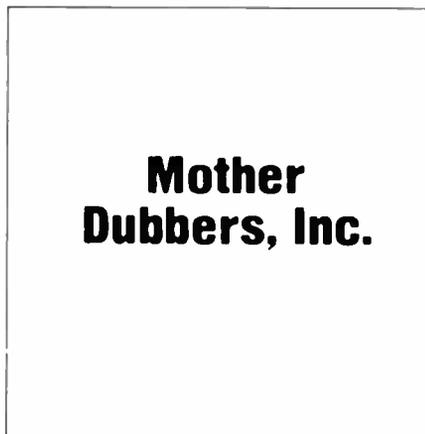
**PRESSING & TAPE DUPLICATION**

P.O. Box 92, Arnold, MO 63010

(314) 464-3013

Contact: Rick Schaumberger, president

**MOSES SOUND ENTERPRISES**  
**TAPE DUPLICATION**  
270 S. Highway Dr., Valley Park, MO 63088  
(314) 225-5778  
Contact: Nelson



## Mother Dubbers, Inc.

MOTHER DUBBERS INC.  
Dallas, TX

**MOTHER DUBBERS INC.**  
**TAPE DUPLICATION**  
13626 Gamma, Dallas, TX 75234  
(214) 980-4840

Contact: Arnett Peel, President

**MASTERING**

Console: Tapro EV 12 x 4 x 2 x 1

Tape machines: Ampex 440, MCI JH 100B, TEAC 80-8, 40 4

Monitor speakers: ADS 810s

Signal processing: UREI LA 3A, UREI 1176LN Crown EQII, dbx 157, UREI 565

Engineers: Russell Smith.

Rates: \$50/hr studio mastering, \$30/hr editing

**TAPE DUPLICATION**

Duplicator: Infonics 200A, Magenfax bin loop

Capacity: How many would you like? We'll meet your deadline!

Method of duplication: In cassette & bin loop

Mastering equipment: Ampex, MCI.

Tape used: AGFA PE 611, BASF, CBS, Ampex

Shell used: Magnetic Media, Lenco and data packaging

Duplicating speed: In cassette, 10:1, bin loop, 45:1

Type of loading: Automatic King model 700s

Packaging availability/Fulfillment services: Labeling, cassette binders, Poly & Norelco boxes, shrink wrapping—full packaging service available

Rates: Call (214) 980-4840 and ask for A. Peel

**MUSICOL, INC.**

**MASTERING, PRESSING & TAPE DUPLICATION**

780 Oakland Park Ave., Columbus, OH 43224

(614) 267-3133

Contact: John Hull, mastering engineer

**NASHVILLE RECORD PRODUCTIONS, INC.**

**MASTERING, PRESSING & TAPE DUPLICATION**

469 Chestnut St., Nashville, TN 37203

(615) 259-4200

Contact: George Ingram, Co-owner

**MASTERING**

Cutting lathes: Neumann, Zuma & Capps computer two

Console: Sphere & Neve

Tape machines: Studer & MCI

Monitor speakers: Electro-Voice Sentry 3's

Signal processing: Parametric & graphic EQ, reverb, limit- in- g/compressor

Engineers: Glen Bullard, Chief Engineer, John Eberle, Studio Mtr., Doug Lawrence, Engineer.

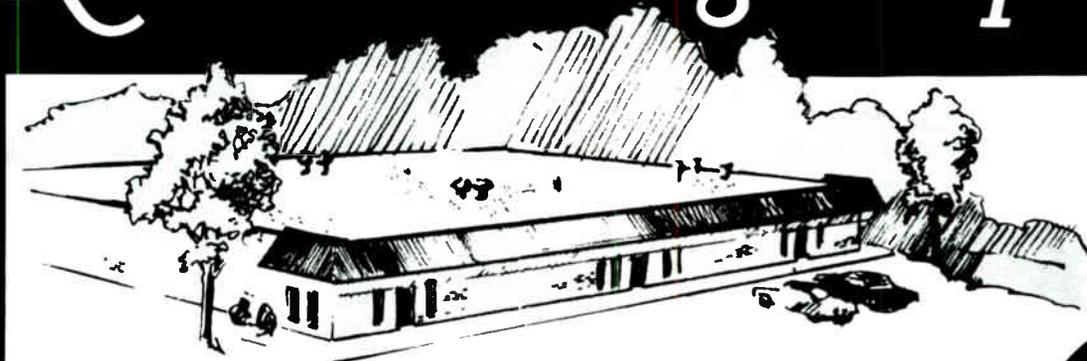
Rates: \$80/per side, 12", \$30/per side, 7"

Credits: Ronnie Milsap, Amy Grant, Rick & Janice Carnes, Richard Lee, Sha-Na-Na, Tupperware, American Airlines, U.S. Govt., PSA, Sperry New Holland, Drivers, Bill Anderson, Dan Seals

Other services: Editing, reference acetate, 1/2 speed cutting, tape duplication, album packaging

—LISTING CONTINUED ON PAGE 80

# Midwest Custom Record Pressing Company, Inc.



— COMPLETE MANUFACTURING PLANT —

Specializing in Records, Album Jackets & Cassettes. "No order too small!"

Convenient Midwest Location

Write or Call for Free Brochure & Professional Assistance!

#6 Grandview Pk. Dr., P.O. Box 92  
Arnold, Missouri 63010 (314) 464-3013

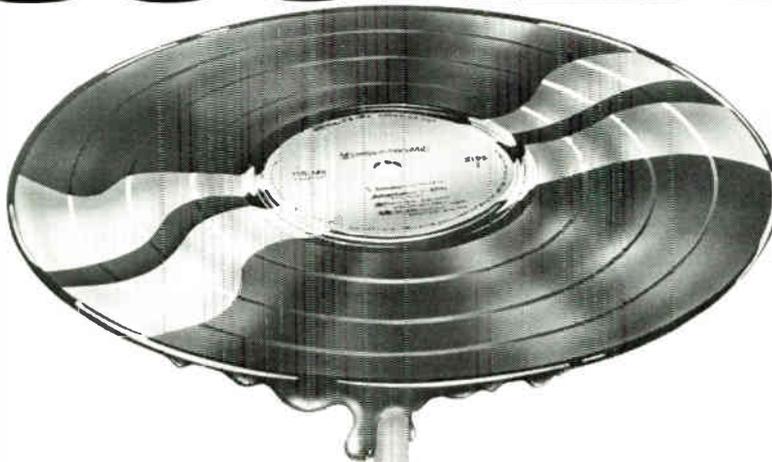
Circle #046 on Reader Service Card

World Radio History



We specialize in Studio Record Orders. Ask for SPECIAL STUDIO PRICING RATES!

# SUCKER.



They said they could handle it.  
And you believed them.  
Next time—before you find yourself  
in a sticky situation—call Ardent.  
Our professionals and state-of-the-  
art equipment offer everything you'd  
expect in recording, mastering  
and video capabilities.

**ARDENT.**  
Ahh—the sweet taste of success.

24 track & 46 track studios •  
Automated mixing • Neumann  
Mastering Equipment • One inch  
video tape production and editing  
• Ikegami EC 35 • Ultimatte 4 •  
Chyron IV Graphics • NEC E-FLEX  
digital effects • Steadicam

## ARDENT

2000 Madison Avenue • Memphis, TN 38104  
901-725-0855 / 726-6553

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## "You Supply the Recording" We'll Produce the Rest



LAYOUTS/ARTWORK/COMPUTER TYPESETTING/COLOR SEPARATION  
FINAL NEGATIVES/COLOR KEYS/4 COLORS PRINTING/POSTERS/RECORDS  
LABELS/JACKETS/COMPLETE CASSETTE & 8 TRACK LABELS/6 AUTOMATIC  
SMT RECORDS PRESSES/L.P. & 45/MASTERING/STAMPERS/COMPLETE  
CASSETTE & 8 TRACK/MANUFACTURING/HIGH SPEED DUPLICATION

PROSOUND INC.  
RECORD PRESSING  
DIVISION OF MIAMI TAPE  
(305) 558-0152

UNIVERSAL LITHO & ALBUM INC.  
(305) 557-2552 557-2562

MIAMI TAPE INC.  
(305) 558-9211 558-9212

8180 N.W. 103 St. Hialeah Gardens, Florida. 33016

Circle #048 on Reader Service Card

TAPETODISK  
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TAPETODISK

Listings of Mastering, Pressing and Tape  
Duplication Facilities Throughout the  
United States

## Central

—PAGE 79

### PRESSING

Presses: (24) Southern Machine & Tool automatics, LP's and 45's  
Capacity: 1,000,000 per month.  
Rates: .58 LP's, 28 45's, large runs per quote  
Credits: Same as mastering  
Other services: Complete record packaging



NASHVILLE RECORD PRODUCTIONS, INC.  
Nashville, TN

### NIGHTINGALE-CONANT CORPORATION TAPE DUPLICATION

7300 North Lehigh Avenue, Chicago, IL 60648  
(312) 647-0300  
Contact: James E. Reising, audio operations manager

### NORWEST COMMUNICATIONS TAPE DUPLICATION

123 South Hough St., Barrington, IL 60010  
(312) 381-3271  
Contact: Mark Karney, owner

### OAK RECORDING LAB. MASTERING

8830 S. Nashville Ave., Oak Lawn, IL 60453  
(312) 599-6222  
Contact: Edwin Stryszak, owner

### OPRYLAND PRODUCTIONS TAPE DUPLICATION

916 Twin Elms Ct., Nashville, TN 37210  
(800) 554-2348, (615) 242-2483  
Contact: Bill Coyne, Buddy Wilkins

### PRECISION AUDIO, INC. TAPE DUPLICATION

18582 US 20, Bristol, IN 46507  
(219) 295-7493  
Contact: Larry Becker, production manager

**TAPE DUPLICATION**

Duplicator: Modified Liberty Bin stereo, Infonics, mono, stereo.  
Capacity: 120 C90/hr.  
Method of duplication: In cassette, bin loop  
Mastering equipment: Ampex 440 C 1/2"  
Tape used: Ampex, BASF, CBS  
Shell used: Mag Media, Pro Media  
Duplicating speed: 16 l  
Type of loading: King 790  
Packaging equipment/Fulfillment services: ITI labeling

**PRECISION RECORD LABS**

**MASTERING, PRESSING & TAPE DUPLICATION**  
932 W. 38th Place, Chicago, IL 60609  
(312) 225-9117  
Contact: Lawrence Sherman, president

**PRESCO PRODUCTIONS**

**TAPE DUPLICATION**  
4366 West 66th St., Cleveland, OH 44144  
(216) 749-7244  
Contact: John F. Presby, president

**THE PRESSING PLANT**

**PRESSING**  
2737 Irving Blvd., Dallas, TX 75207  
(214) 630-6401  
Contact: Phil Kalan, general manager

**BUD PRESSNER RECORDING**

**MASTERING, PRESSING & TAPE DUPLICATION**  
4839 S. Broadway, Gary, IN 46409  
(219) 884-5214  
Contact: Bud Pressner, owner/manager

**PROGRAMMING TECHNOLOGIES, INC.**

**TAPE DUPLICATION**  
6666 N. Lincoln Ave., Lincolnwood, IL 60645  
(312) 676-9400  
Contact: Stanley Roy, sales manager



**QCA CUSTOM PRESSING**  
Cincinnati, OH

**QCA CUSTOM PRESSING**

**MASTERING, PRESSING & TAPE DUPLICATION**  
2832 Spring Grove Ave., Cincinnati, OH 45225  
(513) 681-8400  
Contact: Jim Basken, president

**MASTERING**

Cutting lathes: Neumann VMS 66 with Zuma Disc Computer  
Console: Neuman SP172 with SAL 74 amplifiers  
Tape machines: MCI JH110M  
Monitor speakers: UREI 811s, Advent, Auratone  
Signal processing: Sontec Parametric equalizer, EMT 156 limiters  
Engineers: Todd Deasey, Jim Bosken  
Rates: 12" LP \$75/side, 7" 45s \$35/side, 7" 33 1/3 \$50/side. Session time \$70/hr

**PRESSING**

Presses (Mfg. and quantity): 7 SMT automatics  
Capacity: 60,000 12" per week, 75,000 7" per week  
Vinyl used: Tenaco, Keysor KC500 & KC600  
Rates: Call for complete price list

**QUANTITAPE DUPLICATING INC.**

**MASTERING & TAPE DUPLICATION**  
311 W. Superior St., Chicago, IL 60610  
(312) 951-7270

Contact: Joe Gialiani, manager

**MASTERING**

Tape machines: Scully, Nakamichi digital processing, Otari, Revox, Technics  
Signal processing: EXR, Burwen, UREI, Orban, dbx, Dolby, Technics, Symetrix, Thompson, Crown  
Engineers: Joe Gialiani  
Rates: Upon request  
Other services: Voice impulsing

**TAPE DUPLICATION**

Duplicator: Teac, MTL, Sony  
Capacity: Growing, call for current capacity  
Method of duplication: In cassette, bin loop.  
Mastering equipment: Same as record mastering  
Tape used: Aqia 1612, BASF Chrome.  
Shell used: Magnetic Media  
Duplicating speed: 1-7/8 to 64 l  
Type of loading: King  
Packaging equipment/Fulfillment services: Yes  
Rates: Upon request  
Other services: Video duplication, VHS & Beta Hi-fi duplication  
Also reel time cassette duplication

**RAINBOW BRIDGE RECORDING STUDIO**

**MASTERING & TAPE DUPLICATION**  
117 W. Rockland, Libertyville, IL 60048  
(312) 362-4060  
Contact: Perry Johnson, studio manager

**RICHARDSON TAPE**

**TAPE DUPLICATION**  
#1 Collins St., Box 570A, Mountain View, AK 72560  
(501) 269-3908

Contact: Aubrey Richardson, owner

**TAPE DUPLICATION**

Duplicator: JVC & Technics (Recordex high speed)  
Capacity: 400 per shift  
Method of duplication: In cassette  
Mastering equipment: Otari, Crown, Technics, Technics Digital, UREI EQ and limiting  
Tape used: Ampex, AGFA, & BASF  
Shell used: Mag. Media  
Duplicating speed: 1-7/8 ips (real-time) (16 to 1 high speed)  
Type of loading: Audio  
Packaging equipment/Fulfillment services: In-house shrinkwrap and labeling. Other printing available  
Rates: On request  
Other services: VHS to VHS 1/2" mastering and high speed stereo cassette duplication (We individually check each cassette we duplicate)

**RITE RECORD PRODUCTIONS, INC.**

**MASTERING, PRESSING & TAPE DUPLICATION**  
9745 Mangham Drive, Cincinnati, OH 45215  
(513) 733-5533  
Contact: Phil Burkhardt, production manager

**RON ROSE PRODUCTIONS/RECORDING STUDIO**

**TAPE DUPLICATION**  
29277 Southfield Rd., Southfield, MI 48076  
(313) 424-8400

Contact: Don Wooster, vice president

**MASTERING**

Console: Neotek, Soundcraft, Tascam  
Tape machines: MCI, Otari, Tascam  
Monitor speakers: JBL  
Signal processing: UREI, Orban, Eventide, Lexicon-224  
Engineers: Eight  
Rates: Recording \$80/hour, Audio Post \$175/hour  
Other services: 1/4" video editing, commercial recording, 24 track audio postproduction for video

**TAPE DUPLICATION**

Duplicator: (1) Telex, (3) Magnalax  
Capacity: 3,000 C-60 per day, 2,500 reel to reel per day (3 min)  
Method of duplication: In cassette, bin loop  
Mastering equipment: MCI, Otari, Tascam  
Tape used: Ampex 456, 632; Aqia 526; Ampex 603, 604.  
Shell used: Mag Media, Kyrac, special on request  
Duplicating speed: 60 ips reel to reel, 90 ips - cassette  
Type of loading: (2) King loaders  
Packaging equipment/Fulfillment services: Labeling, boxing, expediting  
Rates: Call  
Other services: Computerized expediting and shipping

**ROYAL AUDIO VISUAL**

**TAPE DUPLICATION**  
4114 Montgomery Road, Cincinnati, OH 45212  
(513) 841-1267  
Contact: Herb or Jean Brancenburg, owners

**YOURS FREE!**

The essential planning & price guide for all of your custom record and tape needs

*It's quick • convenient • easy-to-use*



Now available throughout the United States, **WORLD RECORDS** Canada's largest exclusive custom record and tape manufacturer and packager gives you the audiophile pressings, glossy board jackets, chromium cassettes and service you've been searching for.

**And we can ship them all to you prepaid, to your door, in as few as 3 weeks! Hassle free!**

**WORLD RECORDS** delivers.. each and everytime, fully guaranteed to your original masters because we know how much you depend on them to promote your image. See what we've got to offer you. Then see just how fast we can deliver it.

**STATE of the ART MASTERING**

Neumann VMS 80 Lathe/Digital, 1/2" & 1/2 Speed/Full metal protection

**ULTRA GLOSS BOARD JACKETS**

Quantities as low as 500/  
true colour reproduction

**CHROMIUM CASSETTES**

Full frequency response on CrO<sub>2</sub> tape/  
Non-abrasive head cleaning leader

**VIRGIN VINYL PRESSING**

Audiophile grade/" Assured Excellence  
Guaranteed®"

**IN-HOUSE CREATIVE SERVICES**

Typesetting/Graphic artists/  
Colour scanner

**AIR DELIVERY**

Prepaid air freight delivery to over 200 cities/  
No Customs hassles

**call or write for our planning guide & price lists**



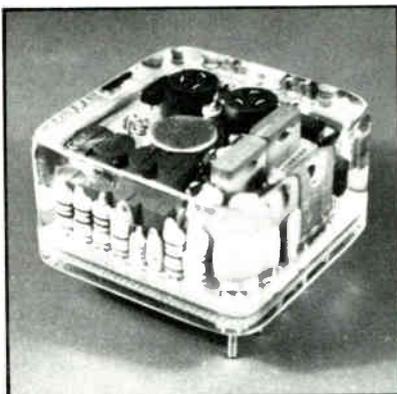
**WORLD RECORDS**

**Baseline Rd. W.  
BOWMANVILLE, ONTARIO  
L1C 3Z3  
416-576-0250**

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# 990

## Discrete Op-Amp



*Electrical Design by Deane Jensen  
Packaging & Production Design by John Hardy*

- **Fast:** 18V/ $\mu$ S @ 150 Ohms, 16V/ $\mu$ S @ 75 Ohms
- **Quiet:** -133.7 dBv E.I.N. (20—20kHz, shorted input, unweighted)
- **Powerful:** +24 dBv @ 75 Ohms (Ref: 0dBv = .775 V)

**AND IT SOUNDS GREAT !**

**THESE USERS AGREE:**

Sunset Sound, JVC Cutting center, Mobile Fidelity, K-Disc Mastering, Sony (Digital Audio Div.), Capitol Records, Inc., WFMT Chicago, Jensen Transformers, Bonneville Productions, DeMedio Engineering, ABC-TV, 20th Century Fox, Armin Steiner, and many more !

**THE HARDY CO.    Box AA631, Evanston, IL 60204    (312) 864-8060**

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## TAPING'S YOUR BUSINESS TAPE'S ONE OF OURS.....

*Call us last for the best prices anywhere*

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DISCOUNTS on 150 PRO PRODUCT LINES

**FULL COMPASS SYSTEMS**

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50 STATES  
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IN WISCONSIN  
1 (800) 362-5445  
LOCAL (608) 271-1100**

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# TAP TO DISK TAP TO DISK TAP TO DISK TAP TO DISK

Listings of Mastering, Pressing and Tape  
Duplication Facilities Throughout the  
United States

## Central

SOLID SOUND  
TAPE DUPLICATION  
P.O. Box 7611, Ann Arbor, MI 48107  
(313) 662-0667  
Contact: F. Martens, president

SONIC SCULPTURES, INC.  
MASTERING  
9745 Mangham Dr., Cincinnati, OH 45215  
(513) 733-5534  
Contact: L. in A. A. Hey, president

SOUND OF NASHVILLE, INC.  
A Division of Southern American Record Pressing Co., Inc.  
MASTERING, PRESSING & TAPE DUPLICATION  
305 11th Ave. S., Nashville, TN 37203  
(615) 244-1124  
Contact: Martha Ivands, sales manager

SOUTHERN AMERICAN RECORD PRESSING CO., INC.  
PRESSING  
305 Industrial Blvd., South, Nashville, TN 37203  
(615) 256-2521  
Contact: Martha Ivands, customer relations

SPECIAL RECORDINGS, INC.  
TAPE DUPLICATION  
3020-26 East Grand Blvd., Detroit, MI 48202  
1600 Woodward, Birmingham, MI 48011  
(313) 873-4655  
Contact: Anthony Charney, vice president & general manager

S & S CUSTOM TAPES, INC.  
TAPE DUPLICATION  
Rt. 4, Box 328-A, Church Hill, TN 37642  
(615) 357 TAPE  
Contact: Mike Napier, president  
TAPE DUPLICATION  
Duplicator: Electro-Sound master & 10 slaves  
Capacity: 84,000 track  
Method of duplication: 3/4 loop  
Mastering equipment: SDC for A80 (2 track), SDC for A80 (8 track), SDC for A80 (Q 7)  
Tape used: 3M Ampeg, Capitol  
Shell used: (b) S-crow  
Duplicating speed: 15 to 1  
Type of loading: Automatic  
Packaging equipment/Fulfillment services: Apex direct to shell printing, auto and 1/2 second automatic high speed wrap per  
Rates: Call or write for quote  
Other services: Full service for cassettes and Hi track insert print and full service audio recording master (1) supplier to other duplicators

STANG RECORDS MANAGEMENT LTD  
MASTERING, PRESSING & TAPE DUPLICATION  
P.O. Box 256577, Chicago, IL 60625  
(312) 399-5535  
Contact: Raymond E. K. Schwaner

STORER PROMOTIONS  
MASTERING, PRESSING & TAPE DUPLICATION  
209 1/2 Emory Street, Cincinnati, OH 45219  
(513) 621-6389

## 1985 EDITORIAL SCHEDULE ADVERTISING DEADLINES

- **JANUARY:** Northwest Studios
- **FEBRUARY:** Independent Engineers & Producers (NAMM); Electronic Keyboards
- **MARCH:** Southeast Studios; Nashville Recording; Loudspeaker Technology
- **APRIL:** Video Production Supplement/NAB (Listings of Video Facilities)
- **MAY:** Northeast Studios; Studio Owners Digital Forum; AES Convention
- **JUNE:** Remote Recording & Sound Reinforcement (NAMM); Concert Recording Forum
- **JULY:** Southwest Studios; Audio Education/School Listings; Mixing Console Technology
- **AUGUST:** Studio Design Issue (Listings of Designers and Suppliers)
- **SEPTEMBER:** Southern California Studios; Film Sound Update
- **OCTOBER:** AES Show/New Products Directory
- **NOVEMBER:** North Central Studios; Canadian Recording
- **DECEMBER:** Tape-to-Disk Issue (Listings of Mastering, Pressing, Duplication Facilities)

**Closing for Space Reservations:**  
7th of the month, 2 months prior to cover date.

**Deadline for Ad Materials:**  
15th of the month, 2 months prior to cover date.

**For more information, please call the Advertising Director at (415) 843-7901.**

## DUPLICATION SERVICES

- CASSETTES:** CUSTOMIZED DUPLICATION OF ALL LENGTHS AND QUANTITIES FOR EVERY APPLICATION — AV, EDUCATION, ENTERTAINMENT, COMPUTER, ADVERTISING/MARKETING. BLANK CASSETTES AVAILABLE IN BULK.
- AV SERVICES:** SPECIALIZED AV DEPARTMENT HANDLES PULSING, MASTERING, DUPLICATING, LOADING AND FINISHING FOR EVERY FORMAT. AVL LABELLE, AUDISCAN, DUKANE, KODAK, COUSINO, MACKENZIE, BELL & HOWELL, SINGER, OPTISONICS, ELBA, TIFFEN, TELEX, AND WOLLENSAK.
- 8-TRACK:** COMPLETE 8-TRACK CARTRIDGE SERVICE INCLUDING DUPLICATING, LOADING AND PACKAGING.
- PRESSINGS:** COMPLETE PRESSING AND PACKAGING FOR 7", 10", 12", AT 33 1/3 AND 45 R.P.M.
- PACKAGING:** CUSTOM DESIGN; SINGLE, MULTIPLE OR PROCESS COLOR PRINTING. CUSTOM OR STOCK MAILERS, CASSETTE CASE LINERS, SHRINK WRAPPING.
- LABELS:** CUSTOM DESIGN, PRINTING, APPLICATION — ALL FORMATS.
- SHIPPING:** ROUTINE DISPATCH AND BULK MAILING SERVICE
- EQUIPMENT:** CUSTOM DESIGN, MANUFACTURE, MODIFICATION AND INSTALLATION. SALES AND SERVICE FOR TELEX, LABELLE, SHURE, AND OTHER NEW AND PRE-OWNED EQUIPMENT.



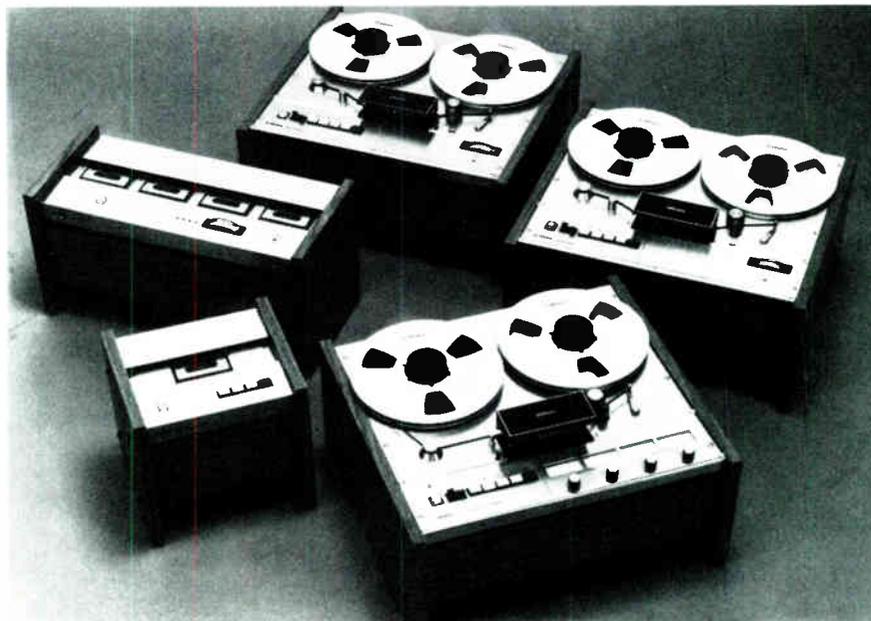
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247 East Ontario Street ■ Chicago, Illinois ■ 60611 USA ■ 312/467-5430

**TOTAL RECORDING DUPLICATING EQUIPMENT AUDIO**

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## @ infonics REEL TO REEL REEL TO CASSETTE CASSETTE TO CASSETTE CASSETTE TO REEL HIGH SPEED RECORDING EQUIPMENT



Tape Capability—CrO<sub>2</sub> & Fe, 70 & 120 usec EQ Frequency Response—20-20,000 Hz  
Wow & Flutter—Less than .09% Distortion—Less than 0.1%  
Track Format—2 Track and Four Track Switchable

(219) 879-3381 MADE IN U.S.A. TLX 233111MCI  
238 Hwy 212 P.O. Box 1111, Michigan City, IN 46360

Circle #053 on Reader Service Card

## COMPLETE TAPE SERVICES TO MEET YOUR DEADLINES AND YOUR STANDARDS

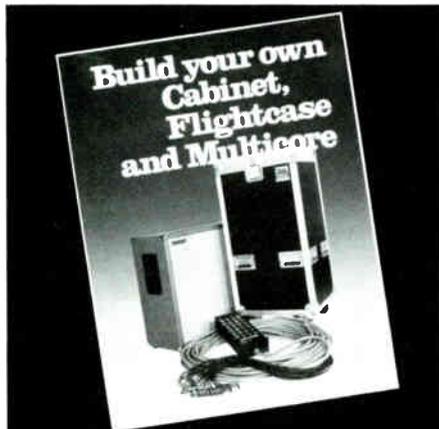
Mother Dubbers specializes in making "impossible" jobs possible.

We'll do what it takes to get your job done on time without sacrificing quality.

- Duplicating For All Quantities & Formats — cassette, reel-to-reel, 8-track
- Full Service Eight Track Recording Studio For Advertising, AV & Music Demo Clients
- Music & Sound Effects Library

**Mother Dubbers, Inc.**  
13626 Gamma Road  
Dallas, Texas 75234  
214/980-4840

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**Build your own Cabinet, Flightcase and Multicore**

We have the necessary top quality hardware:  
Corners, handles, catches, aluminum, extrusions, cables, connectors, vinyl and speakers.

Write for free 60 page brochure and price-list.  
Please send 2 \$ for postage.

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FCC Fittings  
Hawthorne, NJ 07506  
Postbox 356 d  
Phone: 201 423 4405

Circle #055 on Reader Service Card



Listings of Mastering, Pressing and Tape Duplication Facilities Throughout the United States

## Central

**STREETVILLE STUDIOS**  
TAPE DUPLICATION  
161 E. Grand Ave., Chicago, IL 60611  
(312) 644-1666  
Contact: Tracy Woody

**STUDIO PRESSING SERVICE**  
PRESSING  
PO Box 15140, Cincinnati, OH 45215  
(513) 793-4944  
Contact: Beth Hyrne, president

**SUMA RECORDING STUDIO**  
MASTERING, PRESSING & TAPE DUPLICATION  
5706 Vrooman Road, Cleveland, OH 44077  
(216) 951-3955  
Contact: Michael Bishop, studio manager

**SUPERIOR MAGNETICS**  
TAPE DUPLICATION  
Route 3, Box 155, Blue Springs, MS 38828  
(601) 869-2514  
Contact: Joe Taylor



*S.Y. RECORDING  
Skokie, IL*

**S.Y. RECORDING**  
TAPE DUPLICATION  
7876 N. Lincoln, Skokie, IL 60077  
(312) 982-9693  
Contact: Sarqon Yopan, owner; Robert Nossli, manager

**TANTUS PRODUCTIONS, INC.**  
TAPE DUPLICATION  
18461 W. McNichols, Detroit, MI 48219  
(313) 533-3910  
Contact: Mary Ann McGrath, studio manager

**TAPE 24**  
TAPE DUPLICATION  
1244 Remington Rd., Schaumburg, IL 60195  
(312) 882-2442  
Contact: Mike Freeman

**TAPE-FILM INDUSTRIES**  
MASTERING, TAPE DUPLICATION & DISTRIBUTION  
640 N. La Salle St., Suite 275, Chicago, IL 60610  
(312) 951-6700  
Contact: Frank Cimmarusti, branch manager

**TAPEMASTERS INC.**  
TAPE DUPLICATION  
3542 Security St., Garland, TX 75042  
PO Box 38651, Dallas, TX 75238  
(800) 527-1227, (214) 349-0081  
Contact: Jack Rhennans, president

**TECHNISONIC STUDIOS INC.**  
MASTERING, PRESSING & TAPE DUPLICATION  
1201 South Brentwood Blvd., St. Louis, MO 63117  
(314) 727-1055  
Contact: Edw. H. Carter, president

**TRIAD PRODUCTIONS, INC.**  
TAPE DUPLICATION  
1910 Ingersoll Ave., Des Moines, IA 50309  
(515) 243-2125  
Contact: Connie Seidlon, production coordinator

**TRUSTY TUNESHOP RECORDING STUDIO**  
TAPE DUPLICATION  
Rt. 1, Box 100, Nebo, Kentucky 42441  
(502) 249-3194  
Contact: Elsie Childers, owner

**VILLE PLATTE RECORD MFG. CO.**  
MASTERING, PRESSING & TAPE DUPLICATION  
120 E. Cypress, P.O. Box 10, Ville Platte, LA 70586  
(318) 363-2104  
Contact: Floyd Seibau, owner

**VOLUNTEER RECORD PRESSING, INC.**  
PRESSING, TAPE DUPLICATION  
P.O. Box 956 - 1142 Haley Rd., Murfreesboro, TN 37130  
(615) 890-3222  
Contact: Jimmy Lenahan, president

**WOODLAND SOUND STUDIOS**  
MASTERING  
1011 Woodland St., Nashville, TN 37206  
(615) 227-5027  
Contact: Sharon Ingram, mastering traffic manager; Denny Purcell, mastering engineer

**MASTERING**  
Cutting lathes: (2) Neumann VMS 70 SAI 74B rack SX 74 cutterhead VMS 66, VG 66s rack SX 74 head  
Console: (2) Neumann SP 772 (modified) Gotham  
Tape machines: Studer A 80 MKIII 4 and 1/2 precision Mitsubishi X 80A w/ review unit 3M  
Monitor speakers: Meyer 844 Westlake Klipsch MDM 4 Auratone  
Signal processing: Sonlec EQ and compression; Burwen noise filter; Urban stereo matrix; CRS/CMA compressor  
Engineers: Denny Purcell  
Rates: Per lacquer charge; appointment time charge; write or call for current rates  
Other Services: Digital tape copies; X 80 E 1 and 701 1610; IVC; X 80 and E 1 rental for mixing; Mastering from E 1; Outer ear canal enhancement

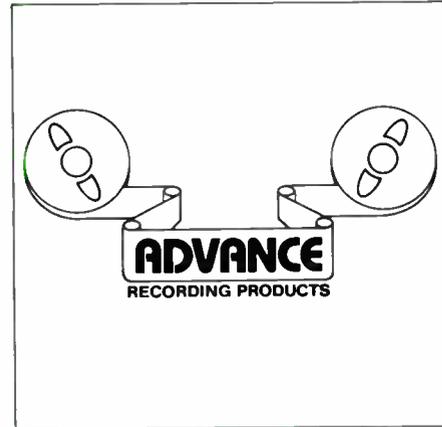
## Western

**A&M RECORDS**  
MASTERING  
1416 N. Labrea Ave., Hollywood, CA 90028  
(213) 469-2411  
Contact: Sandi Johnson

**MASTERING**  
Cutting lathes: Scully lathe fitted with Capps computer fully redesigned by A&M  
Console: Custom designed and built by A&M  
Tape machines: MCI with ATH heads and modified ATH electronics  
Monitor speakers: Assembled by A&M with Tannoy and EV components with H&H amps

**Signal processing:** Modified UA EQ, limiters and filters. CS-4 for mono disks and de-essing equipment designed by A&M  
**Engineers:** Arnie Acosta, Frank Deluna, Bob Carbone  
**Rates:** On request  
**Credits:** Michael Jackson, Supertramp, Donna Summers, Herb Alpert, Prince, Brothers Johnson, Steely Dan, Quincy Jones, Gap Band, The Police, etc.

