

# MIX

**TAPE & DISC SPECIAL**  
· Mini Disc vs. DCC  
· The Remastering Boom  
· Directory of Mastering, Pressing, Tape Duplication and Compact Disc Facilities

PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

**CD RECORDERS:  
Available and Affordable**

**Dreaming  
of a Byte Christmas**



**GARTH BROOKS:  
THE YEAR'S  
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STORY**

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0 174

# LOGIC 2

## The first all-digital, large format console in North America.

A completely digital audio console integrated with a familiar analog-style control surface for music recording, TV and film post production. Logic 2 from AMS.

- *Total Dynamic Automation* of virtually all channel parameters, including Read, Write, Update and Isolate for Fader, Mute. Up to 48 fully automated aux sends. External machine control provided as standard.
- *Multilayer In-Line operation*. Each channel strip controls 4 completely independent mono or stereo signal paths. 27 faders can control up to 108 fully equipped stereo channels, 63 up to 252. Logic 2 is a very large desk with a very small footprint.
- *Input/output circuitry completely user-configurable*. An electronic matrix allows individual assignment of inputs and outputs to any channel strip, group or main output, replacing much of the patchbay of the conventional analog desk.

- *A totally reconfigurable desk*. From recording to mixing, from TV show to film, Logic 2 can be completely reconfigured from stored setups.
- *Comprehensive signal processing*. 4-band, full parametric EQ, 2 band filters and a powerful 4-function dynamics section. *Logicator* rotary controls show settings at a glance, while alphanumeric displays give exact values.



Logic 2 integrates fully into the studio environment. Working with digital/analog multitracks and other digital/analog devices, Logic 2 keeps the signal entirely in the digital domain.

It's here. The first all-digital, large format desk in North America. From AMS.

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# MIX

PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

DECEMBER 1991, VOLUME 15, NUMBER 12

## AUDIO

- 15 The Fast Lane:** The Game of Life  
*by Stephen St. Croix*
- 20 Insider Audio:** Noise Shaping, Part 2  
*by Ken Pohlmann*
- 24 Juxtapositions:**  
Software Development—From Concept to Reality  
*by Mel Lambert*

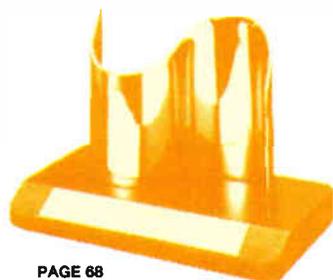
- 68 1991 TEC Awards  
Winners  
& Highlights**

- 80 CD Recorders:**  
Available and  
Affordable  
*by George Petersen*

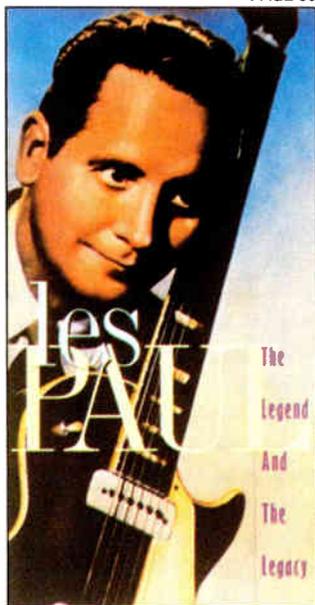
- 102 Studio View:**  
Dreaming of a Byte  
Christmas  
*by Dan Daley*

- 104 Post Script:**  
The Doors' "Soft  
Parade" Video  
*by Iain Blair*

- 108 Post Briefs/Post Notes** *by Iain Blair*



PAGE 68



PAGE 36

## SPECIAL TAPE & DISC SECTION

- 28 Living in the Past:**  
Remastering for CD  
Is Audio's Great  
New Art  
*by Blair Jackson*

- 29 Audio Restoration  
and Archiving:**  
On the Job with  
Alan Stoker  
*by Missy Baker*

- 36 Les Paul:**  
*The Legend  
& the Legacy on CD* *by Mark Smotroff*

- 42 Mini Disc and DCC:** A Comparative Forum  
*by Philip De Lancie*

- 44 Tape & Disc News/Splices** *by Philip De Lancie*



PAGE 29

## PRODUCTS

- 72 The Byte Beat:** Opcode Track Chart, JL Cooper  
CS-1 and Dr. T's X-oR *by Paul Potyén*

- 76 Chip Shots:** New Multimedia Products

- 114 Preview/Hot Off the Shelf**

- 116 Field Test:** Roland Space Sound System  
*by Gary Hall*

- 127 Auditions:** Microtech Gefell UM70 Microphone;  
E-mu ProCussion; Stax SR-Lambda Professional  
Earspeakers *by George Petersen*

## LIVE SOUND

- 92 Garth Brooks:**  
 Ropin' in the Audience  
*by David Schwartz*
- 132 SoundCheck/News Flashes**  
*by David (Rudy) Trubitt*
- 133 Live Sounds:** Van Halen Tour  
*by David (Rudy) Trubitt*
- 137 New Sound Reinforcement Products**

## MUSIC

- 60 Lunching with Bonzai:** Phil Woods—  
 Hard Bopper in Full Swing *by Mr. Bonzai*
- 138 Music & Recording Notes:**  
 Bob Ezrin on Julian Lennon and A-DAM  
*by Iain Blair*; "Voices"—Joachim Berendt  
 Records World Choirs *by Bruce Pilato*

PAGE 132



PAGE 80

## DEPARTMENTS

- 6 From the Editor**
- 9 Current**
- 10 Industry Notes**
- 144 Coast to Coast:**  
 Including Sessions,  
 Studio News,  
 L.A. Grapevine,  
 NY Metro Report,  
 Nashville Skyline
- 168 Ad Index/Reader  
 Service Card**
- 171 Classifieds**

## DIRECTORY

- 149 Mastering, Pressing,  
 Tape Duplication  
 and Compact  
 Disc Facilities**

**COVER:** Audio release formats have changed radically over the years. From the collections of *Mix* staffers, here are a few examples of that continual evolution: Edison cylinder, 78 rpm disc, 7-inch reel-to-reel tape, cassette tape, compact disc, Sony Mini Disc and Philips DCC. Photo: Tony Carlson.



# POWER. PERFORM

What do you really need in a digital audio hard disk system? Simple operation, total creative control, a high level of recording and editing power, and lower cost?

Yes, Studer Dyaxis exactly.

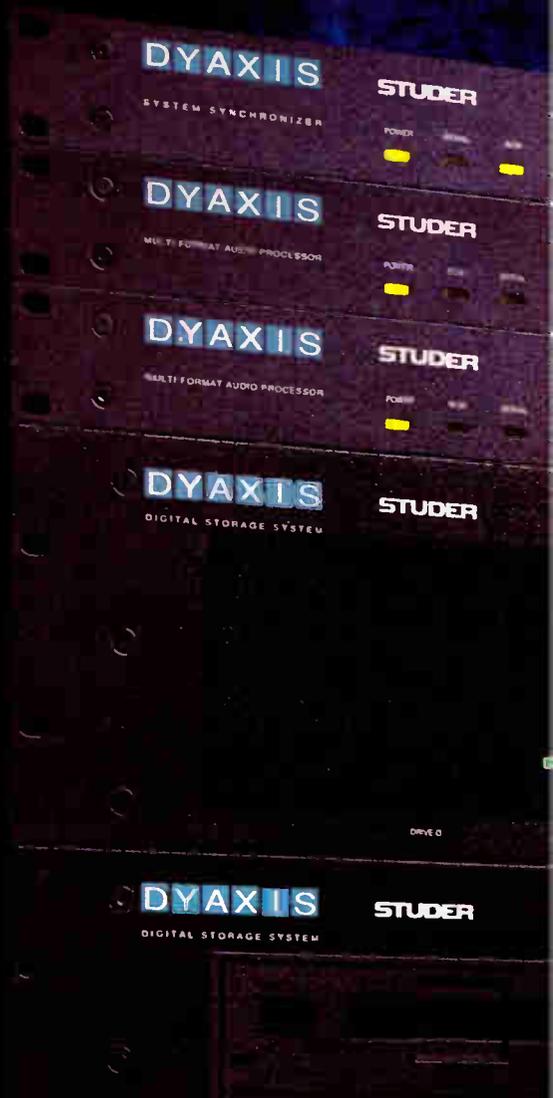
**The New Dyaxis 2+2.** Building upon the original Dyaxis' overwhelming and continuing success, Dyaxis 2+2 is now providing 4-channel simultaneous playback and many new advanced features, such as overdub, multi-take record and programmable in/out, making it the ideal tool for production and post facilities where multichannel applications are required. (Original Dyaxis owners can upgrade!)

**Synchronization Is Easy.** With the System Synchronizer and Timecode option, Dyaxis (and Dyaxis 2+2) is a "master" of sample accurate timecode-based slave applications. By a simple click of the mouse, Dyaxis is ready to lock to SMPTE, EBU, VITC, video, and film tach. Never before has synchronization of audio been so easy.

**Superb Audio Quality.** Dyaxis has achieved a reputation for the best sound quality of any digital audio hard disk system. Through Studer Editech Corporation's own proprietary A-D/D-A convertor implementation, anti-aliasing filter and analog circuit designs, Dyaxis maintains the superb audio quality that you've come to expect from Studer products.

**RDAT Backs Up More.** While others may lose necessary editing and control information by using consumer RDAT units for back-up, Dyaxis' integrated data RDAT subsystem stores all soundfiles along with their precise editing instructions. When restored to disk, Dyaxis users may resume the project exactly where they left off, without the need to re-record soundfiles or re-create critical editing information, or to load in additional instructions from other media.

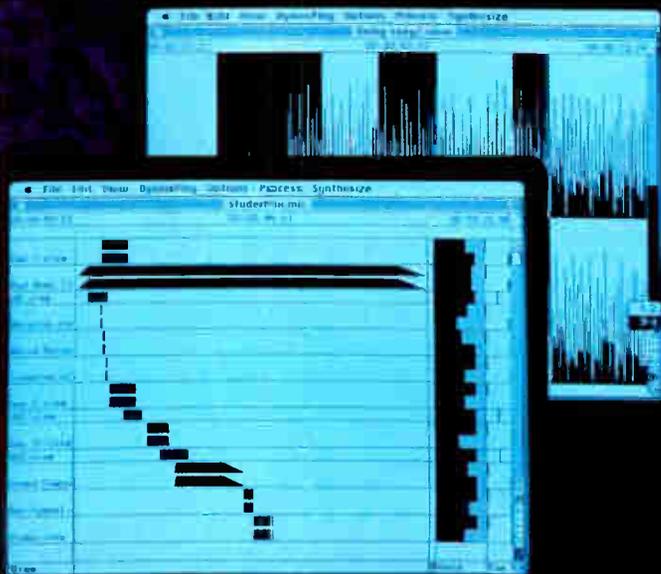
# STUDER



# PERFORMANCE. PROFIT.

**Digital Compatibility.** Dyaxis communicates with and transcodes between all major digital audio formats such as DASH, AES-EBU, PD, SDIF, 601 and more. Up to 100 different sampling rates including 44.056, 44.1 and 48 kHz are available on line. The friendliest of all digital audio systems, Dyaxis makes compatibility and studio interface a breeze.

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**From Studer, a name you can trust.**

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# FROM THE EDITOR

As indicated by this month's cover art, changing formats are among the few constants in this business. The rationales for new formats come in four flavors: smaller size, lower cost to produce, higher fidelity and increased capabilities. And certainly any or all of these qualities are by no means a guarantee of the format's continued existence. The path to consumer audio heaven is riddled with format roadkill such as quad, 8-track cartridge, the elcassette and others that never saw the light of the showroom floor.

For many in the business, changing formats stimulate the sale of music. CD catalog sales have brought boom years to many who thought they had seen the end of their albums' revenue streams. Reissues are big business and are warmly welcomed.

Other than increased sales, changing formats have little effect on the front-end creative operations, save for some minor adjustments to allow for wider dynamic range or more time on the end product. Those who are most affected by such changes are at the end of the production process—mastering and manufacturing.

On the other hand, we are now witnessing another format roll-out whose front-end effect could be quite significant, though at the moment its impact is nearly impossible to measure or estimate. Longtime readers may remember a supplement we included back in 1986 exploring the Interactive Compact Disc, or CD-I, developed by Philips. Well, it's finally here and—surprise—it's come with an instant competitor: Commodore's CDTV. Not only will consumers have to understand what this new interactive format has to offer, but they will also have to navigate another VHS/Beta-type decision. A tough challenge, especially in recessionary times.

One way or another, the interactive CD concept should have a strong impact on consumers... eventually. It's important to realize, too, that the interactive CD is not just another release format for existing product; it is a whole new way to develop and present creativity. As we've said before, interactivity can open new horizons for media producers. The early experimenters will be the ones to reap the first benefits.

Keep Reading,



David Schwartz  
Editor-in-Chief

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Founded in 1977 by

David Schwartz and Penny Riker Jacob

THE DTR-900II, MEANS BUSINESS,  
INSIDE AND OUT.

When a digital machine has earned the reputation of being "the best sounding tape recorder in the world," and at the same time delivers Otari's legendary dependability, it can only mean more satisfied clients, and more business for you. However, DTR-900 users tell us there are other reasons to own one that are just as compelling.

First, you're not locked into a single 48-track machine. Otari's 64-track system can be split for use in two simultaneous 32-track digital sessions. (One practical studio owner says he "uses one and rents one" when he doesn't need all 64-tracks!)

Another owner appreciates what he calls, "the best autolocator—it makes production easy by doing most of the work for you." (He also likes the "900's" unique ability for simultaneous recording on digital and analog inputs.) Still another says, "The DTR-900II's adjustable time advance feature is a lifesaver when we're using an outboard digital console."

Obviously, the DTR-900 means business for these owners. Call Otari at 415/341-5900 for more information about what it can mean to you.

**OTARI**

# CURRENT

## Apple Lawsuit Agreement Reached

An agreement has been reached between Apple Computer and Apple Corps, the Beatles' management company, regarding Apple Corps' 1989 lawsuit against the computer maker. The suit charged Apple with violating a 1981 agreement not to use its logo on music-related products.

The London High Court ordered Apple Computer to pay the Beatles' management company an amount less than the \$30 million it set aside to cover the litigation. According to Apple Computer spokesperson Cindy Mc-

Gaffrey, "A settlement agreement has been reached, but the case still needs to be formally dismissed in the London High Court before we can discuss the specific terms of the settlement." Formal dismissal was expected by the end of the year.

## Concert Sound Workshop

Synergetic Audio Concepts and *Pro Sound News* will co-sponsor the third Syn-Aud-Con Concert Sound Reinforcement Workshop at Chapman College in Grange, Calif., January 14-16, 1992. Entitled "A Hands-On Look at Technology—Current & Developing,"

the workshop will involve the demonstration of current live sound technology—including computer-controlled amplifier systems and equalizer systems—as well as discussion of sound reinforcement issues such as noise control, hearing damage lawsuits and employment opportunities.

Will Parry of Maryland Sound will chair the event, while David Scheirman of Concert Sound Consultants will be facilities coordinator. Staff includes M.L. Prociase of Showco, Roy Clair of Clair Brothers, Mick Whelan of Electrotec and Al-

## Bill Graham, 1931-1991

When rock impresario Bill Graham was killed in a helicopter crash near his Northern California home on October 25, the music world lost one of its most important, influential and dynamic figures. The 60-year-old Graham, whose pioneering production company has been the most successful of its kind for the past quarter-century, was a giant in nearly every aspect of the music industry: concert production, artist management, tour coordination, special event production, philanthropic organization, even record production. His multimillion-dollar company, Bill Graham Presents, will carry on in his absence under the able guidance of a handful of people personally trained by Graham through the years, but there's no question that the business as a whole will miss his vision, leadership and *chutzpah*.

A German refugee whose parents perished in the Holocaust, Graham came to New York at age 11 and worked a number of odd jobs before eventually settling on the West Coast. He was a member of the famous San Francisco Mime Troupe in the mid-'60s, and it was during that time that he put on his first benefit concerts at the now-legendary Fillmore Auditorium in San Francisco. In contrast to the pot-smoking, acid-taking libertines who popu-

lated the burgeoning San Francisco scene, Graham was an extremely well-organized and demanding workaholic with great business instincts.

But above all, he loved music and did everything he could to make sure that it was presented thoughtfully. It was Graham who first put together the sort of eclectic concert bills that the '60s became noted for—pairing the likes of Miles Davis with the Grateful Dead, or Muddy Waters with the Jefferson Airplane.

The concerts that Graham's organization put on at the Fillmore East, Fillmore West, Winterland and other venues set standards, industry-wide, for quality and efficiency. As bands became more popular and started playing larger facilities, Graham and his staff did what they could to make that concert experience as pleasant as possible, too.

Though rock 'n' roll made Graham a very wealthy man, he was always ready to assist worthy causes, whether it was San Francisco's financially beleaguered public schools, Amnesty International, famine relief, earthquake victims or AIDS research. The number of benefits put on by Graham's troops easily reaches into the hundreds. In fact, on the day of his death, Graham had been busy trying to organize a benefit to raise money for victims of the big Oakland-Berkeley fire that had occurred earlier that week.

Passionate, irascible, funny, philosophical, hot-tempered, generous—pick your favorite adjective—most of them fit Bill Graham. To say that he was one-of-a-kind is a vast understatement. Consciously or not, we'll *all* miss his spirit and integrity. Yes, he was the "Godfather of Rock," as one magazine put it years ago, but he was also in many ways the music industry's conscience. And now that he's gone, we'll all have to think for ourselves just a little bit more.

—Blair Jackson

PHOTO: ED PERLSTEIN



# INDUSTRY NOTES

The Audio Engineering Society announced several new officers appointed in the U.S. **Dr. Floyd Toole** will be president for the upcoming year (Dr. Toole was also recently named vice president of acoustical research for **Harman International**); **Leonard Feldman** will be the vice president for the Eastern region; **Bob Thurmond** will be vice president of the central region; and **Richard Burden** will be vice president of the Western region. Overseas appointments include **Neville Thiele** as international vice president and **Gerhard Steinke** as vice president for Europe...**Digidesign's** reported changes include the hiring of **David E. Olson** as vice president of manufacturing, **Joy D. Covey** as chief financial officer and **Paul Rice** as vice president of marketing. Digidesign also opened a regional office in Los Angeles, which will be run by regional sales manager **Mick Walker** and product specialist **Russ Beltary**...**Thomas M. Jenny** moved up to the newly created position of vice president and general manager of the Studer Division of **Studer Revox America**. The Nashville-based corporation also announced Jenny's successor as Western regional manager: **Vencil Wells** will continue to operate out of the Van Nuys, CA, office, but will assume responsibility for personnel, sales and service in the Western region...**Klark-Teknik Electronics** of Farmingdale, NY, promoted **Sam Spennacchio** (already a sales manager for K-T) to marketing manager for **Dynacord GmbH**. The promotion follows on the heels of Klark-Teknik's acquisition of U.S. distribution rights for the Dynacord professional audio and MI product lines...**Derek Davis** was promoted to vice president of operations at **Nakamichi America** (Torrance, CA). Nakamichi also welcomed **Fred Yando** to the position of vice president of sales and marketing...**AKG Acoustics** (San Leandro, CA) hired **Jawxillion Loeb** as product manager for the company's signal pro-

cessing lines...**Sonocraft Corp.** (distributor of multimedia products) relocated to 575 Eighth Ave., 2nd Floor, New York, NY 10018-3011. The new number is (800) 274-SONO...**TimeLine** (Vista, CA) chose **Tim Cuthbertson** to serve as the director of sales and marketing. For more information, call (619) 727-3300...**Matt Robertson** joined **Sennheiser Electronic** of North Hollywood, CA, as sales manager of the Western region. Robertson may be reached at (213) 469-9084, fax (213) 469-3740...**Atlas/Soundolier** chose **Western Audio Sales** (Burbank, CA) as its new representative for Southern California and Nevada. Call (314) 349-3110 for details...**Chyron** (Melville, NY) filed Chapter 11. The company plans to continue with a \$10 million investment from **Pesa Electronics** of Spain fueling the reorganization...**Ferdinand Boyce** is now vice president of marketing at Salt Lake City-based **DOD Electronics**...**Telex Communications** of Minneapolis reported several personnel changes: **Jeff Peters** was named as national sales manager, **Gary Bosiacki** was appointed Western regional sales manager, **Mike Rangitsch** was named Eastern regional sales manager...**Joiner & Company**, a new consulting and design firm, formed in Dallas. By the time of publication, the company may have relocated to Arlington, TX, but can be reached at (214) 392-7800...**Demeter Amplification/Innovative Audio Systems** named **Michael Meltzer** as marketing and sales director of the Los Angeles-based company...**Doug Swan Associates** (Melbourne, FL) is now the Florida rep for **Panasonic/Ramsa**...**Scharff Weisberg** (New York City), previously an equipment rental operation, has opened a sales department. For more information, call (212) 582-2345...**Bob Adams** was elected an AES Fellow by the AES Board of Governors. Adams is currently Analog Devices' senior design engineer of digital audio converter products. ■

—FROM PAGE 9, CURRENT

**bert Leccese** of **Audio Analysts**. Enrollment is limited, but space is still available as of press time. Contact Syn-Aud-Con at (812) 995-8212 for more information.

## Regional Audio News

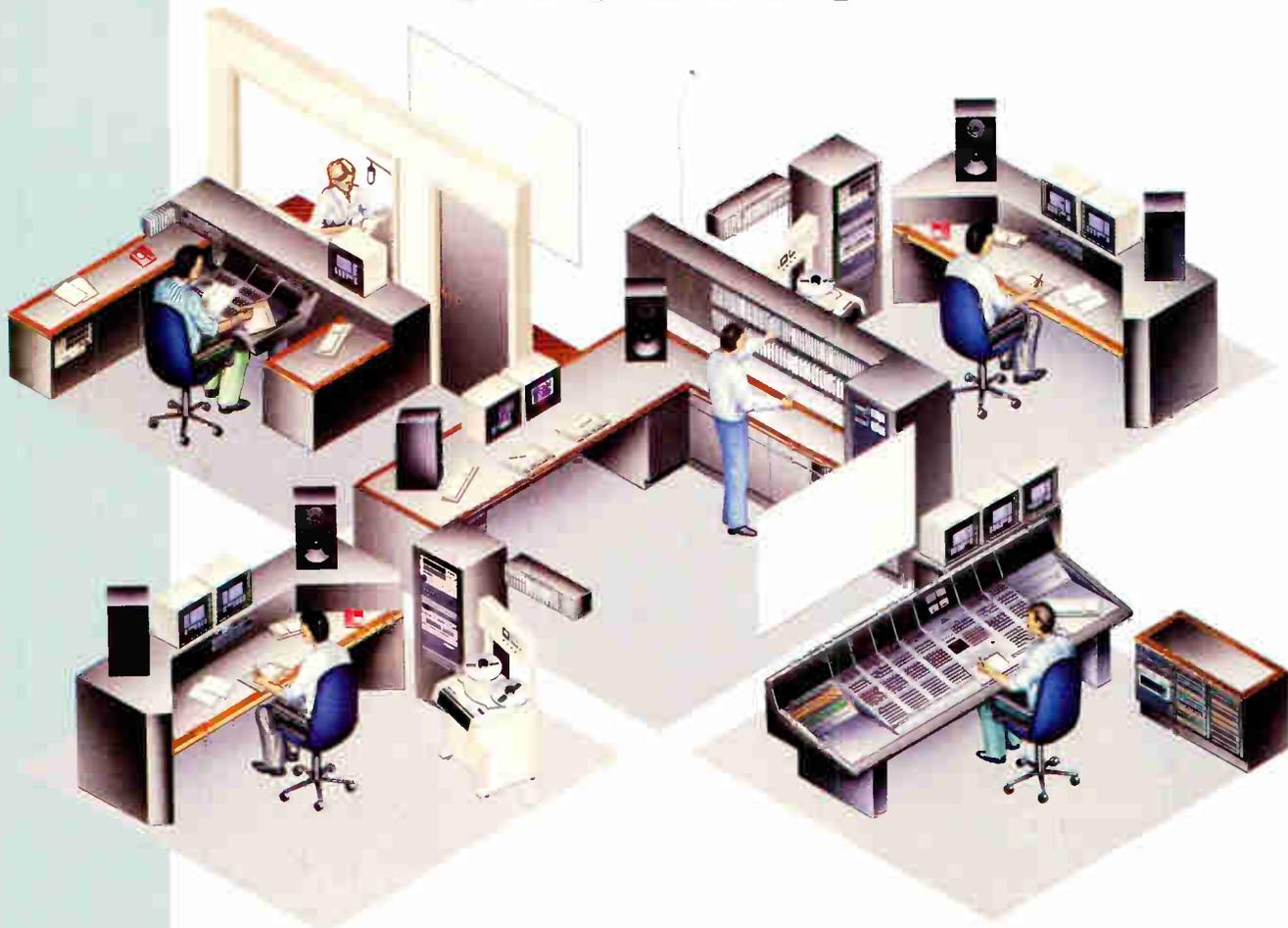
Atlanta is fast becoming a regional music center. And with the '96 Olympics only a short time away, production houses and music companies will no doubt reap some benefits. Contacts should be easier to make for incoming clients with the release of the second edition of the Atlanta Regional Music Directory, which includes free listings of performers, businesses and support organizations directly involved with the Atlanta music scene. More than 2,000 copies will be printed and distributed to local music stores free of charge. Deadline for registration is December 20; the printing is scheduled for January 31, 1992. If you would like to be included, please contact Mark Hoover at (404) 875-9531.