**ABBEY TAPE DUPLICATORS INC.**  
**TAPE DUPLICATION**  
 9525 Vassar Ave., Chatsworth, CA 91311  
 (818) 882-5210  
 Contact: Nick Steed, sales representative



**ADVANCE RECORDING**  
 San Diego, CA

**ADVANCE RECORDING**  
**TAPE DUPLICATION**  
 7190 Clairmont Mesa Blvd., San Diego, CA 92111  
 (619) 277-2540, (800) 854-1061  
 Contact: Steve Smith, general manager

**ALLIED RECORD CO.**  
**PRESSING & TAPE DUPLICATION**  
 6110 Peachtree St., Los Angeles, CA 90040  
 (213) 725-6900  
 Contact: David Brown, vice president, sales

**ALSHIRE INTERNATIONAL, INC.**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 1015 Isabel Street, Burbank, CA 91506  
 (213) 849-4671  
 Contact: Al Sherman, president

**AMERICAN TAPE DUPLICATING**  
**TAPE DUPLICATION**  
 7017 15th Avenue N.W., Seattle, WA 98117  
 (206) 789-8273  
 Contact: John Wehman, manager

**ARCAL PRODUCTIONS INC.**  
**TAPE DUPLICATION**  
 2732 Bay Rd., Redwood City, CA 94063  
 (415) 369-7348  
 Contact: Sal Viola, production manager

**ARTISAN SOUND RECORDERS**  
**MASTERING**  
 1600 N. Wilcox Ave., Hollywood, CA 90028  
 (213) 461-2751  
 Contact: Greg Fulamiti, chief engineer/director

**ASR RECORDING SERVICES INC.**  
**TAPE DUPLICATION**  
 8960 Eton Ave., Canoga Park, CA 91304  
 (818) 341-1124  
 Contact: Bill Dawson, vice president

**AT&T RECORDING**  
**TAPE DUPLICATION**  
 725 North Highland Avenue, Los Angeles, CA 90038  
 (213) 933-5701  
 Contact: Lesley Cohen, sales manager

**AUDIO CASSETTE DUPLICATOR CO.**  
**TAPE DUPLICATION**  
 5816 Lankershim Blvd. #7, North Hollywood, CA 91601  
 (818) 762-2232  
 Contact: Steve Katz or Steve Mitchell, owners

**AUDIODYNE**  
**TAPE DUPLICATION**  
 P.O. Box 825, San Jose, CA 95112  
 (408) 287-3520  
 Contact: I R Charamonte, owner

**AUDIO ENGINEERING ASSOCIATES**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 1029 N. Allen Ave., Pasadena, CA 91104  
 (213) 798-9127  
 Contact: Sari Bebeo, general manager

**AUDIO-VIDEO CRAFT, INC.**  
**TAPE DUPLICATION**  
 7000 Santa Monica, Hollywood, CA  
 (213) 655-3511  
 Contact: Mark Williams, manager tape duplication

**THE AUTOMATT**  
**MASTERING**  
 829 Folsom Street, San Francisco, CA 94107  
 (415) 777-4111  
 Contact: Paul Stuhlbehn, Mastering Engineer  
**MASTERING**  
 Cutting lathes: Sealy Weston  
 Console: Custom  
**Tape machines:** MCI  
**Monitor speakers:** JBL 813, Bowers LS 35A, JBL Yamaha  
 Airstone  
**Signal processing:** All types available  
**Engineers:** Paul Stuhlbehn  
**Rates:** 12" master \$110, 12" Reel \$100, 7" master \$40, 7" Reel \$40, EQ & Handdown \$125/hr  
**Credits:** Blue Oyster Cult, Herbie Hancock, Con Funk Shun, Translator, Holly Near, Jane Fonda, Romeo Void, Heav Hoekers, Narada Michael Walden, Anicet Botill, Stacy Lattisaw



**AWARD RECORD MFG., INC.**  
 Los Angeles, CA

**AWARD RECORD MFG., INC.**  
**PRESSING**  
 5200 W. 83rd St., Los Angeles, CA 90045  
 (213) 645-2281  
 Contact: Marty Ansoorian, president  
**PRESSING**  
**Presses (Mfg. and quantity):** Lened automatics  
**Capacity:** 12,000 per day  
**Vinyl used:** Pure Virgin Keycor Century KC 610 & Vitec Queex  
**Rates:** Furnished upon request  
**Other services:** Printing, mastering, matrix, tapes, picture records, gold records, packaging and fulfillment

**KENNETH BACON ASSOCIATES, INC.**  
**TAPE DUPLICATION**  
 24 Commercial Blvd. Suite E, Novato, CA 94947  
 (415) 883-5041, 1-(800) 231-TAPE  
 Contact: Kenneth A. Bacon, president

—LISTING CONTINUED ON PAGE 86

# Disc Mastering

INC.

Every major recording center  
 has one mastering studio that's  
 a cut above the rest.

In Nashville, it's Disc Mastering Inc.

- ★ Neumann, Neve, Studer, Quad, and Tannoy equipment
- ★ Randy Kling, president—1984 Country Mastering Engineer of the Year
- ★ Represented every week this year on the national charts!

DISC MASTERING INC. • THIRTY MUSIC SQUARE WEST  
 NASHVILLE, TENNESSEE 37203 • (615) 254-8825

Circle #056 on Reader Service Card

**TAPE DUPLICATION:** Real Time - KABA Research & Development RTD-4T System, Hi-Speed Bin Loop—Accurate Sound 1/2" 4-track staggered head Hi-Speed In-Cassette—Otar, Alpha Capacity: 1,500 C-60/Shift.

**Method of duplication:** In cassette & bin loop  
**Mastering equipment:** Otari MK 2412", Otari MX 5050, TEAC 40-4, AIWA & ONKYO cassette decks

**Tape used:** AGFA PEM 468, PE 526, PE 619, PE 627 etc., as required by job

**Shell used:** Kync, Mag Media, Arcal

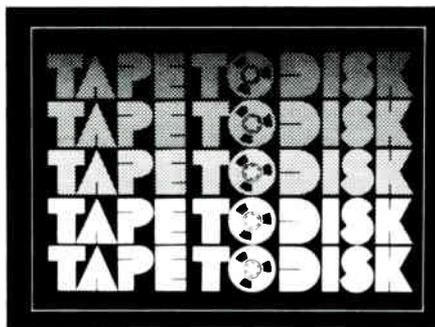
**Duplicating speed:** 1 7/8 ips; 3 1/4 ips, 15 ips, 30 ips; 60 ips as required by job

**Type of loading:** Tape Technology Laboratory Loaders

**Packaging availability/etc.:** Yes

**Rates:** Trade rates to recording studios

**Other services:** Custom computer and flat sheet labels, computer feed labels for 5" and 7" reels and reel boxes, blank label stocks, blank pre-loaded cassettes; boxes, inserts, shrink wrap, mailers. Equipment and supplies division sells most equipment and supplies used by professional duplications. Distributor AGFA-Gevaert video, mastering and cassette tapes. KABA R & D Division sells new Professional Real Time Duplication Systems.



Listings of Mastering, Pressing and Tape Duplication Facilities Throughout the United States

## Western



View through observation window at Kenneth Bacon Associates' new Novato tape duplication facility. One bank of real time decks in the mastering room can be seen through the rear window.

KENNETH BACON ASSOCIATES, INC.  
 Novato, CA

**BAMCO RECORDS**  
**PRESSING**  
 1400 S. Citrus Ave., Fullerton, CA 92633  
 (714) 738-4259  
 Contact: George Baker, manager

**BONNEVILLE MEDIA COMMUNICATIONS**  
**TAPE DUPLICATION**  
 130 Social Hall Ave., Salt Lake City, UT 84111  
 (801) 237-2677  
 Contact: John Campbell, sales manager

**BUZZY'S RECORDING SERVICES**  
**TAPE DUPLICATION**  
 6900 Melrose Ave., Los Angeles, CA 90038  
 (213) 931-1867  
 Contact: Maria Andreozzi

**CASSETTE PRODUCTIONS UNLIMITED**  
**TAPE DUPLICATION**  
 46 S. DeLacey St., Suite 24, Pasadena, CA 91105  
 (818) 449-0893  
 Contact: Keith Myers, vice president marketing and sales

**CASSETTE PROFESSIONALS**  
**TAPE DUPLICATION**  
 320 Stewart St., Reno, NV 89502  
 (702) 722-6292  
 Contact: Bill Stephens, owner

**CHRISTIAN AUDIO TAPES**  
**MASTERING & TAPE DUPLICATION**  
 3005 W. Glendale Ave., Phoenix, AZ 85021  
 (602) 246-4976  
 Contact: Pat & Jack Murray, owners

**CREATIVE SOUND PRODUCTIONS**  
**MASTERING, PRESSING, TAPE & VIDEO DUPLICATION**  
 6290 Sunset, 9th Floor, Hollywood, CA 90028  
 (213) 871-1010  
 Contact: Bob Cotterell

**THE CREATIVE WORD**  
**TAPE DUPLICATION**  
 17885 B-2 Sky Park Circle, Irvine, CA 92714  
 (714) 261-8273  
 Contact: Bryan Hill, president

**CUSTOM DUPLICATION INC.**  
**TAPE DUPLICATION**  
 3404 Century Blvd., Inglewood, CA 90303  
 (213) 670-5575  
 Contact: Rick Hively, national sales manager

**DAVKORE COMPANY**  
**TAPE DUPLICATION**  
 1330-D Space Park Way, Mountain View, CA 94043  
 (415) 969-3030  
 Contact: Paul Korntheuer, operations manager

**DCT RECORDERS**  
**MASTERING & PRESSING**  
 4007 W. 6th St., Los Angeles, CA 90020  
 (213) 383-2155  
 Contact: Pat Burnette

**DYNASTY STUDIO**  
**MASTERING & TAPE DUPLICATION**  
 1614 Cabrillo Ave., Torrance, CA 90501  
 (213) 328-6836  
 Contact: Phil Kachaturian, owner/manager

**ELECTRO SOUND GROUP INC.**  
**(MONARCH RECORD MFG. CORP.)**  
**PRESSING & TAPE DUPLICATION**  
 9545 San Fernando Road, Sun Valley, CA 91352  
 (818) 767-8833

Contact: Debby Heagan, West Coast sales manager

**PRESSING**  
**Presses:** SMT 25 presses  
**Capacity:** 50,000 LPs/day, 36,000 7" /day  
**Vinyl used:** Keyser Vitec  
**Rates:** Upon request — Call or write.  
**Other services:** Fulfillment  
**TAPE DUPLICATION**  
**Duplicator:** Electro Sound equip — 20 slaves.  
**Capacity:** 35,000 per day  
**Method of duplication:** Bin loop  
**Mastering equipment:** Studer  
**Tape used:** BASF (others upon special request)  
**Shell used:** Various  
**Duplicating speed:** 64 l  
**Type of loading:** Manual and automatic  
**Packaging equipment/Fulfillment services:** Scandia  
**Rates:** Upon request — Call or write

**EMC PRODUCTIONS**  
**TAPE DUPLICATION**  
 300 York Avenue, St. Paul, MN 55101  
 6855 Santa Monica Blvd., Hollywood, CA 90038  
 (612) 771-1555 or (213) 463-3282  
 Contact: Ed O'Phelan, Deb Sturges, sales managers

**TAPE DUPLICATION**  
**Duplicator:** Electro Sound 6400 and 8000 duplicating lines.  
**Capacity:** 15,000 daily  
**Method of duplication:** Bin loop  
**Mastering equipment:** MCI and Otari.  
**Tape used:** Capitol Magnetics and AGFA.

**Shell used:** 15 standard cassette colors  
**Duplicating speed:** 32:1 and 64 l  
**Type of loading:** D & D automatic high-speed loaders.  
**Packaging equipment/Fulfillment services:** Complete collection, automatic boxing equipment  
**Rates:** Pricing available on request  
**Other services:** Warehousing and fulfillment of finished cassettes, direct offset label imprinting offering the complete range of ink colors, FX Pro, spine mount an option, heat seal and pressure-sensitive labeling available; complete pulsing, mastering, insert printing also available

**THE EXCEL COMPANY**  
**TAPE DUPLICATION**  
 102 North Ditmar, Oceanside, CA 92054  
 (619) 722-8284

Contact: Dana Berry, sales manager

**TAPE DUPLICATION:**  
**Duplicator:** Magneta, Pentagon, Wollensak — both cassette and 1/4-inch

**Capacity:** 5,000 C-45 per shift

**Method of duplication:** In cassette, bin loop

**Mastering equipment:** Fully equipped professional recording studios

**Tape used:** AGFA 611, 612, Magnetic Media XM-II, CD.

**Shell used:** Magnetic Media

**Duplicating speed:** 16 l

**Type of loading:** King 79C (2)

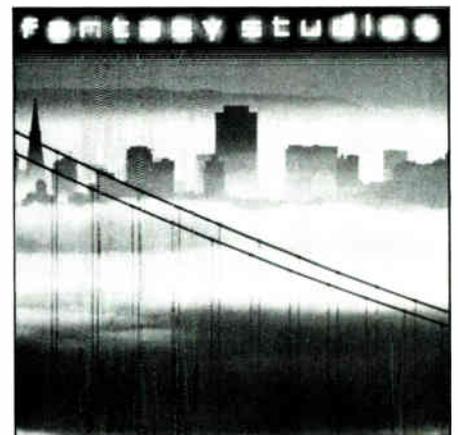
**Packaging availability/Fulfillment services:** Automated labeling, shrink-wrapping, printing

**Rates:** Please call for a pleasant surprise!

**Other services:** Soon real-time stereo at high speed prices! Professional multi-track studio and editing/mastering studios

**FANFARE RECORDING STUDIOS**  
**TAPE DUPLICATION**  
 110 E. Main St., El Cajon, CA 92020  
 (619) 447-2555

Contact: Carol Compton, studio manager



FANTASY STUDIOS MASTERING  
 Berkeley, CA

**FANTASY STUDIOS MASTERING**  
**MASTERING**  
 10th and Parker, Berkeley, CA 94710  
 (415) 549-2500

Contact: George Horn

**MASTERING**

**Cutting lathes:** Neumann mastering system utilizing the Zuma audio computer, Studer tape machines

**Rates:** LP lacquers: \$106/side, 45 lacquers: \$35/side, mastering room run down and EQ: \$ 00/hr

**Other services:** Mastering from Mitsubishi digital master tapes

Preparation of digital masters for Compact Disc manufacturing

Editing and equalization/mastering from F1 format

**F.D.S. LABS/HANK WARING DISC MASTERING**  
**MASTERING & PRESSING**  
 4007 W. 6th, Los Angeles, CA (at Quad Teele Studios)  
 (213) 383-2155  
 Contact: Hank Waring, owner

**FUTURE DISC SYSTEMS**  
**MASTERING**  
 3475 Cahuenga Blvd. West, Hollywood, CA 90068  
 (213) 876-8733

Contact: Gary Rice or Steve Hall

**MASTERING**

**Cutting lathes:** Cybertonics-Zuma DM2002-FDM lathe with Or-

to/in DSS821 cutting system.

Console: Cybersonics MC2003 fully automated mastering console

Tape machines: ATR102 ¼-inch/½-inch mastering machine, Mitsubishi X-80/DDI-1 digital mastering system

Monitor speakers: Custom

Signal processing: Sontec equalizer and limiter/compressor.

Engineers: Steve Hall, chief engineer

Rates: Upon request

Credits: Al Jarreau, Sheena Easton, Donna Summer, Jermaine Jackson, Rod Stewart, Jean-Luc Ponty, Patti Austin.



FUTURE DISC SYSTEMS  
Hollywood, CA

THE GARAGE, AUDIO AND VIDEO  
MASTERING & TAPE DUPLICATION  
316 N. Foxdale, West Covina, CA 91790  
(818) 337-7943  
Contact: Pat Woertink, owner, producer

GARRISON PUTNEY STUDIO  
MASTERING, PRESSING & TAPE DUPLICATION  
4635 East Anaheim St., Long Beach, CA 90804  
(213) 494-4552  
Contact: Clovis L. Putney, owner-operator



GRD RECORDINGS  
Phoenix, AZ

GRD RECORDINGS  
TAPE DUPLICATION  
P.O. Box 13054, Phoenix, AZ 85002  
(602) 252-0077  
Contact: Liv Singh Khalsa, Owner

**TAPE DUPLICATION**

Duplicator: 150 Denon DR-F8 Real Time recorders, 25 Tascam 122 recorders

Capacity: Orders up to 10,000.

Method of duplication: Real-time.

Mastering equipment: Olari, Denon, Orban limiting, Lexicon reverb, 16 bit digital

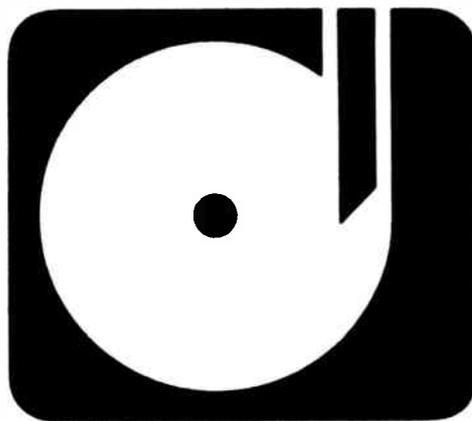
Tape used: AGFA 611, AGFA chrome, metal on request.

Shell used: Maq Media and Shape

—LISTING CONTINUED ON PAGE 88

# THE MASTERING LAB

AN INDUSTRY LEADER IN DISK MASTERING  
SINCE 1967



213-466-8589  
LOS ANGELES

Circle #057 on Reader Service Card

## You put everything you got into making your record the best it can be.



But before everyone hears your work, they're going to see it. Let the quality of your graphics reflect the excellence they can expect to find in your music.

Stoughton can provide all of your record-related printing needs in one stop. Top-quality lithography and fabrication of jackets and sleeves for both albums and 45's, single or multi-color. Labels in all sizes and styles, including picture disks. And, of course, posters and any other graphic material you may need to promote your product.

If it's worth doing, it's worth doing right. Come to the source.

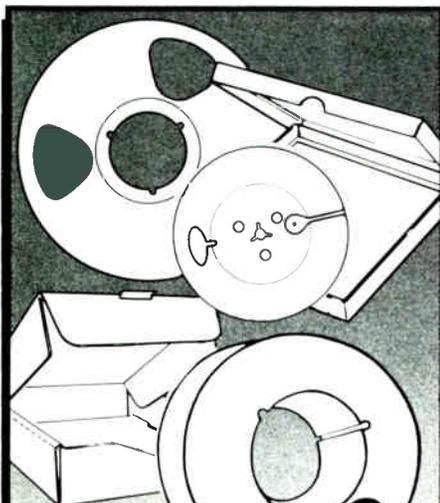
## stoughton printing co.

130 N. Sunset Avenue, City of Industry, CA 91744  
From Los Angeles: (213) 686-2753  
(213) 961-3678

Quality Printing For The Record Industry Since 1965

©1983 Stoughton Printing Co.

Circle #058 on Reader Service Card



**Polyline Corp.**  
**REELS & BOXES**  
**FOR AUDIO AND VIDEO TAPE**  
 PROFESSIONAL QUALITY  
**ALL SIZES**  
 Shipped from Stock  
 (312) 297-0955  
 1233 Rand Road  
 Des Plaines, IL  
 60016

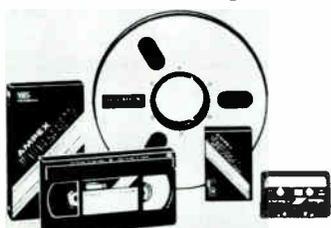
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**Custom Length  
 BASF  
 Chrome  
 Cassettes**

**AMPEX**  
 Blank Recording Tape



**Authorized Distributor**  
**UNITED TAPE  
 COMPANY**  
 10746 Magnolia  
 N. Hollywood, CA  
**(818) 980-6700**  
 Ask for Steve

Authorized Reseller  
 Information Processing Media 

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Listings of Mastering, Pressing and Tape  
 Duplication Facilities Throughout the  
 United States

## Western

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Duplicating speed: 1 7/8 ips (Real Time)  
 Type of loading: Otari  
 Packaging availability/etc.: 4 color printing labels, assembly  
 chink  
 Rates: C15 \$1.05 each, C30 \$1.07 each, C45 \$1.12 each, C60  
 \$1.23 each, C75 \$1.85 each, C90 \$2.00 each (all prices real  
 time, subject to change)  
 Other services: Record and produce new music; high speed  
 duplication for voice; custom load blank cassettes

**HI SPEED TAPE DUPLICATING  
 TAPE DUPLICATION**  
 940 Howard St., San Francisco, CA 94103  
 (415) 543-7393  
 Contact: John Trinidad, engineer

**HOT FUDGE PRODUCTIONS & MANUFACTURING  
 (FLEXIBLE PICTURE RECORDS)  
 PRESSING**  
 9831 Oak Street, PO Box 1029, Bellflower, CA 90706  
 (213) 867-4455  
 Contact: Danny T. Polhamus, production coordinator

**IMPERIAL TAPE CO.  
 AUDIO & VIDEO DUPLICATION**  
 821 9th St., Ste. 5, Santa Monica, CA 90403  
 (213) 393-7711  
 Contact: Howard Gans



JVC CUTTING CENTER INC.  
 Hollywood, CA

JVC CUTTING CENTER INC.  
 MASTERING, PRESSING & TAPE DUPLICATION  
 6363 Sunset Blvd., Suite 500, Hollywood, CA 90028  
 (213) 467-1166  
 Contact: Warren Salyer, studio operations  
**MASTERING**  
 Cutting lathes: Neumann VMS 70 with JVC quartz lock motor,  
 JVC CH90 cutter head and Zuma computer  
 Console: JVC custom disc mastering console

**Tape machines:** MCI w/custom heads & playback electronics/  
 JVC DAS-900, Sony, PCM 1610 2 track digital/Ampex  
 ATH 102.

**Monitor speakers:** Custom Fostex LS 3

**Signal processing:** Sontec & JVC equalizers and limiters, dbx &  
 Dolby

**Engineer:** Joe Gastwirt (chief mastering engineer), Ian Hensch  
 (digital editing)

**Rates:** Upon request

**Credits:** Timothy B. Schmit, Toni Tennille, Jimi Hendrix, Mann-  
 heim Steamroller, Branstorm, The Last Starlighter, Ronald Shan-  
 non Jackson, Kittyhawk, Joe Pass, Joe Turner, Zoot Sims, XTC,  
 Tania Maria, Judas Priest, Eddy Grant

**Other services:** JVC DAS-900 and Sony PCM 1610 digital ren-  
 tals, remotes, and editing. Sole distributor for Adamant/JVC cut-  
 ting Stylus, JVC test records

**PRESSING:**

JVC Custom pressing for both analog and Compact  
 Discs

**Vinyl used:** JVC Custom compounds including JVC super vinyl.  
**Rates:** Upon request

**Credits:** Mobile Fidelity Sound Labs, Sheffield Lab, American  
 Gramophone

**Other services:** Complete printing and art service, including  
 jackets and sleeves

**TAPE DUPLICATION**

**Duplicator:** JVC Custom duplicators

**Method of duplication:** Bin loop

**Rates:** Upon request

**Other services:** Complete printing and art service including  
 jackets and inserts

**KDISC MASTERING  
 MASTERING & PRESSING**  
 26000 Springbrook Ave., Saugus, CA 91350  
 (805) 259-2360 or (818) 365-3991  
 Contact: Sharon Summerfield, customer assistance

**KDISC MASTERING  
 MASTERING & PRESSING**  
 6550 Sunset Blvd., Hollywood, CA 90028  
 (213) 466-1323

Contact: John Golden, studio manager

**MASTERING**

**Cutting lathes:** Neumann  
**Console:** Custom & Sphere

**Tape machines:** Studer, Ampex, ATH

**Monitor speakers:** Custom JBL, Ceteo-Gauss

**Signal processing:** Neve, API, ITI, Sontec, Sphere, dbx, Dolby

**Engineers:** Ken Perry, John Golden, Carol Hibbs, Bill Lightner

**Rates:** Call for rates

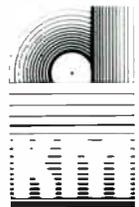
**Credits:** Crusaders, Prince Bushon, Frank Stallone, Ghostbusters,

Fruwitt & West, Men at Work, Isley Bros. etc.

**Other services:** Studer 15" 2 track preview machine and Ampex

ATH 102 1/2" 2 track record machine

**KENDUN RECORDERS  
 MASTERING**  
 721 S. Glenwood Place, Burbank, CA 91506  
 (818) 843-5900  
 Contact: Kent Duncan, creator of mastering



**KM RECORDS INC.**

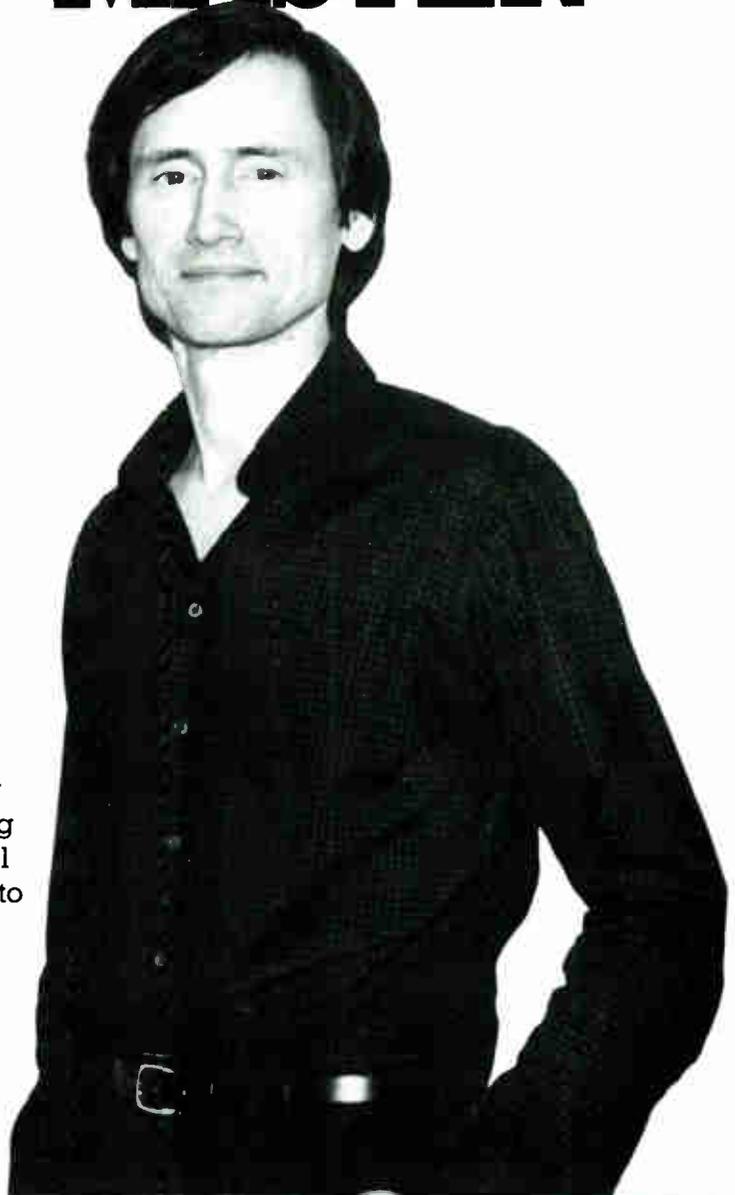
*K M RECORDS, INC.  
 Burbank, CA*

**K M RECORDS, INC.  
 MASTERING & PRESSING**  
 2980 N. Ontario St., Burbank, CA 91504  
 (818) 841-3400  
 Contact: Jim Auchterlenc

—LISTING CONTINUED ON PAGE 90



# The MASTER



When it comes to record mastering, Bernie Grundman wrote the book.

Over the years Bernie has cut the masters for many of the world's best selling albums, including the phenomenally successful 'Thriller' by Michael Jackson. What loudspeakers does Bernie rely on to monitor the quality of his output?

“I've mastered successfully on Tannoy for 17 years. For my new facility I chose Tannoy again.”

*Bernie Grundman*

**Bernie Grundman**  
**MASTERING**

3054 Sunset Blvd. Hollywood, California 90028

(213) 465-6264

**Rely on TANNOY®**  
**The Name for Loudspeakers**

Tannoy North America Incorporated, 97 Victoria Street North, Kitchener, Ontario, Canada. N2H 5C1. Telephone (519) 745 1148. Telex: 06955328.

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**MASTERING**

Cutting lathes: VMS-70, SX-74, SAL 74-B  
Console: Neumann SP-78.  
Tape machines: Modified MCI JH-110  
Monitor speakers: Custom.  
Signal processing: EMT 140, API and other EQ.  
Engineers: Michele Stone, Jeff Sanders, Randy Green  
Rates: Upon request

**PRESSING**

Presses (Mfg. and quantity): Toolex-Alpha (G)  
Capacity: 12,000/day  
Vinyl used: KC 569, Teldec, Quiex  
Rates: Upon request  
Other services: In house metal processing, printing of labels, jacket covers and liners, jacket fabrication, direct on board

**LEW'S RECORDING PLACE**

**TAPE DUPLICATION**  
1219 Westlake Ave North, Suite 115, Seattle, WA 98109  
(206) 285-7550  
Contact: Lew J Lathrop, owner

**LIGHTNING CORPORATION**

**TAPE DUPLICATION**  
7854 Ronson Rd., San Diego, CA 92111  
(619) 565-6494

Contact: Mike Larsen, president

**TAPE DUPLICATION**

Duplicator: Wollensak (3M) 10, Pentagon  
Capacity: 26 cassettes/run (8,000 C-60/day)

Method of duplication: In cassette

Mastering equipment: Ampex, Otari 2 and 4 track reel to reel, BIC & Superscope cassettes

Tape used: BASF, DPS.

Shell used: Magnetic Media (5 screw), white or black

Duplicating speed: 30 ips (16 1)

Type of loading: King

Packaging availability/etc.: Complete albums, boxes, labels, shrinkwrap

Rates: C-30 \$1 00, C-60 \$1 15, C-90 \$1 40

Other services: Voice studio, remote recording, video taping 3/4 and 1/2", multi-media slide shows and sound tracks



Listings of Mastering, Pressing and Tape Duplication Facilities Throughout the United States

# Western

**MASTER DIGITAL INC.**  
**AUDIO AND VIDEO DUPLICATION**  
1749 14th St., Santa Monica, CA 90404  
(213) 452-1511

Contact: Paul Addis, vice president, sales

**TAPE DUPLICATION**

Duplicator: 16 bit digital Sony or analog

Method of Duplication: Real-Time only

Mastering equipment: Studer B67, Sony PCM 1600.

Tape used: Sony UCXS - BASF chrome - custom loaded to length

Shell used: Shape, MK 10

Duplicating speed: Real Time

Packaging availability/Fulfillment services: Color stock, typeset 1 cards & labels

Rates: \$3 00 & up

Other services: Film & video production, digital audio recording, Compact Disc mastering, videophile—1 inch and 1/4-inch stereo, VHS Hi-Fi and Beta Hi-Fi duplication



**THE MASTERING LAB**  
Los Angeles, CA

**THE MASTERING LAB**

**MASTERING**

6033 Hollywood Blvd., Los Angeles, CA 90028  
(213) 466-8589

Contact: Susan Fridgen, studio manager

## Audiophile Quality and Service

The people at KM Records are masters at their craft and treat each recording as "solid gold." From tape to record the cost-effective way, because we do it all in-house: mastering, matrix electroforming, record pressing, label and jacket graphics and printing.



## KM Records — always a sound choice.

2980 N. Ontario Street, Burbank, CA 91504  
Tel. 213 841-3400 or TWX No. 910-498-5700

Circle #062 on Reader Service Card



**RECORDING STUDIOS**

**MCA WHITNEY RECORDING STUDIO**  
Glendale, CA

**MCA WHITNEY RECORDING STUDIO**  
**MASTERING & TAPE DUPLICATION**  
1516 W. Glendale Blvd., Glendale, CA 91201  
(818) 245-6801

Contact: Frank Kejmar, Studio Manager

**MASTERING**

Cutting lathes: (2) VMS 70, Tandem w/Zuma computer

Console: Neumann w/custom electronics

Tape machines: Studer A80 w/custom electronics, ATR-100, Tandberg 3014

Monitor speakers: UREI 813

Signal processing: Sontec parametric

Engineers: Dave Hernandez

Rates: Upon request.

Credits: Metal Blade Records, Blondie, Pat Benatar, The Knack, Barry White, Love Unlimited Orchestra, Aretha Franklin, Andre Crouch, One Way, E.T., Crusaders, Tanya Tucker, Suzie Quatro, etc.

Other services: Professional 24 track recording studios.

**TAPE DUPLICATION**

Duplicator (Mfg. and quantity): 12 Ampex reel to reel, Otari cassette

Method of duplication: In cassette

Tape used: BASF Pro I

Shell used: Magnetic Media.  
Duplicating speed: 8:1  
Packaging availability/etc.: Labeling, insert card, delivery.  
Rates: Upon request.  
Other services: Professional 24 track recording.

**MCCUNE AUDIO VISUAL**  
TAPE DUPLICATION  
951 Howard St., San Francisco, CA 94103  
(415) 777-2700  
Contact: Don Geis, chief engineer

**MIRROR IMAGE**  
TAPE DUPLICATION  
10288 E. Jewell Ave. #45, Denver, CO 80231  
(303) 751-2268

Contact: Chris, John or George, manager

**TAPE DUPLICATION**

Duplicator: Denon DRM-33, 100 each.

Capacity: 5000 C-30 2 shifts.

Method of duplication: Real-time.

Mastering equipment: Technics RS-1500 US.

Tape used: Ampex, Agfa, BASF, Maxell, TDK, Sony

Shell used: Mag Media

Duplicating speed: 1-7/8 (Real-Time).

Packaging equipment/Fulfillment services: Packaging, shrinkwrap, etc.

Rates: As low as 88 cents for C30.

Other services: Aphex processing, dbx, Dolby B & C.

**MJS MAGNETIC TAPES**  
TAPE DUPLICATION  
2514 Seaboard Ave., San Jose, CA 95131  
(408) 262-5544  
Contact: Mike Steiner, owner

**ML TAPE DUPLICATING**  
TAPE DUPLICATION  
6935 Valjean Ave., Van Nuys, CA 91406  
(818) 988-2737  
Contact: Bill Ball, owner

**MOBILE FIDELITY SOUND LAB**  
MASTERING, PRESSING & TAPE DUPLICATION  
21040 Nordhoff, Chatsworth, CA 91311  
(818) 709-8440  
Contact: Pete Schrutzer

**MOON VALLEY CASSETTE**  
TAPE DUPLICATION  
10802 N. 23rd Ave., Phoenix, AZ 85029  
(602) 864-1980

Contact: Mark Bruno, manager

**TAPE DUPLICATION**

Duplicator: Otari DP-1010, multiple slaves.

Capacity: 500 C-60s per hour

Method of duplication: Bin loop

Mastering equipment: Otari 5050 2 track, MX5050 4 track.

Tape used: AGFA 611, AGFA 8-11

Shell used: Kync, 5-screw

Duplicating speed: 16:1

Type of loading: Otari automatic loaders

Packaging equipment/Fulfillment services: RZ126 19x26 off-

set, 1250W offset, shrinkwrap.

Rates: As low as 56 cents/C-15, 85 cents/C-45.

Other services: Custom packaging, original recording, music arranging

**MOTOWN/HITSVILLE STUDIOS**  
MASTERING  
7317 Romaine St., Hollywood, CA 90046  
(213) 850-1510

Contact: Mark Koffman, studio manager

**MR. SPEED CASSETTE DUPLICATION**  
TAPE DUPLICATION  
5816 Lankershim Blvd. #5, North Hollywood, CA 91601  
(818) 767-7333

Contact: Mr. Speed, manager of operations

**TAPE DUPLICATION**

Duplicator: Sony high-speed equipment.

Capacity: Quantity discounts — No minimum.

Method of duplication: In cassette

Mastering equipment: State-of-the-art computerized equipment.

Tape used: BASF LHD

Shell used: Mag Media, 5-screw.

Duplicating speed: 8:1

Type of loading: Custom length cassettes.  
Packaging equipment/Fulfillment services: Complete services available.  
Rates: Competitive rates — Call for quote or price list  
Other services: Real-time duplication available.

**MUSIC ANNEX**  
TAPE DUPLICATION  
970 O'Brien Dr., Menlo Park, CA 94025  
(415) 328-8338  
Contact: David Porter or Keith Hatscheck

**MUSIC LAB, INC.**  
TAPE DUPLICATION  
1831 Hyperion Ave., Hollywood, CA 90027  
(213) 666-3003  
Contact: Craig Durst

**RAY NAKAMOTO PRODUCTIONS**  
MASTERING & TAPE DUPLICATION  
1030 48th St., Sacramento, CA 95819  
(916) 461-3400  
Contact: Ray Nakamoto

**NORTHWESTERN INC.**  
TAPE DUPLICATION  
1224 SW Broadway, Portland, OR 97205  
1 (800) 547-2252; 1 (503) 226-0170

Contact: Paul Buescher, Sales Manager

**MASTERING**

Console: Spectra Sonics

Tape machines: Ampex ATR102-ATR 800.

Monitor speakers: Altec 604.

Signal processing: Spectra Sonics, Echoplex.

Engineers: Gary Shannon, Bob Lindahl

Rates: \$50.00 per hr.

**TAPE DUPLICATION:**

Duplicator: AudioTek 2000 BL.

Capacity: 4000 per day C-45.

Method of duplication: In cassette, bin loop.

Mastering equipment: Ampex ATR 800-4, ATR 800-2

Tape used: Ampex 603 and AGFA 612 Magnetite

Shell used: Kync.

—LISTING CONTINUED ON PAGE 92

## VIDEO MASTERING BY THE MASTERS

- **Four years ago, Master Digital**, using digital audio techniques, proved to the recording industry that we could consistently duplicate real-time audio cassettes that exceed the quality of records
- **Three years ago, Master Digital** pioneered the synchronization of digital audio to video, giving masters an audio dynamic range never before associated with video.
- **Two years ago, Master Digital** began compact disc mastering and has since produced the

largest single compact disc order to date for the world's largest electronic retailer.

- **One year ago, Master Digital** started engineering the most sophisticated video cassette mastering facility. Now we are pleased to announce that our new facility is on line producing stereo VHS Hi-Fi, Beta Hi-Fi and U-Matic duplication. Our video mastering division has consistently produced the highest degree of video and audio quality that our broad client base has come to expect.

Based on the principles of high technology and dedicated customer service, we would like to add you to our list of satisfied customers. If your company demands the highest quality product at a more than competitive price, delivered when promised, then call our V.P. of Sales, Paul Addis, and **experience the Master Digital difference!**

**(213) 452-1511**



**Master Digital, Inc.**  
1749 14th Street • Santa Monica, CA 90404

Circle #063 on Reader Service Card

**Our 45th Year**



# RAINBO RECORDS

1738 Berkeley Street  
Santa Monica, California 90404  
(213) 829-0355 (213) 829-3476  
TWX 910-343-6862

**The ONE STOP Center  
For Custom Record  
Pressing and  
Cassette Duplication**

-  Any Size
-  Any Shape
-  Any Picture
-  Any Color

**In-House  
Mastering • Processing  
Labels • J-Cards**

**Record Jackets  
Picture Sleeves  
Collation • Fulfillment**

**(213) 829-0355**



**No Order Too Large  
No Order Too Small  
10-Day Turn Around**

Circle #064 on Reader Service Card



Listings of Mastering, Pressing and Tape Duplication Facilities Throughout the United States

## Western

—PAGE 91

**Duplicating speed:** 32:1  
**Type of loading:** 2-King 760 automatic  
**Packaging availability/Fulfillment services:** Shrink wrap in sets; labels  
**Other services:** Reel to reel at speed Ampex AG 440 C 6 slaves



ORPHARION RECORDINGS  
Long Beach, CA

ORPHARION RECORDINGS  
TAPE DUPLICATION  
PO Box 91209, Long Beach, CA 90809-1209  
(213) 438-4271

Contact: Jonathan Marcus or LaVonna Hasz  
**TAPE DUPLICATION**  
**Duplicator:** Intonics 200A, one Real Master two 4 position slaves Small quantity real time with Sony TC K777s  
**Capacity:** 1,000 C45's/day  
**Method:** In cassette  
**Mastering equipment:** Digital processors Audio + Design modified Sony 701ES, dbx 700 1/2 inch VHS and Beta Formats Analog tape machines Nagra T Audio 1/4 inch 30 ips AES 15 ips NAB, 15 ips NagraMaster, 7 1/2 ips NAB Otari MX 5050B 1/4 inch 1/4 track record 1/2 track playback 15 ips NAB 7 1/2 ips NAB 3 1/4 ips NAB Cassette decks Four Sony TC K777s Nakamichi ZX 9 Dolby A, B, C dbx I and II  
**Tape:** 1/4-inch mastering tape AGFA 468 Cassette tape BASF Cr02 and normal bias  
**Shell:** Data Pac, Magnetic Media, Shape  
**Duplicating speed:** 10:67:1 or Real Time  
**Loader:** Electro Sound  
**Packaging-printing rates:** Call for quotes  
**Other services:** Audiophile remote recording

**OUTBACK STUDIOS**  
TAPE DUPLICATION  
489 1/2 Cavour St., Oakland, CA 94618  
(415) 655-2110  
Contact: Nancy Dyer, traffic manager

**PRECISION LACQUER**  
MASTERING  
1008 North Cole Ave., Los Angeles, CA 90038

(213) 464-1008  
Contact: Kate Emerina, studio manager  
**MASTERING**  
**Cutting lathes:** Tandem Compudisc Ortolon  
**Console:** Custom/NTP  
**Tape machines:** Ampex  
**Monitor speakers:** K&H Horrible Tones  
**Signal processing:** NTP, UREI, Ortolon, Stephen's ears  
**Engineers:** Stephen Marcussen  
**Rates:** Call for information  
**Credits:** Stevie Wonder, Fleetwood Mac Pointer Sisters, Stevie Nicks, Tom Petty, Mick Fleetwood, Duran Duran, Barbra Streisand, Tina Turner, Olivia Newton-John, Devo, U2

**PRESENT TIME RECORDERS**  
TAPE DUPLICATION  
5154 Vineland Ave., N Hollywood, CA 91601  
(818) 762-5474  
Contact: Bob Wurster

**PROJECT ONE A V**  
TAPE DUPLICATION  
6669 Sunset Blvd., Hollywood, CA 90028  
(213) 464-2285  
Contact: Maria or Dalton Priddy managers  
**TAPE DUPLICATION**  
**Duplicator:** 30 Tascam 122B and Technics M260, various 1/4 inch Umatic, VHS and Beta decks  
**Capacity:** Audio 900 to 1,000 album lengths and video 200 to 500 music videos per day  
**Method of duplication:** In cassette  
**Mastering equipment:** ATR 102s 1/4 inch and 1/2 inch 2 track, Otari MTR12 1/4 inch and 1/2 inch 2 track all video formats PCM FI  
**Tape used:** AGFA normal and hi bias custom length or TDK Maxell, Scotch 3M XS AUX  
**Shell used:** Magnetic Media, Shape MK 10, TDK, Maxell, Scotch 3M  
**Duplicating speed:** Real time Actual master and cassette deck running speed  
**Type of loading:** King  
**Packaging availability/Fulfillment services:** Various colors of labels and jacket stock available  
**Rates:** Depend on quantity and program time — Call for the highest quality real time audio or video master cassette and reel copies available  
**Other services:** Major discount audio and video tape supply house call our supplies department for the lowest price possible



RAINBO RECORD MANUFACTURING  
Santa Monica, CA

RAINBO RECORD MANUFACTURING CORP.  
dba RAINBO RECORDS  
MASTERING, PRESSING & TAPE DUPLICATION  
1738 Berkeley St., Santa Monica, CA 90404  
(213) 829-0355; 829-3476

Contact: Steve Shickson, production supervisor, Jack G Brown, president

**MASTERING**  
Farm out Top mastering studios Top priority  
**PRESSING**  
**Presses:** 20 automatic leased 12 inch and 7 inch presses (3) dual cavity 7 inch, picture records, shaped records  
**Capacity:** 50M to 50M per day  
**Vinyl used:** Keycor, QJarey  
**Rates:** 12 inch lacquers two sides \$166.7 inch, \$96 two sides Processing three stage 12 inch \$164.7 inch, \$120 two sides 12 inch pressing average 55.7 inch average 26  
**Other services:** Labels in house, album jackets for 12 inch, picture sleeves for 7 inch, minimum 1,000 one color lots  
**TAPE DUPLICATION**  
**Duplicator:** Audio Tech, six slaves one master

Capacity: 6,000 per shift  
 Method of duplication: Bin loop  
 Mastering equipment: Studer  
 Tape used: BASF I.H2  
 Shell used: Varies  
 Duplicating speed: 32 ips  
 Type of loading: King  
 Packaging equipment/Fulfillment services: Yes  
 Rates: Mastering \$60, label plate \$30, J-cards \$75 (minimum for 2M 40 min 75 to 70.50 minutes 83 to 73)  
 Other services: Artwork, insert film and paste up \$200 from jacket, insert film and paste up \$250 from camera-ready art. Note: All above cassette duplication prices include cassette case and cellophane wrap

**RAINBOW CASSETTE STUDIO**  
 TAPE DUPLICATION  
 P.O. Box 472, Taos, NM 87571  
 (505) 776-2268  
 Contact: Tony Isaacs, manager

**RAINBOW VENTURES, INC.**  
 MASTERING, PRESSING & TAPE DUPLICATION  
 2219 West 32nd Avenue  
 Denver, Colorado 80211  
 (303) 433-7231  
 Contact: Michael Moryc, studio manager

**BILL RASE PRODUCTIONS, INC.**  
 TAPE DUPLICATION  
 955 Venture Ct., Sacramento, CA 95825  
 (916) 929-9181  
 Contact: Bill Rase, owner

**RECORDING ETC.**  
 TAPE DUPLICATION  
 663 Cowper, Palo Alto, CA 94301  
 (415) 327-9344  
 Contact: Dennis Reed, owner, Ted Brooks, manager

**RECORD TECHNOLOGY, INC.**  
 PRESSING & TAPE DUPLICATION  
 486 Dawson Dr., Camarillo, CA 93010  
 (805) 484-2747  
 Contact: Bill Bauer, president

**RECORTEC, INC.**  
 TAPE DUPLICATION  
 275 Santa Ana Ct., Sunnyvale, CA 94086  
 (415) 962-0220  
 Contact: Ed Wong, vice president

**REELTIME TAPE DUPLICATION**  
 TAPE DUPLICATION  
 125 Altana St., San Rafael, CA 94901  
 (415) 459-7180  
 Contact: Tony Johnson, owner  
 TAPE DUPLICATION  
 Duplicator: Pioneer 550 (10)  
 Capacity: 1 to 1,000 or more  
 Method of duplication: Real time  
 Mastering equipment: Pioneer 1250, Technics 1500, wall repairing outboard gear  
 Tape used: 1DK D, TDK SA, Custom loads of BASF chrome or Agfa normal or chrome  
 Duplicating speed: Real time  
 Monitoring: JBL 4411, Yamaha P2100, Crown IC 150  
 Packaging equipment/Fulfillment services: Labels, inserts, boxes available  
 Rates: Very reasonable, call for quotation  
 Other services: We specialize solely in music demo reproduction, editing services available

**REX RECORDING CO.**  
 MASTERING, PRESSING & TAPE DUPLICATION  
 1931 SE Morrison, Portland, OR 97214  
 1- (800) 547-5547 (outside OR), (503) 238-4525 (in OR)  
 Contact: Gary Perman, producer

**ROCKY MTN. RECORDING**  
 MASTERING & PRESSING  
 8305 Christensen Rd., Cheyenne, WY 82009  
 (307) 638-8733  
 Contact: Georgia Alexander, sales

**SEACOAST RECORDING**  
 TAPE DUPLICATION  
 926 Turquoise St., San Diego, CA 92109  
 (619) 270-7664  
 Contact: Jack Elliott, owner

# THE NEW PERSPECTIVE IN AUDIOVISION

## Manufacturing & Duplication of Custom Length:

- AUDIO CASSETTES (Agfa, BASF, Magnetic Media)
- VIDEO CASSETTES (Japanese Professional High Grade)
- REEL TO REEL TAPE (Agfa, Ampex, Scotch 3M)

## Audio & Video Cassette Accessories:

- Plastic Reels & Boxes
- Cassette Storage Boxes
- Labels & Inserts (ask about printing)
- Cassette Shells (V-O's; C-O's)
- Audio & Videotape Pancakes (hubs)

*At Imperial Tape Company we are dedicated to Personal Service, Quality, Competitive Bid Pricing & Education! When was the last time you spoke with the owner of the company that supplies your audio and videocassette needs?*

For more information, call person-to-person collect. Ask for Howard Ganz, owner.

## Imperial Tape Company

1014 Broadway • Santa Monica, CA 90403 • (213) 393-7131

Circle #065 on Reader Service Card

**Looking for Cassettes? THINK FILAM Quality Products**

**FILAM NATIONAL PLASTICS INC.**

CALL: BING or MIKE (213) 630-2500

13984 S. ORANGE AVE. PARAMOUNT, CA 90723

The advertisement displays a variety of cassette tape components and packaging. On the left, there is a circular component labeled '1/4" Nab Hubs'. Below it is a 'C-O White, Beige, other colors' cassette shell. In the center, there are several 'Norelco Type' cassette shells in different colors: 'Smockey Clear', 'White and Clear', 'Black and Clear', and 'All Clear'. Below these are 'Bulk Hub Locks' and 'Individual Hub Locks'. At the bottom, there are 'Poly Box' and 'Straight Back' cassette boxes, with the latter available in 'All Clear' and 'Straight Back Black, Clear'.

Circle #066 on Reader Service Card

SEA HEAR INDUSTRIES  
 MASTERING & TAPE DUPLICATION  
 419 W. Walnut, Gardena, CA 90248  
 (213) 516-0315  
 Contact: Dick Kensel

SHUR-SOUND & SIGHT, INC.  
 TAPE DUPLICATION  
 3350 Scott Blvd., Bldg. #5, Santa Clara, CA 95054  
 (408) 727-7620

Contact: Glenn Cardon, vice president  
**TAPE DUPLICATION**  
 Duplicator: Electro Sound plus five slaves, Infonics  
 Method of duplication: In cassette, bin loop  
 Mastering equipment: Ampex AG 440, Revox A700, Pioneer 707  
 Tape used: Ampex, Alga  
 Shell used: Magnetic Media.  
 Duplicating speed: 16 1  
 Type of loading: Electro Sound (4)  
 Packaging equipment/Fulfillment services: Turk automatic labeler, Great Lakes shrinkwrap.  
 Rates: Call  
 Other services: Real time tape duplication, location recording, conferences, seminars.



Listings of Mastering, Pressing and Tape  
 Duplication Facilities Throughout the  
 United States

## Western

SONIC ARTS CORP./THE MASTERING ROOM  
 MASTERING, PRESSING & TAPE DUPLICATION  
 665 Harrison St., San Francisco, CA 94107  
 (415) 781-6306, 957-9471

Contact: Ron Sullivan, custom accounts  
**MASTERING**  
 Cutting lathes: Neumann, fully automated and computerized VG66 amp w/Neumann SX-68 cutting head  
 Console: Custom  
 Tape machines: Neumann, Telefunken, 3M, Inovonics, Ampex, featuring 1/2-inch 1/2-track mastering and PCM digital mastering  
 Monitor speakers: Altec 604 w/BL woofers  
 Signal processing: Parametric and graphic EQ, Inovonics, Dolby A, and dbx noise reduction; UREI and Inovonics limiters, AKG echo chamber  
 Engineers: Leo de Gar Kulka, Kenneth Lee (asst.)  
 Rates: \$25 per 1/4 hr, plus lacquers - 7" \$40/side; 12" \$50/side

Credits: Phillips, Warner Bros., Concord Jazz, Ralph Records, DIXY Catero, and many local labels

Other services: Half speed mastering, digital mastering

### PRESSING

Vinyl used: Keysor, Telder  
 Rates: Call or write for brochure  
 Other services: Jacket, label and poster printing, colored vinyl, promotional buttons, stickers, matchbooks, and T-shirts

### TAPE DUPLICATION

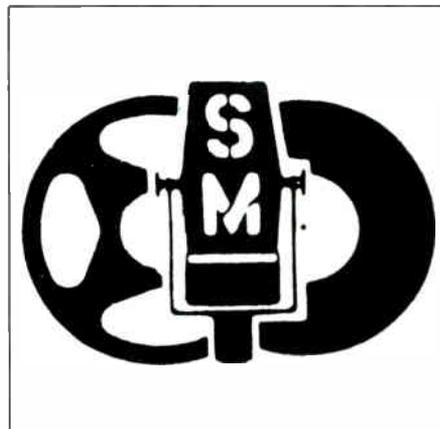
Mastering equipment: 3M  
 Tape used: AGFA PE 611  
 Shell used: Data packaging  
 Packaging availability/etc.: Album art reproduction, labels  
 Rates: Call or write for brochure



SONIC ARTS CORP./THE MASTERING ROOM  
 San Francisco, CA

SOUNDMARK, LTD.  
 TAPE DUPLICATION  
 4950-C Nome Street, Denver, CO 80239  
 (303) 371-3076

Contact: Wanda Martin, David Howard, account executive



SOUND MASTER AUDIO/VIDEO RECORDING STUDIOS  
 North Hollywood, CA

SOUND MASTER AUDIO/VIDEO RECORDING STUDIOS  
 MASTERING

10747 Magnolia Blvd., North Hollywood, CA 91601  
 (818) 650-8000

Contact: Barbara Ingoldshy, studio manager

### MASTERING

Cutting lathes: Cybersonics with Ortolon cutting amplifiers and head

Console: Cybersonics

Tape machines: MCI and Ampex

Monitor speakers: House

Signal processing: Everything

Engineers: Brian Ingoldshy, Joe Beniche, Ken Ingoldshy

Rates: On request

Credits: Elton John, Olivia Newton John, Joe Cocker, many others.

Other services: 24 track automated recording studio and full production video complex.

SOUNDOME  
 MASTERING & PRESSING

17422 Murphy Avenue, Irvine, CA 92714  
 (714) 474-2015

Contact: Richard Donaldson, manager

SOUND PRESERVERS CO.  
 TAPE DUPLICATION  
 911 East Fourth Avenue, Olympia, WA 98506  
 (206) 352-9097  
 Contact: Allen Giles, owner

## RECORD PRESSING & TAPE DUPLICATING

Are you wondering where you can go to get the best possible PRICE, SERVICE and QUALITY for a complete customized package deal for your record pressing and tape cartridge duplication? LOOK NO FURTHER!!

### ONE CALL DOES IT ALL

"IT'S A SERVICE YOU WILL APPRECIATE"

**JAMES TAKEDA**  
**(818) 760-6644**

### SERVICES OFFERED:

Disc Mastering, Processing, Labels, Record Pressing, Album Jacket Layout, Designing, Color Separation, Offset Printing, Album Fabricating and Shrink Wrapping, Cassette and 8 Track Duplicating, and more...

SEND FOR YOUR FREE PRICE QUOTATION



**Takeda**  
 Record Service

11542 Burbank Blvd. #2, North Hollywood, CA 91601

Phone: (818) 760-6644

Circle #067 on Reader Service Card

**SOUNDS UNIQUE**  
**TAPE DUPLICATION**  
 2514 Seaboard Ave., San Jose, CA 95131  
 (408) 262-8793  
 Contact: Mike Steiner, owner

**SHEFFIELD LAB MATRIX**  
**MATRIX PRESSING**  
 1830 Olympic Blvd., Santa Monica, CA 90404  
 (213) 829-7825  
 Contact: Richard (Sum) Doss, general manager

**STOUGHTON PRINTING CO.**  
**JACKET & LABEL PRINTING**  
 130 N. Sunset Ave., City of Industry, CA 91744  
 (213) 961-3678 or (213) 686-2753  
 Contact: Ace or Jack Stoughton  
 Other services: Sleeves and picture disks

**STUDER REVOX**  
**MASTERING & TAPE DUPLICATION**  
 14046 Burbank Blvd., Van Nuys, CA 91401  
 (818) 780-4234  
 Contact: Thomas Jenny, West Coast manager

**STUDIO MASTERS**  
**MASTERING**  
 8312 Beverly Blvd., Los Angeles, CA 90048  
 (213) 653-1988  
 Contact: Larry Wood, executive vice president

**TAKEDA RECORD SERVICE**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 11542 Burbank Blvd. #2, North Hollywood, CA 91601  
 (818) 760-6644  
 Contact: James Takeda, sales & service consultant  
**MASTERING**  
 Cutting lathes: AM32B with SX68 cutting head, VG66 amps  
 Tape machines: MCI JH-110M-2-VP  
 Monitor speakers: Alterc 604  
 Signal processing: Orban parametric EQ 622B, Inovonics compressor/limiter.



**TAKEDA RECORD SERVICE**  
 North Hollywood, CA

Engineer: Richard Simpson  
 Credits: Elvis Presley, Willie Nelson, Henry Mancini, Glen Campbell, John Denver plus numerous rock groups and gospel groups, country music groups, Mexican groups and projects for majors as well as small independent labels and artists

Rates: \$75 a side 12-inch master; \$30 a side 7-inch master.

**PRESSING**

Presses: Record pressing done by top quality facility.

Capacity: Unlimited

Vinyl used: Keycor, Vitec

Rates: \$555/This package includes 1000 7-inch 45 HPM pressings in white dustler, mastering, processing, labels & test pressing. \$1879/1000 12 inch LP (same package as 7 inch) also includes custom designed & custom printed album jackets, shrinkwrapped

**TAPE DUPLICATION**

Duplicator: Duplication done by top quality facility

Capacity: Unlimited

Method of duplication: Bin loop

Other services: Complete tape-to-disk/tape-to-cassette manufac-

turing; complete printing service; labels, album covers, cassette inserts Complete album production: designing, layouts, color separation, litho printing, fabrication & shrinkwrapping.  
**Packaging availability:** We specialize in total packaging  
**Rates:** Call (818) 760-6644 or write for highly competitive rates.

**THE TALKING MACHINE**  
**MASTERING**  
 6733 N. Black Canyon Highway, Phoenix, AZ 85015  
 (602) 246-4238

Contact: Copper Bittner.

**MASTERING**

Cutting lathes: Scully with Zuma digital computer and Ortofon DSS 732 cutting head.

Console: Custom Electronics.

Tape machines: MCI and Otari.

Monitor speakers: UREI 813 Time-Align

Signal processing: Dolby A, dbx, UREI LA-4, comp/limiter, Ortofon Treble Limiter, Echo Plate reverb

Rates: 12" masters \$85/side, 7" 45 masters \$45/side, 12" 45 masters \$70/side, 12" LP reference \$85.00, 7" 45 ref \$30.00, 12" 45 reference \$75.00

Other services: Tape copies, editing, assemble, digital transfer  
 Please call or write for rate card.

**TAPELOG**

**TAPE DUPLICATION**

10511 Keokuk Ave., Chatsworth, CA 91311

(818) 882-4433

Contact: Don Hollingsworth or Kristin Cnsalli

**TAPES AGAIN**

**TAPE DUPLICATION**

1135 Pearl St. Ste. #7, Boulder, CO 80302

(303) 447-8787

Contact: Mitch Rose, president

**TAPE DATA MEDIA**

**TAPE DUPLICATION**

3405 W. MacArthur Blvd., Santa Ana, CA 92704

(714) 545-6905

Contact: Jim Schubert

CLINT FRIZZELL AND WEST  
 TENNESSEE ERNIE FORD  
 DUKES OF HAZZARD  
 TANYA TUCKER  
 ROY ROGERS  
 SHIRLEY BASSEY  
 PATRICE RUSHEN  
 PORTER WAGONER  
 JONI MITCHELL  
 BELLAMY BROTHERS  
 JIM STAFFORD  
 STEVEN SOULES  
 PAUL ANKA  
 JOHN SCHNEIDER  
 ROBERTO CARLOS  
 STEPHANIE WINSLOW  
 TOM SULLIVAN  
 BJ THOMAS  
 MERLE HAGGARD  
 FRANK ZAPPA  
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 (818) 283-1888  
 Contact: David Cheppa, engineer, general manager



**WAKEFIELD MFG., INC.**  
 Phoenix, AZ

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**MASTERING, PRESSING & TAPE DUPLICATION**  
 P.O. Box 6037, 1745 W. Linden, Phoenix, AZ 85005  
 (602) 252-5644  
 Contact: An account executive

**MASTERING**  
 Cutting lathes: Neumann VMS-70, SX 74 head, SAL-74B electronics, Zuma computer  
 Console: Neumann  
 Tape machines: Studer A 80 MK II 1/4 inch and 1/2 inch, Otari MTR-10  
 Monitor speakers: UREI 813s, JBL 4310  
 Signal processing: Sontec  
 Engineers: Roger Seibel  
 Rates: Contact an account executive  
 Credits: ECM, Flying Fish, Rounder, American Gramophone, 1750 Arch  
 Other services: Digital mastering Sony PCM-1610  
**PRESSING**  
 Presses: SMT automatics  
 Vinyl used: Vitec Quies I and II, Keyser KC-600, Teldec available



Listings of Mastering, Pressing and Tape  
 Duplication Facilities Throughout the  
 United States

## Western

Rates: Contact an account executive  
 Other services: Complete tape-to-disk manufacturer. All printing (labels, jackets, stickers, inserts, etc.), complete matrix department

**TAPE DUPLICATION**  
 Rates: Contact an account executive  
 Other services: Complete duplicating and printing services

**HANK WARING DISC MASTERING**  
**MASTERING**  
 4007 W. 6th St., Los Angeles, CA 90020  
 (213) 393-2155  
 Contact: Hank Waring

**WEST AMERICAN SOUND**  
**TAPE DUPLICATION**  
 8120 Webb Ave., North Hollywood, CA 91605  
 (818) 768-6100

**WINTER SUN**  
**TAPE DUPLICATION**  
 1802 N. 23rd Ave., Phoenix, Arizona 10802  
 (602) 864-1980  
 Contact: Mark Bruno, manager

**ALLEN ZENTZ MASTERING**  
**MASTERING**  
 7083 Hollywood Blvd., Suite 302, Hollywood, CA 90028  
 (213) 469-5855  
 Contact: Allen Zentz, owner

## Outside U.S.

**AMPS**  
**AUDIO & VIDEO DUPLICATING**  
 230 Don Park Rd. Unit 7, Markham, ONT L3R 4J1  
 (416) 475-3676

**C & L AUDIO DISTRIBUTORS**  
**TAPE DUPLICATION**  
 3889 Chesswood Dr., Toronto, ON  
 (416) 636-4795  
 Contact: Syd Cupland, Ernie Lyons

**DISQUES SNB LIMITED**  
**MASTERING & TAPE DUPLICATION**  
 8400 Cote de Liesse, St-Laurent, PQ H4T 1G7 Canada  
 (514) 735-2271  
 Contact: Sabin Brunet, president  
**MASTERING**  
 Cutting lathes: VMS 70 Zuma audio computer control  
 Console: Neumann SP  
 Tape machines: Teletunken (Preview & Record Play), Studer (Record Play)  
 Monitor speakers: Klein & Hummel Tri Amp  
 Signal processing: Dolby's, dbx, Orban Parametric EQ's, NTP L.I.M. COMP Neumann GV 74 B transformerless  
 Engineers: Sabin Brunet, Emile Lapine, Alain LaLancette  
 Rates: Mastering I.P. \$96 per side, 45 rpm \$46, per side, Studio time \$80/hr. EQ's tape copy \$84, CANADIAN FUNDS

Credits: DGG, Polygram, Virgin, Arista, RSO, Phillips.  
 Other services: Pressing/cassette duplication (real time), eq's tape copies

**PRESSING**  
 Presses: Pressing available on demand.  
**TAPE DUPLICATION**  
 Duplicator: Real time duplication  
 Capacity: 500 per 8 hour shift  
 Method of duplication: In cassette  
 Mastering equipment: AKAI/Sony  
 Tape used: ACF A  
 Shell used: Armax  
 Duplicating speed: Real time  
 Type of loading: Semi-automatic  
 Packaging availability/Fulfillment services: In-house packaging, no direct printing on cassette, complimentary printing of insert card, labels and related printing services available  
 Rates: On demand

**ENREGISTRMENTS AUDIOBEC CANADA INC.**  
**MASTERING, PRESSING & TAPE DUPLICATION**  
 600 Ouest. Port Royal, Montreal, Quebec, H3L 2C5  
 (514) 384-6667

Contact: W. Lewis, manager  
**MASTERING**  
 Cutting lathes: Neumann  
 Console: Custom Neve console  
 Tape machines: Studer  
 Monitor speakers: Tannoy  
 Signal processing: Dolby, dbx, EMT compressors/expanders, Fairchild limiters, on board EQ.  
 Engineers: I. Reheuk  
 Rates: On demand  
 Credits: All major labels  
**TAPE DUPLICATION**  
 Duplicator: Certe Gaus  
 Capacity: 2 million per annum  
 Method of duplication: Bin loop  
 Mastering equipment: Studer, Neve  
 Tape used: All major brands  
 Shell used: All major brands  
 Duplicating speed: 32:1  
 Type of loading: King, Decca  
 Packaging equipment/Fulfillment services: Tapmatic, Marden Edwards  
 Rates: On demand  
 Other services: Printing services on demand

**EVERGREEN AUDIO VISUAL LIMITED**  
**MASTERING & TAPE DUPLICATION**  
 250 Merton St., 3rd Floor, Toronto, ON M4S 1B1  
 (416) 489-8003  
 Contact: L. Green

**IMPERIAL RECORD CORP. LTD.**  
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 8849 Selkirk St., Vancouver, BC V6P 4J6  
 (604) 261-1348  
 Contact: David Kidd

**MCCLEAR PLACE STUDIOS, LTD.**  
**MASTERING**  
 225 Mutual St., Toronto, Ontario  
 (416) 977-9740  
 Contact: Lorraine Hume, traffic manager

**METRO MEDIA INDUSTRIES**  
**TAPE DUPLICATION**  
 546 Gordon Baker Rd., Willowdale, ON M2H 3B4  
 (416) 493-8810  
 Contact: V. Kirton

**NORTHERN SOUND PRODUCTIONS**  
**AUDIO AND VIDEO DUPLICATION**  
 337 Bellanca Ave., Yellowknife, NT X1A 1Y8  
 (403) 873-5403  
 Contact: Michele Boodman, advertising manager

**OVERLAND STUDIOS**  
**TAPE DUPLICATION**  
 1877 Walker Rd., Windsor, Ontario  
 (519) 945-4230  
 Contact: Clive Mun

**PANFOR DUBBING LIMITED**  
**TAPE DUPLICATION**  
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 Contact: William Forster

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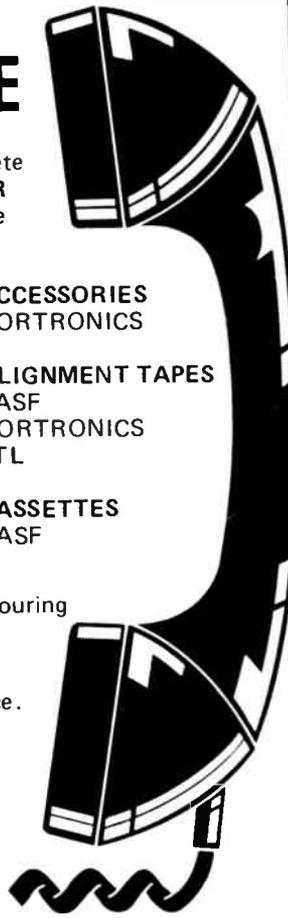
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7802 Express St., Burnaby, BC  
(604) 420-4227  
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U.S. office: 1308 Meador St., Unit C5, Bellingham, WA 98225

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Santo Domingo, Dominican Republic  
(809) 537-2169, (809) 537-2395  
Contact: Ramon Elandin, vice president

### R.E.P. SOUND IMAGE

TAPE DUPLICATION  
180 Skeldon Drive, Cambridge, ON N1R 6V1  
(519) 823-2269  
Contact: Ron Penner, owner

### SEFEL RECORDS

MASTERING, PRESSING & TAPE DUPLICATION  
320 Bow Valley Square II  
205 5th Ave. SW, Calgary, AB T2P 2V7  
(403) 265-0510  
Contact: Andras Ioc, production coordinator

### SUMMIT SOUND INC.

PRESSING & TAPE DUPLICATION  
Glen at Whalen St. (P.O. Box 333)  
Westport, Ontario K0G 1X0  
(613) 273-2818  
Contact: David Daw, production coordinator

### WORLD RECORDS

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Baseline Road W., P.O. Box 2000  
Bowmanville, Ontario L1C 3Z3  
(416) 576-0250

Contact: Bob Stone, managing director

### MASTERING

Cutting lathes: Neumann VMS 80.