Meanwhile, across the country, the Great Basin Audio Society has formed in Reno as "a nonprofit organization dedicated to improving audio reproduction technology." Professionals in the recording, sound reinforcement and music industries are encouraged to join and share their knowledge. Meetings are bi-monthly; the next one is January 26, 1992. Call Eric Barbour at (702) 358-2019 for more information.

## SPARS News

The Society of Professional Recording Services, in conjunction with UCLA Extension, will host a weekend business conference on January 25-26, 1992, entitled "The Business of Operating a Recording Studio: Realities and Opportunities in the '90s." The conference will be hosted by Guy Costa, CEO of Quadim Corp., and topics include: Controlling the Bottom Line, Pricing, Personnel, Legal Issues, Marketing and Personal Use Studios. Call Shirley Kaye at (800) 771-7727 for more information. ■

# Network



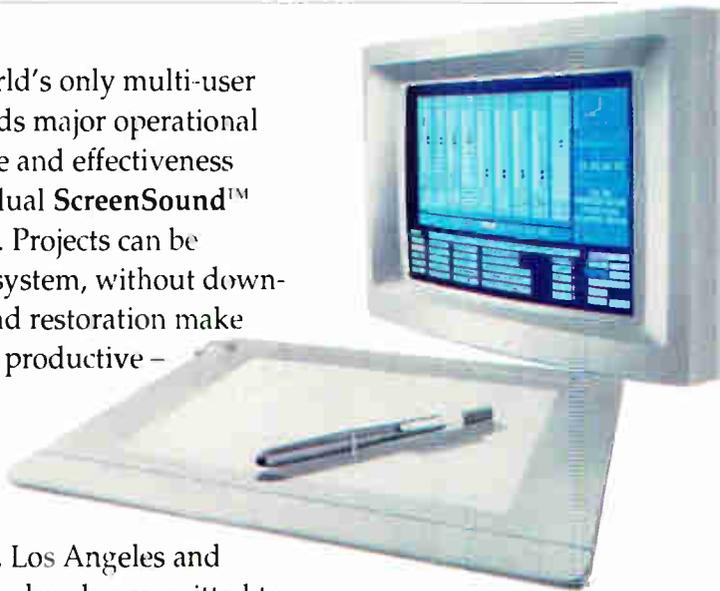
**ScreenSound**  
Digital Audio-for-Video Editor/Mixer

**SoundNet**  
Digital Audio Network

## The Future of Audio Post-Production

SSL's **SoundNet™** is the world's only multi-user digital audio network. It adds major operational efficiencies to the ease of use and effectiveness already provided by individual **ScreenSound™** editing and mixing systems. Projects can be transferred from system to system, without downloading. Off-line back-up and restoration make every hour of operator time productive – *working for clients.*

Find out why Fox TV,  
Los Angeles; GTN, Detroit;  
Soundcastle / Post Modern, Los Angeles and  
Musifex, Arlington, VA., are already committed to  
networked systems for their future post-production needs.



**Solid State Logic**

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**SSL DIGITAL**

# We built our woofer and tweeter a better home.

TEC  
TECHNOLOGY ELECTRONIC EQUIPMENT  
1991  
WINNER



## DMT AND TRANSDUCER HOUSINGS —

All Cabinets used in the new Tannoy Monitor Series represent considerably more thought and design than the average 'chipboard cabinet of the correct volume'.

Cabinets are constructed from a high density space-frame with rounded corners and edges, supporting MDF/high pressure twin laminated walls.

Rounded corners and edges greatly inhibit sound reflections and diffractions from cabinet boundaries. These can be major sources of irregularities in the reproduced sound, particularly in terms of the perceived placement of instruments within the sound stage. For the high frequency unit to make an effective job of launching all the detail that it can generate into the listening space, it must be held rigidly in the cabinet throughout its operational frequencies.

This is the key to the Tannoy cabinets. If a 'rigid' cabinet

is used, the redundant energy from the rear of the bass unit and frame cause endless resonance problems within the cabinet. Differential Material Technology provides the answers by using a variety of different adhesives between the rear of the drive unit and brace, the cabinet walls and the brace and within the layers of the MDF laminate.

The lossy couplings effectively transmit and absorb energy in a frequency selective way. Put more simply, at low frequencies the drive unit sees the cabinet as a rigid structure and at higher frequencies as a resonance absorbing/damping structure.

DMT provides an ideal cabinet solution for the complete frequency range, eliminating unwanted loudspeaker biases.

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## Not your average woofer and tweeter.

by Stephen St. Croix

## THE GAME OF LIFE

**S**TOP! No, I don't mean that you should stop reading; I mean that I want you to take a few minutes out of your day and give them to me. I want you to stop thinking about that appointment that's coming up in a couple of hours, forget about that problem with your hard drive. Put away those images of stuff you want and the memories of stuff you've done. Forget about shipments that still haven't shown even though they were promised ten days or ten months ago. Let it go for a moment.

The question is, "What are we *doing* here?" Now, I'm not asking a deep philosophical or religious question, or posing a generalized academic prob-

lem. I'm asking *you* personally, as close to face-to-face as print allows, what you, the person holding this magazine in your hands right now, are doing here, in the recording industry. Why are you reading this industry publication, why are you in this business, and why are others like you in it?

Here's what I want: I want you to step away, step backward—far enough to get an overview of what it's all for.

Okay. The majority of us are here for two reasons. First, to make better-quality audio recordings of some type. For some, that might be cleaner, tighter, more realistic mixes; for some, better, more dynamic film tracks; and others

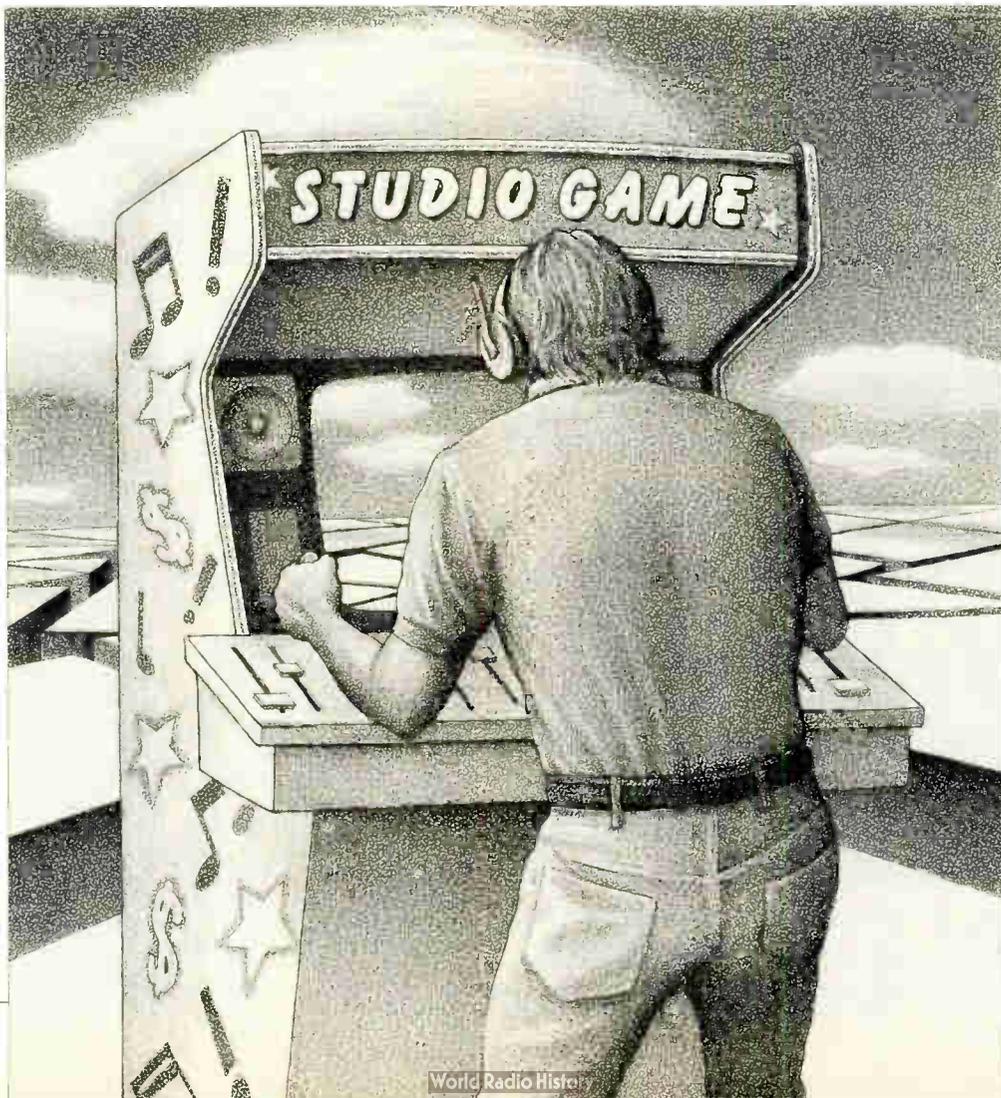


ILLUSTRATION: JEREMY THORNTION

might be here to compose, arrange or even perform better music. Still others are strictly into self-expression, but they also share the desire to do the best possible job.

The second reason is to make money. Money is real interesting stuff when it is part of an equation where science, technology, skill, judgment and pure creative artistic talent are variables.

Money takes on a special importance for us, as it is one of the two report cards for our professional lives (the other being, of course, direct personal satisfaction).

Financial success in the recording industry is a very solid indicator that we are probably doing things right. It is the first confirmation that our plans and abilities are basically correct, that we have indeed figured out what the world wants, and perhaps more importantly, that our personal skills and talents are worth something. Simply put, money in this case confirms that we have successfully contributed.

But that's just the beginning. If you are in fact good enough, and if you have figured out how to channel your skills properly, enough money comes to allow you to expand that power to contribute. More money buys more equipment. More equipment to be installed into three basic (and rarely discussed) categories:

1) Gear that allows us to produce the same end-product. With the same quality, in less time—which allows us to be both more productive (obviously) *and* more artistically creative, because the time between thinking of what to do and then hearing the result is shorter. So, the productive feedback loop is shorter. This means that you spend more time creating and less time waiting (for the machines to do what you asked them to do).

As you can see, a shorter creative loop tends to keep you moving, flowing, simply creating. You are more likely to try to improve problem areas, or even try some trick you have been thinking about for a week or so, when it takes three minutes instead of 25. Got it?

2) Gear that improves the quality of the end-product. This might be better guitars or synths for players, better reverbs or mixing desks for engineers, and so on. Better, cleaner, quieter gear means more transparency,

more "room" to create.

3) Gear that is, when all the smoke clears, fun. I believe the technical term is "toys." Good toys are totally valid, as they promote creative experimentation and expression. (Studio owners who have engineers pleading for the Toy-of-the-Month, take note.)

Side note: Of course, if you are terrible at your job, these toys will only give you more potential for becoming

You, as the hero, are searching through a complex maze in a 16-bit color castle, learning as you go along: picking up "power pills" (money), "weapons" (studio gear) and "allies" (employees and contacts) along the way.

even more terrible and tasteless.

So here we are with all this new hardware (and software) that the money bought, and now we can be even *more* powerful, creative and... successful.

### Tron

It looks to me like those of us who are doing this for a living are in a giant video game.

Look at yourself. You originally began to play for fun—to experiment, to express yourself—but as time went on and you got better at it, you began to play for the sake of the game itself, and then for points.

It's one *long* game. You, as the hero, are searching through a complex maze in a 16-bit color castle, learning as you go along: picking up "power pills" (money), "weapons" (studio gear) and "allies" (employees and contacts) along the way, while acquiring the experi-

ence and skills needed to make it to the next level.

As you play along, you discover pitfalls, traps and secret enemies, and you learn how to deal with them.

### Trash

When you started out, you found yourself competing with other players, as you expected. Then you discovered that there were two totally different creatures on the screen: your kind and the Assholes (these enemies have appeared on all our screens at some time, and have been there ever since).

The Assholes are actually kind of interesting in that they share several common traits, but appear as many different creatures. For example, they are always incompetent, and they will always deliver an inferior product. But each one looks different until discovered. Some simply lie with promises of delivering the same quality for less, in order to steal your business, while some actually charge *more* and still deliver trash. Some appear as sleazy bottom-dollar houses right up front, while others deal in expensive snake oil and "magic." Well, you get the picture.

The absolute common thread that binds them all together and separates them from you and I is that they are in it *only* for the money. Today their scam is audio, tomorrow drugs or used cars.

### Truth

Every now and then, the game itself offs one of the major villains, and we all rejoice. This happened only a few months ago on the West Coast, where it seems like a major pro gear dealer took the money and ran. This hurt many customers and several equipment manufacturers, but at least they're finally gone. One more point for the good guys.

Since this is actually the real life that each of us has chosen, the points have become money and the stakes have become reality. For me (and I suspect most of you), it just makes the game that much more interesting, that much more intense, that much more fun.

It's a great game, because the individual players eventually learn how to win for themselves—and how to team up to destroy the enemies. ■

*Mr. St. Croix feels that the time has come to open up and admit that he was once deeply disturbed by something in italics when he was an impressionable child.*

# The Top 500



Play the D4 with its onboard trigger inputs.

Alesis drum machines are famous for their sounds. The HR-16's natural acoustic drums are still the standard for transparent rhythm tracks. The punchy aggressive samples of

the HR16:B redefine how to make rhythm tracks burn. The SR-16 is an instant hit with its sampled reverb and ambience techniques.

Now you can have all this and more with the new **Alesis D4 Drum Sound Module**. There's an incredible 500 sounds in all. Right at your fingertips.

The D4's sounds are unparalleled for their realism. For example, when you hit a D4 sound harder, the tone *and* pitch change just like a real drum, thanks to the D4's Enhanced Dynamic Articulation.™ Plus, stereo reverb and ambience are built into many of

the samples so you can keep your mind on the beat.

Using the D4 is a breeze with its large data entry knob and dedicated buttons for all major functions. There's even a touch-sensitive preview button and headphone output for instant gratification... and latenight drumset programming.

The D4's 21 user definable drumsets are accessible via MIDI or through the 12 onboard audio trigger inputs.

You can even replace a wimpy drum sound on tape. Which you'll want to do if it didn't come from a D4. No rocket science here. Just pure honest incredible sound. The only reason to buy a drum sound module.

Everybody wants a hit. The D4 has 500 of them right now. At your Alesis dealer.



Play the D4 with MIDI software or hardware.

12 audio trigger-to-MIDI inputs are built in for drum triggers, pads, or tape.



## ALESIS THE TOP 500 DRUM SOUNDS

THIS WEEK	LAST WEEK	WKS ON CHART	TITLE ARTIST	DRUM PRODUCTION	THIS WEEK	LAST WEEK	WKS ON CHART	TITLE ARTIST
1	2	208	HONEST SNARE HR-16	ALL WOOD-BRASS RIM	302	NEW	▶	RAW HIDE BRAND NEW D4
2	NEW	▶	STUDIO TOM BRAND NEW D4	16" MAPLE TOM w/VERB	303	450	52	HI ROOM TOM HR-16
3	NEW	▶	BIG "O" BRAND NEW D4	DOUBLE HEAD KICK w/VERB	304	NEW	▶	WET HALF BRAND NEW D4
4	5	52	RIM SHOT ROOM SR-16	BRASS PICCOLO w/VERB	305	327	52	RIM 2 CENTER SR-16
5	10	156	BIG FOOT HR-16:B	SINGLE HEAD 26" MAPLE	306	123	208	DOUBLE HEAD
6	NEW	▶	SLAM BRAND NEW D4	POWER TOM w/VERB	307	223	151	ARTIC
7	23	156	COMBO SNARE HR-16:B	PICCOLO PLUS WOOD	308	401	5	DOUBLE HEAD KIO
8	NEW	▶	BIG BALLAD BRAND NEW D4	WOOD SNARE w/BIG VERB	309	NEW	▶	
9	NEW	▶	FAT CITY BRAND NEW D4	SUPER FAT SNARE	310	175	1	
			HALF OPEN HA	ARTICULATED HI HAT	311	NEW	▶	
					312	211		



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by Ken C. Pohlmann

# NOISE SHAPING

## PART 2

Last month, we examined the theory of noise-shaping circuits, observing how re-quantization error can be shifted beyond the audio band with the appropriate DSP circuit. However, other factors need to be taken into consideration in the design of noise shapers, and a useful low-bit converter requires still other circuit elements.

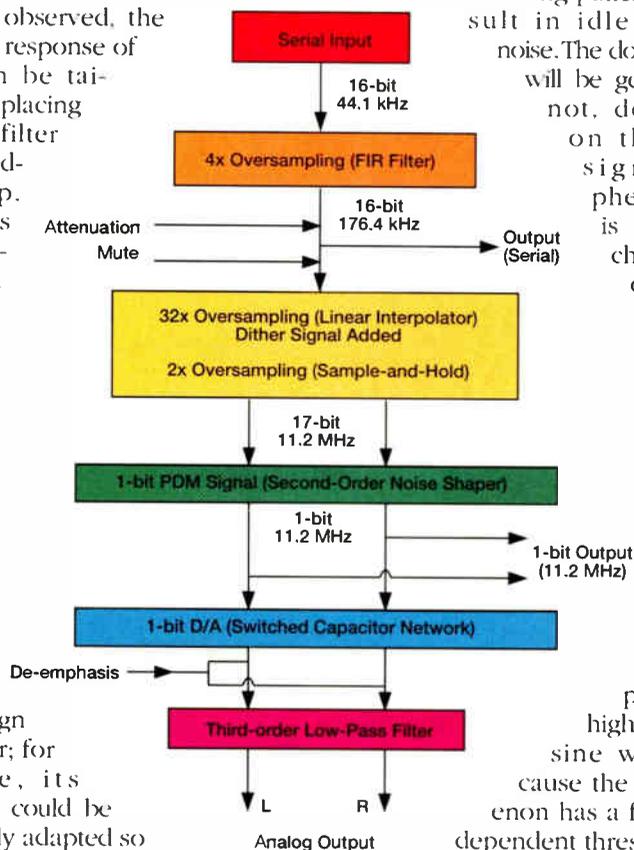
As we observed, the frequency response of noise can be tailored by placing a digital filter in the feedback loop. There is great flexibility in

the theoretical design of the filter; for example, its parameters could be dynamically adapted so that the error noise is always optimally masked by the audio signal. It is important to note that such a configuration alters the frequency response of the error signal, but not that of the audio signal; the configuration has the effect of passing the noise through the filter, not the signal.

The low-level linearity of low-order, noise-shaping circuits can be degraded by idle patterns. Given a zero input signal, a noise shaper may output a

regular 1010 pattern. A very low-level input may result in a similar pattern, disturbed by double ones and zeros. If the period of the repetition of such patterns is long enough, they may be audible as a tone, rather than noise. Because they occur when the channel is idling, these non-linear patterns are called idling patterns and result in idle channel noise.

The double codes, will be generated or not, depending on the input signal; the phenomenon is especially characteristic of low-am-



**Figure 1: A complete bitstream converter.**

plitude, high-frequency sine waves. Because the phenomenon has a frequency-dependent threshold level below which the signal is not coded, the effect is sometimes called thresholding.

First-order noise shapers exhibit these effects because of their stable 1010 patterns. Higher-order noise shapers are much less prone to the problem because their output patterns are less stable. However, in many multistage designs, the effect can occur in each of the cascaded low-order stages. Thus, it is important to add a

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World Radio History

# Studio 5

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dither signal in the first stage to disturb any fixed patterns.

In a traditional noise-shaper design, the poles of the loop filter are at 0 Hz, as in an ideal integrator; this design results in zeros in the audio band. In some noise-shaper designs, a technique called zero shifting is used to modify the rising noise spectrum by shifting one or more zeros to the edge of the audio band (e.g., 18 kHz). For example, when two zeros are shifted in a third-order noise filter, noise in the range from 13 to 20 kHz may be reduced, but increased below 13 kHz. Overall, the noise measurement is enhanced. But, suppression of idle patterns can be reduced, thus the zero-shifting technique must be used with care.

Noise shaping is advantageous because a simple shaper can remove quantization noise from the audio band. Higher-order, noise-shaping algorithms can remove even more noise overall, but relatively more noise is present near the Nyquist frequency. Hence, these algorithms are more effective at high oversampling rates because there is more spectral space between the highest audio frequency and the Nyquist frequency.

Another important objective of noise shaping is reduction in the number of bits required to represent the signal. Oversampling, noise-shaping converters use a low-bit quantizer to code the signal over a few quantization levels; this avoids the degradation of differential and absolute non-linearity that amplitude coding is susceptible to. Noise shaping is prerequisite in any low-bit system. To convert a maximum-amplitude, 16-bit word, a 1-bit system would have to perform 216 toggles per conversion period; with a sampling rate of 44.1 kHz, this would demand a toggle rate of approximately 2.9 GHz. This is too fast for current technology. As the rate is slowed to accommodate hardware limitations, 16-bit performance is lost and noise levels increase to an intolerable level. Hence, noise shaping is necessary in a low-bit coder. Looked at in another way, bit reduction is required to output a low-bit signal from a 16-bit source. However, this greatly degrades the signal's dynamic range. Noise shaping uses the error generated in the bit-reduction process, returning it back to the input through negative feedback to

reduce noise in the audible spectrum and improve dynamic range.

Bitstream D/A conversion, devised by Philips, is a true 1-bit technique. In its second-order implementation, the sampling rate is increased from 44.1 kHz to 11.2896 MHz—an increase of 256 times. At the same time, the 16-bit signal is converted to a 1-bit signal. It is this fast, 1-bit output that reproduces the audio waveform. The re-quantization error of the output signal is corrected by noise shaping. The output section requires only an on and off state. All ones would be a full positive signal, all zeros would be a full negative signal, evenly alternating ones and zeros would be a zero level signal, and other variations would create intermediate levels. Specifically, the method uses pulse density modulation.