Consoles: Neve

Tape machines: Studer, MCI, Ampex.

Monitor speakers: Various.

Rates: Includes with custom pressing and tape duplication services offered.

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Vinyl used: Kysor

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### TAPE DUPLICATION

Method of duplication: Bin loop.

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Rates: Package prices

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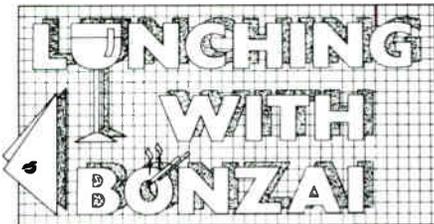
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# THE MIDAS TOUCH

# HAL BLAINE



by Mr. Bonzai

Hal Blaine is a walking archive of drumology, a living bundle of energy that has supported 190 gold records. Chances are he is the most recorded drummer in history. His experience spans 40 years of musical upheaval, from the Big Bands through jazz to the quintessential pop sound of the '60s and '70s. He is still one of the most sought after studio pro's, currently working on the new David Grisman album. Hal is credited with two historic contributions: the monster drum kit and mid-range tuning.

As I shuffled down a dock in Marina del Rey, juggling the Beaujolais and journalist baggage, Hal waved from the deck of his cabin cruiser. He's tanned and fit, open and congenial. He got very animated when he talked about drums and where they have led him. In this transitional period in musical history where electronic drummery is rapidly altering the state-of-the-art, Hal is a philosopher, a participant and one of the endangered species of disciplined skinbeaters.

We grabbed a couple of deck chairs and started munching peanuts, wine and anecdotes.

Mr. Bonzai: Why did you end up as a drummer?



Hal Blaine: I started with some dowl- ing from an old rocking chair that I used for drumsticks when I was eight years old. I always knew I would be a drummer, although I don't think I had ever actually seen one. This was before television—we just had radio and records. My family lived in a Jewish ghetto in Connecticut and my father was a shoe repairman. He was a very hard working man and on Saturdays he would take me to the State Theater in Hartford, one of the last great Big Band theaters. He would

hand me my bag lunch, pay the quarter admission and leave me there for 12 hours while he worked. I would sit through about seven shows and see everything from vaudeville acts like "Buck and Bubbles" to the great bands of the day.

When I was 13 we moved to California and my sister gave me my first set of drums. We lived in a very tough housing project—it was sink or swim. A big Polack named Bob Kaminski became my friend and guardian. He watched after

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*Hal Blaine (left) and Bones Howe at the Grammy Awards dinner, 1971.*

PHOTO JASPER DAILEY

me because he didn't want anything to happen to my hands. We're still friends to this day, and he's still as tough as ever. I started my own little band and we got our first jobs near Lake Arrowhead at the Chickabunny, playing for five bucks a night and a free chicken dinner.

I learned from some great musicians: Carl Ingram, Sharky Hall, Blinky Allen, Leroy Viregar. I was very lucky to work with such professionals when I was just a kid. I made friends with these black musicians and they used to take me to Jack's Basket, a big jam session place. You couldn't even get in the door if you were white, unless you had the right escort. It was great exposure, great training. I eventually got a steady job at a black place called J.D. Greenwood's Roseroom, on the wrong side of the tracks in San Bernardino.

When I was 16 I joined the service. This was about 1946 and we got sent to Korea. I was the only enlisted man in an all-officers band. We were the last Americans to get out of Shanghai before it fell in '47 to the Reds. It was an intriguing situation—playing music, but there was also a lot of gun time and skirmishes.

When I got out of the service, I joined a comedy band back in San Bernardino. I would sing, play drums—it was what was known as a "funny hat band." We did pantomime, did comedy routines, sometimes dressed up as women with balloons for breasts. I was lucky once again to be thrown in with really well-trained musicians. I worked with lots of bands, got my Dixie chops down, travelled around the country backing a lot of acts.

*Hal Blaine at his first Monster Drum kit. (1963-64).*

**Bonzai:** Had you had any formal training?

**Blaine:** Well, I met a great comic and a very good guitarist named Rick Verdi. He joined a group called The Three Sons. Rick talked me into going to music school in Chicago. I thank him to this day. I moved there in '49 and went to the Roy Knapp School of Percussion—the most incredible percussion institute in the world. It was Gene Krupa's alma mater, Louis Bellson's—a lot of the great drummers went there.

**Bonzai:** What made it such a special place?

**Blaine:** It was a school with real camaraderie. We had eight hours of class every day, learning to read music, studying theory, music appreciation, arranging,

harmony, big bands, small bands—plus, they would bring in top drummers for us to talk with.

**Bonzai:** Were you working at the time?

**Blaine:** Yes, it was another lucky break that I was living at the Majestic Hotel. This was quite a hotel—musicians, hookers, pimps, addicts. Every form of low life lived there. I got to know a lot of strippers and one night a great drummer named Mickey Screema got sick. He was backing a stripper named Dixie Lee and she called me to fill in. It turned into a regular job and again, a great training ground. It was strictly sight reading and the strippers would work a slow song, a medium and then a fast one. You played from eight at night to four in the morning without intermissions. If the pianist had to relieve himself, I would jump down and comp enough piano for the slow tune. We would cover for each other and play all night.

When I left Chicago, some influential friends helped me put together a band for a club called The Magic Carpet in San Bernardino. It was a supper club with dance music and comedy acts. That's where I met Lenny Bruce early in his career—around '52.

**Bonzai:** Was he different in the early days?

**Blaine:** No, I don't think so. I was waiting outside the club for the new comedian and he drove up in an old beat up Dodge with smashed fenders. The upholstery looked like a cat had ripped it out. He in-

PHOTO JASPER DAILEY





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PHOTO: JASPER DALLBY

*Mel Taylor of the Ventures (1964) with Hal Blaine (right).*

Records of the Year. I was also the drummer on "The Mamas and the Papas" albums, produced by Lou Adler.

**Bonzai:** Why were you at the center of all this activity?

**Blaine:** Because I had a sound. Almost every drummer I had ever known tightened his heads as tight as he could. It's like talking in a high voice all the time, which was unnatural to me. Every instrument has a range and the best quality is in the midrange. I tuned to a midrange and got a very fat tom-tom sound—boom, boom, boom, not a ticka-ticka-ticka. It created a new sound on records that was identified with the West Coast. I also designed the drum kit that drummers use today—the massive tom-toms. Generally, drummers were using four drums, sometimes five. I had eleven. I gave it to Ludwig Drums and they marketed it as The Octopus. I wanted to be musical. Listen to the early Carpenters stuff—you'll hear the fills. We used the sound on radio spots, too. You just couldn't get that sound with only four drums.

**Bonzai:** It seems so obvious.

**Blaine:** I know, but it wasn't being done. It evolved from working with Terry Melcher and The Byrds and some of those early rock groups. My first gold record was for "Mr. Tambourine Man." I was strictly a side man brought in for the recording sessions. I did just about every Beach Boys record, Jan and Dean, The Monkees. We made 35 dollars in the afternoon while the groups made \$35,000 that night. But there were no animosities. Dennis Wilson, for instance, and I were very good friends. When he did his solo album he called me for the recording. Dennis was a fine drummer—for the

stage, but he wasn't really a great recording drummer.

**Bonzai:** What makes the difference?

**Blaine:** It's experience mostly. Knowing what to play on a record as well as what *not* to play. With experience you don't have to think about it—it becomes second nature. At this point I must have recorded close to 35,000 records.

**Bonzai:** How did multitracking affect your sound?

**Blaine:** Didn't mean a thing to me. They just started putting up more mikes. There is an interesting story about the first time I got called for a film. It was at 20th Century Fox and I was a little frightened. I was hired because I was known as the top rock and roll drummer, and they needed some rock music for a film. The engineers put up one mike about six feet in front of me and the producer kept saying, "Hal, we're not getting that sound you get on records." I had to explain that we used a mike in front of the bass drum, a mike on the snare, and a couple of overhead mikes. The producer told the engineers, "You better listen to this kid." It started a whole thing where they had to tear the studio apart and put in the proper lines and machinery. From then on they were always calling me. I did a lot of TV shows—"Batman," "The Brady Bunch," "Mannix," to name a few.

**Bonzai:** Did you start making big money?

**Blaine:** I was making about \$8,000 a year when I was on the road. My first year in the studio I made \$40,000. That continued to increase until I leveled off at about \$150,000 a year for session work. There is also a union melting pot that is divided up according to the number of sessions you do in a year. I was doing

sometimes five, six sessions a day, with perhaps three songs per session. I got a check from the union in '64 for about \$3,000. By '68 it had jumped to \$25,000. This was pretty good money for a little drummer from Holyoke.

**Bonzai:** I've heard it said that drummers don't have the longevity of other musicians.

**Blaine:** You have to know how to handle yourself. You have to be consistent. I've never been into drugs, and that may have something to do with my long term reputation. There is also a lot of diplomacy involved. I have a knack for getting people to laugh at the right moment when a session is getting tense. I also feel that I've been creative in the drum field. I've helped to make some plain records into good records. I had also done some acting and that may have helped me to get a feel in my playing. I listen to the lyrics and fit the dynamics of my playing to the meaning of the song. You play soft, you play hard—it all depends on the song. This used to cause problems at first with engineers. They wanted me to play at consistent levels so they could adjust the volume in the control room. H.B. Barnum would tell them, "Learn how to record him the way he's playing. That's what the song is all about."

**Bonzai:** Do you tend to favor some engineers over others?

**Blaine:** I've worked with some greats: Chuck Britz, Larry Levine... Bones Howe was a great engineer who has become an incredible producer. It was mutual admiration, I guess. They were creative people in their own right and knew how to get the sound on tape.

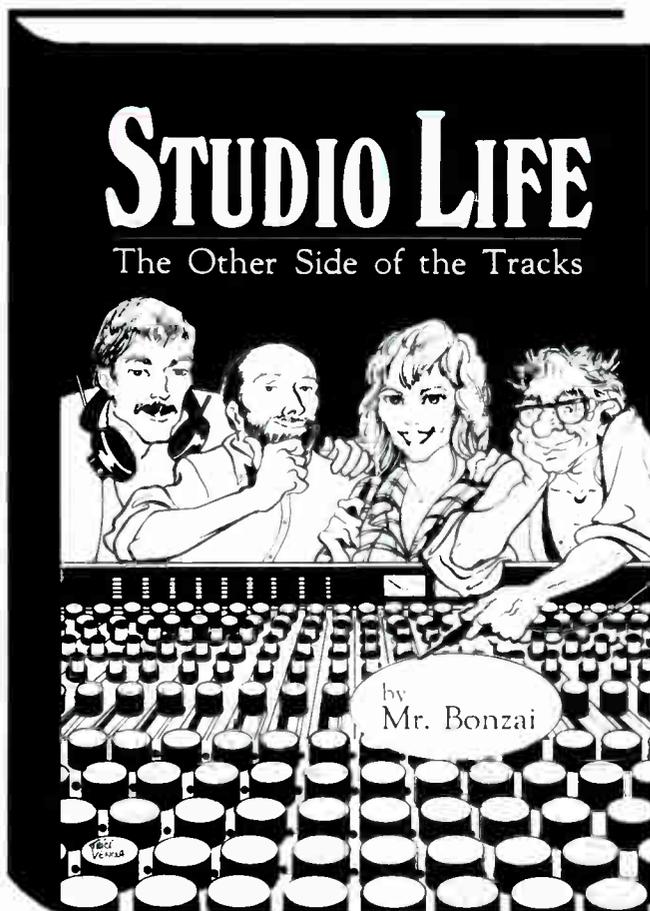
**Bonzai:** Do you think drumming is a dying art?

**Blaine:** I just don't know. You're not going to replace drummers, but you will replace what drummers are playing. The adding machine has become the calculator. Drums are going electronic and I think every drummer should be learning about it. We are just beginning to scratch the surface and things are going to change. There is an infinity of possibilities now, and I believe there is room for great feeling in electronic playing. At one time pianists only played pianos; now they are playing all sorts of electronic keyboards. There will always be live performances and drummers will be playing, with or without electronic drums. Drummers should learn keyboards to be well-rounded, especially since a lot of electronic drums are played with keyboards.

**Bonzai:** Do you have any advice for aspiring drummers?

**Blaine:** There are no losers, only winners who give up too soon. ■

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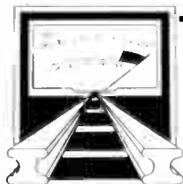
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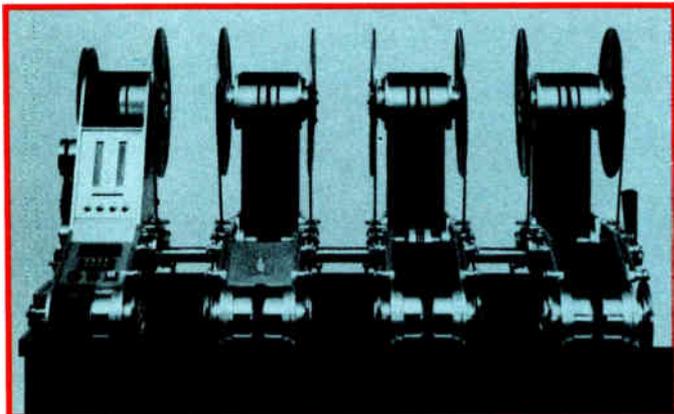
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# PREVIEW



## Magnifax 7000 Series Duplicators

The Magnifax 7000 Series is a line of self-contained 16:1 bin loop duplicators with seven slaves. The 120 ips unit utilizes 7½ ips masters, and provides for an output of over 6,900 C-45 tapes in a 24 hour day, including loading and cleaning time. The Magnifax common mandrel castan drive system eliminates speed variations between master and slaves, and the 7000 also features digital bargraph metering with auto-reset peak reading memory; a solid state counter/command module; a low maintenance hysteresis braking system; a shortened audio path for lower noise with all the amplifiers located on a single motherboard; and an infrared photocell stop tone detector on the bin loop master.

Circle #123 on Reader Service Card

## Pakmate Automatic Soft Poly Cassette Inserter

The Pakmate is an automatic packaging system for inserting cassette tapes into soft poly boxes at 80 pieces per minute. The compact one-and-a-half by three foot table top mechanism is simple to use—load two hoppers with boxes and cassettes, and the finished products can then be removed or can feed another machine directly, such as a box labeler or mailing inserter. The unit operates on dry air, 7.5 cfm at 90 psi, features an automatic shutoff when hoppers are empty, is manufactured by Paktec Automation Inc., and is distributed by Lenco. Price is \$9,995.

Circle #141 on Reader Service Card

## Lynx Time Code Module

The Lynx system from TimeLine Inc., of City Island, New York, is a high performance unit which integrates four independent functions in a single half-rack width enclosure. Each contains a wide band SMPTE time code reader, operating at 1/20th to 60 times speed at either 24, 25, or 30 fps; a generator for SMPTE, EBU, or film standards, with a sync tone frame reference frequency output (60/59.94/50/48 Hz), internal/external sync selection, and tach to time code translator; a synchronizer which can be expanded with up to 32 machines on line; and an RS-422 communications port.

The system assigns one Lynx module for each machine to be controlled—thus any machine can be selected as the master. The front panel controls are logically laid out with a comprehensive display of both hours/minutes/seconds/frames and LED operational status indicators. Optional accessories include a VITC reader board, film chain quadrature interface, and an Adams • Smith ASCII to Lynx RS-422 protocol converter. The Lynx units are priced at \$2,450 each and will be available next month.

Circle #124 on Reader Service Card

## Barcus-Berry BBE 202

The BBE 202 differential load reactance compensator from Barcus-Berry Electronics, is a multi-band, program-controlled signal processor which can be employed to improve the overall sonic clarity of virtually any reproduced sound. This two channel, rack mount unit utilizes high-speed dynamic gain-control circuitry to audibly improve the reproduction of program transients. This adds brightness and presence without introducing the undesirable stridency which is so often characteristic of "equalized" sound, especially at peak levels.

Once installed between the program source and an amplifier, recorder or transmission line, all processing functions are fully automatic. Phase adjustments are primarily directed toward preventing high-frequency time lag (transient distortion) and the automatic gain changes are based on interband program amplitude ratios. Swept frequency response of the system is essentially flat from 20 Hz to 20 kHz in both the operating and electronically-buffered bypass modes. Amplitude changes are developed only in direct response to application of a spectrally-diverse program signal.

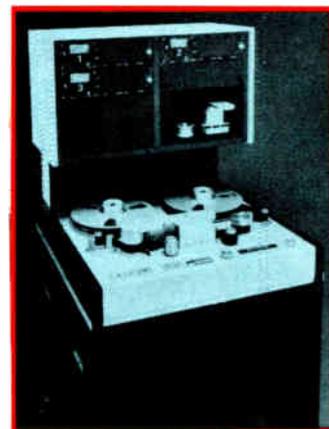
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## Studer Video Layback Recorder

The Studer A80VU-3 LB is designed for video post-production applications, and provides high quality recording and reproduction of audio tracks on 1-inch video tapes, in either the type B or C format. Converting from one format to the other is accomplished by exchanging the headblock and the tach roller. A switch is provided to change direction on the left spooling motor.

Originally designed for 2-inch tapes, the transport is "over-engineered" to provide smooth and positive handling of tapes. The extremely stable headblock is equipped with erase, record and reproduce heads for three audio channels. Frequency response is 30 Hz to 18kHz ( $\pm 2$  dB), signal to noise ratio is 65 dB (ASA-A weighted at 254 nWb/m), and wow and flutter peak value is less than 0.04 percent (DIN 45507). The A80VU-3 LB is fully compatible with popular audio/video synchronizing and editing systems, and is priced at \$13,500.

Circle #126 on Reader Service Card



## Shure SM91 Boundary Mike

Shure has introduced the SM91, a low-profile condenser microphone designed for surface-mounted applications where a unidirectional pickup pattern is desirable. Like the "pressure zone" microphones in common usage, the Shure

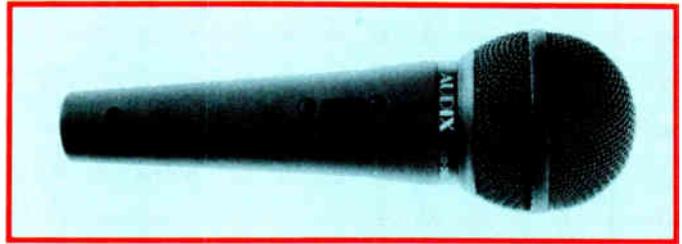
SM91 takes advantage of the well-known principle of boundary effect. Because of this principle, placing a Shure SM91 microphone sufficiently close to a barrier or boundary will cause it to perform with as much as 6 dB higher sensitivity and approximately 3 dB greater rejection of random background noise. The unidirectional pattern also allows for effective isolation without the need for physical isolation barriers often used with "pressure zone" models.

The SM91 is supplied with a small, sturdy, low-distortion, high-clipping-level preamplifier which may be powered either by two standard 9-Volt batteries or by an 11 to 52 VDC phantom power supply. The preamplifier unit also includes a 12 dB/octave low-frequency cutoff switch for response tailoring, a battery power switch, and a green LED battery condition indicator. Also included is a 25-foot, small-diameter, two conductor, shielded interconnecting cable with two three socket miniature Switchcraft connectors. The SM91 is priced at \$300.

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## FM 1000 Power Amplifier

The FM 1000 from FM Acoustics is a single channel amplifier which, according to the manufacturer, delivers continuous power in excess of 1,000 watts, even into the most difficult loads, with a power bandwidth of 5 Hz to 120k Hz. Input connectors are XLR balanced; outputs are both five-way binding posts and special high current 200 amp connectors. The amplifier features extensive built-in protection circuits which continuously check  $\pm$  DC offset, cooling fin temperature, transistor temperature, fan speed, and output load impedance, so the unit will perform without any limiting into a one ohm load, yet still be able to shut down should a short circuit occur.



## Audix UD-260 Microphone

The UD-260 from Audix is a high output, low impedance dynamic microphone which incorporates a new air-suspension design and an integrated capsule system for easy field replacement. Designed as a rugged high-end vocal microphone for stage and live applications, the UD-260 provides a smooth response from 50 Hz to 18,000 Hz without harsh mid-range peaks, and a tight cardioid pick-up pattern for higher gain before feedback. The mike is available in black, non-reflective matte gray and six brilliant colors with matching cables. Suggested list is \$179, including protective carrying pouch and stand adapter.

Circle #128 on Reader Service Card

## Bikini Interchangeable Cassette

The Bikini cassette from the Reel Corporation in Southfield, Michigan, is a system of interchangeable mini tape reels which snap into a transparent shell for use on standard cassette machines. The tapes are packaged in a set of five reels with storage cases for each, a reloadable shell with tape-up reel, and

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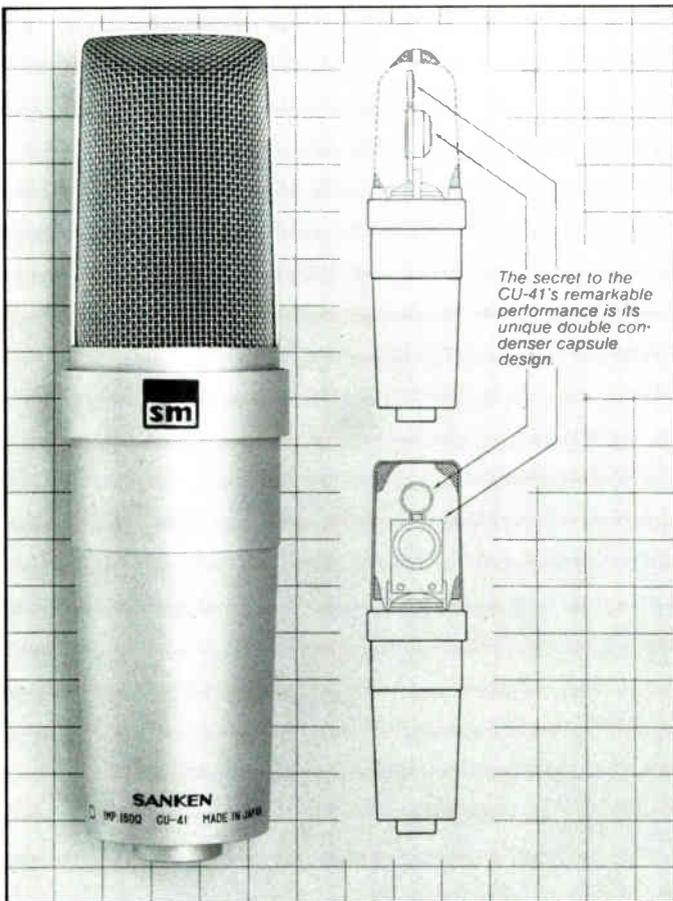
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identification labels. The system's advantages are reduced storage requirements and the ability to edit cassettes. A complete package is priced at \$24.99, and currently is only available with premium chrome 50 minute tapes, although the company plans to offer metal and normal bias formulations at a later time.  
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## LinnDrum Alternate Sound Library

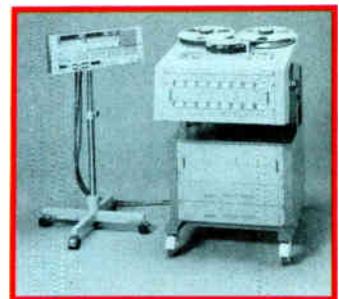
Linn Electronics, manufacturers of the widely-used LinnDrum digital drum machine, now has over 200 alternate sounds in its library. Aside from the extensive set of standard drum sounds (including 16 kick drums and 37 snares), the library now includes diverse oddities such as grunts, groans, gourds, guicas, scratches, snaps, drips, barks and bass guitars that can be quickly swapped in and out and sequenced in the same manner as the drums.

Linn has also put together various complementary sounds together in economical packages, including: Electronic Drums, Rock Drums, N.Y. Scratch Set, Acoustic Studio Set, Latin Percussion, Ethno Pop Set and nine others. In the unlikely event that a needed sound can't be found in the library, Linn will make custom sound chips for as little as \$50. Single chip sounds from the library retail for \$40. Two chip sounds retail for \$60 and most of the sets retail for \$129. Demonstration cassettes are available.

Circle #130 on Reader Service Card

## New Tascam 16 Track

The Tascam MS-16, unveiled at the AES Convention, is a one-inch format sixteen track recorder/reproducer with remoteable meter panel. The wide variety of features and capabilities offered include rear panel SMPTE connector with TTL logic lines for interfacing with most popular controllers, a rugged, rack mountable transport designed for remote recording and location audio applications and a full three-motor servo system for positive tape tension control throughout quick lock-ups and stops.



Amplifiers are all direct coupled for lowest distortion and optimum low frequency response. Better transient response and phase characteristics are obtained with the MS-16's first stage sync and play head amplifiers which use differential paired ultra-low noise FET's. The MS-16 also has separate low frequency compensation adjustments for record/sync and repro heads, and both +4 dBm balanced XLR and -10 dBV unbalanced RCA outputs.

Optional accessories available include a ten-point auto locator with ten-key numerical input pad, basic function remote control, CS65 console, and a dbx unit which can be connected to the MS-16's multipin connector. Although exact price information was not available at press time, the basic unit is said to be priced at approximately \$9,000.

Circle #131 on Reader Service Card

## Agfa-Gevaert Digital Mastering Tape

Agfa PEM 297 D, a new highly dependable digital audio mastering tape, has been introduced by the Magnetic Tape Division of Agfa-Gevaert, Inc., Teterboro, New Jersey. The new 1/4-inch tape comes on 4,600 foot, 10 1/2-inch reels. The new material features fewer dropouts which lowers the need for error correction and reduces the possibility of program loss. Because of superior slitting, the new tape offers better winding, better handling and less chance of edge damage.

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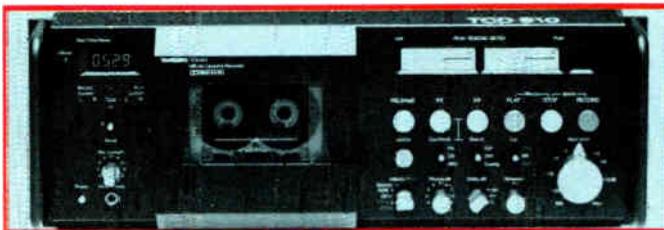
## Keysor Disk Noise Analyzer

Keysor Corporation has patented the first computerized system that can accurately determine the causes of sound discrepancies on record disks. According to Howard Hill, president, the analyzer determines whether recorded noises like "tics," "pops," and various tonal inconsistencies on disks are a result of the record material itself or imperfections in one or more of the disk fabrication steps.

Keysor's noise analyzer can isolate and identify certain kinds of noises that may be peculiar to a particular material formula. It can also determine how well a specific frequency is reproduced on various materials, from the master disk lacquers, through the metal molds, to the finished pressings.

The system operates by taking one or more sound samples from the record surface and filtering the signals to isolate individual frequency bands. The signals and their decibel levels for each frequency are then broken into specific time intervals and graphically displayed on a CRT. The samples can be simultaneously drawn on the CRT as a three-dimensional "picture of sound," or identified individually and displayed. The complete sample can be averaged and compared to others, and also weighted for statistical analysis based on differing listening standards.

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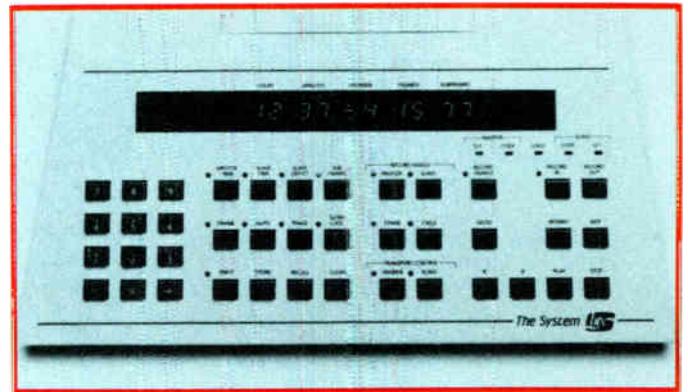
## Tandberg Pro Cassette Decks

The Tandberg TCD 910 Master Cassette Recorder and TCD 911 playback-only machine incorporate state-of-the-art design and functions specifically designed for studio and professional applications. Among them are: a discrete three-head system; peak-reading, equalized meters (which respond to a two-millisecond peak with 1 dB); and built-in oscillators for bias, record current, and azimuth adjustment. The TCD 911 features a front panel azimuth adjustment and pitch control, allowing correct playback of tapes recorded on other decks.

Both models are also equipped with an eight-bit microprocessor with 32K of EPROM memory, which operates the LED real-time counter in minutes and seconds, as well as the

units' auto search mode, recap function, and the decks come with electronically-balanced XLR connectors, and can be optionally transformer-balanced upon request. Other options include an infrared remote control, rack mount, and an RS-232C port.

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## New BTX Synchronizer/Controller

The latest offering from BTX Corporation is The System, which combines both controller and synchronizer in a single low-cost, compact unit, is a dual-transport controller/synchronizer that needs only an 18-inch by 18-inch space, stands 5-inches tall and weighs about 20 lbs. The built-in keyboard has 40 dedicated function keys and a ten-digit LED time code display that facilitates autolocation and editing.