Fig. 1 shows a complete bitstream D/A converter. The first of the three oversampling stages performs four-times oversampling to attenuate image spectra; in addition, first-order noise shaping is performed in the filter. The second stage performs 32-times oversampling. A dither signal (-20 dB at 352 kHz) is added to prevent idle patterns from causing non-linearity. Two-times oversampling is performed in the third stage. This 17-bit signal (dither adds one bit to the original 16-bit signal) undergoes second-order noise shaping as described above, and a single bit is output from the quantizer. Finally, D/A conversion is accomplished at a 1-bit D/A converter via pulse density modulation, outputting 1-bit data at 256-times oversampling. A third-order analog lowpass filter removes out-of-band, high-frequency components.

The first of the three oversampling stages uses a non-recursive FIR interpolation filter. First-order noise shaping is performed in the accumulator of the multiplier. The signal is down-scaled to prevent clipping during any signal overshooting. The gain of the filter is selected to compensate for the effects of other stages in the conversion path. In particular, a high-frequency rise is used to compensate for the aperture error (-3 dB at 60 kHz) present in the output analog filter. Thirty-two times oversampling is performed in the second-stage filter through linear interpolation. In the third stage, two-times oversampling is performed through a sample and hold operation.

Noise-shaping coding can be used

in conjunction with oversampling to reduce word length. In the case of the second-order implementation of bitstream, the quantization noise introduced by the word length reduction is spectrally shaped by a lowpass feedback loop around the quantizer. Signals are processed in two's complement format; the 1-bit code from the quantizer is the output sign bit. The remainder of each sample is fed back as a quantization error, after a limiting operation designed to prevent overflow. A 21-bit data bus is used within the loop. Second-order noise shaping is performed by adding double the error and the negative value of the error to the previous two samples.

Two values ( $\pm 1$ ) are output at 11.2896 MHz. This pulse density modulation signal is converted into an analog signal using a switched dual-capacitor network. Two control signals representing the datastream's logic 0 and logic 1 values control the switching of the capacitors, subject to a clock pulse. During the negative half of the clock, the first capacitor discharges while the second capacitor charges. During the positive half, if the data is a logic 1, the first capacitor is charged by taking a fixed amount of charge from the summing node of an op amp. If the data is logic 0, a fixed charge is transferred into the summing node from the second capacitor. In this way, there are only + and - full-scale reference points, and intermediate points are determined by time averaging. There is no MSB change around zero, because zero is represented by an equal number of positive and negative full-scale pulses. Zero-cross distortion is thus eliminated. A stereo bitstream converter can be contained on one chip.

Thanks to noise shaping, low-bit converters are making steady inroads against traditional multibit converters, particularly in the consumer market. In time, it is entirely possible that all digital audio devices will use low-bit architectures. In future "Insider" columns, we'll examine the workings of low-bit A/D converters.

*[This material is adapted from Advanced Digital Audio, a new book edited and co-authored by Ken Pohlmann.]* ■

*Ken Pohlmann is a professor of music and director of Music Engineering at the University of Miami.*

by Mel Lambert

# SOFTWARE DEVELOPMENT

## FROM CONCEPT TO REALITY

A

s routine tasks in recording and production facilities become the province of workstations and computer-controlled hardware, our industry finds itself increasingly involved in the development and evolution of functional software. Studios, in turn, are becoming highly dependent on the programming talents of a rare handful of people who can turn a concept into reality.

Drake Philbrook, president of Sprocket Development International, has been involved with the genesis of several software applications, including the new 360 Systems DigiCart disk recorder; Studer Editech's MacMix editor and EQ user interface for the Dyaxis workstation; Mac- and IBM-compatible Software Developer's Tool Kits for the Panasonic SV-3900 serial-capable DAT machine; and a Programmer's ToolKit for TimeLine's System Supervisor time code synchronizer and machine-control system. He also has extensive experience in recording and post-production mixing, having worked as director of operations at Music Animals, a leading Hollywood audio-for-video film post house.

"Each of these firms defined its software project in a different way," Philbrook recalls. "My work with Studer Editech involved a detailed specification stage, during which each screen display was designed, and the function of each button and user feature was closely defined, on paper. From that tight spec, I would develop the necessary control software to implement the various functions.

"For smaller companies, I might be more actively involved in defining the program's functionality," he adds. "During development of 360 Systems' DigiCart system, for example, I was able to draw on my years of studio ex-

perience to define a number of the necessary control and user-interface features. In cases like that, I would also need to work closely with the hardware designer, so that the functions I had been specifying in the controller software could be implemented by the microprocessor and support chips."

This initial Development Stage allows the target product to be closely defined and refined over a period of time, until it reaches Alpha Stage, or the first reliable software release. "At that point," Philbrook says, "I will have developed most of the primary functions and can produce a release that allows them to be evaluated by in-house staff. This Alpha Stage might last for up to eight weeks, depending on the project. During that time, we'd look for first-level bugs and anomalies, and make sure that all of the features are consistent and reliable. We may already have identified some obvious bugs in the software, but these might be left unfixed until we have more feedback from the alpha test sites."

Next comes the Beta Stage, during which the program is sent to outside test sites. "I normally look for a small number of beta sites," Philbrook says, "mainly because I need reasonably quick responses. Because of the logistics involved, it's much easier to work with no more than about six beta sites—a couple each from the recording, broadcast and post-production industries. During this Beta Stage, which could last up to six weeks, I might offer as many as three revised versions of the application: the Initial Release, followed by an Interim Release that fixes some of the bugs uncovered during the first test sequences, followed—if we have more updates—by a Third Release.

"I would expect each beta site to prepare a fully annotated report of what they encountered while using the Beta Release software, from that information I can continue to refine and extend the program. The Final Release incorporates fixes for the various bugs discovered by the beta sites, but continues to evolve as users work with the product. During its useful lifetime, we continue to gather feedback from the marketplace and offer fixes and updates when they become necessary."

Evan Brooks is a co-founder and current VP of engineering at Digidesign, where he is responsible for a team of seven software writers and 14 hardware engineers. During the past several months, Brooks and his team have been hard at work on a major upgrade to the firm's Sound Tools random-access editing and processing software, in addition to other projects currently under wraps.

"The development process is highly interactive," Brooks concedes, "as the hardware designs and software functions evolve mutually from one another. We use the Macintosh as the master platform, writing code in a mixture of MPW C, C++, Object Pascal

and 68000 Assembler; signal-processing functions will be written in [Motorola] 56000 code for the hardware DSP cards.

"Our alpha/beta sites will be both inside and outside the company—for Pro Tools we used up to two dozen people," he continues. "We make no real distinction between alpha and beta stages—which for Pro Tools lasted four months—it's just a measure of the project's completeness. Because we are continually refining the software, we prefer to work continuously toward the final release, while identifying and eliminating as many bugs as possible.

"There will *always* be a finite number of bugs in any complex program," Brooks adds. "All users need to accept the fact that software will have bugs in it; we are committed to fixing them on a continuing basis. Our policy is to first, ship product that will work reliably; and, second, fix any problems on a timely basis in response to user feedback."

Dane Butcher, president of Symetrix and project leader for the DPR44 Recording and Editing Station, says that the development of a sophisticated

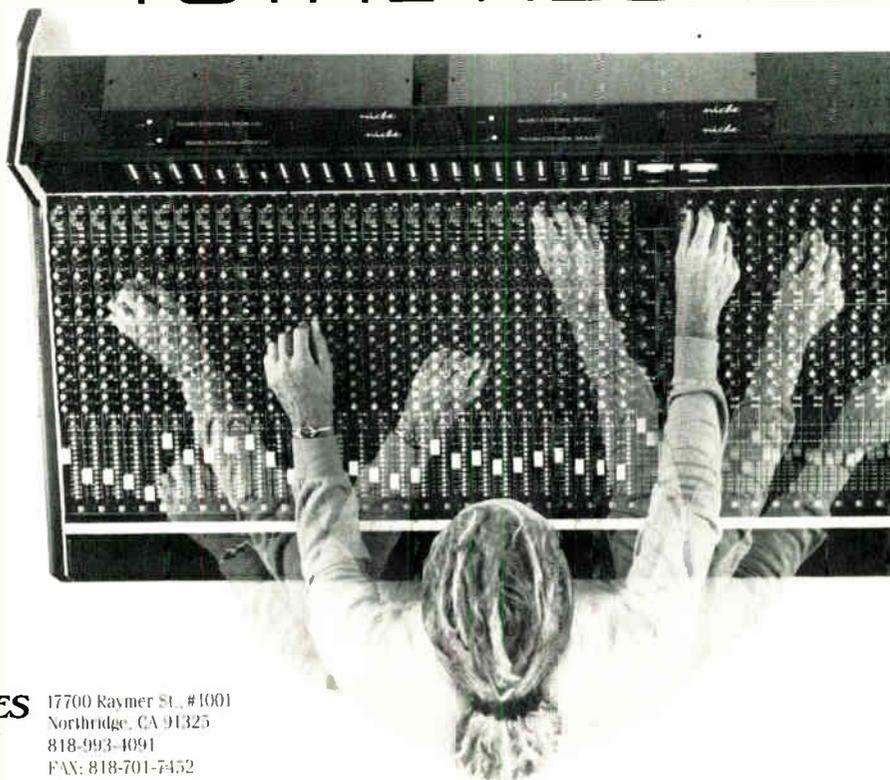
hardware/software system can require a great deal of patient planning. "The DPR44 hardware has been up and running for a while now, and is extremely stable. Meanwhile, our two main software designers, Edmund Pirali and [Mix columnist] Stephen St. Croix, have been finalizing the user interface and system functions. We're now ready for the first Alpha Stage, during which a pre-production system will be installed at three sites: a local studio here in Seattle, to allow us to sit in on the first practical sessions; a second facility on the West Coast; and a third, East Coast location.

"That will take us through the early part of 1992," Butcher adds, "at which stage the system will have matured and will include any additional functions that might be identified by the alpha sites. We consider Alpha to be a 'contingency' stage during which we need to fix any outstanding bugs. In this highly competitive industry, we cannot come to market too early with a revolutionary new product!

"Good beta sites are harder to come by," he continues, "mainly because nobody ever has the time to test new systems. We hope to identify as many

## TOTAL RECALL

Don't let the good looks fool you, the Niche Audio Control Module (ACM) is a versatile device designed to maintain the absolute clarity of your audio signal, using an innovative non-VCA technology to eliminate coloration. The ACM can be controlled by any sequencer giving you the power of Total Recall of all your dynamic and snapshot levels and mutes. Eight individual inputs/outputs and stereo mix out for **\$479** retail. Check it out at your local dealer and start mixing with eight arms.



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as three beta locations, one of which will probably be one of our planned alpha users. Each beta site will have the system for two to three weeks, during which time we will continue to gather feedback for Edmund Pirali and [hardware architect] Bruce Hemingway. By spring 1992 we should be out of Beta, and we plan to begin initial shipments by the second quarter—in time for next year's NAB Convention."

Workstation manufacturers need to maintain close links with current and future users of their products, both to enhance current releases and provide

feedback for new versions. For example, Sonic Solutions recently issued beta versions of its new Sound-for-Picture system to a pair of post-production facilities. At New York's Videomix, which specializes in sound effects design, production engineer Philippe Guichard has been evaluating Sonic System's new time code synchronization and machine-control software since May.

"We now have full time code sync, A/B Editing and EDL support on our 8-track system," Guichard explains. "We handle a lot of audio editing for picture at Videomix, including sound effects design for shows such as the

PBS *Nature* series.

"Initially, we had several problems with reading and converting time code into the system—particularly at a 48kHz sampling frequency—but we soon got that fixed. We've received at least ten new versions of the software, from V1.1 Alpha to the current [late September] V1.2 EK Beta.

"We are in regular touch with the Sonic people," he continues. "In fact, I'm talking with them a couple of times a day with bug reports and ideas for product improvements. For example, I would like to be able to nudge an audio segment backward or forward a single video frame at a time, to resync sound to picture. At present, you have to enter a new 'In' time for each sound element, and then audition it at the new location. It would be very useful to simply slip the cue a couple of frames and audition the results quickly. Sonic says that it will implement that function, which will be great.

"In terms of hardware," he says, "we've received three upgrades for Sonic's new Universal Clock Interface, which allows us to read, write and lockup to any time code rate." In October, Videomix expected to receive a redesigned processing card for the Macintosh controller, which takes up less space in the host processor and reduces overheating problems.

"We will continue to put the Sound-for-Picture software through its paces for several more months," Guichard says. "A final version, which will include full compatibility with CMX-format EDLs, effects looping and other functions, isn't expected before the end of the year. It's been very useful for us to be closely involved with the development of such a complex product. I'm sure that Sonic Solutions has benefited from our hands-on experience with the new software in a day-to-day functional environment."

The number of potential problems increases geometrically with the complexity of a software application. But with sensibly planned Alpha and Beta evaluation processes, users can be reasonably assured that the final release will function as advertised. ■

*Drawing on over 16 years of active experience with all dimensions of professional audio on both sides of the Atlantic, Mel Lambert now heads up Media&Marketing, a high-tech consulting and marketing service for pro audio firms and facilities.*

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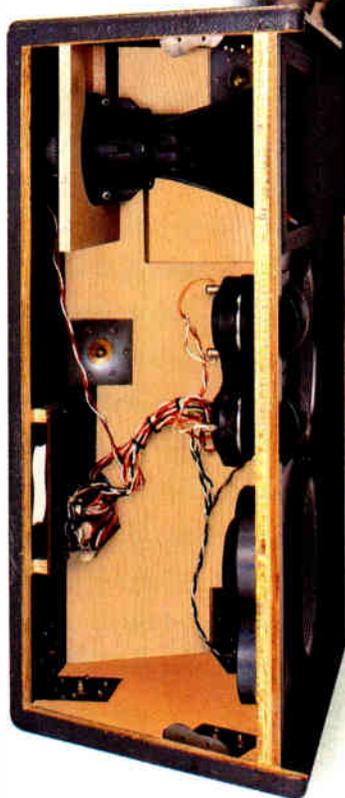
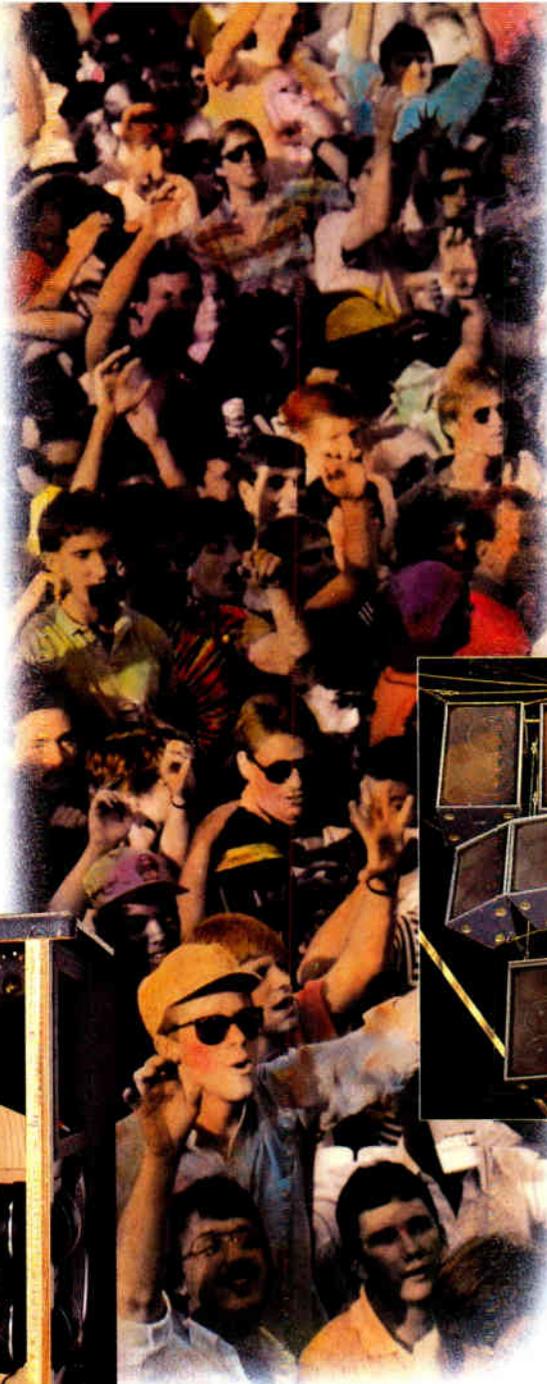
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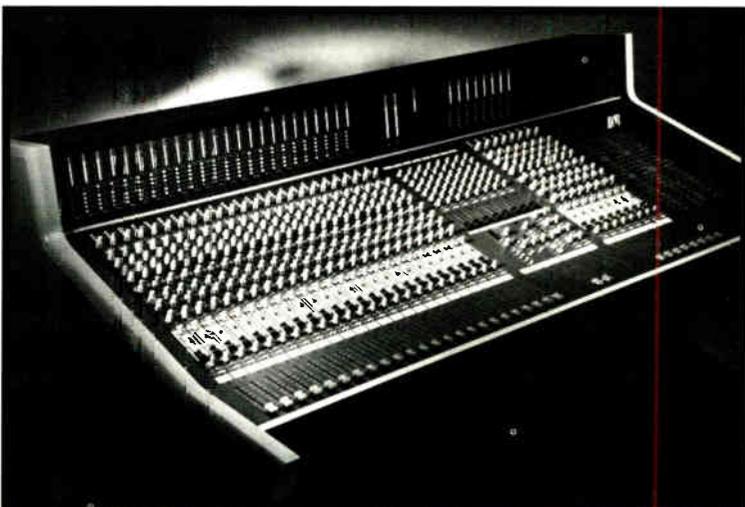
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World Radio History

a short period.

"Then I started learning about being an assistant engineer," he remembers, "but I found out fairly quickly I wasn't interested. I didn't enjoy being in a room with seven or ten musicians, all of them yelling to make their instrument louder. All their concentration was on individual items, and what interested me was the big picture. That's one reason mastering appealed to me—it deals with the big picture."

He stayed in shipping until a position opened up in the mastering department. By the middle of 1972 he was eagerly learning at the side of one of the best of that era, Domenic Romeo, who had mastered records by such giants as the Stones, the Moody Blues and George Harrison. In an effort to broaden his knowledge of the field, Gastwirt moved over to a then-fledgling operation called Masterdisk and worked under Bob Ludwig. Between Romeo and Ludwig, Gastwirt received quite an education.

"Romeo was a complete feel guy, and Ludwig was a complete technical guy," Gastwirt says. "I don't think Romeo would think about the signal chain. He would simply put on a

record, take his equalizer and add some bass to it if he thought it needed bass, and add some highs if it needed highs. Bob's the one who taught me that different EQs and different compressors will give you different sounds, so it's not just a matter of equalizing something—it's a matter of picking the right pieces of equipment for that type of music."

An avowed fan of the late '60s/early '70s California bands—especially the Grateful Dead—Gastwirt left Masterdisk and moved to San Francisco ("right down the street from Wally Heider's"), where he got a job as a carpenter at the Record Plant in Sausalito. "It was a step down from what I'd been doing in New York, but I did help build a live acoustic echo chamber, and I learned a lot of things that helped me later on. I've even referred back to my original notes on that project." The Bay Area proved to be too small a pond for the admittedly ambitious Gastwirt, so he next headed down to L.A.'s Kendun Recorders, where he was one of five mastering engineers on staff. From there he did a stint at Artisan Sound and then moved back to New York to work for CBS. "But I hated working for a big record com-

pany," he says.

Today, as one of the principals (Cal Roberts is the other) in the very successful OceanView Digital Mastering, Gastwirt is essentially his own boss, and he has the best equipment available at his disposal: a customized Neumann console, Ampex and Sony tape machines, a Sonic Solutions system (including NoNoise), and much more. In one of those rare twists of fate, he's managed to build his recent career on the strength of remastering projects for many of the California bands he's loved since his teens.

He admits that meeting and working with the Dead's Jerry Garcia has been "the biggest thrill of my life." The two met at Bruce Botnick's Digital Magnetics studio when Garcia was working on a video several years ago. "We started talking, and it turned out a 14-hour conversation," Gastwirt says with a laugh. "Not long after that we mastered *In the Dark* [the Dead's '87 hit] together, and right after that he instructed Warner Bros. to send me the Dead's whole catalog and do the mastering on that. At that point, there were CDs of the Dead's Arista albums out, but they sounded God-awful. I found

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out that they'd been made from second- and third-generation EQ copies. So then García got involved, and he asked me to master all of the Arista catalog as well." Gastwirt has been the Dead's semi-official mastering engineer ever since, working on both new projects and the band's new historic reissue line.

"Most of the Dead albums and Hendrix albums I've done [such as *Electric Ladyland*] were well-recorded, but there was a lot of really bad stuff going on in recording in the '60s. If you listen to some of those records that Rudy Van Gelder did in the '50s, and then you listen to a lot of things from the late '60s and early '70s, you say, 'What happened?' It's like everything went backward. Part of it was the accumulation of extra tracks and bad transistors and a multitude of things that affected the technology as it was expanding. Transistors in the '70s typically sounded hard, strident. And when you multiply that by 16 and 24 tracks, it just got worse and worse."

Gastwirt says that because he is so often a big fan of the music he works on, it helps him in his work. "When we get a job like the Yes box or the Crosby,

Stills & Nash box, there's more to it to me than just making it sound good. I have this thing where I want to make it sound better than anybody's ever heard it before, because I love this music, and it's important to me. I think we accomplished that on the CSN box, and part of it is that we wouldn't accept any EQ copies or safeties from Atlantic. We had a studio full of 900 tapes before we even started the project. In certain cases, we took the individual tracks, unmixed, loaded them onto the Sonic System, did a little de-noising, and then synched them back up and mixed them afterward. The results were unbelievable. I got to sit down with Stephen [Stills] and Graham [Nash] and listen to a lot of takes of songs and help them decide which takes sounded better and felt better musically. That's the best way for me to work, and I think the results are amazing. If you like CSN, you're going to love this box."

Gastwirt believes in using the Sonic System in moderation. It's been particularly helpful on the older recordings he's remastered for Smithsonian/Folkways, though he notes, "My greatest challenge in dealing with all the pops and clicks you find on '30s and '40s

recordings is not taking out so much, so that the music is no longer listenable. I think my job is restoring what the original intent of the music was to a great extent.

"I'm a purist in some ways, but at the same time everything has its place. NoNoise is a device that's like a hammer—if you use it too hard, you're going to hurt the music. If you can be gentle and use it as a tool only in proper situations, that's not really changing history, so to speak. It's just removing a little hiss."

At this point, about 70% of Gastwirt's time is spent working on remastering, and that suits him just fine. "If there was music coming out right now that was as exciting as the '60s and '70s, I'd be fighting to get every mastering job I could," he says. "But I think it's so important that somebody who really cares about and loves this music is restoring it for the world—and for history."

#### LARRY WALSH Capitol Recording Studios

The year is 1982. Larry Walsh hears through the grapevine that Record Plant studios in Sausalito needs a



maintenance engineer. "I thought, 'This is great. I can do this,'" he remembers. "After all, I'd been an apartment manager!" When he arrived at the studio, he was informed that this was a very different kind of "maintenance," but he hired on as a janitor anyway, and he was up and running in a recording business career. (Doesn't it make you want to toss that recording school degree in the dumpster? Don't. Times have changed.) It's not like he was ignorant of technical matters. He was a serious, lifelong tech-head who'd worked as a live sound engineer since he was 15, but he burned out on road

work.

Soon, producer Ron Nevison got him a job working for Chris Stone at the L.A. Record Plant, "as a slave for minimum wage," he says. "That was kind of rough. I ate spaghetti for about three months—God, it was horrible." Still, Walsh picked up knowledge in his capacity as "slave," and it wasn't too long before Stone put Walsh onto a new project: He sat in a warehouse in Compton for three months watching videotapes sent over by Sony Japan explaining their latest venture, the 3324 and 1610 digital multitracks. Then, when Stone started renting out ma-

chines, Walsh would install them and get the operators up and running—and do maintenance calls. Soon Capitol Records was knocking on his door asking him to supervise their leap into digital mastering.

"Capitol was one of the last labels to get into [remastering for CD]. They had no equipment, no procedures, no idea how to do it. Digital Magnetics was doing a lot of people's stuff back then. So I came in [to Capitol] and set up everything—how we master them and track them and set up standards." Today, Capitol's mastering operation is equipped with Sony digital, Neve and Studer consoles, Sonic Solutions and Sony editing systems, Sony, Studer and Mitsubishi tape machines, custom JBL monitors, and a wide assortment of top signal processing gear.

"The labels are funny," Walsh says. "They're like these big dinosaurs, always tripping over their tails. Capitol knew they had all this stuff [in the vaults], but they were only interested in front-line, current stuff at first. Then all the collectors started going crazy—'Why aren't you issuing all these great things on CD?' So, Capitol's chairman, in his wisdom, said, 'Okay, we need 50 titles by January 1.' And this was in October. So I did the 50, and they were shit, because I had no time to work on them. They were bogus, but they put them out anyway.

"I was new to remastering, so I didn't even know that you wanted to work from the masters," he explains. "So, for example, the first Band album [*Music from Big Pink*] was from something like a third-generation Dolby A tape copy. Capitol got slammed for it, of course, but luckily my name didn't go on anything back then. Capitol wasn't the only one who did that sort of thing in the beginning, either. Things have changed a lot since then."

In fact, Capitol rectified its early errors and has gone on to develop a serious reissue program. Walsh was at the helm for one of the label's most ambitious boxes: a 75-song Sinatra retrospective (*The Capitol Years*) that was released earlier this year to commemorate the singer's 75th birthday. He's also worked on a number of individual reissues of '50s and early '60s albums by Sinatra, Dean Martin, Judy Garland and other singers who dominated the Capitol roster in the pre-Beatles era.

As usual, tracking down the right

—CONTINUED ON PAGE 169

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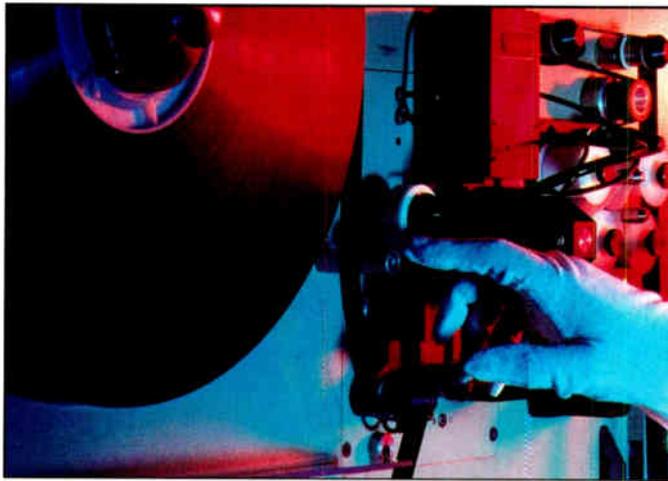
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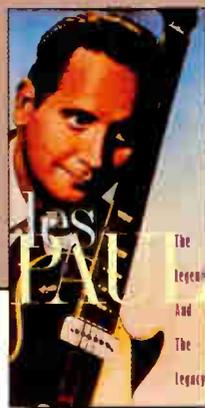
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# The Legend and The Legacy

The Making of the

# LES PAUL

CD Box Set



One of 1991's most "handle-with-care" projects has to

be Capitol Records' massive boxed set honoring the Grand Daddy of multi-track recording, the Godfather of the electric guitar and the Proud Papa of a stellar stream of hits that topped the pop charts between 1948 and 1958—Les Paul.

Capitol not only had the luxury of access to Les and his personal archives in creating the set—including his original master tapes—but also employed a top-notch production team (reissue specialist Ron Furmanek and Capitol recording engineer Bob Norberg) that was absolutely dedicated to making this a benchmark set. Both were avid Les Paul fans before the project, and the results testify to their care and dedication.

"Everyone owes something to Les in terms of influence," says Furmanek. "This set is a major event."

It certainly is. Entitled *Les Paul. The Legend and The Legacy*, the set spans four discs and more than five hours of music. It includes several complete shows from the long-unheard "Les Paul & Mary Ford At Home" radio series, originally broadcast in the late '40s and early '50s. Rare B-sides, all of the es-

by Mark Smotroff



sential singles, and one entire disc of unreleased material round out the collection, a hit-by-hit documentation of the roots of multitrack recording and pop electric guitar performance.

From day one, quality has been paramount to Les Paul and his music. Even back in the '40s and '50s, Les recalls that his attention to high-fidelity unsettled many accustomed to less than the best. "It's just one of my things," Les says. "Good quality is terribly important to a hit record. I don't know how many people have stopped me to ask if it is really that important, when it's what's in the grooves that sells."

Les was clearly on the right track. Not only did his recording techniques forever change the way music is made, but today—40 years after they were recorded—they still sound amazingly



**Les Paul and his Grammy Trustees award, presented at the 25th anniversary show in 1983.**

clean despite their age and the wide-ranging conditions under which they were made.

Fortunately, most of the masters still exist. "I like to go back to the original master tapes," says Furmanek. And according to Norberg, every effort was made to locate the best possible tape, as close to the master as possible.

"One of the main criteria with the Capitol Collectors Series is quality," says Norberg. "My goal is to try to get everything we do to sound like it was recorded yesterday. I spent about six weeks working on the set.

"Les sent us new tapes on several tunes," Norberg continues. "We went

back to the original, lacquer 78 rpm discs on three tunes—"Cryin'," "Dry My Tears" and "What Is This Thing Called Love" were mastered direct from the discs." Norberg adds that in several cases, the discs had deteriorated to the point where the 30-ips tape master dubs, originally made in the '50s, sounded better.

Fortunately, Les had the foresight to take every step he could to preserve his master recordings. "We saved our tapes at 30 ips," he says. "The others out there were at 15 ips, so we beat the rap by thinking ahead."

Norberg admits that the majority of Les' recordings were so clean that the Sonic Solutions Sonic System was only essential for those instances where there were ticks and pops, particularly on the disc transfers—and even then, the discs sounded good.

"I have more trouble with tapes from artists in the '70s, with bad Dolby and bad oxide," adds Furmanek.

Les explains how he took sound-quality factors into account even in the original mastering process: "When we mastered from disc, we played it backward. So instead of the attack followed by a clipped decay, it built up. This way it was ready for the shock that was about to happen. I recorded on 17-inch discs recording at 78 rpm, using a 33-1/3 curve, so I could afford to widen the grooves and get much more level on record. I was cutting 80 lines per inch while others cut 230: I was cuttin' cor-duroy pants and doing it backward!"

Tape hiss, however, was a problem, and Norberg has his own process to remove it. "Most of these tracks (on the CD) come from the era when Les was recording sound on sound," he explains. "The hiss goes up 3 dB with every generation. Les did a lot of high-speed stuff, and for that reason it tends to mask the noise. Now, I'm a big fan of Les Paul, and when I used to hear his recordings, I never noticed any hiss. However, when I got into this with a critical ear, trying to make it as good as I could, there was more than I thought.

"I have a dbx 929 single-ended noise reduction unit," he continues. "It is a dynamic filter, so the minute there is any transient or high frequency, the filter opens up. In the absence of high frequencies, it closes down. The side effect is that it tends to dull things. To solve this, I developed a process through my Studer 12x4 console where the signal comes from the tape machine through the single-ended noise reduction [dbx].

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"Buses three and four from the Studer feed a sidechain that includes several components, the end result being a restoration of the high frequencies lost in the 929, without increasing the tape hiss.

"My process works dynamically," he adds. "I can take material that is quite hissy and actually make it brighter and more open, with more high air...and no hiss."

For the final analog-to-digital conversion, Norberg swears by his Pygmy. "It is a 64-times oversampler made by Pygmy Computer Systems in Miami. And it is made for people like me who don't like the harsh and unmusical quality of the analog filter on the Sony 1630. The Pygmy takes the console output and puts it on to the Sonic Solutions."

Compared to the massive reconstruction jobs necessary for the James Brown and Frank Zappa CD reissues, Les Paul's set sounds like a producer's dream: great quality music, excellent source material, legendary status. However, certain tracks needed some clean-up work, according to Norberg. "'How High The Moon,' for example, came off a tape recorded for Les' radio show," he says, "so it was very noisy. 'Jazz Me Blues,' and 'Josephine' were also ones that were very noisy, with no high end."

The best boxed sets on the market have given fans access to rare and unreleased material, and *Les Paul, The Legend and The Legacy* is no exception. Each disc contains a complete radio broadcast featuring wonderful and wacky skits created by Les and Mary as showcases for his new inventions and techniques.

Les Paul recalls: "We created the shows to be interspersed before, during and after the news. I'm not terribly proud of my scriptwriting, but we had to do something. For one, I got the idea to build a whole episode around my new invention, the 'Les Paulverizer,' back when it was just a myth, just schtick. In this episode, it seems Mary thought it'd be good to hook my Paulverizer to her Hoover vacuum cleaner to see if she couldn't vacuum six rooms at a time!"

"What Les did was amazing," Furmanek adds. "Some of the shows had funny themes, but they are clever. Nobody was doing those types of things back then. He went wild. Just listen to the 'chipmunk' things on those radio broadcasts. The Chipmunks didn't come out until about eight years

later."

"In one episode I became concerned about depending too much on electricity, so I tried to invent a gas-powered Les Paulverizer," Les adds. "By then, everybody accepted the electric guitar, but the idea of a gas guitar sounded ridiculous. Still does! So I tried different gases, and the best one was laughing gas, so, of course, we started giggling and getting really silly."

Radio was an important avenue for Les, and his shows offered many outlets for trying out new material, experimentation and a little bit of fun. "Nearly every week we'd dream up some reason to play something a little hokey," says Les. Indeed, silly hillbilly boogies and even a rollicking take of "Hawaiian War Chant" are included.

"'I'll See You In My Dreams' presented more of a challenge," Les adds. "I wanted to see how many dubs down I could go on one tape machine and still be able to hear the first take. I forget the final number of parts, but it was somewhere around 37 or 38—just astonishing."

Also on the set are true stereo recordings of commercials Les and Mary made for Robert Hall Clothing and Rheingold Beer—among the first commercials ever made by major recording artists.

"We did about ten of these, each different," Les says. "They were so big that within a few months Capitol was pleading with us to stop doing them because they were hurting our record sales. In the industry, they were terribly controversial. It was unheard of, and we took some heavy criticism. Of course, after that, other celebrities were clamoring for commercials, and to this day, everybody just dies to get one. Back then, Mary and I were out there all alone."

The future looks bright for the Les Paul and Mary Ford recorded legacy. Les vows that his final Capitol LP, *Time To Dream*, will be reissued in its entirety, as it is his favorite album. Les still performs weekly at Fat Tuesdays jazz club in New York and is considering an album of new material. We'll be listening, Les. ■

*Mark Smotroff is a San Francisco Bay Area-based communications consultant who has served the professional and consumer audio/video industries for many years. He extends special thanks to roving editor Mr. Bonzai for involving him in Mix's February 1985 Les Paul feature.*

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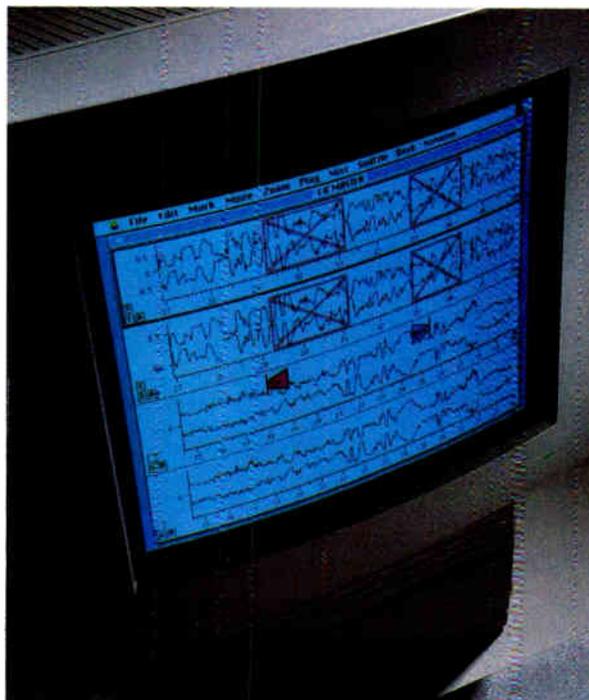


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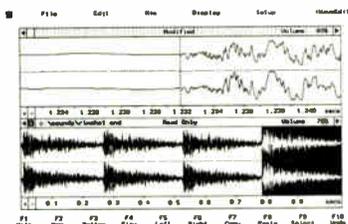
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# Tape & Disc News

**Duplitronics Makes MCA Sale**

Duplitronics, one of two U.S. manufacturers of digital bins for cassette duplication, has placed several of its DM-400 bins at MCA's dupe plant in Gloversville, N.Y. The bins will be high-speed-loaded from masters prepared on Duplitronics MM-100 mastering systems, which were purchased for MCA's mastering facility in North Hollywood, Calif. Duplitronics has also announced sales (primarily of DM-400s with remote mastering capability) to a number of independent plants. The facilities include Evermark in Los Angeles, SAS Industries in Lynchburg, Va., and Tape Transcriptions in New Zealand.

Meanwhile, Duplitronics is keeping busy on the legal front. The company has been embroiled in a patent dispute with rival bin maker Concept Designs, which has led to the filing of a number of lawsuits, including one against giant WEA Manufacturing for using Concept's DAAD system. Now Duplitronics has filed a similar suit against Canadian music manufacturer Cinram, which operates the ARP Media Enterprises dupe plant in Richmond, Ind.

Duplitronics has also filed its response to a recent Patent Office action which upheld only six of its 34 patent claims (see "Tape & Disc News," November 1991). According to company president Jeffrey Binder, the response includes 54 claims—some original, some new and some amended to overcome the patent examiner's objections to claims that were previously disallowed. The claims are currently under Patent Office review.

**U.S. Copyright Office and ABA Call for Performance Right**

The U.S. Copyright office and the American Bar Association have both come out in favor of establishing a "performance right" for artists and owners of musical recordings. At present, U.S. copyright law provides for the payment of royalties only to songwriters and publishers. The actions lend weight to a campaign by the RIAA for the performance right, which already exists in

about 60 other nations.

According to the RIAA, current U.S. law will allow digital cable audio services to profit by electronically offering consumers recordings for which no royalties have been paid (bypassing prerecorded music manufacturers and retailers in the process). That claim is disputed by cable and broadcast groups, who argue that radio airplay provides free publicity for record company products. A contentious showdown in Congress is expected.

**ITA Blank Tape Figures**

The ITA reports that U.S. shipments of blank audio cassettes were up 5.3% in units in 1990 over 1989. The dollar value of the shipments, however, declined 2.5%. A similar trend was evident in videotape, with video pancake shipments up 1.6% in units and off 1.9% in value. VHS cassette shipments, meanwhile, rose 6.3%, while dollar volume fell 4.5%. Beta shipments were off 12%.

**El Mar Turns 25**

El Mar Plastics is celebrating its 25th anniversary as a supplier to the tape business. The company started out in 1966 making reels for 1/4-inch tape, and later expanded into 8-track cartridges and Norelco boxes for cassettes. El Mar now supplies C-0s, cassette and CD boxes, hubs, cores, reels and component parts for cassette shells.

**New TDT Facility**

Tape Duplication Technology opened a new manufacturing and technical support facility in Hong Kong. The company offers "remanufactured," high-speed audio duplication gear as an alternative to the purchase of stock new equipment. The idea seems to be catching on, with orders currently in progress for Coastal Productions (Tampa Bay, Fla.), Mastertape Audio (Wichita, Kan.) and Trackmaster Inc. (Pompano Beach, Fla.).

**3M and Burlington Earn Label Recognition**

3M Corporation and Burlington Audio Tapes have been recognized by the SJK Foundation for their help in keeping nursing home residents entertained. The foundation maintains Mobile Audio Library Carts in the homes, giving residents free access to cassette recordings of books, magazines and radio shows. The two companies sponsor the SJK program in Long Beach, N.Y. In thanks for their contribution, the



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16. It works as well on stage as in the studio
17. 16 Bit Linear conversion
18. It's easy to program
19. It's easy to hook up
20. It works great in my MIDI system
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22. It works great with my bass rig
23. My flute sounds better through it
24. 20Hz to 20kHz Bandwidth
25. 127 MIDI sources can modulate any of 57 parameters
26. Works great in any country
27. You can take it on cruise ships
28. Everybody in Hollywood thinks it's cool
29. They use it back East
30. They use it out West
31. The North and South think it's great
32. Affordable enough for demos
33. Perfect for masters
34. It will be with you throughout your career
35. Those cute buttons with the little lights
36. Pressure sensitive programming buttons!!
37. The chorus is unreal
38. Reverb + chorus Programs are awesome
39. Pro engineers can't believe it's so inexpensive
40. They've got one in every room where I rehearse
41. I need one in my rack and one at home
42. The vocals stunk until I added the Quadraverb
43. Instant vocal doubling + chorus + reverb + eq
44. My guitar finally has a voice
45. 20 Bit processing
46. Incredible resolution for perfect reverb tails
47. It sings
48. Fills in the cracks of my keyboard
49. It's like a synthesizer for processing
50. There's no better reverb
51. The multitaps are unbelievable
52. You can delay up to 1.5 seconds
53. With everything on, there's still 800ms of delay
54. The price is unbelievable
55. All Alesis reverbs are great
56. It makes my drum machine sound real
57. It was the finishing touch on my demo
58. ...and my demo got me a deal
59. It's great to borrow, but better to own
60. Late at night under headphones I leave the planet
61. My mixes sound like movies
62. My speakers sound bigger
63. Close your eyes and you're there
64. For a successful music career
65. For birthdays
66. For Christmas
67. The auto-panner is great
68. Michelangelo would have used one
69. It gives me new keyboard sounds for free
70. It's so musical sounding
71. It's as wet as you can get
72. Use as much as you like
73. The resonators are great for guitar
74. The ring modulators are great for sci-fi
75. The sampling is a cool convenience
76. You can automate parts of your mix
77. It's a necessity
78. The specs are great
79. It makes my ears feel better
80. It makes A & R departments hear better
81. I'd be lost without it
82. I don't need it at the beach...but I might
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86. Alesis loves me
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foundation has begun using labels identifying the sponsors on all cassettes in the cart.

**SPLICES**

The Society of Vacuum Coaters will hold its 35th annual conference March 22-27 in Baltimore, MD. Sputtering, evaporation, optical coatings and thin film technology are among the scheduled topics. Call (505) 298-7624 for further information...Martin Audio (Seattle, WA) has tripled its real-time duplication capacity, bringing its KABA copy positions to 50 and adding a tapeless digital drive which allows duplication in both directions at once...American Helix reports that it was the "official CD manufacturer" of the 1991 New Music Seminar in NYC. The Lancaster, PA-based company introduced attendees to a number of new products, including its five-color PictureDisc, glow-in-the-dark labels, colored polycarbonate substrates and the C-Case, an "environmentally correct" package for CDs...Automatic Inspection Devices of Toledo, OH, has entered into a sales and service agreement with Robi-System for sales and service



*(Left to right): E.J. Foegle of 3M; Ruth Schwartz of Burlington; Stephanie Joyce Kahn, president of the SJK Foundation; Steve Sarmuksnis of 3M; and Rudy Schwartz of Burlington.*

of the company's optical disc inspection gear in Europe...Frankford/Wayne in New York City reports mastering projects by Carlton Batts for the East/West, EMI and Motown labels...Lyrec (Skovlunde, Denmark) has announced the sale of a Master P-4400 and four slaves to high-speed duplicator Galvomat of Belgium...Modern Videofilm has installed 501 VHS duplication positions in its Hollywood facility. The company chose 167 JVC BR-S777U three-in-one duplicating decks...Europadisk Ltd. of New York City completed mastering of two albums for

Wynton Marsalis and one for brother Branford Marsalis. Europadisk also did projects for the Warner Brothers, East/West and Luaca Bop labels...Audio Magnetic Professional Services of West Palm Beach, FL, introduced a non-wearing ceramic capstan sleeve designed for the ElectroSound 8000 system. For more info, contact AMP Services at (800) 826-0601, or in FL (407) 659-4805...Kewall Real Time Tape Duplicators (Bay Shore, NY) added its second DAT recorder and will be adding 25 real-time cassette decks to increase its total to 100...

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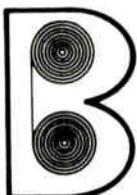
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—FROM PAGE 42, MINI DISC AND DCC

*portability, convenience, extra features and consumer appeal?*

**Mike Piehl:** I haven't heard MD. But I assume the fidelity is similar to DCC, and if so, it's excellent. And I think they're roughly comparable as far as portability. But one important difference is that any DCC player will play back a consumer's existing analog cassette library. Another nice feature is the text display capability. You can put seven languages simultaneously on the tape. That's an advantage for the software industry, because the text infor-

mation cannot be copied in a digital copy to a blank DCC. So it adds additional value to the prerecorded tapes. **Ed Outwater:** I don't know about the fidelity. I think they are pretty similar as far as the data-compression schemes they use. But nobody in our industry, except perhaps some people at PolyGram, has had the chance to make an A/B comparison between a source tape and either a DCC or an MD. That's the acid test, and, ultimately, that's going to have to be done.

Regarding portability, DCC, being a tape format, is probably less prone to problems from dirt and being bounced around. But MD, if it does get bounced,

can play out of memory for quite a bit of time, so you wouldn't even notice it. Definitely some of the strong points of DCC are convenience and durability. We really don't know about MD yet.

As far as consumer appeal, I think that the general impression of the consumer over the past few years is that optical technology is better than tape technology. So the seed has been planted that the optical technology is the technology for the future. Whether that is true or not, I can't say. But that impression is out there.

**Leonard Feldman:** From what I've heard so far, I'd have to say the fidelity is about equal. For portability, I like MD better, because it will be impervious to vibration and shock due to the built-in memory buffer, which will prevent mistracking. Also, the prototypes of DCC portables that I've seen were quite large, somewhat larger than a good-sized Walkman, whereas the MD prototypes were quite small, especially for the player, which is what one would carry about. Of course, there are going to be a lot of DCC manufacturers, so I'm sure there will be those who will try to make something smaller than what Philips has shown us.

MD also has the instant access, which is a plus of any optical format. I think MD would be more convenient. As far as extra features, the DCC text display is a good feature. I like it. But I suspect that they could do the same thing with MD, though they haven't actually said so. So that may be a plus for DCC in the first generation of hardware.

In terms of consumer appeal, I wouldn't discount either one of them. There may be a place for both. In a car application, for example, I think DCC would win out, because people are accustomed to popping a tape into a slot, whereas my experience with CDs is that it's an awkward system for a car if you are talking about a single-play machine. But in terms of the Walkman-type of portable, I think MD has the edge. So they may coexist.