The System features pre-programmed loops with optional preview, pre-programmed or "hot" master and slave record-in and -out, offsets up to 24 hours, selectable interlock speed and type, synchronization accuracy within 1/3000th of a second and a system memory, along with standard transport control and autolocation capabilities.

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## TAC Scorpion

Shown at the AES Show and now available, the TAC Scorpion is a versatile, low-cost, high performance mixing console derived from the TAC 16/8/2 system which the Scorpion replaces. Principle features include fully modular construction in a strong welded steel frame, 16 routing busses plus a separate stereo buss, four band EQ with swept mids and selectable turn-over points, four aux sends, two assignable aux returns, and fader reverse function metering with switchable peak/VU ballistics.

The Scorpion comes in two frame sizes, a 27 position and a 43 position. A 16/8/2 with eight track monitor in a short frame retails at \$5,950. The same configuration shortloaded into a large frame retails at \$6,950. A 24/16/2, 32/8/2, or 40/2 are priced at \$8,950, and short loaded mainframes of any configuration are available. Circle #136 on Reader Service Card ■

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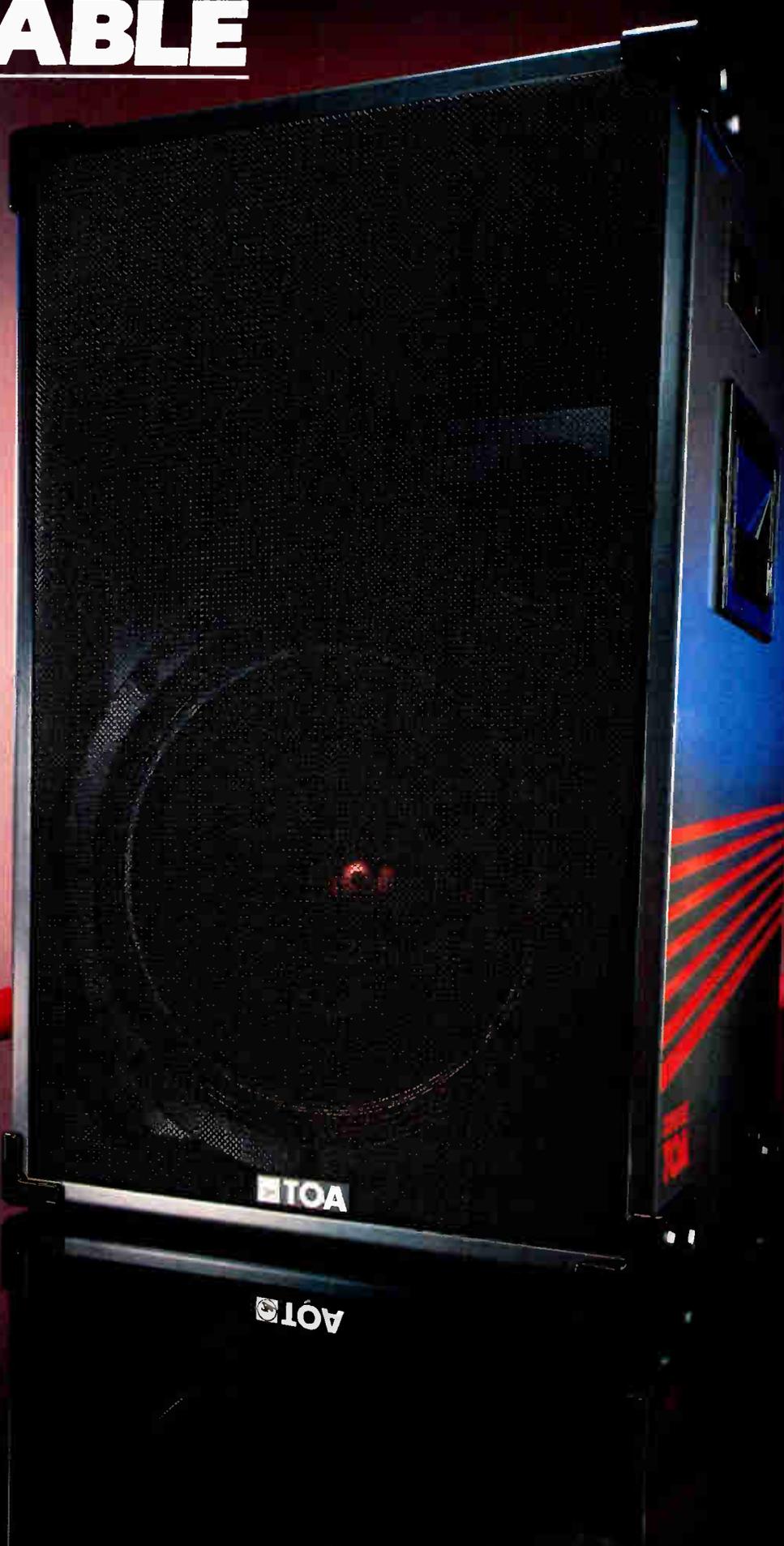
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# SOUND ON STAGE

In its 12th year, the San Francisco Blues Festival brought a lineup to Fort Mason's Great Meadow that had a little something for every blues taste: Washington D.C.'s Nighthawks (featuring premier Japanese blues singer Toru Oki), the great James Cotton and Little Milton Campbell, an ample dose of New Orleans Mardi Gras and Louisiana zydeco music, the British blues of Bob Hall and Dave Peabody, the best of blues from California and Texas, country blues traditionalists Robert Lowery and J.C. Burris, and much more.

The official program of the festival mapped out the two days' activities, exact down to 45-minute sets and ten-minute set changes. "I did not make the schedule," grimaces Leroy Shyne of Shyne Sound, taking a break from his work at the Great Meadow the day be-

## The SAN FRANCISCO Blues Festival

fore the opening of the festival. "I'm pretty good at it though. Ten-minute set changes are next to impossible, but most of them will be really close. You have to design the system so that can happen."

It's Shyne's outfit that has the responsibility of making the day run smoothly, so he has done a lot of thinking ahead. "My monitor set-up is quite a bit different from your average rock and roll set up," he says. "I use wide-dispersion monitors [Bose] and I wash the stage rather than giving real high-volume monitors with a narrow beam for each microphone and a whole lot of monitor mixes. I just make sure you can run around the stage and don't have to get right in front of a mike to hear. If the guy wants to get down on his knees away from his microphone, he doesn't have to worry about not hearing himself. If a band comes up and I really have no idea what their needs are, and we only have ten minutes for a set change, we don't have to take a half-hour to aim the

monitors.

"Having been a musician for so long, I feel that I am in touch with what musicians need," Shyne says. "The whole idea is to make it sound like music rather than just getting it loud."

Randall Instruments provided amps for all the musicians at the festival, another factor in making the set changes go faster. "In the blues, you come all the way across country and say, 'Hey, is there a guitar I can play?' They can make do with anything," comments Shyne. "There is actually more resistance from the rock and rollers who say 'Oh, I don't have my '56 Strat, I can't play.' A blues player can make do with anything."

While Shyne has been involved with the Blues Festival for six years, this is the second year the sound has been entirely in his hands. Shyne Sound has also provided audio reinforcement for the San Francisco Folk Festival, the Fourth of July festivities at Chrissy Field, the Martin Luther King Day rally at San Francisco's civic center, gospel festivals and disarmament rallies. "Sometimes not only do they have five-minute set changes, but the bands only play for 20 minutes," he says. "So that's where I get my skill, to get it to sound like music in the first tune. We're working real hard for 20 minutes and the set's over. We don't get to enjoy the rest of the set and fine-tune everything."

When given the time to fine tune, Shyne takes the work seriously. "I just keep going back to the beginning, like 'Can I hear every instrument?' I follow the focus of the music and make sure that it stands out just in front of everything else. And besides that, when any one of the instruments sounds unnatural or bothers my ear, doesn't sound like music or I feel is going to bother somebody else's ear or distract their attention from the music, I have to correct that. You don't want the audience to be distracted by a real odd phenomenon of distortion or unnatural EQ. It's basically just staying right at the mixer and trying to make it sound better and better until it's over."

Shyne was busy fine-tuning during Sonny Rhodes' set. By the end of the first number by Rhodes' band, the horns were sounding tight and well-balanced. And by the time Rhodes finished his first vocal number there was a very pleasant delay effect on his voice. "I have

two sends on my board," says Shyne. The first goes to a simple slapback delay [DeltaLab II], then returns into the board. On the return I send it out the other delay [Orban Dual Spring Reverb]. So what I have is not only a simple slapback delay that I can bring up with the fader, but a delayed reverb, which is a little more like a natural reverberation in a room. What I'm approaching is a more realistic, natural delay and reverb combination."

Beyer M600 microphones were used across the front line at the Blues Festival, for vocals and horns, for the washboards and dobros played during Robert Lowery's set, for the booming tuba in the Dirty Dozen Brass Band. In studying the Synergetic Audio Concepts of Don Davis, Shyne has become interested in the development and use of PZM microphones. "Up to now in the printed literature of how to use PZMs has always been in the recording studio. Nobody wants to use them in sound reinforcement for fear of feedback like omnidirectional microphones. My understanding of the principle of PZMs is that it's the first microphone you can record talking with at long distances and still maintain a present quality, still sound real present. Up to now in sound reinforcement it's all been close-miking. PZMs are not omnidirectional mikes, they're hemispheric, so you can point them away from monitors and not get feedback. I use them in sound reinforcement for choirs, or for a drum overhead, or under the lid of the piano. That gets a real natural piano sound."

"James Cotton had his own old-time microphone running into his amp," continues Shyne. "That's Chicago style. They love those kind of handful-size, round type of old style microphones, like radio mikes. They hold the microphone and the harp in their hands and get different sounds by moving their hands around and stuff. And it usually goes into an old Fender amp. Those old Fender tweed amps with four 10s are real common in the old Chicago blues. Each harp player looks around and tries old mikes and amps until he finds the ones that really sound good."

Shyne uses a Soundcraft 20-input, five-output board, a Symetrix Model 501 Peak RMS compressor/limiter, a dbx 165 compressor/limiter, an MXR 31-band equalizer, and BGW amps. "My Symetrix is set at full limit, and acts as a



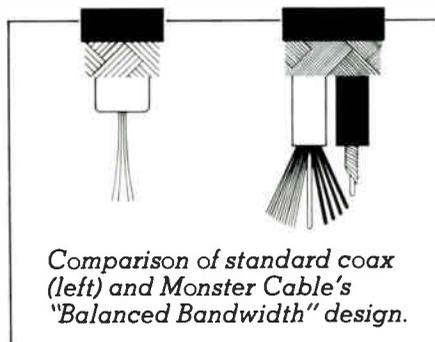
Monster Cable, the company that makes the audiophile speaker cable, has entered the pro studio market with ProLink (TM) Series microphone cable. There are three grades of cable labeled Series 1, 2, and 3, and Monster claims even the lowest grade will provide audible improvements when replacing normal studio mike cable. Stamped on the Series 1 cable are the words "Studio Reference Standard 'Multi Phase Aligned' High Resolution Microphone Cable," which clearly states the company's intentions in making this cable.

With all the wire, chips, FETs, and amps in line between the mike and tape, how could twenty feet of cable make much difference? Well, Monster Microphone cable can make a *big* difference in the quality of signal you put down on tape.

Listening tests were done at LA Record Plant Studio D using Meyer 833 monitors in the control room. A variety of microphones and cables were compared to get a solid picture of the cable's effect. The Series 1 was hooked up to kick and snare first, and immediate improvement was noticed. The signal was much more clear, attack and low end were quite distinct, with richer more abundant lows. Electric bass taken with a D.I. exhibited the same characteristics: more lows with a more clearly defined

sound. There was no desire to reach for that track saver, the EQ knob.

To better understand the sonic difference I hooked up my AKG "The Tube" mike and listened to the spoken word while changing back and forth between the different ProLink series cables and the studio mike cables. Compared to the ProLink, the standard cable sounded muddy in the lower mids and not as clean on top. There is a clear, crisp advantage even in the Series 3 (least expensive) cable. There is also an audible difference between the three series, with the Series 1 exhibiting the best low end and most transparent top. When the feed from the console was hooked up through the Meyer processor to the amp with Series 1, big changes occurred. The front-to-back mix depth opened up, adding a



Comparison of standard coax (left) and Monster Cable's "Balanced Bandwidth" design.

more spacious effect to background vocals and producing a deeper 3-D mix. The bottom was also clear and spacious.

After this listening I spoke with Ian Eales (currently engineering Al Jarreau's new album) about the cable. He had just purchased several Series 1s and was using them to record vocals and horns. Ian felt that with this cable there was no phase smear between the highs and mids, and that accounts for the pleasing clarity. He found that with instruments containing high transient content he was no longer hearing the attack ahead of the lower frequencies.

This leads me to why this cable does what it does. The conductors are made of extremely pure copper, and in the Series 1 there are three separate conductors of varying thickness. The theory is that the lower frequencies travel down the thickest strand, mids in the medium size and highs in the tiny hair-like strands. It's sort of a natural frequency dividing network, with the electrons flowing down the path of least resistance. The whole thing is much more complex than this simple explanation, but its purpose is to allow all frequencies to arrive in phase. I didn't major in physics, so theory is not my cup of tea, but a degree is not needed to hear the difference this construction makes.

Aside from the sound, Monster ProLink has the most innovative XLR connector to date. Designed by Monster Cable and built by Neutrik, it is a maintenance dream. No more screwdrivers needed with this simple assembly. A main barrel slides over the contacts and strain relief and is hand tightened by a threaded section that secures the strain relief and holds the whole thing together. Along with having no screws to deal with, this connector is a good 1 1/4 inches shorter than a normal XLR. What a beauty and a real time saver. The connector comes standard on all series cables and is also available separately. I highly recommend it for road work.

Monster Cable has also come out with a line of musical instrument studio reference cable based on the same design theory and with another trick 1/4-inch phone connector. Now you can run keyboards, bass, or guitar into an amp or D.I. with a full phase-aligned signal.

Yes, Monster's ProLink can make a big difference in sound quality. I think you'll find less desire to use EQ, as the sound in the control room will more closely match the sound in the studio.

—Bob Hodas

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# Catching up with Glen Campbell

by Carol Kaye

When many people think of Glen Campbell, they think of the handsome, country-pop singer who gave us hits like "By the Time I Get to Phoenix," "Wichita Lineman" and "Gentle on My Mind," and had a popular television show in the early '70s. But when I think of Glen, I think about a whole different kind of person. I think about a great guy I played a lot of sessions with. But, even more than that, I think about a guy who played more sessions than just about anyone I knew in the '60s and '70s. He played rhythm guitar, lead guitar and bass guitar for artists such as Elvis, Dean Martin, the Beach Boys, Jan and Dean, Sonny and Cher and a lot of Phil Spector sessions. Few people know that he actually joined the Beach Boys after Brian left and played bass with them on the road for about a year in the mid-'60s.

Well, Glen's been back on the country charts again with his terrific version of J.D. Souther's "Faithless Love." Recently I had a chance to speak with Glen for a few minutes and we talked about some old times and a few questions I'd never gotten a chance to ask him back when we were doing a lot of session work together.

**Kaye:** What made you leave Los Angeles?

**Campbell:** I moved to Phoenix in 1981 because I found a place here that I liked.

I liked the climate here, it's just great. I started a new family. We've got a seventeen month old boy and one more on the way.

**Kaye:** How did you get your start in the session business?

**Campbell:** When I was a child I got a guitar and started learning how to play. Later, when I moved to Albuquerque, I got into Django Reinhardt and really wanted to become a jazz player.

**Kaye:** Did you ever take singing lessons?

**Campbell:** No.

**Kaye:** How about guitar lessons?

**Campbell:** No, I never took guitar lessons. I learned to read the chord charts for the sessions, that was about it.

**Kaye:** Why did you break out as a singer from the successful career as a session player?

**Campbell:** I've always wanted to sing and play.

**Kaye:** How did you choose the songs?

**Campbell:** I picked the songs that I liked. "Gentle on My Mind" was just for the lyrics. I loved the melodies on tunes like "Wichita Lineman" and "By the Time I Get to Phoenix," and of course I really liked "Rhinestone Cowboy." When I recorded those songs I had a personal feeling for all of them and the music was

there. It was really the whole ball of wax for me.

**Kaye:** What do you think about today's recording techniques?

**Campbell:** Well, you remember we used to record on four track and then eight track came along and we thought that was great. Of course these days you record on 120! Quincy Jones and those guys will hook up three or four 24 track machines. The techniques have changed a lot. The sound is better nowadays. But maybe it's getting a little too gimmicky, with the synthesizers and all. I use live everything for my sessions here in Phoenix, and do most of my work at Pantheon Studios.

**Kaye:** What do you think is needed in today's music?

**Campbell:** I really think more live players are needed in today's music. As far as the songs, I think Lionel Richie's stuff is great. But I think we need more good songs... more lasting songs... not the ones that are here today and gone tomorrow. A lot of people are just hitting for the one-shot market.

**Kaye:** Do you work with a fixed band these days?

**Campbell:** Right now I've got a five piece band called Caledonia. I think that was the old name for Scotland. This band actually came together in 1975 and its been kind of on and off since then. This present formation of the group has been together for about three years.

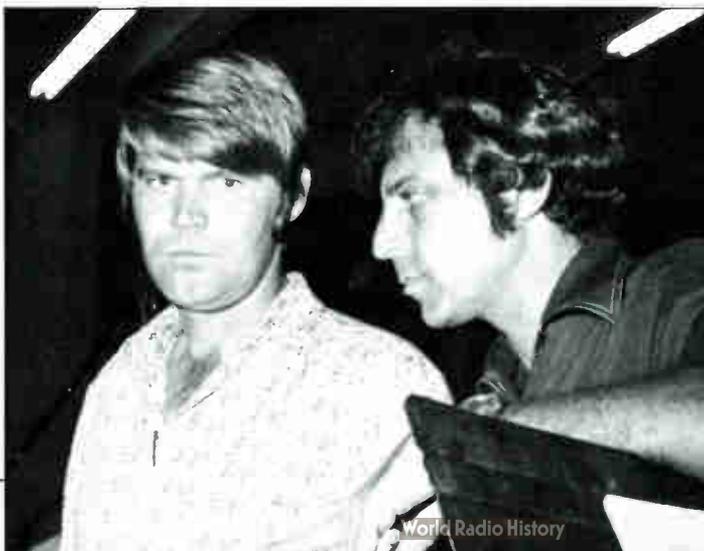
**Kaye:** Are you doing much roadwork?

**Campbell:** Well, I'm leaving in the morning for Toronto and then several dates in Michigan and Champaign, Illinois. I'll be out for about two weeks. I'm doing a lot more playing now, but I've been doing concerts since about 1968. I'm really enjoying it now as much as ever. We played a show here in Phoenix last night at the Symphony Hall and it was just great. I had an orchestra for it... 12 strings, brass, reeds... I really like playing with the symphony. I played with the Toronto Symphony in August, I played with the London Philharmonic, the Richmond Symphony, Minneapolis Symphony, Cleveland Symphony... I really enjoy doing that.

**Kaye:** What is your current recording situation?

**Campbell:** I've got a gospel album coming out at the end of the year. I want to start 1985 off right. I want to start it off with God. ■

Here's a shot of Glen in 1965 with session drummer Hal Blaine. (Don't miss Mr. Bonzai's interview with Hal on page 100.)





# PRODUCERS-DESK



## Rupert Hine

by Bruce Pilato

"The first record I recorded in the '60s as an artist was produced by the man in Britain who was notorious for turning down The Beatles for Decca Records," says Rupert Hine, leaning forward in his chair. "I said I wouldn't hold that against him and I went ahead and made a record with him anyway, and, . . . he *ruined* it! So, I knew that one day if I could ever get to be a record producer, I'd be putting one of these guys out of a job, and that would be a good thing."

Hine, indeed, did go on to become a record producer; a very successful one, at that. He is also a music video

director; owner of the Farmyard, (one of England's hottest studios) and his own record label in the U.K.; a composer and arranger with several hits under his belt in Europe; one of London's most in-demand studio musicians and synthesizer programmers; and still, a recording artist, in his own right.

Not bad for struggling musician, who like others, had every door slammed in face along the way. Today, however, Hine opens his own doors.

In the '80s, Rupert Hine has become famous, yet remained faceless. In the U.S., he is still relatively unknown (people often confuse him with Rupert Holmes, a Top 40 artist and producer best known for "The Pina Colada Song"), though that is beginning to change. Every album he has produced in the last

two years has charted. Among them are the last few albums from The Fixx, including their hit, "Deeper and Deeper," found on the *Streets of Fire* soundtrack; Howard Jones "What is Love;" the last two Chris DeBurgh LPs, including "Don't Play the Ferryman" and "High on Emotion;" and two songs which he wrote and produced for Tina Turner's *Private Dancer* record.

"I only produce the artists whose ideas are very close to the kind of ideas I have for songs," said Hine during his brief stay in New York City to speak at the New Music Seminar and to promote his newest record, *The Wildest Wish to Fly*, on Island Records. "If the songs and the ideas of the artist didn't highly interest me, then there'd be no point in doing the project."

He is constantly being asked to

produce, even by many major artists, but Hine often turns them down to work instead on unestablished acts. "They [major artists] usually get mad when I tell them I'm not interested in their work; some have even hung up on me. But, I'd rather help someone who's got a lot to say. I look for new bands all the time."

When Hine does find a project that interests him, he dives into it head first, contributing not only to the actual production itself, but to the shape of each song, the arrangements, and lately, right through to the making of the album's video clip.

Though some feel it's dangerous for a producer to have as much control as Hine does in the projects he takes on, he insists he is only giving the direction an artist wants. "That's what they wanted. That's why they came to you to produce. They don't trust A&M men; they don't like managers. They trust you."

Hine says he doesn't need to "experiment" his own production curiosities on the artists he produces, because he is able to do that on his own records. (In addition to his newest, he did two previous LPs for A&M, *Waving Not Drowning* and 1981's *Immunity*, which was one of

*I'm very interested in video when it is a complement to the artist's song and not just because you have a single.*

Europe's biggest AOR hits.)

"I've had more artists approach me, not because of what I had previously produced, but rather, because they wanted me to make them sound like my *Immunity* album. That is the record they all like and play to death and they all want to sound like that record, but I haven't made any of them sound like that record."

Rather than inject his own ideas, Hine is more likely to take an artist's original thoughts and embellish them, using technology he has developed through countless hours of studio experimentation. "About four years ago I started to figure out all the alternative methods of sequential effects that are humanly caused," he says. "Most of the things on my own album that sound electronic are triggered by my hand slapping my knee or sometimes, by me just running in the studio."

When I mention to Rupert that the new Todd Rundgren solo album, *Acappella*, contains only voices—no instruments—put through sound sampling keyboards, he casually points out he did

the same thing nearly four years ago.

"I had a minor hit in England a few years back, where I did 60 tracks of vocals and no instruments. I went through 30 filters, a harmonizer and assorted studio gadgetry." For Hine, the record was a labor of love that required hundreds of hours of trial-and-error recording. He claims, though, it is possible to reproduce nearly any instrument with the human voice if you put your mind, mouth, throat and ears to the test.

"For example," he says, talking as though he was lecturing a university class in sound engineering, "to create a really excellent bass drum sound on a record, all you need is a bass dynamic microphone, a certain kind—depending on how windy your breath is—and then you basically just find the combination between the pop made from the microphone and the pop made from your voice. And when you get the right balance, you can get an amazing sound. There's lots of little voice tricks you can do."

Hine's best known productions, of late, often incorporate striking audio imagery that is as important to the records as the melody hooks themselves. Examples of this include the "gun shot" drums and "crying" guitar lines in DeBurge's "Don't Pay the Ferryman," and the hypnotic keyboard sequencer line that runs throughout The Fixx's "Deeper and Deeper."

"That wasn't done with a keyboard," says Hine, smiling as he caught me by surprise. "We did that with a hi-hat."

His approach to video, a new field he has entered with great enthusiasm, is the same as his approach to audio production: only do it when you've got something worth saying.

"I'm very interested in video when it is a complement to the artist's song and not just because you have a single," he says pointing out that his own record may contain videos that are not necessarily the singles on the record.

"There are an awful lot of songs that lend themselves to visual interpretation, and equally, there are an awful lot that don't. We've gotten into the situation from a lot of record companies where we expect a video for a single. That's where the problem is. Not every recording artist is an actor, I directed and produced The Fixx videos because most of their songs are about interesting ideas that can be easily interpreted into visual mediums. But many artists and their songs do not."

Hine doesn't see his dual role as record producer and video director on the same project as any sort of violation of power. "During the course of making a record and understanding what we're trying to do with it, it is only logical that we should keep all of it in the same control for the video imagery."

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# Joe Ely: Confessions of a Digital Hillbilly

"I'm really excited about these times," drawls Texas roots-rocker Joe Ely. "It's kind of out of character for me, because I grew up in the flatlands where there's nothin' but the wind, and cotton, and... *Bob Wills*. But I just see somethin' that's an answer to a lot of things that I had wished there were answers to in the first place."

Like more and more people these days, Ely's finding his answers in computer technology. But news that this 37-year-old rockabilly strong-arm man had composed all the tunes for his fifth LP, *Hi-Res*, using an alphaSyntauri/Apple computer rig raised eyebrows and hackles among rock purists. After all, aren't hard-bitten, road-toughened songwriters supposed to find answers in their souls and not in the same type of machine that sends you the gas bill?

"I thought about that," Ely confesses. "But at the same time when I get started on somethin' and get carried away with it, I get almost fanatic. Because I really dug into this whole world I was exploring, I thought I'm just gonna have to do this no matter what anyone thinks. I couldn't let tradition stand in the way. That's just what I suppose you have to do every once in a while if you're going to make a step in some direction or another rather than just standing still."

When his brother Mark first began filling Joe in on some of the Apple's capabilities, the singer responded with the yawns of the uninitiated. Ely's interest perked when he heard that the computer



could tie in with an alphaSyntauri synthesizer, making it potentially very user-friendly to a songwriter working on a closely watched budget in an eight-track home studio.

"I decided to look into it as a composing tool," Ely recalls, "and ended up becoming fascinated by what the technology was leading into, as far as tying in the recording part as well as the composing, in my case. So using the Syntauri, which is a fairly low-end machine compared to things like the Fair-

light, I found I could hear parts on songs as I was writing them, without going to tape, by just going to floppy disk and being able to overdub, punch in and punch out."

The new musical technologies first caught Ely's ear when he toured England with Merle Haggard and, later, the Clash in the late seventies and early eighties. At that point, he didn't much like what he heard. "I wasn't real thrilled with the 'techno' sound," the self-termed

—PAGE 126



The elephant's nightmare

## Producer Jeff Eyrich Breaks Down Barriers

One of the marks of a good producer is that he doesn't smear the mark of an artist, and by this standard Jeff Eyrich is a very good producer indeed. Consider the evidence: The Plimsouls' single, "Million Miles Away," and their album, *Everywhere At Once*; T-Bone Burnett's *Proof Through The Night*; the second album from Rank and File, *Long Gone Dead*; the Gun Club's *Las Vegas Story*; plus the brand new Blasters album. Not exactly a list of repressed artists. When you listen to these records it is clear that Eyrich chooses his projects more for their healthy individuality than for their easy marketability, and he has had re-

markable success in capturing that sudden snap of energy as an artist shifts into a more powerful gear.

Having worked his own way up through the ranks of touring musicians and L.A. studio players, Eyrich knows exactly what it is like on the other side of The Glass. "I don't like that barrier between the producer and the band," he says. "I shouldn't be able to walk freely through the band and pick up a guitar and say 'All right, I want it like *this*.' That's not what I'm about at all. I think that the respect has to be mutual. For example, I respect Johnny Bazz in The Blas-

—PAGE 127

# Danny Tate Converts to Rock and Roll

"Fuel on the flame  
Gas on the fire  
You've got to turn, matches to ashes

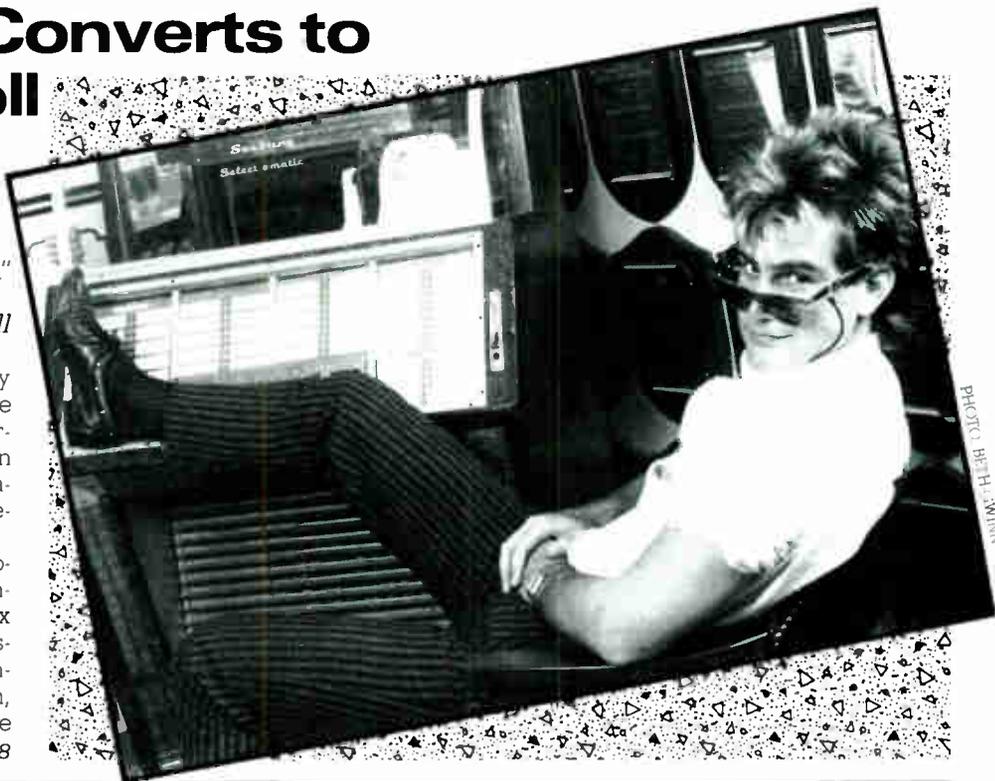
(So) Don't build a fire you can't put out."

—from the LP *Sex Will Sell*

So what's this—a new morality in rock and roll? Seems like it, from the evidence of Danny Tate, a 6-foot-4 former tight end who earned a degree in music theory and composition at Ouachita Baptist University in Arkansas before coming to rock and roll.

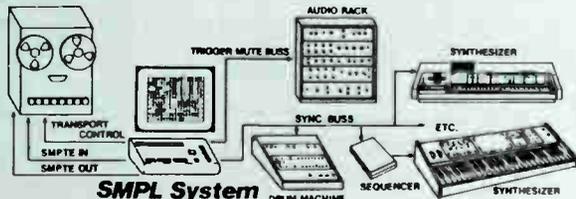
Up until about 1974, it was supposed to turn out very differently. Danny, fourth of David and Hazel Tate's six children, would become a Baptist minister of music like his father. But when Danny brought some black friends to church, the Christian spirit seemed to evaporate

—PAGE 128



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—FROM PAGE 124, ELY

"digital hillbilly" remarks of the synth-pop brigade that dominated the air waves back then. "Now, the stuff that Thomas Dolby did, some of it is to me really masterful. Like 'One of Our Submarines.' Just the sounds in there, the way the rhythms are put together, captured my attention, especially when I started working using the computer and a drum machine.

"To me, it was just a completely different way of working than the way I always had worked, which was mainly just get a few chords, get the lyrics, and hum a melody in my head. The arrangement would come together when everybody got in and the tape was rollin'. I see all of this stuff mainly as a tool to be able to hear things, to assemble your sound *before* you go into a studio and there are suddenly big holes in your pockets."

In fact, *Hi-Res* uses hi-tech effects primarily as trappings, despite Ely's new compositional techniques and the computer graphics art work he designed and generated (under the moniker Earle Epiphone) for the album. Part of the reason for this is that his home tapes didn't quite come up to the quality he wanted:

"I been hearing about Moog tying in a synthesizer with the Apple Macintosh. And I think that, because the Macintosh has a bigger processor, it's not gonna run into that 'aliasing' of sound, when sound hits a brick wall and the frequencies can't get any higher. I think maybe with a Macintosh, it will cure that."

Another reason the record's not machine-ridden is this strange problem of techno-nightmares. "I believe I recorded every song that's on the album in my home studio," Ely states. "I really did wake up in a cold sweat in the middle of the night with this robotic drum sound marching off in my head. I'd wake up practically screaming. It got to the point that everytime I would start to record stuff with a drum machine, I would make sure that I'd speed it up when the chorus came down, *rush* it a little bit.

"But even that didn't help. It still didn't have the *feel* of a muscle moving a stick through the air and cracking on a drum head, where you can almost hear that 'whish' and you can almost hear that foot pedal 'whoosh' and crack. After a couple of months it really started bothering me, so I had to take it in there and add that muscle and sweat and bone crack-

ing against those drum-heads."