*What criteria do you think the major labels will use to decide which, if either, of the formats to support with software? How soon do you expect the decisions to be made? What outcome do you expect?*

**Piehl:** Software support is the big difference between DCC and MD. There is no such thing as succeeding in a mass consumer market without software

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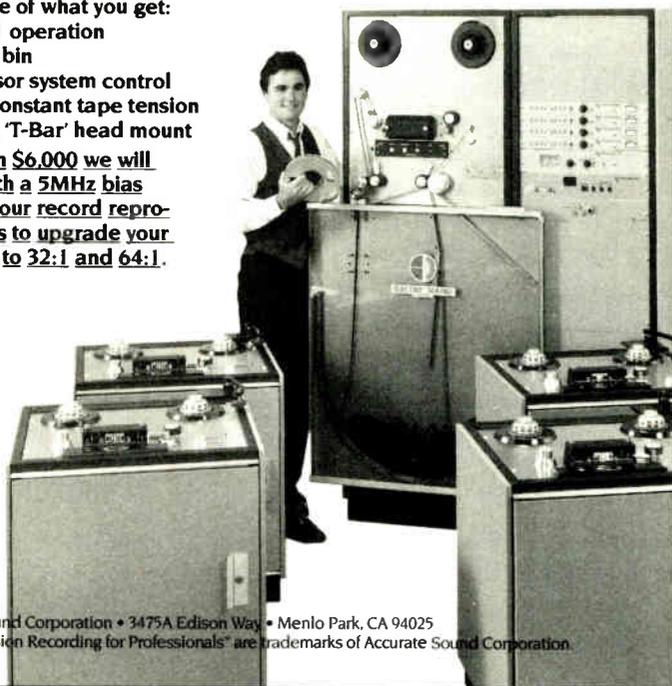
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support. Virtually every major record company has already publicly announced their support for DCC. Even since MD was announced, more and more people have come onboard for DCC. But thus far, nobody has publicly supported MD software, including Sony/CBS Records. They are still thinking about it. So support for MD remains to be seen.

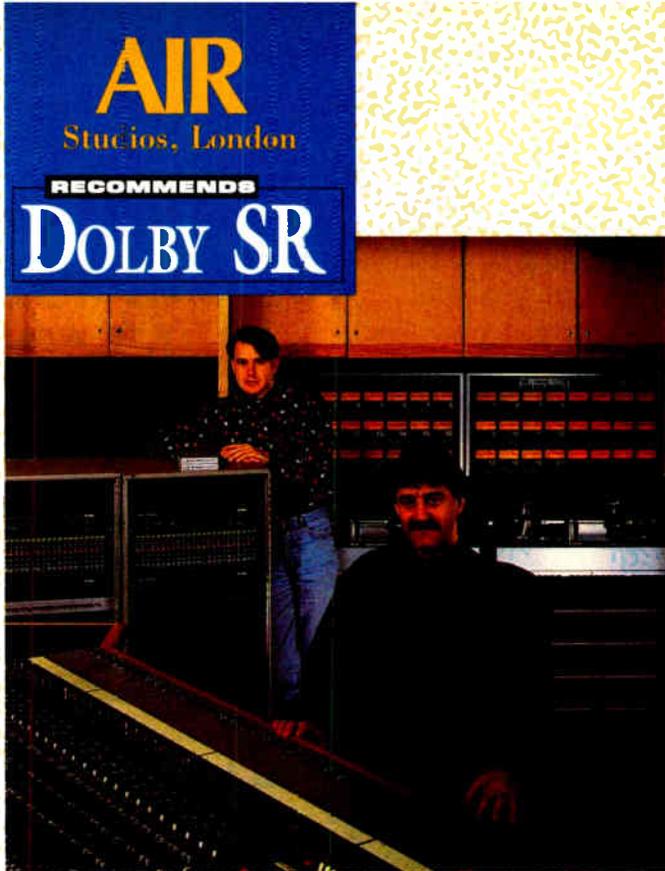
I think that one reason DCC already has the support is that it's not that dissimilar from the analog cassette. People are clearly comfortable with a tape format, because the compact cassette is far and away the largest music carrier in the world. The duplicating machines can be retrofitted for DCC relatively inexpensively. And the retail display systems now in place need no conversion to accommodate DCC.

**Outwater:** Warner Music Group has endorsed, in principle, both formats. In other words, we think that it's a good idea to give both of these formats a chance, assuming that the apparent resolution of copyright concerns becomes final. But we don't yet have all the information necessary to make a final judgment on the formats. The quality of the reproduction will certainly be a consideration, as will durability. And there is the cost of manufacturing. But the primary consideration will be consumer acceptance in the marketplace.

Because of previous negative experiences in trying to launch a format without prerecorded software available, there has been an effort by the hardware manufacturers to involve the music companies in the DCC launch. And I assume that will also be true with MD. So what will happen is that both formats will be out there, to some degree or another, for some period of time. And once the music companies are satisfied that prerecorded product can be produced successfully and economically, and that people seem to want it, then we as an industry will give it to them. And then we'll see what happens.

I've heard people say that the formats will be able to coexist, but my opinion is that they will be competing for the same market. So one format will succeed as a major format, and one won't—or it will end up as kind of a fringe format like DAT. In the final analysis, it will be the marketplace that will decide.

See Page 168 for Reader Service



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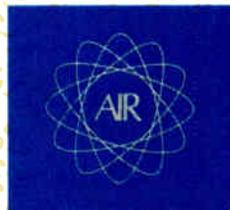
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stock (chrome or cobalt-ferric), Dolby S-encoded, duplicated from a digital bin to HX-Pro-equipped slaves, and always containing all the material found on the corresponding CD release. What effect, if any, might that have on consumer interest in data-compressed digital formats like MD and DCC?

**Piehl:** Very little. I think that the public perception of the analog cassette, no matter how well-recorded, is that it is an older format, which is not on par with CD. But consumers will perceive DCC—because it is a digital medium—as being on the same performance level as CD. I don't think consumers will ever put an analog tape in that same class.

**Outwater:** The only downside of that idea is the nature of the analog cassette mechanism. It gets back to an old problem, and that is playback azimuth. You can do all the things you listed, but if you don't have the correct match between the way the cassette was recorded and the way it's played back (i.e., playback azimuth), you lose everything. Because of that catch, you can't guarantee optimum sound reproduction the way you can with a digital format. So the cassette becomes, by definition, a secondary format in terms of quality.

If you could somehow guarantee correct playback azimuth, the analog cassette would be a killer format. And if the hardware people got it in their minds to do it, they could. But in my experience, they aren't interested. They seem to be more interested in promoting new formats, and the hardware that goes with them, than in selling more analog cassette decks with this added azimuth feature.

**Feldman:** I think it would have a profound effect. I think in that case there would be a real resistance to either new format. I've heard Dolby S, and it's pretty remarkable. It's a marvelous improvement, and I highly respect it. But again, you'd have to develop a base of Dolby S-equipped recorder/players. If you have Dolby B, there is some measure of backward compatibility, and the casual listener would probably be content with that. But the person who really cares about perfect compatibility would go out and buy an S machine. ■

*Tape & Disc editor Phil De Lancie is a mastering engineer at Fantasy Studios, Berkeley, Calif.*



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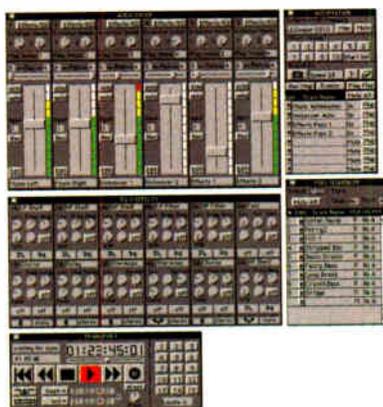
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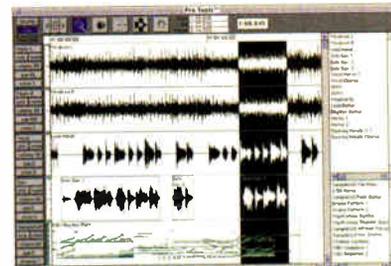
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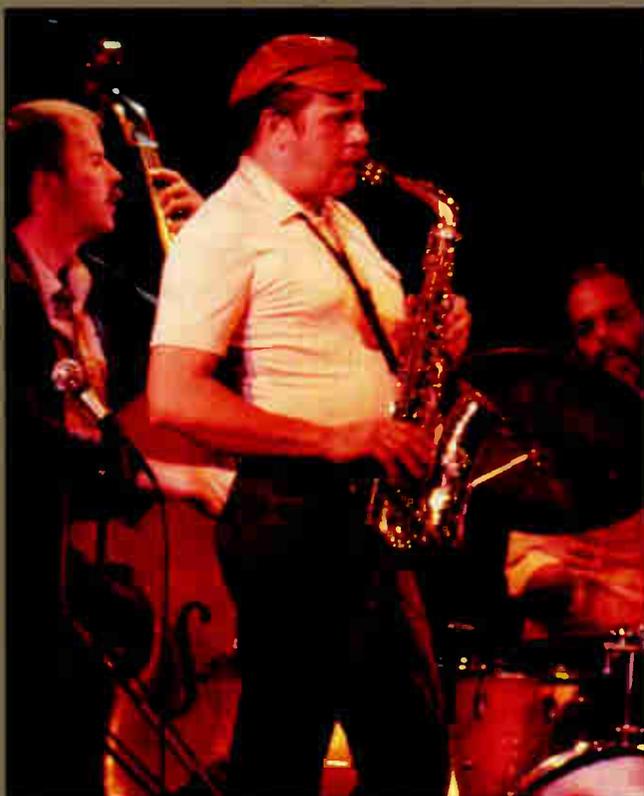
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by Mr. Bonzai

# PHIL WOODS

## HARD BOPPER IN FULL SWING

PHOTO: WALTER BREDEL



An evening with Phil Woods is proof that jazz is alive and well, still kickin' after all these years. His Quintet is sweet, hot poetry in motion, with Woods bopping around the band and then stepping back to let each player shine individually. Airtight rhythms keep the music rock solid, down-to-earth, a foundation for fiery flights of free-form improv.

Juilliard alumnus Woods cut his first records in the mid-'50s and nailed his reputation as one of the most inventive of the Hard Boppers. His command of the alto saxophone and clarinet, both as soloist and ensemble player, has powered him right into the '90s. He's performed and recorded with Billie Holiday, Benny Goodman, Bill Evans, Michel Legrand, Thelonius Monk, Dizzy Gillespie, Quincy Jones and Lena Horne. A four-time Grammy winner, Woods has been honored as an Officer

of the Order of Arts and Letters by the French government, and he's dominated both critics' and readers' polls in *downbeat* for the last two decades.

Let's meet Phil Woods, a pioneer and leader, a legend in full swing.

**Bonzai:** Caught your show last night at Catalina's—a great band. And I understand you have been recording.

**Woods:** Yeah, we recorded three nights. We're sort of a cottage industry, with my drummer Bill Goodwin producing our records. We just deliver finished product to various companies. Never had the luxury of a long-term contract, but we were with Concord for four years. This new one is for Milestone. We set up the gear in the dressing room, using a hard disk format, a couple of DATs and an analog for safety. I just heard the recording, and it's absolutely stupendous. The cats went over yesterday and checked everything out. We've always prided ourselves on the sound of our recordings. We ran an 8-track just in case it might need some touching up, but we won't have to use it. Everything is in perspective.

**Bonzai:** Nice to just go in and lay it down...

**Woods:** Well, we're a well-rehearsed band. We don't go into a studio or live recording situation until the material has been played live for at least six months. And we always use the same engineers: Jim Anderson on the East Coast and Chris Fischera out here. Chris really knows the group, and we've got a nice rapport. He's an extension of our family. And we are a family—you have to be at these prices. [Laughs]

**Bonzai:** And Bill Goodwin has been your drummer for 18 years?

**Woods:** Yes, and Steve Gilmore has been my bass player since then, too. The three of us have been together for a long time, and we picked musicians

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who are sensitive to what we're doing. You've got to have the right cats—Hal Crook on trombone and Jim McNeely on piano.

**Bonzai:** What does Bill contribute as the producer?

**Woods:** He just knows how it's supposed to go. I can concentrate on playing and formatting the set. This new record is essentially a set, just as we played the first set at Catalina's. If you want a live recording, that's what the Phil Woods Quintet does. It's not a phony sequence; it's just as we play it live. Bill takes care of the million details—comes out a few days early to get together with our engineer, check out the equipment and work with the club. Makes sure the engineer gets fed and picks up the tabs. I just sign the checks. He's my brother-in-law, so I trust him. [Laughs]

**Bonzai:** With jazz, the work is really on the line. You might have the ruthless critics, and you have the newcomers.

**Woods:** And we have a wide range of musician/friends coming in. I was in the office getting my horns together, warming up the clarinet, and who walks in but Artie Shaw. He says, "Are

you playing tonight?" And I laughed and said, "No, Artie, not tonight!" Bud Shank introduced us on the opening night of recording. Ross Tompkins, from *The Tonight Show* band, dropped in. About twelve trombone players came by to check out Hal Crook. We got a nice range of people I respect.

I miss playing to just the folks, though. Fridays and Saturdays, the more astute listeners usually don't come out, in general. Most of the cats come in early in the week. I expected the weekends to be really swinging, what with all the publicity. I was disappointed with the turnout. It looked like Tuesday night in Oklahoma City. But who can figure? And it's not a cheap joint. Jazz is no longer cheap, like it was when I came up. It's almost become a foo-foo kind of art, too expensive for the kids. It's the nature of the beast. I think there are enough festivals around, but that isn't the same as going to a club.

**Bonzai:** It's unfortunate that jazz is so much more appreciated in Europe and Japan, away from its homeland.

**Woods:** And the Japanese in New York City are often about 35% of the audience. Without European tours and Japan, I don't think I could keep the

Quintet going.

**Bonzai:** Benny Carter was one of your early heroes...

**Woods:** I think anybody who plays the alto would have to say ten Hail Marys to Benny Carter.

**Bonzai:** It's been said he literally defined the jazz alto sax.

**Woods:** He's been doing it since the beginning of jazz. He was playing with Charlie Parker in the heyday. Prior to that he was in the swing bands. He was one of the first expatriate musicians to go to Europe and turn on the audiences, for which we are all reaping the rewards.

**Bonzai:** And you just had a recording reunion with Carter—84 and still kickin'.

**Woods:** "My Man Benny, My Man Phil." It's actually Benny's recording, but we share the limelight.

**Bonzai:** A surprise to hear singing, too.

**Woods:** Yeah, that was a kick.

**Bonzai:** I'm told you inherited your first sax from an uncle.

**Woods:** My uncle died when I was 12. I had been spotted opening up the case, because I knew where he kept the alto. I liked the gold shininess, and the pearl and all that. In my larcenous mind, I was probably trying to figure

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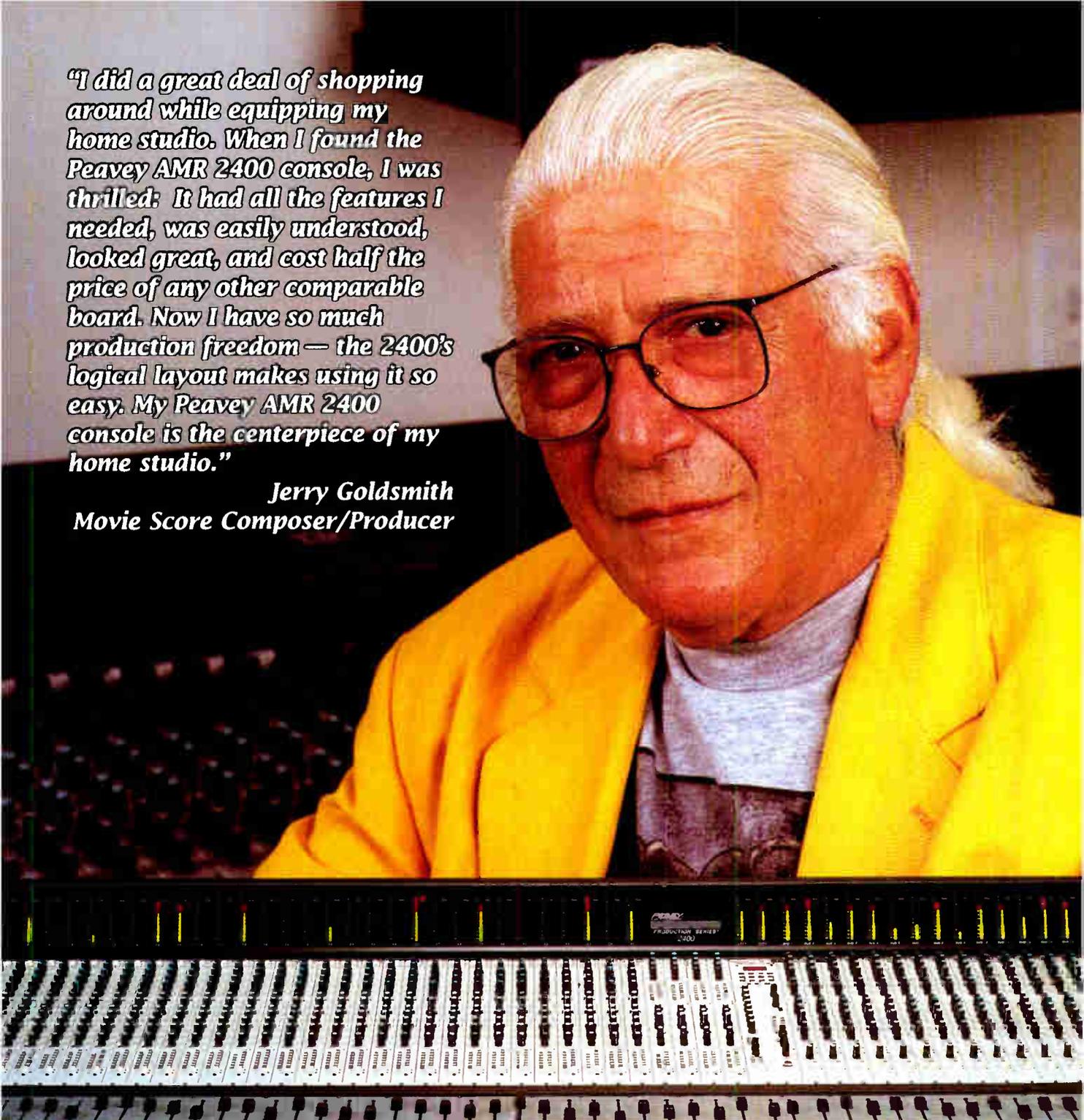
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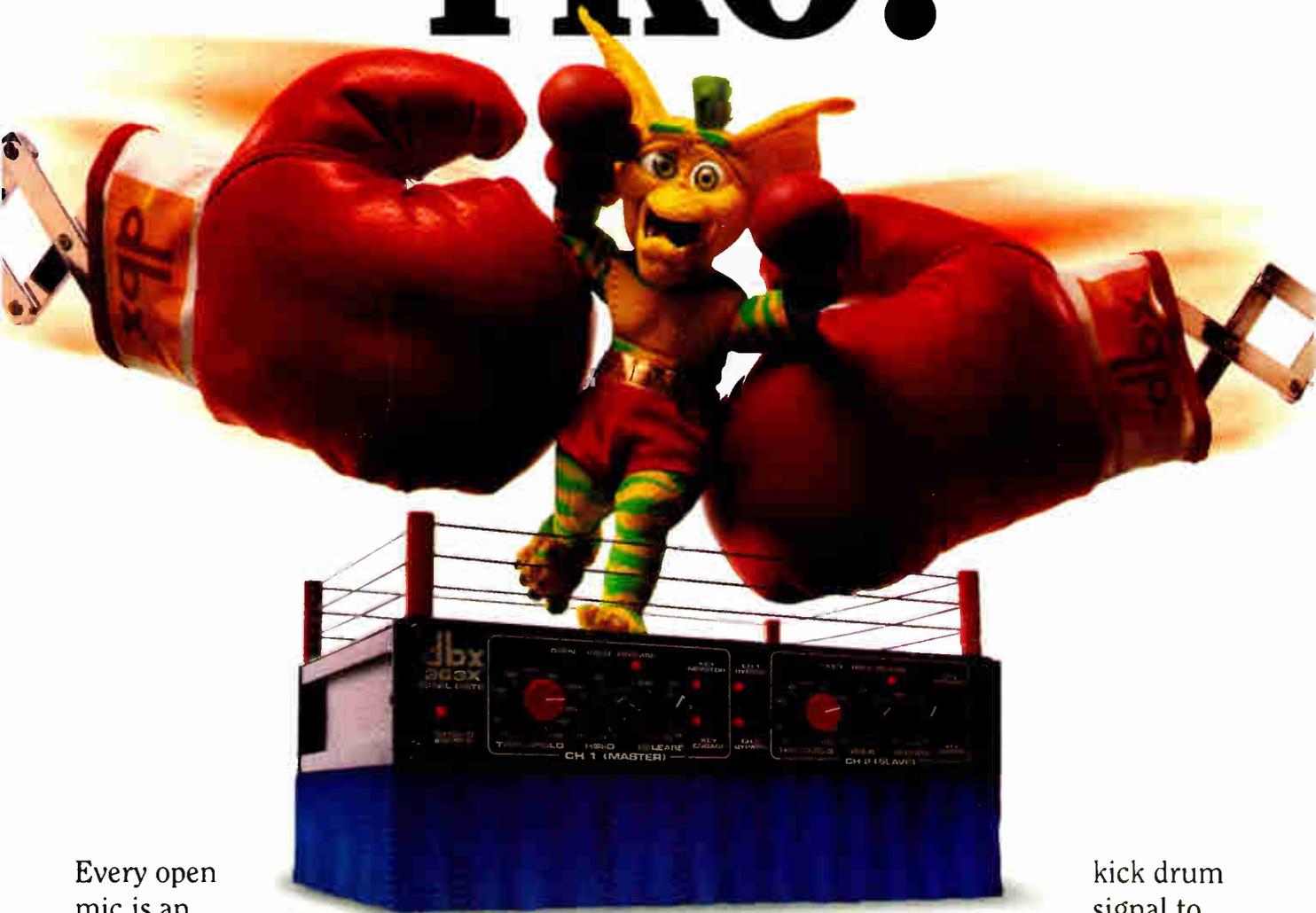
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out what it would get me if I melted it down. When he passed on, I was given the saxophone.

**Bonzai:** When did the jazz passion grab you?

**Woods:** I was 14. I saw Johnny Hodges with Duke Ellington's band, heard my first Charlie Parker record. It came into focus for me. I grew up with a good peer group of musicians in Springfield. We had this band, and I was the youngest of the group. Joe Morello was our drummer, ended up with Brubeck for 17 years. Morello did the famous "Take Five" solo. Chuck Andrus played bass; he worked with Woody Herman for years. Hal Sara was the piano player, lived two doors up the street from me. Sal Salvador went on to play guitar with Stan Kenton.

**Bonzai:** Did you give up all your school studies to go for the music?

**Woods:** No, I was pretty good in school. All these guys I was playing with were going to New York, so I enrolled at Manhattan School of Music, studied Mozart in the daytime and Charlie Parker at night. Transferred to Juilliard and did four years as a clarinet major, composition minor. I was in New York from '47 to '51 at the Conservatory.

**Bonzai:** How did the academic studies help you?

**Woods:** I'm a much better musician from having studied the old-fashioned way, from Beethoven, Bach and Brahms. I have much better insight into Art Tatum, Charlie Parker and Dizzy Gillespie. I get a little scared when I think of people going to school just to study jazz, not doing species counterpoint, as boring as it might be, and the old-fashioned ear training. Being able to read a Bartok score. Just studying jazz is too limiting. You have to learn about music. The same rules apply, and just focusing in on the jazz...but a good student will listen to Stravinsky and Bartok, and flesh out an education. You see, there weren't any jazz schools in those days. I had no choice. If you wanted to be a musician, you went to a conservatory. In those days, you couldn't even major in the saxophone. I majored in clarinet. Sax was still a military band instrument.

**Bonzai:** You mentioned Charlie Parker. Did you know him?

**Woods:** I wouldn't say that anybody knew Charlie Parker, except maybe his wife, Chan. But he knew me—always

asked if I had enough to eat. Played a few sessions together. He played my horn one time when I was working in the Village at a place called The Nut Club, a stripper's joint. When you walked in the door they handed you a wooden hammer so you could beat the shit out of the table in favor of your favorite stripper. Gil Evans used to come in and sit in on piano.

Anyway, I was playing for strippers every night, rendering "Harlem Nocturne" on an hourly basis. I was going through this thing—I didn't know if my horn was okay, if the reed was happening. I didn't like the mouthpiece. I was having a crisis with the instrument.

I heard Bird was across the street. He was playing a saxophone that belonged to Larry Rivers, the painter. Larry used to carry it around in a gold lamé sack. It was a terrible horn. Bird was trying to play this baritone sax. I said, "Mr. Parker, perhaps you'd like to use my alto?" He said, "Yeah, that'd be nice, son."

You want to see me run across Seventh Avenue? I was stopping traffic. I got my alto and ran back to the club. I handed him my horn and he played "Long Ago and Far Away" by Jerome Kern. He played the shit out of it. I realized there was nothing wrong with my saxophone. [Laughs] And then he

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handed it back and told me to play. I did the best I could, and he said, "Sounds real nice, son." Man, I went back to work, and this time I didn't have to stop traffic—I was walking above the cars. And I played "Harlem Nocturne" like I'd never played it before.

**Bonzai:** In your mind, what was Charlie Parker's essential contribution?

**Woods:** I'd like to quote Dizzy: "He gave us the vocabulary." The vernacular, the language. Dizzy was already exploring the harmonic possibilities, but he was still coming out of Roy Eldridge phrasing. Bird gave us the whole way of how to phrase and change that 2/4 pulse to the 4/4 pulse. How to play over the bar line. He gave us all that, plus he was an improvisational genius. Raw, pure energy. It poured out. Between Dizzy's thing, the harmonic sophistication and the introduction of Latin rhythms, and Bird's language—the way that the music is spoken—it changed the whole goddamn planet. The planet may not be aware of it, but I know it changed.

I've taken part in several State Department tours. At the highest levels of

our government, when they wanted to put their best foot forward, they sent Dizzy Gillespie, Duke Ellington or Benny Goodman. Not so much now, since the Reagan legacy, but when there was money for this sort of thing... So you've got these tours, and a lot of jazz education, but there's really no jazz business. It's a scuffle, because we have more musicians than we'll ever have gigs. And the recording industry—it's all done by three guys with EWIs.

**Bonzai:** But you've taken charge of your recording career.

**Woods:** I came out of the New York recording scene. In New York, from the mid-'50s to the mid-'60s, the recording situation was swinging. Quincy Jones was there, along with a lot of the Hollywood composers. That's where the major work was done, and it was usually done with a big band. You'd see five saxes. Plenty of work. I did pretty well. And the music was of a very high caliber.

When things changed and a guy playing three chords wrong could play Yankee Stadium for megabucks and sell millions of records, the business changed. The industry moved to the West Coast, and the electronic thing

happened, and the bands were cut down.

**Bonzai:** So you're not too impressed with the way the industry has evolved.

**Woods:** It's not my job to be pleased. I prefer to be a thorn in the side of the whole music establishment. I think they're a bunch of assholes. I'm about to turn 60, and I have no points to prove anymore. I'm comfortable playing the music I believe in. You've only got one shot in life. If you don't have the passion of your convictions, then you have to live with it. If you want to be part of the music industry, that's fine. I get cats coming up to me and saying, "Oh, man, next year I'm getting out of this town, and I'm gonna join you and play some jazz." Well, do what you have to do. Enjoy life. You don't have to join me. I don't recommend it.

**Bonzai:** You played on Billy Joel's "Just The Way You Are." I'd like to hear about your experiences in the rock world.

**Woods:** I touched the rock world with Billy Joel, recorded "Dr. Wu" for Steely Dan. Worked with Phoebe Snow. Had a short burst on "Still Crazy After All These Years." "Just The Way You Are" would be my best-known. In fact,

—CONTINUED ON PAGE 167

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It was a night of excitement and anticipation in the Big Apple as more than 700 audio industry professionals gathered to honor the nominees and winners of the seventh annual Technical Excellence & Creativity Awards.

Held October 5 at Manhattan's Grand Hyatt Hotel, the 1991 TEC Awards recognized 21 winning companies and individuals, voted the best of the year by *Mix* subscribers. Ably hosted by video and recording artist "Weird Al" Yankovic, the evening's festivities also included the induction of Ray Dolby, M.T. "Bill" Putnam and Bruce Swedien into the illustrious TEC Awards Hall of Fame.

For the first time, this year's voting saw three ties. Walters-Storyk Design Group and Russ Berger Design Group took top honors in the Acoustics/Studio Design Company category; the Alesis SR-16 and the Roland S-770 tied in the category of Musical Instrument Technology; and the Sabine FBX Feedback Exterminator and the TC Electronic 6032/1128 Remote Equalizer both took home TEC Awards in the category of Sound Reinforcement Product of the Year.

This year's ceremony also marked the introduction of the Les Paul Award, named for the pioneer of multitrack recording and the electric guitar, and presented to institutions and individuals who have set the highest standards of audio professionalism. The Les Paul Award was presented by Les Paul to Gene and Roy Clair of Clair Brothers Audio, world-renowned sound reinforcement company; Bob Ludwig, mastering engineer extraordinaire of New York's Masterdisk; and Tony Bongiovi and Bob Walters of Power Station, New York City's world-famous recording studio. All three recipients are multiple TEC Award winners.

Prior to the awards ceremony, presenter Art Garfunkel, emcee "Weird Al" Yankovic and a host of other celebrities attended a reception where Capitol Records recording star Les Paul autographed a classic Gibson guitar. It will be auctioned off at a later date by the nonprofit Mix Foundation for Excellence in Audio, sponsor of the TEC Awards, with the money going toward research into the treatment of deafness and hearing impairment and for audio education scholarships.

# THE 1991 TEC AWARDS



Emcee "Weird Al" Yankovic as he moaned, groaned and joked his way through the awards ceremony.



Presenters Will Lee and Suzanne Ciani before their appearances on stage.



Ray Dolby (l) accepts the TEC Awards Hall of Fame plaque from *Mix* magazine editor-in-chief David Schwartz.

Half of the proceeds of the TEC Awards go to the House Ear Institute's "Hearing Is Priceless" (HIP) campaign, co-sponsored by *Mix* magazine, to educate the public about the danger of listening to music at excessive volume. The balance goes to the Society of Professional Audio Recording Services; the Audio Engineering Society Educational Foundation; and Full Sail Center for the Recording Arts (winner of the Recording School/Program category), as well as the other recording school nominees, for audio scholarships.



Les Paul signs a classic Gibson guitar while House Ear Institute representative Michael Stanley, MFEA director of development Penny Jacob, and Gibson Guitars representative Jimmy Archey look on.

PHOTOS: GARY GERSHOFF



# 1991 TEC AWARDS WINNERS



▲ (L-R) *Mix* magazine editor-in-chief David Schwartz, TEC Awards executive director Karen Dunn, AES Educational Foundation representative Emil Torrick and TEC Awards executive producer Hillel Resner.

▼ (L-R) Hal Blaine presents Bob Clearmountain with his second TEC Award of the evening. Clearmountain garnered TEC Awards for *Recording Engineer* and *Remote/Broadcast Engineer*.



Recording artist Jon Lucien (l) congratulates Mike Pinczek on winning his TEC Award for *Sound Reinforcement Engineer*.

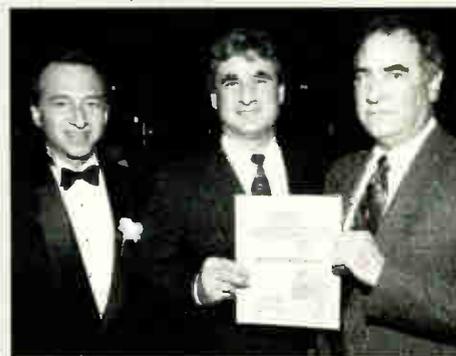


▲ George Mussenburg, a 1990 Hall of Fame inductee, congratulates 1991 Hall of Famer Bruce Swedien.



Ex-SPARS president David Teig (l) congratulates Lexicon's Ron Nownan for winning the TEC Award for *Signal Processing Technology* for the Lexicon 300 Digital Effects System.

▼ (L-R) David Schwartz with Roy and Gene Clair of Clair Brothers, Les Paul Award winner and TEC Awards Silver Sponsor.



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### Audio Post-Production Facility

Post Logic Inc., Hollywood, CA

### Remote Recording Facility

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Full Sail Center for the Recording Arts,

Winter Park, FL

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Bob Clearmountain

### Remote/Broadcast Recording Engineer

Bob Clearmountain

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### Sound Reinforcement Engineer

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### Audio Post-Production Engineer

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Ray Dolby

M.T. "Bill" Putnam

Bruce Swedien

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Bob Ludwig

Clair Brothers Audio

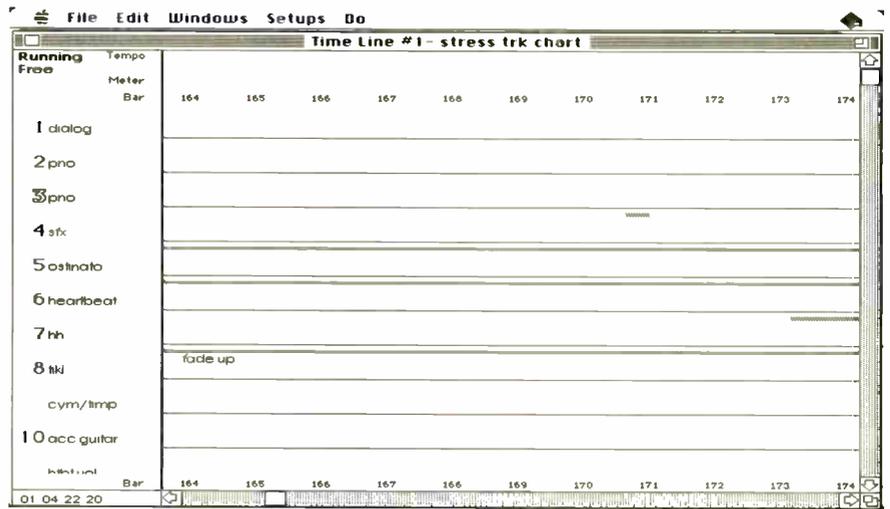
Power Station

## THE BYTE BEAT

out to its corresponding instruments. However, the program allows the user to send MIDI messages (such as volume or program change) to a single MIDI channel. While this feature is useful for changing a reverb setting or making a last-minute level adjustment, I'd like to see it expanded in future versions of Track Chart to include full MIDI playback; Opcode has responded positively to this suggestion.

When used with MIDI Manager, this version can run concurrently with a sequencer, which allows simultaneous MIDI playback while viewing a Track Chart time line. And I know of at least one user who has decided that the additional investment of a Mac Classic running Track Chart in sync with his sequencer on his primary Mac was worthwhile in terms of achieving low-budget, full automation.

Track Chart has a number of other useful features, including design and printing of console fader labels, tape box labels and cassette labels. Add its value as an archiving, printing and time-line viewing tool, and Track Chart is a valuable asset to a busy Mac-based



**Information can be displayed as a function of time in Track Chart's time line window.**

studio at \$179.95.

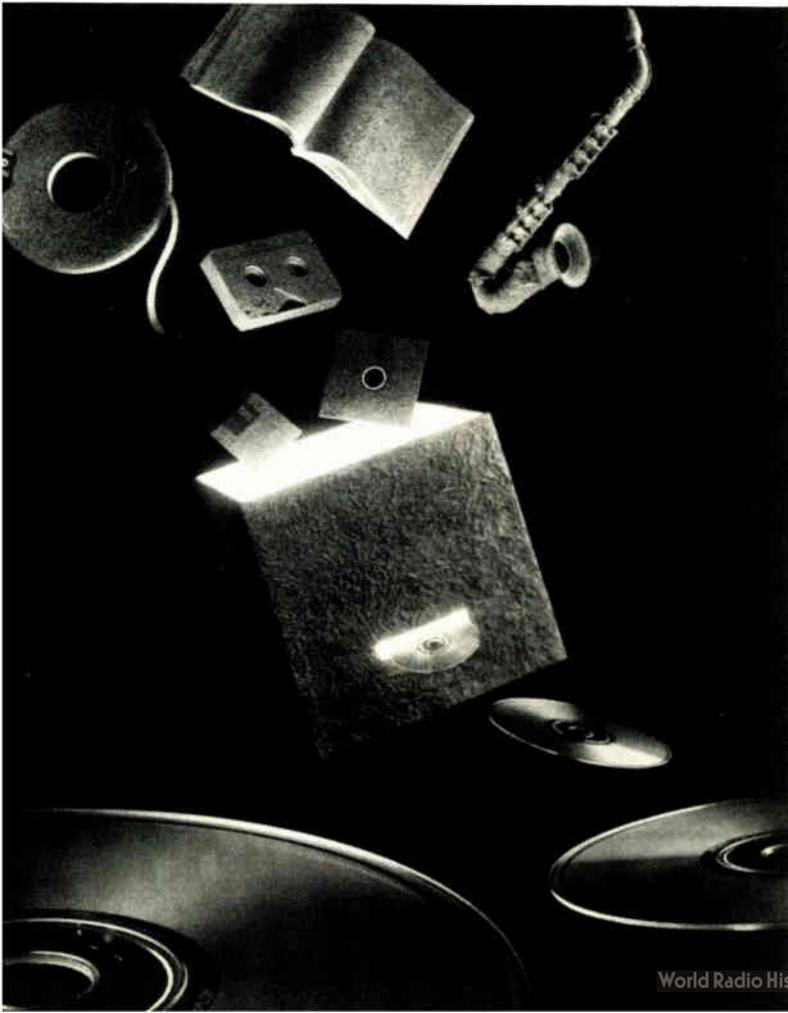
Opcode Systems, 3641 Haven Dr., Suite A, Menlo Park, CA 94025; (415) 369-8131.

### JL Cooper's Answer to the Mouse

In their never-ending quest for alternatives to the Macintosh mouse, developers have come up with some ingenious designs, among them the

trackball, pen and voice-command module. Now there's JL Cooper's CS-1, the interface designed with audio in mind. Developed for Digidesign's Sound Designer II, the CS-1 goes a couple of steps further by providing "transport" control for both Performer and Vision sequencers, and optional editing software allows presets for any Macintosh application to be created,

—CONTINUED ON PAGE 78



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## Multimedia Chip Shots

### Passport Designs Audio Trax and Media Music

Audio Trax is a Macintosh program from Passport Designs (Half Moon

record and play back digital audio directly from the hard drive. Other Mac II and SE30 machines require only a Farallon MacRecorder with sound input driver. Audio files are AIFF standard, allowing for editing from Passport's Alchemy or Farallon's Sound Edit software. Audio Trax supports Apple's MIDI Manager, and files can be linked to MacroMind Director and other presentation programs using HyperCard. The program is available for a \$299 suggested retail price.

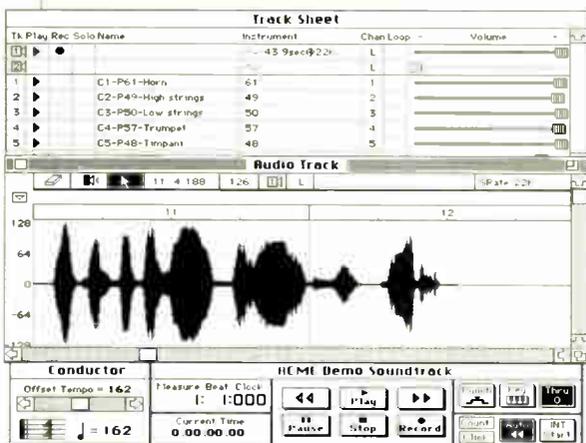
The Media Music Sampler, also from Passport, is the musical equivalent of "clip art" on CD-ROM. Designed for use with multimedia presentations, this CD-ROM of original production music is available in the following formats: 16-bit CD Redbook Audio (44.1 kHz), 16-bit stereo AIFF (44.1 kHz), 8-bit mono AIFF (22 kHz), 8-bit mono SND (22 kHz) and MIDI (Type 1, Type 0 and Master Tracks Pro). Also available is a

CD-ROM for the PC with equivalent formats. The Media Music Sampler includes more than 20 song clips of production music in various lengths and musical styles, at a list price of \$99. With the purchase of Media Music, you also get a royalty-free right to use the music in non-commercially distributed presentations. Commercially distributed usage requires additional licensing fees.

Circle #250 on Reader Service Card

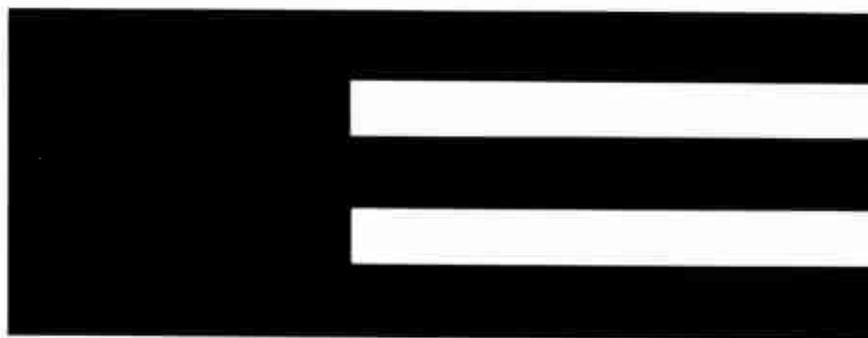
### Sundance Desktop Video Editing System

Sundance Technology Group (Irving, TX) has released Version 1.0 of its Sundance System: video post-production software and hardware for the Macintosh. The system includes Q-BASE Scene Logging Database; Q-CUT Editing Software; and MMI, a proprietary multimedia interface that connects to the modem port, enabling control of up to 15 source machines. Events from Footage Logs created in Q-BASE can be located by key word search and imported into Q-CUT for editing. The MMI also provides video

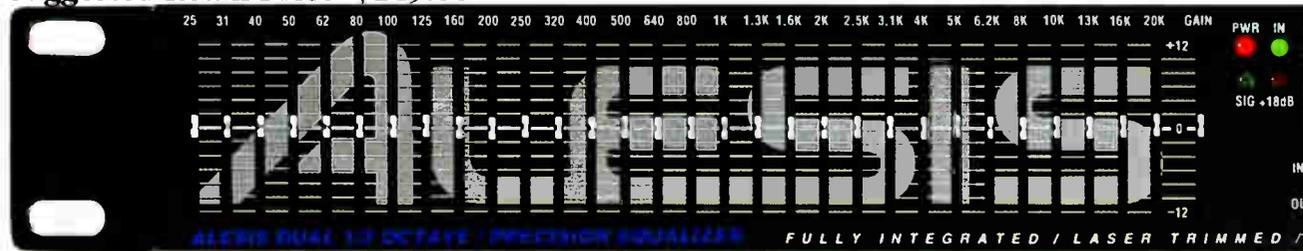


AudioTrax's Track Sheet window.

Bay, CA) that combines an 8-bit (11kHz or 22kHz sampling rate), 2-track digital audio recorder with a 64-track MIDI sequencer for multimedia audio production. When used with a Mac IIsi, the package requires no additional hardware to



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switcher control for dissolves, wipes, keys and other video effects. The price of the Q-BASE Scene Logging Database is \$875. Q-CUT includes Q-BASE, and is priced at \$3,950. The MMI is \$1,395.

Circle #251 on Reader Service Card

### Light Source Inc. Multimedia Toolkit

Now shipping is Version 1.1. of Multimedia Toolkit software for the Macintosh from Light Source Inc. (Greenbrae, CA). Multimedia Toolkit was developed to work with MacroMind's MediaMaker and NEC's PC-VCR to provide multimedia authors with an economical way to access video information directly. The package consists of two modules. The first is a DA that allows remote control of NEC's PC-VCR from any application. The second is a HyperCard Toolkit designed for users who want to control the PC-VCR directly within HyperCard 2.0. Also included is a driver for MacroMind's MediaMaker software. Accuracy is said to be  $\pm 2$  frames. Multimedia Toolkit is priced at \$149.

Circle #252 on Reader Service Card

### Covox Sound Master II

The Covox (Eugene, OR) Sound Master II is a PC card and associated software that provides an easy means of creating, editing and playing back original music through its graphics-based interface. It features 8-bit digital recording at 25 kHz (with optional playback at 44.1 kHz), as well as two-operator FM synthesis and 11-voice polyphony for \$229.95.

Circle #253 on Reader Service Card

### MIDIMAN SMPTE Player

SMPTE Player is a program for the IBM PC and compatibles that allows any standard MIDI sequence file to be played using MIDI Time Code (MTC). Previously, no major IBM sequencer has supported MTC, relying instead on special non-MTC-compatible, SMPTE-interface cards to sync to SMPTE. Besides allowing direct synching to SMPTE/MTC, SMPTE Player acts as a sort of mini post-production environment in which the start and end time of a piece can be set and edited. The program retails for \$74.95.

Circle #254 on Reader Service Card

### Abbate Video OnTrack/Mac

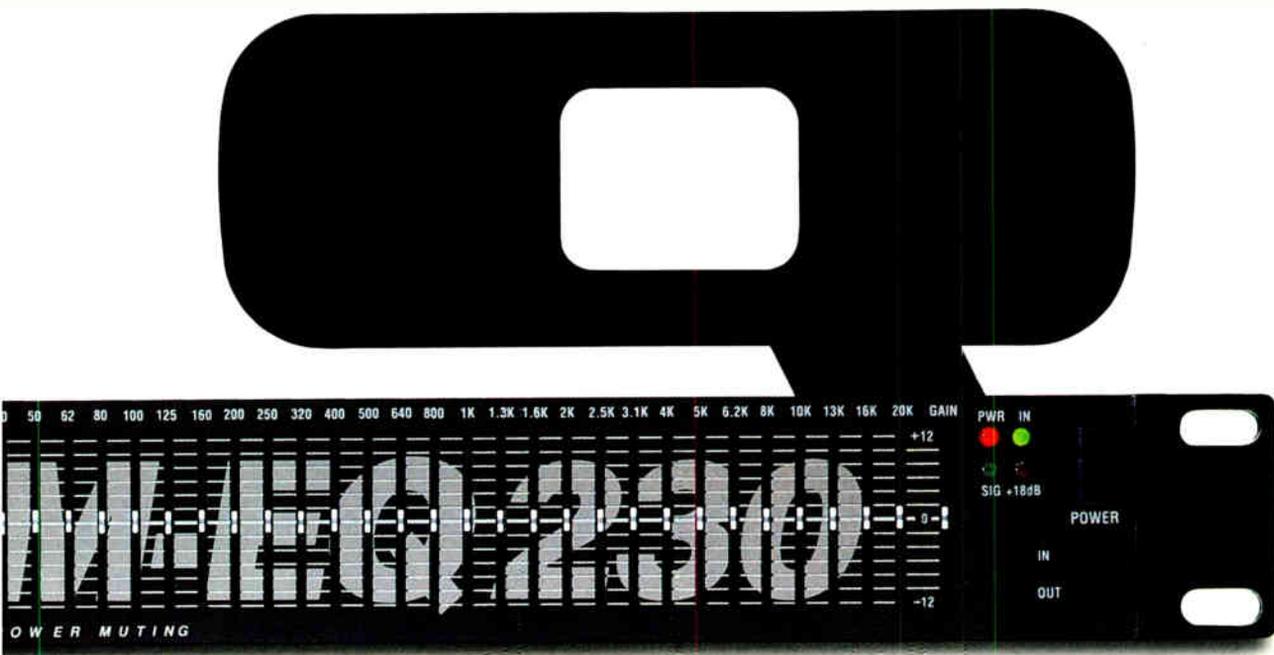
OnTrack/Mac, from Abbate Video Consultants (Norfolk, MA), is a software and serial cable package that turns the Mac into an automatic edit controller for selected consumer VCRs. The HyperCard 2.0 stack can control most Sony consumer video equipment, as well as many 8mm and Hi8 camcorders from other companies. The toolkit also includes CueTrack, a complete HyperCard application logging and editing videotape. The package is priced at \$199.