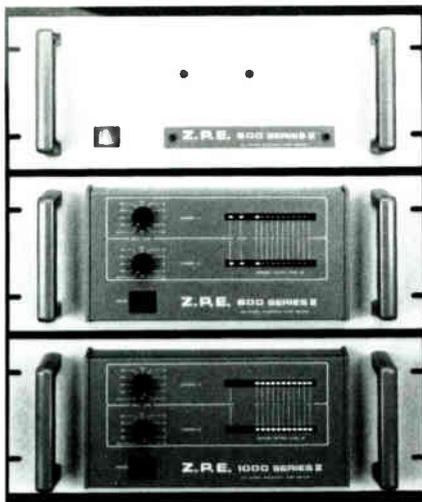
Right now, Ely's working on some new material in his studio and will resume crafting the follow-up to *Hi-Res* early in 1985, after tours of Australia and Japan. While it's too early to say for certain, Ely ventures that "The next record I'm sure will be somewhat different because I don't think I'm gonna go about recordin' it the same way."

Not that the boy from Lubbock has forgotten the lessons his new tools taught him. "I can see the possibilities for musicians in the future," Ely reasons. "Because of the way digital sound is working, I can see that in the next few years digital recording will be within the grasp of the man on the street. Once they're able to actually write to the Compact Disc as well as read it, when you're able to have somethin' available that stores that much information, suddenly the price of digital recording will drop drastically, and people will be able to make high-quality recordings on modest machines."

And if they have half the talent, imagination and restraint of Joe Ely, they'll be in business.

—Anthony DeCurtis

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Jeff Eyrich (right) with T-Bone Burnett (left) and engineer Dennis Kirk.

—FROM PAGE 124, EYRICH

ters when he plays any part at all; he *is* the feeling of bass for that band. But as a producer I'm at least able to give him more than some vague opinion about his part because I can play what I'm thinking rather than just talk about it. Then he plays what he plays best."

Eyrich's years as bass player in Tim Buckley's band set the stage for his future relationships with strong artists. If you were looking for fierce integrity, Buckley was practically the second Miles Davis in towns like Buena Park and La Habra, deep in County Disney in the late 1960s. Eyrich learned all about artists who live for the heart, not for the chart.

"It's true that on the one hand a record has to have songs that are going to hit the radio. This is necessary for the record company; it's their first step up into the record. I've got to be able to go to them and say, 'Here are three strong possibilities for singles,' and they really have to *be* that. But a strong artist, even if he's as open as possible, will not be molded. You can only encourage someone to be as artistically strong as possible, and point out compromises here and there that keep in mind the end product rather than some specific little problem.

"A lot of this process of making a record is letting things go. There are lots of these points where people have to let go of something in order to grow—sometimes it's the band, sometimes it's the producer; mostly, it's both of us. But the more a band learns about how to make a record, the better it is for them when they go in to make their *next* one. It's a totally different process than: playing live, and unless a band is given the leeway to learn about a studio they're never going to be able to make a record that puts them over the top. One of the jobs of a producer is to provide as much knowledge as possible and know that the band will recognize the ideas that work well for them."

Eyrich's horizons as a producer are rapidly broadening beyond Los An-

# MUSIC NOTES

geles. His next project will take him to Paris, where he is scheduled to produce a French band that has met with stone-wall resistance from French radio because they sing in English. The challenge as Eyrich sees it is not to break this band in the larger English and American marketplace, but to make a record that can finally tear down the Bastille of French radio policy. Given the energy that Eyrich has been able to capture in his other records, I'd say La Rock Francaise is in for an unexpected visit from the real world.

—Greg Copeland



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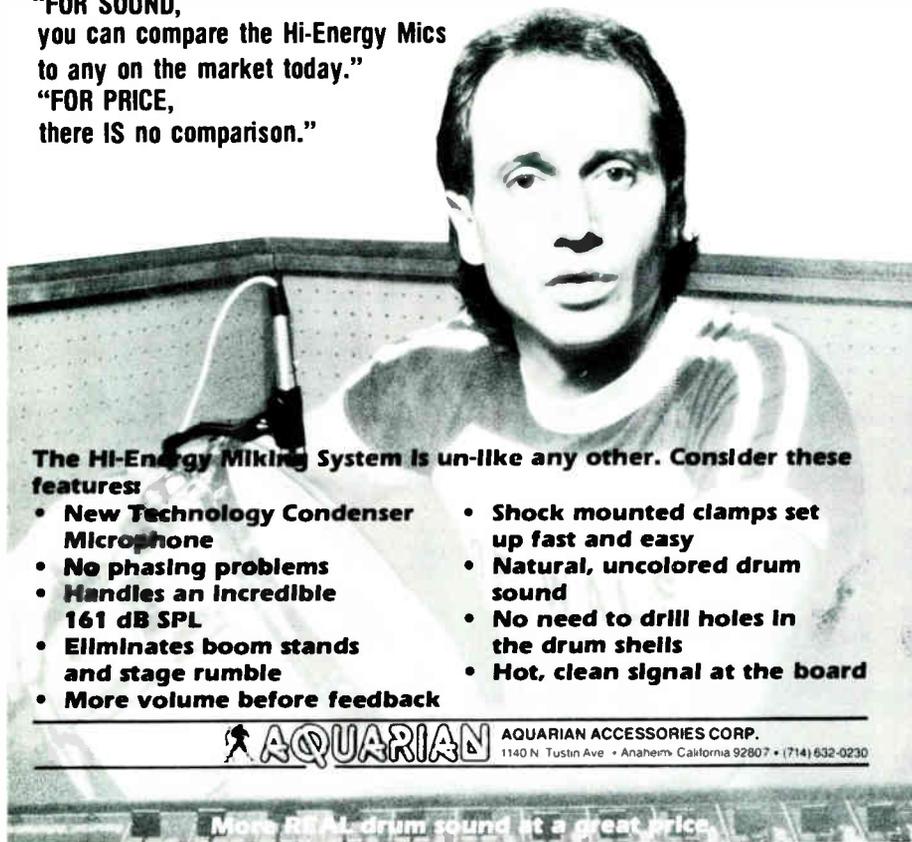
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—FROM PAGE 125, TATE

right through the stained glass, and soon came official condemnation from the pulpit as well.

This year, Danny Tate wrote a song—one of nine on his debut album, *Sex Will Sell*—called "Breaking the Ice," which begins: "Love me for what I am not for what you want me to be . . ." And while it sounds like it might have come from Thomas Dolby or Howard Jones or maybe Red Rider, it was written for David and Hazel Tate.

"Intentionally, that had to be the last song, just to tie everything together," Tate said recently during a soundcheck in Louisville, where he and his band, East of Eden, would knock out another night behind Tate's songs. Songs about "sensual innocence" and "innocence meeting reality in the '80s," Tate calls them. And like his lyrics and his conversation, these songs are filled with fire and ice, passion and resistance, temptation and denial.

All of them, the eight Tate wrote or co-wrote and the cover of the Lieber-Stoller chestnut "Love Potion No. 9," came in a burst of creativity this spring when Tate literally moved into Memphis' Cotton Row Studios to write and record *Sex Will Sell* with keyboardist/producer Carl Marsh, who was anxious to use his training on the amazing, \$35,000 Fairlight computer musical instrument.

At the time, it was the only Fairlight in the South, though Marsh, who travels extensively for session work, has now bought his own. He already hopes to use it on Danny Tate's next album—on a major label.

Until last year Tate was one of hundreds of young songwriters pounding the pavement in Music City trying to sell his songs. Then, through a fluke, a song he'd co-written was slipped to Rick Springfield and ultimately became "Affair of the Heart." And suddenly, Danny Tate saw destiny looking him in the eye.

*Sex Will Sell* is being called "just a little to the left of what people normally consider right" by his own publicity firm. But the music is mainstream American power pop, meaning it's colored with Tate's soul, funk and rock and roll inputs. And the lyrics are decidedly level-headed and mature for any kind of pop.

That title track, for instance, argues *against* sex as a selling tool: "Sex will sell. You get a little dirty. You get a little more than you buy . . . Pardon me but it's a legal crime." And "Gravity of Resistance" argues *for* restraint in relationships—even holding out—because "the thrill is in the hunt and not the kill."

But on the other hand, Tate has

done his share of experiencing, too, else songs like "The First Taste" would lack the convincing itch of the raging hormones that inspired them.

Stan Lassiter's crunchy, rene-gade guitar rubbing up against Tate's and Doug Sisemore's synth-slides helps with the tension. Roy Vogt's fat bass lines and "Mellow" Mel Owens' funky percussion keep the itch alive. And Tate's voice, a slightly husky baritone that can turn soulful and sweet on ballads, is the glue that gives it all some human warmth.

"Can I have some of that cigarette?" a soaking wet Tate asks after finishing the last set of the night. He quit the nicotine habit a few months back but insists a couple of lungfuls can't hurt. Despite his tall, lanky frame and the frankly fake blonde edges on his hair, Tate's presence is that of a vulnerable, overgrown boy with disarmingly direct brown eyes and an eager, guileless smile.

He'll tell you right off that while he admires Thomas Dolby's keyboard work and always felt David Bowie as an influence as much as the Song of Solomon, his real motivations are simpler: "Being hungry will drive you to be creative."

He'll also tell you that as a minister's son, with both financial and behavioral limits a constant part of his youth, music was his weapon. "It was a way to raise myself above it all—or out of the concerns of this world entirely. And I never cared to be equal (to those around me); I always went straight for the top," Tate said.

That meant "no time to hang out and no time to be lonely," just clear, focused work and discipline. Even now, on the brink of success at 28, he seems genuinely surprised that he's never been married or even engaged, but also sure that such personal and worldly concerns will have to wait until the career's secure. Originally, he was going to call the album "Breaking Bad Habits," but now, he thinks the bad habits will take care of themselves as long as he keeps the focus tight.

So, as soon as he finished in Louisville, he was headed back home to Nashville where he's got a lot of sounds to record and feed into Carl Marsh's Fairlight. And with a hectic schedule of dates through early '85, he's suddenly become more prolific than usual as a songwriter, too. His publishers, manage-

ment firm, attorney and publicist all think his success is inevitable; they insist they are just waiting for the right label deal for Tate. And there have been several pretty interesting offers already.

Meanwhile, items and photos have been appearing in *Billboard* and *Cashbox*, and the record's been getting airplay wherever Tate plays—in Memphis and Chattanooga, Tennessee; Paducah and Bowling Green, Kentucky; and Starkville, Mississippi. In Louisville, WLRS-FM put an hour of Tate's sets on the air live, and the record's only ballad, "Don't Say Goodbye," is the top request on at least one Nashville station as presstime nears.

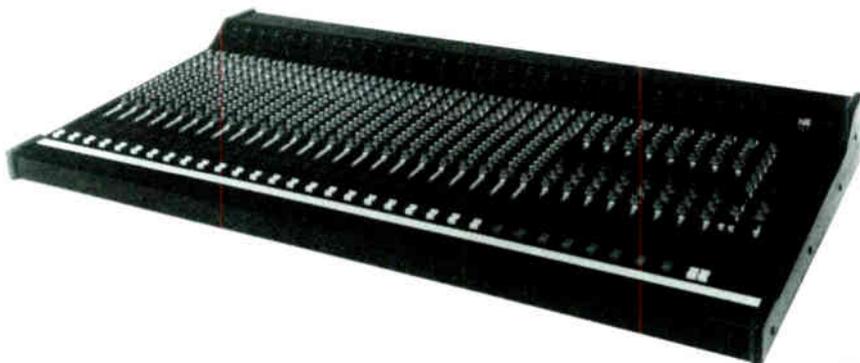
But Tate is philosophical about the progress, too. "My music is not to set trends, and it's not necessarily what everyone's thinking or talking about. Let it be just whatever comes out—whatever's honest, you know?"

—Laurice Niemtus

**Note:** *Sex Will Sell* is available from Gravity Records, PO Box 40975, Memphis, Tennessee 38174-0975, for \$8.98 plus \$1.00 shipping. ■

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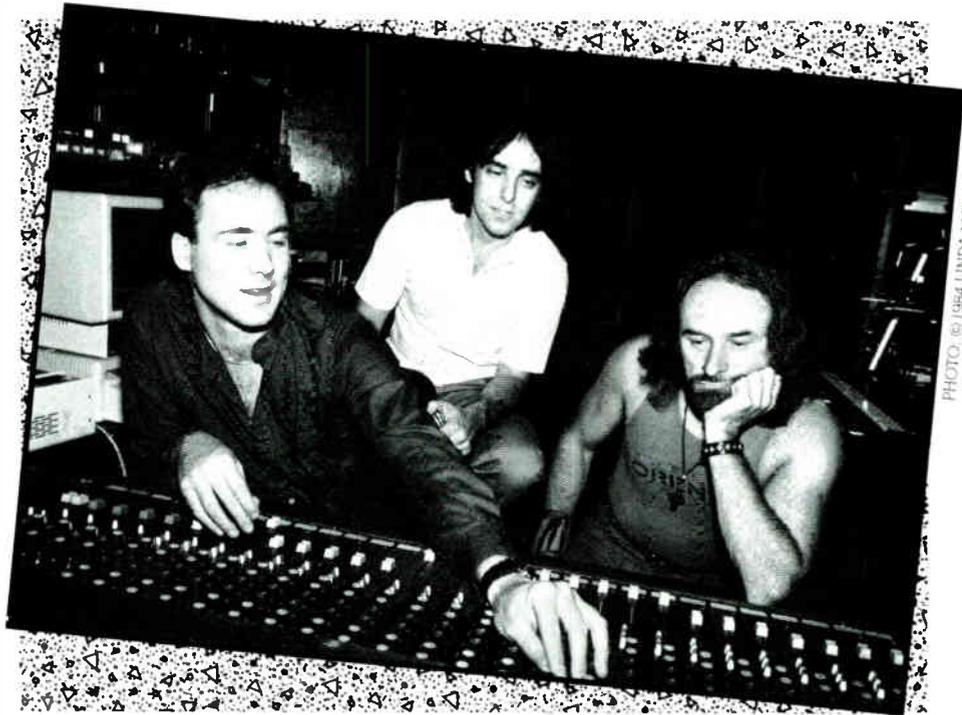
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## Stan Borys: Polish Star Starts Anew

Struggling rockers who think they've got it tough grubbing for gigs in the free world should try plying their trade in Poland. State-run record companies and studios, endless streams of government censors, periodic arrests and starvation wages are typical of what your average recording star can look forward to there.

Not that Stan Borys was your average recording star in his decade-long tenure as a chart-topper in Poland. His metaphorically cloaked tirades against the Communist government, as well as his association with Lech Walesa and Cardinal Karol Wojtyla (now Pope John Paul II), kept Borys under closer-than-average scrutiny. Still, he managed to rack up a box score impressive even by Western standards: more than 40 hit singles, over 4,000 concerts performed for millions of people all over Europe,



Borys (right) with Brian Adler (left) and Dick Hansen at Boardroom Studios.

## New Power Amplifiers Debut at AES

AES Conventions always bring with them dazzling products from dozens of manufacturers, but power amplifiers are among the few categories of equipment that have an almost universal appeal to everyone in the music business, from musicians and mixers to sound contractors and reinforcement people. Space limitations do not permit listing all the new amplifiers, but here briefly are several entries.



Soundcraft Electronics introduced their first line of power amps, with three models ranging from 85 to 435 watts per channel into eight ohms. These

compact units combine MOS-FET and bipolar designs, allowing the amplifiers to respond to instantaneous peaks of under five milliseconds at five to seven times their rated power. The rated power specifications (at eight ohms) and prices for the Soundcraft line are as follows: The SA150 delivers 85 watts/ch in an 1 3/4-inch rack space, \$749; the 3 1/2-inch SA 600 has 150w/ch, \$949; and the 7-inch SA2000 with 435 w/ch is \$1,975.



JBL/UREI unveiled two amplifiers, the 6230 and 6260—rated at 75 and 150 watts (into eight ohm loads), and 300 and 600 watts bridged into eight ohm loads, respectively. Protection circuitry includes current limiting under improper loading/driving conditions and an output relay to guard against DC offset conditions, large low frequency transients, and provide power on/off muting.

In addition to fully complementary driver and output circuits, the amplifiers also utilize active differential inputs for transformerless balanced operation. The 6230 is priced at \$618, the 6260 is \$870.

While Crown International is certainly no newcomer to the power amp market, their new Micro-Tech 1000 turned a few heads at the show. The 3 1/2-inch high unit puts out 280 watts per



channel or 800 watts in the bridged mono mode at eight ohms. The Micro-Tech 1000 uses Crown's "Grounded Bridge" output design which allows extreme voltage swings without putting output transistors in series, yielding lower distortion and greater reliability. Extensive protection circuits are included as is a unique reversible airflow cooling system, so the forced air direction can be changed from front to back, depending on the dictates of each mounting situation. The Micro-Tech 1000 is priced at \$995.

—George Petersen

numerous international awards, and an estimated six million records sold. Of course, when the government's making off with 99 percent of your income, accurate figures are hard to come by. "I don't think that's right, six million," Borys reflects. "I think it's more."

Fed up with a Poland where "after ten years as me, I was tired," Borys emigrated West in 1976. After a year in New York he went to Chicago, where he currently supports his common-law wife and stepson by playing area ethnic clubs where his name is still revered.

Borys recently finished a six-song demo at suburban Board Room Recording, produced by veteran Chicago engineer Stu Walder and studio owner Brian Adler. His manager, Dick Hansen, is shipping it to major labels.

"There's a certain sensitivity of American audiences to music," says Borys, "and I think the songs I've recorded can be picked up by American listeners."

Borys began performing in Poland at the age of 17, when he joined a traveling theater group. After a stint in Polish professional theater, for which he received favorable notices from national drama critics, Borys formed his first rock and roll band, Blackout. (The group's name, notes Borys, not only refers to the wham-bam form of comedy sketch but to the insidious forces of communism. "The sun's going down, and somebody or something is trying to make you darker," he attempts to explain.)

With his Christlike locks and beard, as well as the deliverance-from-oppression tenor of his songs (cleverly masked for the government censors, of course), Borys became known as the "Jesus Christ of Polish Song."

"I was one of the only performers who wasn't smiling at the people, wearing nice clothes, and singing songs like, 'I love you baby, la la la,'" Borys says with an air of distance. "In my lyrics, from the beginning, was something absolutely different—and it was making people think."

Borys had to couch all references to Poland's communist regime in metaphor, and according to him it wasn't too hard to fool the censors, who went over every word with a fine-toothed comb.

"I couldn't write words like 'I hate Russia' or 'I hate red flat,' or I wouldn't be able to step out on the street for fear of being thrown in jail," Borys recalls. "There were officials or secret police at every concert."

What he could do was write songs like "Captured Swallow," which, with its poignant image of a bird trapped in a church, allegorically detailed the

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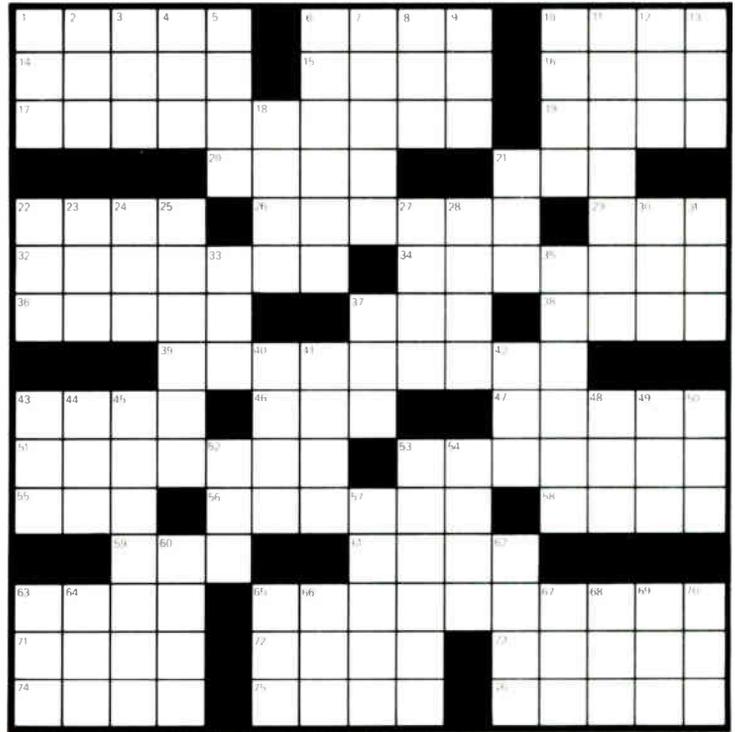
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### ACROSS

- 1 Song
- 6 Rare
- 10 Not up
- 14 San Antonio site
- 15 Rosanna band
- 16 Hill and
- 17 Memoranda from the Titanic?
- 19 Vaporous prefix
- 20 British dell
- 21 Quantity (abbr.)
- 22 Summers at Lourdes
- 26 \_\_\_\_\_ ladder, on a fire engine
- 29 Highest note
- 32 Ruling tapes?
- 34 Like the firmament
- 36 \_\_\_\_\_ stand (subway option)
- 37 Tree
- 38 Boney prefix
- 39 Studies of certain attractions
- 43 Whale
- 46 \_\_\_\_\_ frequencies
- 47 Say
- 51 Indianan
- 53 Places to find 17A
- 55 Parent
- 56 Middle East person
- 58 Bahhile
- 59 Orchestra
- 61 Crow's
- 63 Connect
- 65 A certain medium transfer
- 71 Axis, for one
- 72 A flop
73. Hebrew holy work
- 74 Sax
- 75 Ball club
- 76 Military stopover, on a march

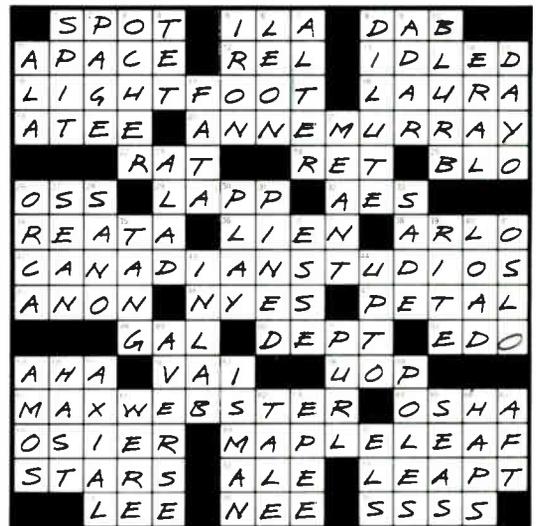
### DOWN

- 1 Presidential nickname
- 2 Moslem name
- 3 Managed
- 4 Cockney abode
- 5 Over
- 6 Makes up for
- 7 Hand raiser
- 8 Follower
- 9 Day in May?
- 10 Common progenitor
- 11 Men at the plate
12. Tree
13. Italian god

18. Singer Holly
21. In the manner of
- 22 Print measures
- 23 Siamese
24. Superlative suffix
- 25 Breathing pores
- 27 \_\_\_\_\_ Memorex?
- 28 Prefix for central chambers
- 30 Rent
- 31 Sweet drink
- 33 Golden
- 35 List
- 37 Handful
40. Type of club
41. Mean
- 42 Particular ball
- 43 Piece of resistance
- 44 Outback cutter

- 35 Disc
- 38 Power project
- 39 Shelley's disk
- 50 Alphabet trio
- 52 Door's suffix
- 53 Arabs, to some
- 54 For fear that
- 57 Console port
- 60 Division word
- 62 Curry
- 63 Resort
- 64 Amigo
- 65 Hat
- 66 Summer cooler
- 67 Girl's nickname
- 68 Outlaws of Londonderry
- 69 Fool
70. Famed revolutionary

### Solution to November Mix Words



trauma of life under a totalitarian government. That song, now translated into English and bearing the title "Freedom Bird," is the centerpiece of Borys' new collection of songs.

As Borys' fame grew throughout the early '70s, he found himself giving concerts all over Europe, including West Germany, France, Belgium, Greece, and even the Soviet Union. At the 1973 Olympia of Songs competition in Athens, Borys performed before 100,000 people and walked off with an award for "best interpreter."

Borys kept up a killing pace during those years, frequently doing up to three concerts a day "to make enough money to keep musicians and managers, and meet road expenses," he says. (The government, it goes without saying, kept most of the touring proceeds, as well as record revenues.)

The daring rocker was arrested and questioned by the government several times during that period, once following a secret concert arranged by Cardinal Wojtyla.

Despite further career accomplishments—including appearances in films and on television, guest starring in Poland's first rock opera, *Naked*, and

carrying away "Best Interpreter" honors at an international music competition in Caracas, Venezuela—Borys decided to chuck it all and try the Free World for a change. "I had done everything in Poland," he says. "I wanted to go somewhere where I was totally unknown, and after a year of trying, I did it. I came to America."

Borys spent a year in New York, playing ethnic clubs and picking up the language. "It took me two years before I opened my mouth (in English)," he chuckles.

Now settled in a bucolic Chicago suburb called Lake in the Hills, Borys performs in ethnic clubs in the Chicago area, where, he estimates, 90 percent of the Polish population knows who he is. Working with house bands "who all know my music," Borys renders original songs as well as American pop covers encompassing anything from Billy Joel to Billy Idol. "There's so much good music on the market," he enthuses.

Borys' recently completed demo tape, according to co-producer Brian Adler, consists of "mostly music that he'd done in Polish, with a rock rhythm section and full orchestra." In order to update Borys' music to 1984, the tunes

were translated into English, and "rearranged with a techno sound," according to Adler.

The six songs were recorded on an MCI 16 track machine, utilizing Lexicon digital delay and digital reverb. A battalion of synthesizers worked by Chicago keyboardist Christ "Hambone" Cameron and including a Yamaha DX7, Memory Moog and Simmons drums, took the place of Borys' customary orchestra.

"Stan was blown away by the hi-tech stuff," remarks co-producer Stu Walder, a veteran engineer who's worked with Ramsey Lewis, Tyrone Davis, The Manhattans, and Champaign. "He had told us the two studios in Poland were huge—with staff of 250 or so people—and he was amazed that we could get this sound out of such a small place."

Working with Borys was a pleasure, says Walder, though he notes with tongue-in-cheek, "He didn't care much for our Polish jokes."

"He told us a few of his own," counters Adler with a chuckle.

Now for the hard part: getting Borys' name spread around. Manager Hansen feels it'd be easier to break Borys via the TV talk show circuit, an avenue

—PAGE 134

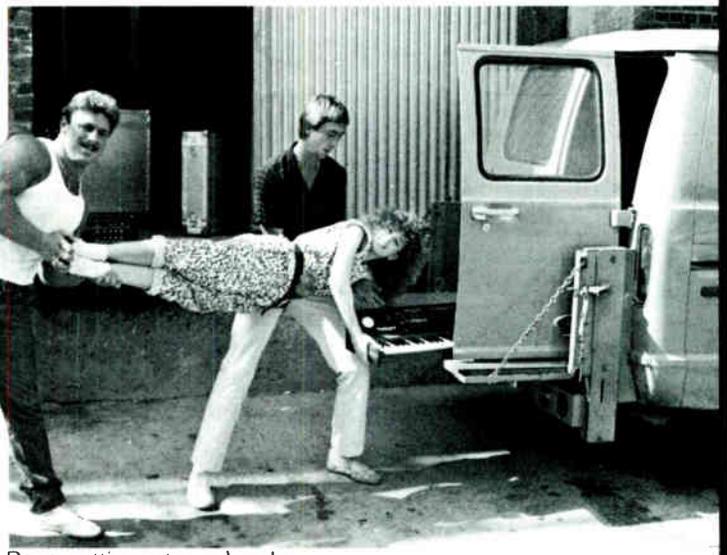
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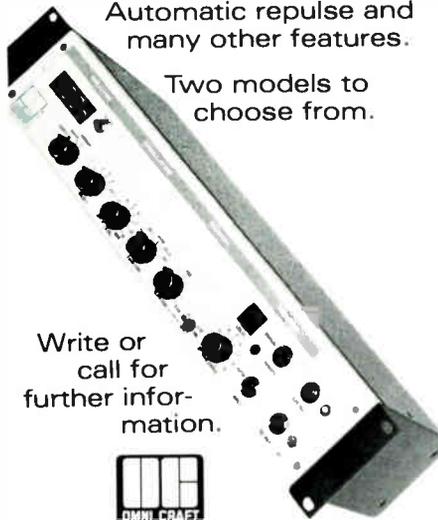
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—FROM PAGE 133, BORYS

he's pursuing while he shops Borys' tape.

Stan himself feels that his very intense brand of rock and roll is relevant not only to people of the Eastern bloc but to thinking people in general. "Songwriters and performers should be not only making people happy, but telling them what's wrong with society," he says. "You and I and other people know it's not all nice and great in American society, and I think we should talk very loud about that.

"I could write a 500-page book telling what it means to have your own thoughts and live in a system where someone is trying to make you think as they want," Borys sighs. "I want to tell what it's like to be a writer and have the system taking your hands and making you write the words they want . . ."

"Rock and roll people in American sing about freedom, but I think the only people who can express what freedom is are people like me who didn't have it."

—Maira McCormick

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This is Ray Bradbury. Join me for the next thirty minutes on a tour through time and space. Come along to the far future; follow me into a strange past with stories that almost could be—or might have been. Real or unreal. . . this is Bradbury 13.

So begins National Public Radio's recent 13-part series of fascinating stories by the noted author, produced on a 1982 NPR grant by writer/engineer Mike McDonough. He has earned 14 national awards for his work, including several for Bradbury stories he had already produced on his own. "I met Ray Bradbury when I was a teenager," McDonough notes, "so I was particularly pleased when he encouraged me to adapt his stories for radio."

Absent the visual effects of movies and TV, audio drama must use very specific, but very simple, sounds to induce a picture in the mind of the listener. When it came time to begin work on *Bradbury 13* at Brigham Young University's Media Productions studio—where he is employed as an engineer—McDonough decided he just couldn't use "gunky old sound effects." He got his first tape recorder at the age of eight, and began tapping into the speakers at drive-in movies with alligator clips in order to record the soundtracks. He spent hours listening to the sound effects in movies like *Journey to the Center of the Earth* and

the early James Bond films; he became so familiar with certain effects that he could watch an old movie on TV and tell which Hollywood studio it came from just by listening to a few sound effects. "It got to the point where I thought if I heard one more Universal Studios door slam I'd go crazy," he recalls.

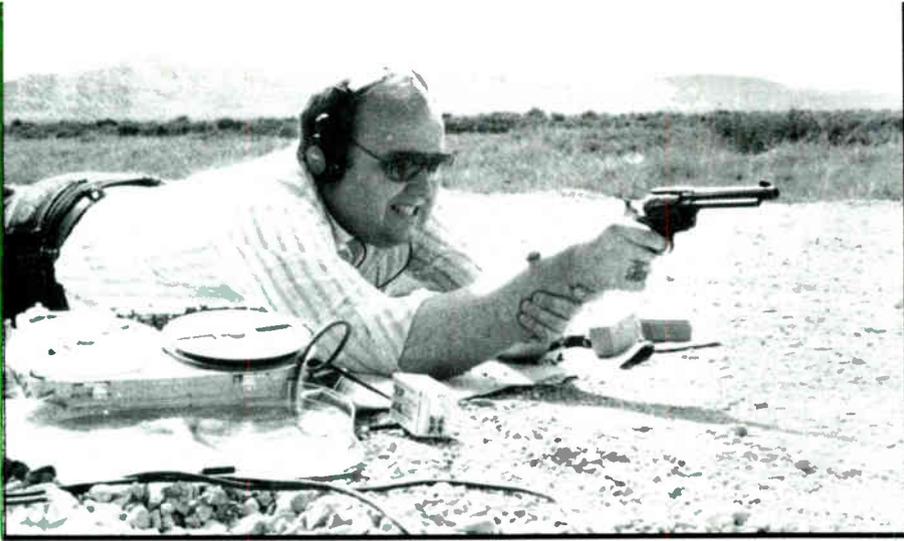
Another example of a well-worn sound-library item is a "thunderclap and roll" from the original version of *Frankenstein*, recorded in 1931 and used over and over again since, in everything from *Star Trek III* to Disneyland's Haunted Mansion. It's a classic recording, says McDonough, but with today's equipment it's possible to make much more effective sound cues. To illustrate, he plays a thunderclap and roll that blows the listener across the room. He made the tape himself, with a Nagra 4S (a movie industry standard for most remote recording situations) and a pair of Electro-Voice RE-20 microphones, while producing *Bradbury 13*. The lightning bolt that produced the sound "hit about a block away from me and took out some windows," McDonough says with a smile.

In addition to the RE-20s, McDonough uses Sennheiser 816s and 416s and Neumann KM-84s. He usually records at 15 ips, but for certain loud sounds—gunshots, for example—he prefers 7½ ips because it introduces a bit of natural overload and distortion.

One of the Bradbury stories required an outer-space feeling. "There's no sound in space, of course," says McDonough, "but I wanted the emotion of these guys floating through space." What he ended up using was a recording of the Mormon Tabernacle Choir warming up—many voices singing many different notes and runs. He slowed the tape down and put it through a harmonizer to get the emotion he was listening for.

Some of the sounds and feelings require unlikely combinations. McDonough combined the air cable of a scanning electron microscope, the latch of a trash compactor, an electric car window opening and the air brakes of a semi to suggest the sound of a time machine's hatch being opened. After recording the sounds McDonough spent almost a day editing them together to get the effect he wanted. He says it's not unusual to put several days of work into a segment that lasts only two or three minutes in the final product.