Circle #255 on Reader Service Card

### Steinberg Cubase Mac Audio

Up to 16 digital audio tracks can be recorded and edited along with MIDI tracks on the new Cubase Desktop MIDI Recording Program from Steinberg Digital Audio (Northridge, CA). The package is designed for use with Digidesign's Audiomedia Card, Sound Accelerator Card and Pro Tools, and is priced at \$950.

Circle #256 on Reader Service Card



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## THE BYTE BEAT

—CONTINUED FROM PAGE 74  
edited and stored.

The box connects to a computer via the ADB port (as does the mouse) and can be used along with, or in lieu of, the mouse. It is compact and well-made. The optically encoded jog/scrub wheel is easy to use and a good alternative to scrubbing digital audio (or MIDI tracks) with the mouse. By combining the jog wheel with 15 well-laid-out function keys and an optional footswitch, common operations of most sequencers and workstations can be controlled from the CS-1.

After becoming familiar with the controller, I used the mouse and Mac keyboard less and less—a phenomenon I remember experiencing with keyboard equivalents when first starting up on the Mac. Recording, rewinding, playing, capturing regions and switching between windows in Sound Designer was much more intuitive, and the ability to switch between jog mode and scrub mode was a useful feature.

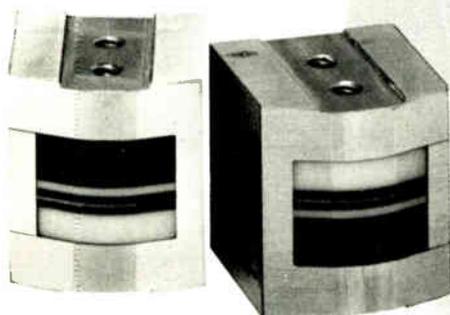
The CS-1 editor is available as both a DA and an application. Of the four presets available on the CS-1, only the third and the fourth are editable. (The first two are for Sound Designer and Macintosh extended-keyboard F-keys.) It would have been nice to be able to edit and save the Sound Designer keys in the original preset, but that's a small gripe. A second minor quibble is that the CS-1 assigns only keystrokes to its own keys—not mouse moves. However, this is overcome easily with the use of a macro program such as QuickKeys, which *can* assign mouse movements to keyboard equivalents, which in turn can be assigned to a CS-1 key.

Pressing the Shift key is like pressing the command or option key on the Mac—it changes the functions of the other keys. Its location is the only flaw in an otherwise ergonomically superb design. I'd like to suggest that since it is one of the most frequently used keys, it might be better positioned lower on the unit so that it can be pressed with the thumb or little finger.

I recorded a sound file and created a lengthy playlist in record time with the CS-1 after less than an hour of working with it. It's an excellent value at \$499.95 (the editor is an additional \$49.95).

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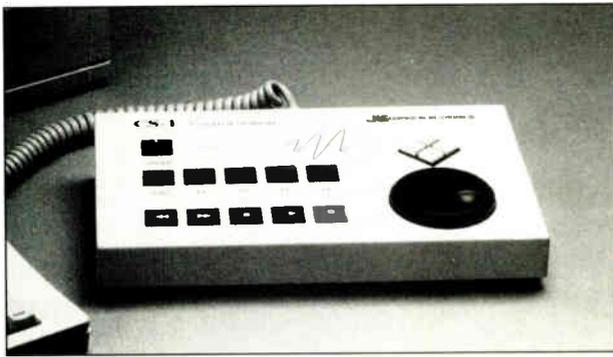
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### **X-oR Universal System Exclusive Orchestrator**

X-oR is Dr. T's solution to the management problems of labyrinthian MIDI systems. (Opcode's Galaxy Plus Editors is the other comprehensive offering in this category.) X-oR deals primarily with system exclusive MIDI data. Profiles of all but the most obscure MIDI instruments are included with X-oR to accomplish this task. A profile consists of a software driver, which communicates with the instrument, and an editing template, which

determines how the instrument's parameters are displayed and edited. X-oR is said to be capable of handling more than 100 instruments at a time.

Setting up X-oR is a nontrivial endeavor, particularly if you have a lot of instruments. Because MIDI system configurations

vary greatly—some use multiple programmable patchers; others don't use any patchers or mergers—it's difficult to provide step-by-step instructions in a manual. Assuming that your MIDI devices are set up and connected to the Mac, you copy the appropriate instrument profiles onto a folder on your hard drive, and proceed to the MIDI Setup dialog box, the Instrument List Editor and Instrument Setup Window to reflect your MIDI configuration. Both the manual and Profile Help do a good job of guiding you through the inevitable troubleshooting procedure in customizing your setup.

Once you are wired, you will probably need to take some time to famil-

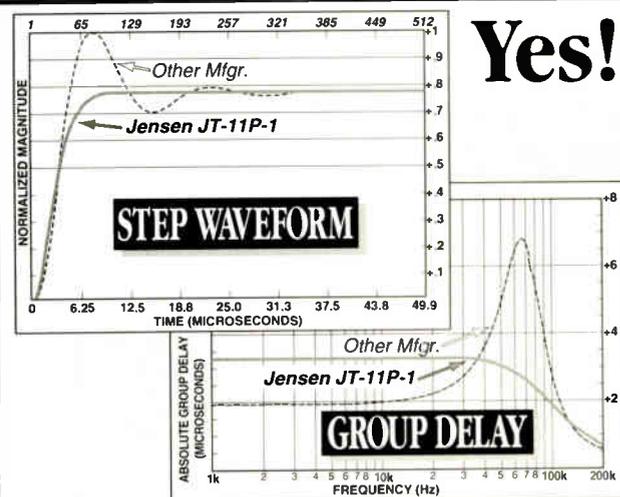
iarize yourself with the many windows and terms used to describe them. The more complex your instrument, the more windows. X-oR makes distinctions between banks, libraries, patches, performances and instruments, and it takes time to grasp what those distinctions are for each device in your system.

Having said all that, X-oR has many powerful features that make it easy to configure your system instantly, search for, audition and edit patches, banks and libraries, and import libraries to MS-DOS or Atari platforms. In combination with MIDI Manager, X-oR can be used to edit sounds while your sequencer is playing, and to record system exclusive data created using X-oR into your sequencer. (Dr. T's advises against using MIDI Manager in this context unless you are running a Mac with a 68020 processor or better, and I agree.) Priced at \$399, X-oR is a good value for the right user.

Dr. T's Music Software, 100 Crescent Road, Needham, MA 02194; (617) 455-1554. ■

*Paul Potyten is a Mix associate editor and a freelance composer/producer.*

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# CD



## RECORDERS



**by George Petersen**

### Available & Affordable

It's been over a decade since that fateful day in 1980 when Sony and Philips first proposed the compact disc standard, and the world is not the same. Consumers loved the new medium's convenience and sparkling audio quality, while record companies prospered with CD reissues of older material. Until recently, however, the compact disc mastering/manufacturing process offered no method of pro-

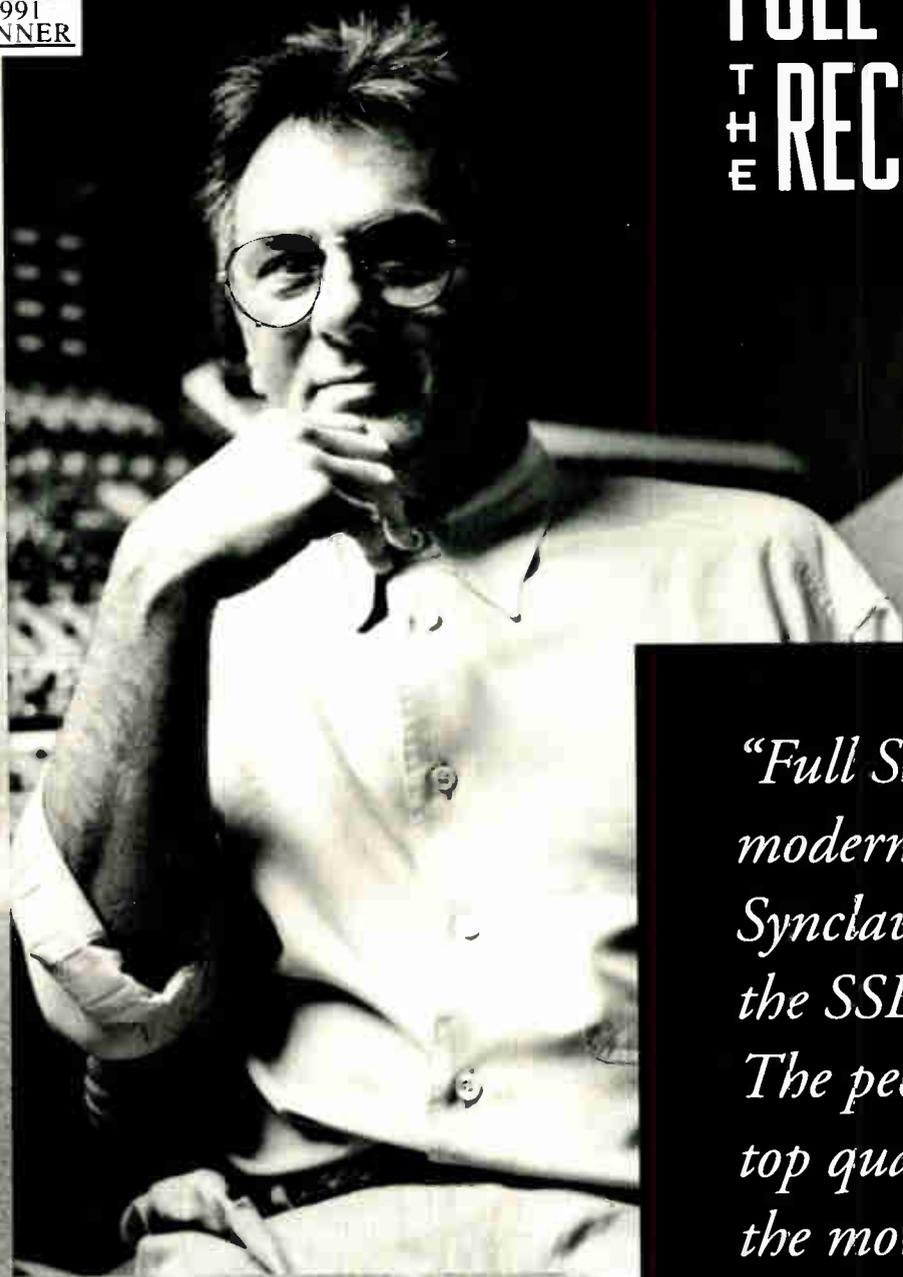
viding reference discs, and horror stories abound of major label CD releases cut from equalized, second- and third-generation tape duplication masters. Of course, it's always nice to know what your product sounds like on CD *before* committing to thousands—or even millions—of units.

Today, write-once (WO) CD recorder systems are available from nearly a dozen manufacturers. From a technology standpoint, creating a disc-based read/write system is not such a big deal. The real trick is producing a disc that is playable on any CD player, with full access to the table of contents (TOC) section, which contains the timing and indexing data.

By nature, the discs are non-erasable, operating in much the same manner as photographic film. With

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The DN-7700R includes AES/EBU and S/PDIF digital ports; for users requiring analog I/O, Denon's optional BU-0170A (\$4,000) provides the required ADCs and DACs, a large LED level display with selectable VU or peak characteristics, internal/external clock source switching and a headphone output. A multi-unit interface option permits the chaining of up to ten DN-7700R recorders, and eliminates the need for the BU-0170A interfaces on the slave machines, thus reducing the overall cost of a short-run CD duplication system.

Available as an option for Macintosh-based workstations from **Digidesign** (Menlo Park, Calif.) is the Yamaha PDS CD recorder. Controlled by Digidesign's Master List PDST<sup>SM</sup> software, users can route audio directly from the AES/EBU outputs of either Sound Tools or Pro Tools to the Yamaha YPE301 encoder and YPR201 recorder.

The Master List software creates a master playlist of digital audio files on one or more hard disks, and supports data such as catalog and ISRC codes, emphasis switching, song offsets, and track and index numbers. Up to 14 CD



recorders can be controlled by the Macintosh and one Yamaha encoding unit. The Yamaha encoder/recorder pair has a retail price of \$24,995; additional recording units are \$14,995.

Spot 90, from **Gotham Audio** of New York City, is a turnkey system that includes a 286-based CPU with VGA graphics, Audio + Design's Prodat 1B master recorder (with Apogee filters), and Yamaha's YPR201 recorder/YPE101 encoder combination. The

### **The Kenwood CD-WO system**

system is designed to make compact discs directly from a DAT master, and up to 14 recorders can be online simultaneously. The basic turnkey system is priced at \$35,000.

Gotham recently released Spot 90 Version 2.0 software, which adds features such as automated assembly editing for the DAT master, autoloading and TOC updating of material from

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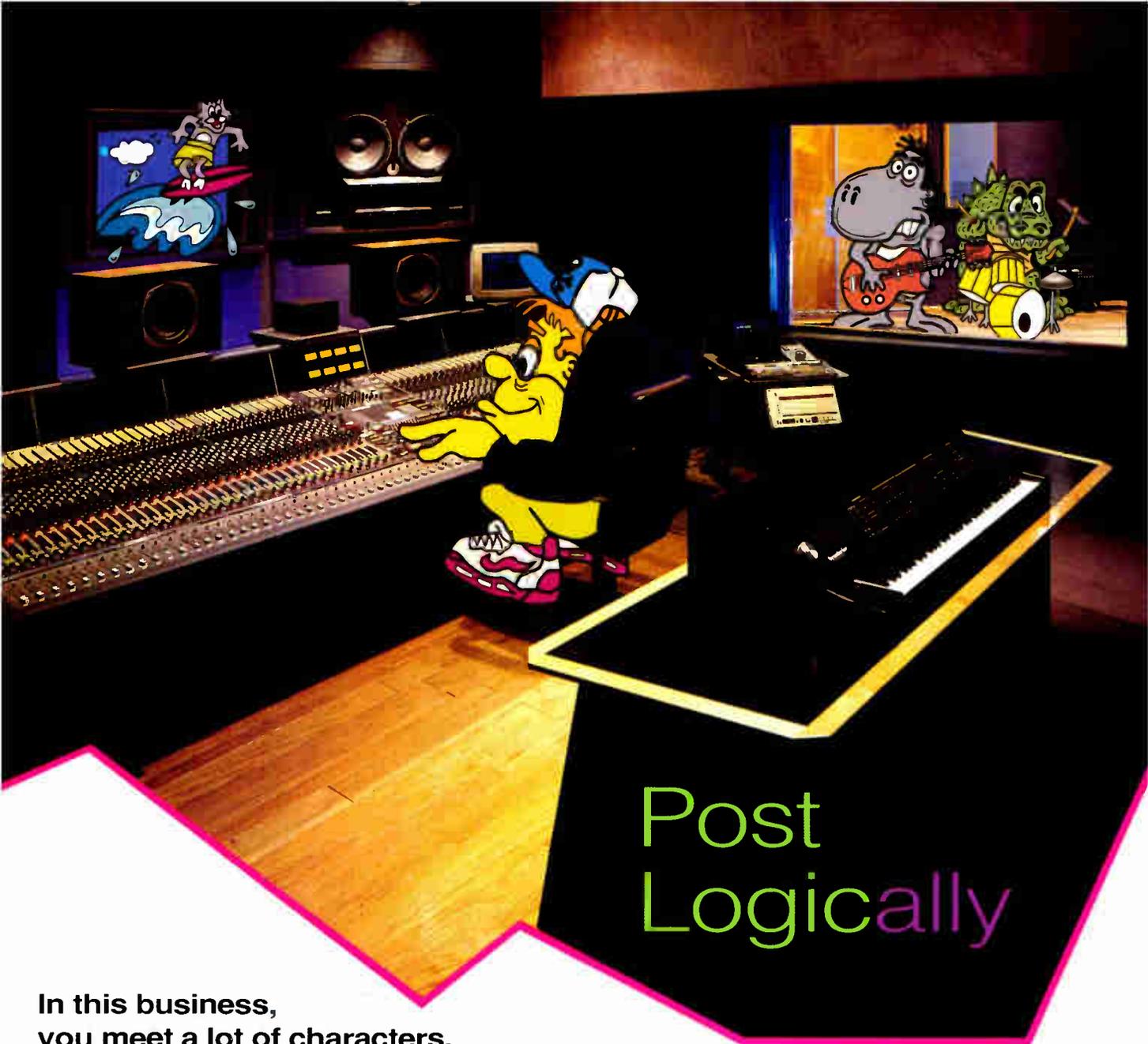
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an edited source, automatic DAT preparation (transferring TNO markers from any DAT tape to CD indexing points), and an optional PC card that allows recording of all PQ data on track 1 of the DAT leader.

Also available from Gotham is CDR 90, which is similar to Spot 90 but is designed for writing CDs directly from your Sony PCM-1630/DMR-4000 combo. Since CDR 90 lacks the Prodat, digital interfaces and SMPTE reader/generator, it is priced at \$29,000.

**JVC** (U.S. offices in Elmwood Park, N.J.) has announced plans to unveil a hybrid (combination CD-ROM/CD-Audio) recording system in 1992, but pricing, shipping and other details were unavailable at press time.

The CD-WO system from **Kenwood USA** (Long Beach, Calif.) comprises the DA-7000 CD encoder (\$14,000), DD-7200 CD writer (\$10,000) and PC software (\$6,000) for generating the subcode data. Options include a CD-ROM writing formatter and a unit for encoding CD+G graphics with the digital audio. Recording can take place in either uninterrupted or incremental modes, and the unit accepts inputs from PCM-1630 or DAT sources. A U-Matic transport can be controlled directly by the DA-7000 encoder, which can also feed up to ten CD writers.

The CDR-600 from **Marantz Pro Products** (Aurora, Ill.) makes its U.S. debut at next month's NAMM show in Anaheim. This three-rackspace unit reportedly has the ability to write a temporary TOC on the disc, allowing users to interrupt the recording process and continue recording additional tracks at a later time. Other features include S/PDIF digital and +4 XLR analog I/O and 1-bit analog converters. Also provided is the ability to download PQ information from computer-based, hard-disk editing systems. Tentative pricing is under \$10,000.

**Optical Media International** (Los Gatos, Calif.) recently announced macTOPIX Pro CD™ and macTOPIX-CDR Pro™, two multimedia CD-ROM and CD-Audio premastering/CD recording systems for the Macintosh. Available as software-only or as an integrated hardware/software system, macTOPIX is compatible with all multimedia graphics, digital video and digital audio editing/authoring software tools, such as Director, Authorware, Media Tracks and Sound Designer; all industry-standard graphics, video compression and PCM audio file

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Ampex Corporation and Sprague Magnetics of Van Nuys, CA have reached an agreement which allows Sprague to provide Ampex's customers ongoing service and support for Ampex audio recorders throughout the world.

The agreement allows Sprague to purchase all existing inventory of Ampex audio recorder parts and appoints Sprague as the sole authorized source for replacement parts for Ampex audio recorders. Ampex has the 3rd largest installed base of tape recorders in the world. Sprague has assured Ampex that parts and service will be available to its customers through at least 1995.



Sprague Magnetics, Inc. 15720 Stagg Street, Van Nuys, CA 91406  
 Phone: 818-994-6602; Fax: 818-994-2153; Telex: 754239;  
**1-800-553-8712**

formats are supported. OMI also offers complete CD premastering/development packages for IBM-PC/AT and PS-2 compatible computers.

Software packages begin at \$1,295, and supported formats include CD-Audio, CD-ROM, Mixed Mode (ROM + audio), CD-ROM XA, CD-I, DV-I and user-defined formats. Among the available hardware options are Sony's CDW-W1 CD recorder (\$16,995) and CDW-E1 encoder. The latter allows the use of up to 32 CD recorders simultaneously.

**Otari** of Foster City, Calif., is now offering an optional CD recording package for its DDR-10 digital recorder/editor workstation, utilizing Yamaha's YPE301 encoder and YPR-201 recorder. Signal is fed from the DDR-10 to the recording system via AES/EBU and an RS-422 cable, so the writing hardware can be located up to 100 feet away. Up to 14 recorders can be connected to a single encoder. The software is a dedicated version of Digidesign's Master List program, and a single-disc system is priced at \$24,995.

**Pioneer Electronics** (U.S. offices in Long Beach, Calif.) is slated to begin delivering its RPD-1000 stand-alone CD recorder in Japan this month. Designed for the institutional market and priced at 950,000 yen (about \$7,200 U.S.), the RPD-1000 includes an onboard sampling rate converter that changes digital sources recorded at 32 or 48 kHz to the CD-standard 44.1 kHz. The back panel has balanced and unbalanced analog I/O, AES/EBU and S/PDIF digital inputs, and S/PDIF digital outputs. [Note: At press time, there was no word concerning availability of this product in the U.S. Stay tuned for further developments.—ed.]

One of many options for the various configurations of the Sonic System workstations from **Sonic Solutions** (San Francisco, Calif.) is the CD Maker. Priced at \$25,000, the CD Maker option includes a Sony CDW-E1 encoder/CDW-W1 recorder combination; also available is a software package that can automatically generate PQ track and index points from an edit decision list. AES/EBU and SDIF digital inputs are standard; Apogee A/D and D/A converters are optional, as is Sonic Solutions' acclaimed NoNoise™ system for click removal, complex filtering and broadband noise reduction.

Housed in a three-rackspace box is the D740, a stand-alone CD recorder from **Studer** (Nashville, Tenn.). The

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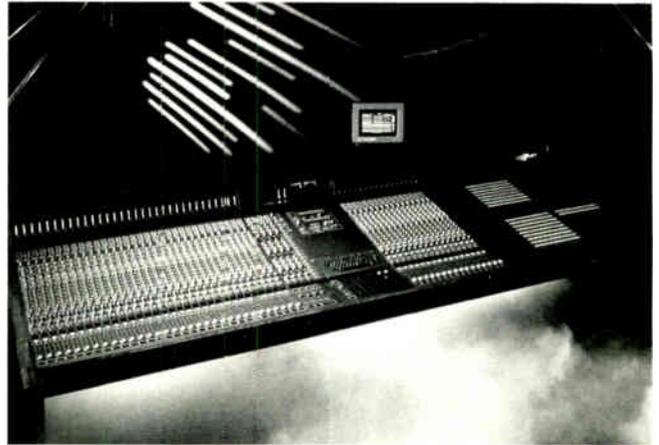
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unit allows start/stop recording, with a temporary TOC readable only by the D740; once a permanent TOC is written, the discs are playable on any CD player. The rear panel includes transformer-balanced XLR inputs and outputs, unbalanced RCA outputs, AES/EBU digital I/O, S/PDIF coaxial and optical inputs, and a 25-pin parallel remote jack with fader start. The D740 is priced at \$12,950.