Though he created totally new sound effects for *Bradbury 13*, McDonough also sought to retain the '50s flavor Bradbury wrote into his stories. In "Night Call, Collect," he wanted the sound of a 1952 Chevy; he didn't want just any old



*Bradbury 13 producer/engineer Mike McDonough on a recent ricochet recording expedition in the deserts of Utah. The microphone was placed about 100 yards away.*

car. He contacted car collectors and dealers but was unable to find a car which had the original engine and transmission.

Driving home from work one day McDonough spotted a Chevy that was old and falling apart. He knew it would have the authentic sound he needed. "I followed the guy, honking at him, and he kept looking at me like I was crazy," McDonough laughs. The Chevy owner thought McDonough even more

insane when he found out why he'd been stopped. But he agreed to let McDonough record, and four days later the two men spent a couple of hours in a quiet parking lot recording stops, starts, turns, door openings and closings, and "everything else we could think of."

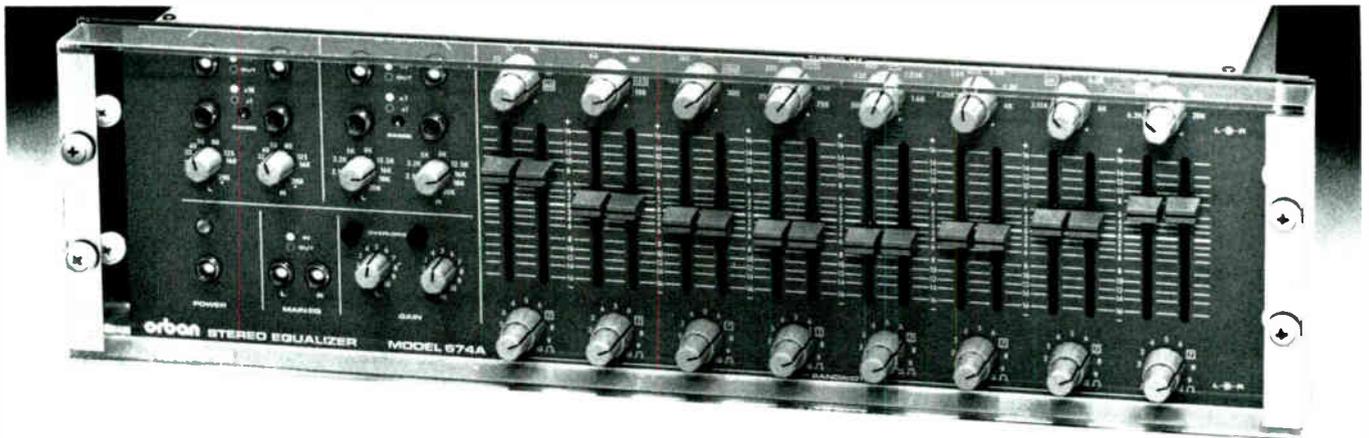
McDonough and his associate producer, Jeff Rader, went to record some horses in an attempt to create the sound of an angry dinosaur. They didn't have much luck until the horses' owner

showed up, pointed out that it happened to be mating season, and walked a mare past a group of stallions. McDonough and Rader got some great sounds.

The first run of *Bradbury 13* played on more than 250 stations, many of which plan to repeat the series soon. McDonough has received fan letters from all over the country, and NPR has contacted him about doing another series. He's not sure he's up to it, though, after spending two years on *Bradbury 13* from writing to the final mix. "There's no money" in producing audio dramas, he notes; movie gigs are what McDonough is shooting for.

What does a sound effects freak do in his spare time? Recently McDonough and sound engineer Ben Burt of LucasFilm spent a three-day "vacation" recording ricochets, shooting more than 800 rounds in the process. After returning home, McDonough happened to see the 1938 version of *Robin Hood* on the tube one night and decided it was time to get back to some serious work: recording "arrow swooshes." Why? "Because the sound of arrows has always fascinated me," he grins.

—Quint B. Randle



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—FROM PAGE 8, SESSIONS

cording, San Francisco, ADR work was done on *The Ewok Movie* (LucasFilm), which will be a family oriented television special aired during the holidays. *Mishima* (a Japanese film whose executive producers are Francis Ford Coppola and George Lucas with Tom Luddy as American producer) was working on its Foley sessions, and Coppola's *Cotton Club*, wrapping up in postproduction, was in recording some music. *Triad Studios* of Redmond, WA had *Agape Force Productions* completing a picture book LP project with *Ron Krueger* producing. *Uncle Bonsai* was in for overdubs and mix on LP project with *Larry Nelzger* producing. *Luther Greene* of San Francisco's *Studio C* reports that the recently mixed *The Adventures of Mark Twain by Huckleberry Finn* was screened at Disney Studios in Burbank to rave reviews. Other recent mixes at Studio C included *J. Gary Mitchell* (The Wizard of No), *Tom Valens* (To Make a Difference-Will Harvey mixing) *Beggars Banquet Recording Studios* in Santa Rosa, California have simplified their name to *Banquet Sound Studios*. Among the acts in the studio recently were *Flight of the Griffin*, *Carole Shinnete* and *David Andez*

## SOUTHWEST

*Reelsound* of Austin, Texas, had its 46 track remote tractor-trailer unit called in to provide audio support on the recent Neil Young *Austin City Limits* PBS television show. Producer *Elliot Mazer* brought in a Sony PCM 3324 digital 24 track machine to record the show for live album use. Working on the Reelsound crew was *Mason Harlow*, *Gordon Garrison*, *Brent Campbell* and *Malcolm Harper*. *Aarora*, an Austin-based group, recently recorded their new 12-inch EP at *Dallas Sound Lab*. All four songs were recorded and mixed digitally on a Sony 3324 24 track and PCM F-1 two track. *Russell Whitaker*, president of DSL, produced the project with *Rusty Smith* and *Ron Cote* engineering. *Richard Mullen* produced tracks for a new album by *Omar and the Howlers* at Austin's *Riverside Sound Recording Studio*. Recent activity at *Lone Star Recording* in Austin included the final mixes for an album by *Conni Hancock* of the Supernatural Family Band. The record was co-produced by *Joe Gracey* and legendary blues guitarist *Lonnie Mack*. Engineering was done by Joe Gracey. At *Rivendell Recorders*, Pasadena, Texas work continued on vocals and overdubs for *Harvest*. *Brian Tankersley* engineered the project for producer *Wayne Watson*

## SOUTHERN CALIFORNIA

*Robbie Buchanan* was in *Mama Jo's Recording*, North Hollywood, producing a new cut for MCA Records artist *Melissa Manchester* with *Jack Joseph Puig* at the controls with assistance by *Steve Ford*. Producer *Brown Bannister* com-

pleted mixing the new *Imperials* album for Word Records at Mama Jo's and did some overdubs on the new *Amy Grant* album. Both projects were with Puig engineering with assistant engineer Ford. At *F.M. Music's* 24 track studio in Los Angeles, *Frank Musker* (writer for Chaka Khan, Air Supply, Bette Midler among others) was in producing his own solo album with engineer *Philip Moores*. At *Skip Saylor Recording*, Los Angeles, producer *Dan Siegel* was in recording an album on jazz guitarist *Steve Narahara* for Pausa Records. Skip Saylor engineered and *Tom McCauley* assisted Warner Brothers artist *Los Lobos* were in at *Sunset Sound* mixing their upcoming LP. *T-Bone Burnett* produced with *Larry Hirsch* engineering. *Coke Johnson* assisted. Also, CBS artist *Kenny Loggins* was in mixing for his upcoming LP, Kenny producing with *Humberto Gatica* engineering and *Stephen Shelton* assisting. Recording activity at *Larrabee Sound* in Los Angeles found producers *Jimmy Jam* and *Terry Lewis* in mixing CBS artist *Alexander O'Neil* and MCA artist *Thelma Houston* with engineer *Steve Hodge* assisted by *Fred Howard*; and *Shalamar* tracking with producer *Howard Hewett*, engineer *Dave Rideau* and assistant *Toni Greene*. *Sound Arts Recording Studios* in Los Angeles was utilized by *Greg Guiffria* of the group *Guiffria* to record the keyboard and final overdub phase of his first album for Camel Records. Greg was formerly the keyboard player with Angel. Before their three week tour of Japan, *Weather Report* was in at *Crystal Studios* in Hollywood recording some tracks for their forthcoming album. *Howard Siegel* engineering. A&M artist *Alan Gorrie* finished up his LP at *Conway Recording* in Hollywood. *Jay Gruska* produced. *Mick Guzauski* engineered with assistance from *Rick Clifford*. Capitol Records artists *The Motels* cut tracks for their LP with producer *Richie Zito*. At *Santa Barbara Sound*, *Jack Puig* cut basic tracks for Nashville's *Imperials*, with *Terry Nelson* assisting; and *Kenny Loggins* completed with final overdubs on his upcoming CBS album. In Studio A of *Lion Share Studios* in Los Angeles *Eric Clapton* was in laying tracks for his next Warner Brothers album, produced by *Ted Templeman* and *Lenny Waronker*, engineered by *Lee Herschberg* with *Tom Fouce* assisting

## STUDIO NEWS

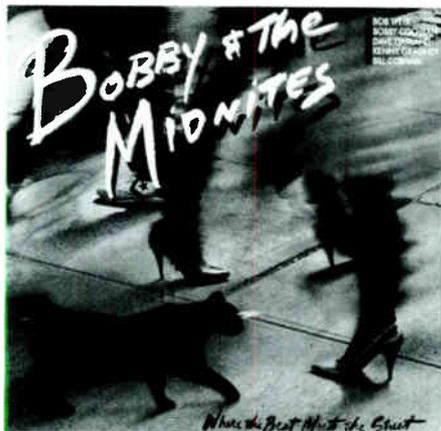
*Workshoppe Recording Studio* of Douglaston, NY has a new studio manager, *Deb Corsha*. Corsha previously managed Beethoven's, a New York Music Club. *Fred Landerl* has joined Steve Rathe's *Murray Street Enterprise* (NYC) as operations manager. Landerl was formerly assistant manager/program director of WHY-FM (the public radio station) in Philadelphia. *Bill Lightner*, vice president of *K Disc Mastering* in Hollywood, California, reports that plans are now being finalized for their new third room, and that engineers *Phil Brown* and *Bobby Hata* (both formerly of Amigo) have been added to the staff to keep up with their growing business. *Sounds Unreel Studios*, a new 24 track recording facility

owned by Memphians *John Hornyak* and *Don Smith*, began operation in mid-April of this year. This is the first new 24 track room built in Memphis in over four years. The design work for what will eventually be a two studio complex was handled by *Phase Audio, Inc.*, a Memphis-based sound contracting firm. *Production One*, Philadelphia's newest full-service audio production house, celebrated its grand opening in mid-October. Located at 610 S. 2nd Street just off Head House Square, *Production One* offers full audio production services, specializing in jingle production and custom TV and radio commercials. *Northeastern Digital Recording* of Shrewsbury, Massachusetts recently became the first fully professional two track digital recording and editing facility in New England. In October 1984 the company began offering a variety of services: digital two track mix-down, editing and mastering for phonograph record, Compact Disc, or cassette; digital recording for video postproduction and digital two track live and remote recording.

*Sheffield Audio-Video Productions* of Phoenix, Maryland, has just installed a new Solid State Logic SL4000 E automated console with primary studio computer and total recall computer.

*Roar Productions*, of Columbia, Maryland, has purchased a new 6-foot-2 Toyo grand piano. This beautiful instrument is available for all music sessions, and will be the centerpiece of the new wood floor in studio A. Other additions include two Symetrix 522 multi-purpose processors, and additional Sennheiser 421 and 441 microphones. *Compact Video* of Eurbank, California, one of the West Coast's largest television and film postproduction facilities, recently took delivery of a Neve 5116 console with Necam 96 automation. Newly installed equipment at *John Wagner Studios* in Albuquerque, New Mexico includes the following: Adams-Smith System 2600 SMPTE synchronizer, 3/4-inch JVC CR8250U stereo VCR with 3rd time code channel, Panasonic VHS stereo VCR, Sony/MCI 1-inch VTR for layback, network stereo sound effects library. Austin-based *Reelsound's* owner *Malcolm Harper* announced the relocating of their east coast remote audio bus to Nashville. "The Bus," which is a 1948 Flexible, comes to Nashville with a long list of credits: two gold and one platinum record awards with album and video jobs for Ted Nugent, Genesis, Journey, ZZ Top, Dwight Twilley, John Waite, The Gap Band, Willie Nelson, Alabama, Oak Ridge Boys and others. *G.E.M. Recordings* has opened central South Carolina's first 24 track recording facility located at 2825 Millwood Avenue in Columbia, South Carolina (803-256-3413). G.E.M. has operated since 1981 as an eight track studio. The studio has installed a new MCI/Sony JH 636 console, and outboard gear to complement their existing equipment including a Lexicon 224. *Morrisound Recording* in Tampa, Florida has installed a new 32 channel automated Sound Workshop Series 34 mixing board with high resolution meters. Morrisound also added a new pair of JREI 813B monitors. *ASC Video Corporation*, and *Mark Chatinsky*, have moved to new and larger quarters at: 3815 Burbank Boulevard, Burbank, CA 91505. Their new phone number is (818) 843-7004.

Send press releases to: *Sessions/Studio News, Mix*, 2608 Ninth St., Berkeley, CA 94710.



**BOBBY & THE MIDNITES**  
**Where the Beat Meets the Street**  
 Columbia BFC 39276

Produced by Jeffrey Baxter; Engineered by Larold Rebhun; Assistant engineers John Boghossian, Brian Leshon, Mark Wilczak, David Ferguson; Addition overdub engineer Bobby Cochran; Recorded at Cherokee Recording Studios, Casual Sound, Tam High Recording, Cochran's Studio B; Mastered at Future Disc.

Although Jeff Baxter is listed as the producer of *Where the Beat Meets the Street*, it could be said that the record was co-produced by Bobby & the Midnites. With Baxter and the various members of the band charging off to other gigs around the globe during the making of the album, a lot of work was done in the home studios of guitarists Bobby Cochran and Bob Weir in addition to Baxter's place, Casual Sound. It is due to the engineering skills of Larold Rebhun and the open-minded collaboration between band and producer—and among the band members—that *Where the Beat Meets the Street* has a consistent sound and feeling.

Pre-production began with everyone presenting songs of their own and then going through a pile of cassettes from outside songwriters, according to guitarist Bobby Cochran. "We picked out about eight cover songs, and during the rehearsals we narrowed it down to five that we liked." That rehearsal period, at Baxter's place, also yielded a complete set of eight track demos.

The basic tracks were cut at Cherokee Recording Studios, with Larold Rebhun—who had also done the eight tracks—at the board. "It's Mr. Baxter's favorite place," notes keyboard and sax man Dave Garland. The atmosphere was sufficiently casual in that two-week period, Garland adds, that "People would walk into the studio and say, 'I'm

not working today—you guys want any help?' That happened with Jim Ehinger, who plays piano with Billy and the Beaters, and with Steve Cropper, and the Stray Cats." (The en-masse live take of "Rock in the '80s," which included the Midnites plus all the aforementioned players, was reported in the April '84 issue of *Mix*.)

Once the basics were completed, drummer Billy Cobham returned to his home in Switzerland. Weir charged off to work with the Grateful Dead, bassist Kenny Gradney hit the road with Mick Fleetwood's Zoo, etc. Slave tapes were made for Weir's, Cochran's and Baxter's home studios. "They did a mix onto eight tracks of another 24 track," says Cochran [Weir's Stephens deck was brought to LA for the transfer]. "Then we made a six track mix onto 16 track for my place, and a stereo mix onto eight track for Baxter's—all with click track and SMPTE code so we could dump tracks back onto the master reel or sync them up when we mixed."

"Jeff liked some of the sounds I had on my demos, so we knew I'd probably lay the acoustic guitars down at my place ["Studio B"] on my own," says Cochran. "When Jeff went to Australia to do some other work, Dave and I went hog wild at my place and cut everything that we thought needed to be on the album that we had time to record. We did some background vocals, a couple of lead vocals, some lead guitars, saxes and synthesizers.

"Then when Jeff came back, he listened—and he liked about 90 percent

of it. What he didn't like, we redid," Cochran adds.

At one point Cochran and Garland joined Baxter and Rebhun at Weir's "Tam High Recording" in northern California, where work was done on lead and background vocals and some saxophone parts. Baxter's house—dubbed "Casual Sound" quite appropriately, since the mixer and recorder are on the floor and patching is done "digitally" (with the fingers, that is)—was the scene of further overdubs, including the background vocals by Sherlie Mathews, Kathie Pinto and Paulette Brown.

Not all the recording situations were to everyone's liking, however. Baxter's house turned out to be a little too casual from time to time: "I remember doing a saxophone overdub in the living room, starting to get into it and looking out the window and seeing the gardener staring at me through the glass," says Garland. "Then when he got bored watching us, he'd fire up his power edger and we'd have to shut down. It was a little frustrating . . ."

Before mixdown began, everybody listened to everything and decisions were made as to what should be kept. Some things may have gotten lost in the confusion of formats and the multitude of master reels, but Cochran maintains that "less stuff got away than if we'd just had two 24 tracks. Ideas were put on those tapes that wouldn't ordinarily have been kept, but because we had more tracks available we could keep going for that *one more take*."

"We knew we had a vocal on 'I

*Recording at Tam High: (left to right) Jeff Baxter, Bob Weir, Larold Rebhun.*



PHOTO: DAVID GAINS

Want to Live In America' that we could use, but I wasn't really happy with it," Cochran explains. "So while Jeff was in Australia I laid down a new vocal on my 16 track. That turned out to be better than the other ones."

Mixing presented some interesting challenges. "We lost the SMPTE code on 'Rock in the '80s' about halfway through the song," Cochran recalls. "The tune would go apeshit in the middle and start sounding like we had two of everything. Larold crammed a new time code track at really high level using a 24 track on the 16 track tape so it didn't completely wipe out the old one—and he was able to sync it up again."

In another instance, Rebhun took the synthesizer track from one of the demo tapes and transferred it to the master without benefit of time code. "Baxter's synthesizer was used for the 16th-note line on 'Ain't That Peculiar,'" Cochran explains. "When we wanted to fix a couple of mistakes, the synth had been stolen. So Larold copied the track from the demo onto a two track at 30 ips, then he played the master and started the two track when he wanted the part to come in."

No two tape machines ever run perfectly in sync, of course. "That's where the magic comes in," says Cochran. "He just played it until it got out of



PHOTO: DAVID GANS

(Left to right) Bobby Cochran, Dave Garland and visitor Joe Crowley look on as Larold Rebhun makes an adjustment.

sync, shut it off, lined it up again and recorded some more of it. He was able to take all the good parts we needed and just wind them in."

There were times during the distributed-processing portion of the production when various band members would return from their other gigs

and find that shocking new developments had taken place in their absence. But reason and professionalism prevailed. "We all worked hard on the album," says Garland in conclusion. "We all did the best we could, and we hope people enjoy it."

—David Gans

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**ELTON JOHN**  
**Live in Central Park, New York**  
 VCL/Media Home Entertainment  
 VL 9003

Directed by Mike Mansfield; Produced by  
 Danny O'Donovan; 59 minutes.

Elton John's 15-year solo career has included an unholy number of critical and popular ups and downs brought about by the war between the talented composer/performer and the obnoxious music-hall screamer within him. All too often the lame lamé half has won out over his demonstrably better instincts.

*Live in Central Park*, recorded in September of 1980, shows John at one of his low points, well before the revitalized and revitalizing LPs *Too Low for Zero* and *Breaking Hearts*. The song selection reflects his weakest hits, including "Bennie and the Jets" (featuring a ridiculous "piano solo" that utilizes none of the man's considerable keyboard skill), "Someone Saved My Life Tonight," "Sorry Seems to Be the Hardest Word," and "Philadelphia Freedom," plus non-hits "Little Jeannie" and "Get Up and Dance." Respectable if uninspired readings of "Goodbye Yellow Brick Road" and John Lennon's "Imagine" round out the tape.

According to the liner notes, *Live in Central Park* was taped using nine cameras, before a non-paying audience of 400,000 people. It's interesting that with all those cameras director Mansfield couldn't find enough of interest onstage to keep from cutting to the audience an unreasonable number of times. And the spectators shown don't seem terribly excited by the sounds coming off the stage—nor, for that matter, do the band members.

Those who remember the great music Elton John made in his early years, and those who are captivated by his recent work, will be disappointed by the clown in *Live in Central Park*. Those who were drawn to him in his garish period will find the visual wattage insufficient (even though the last of his three costumes is a Donald Duck outfit!). With a full-length conceptual video (*Visions*), a three-song Video 45 and *To Russia With Elton* available there is much more satisfactory video than *Live in Central Park* for Elton fans of all stripes.

—D.G.

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# INTERACTIVE

by Carole Berkson

## Team Work

Last issue we examined some of the basics of interactive video. We continue that discussion by looking into the coalition of people from different disciplines required for most interactive video projects and the steps typically needed to complete a project.

**Executive producer:** The executive producer directs the analysis of project objectives and manages a team of professionals in content/instructional design, media production and computer systems design.

**Content specialist/instructional designer:** The content specialist/instructional designer must determine the specific information content as well as the hierarchy and flow of information.

**Writers:** A combination of written documents is required to access the array of interactive video capabilities. An interactive video project may employ several writers, each with specialized talents for one type of writing. Once the project's content is translated into flowchart format (the project map), dialogues between the system and the user must be written to account for every possible interaction. Tests for educational achievement give the user feedback and measure the training effectiveness of the system. Surveys may be written to measure consumer perception of product as well as consumer rating of the interactive demonstration system. Video scripts for on-screen role-playing and other demonstrations are the blueprints for video production.

**Computer designer/program-**

**mer—Disk design & control:** Comprehensive flowcharts and program code are the computer system design and programming maps. The computer designer/programmer may work with the content specialist/instructional designer, the writers or both to validate the flowchart. Then, based on the flowchart, equipment control will be designed and program code will be written (or an authoring language or system can be used) to instruct the equipment about how to handle end-user input, branching (instructions to move from one sequence in a program to another), control of video screen audio/visuals, etc.

**Media producers:** Audio and video producers and directors produce live action sequences, and, together with editors, combine the animation and stills produced by artists and photographers.

## Interactive Video Production TEAMWORK: PEOPLE AND THE PROCESS

An interactive video project is produced through the following stages:

**Analysis & Design** ▶ **Pre-Production** ▶ **Post-Production/ Pre-Mastering** ▶ **Mastering** ▶ **Interactive Video Program Implementation**

### Analysis

Overall project direction begins with responsibility for analysis and determination of the project objectives. Who is the target audience (end-users)? How will distribution be made and how long a shelf life is expected? What are the hardware and software requirements, and how will the user workstation be configured? How will performance be measured?

### Design

The most effective interactive systems create the experience of a smooth dialogue and personalized re-

sponses in the interchange between system and user. The more simple the system appears to the user, the more complex is the design.

Storyboards and script are drafted, reviewed and revised to communicate information, change attitudes and behaviors, teach performance skills, and evaluate end-user performance. A flowchart is designed to map the interactivity and branching among live action, animation, video text frames, graphics and photographic stills. The computer program is designed according to the script and storyboards.

### Pre-Production

Once the script is approved, the video producer and director schedule production, cast talent and select music. Based on the interactivity patterns defined by the final script, the layout of the video disk geography is planned. Disk geography positions final edited footage in order to take full advantage of interactive capabilities; the video disk must be mapped geographically such that each element's position on the disk allows the shortest possible response time.

## Production

Art, photographs, print materials, video text frames and animation are produced, reviewed and approved. At the same time, location and studio live action sequences are shot. The two audio tracks can be used for stereo but often are used for separate applications (e.g., different languages or two types of instructional materials or music); two voiceover or music soundtracks may be produced. Audio and video are then reviewed and approved. The computer programming is written. If the video disk player is used as the computer manager for all media elements, then the programming will be tested and debugged.

## Post-Production/Pre-Mastering

Editors make an off-line preliminary edit tape and then edit and/or order all media elements on 1-inch master videotape. In order to be mastered, all materials must be assembled in the proper order for disk mastering and must be transferred to 1-inch type C composite or 3/4-inch professional NTSC 525-line, 60 Hz video tape. Mastering companies stress the noticeably better disk image resolution from 1-inch premaster tapes. The mastering facility produces a disk-coded master tape which is reviewed and approved. Frame numbers from the master tape are entered in the computer program.

## Mastering/Packaging/Implementation

Within a few days, a proof disk can be reviewed for approval. Completed video disks, including packaging, may be received between one day and a few weeks later, depending upon the quantity to be replicated. The computer programming can be debugged when the program runs on a computer external to the video disk player. Finally, the combined hardware/software video disk system can be implemented.

## Producer Beware!

The promise of interactive technology is clear; entertainment, education, marketing, data storage—the possibilities are just being tapped. However, as with any new medium, producers' conceptual orientation will require some adjustment. Computers, programming languages and research on interactive production techniques will all require investments of—yes, time and money. Interactive video production is like producing an audio tape, video tape, record and book all in one; the planning and scripting stages are far more complex and time-intensive with a longer turnaround time than for linear programming. The opportunities are expanding for both producers and media production facilities to assist a whole new group of clients to take full advantage of the medium's unparalleled performance potential. ■



Tom Hannaford, Dixieland Productions, Atlanta, GA

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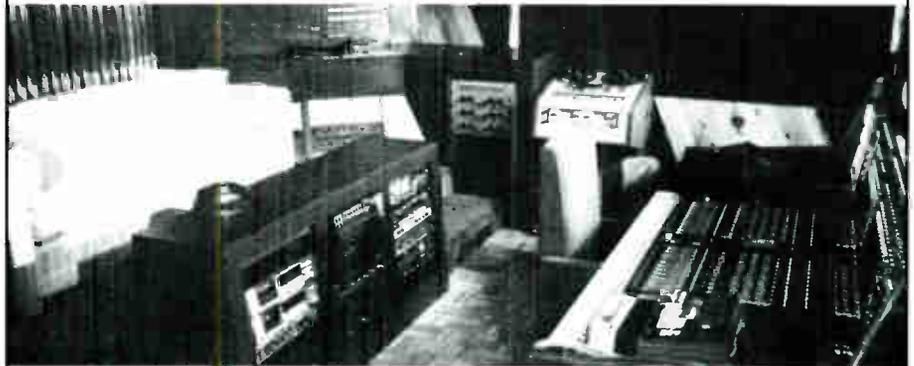


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# VIDEO NEWS

by Mia Amato

## TV TRIVIA/ A STUDIO REPORT

Future episodes of "Lifestyles of the Rich and Famous" will be shot entirely in the Betacam format. The series, syndicated to 150 stations, is being edited directly from the half-inch component format to one-inch Type C at *Video-works* in New York. *Russian Hill Recording* of San Francisco has been handling all the ADR work for NBC's series "Partners in Crime;" audio post supervisor *Scott Stambler* has the task of putting words into the mouths of *Loni Anderson* and *Lynda Carter*. No detective work needed to discover who created opening titles for "The Bill Cosby Show" . . . the still-frame animations are practically a trademark of L.A.'s *Homer & Associates*. The syndicated show, "This Week's Music" is currently being taped at *MTI Television City* in Manhattan, coordinated through *Shirley Abraham*. *Reeves Teletape* provided mobile fax and post for the PBS tribute to *Glenn Miller* airing this month. Produced by *Bill Siegler*, the dance concert features *Tex Beneke*, *Marion Hutton*, *Johnny Desmond* of the original Glenn Miller Band.

## IN THE DANCE VIDEO ZONE

*Chris Russo* considers himself a music fan, and a champion of progressive sounds. And maybe he is. As a founder of *Telegenics*, he's been able to give independent label artists a leg up, into the spotlight, with his nationwide club video pool.

Each month *Telegenics* ships to 500 clubs two hour compilations of dance-oriented videos—a broad spectrum of R&B, rap, juju, not likely to be seen on television.

Like other pools, *Telegenics* carries clips from major labels, but it's almost as if the Brooklyn-based company had a mission in life to preach a regional sound with clips from *Streetwise*, *Tommy Boy* and other black independents. Along with *Wham!* and *Scritti Politti*, its reels accommodate *King Sunny Ade*, *Soul Sonic Force*, *Tavares*, even *Eartha Kitt*.

Perhaps the company's most

important contribution to the video clip industry has been an outlet for black artists. "We were the first pool to do anything with bebop music, no one else would touch it," Russo said. "I think we helped it happen as a national phenomenon." Bebop, he adds, has since been musically integrated into progressive synth-pop "with other black sounds that are the basis for most dance music. I admit I'm starting to get a little tired of the rap stuff."

Russo foresees the end of break-dance clips, a problem for someone providing videos to clubs in regions not yet jaded by the dance novelty of teens spinning on their heads. "They want more of it," he explains, "but I think it will peak there too, and far quicker, as fads usually do. As far as New York is concerned, breakdancing here is a statement. They've been doing it in the Bronx for years, and I'm sure it has even an earlier base in street-dancing, folk-dancing maybe even an appropriate turn. Long after they've stopped doing it in L.A., the kids will still be doing it here, and it will take on new significance, and new forms."

Russo also likes to inject political consciousness on the dance floor, with clips like "Rap Master Ronnie," a Reagan satire composed by *Elizabeth Swados* and "Doonesbury's" *Gary Trudeau*, and by presenting the controversial "Two Tribes," by *Frankie Goes to Hollywood* in its unexpurgated form.

"The first time I saw that clip the hair on the back of my neck stood up," he recalls. "It still gives me chills."

*Telegenics* began its club pool in April of 1983 with three partners. Russo has a background in band promotion. Filmmaker *Tom Delessio* worked at MTV as a technical director. *Stephanie Shephard* has been a reporter for *Dance Music Report*.

"Tom does all the technical stuff, supervising editing and dubbing," Russo explained, "and *Stephanie* knows the music business the best. It took a lot of work to get it started, because *Rock-america* really had it all sewn up. We had to prove ourselves, and we worked our asses off, and *RCA* came in, and the independents."

Today the service offers two dance compilations and a pop reel covering established rock acts. Ambient footage is also available. There have

been special club promotions for *Nina Hagen* and *Culture Club*. *Delessio* and *Russo* have also produced video clips for *The Flirts* and for *Rhett Hughes*, ("We'd like to get back into that business," *Russo* adds) and now generate a monthly newsletter filled with gossip and technical tips for club VJs.

Integral to the promotion concept is a tracking service, now computerized for their record company clients. "As part of the contract, clubs that subscribe and receive our tapes must supply us with feedback, including a top ten," *Russo* explains.

"The most important question is whether they've programmed the record before the video," he stresses. "In a great many cases you find the club programmers never heard of a tune until they saw it in video . . . I'd go as far as to say that 30 or 40 percent of the time they're playing the video before the record." *Russo* theorized that video offerings have more clout than record pools today because they are more expensive per cut, and so perhaps perceived as more valuable. "And video makes it more interesting," he adds. "I think a lot of records get played because of their videos."

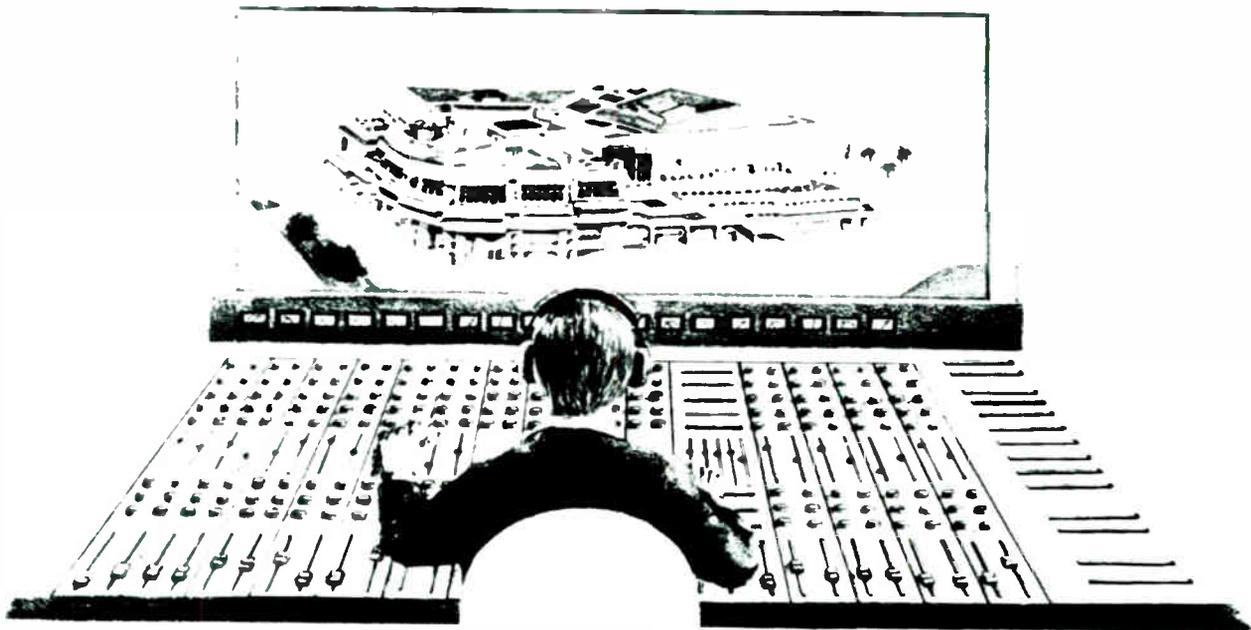
Editing of masters and duplication are done at *VCA Teletronics* and its subsidiary, *S/T Videocassette*. "S/T has come a long way in working with us to maintain high quality in our audio," *Russo* says. They are also working with *Panasonic* to alleviate a problem many have discovered: in VHS hi-fi, a problem of longitudinal tracking which often makes audio designed for VHS hi-fi sound inferior when played back on standard VHS decks.

Audio for the compilation tapes is laid down separately at *Regent Recording*. "We use Dolby A noise reduction, we do a lot of audio sweetening and a certain amount of retracking," *Russo* explains. "Of course the problem still remains that you have to equalize for the individual club room. On all our tapes, we put an audio test, and we give them 30 seconds of pink noise." He recommends that clubs look into the dbx 2000 digital equalizer if they want to maintain a good tape sound with a minimum of adjustment between tunes.

The one cloud in *Telegenics*'s future is pay-for-play, and *Russo* says if they have to, they will pay to acquire certain clips to get them on their reels. "I don't say it will kill the video business, but it will certainly cramp its style," he adds. "Executives are starting to look to the clubs as a money making machine, and not as a promotional tool. I think they may have the audacity to ask clubs to pay for clip play. Of course that would destroy the whole concept. The thrust is in promotion and record sales, and that's what sets the pools apart from broadcast." ■

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# HIGH-DEFINITION AND DIGITAL TV

## U · P · D · A · T · E

by Lou CasaBianca

The history of television technology will record that these are revolutionary times. Advances in satellites, cable, digital, and very large scale integrated circuits (VLSI) are opening up a whole new era of global and personal communications. Laser video, compact audio disks and stereo broadcast television are bringing audiophile sound quality to feature films and home video. Over the next 10 years we will participate in the implementation of a new technology which will generate a listening and viewing experience that will be a whole generation better than the television of today.

The new standards which will influence television as it moves into the 21st century are being formulated in Washington D.C. by the Advanced Television Standards Committee (ATSC). The committee, which in effect will be replacing the 30-year-old NTSC standards, will be making delicate and controversial decisions about which technologies will develop the fastest, be the most cost effective and still be functional for the 1990s.

The major manufacturers and broadcasters have been forced to make decisions based upon knowledge that is literally changing from month to month. Regardless of which approach is taken, the new standards must also maintain a high degree of compatibility with the existing television system and with the sets in people's homes.

### DIGITAL VIDEO RECORDING

Digital TV will eliminate the current set of mixed international standards of NTSC, PAL and SECAM and establish a worldwide digital television standard, which will be convertible to the older formats as needed. There are still many variables and unknowns in the develop-

ment of the DVTR (digital videotape recorder) and critical disagreements among manufacturers.

### CONTROVERSY

Among the questions under consideration are two issues that dominate the digital debate. First is setting the relationship between the cost of a single playback channel and its bit rate. The other is determining the narrowest trackwidth that will provide reliable operation under typical variations in temperature, humidity and vibration. The following is a review of the critical factors affecting the development of digital and high definition TV.

### CROSSTALK

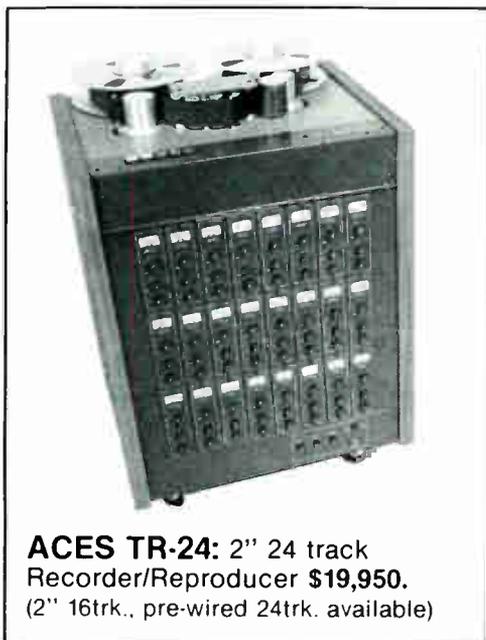
Crosstalk will effect limits in both head construction (e.g., head stacks or clusters vs. spaced heads) or in the track format (such as guard-band and multi-azimuth systems). Crosstalk from one record head to another is a serious problem because it is amplified by the record process. Record-to-playback crosstalk limits "confidence playback" quality. Crosstalk from a recorded track to an adjacent head decreases exponentially both with spacing and spatial frequency. Because crosstalk waveforms tend to be sinusoidal, as contrasted to noise, for equal values crosstalk produces less worsening of bit error rate (BER). Crosstalk levels may exceed noise levels by 5 dB or more with very little effect.

### CONTINUOUS VS. DISCONTINUOUS RECORDING

Another area under consideration are proposals for discontinuous vs. continuous recording. The trade-off cost for discontinuous recording must be evaluated not only in terms of money, but in space and complexity. It requires

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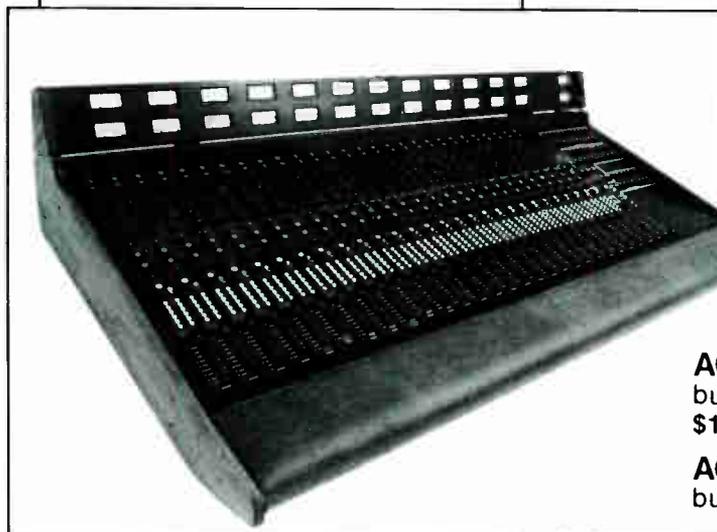


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more memory and by digital TV standards it is also slow, requiring as many as 32 parallel stores. Another disadvantage of discontinuous recording is that it increases the bit rate to be recorded. This generally increases the number of signal channels, both record and playback. The memory and the channel costs may be reasonable in a studio DVTR, but have serious implications in the smaller, portable machines. Other areas of controversial decision making include multiple vs. single head configurations, picture-in-shuttle problems, and drum rotation rates in 50 and 60 Hz systems.

## AUDIO SAMPLING RATE

It is generally agreed that audio signals will be recorded either within the video track or on an extension of it. The optimum solution appears to be the use of common sampling rate for 50 and 60 Hz systems and the recording of an equal number of samples on each recorded track. The downside is that this will require a sampling rate of 100,000 per second. Machines will have four channels of digital audio at 16 bit/sample rate. Other parts of the studio system and the transmission circuits are much more sensitive to bit rate, and will require the use of a lower sampling rate. What is beginning to be apparent is the increasing acceptance of digital Compact Disc and the evolution of consumer standards interfacing with professional digital audio production.

## NEW STANDARDS TIMETABLE

High Definition Video has been under development for more than 10 years. In addition to higher resolution, it will provide improved color rendition and stereo sound. Its wide aspect ratio is comparable to 35mm film projection. The merging of film and videotape in motion-picture production, will bring advances in flexibility and efficiency in movie production and distribution. Film producers such as Francis Coppola, George Lucas and Glenn Larson are advocates of what is being called electronic cinema. One of the by-products of video for cinema production is the expansion of the range and scope of special effects. The present day systems are NTSC with 525 lines, PAL and SECAM at 625 lines; in each case interlaced with a 4:3 aspect ratio. Higher definition TV will probably be put in place as part of a process that is likely to go through several distinct evolutionary stages.

## IMPROVED TV

In the first phase the signal received at home will remain essentially the same for the short-term future, 1984-1987. Special circuitry in the receiver processes the signal to improve image quality. The circuitry could range from comb filters through digital processing

to remove noise and impairments. Another option is the use of full framestore devices in each receiver which will provide major improvements in quality and apparent resolution.

## ENHANCED TV

In the medium-term future, 1988-1997, we may have "progressively scanned" video with the same aspect ratio as present day TV. At this stage, the broadcast signal would be supplemented or changed significantly. A standard NTSC-compatible television channel would be imbedded within it. Combined with signal processing techniques in the receiver, extra information in the signal will provide a wider picture which could have twice the resolution of the current NTSC standard, without a larger increase in the number of scanning lines. By making maximum use of digital signal processing particularly for progressive scanning, Enhanced TV will be able to provide a vastly improved picture. This is the technology which could provide the basis for a continuing TV boom through the 1990s.

## HIGH DEFINITION TV

In the long term future, say from 1998 onwards, we will see the implementation of Ultimate TV or HDTV. It will use at least double the number of lines in the 525-line NTSC standard. Pioneered by NHK Japan and Sony, and first demonstrated in the early 1970s, this approach increases vertical resolution by increasing the number of lines to 1125. A wider screen aspect ratio and increased horizontal resolution will require that the transmitted signal have five times the standard NTSC bandwidth. While this system appears to be likely to have a role in studio production and movie distribution, the consensus is that a more efficient approach must be found for HDTV broadcast.

## BROADCASTING HIGH DEFINITION TV

Proposals for Direct Broadcast Satellite (DBS) will eventually bring High Definition Television to the U.S. Work is proceeding on the assumption that HDTV bandwidth will require no more than two channels of standard definition TV, and that the signal will be compatible with standard definition sets. For DBS the, "time multiplexed component" (TMC) format for the broadcast color video signal is now generally advocated. The TMC format separates the color and luminance components of the signal by transmitting them at different times, and not simultaneously on different frequencies as is the case with current standards. The advantages are the elimination of cross-color and cross-luminance, and an improved signal-to-noise ratio. The question still remains how higher resolu-

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tion will be achieved—by enhanced signal processing in the receiver, or by transmitting more scan lines.

One solution proposed by CBS dealing with the problem of near-term obsolescence is the development of a compatible two-channel system. One channel would handle the conventional 525-line, 4:3 aspect ratio NTSC signal; the other augmentation channel would carry a wider, 5:3 aspect ratio image of the same picture. The two channels would be interlaced in specially-equipped receivers producing an image of 1050 scanning lines in the 4:3 aspect ratio central region, and 525 lines at the edges. The main advantage of the CBS system is that it provides an NTSC compatible signal and a form of high definition without the need for expensive digital circuitry, such as a frame-store. However, the system would push present satellite technology to its limits, requiring more powerful satellite signals, larger rooftop antennas, and low-noise electronics.

Other proposals, by Philips and others, assume that it will be feasible to provide a framestore in the receiver, as a way to combine channels and provide higher resolution. The framestore also provides a progressively scanned image, achieved by reading the whole frame into digital memory and scanning it out in line sequence. Requiring less bandwidth, this approach will make it feasible to deliver the image within the 9 MHz bandwidth of two standard cable channels. If the projected cost reduction in framestore devices materializes as expected, the higher resolution and additional features available with the framestore approach make it look very strong.

#### DTV/DIGITAL TV

A hybrid of TV and computer technologies, digital sets will enable viewers to double their NTSC TV resolution of 525 lines to 1050 line HDTV image. Digital sets can memorize information, such features, as freeze frame, split screen and zoom effects which will be controlled by the viewer. While the selection of worldwide HDTV/digital TV is an essential first step, there are still many other factors that must be defined. These decisions will effect not only the television industry but also the future of sound broadcasting, professional audio production and consumer electronics.

For more in-depth information, you may want to refer to Tim Johnson's "Strategies for Higher-Definition Television," published in this country by Knowledge Industry Publications, White Plains, New York, and "Digital Video Recording Format Considerations Including Audio," by C.E. Anderson and M.O. Felix available from Ampex Corporation and "High Definition Video Systems" available from Sony Corporation in Park Ridge, New Jersey. ■

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# The most significant word in the industry.

by Neal Weinstock



INTERFACE

Going for the golden goal: preproduction financing for music videos. The obvious sources: record companies; clubs and club distributors; one's own pocket. A little less obvious: home video distributors. Subtle sources: production houses; feature productions and teleproductions and advertising agencies with a need for music segments; the tax write-off game; foreign rights. And a thousand other spaces to land on in this never-bored game with no rules. Can the canny producer put together several financing sources where one obvious source either can't provide enough, or where too much is never enough? It's being done all the time in films, dear chaps. That's what festivals and conferences are for. And this is how music videos are beginning to begin.

Scene: A beige Hilton. A journalist taking notes at a grand piano outside "The Most Significant Event in the Industry," for which a few hundred young students of movies, TV and rock and roll have each paid a few hundred dollars to a few producers who tell them how hard it is to enter their line of work. Down the hall is the eighth annual meeting of the US-USSR Friendship and Trade Commission. The journalist observes the Russians acutely, attempting to reach for a kernel of understanding about them, just as he must separate the grain of news from so many future newsmakers at The Most Significant Etc. Russians all walk as if just emerged from a men's room, he concludes, without noticing that his piano's raised lid hides the men's room door from his view. Down another hallway, International Business Machines is introducing a new child to a few friends

for a few days, accepting congratulations and requests, giving instruction and wonderful free food. A journalist could starve at The Most Signifi Etc.

Irena Uspensky is in even greater danger. A small brunette who smiles at passers by from behind a pulpit marked by the name of a video studio, she may just pass out from terminal boredom and hunger. She has been given a lunch break by her employers, but has not been given pay; her employers recognize the value she perceives in the opportunity they are providing her. And only coffee seems to be given away at The Most Sig Etc. Irena never notices the booth of the New York City Dept. of Welfare for Motion Picture Producers, distributing free apples, until it is too late: all taken by her counterparts at other booths.

A journalist observes her staggering barefoot, working heels in hand, to the water fountain near the men's room near the baby grand. He asks her name; the response confirms another expectation about the Russians—they all dress like they are from a far neighborhood of Brooklyn. Moved by cross-cultural self-interest, he offers her lunch. IBM is giving it away, anyway. So might Comrade Irena.

On the way to infiltrate the IBM crowd (who look like they are all from Westchester or Connecticut), they bump into an open-shirted man who looks like he is from Queens. He is Mersh Greenberg of Silvercup Studios.

Mersh: "We're getting so much music video business—I never would have believed it. And they're incredible: it's not the movie business, you know, it's the record business. The stars, the groups control everything. They don't care what the budget shoots up to. They'll shoot something over 100 times—there's no conception of business sense." Even so, Mersh goes on to say,

Silvercup is taking part in some innovative financing deals for music videos. "Tax write-offs," he says. "You know record companies write all of this off as promotion. Producers can, too; and they can sell the write-off to a corporation that can use it." And that's all Mersh wants to be quoted on that subject.

Besides, conversation is interrupted by a common occurrence at confabs. Enter, Mr. Persistent Vaguely-Known Best-Friend in the World. He shakes down an introduction to Mersh, proceeds to try to sell him his World's Greatest Product for Filmmakers, and Mersh is the most gracious of interruptees. Exeunt all. Over lunch a journalist's curiosity proves the death of exotic romance, and Irena is discovered to be ambitiously promoting a video in which she flexes to ditties in the public domain.

Irena: "It's getting to be too many industry conferences, I'm getting confused. All seem to have the same themes: money, blind ambition, fame and fandom. Conferences seemed to me at first to be the place to be to soak information in. So they are, but the information is not so much goal-oriented as gossip about people who wrongly think they are goal oriented; they enjoy being part of the scene much more than actually doing anything. I try to pin these people down on actually doing anything and it's not possible."

Scene: A movie palace. A dais before the silver screen. Behind water pitchers sit independent filmmakers: Amos Poe, director of *Alphabet City*; Susan Seidelman, producer/director, *Smithereens*; Slava Tsukerman, director of *Liquid Sky*; Tim Ney, director of the Independent Feature Project, and others of equal but extraneous import.

Parenthetical note: If an independent of limited or unlimited means planning any motion picture production of any kind, call or see Tim Ney in New York, or get the IFFP's most helpful advice book. Avoiding the IFFP will be perilous to your health.

Slava Tsukerman: "A script must be written to the available budget. One investor had \$500,000, so we were able to make *Liquid Sky*. If he had more, or less, I would have written something else."

Memorable anecdotes like: Susan Seidelman all out of money for an answer print two months 'til Cannes; still she can afford breakfast at the Parker-Meridien, meets two film producers at the next table who overhear her woes and invest in the otherwise blasted *Smithereens*. "The moral is always eat breakfast at the Parker-Meridien," she says.

Overflow crowd of the dreamy-eyed ponders its own capabilities. Nobody takes notes. Same crowd as at that music video panel in Chicago, which spawned words such as, no, well, nothing memorable. Irena U. was there,

# Back Issues

- 1982 January, Northwest Listings.** Mixing Consoles Grateful Dead's Studio Lindsey Buckingham.
- 1982 February, Southeast Listings.** Digital Synthesizers Dave Edmunds. John Meyer
- 1982 March, Northeast Listings.** Car's Studio. Microphones Phil Ramone.
- 1982 April, Video Focus.** A/V Studio Listings. Video Music Satellite Mike Nesmith. Legal Issues in Video John Boylan
- 1982 May, Southwest Studios.** Quarterflash Charlie Pride's Studio. Digital Recording. Fantasia Digital Soundtrack
- 1982 June, Concert Sound & Remote Recording.** Drum Machines, Pt. 2. Keyboard Artists Forum Video Legal Issues Bones Howe.
- 1982 July, Studio Design.** Listings of Designers, Suppliers Power Amp Report. Quincy Jones Willie Nelson's Studio
- 1982 August, 5th Anniv. Issue.** History of Recording Asia. Oscar Peterson. Bill Porter Beatles' Console
- 1982 September, S. Cal. Listings.** Film Sound The Dregs Video Synchronizer Survey Digital Discussions, I Supertramp Studio.
- 1982 October, N. Central Listings.** Studio Monitors John Cougar Digital Discussions, II.
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- 1982 December — SOLD OUT**
- 1983 January, Northwest Listings.** Multi-track Analog Tape Recorders Record Restoration Michael Palin Narada Michael Walden
- 1983 February — SOLD OUT**
- 1983 March, Southeast Studios.** Echo, Reverb & Delay, I Buddy Buie Electronic Religion Phil Dunne
- 1983 April, Music Video.** Video Production, Post Production Listings Missing Persons Echo, Reverb & Delay, II Toto
- 1983 May, Northeast Listings.** Donald Fagen, Mixing Console Forum Echo, Reverb & Delay, III. Harry Nilsson Randy Newman
- 1983 June, Sound Reinforcement/Remote Recording.** Showco. Frank Zappa Mixing Console Forum, II Papa John Creach
- 1983 July, Southwest Listings/Recording School Listings.** Audio Special Effects Josef Zawinul Education Update
- 1983 August, Studio Design, Designers & Suppliers Listings.** Bill Putnam Phil Collins. Bee Gees' Studio
- 1983 September — SOLD OUT**
- 1983 October, Fall AES New Products.** Video Production Supplement Women in Audio Joe Jackson Interview
- 1983 November, N. Central Listings.** Compressors/Limiters Canadian Rock Herbie Hancock Vocal Miking
- 1983 December, Tape to Disk.** Stereo Mastering Recorders Audiooptics Godley and Creme Stan Freberg.
- 1984 January, Northwest Listings.** Reference Monitors Video Hardware/Software Huey Lewis Michael Sembello
- 1984 February, Independent Engineers & Producers.** NAAM Show Ronnie Lane. Keyboard Artists Forum. Allan Holdsworth.
- 1984 March, Southeast Studios.** Microphone Special Report. Religious Recording Oak Ridge Boys Sound in Australia
- 1984 April, Video Production & Post-Production.** Video Production Supplement. Time Code Special. Jeff Baxter and Brian Setzer
- 1984 May, Northeast Recording Studios.** Studio Computers NASA Sound Robert Moog. Billy Joel and Jim Boyer Roger Nichols.
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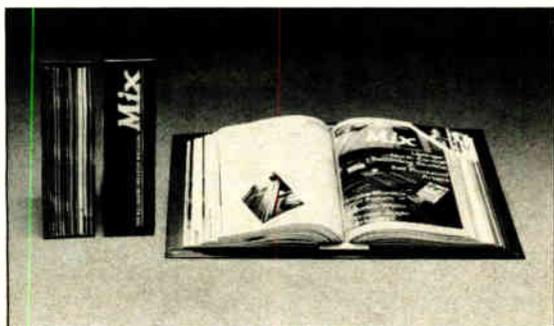
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gauging the connection between what Francis Coppola said ("Somebody should not be able to pay \$50 for my work and then rent it out as many times as they want for the next 10 years,") and the phenomenal home video prices for music tapes announced every day, in *Thriller's* wake. Vestron's near \$2 million for home video rights to old Stones clips. Media Home Entertainment's \$1.3 for Bowie's *Serious Moonlight* and \$500,000 for a *Journey* to the loss column. No, that was August, the very loveliest time for the Nevada desert, video retailers cavorting at the VSDA show. Gets even more confusing to me than to I. Uspensky. Home video prices for music are just establishing themselves; stars, so far, get overpaid, and odd bedfellows Irena and Francis underpaid. What do I. Uspensky and F. F. Coppola have in common? Nobody knows what their product is worth exactly, when it is on videocassette.

This has much to do with the average video retailer refusing not merely to stock anything other than recent movie hits, but refusing even to special-order these things for interested customers. Record stores continue to lag in handling music video, too. So there is a logjam. Obviously, the public wants music videos, and there are plenty being made. Getting rights together is a common problem, but getting past the retail rental block is a bigger one.

Production money is perhaps better defined as expected distribution income. But music home video distribution is an unpredictable, unprofitable mess. Solutions: direct marketing, or marketing tie-ins with other media, or with other video product—like the movies. What do these marketing solutions have to do with producers looking for *pre*production money? "If you can demonstrate how somebody will make money," says Amos Poe, "you stand a better chance of them giving it to you." Poe says his next film (last was *Alphabet City*, remember) will be partially financed this way. You too can have a *Music Video From Streets of Fire*. Or peddle rights to a video to the ad agency world, to use in commercials, after an appropriate uncommercialized window to give the music a shot at establishing legs. Much abuzz about such strategies between tanning sessions in St. Tropez.

Or was that a beach in Chicago? I get the two places confused. There was a woman in outmoded sort of dress, no shoes, walking along a beach. Sand dunes shifting. She revels in the water particles in the air. Loud noise, camera pulls back to show tractors, plowing just behind her. "Comrade, come back to work!" shouts an employee of the Chicago Park District at Irena. That's right, it was Chicago, not St. Tropez. I get confused. "Cut!" she yells back. "Now let's set up for the backbeat retake." ■

—FROM PAGE 30, WONDERLAND

sweet sounds of success using a computer interface. Alonso designed the interface board which translates the Synclavier's output to a computer-acceptable language, and from there, the computer can make the signal understandable to the DECtalk speech synthesizer (from Digital Equipment Corporation). This DECtalk produces speech using stored word sounds called *phonemes* that are combined to form any English word using a set of 8,000 mathematical equations that make the sounds flow together as we hear them in natural speech. The DECtalk, designed by Dennis Klatt, is particularly useful because it has seven different voices that can be modified, plus an eighth that can be completely created from the user's imagination. "Voice sculpting" is the descriptive term DEC uses.

So this design can assign a separate voice for each of the eight banks of lights on the Synclavier, and changing the pitch of the voices can indicate whether, for example, a mode is on or off. Sounds confusing, perhaps, to the average ear, but as Bralove says, "That's what's so great. It doesn't matter if it's too complicated for anyone else. I'm only designing for Stevie Wonder, and he has amazing recall."

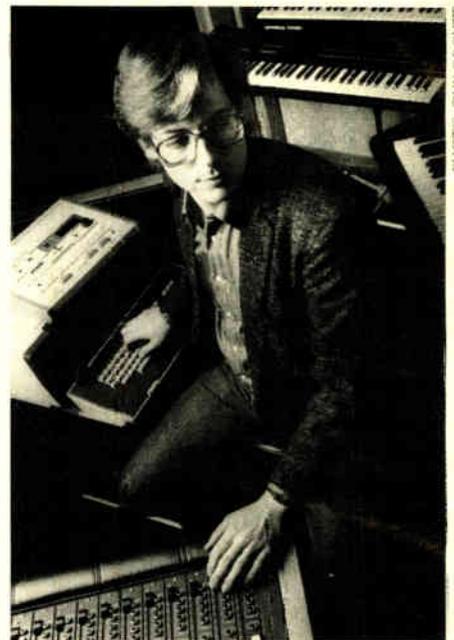
When Dennis Klatt designed DECtalk, he meant for these voices to be characters, so he made them all very distinctive with names such as "Huge Harry" with the big bad bass, and Perfect Paul whose vocal chords sound as if they've been shrunk wrapped.

Will the steady stream of upgrades mess up his work with the additional dedicated buttons and lights? Bralove says, "That's what I like about working with someone like Sydney, because the Synclavier is designed to be consistent with its upgrades," so he feels, though constant flux is a given, his work in adapting the machines to "speak" is not in vain.

INTERFACING THE FUTURE

While many musicians like the flexibility of the Fairlight—its ability to create a sound by drawing a waveform with a lightpen, then edit it with the CRT—this presents a stumbling block for Stevie Wonder, but not a dead end. "If it's a possibility, Steve will examine it," Bralove says. He hopes to design a braille system that could define the contours of a waveform so Stevie could trace it, and therefore modify the line [edit the sound]. Bralove cites the work of scientist Doug Moore who's trying to perfect a full screen braille graphics display system for the blind.

Speech recognition is another



Bob Bralove working with computer for keyboards.

frontier. Already Bralove has begun experimenting with a Votan 5000 unit, which can recognize certain key words whose waveform templates have been entered in its memory, and respond with digitally recorded speech (unlike the phoneme system of DECtalk, the quality of speech is better, but the vocabulary is more limited.)

Votan of Fremont, California has entered the American office environment with its VPC-2000 voice card for the IBM computer. For \$2,500 the user can modify his software to tell him out loud what to do next, and he can respond or give commands by talking instead of fumbling through a set of key strokes. The board allows the IBM unit to interface with a telephone, as well.

Perhaps many of the technologies that have come out of research from people such as Alonso, Kurzweil, Klatt and Bralove will not be confined to specific cases of immensely rich, gifted pop stars who are blind. Studio owners and composers may find voice or sound cuing and reading helpful in learning and using complex systems.

Since it's part of his job to make sure that Wonderland stays state-of-the-art, Bralove feels he has general knowledge to offer. He's writing software for data base management of recording studios. Because each studio's needs are different, he's decided to publish modules to address specific subjects. So far, he's got one module ready to go which helps catalogue sounds.

He's seen a lot of sounds go in a variety of machines, and come out on the radio. A faint smile and a simple statement reflect his attitude toward his job: "I'm watching the master." ■

PHOTO: GUY ORCUTT

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PS Form 3526 July 1987

## USED RECORDING EQUIPMENT FOR SALE

### MICROPHONES

AKG: C61, C28, C24 stereo, C12a, C414e, C29, C60, C535, D15, D19, D202, D24, D160, D30  
 NEUMANN: KM54, KM53, KM64, KM66, KM56, U47, U67, U64, SM2, SM69 stereo  
 SONY: ECM377, C500, C37a, ECM22p, ECM51  
 RCA: BK5, 77a, 44a, 77dx, Skunk Mic  
 SENNHEISER: MD211, MKH405  
 BEYER: M101

### EQUALIZERS

API 550 • ITI Parametrics • Melcor GME 20 • MAP (replaces API) • Altec Graphic • Dalcon Custom EQs (5) • UA 550 Hi Low Filters • White 3400 Graphics

### MIXERS

30 Input Trident B Range • 20 Input API • 24 Input Electrodyne • Teac Model 1 • 4 Input Pultec Mixer • 32 Input Trident series 80 *CALL FOR AVAILABILITY OF NEVE, TRIDENT AND HELIOS CONSOLES*

### AMPLIFIERS

MacIntosh 2105 • MacIntosh MA230 • Marrantz 240 • Citation 12 • Symetrics Head Phone Amp

### TAPE RECORDERS

Otari MTR-90 MK2 24 track • 3M M56 2 track • Scully 280-1 • Ampex 351-2 • Ampex/Haeco Playback Only 2 track/full track • 3M M79 16 track

### OUTBOARD GEAR

MXR Phaser Flanger package • Roland Stereo Phaser • Micmix Dyna Flanger • Marshall Time Modulator • Delta Labs DL1 DDL • Eventide Omnipresser

### LIMITERS

Allison Gain Brains • Electrodyne Limiter • API 525 Limiter/De-esser

### NOISE REDUCTION

Dolby Cat-44 cards • Dolby A 361 frame (no Cat-22)

### CROSSOVERS

Crown VFX-2a • Mastering Labs (for 604) • BGW

### MISCELLANEOUS

API575 Oscillator • Stevens VSO (as is) • Stemco (Ampex) 8 track 1" • Urei 1109 preamps • API VU meters • Sennheiser Mic Power Supply • Lagnevein & UA Tube Mic preamps • Allison LX100 • MCI 16 track (play-head only) • 3M 8 track heads 1" (3) • Ampex 8 track head assembly • Neumann 66 lathe with 68 cutter head complete with all solid state computer and amplifiers

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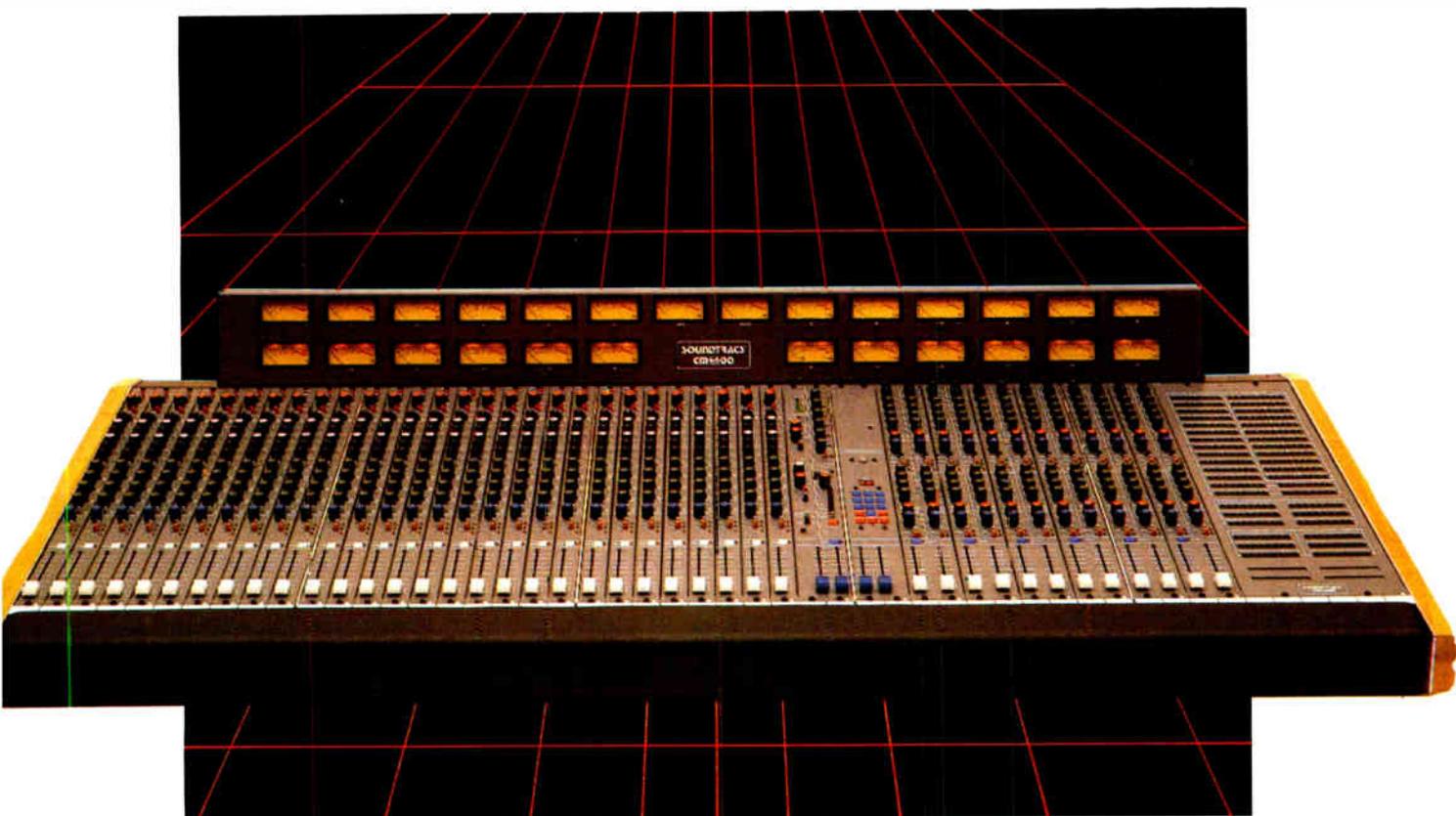
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