The YPDR system from **Yamaha Pro Audio** (Buena Park, Calif.) consists of the YPDR601 recorder and the RC601 full-function remote controller. If desired, the unit can be operated on a "start-stop" basis, where one track could be recorded from an AES/EBU source, the next from an analog source, etc. Two TOC modes are offered: in the "pre" mode, 99 tracks of ten or 30 seconds are written before the audio is recorded. If the audio is shorter than a track, the unit inserts silence at the end of the cut; if the program material is longer than a track, the recording can cross the boundaries between tracks. Using the "pre" mode, a partially recorded disc can be played on any CD player. In the "after" mode, a permanent TOC is created after the audio is recorded.

The YPDR601 recorder is \$16,000; the RC601 remote is \$4,000. System features include large, lighted transport controls, XLR balanced analog inputs/outputs, AES/EBU and SDIF-2 digital ports, sync in/out and the ability to slave up to seven recorder units from a single remote for quantity duplication.

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World Radio History

# Garth Brooks

## *Ropin' the Audience*

by David Schwartz  
photos by Henry Diltz

**"I love to knock people off their seats,"** says the red-hot, crossover country singer Garth Brooks. "I like to see people come to the show, go nuts, and then talk about it until we come around again."

Brooks has been excelling at knocking people off their seats, as well as keeping other country artists off the top of the charts, for nearly a year now. His second album, *No Fences*, logged 42 weeks at Number One on the *Billboard* country charts, being knocked back to Number Two by the release of his latest CD, *Ropin' the Wind*. More impressively, his new record exploded onto the pop charts at Number One on the first week of release, certainly an unheard of achievement for a "country" artist. It is the first crossover country record to reach the top of the pops since *Kenny*

music with meaning. "Our concert is country music," says Brooks, "but with a late-'70s rock show mood, and it's the '90s as far as the mobility onstage—without any wires or mic stands.

"It's a melting pot, as my whole life has been," he adds. "George Strait was the guy who made me know country music was where I wanted to go. But seeing a Queen concert when I was in high school showed me how important the general power of the show was in connecting with the audience. Groups like Kansas and Styx showed us



*Roger's Greatest Hits* 11 years ago.

Representing a new generation of country artist, one raised on tradition but influenced and inspired by the power, excitement and technology of modern rock concerts, Brooks has

created a fusion between country and popular music that reaches out to a broad cross section of music fans in search of

how exciting and well-staged a show can be, and we're always drawing influences from all kinds of artists, where we see and hear things that turn us on—

Billy Joel, Cinderella, even Megadeth. We try to put together an all-star event, a whole concert of things, so that by the end of it, people are worn out."

Audiences are not the only worn-out people at a Garth Brooks concert. With a band using wireless instruments and wireless headset microphones, constantly and unpredictably running around onstage, the sound and light technicians haven't a moment to relax. Most unfortunate is monitor mixer



Brent Dannen, who has the insane task of trying to mix stage sound for a pack of musicians who are continually rearranging themselves onstage. "See this T-shirt?" says production manager John McBride, pointing proudly to his "Workin' for a Madman" shirt. "There's a reason for that!"

McBride, who started MD Systems in 1984 in Wichita, Kan., with a borrowed \$6,000 worth of amps, speakers and a 12-channel mixer, notes that despite the challenges of this kind of show, the effort is well worth it. "With Garth, we care more. Garth ruined us for working for anyone else because he treats us so well. But he expects his people to work hard. We're carrying fewer people on the road than other tours doing the

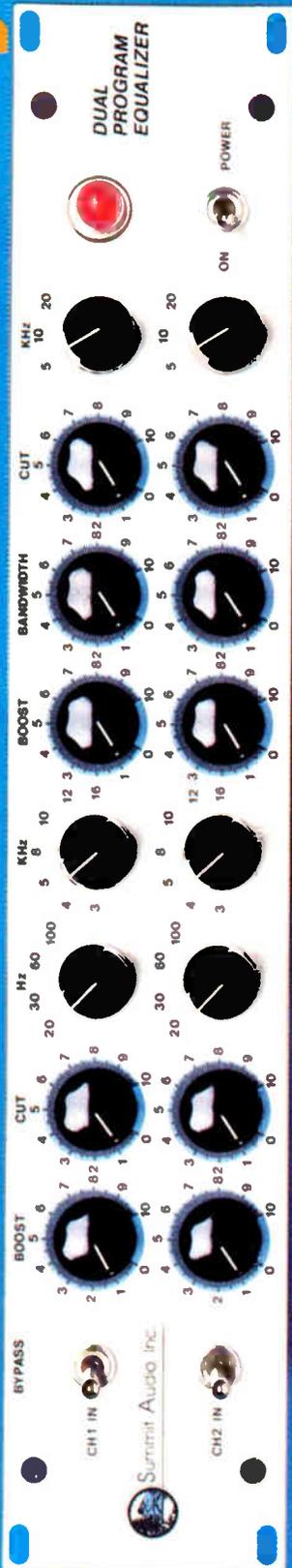
same kind of job. We work harder, but we get taken care of."

"Mixing Garth requires you to stay on your toes and be ready for anything to happen," says house mixer Dan Heins. "Like last night (the first of two sold-out shows at Dallas' Reunion Arena being taped for an NBC network special). I wasn't aware that Garth and Ty England, his other acoustic guitar player, were going to smash their guitars against each other at the end of 'Friends in Low Places' until five minutes before showtime. I'd heard something about it, but I thought I'd better ask, because if they were, I'd better mute them. Other shows seem to be more rehearsed and choreographed, but with Garth's show it's always a free-for-all. We don't have a set list that we

**Left: House mixer Dan Heins at work for the Dallas Reunion Arena concerts behind MD Systems' Yamaha PM3000. Right: Record producer Allen Reynolds (right) and engineer Mark Miller mix the Dallas concert for an NBC television special from the Omega Audio remote truck outside the arena.**



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use for the whole tour—every night's different, and he could throw something in at any moment. You've got to stay on your toes."

After graduating from the University of Kansas in the mid-'80s, Heins joined MD Systems because "John (McBride) was the regional sound god around Kansas and had the best system." The two worked a variety of Midwestern shows for artists as diverse as Yngwie Malmsteen and Cameo, until in September 1989, while handling sound for a Ricky Van Shelton show, they encountered Brooks as an opening act. "Garth had just come out with his first album and didn't have a house mixer," says Heins. "It was just luck that I made an inquiry into who was going to mix him and got the job. Garth pretty much stole the show."

By January 1990, McBride, Heins and MD Systems had relocated to Nashville, betting on the continued growth of Brooks' career, though McBride admits that at first Brooks wasn't able to carry production. "But within about six months," McBride says, "I needed to expand to keep up with him. His career was skyrocketing."

Brooks' success has moved MD Systems into the big leagues of equipment operation in a relatively short time. This has brought a certain amount of freedom, along with a great challenge in matching technology with the intense demands of this unique artist. "When Garth has an idea," says Heins, "you never want to say to him, 'That's never been done before,' because that's just what he's trying to do out there. He's trying to expand every aspect of the show to the point where it's right on the edge. And he wants people behind him who'll say, 'I don't know, but we'll find out, and we'll try it.'" MD Systems recently added the technical expertise of Wally Bigbee (head tech on the "Monsters of Rock" tour) and has received considerable technical support from Crown International, Systems Wireless and Brock Jabara, P.E.

For the Dallas arena shows, as well as the balance of the "Ropin' the Wind" tour, MD upgraded to 48 full-range flown cabinets, each composed of two 18-inch speakers, two horn-loaded 10-

inch drivers, and one 2-inch tweeter. The cabinets were built by JTB Associates of Wichita, a group normally employed to remodel interiors of jet aircraft.

With flying safety in mind, MD asked for high-test precision work. "We took the cabinets to Pittsburgh Testing Labs," says McBride. "They weigh 250 pounds apiece, and we fly them four deep, maximum. With 150 pounds for the motor and 100 pounds for the bar, that's 1,250 pounds split between two support points, or 625 pounds per point. We had them tested at 5,000 pounds per point for 12 hours. When it comes to flying systems, you can't be too careful—especially if you're over seating. If that stuff ever falls, I hope I'm the first one in line. I hope I get crushed, because I can't imagine causing harm to anyone over this business."



Driving the cabinets are Crown 2400 and 3600 Macrotech amplifiers, with

house sound mixed by two Yamaha PM3000s. Recently, the company began using a Crown IQ 2000 for control and monitoring of the amplifiers during the shows, to give total access from the house mix position and for a faster balance, especially when working in the round. Says McBride: "One of the advantages of the IQ is that in a hall like Reunion Arena, Dan can sit at the house console and I'll walk the room with a radio, and he can turn down certain amplifiers and speakers in areas that may be closer to the audience so we get a better overall coverage. Then we can save those settings on disk, and the next time we come to Reunion, as long as we're flying the same configuration, we'll know where we are."

Bringing the vocal above the adoring crowd noise at a Garth Brooks concert is one of the sound crew's more serious considerations. "Competing with the crowd for volume gets into a snowball effect," Heins says. "I try to keep it down to a non-fatiguing level. We run an average of about 100 dB at the house console. Last night the crowd was louder than the P.A. a lot of the time. The crowd on the floor was hurting my ears, but the P.A. wasn't."

Brooks' vocal mic—as well as that



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of the rest of his mobile band—is the AKG 410, the best-sounding mic the crew found for this demanding application. To keep a reign on Brooks' dynamic voice, "We constantly use a good deal of compression, anywhere from 3 to 6 dB of gain reduction," says Heins, "because the proximity of his mic to his mouth never changes. And he can go from something that's really soft to Bam!—something that really pushes it into compression. We also use a Klark-Teknik DN405 parametric EQ to take out some mid-low, to control popping and to bring out intelligibility."

Garth Brooks certainly doesn't take the technical side of his show lightly. "The band has always said that the most important man at any concert is the man at the house mixing board," Brooks says, "because you can be playing your ass off, and if the engineer isn't picking it up, the audience will never hear it. The MVP of any concert is the engineer."

Brooks' show also caught lighting operators off-guard in the early days. "When we first started running around onstage," says Brooks, "it would take awhile for spotlight operators to catch up with us, because they were used to

just setting the spots on a certain point and going to get some popcorn or something. But now they watch every move we make. And if they're doing that, then they're focused in on us. So that's when the message of the song comes through, and it's a way to keep people's attention. When they're watching you, they're listening to you.

"I like to move around to keep people's attention, to keep them into what I'm saying and doing, so that there's no lull in the show," he continues. "The mobility brings attention, and attention allows you to deliver the messages you came to deliver."

So what are the messages? According to Brooks, "Rules and records are made to be broken, but at the same time there are morals and decency that should remain. Kids need to know that drugs and excess of alcohol is for losers. And people need to know that no matter how old you are or how far down in the dumps you think you are, dreams can be achieved no matter what your starting point is. That's some of what we are trying to convey onstage as well as offstage."

But Brooks' appeal, in the long run, comes largely from his songs. Allen Reynolds, who has produced Brooks' three albums to date, feels that in the space of those albums, "Garth has offered 30 incredible pieces of material. And in this business, that's always going to give you a competitive edge."

Reynolds, a 25-year-veteran of the Nashville recording scene and producer of albums for Don Williams, Crystal Gayle, Emmy Lou Harris and Kathy Mattea, was first introduced to Brooks by manager Bob Doyle. Says Reynolds: "I liked Garth's voice from the time I first heard his tapes, and when we met, he seemed to have his feet on the ground and had an idea of what he wanted to do and what he was about. So I offered to do a few sides together."

Reynolds took Brooks into Jack's Tracks, the Nashville studio that the producer purchased from Jack Clement about 15 years ago. "The first day, we cut the first four sides of *Garth Brooks*, including 'If Tomorrow Never Comes' and 'Much Too Young to Feel This Damn Old,' two hit singles from the album. So it was a really good day.

"I was telling people about Garth before the record debuted," Reynolds adds. "I felt certain it was going to make a dent and launch him. But I didn't know the record was going to do as well as it did. Ordinarily, in the coun-

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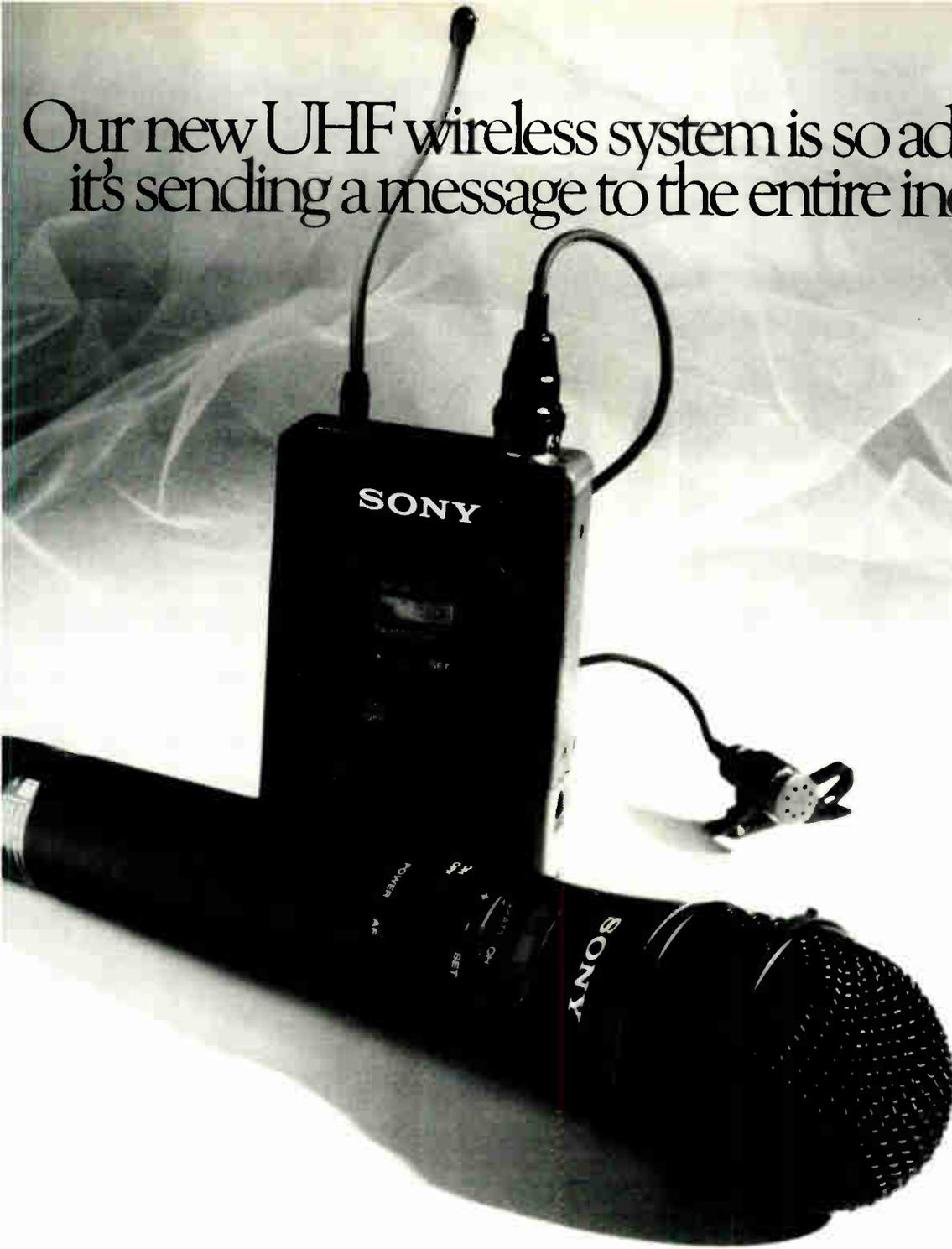
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try music field, it takes a bit longer. He's been exceptional in that he's taken off like a rocket."

Reynolds considers Brooks' success to be partly due to the fact that the artist doesn't like to write all of his songs. "He's one of the best songwriters I've known, and he's friends with and a big fan of songwriters in Nashville. I think it underlines his professionalism that he doesn't write all of his songs. He didn't write 'Friends in Low Places' or 'The Dance'—two huge records in his career. I look at some of his competitors, and they've got their name on every song. Garth doesn't want the songwriting community to give up on him and say, 'He wouldn't be interested in my song.'

"Garth doesn't dominate the material on his album, but he does like to be in there with his name on a handful of competitive songs. I think if he didn't feel he was competitive, he wouldn't have any on there. But then I think he would be disappointed with himself."

"I'm influenced by both male and female artists," adds Brooks. "There are a lot of female artists out there who cut songs that men would never cut. Those are the ones I'm looking for, the ones that show that men have a very tender side, too.

"When I'm working with another writer, I usually bring in ideas," he explains. "I'll say, 'I've got this idea of a guy who goes home with his wife and meets his old flame in a grocery store. While they're talking, he keeps looking back and forth between his wife and his old flame and realizes, 'Oh God, thanks for not letting me make this mistake that I once asked for.' That was the basis, with a few changes, for 'Unanswered Prayers.'"

Brooks' most recent crossover hit, "Shameless," emerged from Billy Joel's *Storm Front* album. Reynolds says, "Garth heard the song on Billy's album and just loved it. He put it in his show on the road, and it was killing people. I told him it was not a song I would ever have thought to present to him. But Garth kept his eye on the song, and when it became pretty certain that Billy wasn't going to release it as a single, Garth wanted to cut it. As far as I was concerned, if something moves my singers deeply and doesn't get too far out on some extreme edge, I'm game. I think that's part of what supplies the surprise element. And the artists who have thrilled me have surprised me again and again. Garth is a very emo-



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tional guy, not just as a singer, but as a person. So when he finds a vehicle that connects with his emotions like 'Shameless' did, I'm going to do my best to accommodate him."

Brooks views his producer as a guiding force in the studio. "Allen is like a big pair of hands. While you're running as fast as you can and doing all the crazy things, if you get out of bounds, one of the hands will come and tap you back in—not slowing you down—just getting you back to reality so you can keep running. He also gives me peace of mind. I'll go to him and say, 'Allen, can we get away with this?' And when he looks at you and says, 'Yeah, pal, I love it,' that's when we go with all the confidence in the world and do that thing we've never done before."

Reynolds, by contrast, sees his role as getting the necessary preparation done beforehand, "so that you're not just in the studio groping around. I try to be the catalyst. I try to make sure the ingredients are good. I try to make everyone calm and not self-conscious. The hardest part of my work is done before we get into the studio. Once we're there, I like to keep the technology out of the way as much as possible and encourage the performance."

Dealing with the technology in the studio is left to Mark Miller, who has handled all of Brooks' recordings with Reynolds. Brooks maintains an almost reverential relationship with Miller and credits him with much of the success of his vocal sound on record. "I think if you look up engineer in a Greek dictionary," Brooks says, "it would say something like 'savior of career.' Mark can make my voice sound 20 times better than I think it does."

"Garth likes to sing live in the studio with the band," says Miller, "just the way he sings onstage, in order to sound more spontaneous and more like a performance. We almost never overdub him. He's an incredible singer, but fortunately he doesn't run around in the studio when he's singing, like he does onstage."

Miller builds a six-sided gobo around Brooks to isolate his vocal while keeping him in touch with the band. Miller has been using a Sanken CU-41 microphone on Brooks, which he sends through a Tube-Tech CL-1A compressor. Usually employing a little "generic" reverb from an EMT plate on the basic track, Miller counts on the studio's live chamber to add vocal depth during mixing.

"The Sanken is a great vocal mic that

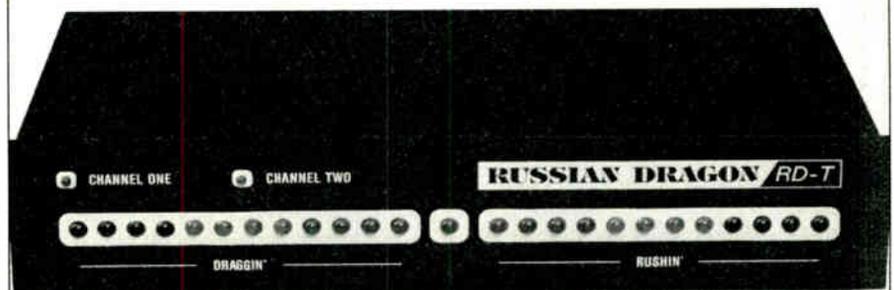
we've also started using with Don Williams," Miller says. "We've been using it for Kathy Mattea for three years now and have had great success with it. I'm always jockeying around its position to find the sweet spot. A quarter of an inch can make a big difference, you know."

Where does an artist like Brooks go from here? Bigger, more elaborate shows, wider-reaching tours, a new album? When you're Garth Brooks, other priorities enter in. "I'd love to do a duet with my mom, if I could ever find a song that was special enough for her. My mother was on Capitol in the mid-

'50s. It would be a once-in-a-lifetime shot. I've tried to write the song, but it might be too close to me. Kent Blaze, the guy who wrote 'If Tomorrow Never Comes,' and I are trying to write a song called 'Pickin' Up After You.' It talks about a mother who picks up after her child, and then the child grows up and comes to do the profession that his mother did, that she gave up for the child. So now he's picking up after her, to finish what she started in music." ■

*David Schwartz, editor-in-chief of Mix, was into country before it was cool... but didn't want anyone to know.*

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by Dan Daley

# DREAMING OF A BYTE CHRISTMAS

There is no Santa Claus. There is, however, a sanity clause. (Groucho Marx told us that a long time ago.) That is to say, there is a logic in project studio technology acquisition. I asked some of the people you've seen in this space to put together holiday lists for their own project studios. The answers show some definite patterns. For starters, digital is all over the place, from DAWs to DAT to consoles to outboard gear.

For an industry segment that got its start with analog, and considering the reinvigoration of analog in the wake of new tape releases by 3M and Ampex this year, the digital pattern is worth noting. It can likely be attributed to the

And, while everyone mentioned equipment, a few also mentioned changes to their physical environments. Not surprising, as this would be a logical step in project studio maturation. Direct signal injection was the primary m.o. with the MIDI-based systems that were the core of a significant number of project studios. As those systems reached their individual ceilings, the inclusion of live, acooustic recording capability became a goal for many, via the addition of iso booths. Also, the sheer amount of equipment acquired over the last couple of years forced many to consider more control room space.

At Max Highstein's Natural Sound in Sante Fe, Christmas came a bit early with a Tascam MSR-24 upgrade to Dolby S noise reduction. With analog still the dominant multitrack component of the project environment, Dolby S is likely to start cropping up in more studios as the need to compete with digital noise floors increases.

The rest of Highstein's list is digital, and it shows how rental companies have become the beta providers for the project studio. While Highstein used to rent Harmonizers and a second DAT deck, he expects to purchase both for the studio in the coming year—an Eventide Harmonizer and a Tascam DA30.

Due north, we hit Valentine Productions in Denver, where a digital multitrack system with long recording capacity heads the list. According to Laurie Gordon, the Alesis 8-track system is of particular interest because it uses VHS tape, which in turn will help control media costs. Another potential choice is the Roland hard disk-based 4-track system. She's looking to spend up to about \$6,000 in this category.

Part and parcel with that acquisition would be a computer-based 2-track



proliferation of lower-priced digital multitrack systems, particularly ones from Yamaha, Korg, Roland and Alesis, as well as software-based systems such as Sound Tools.

digital editing system. "This kind of system would sync to a less expensive, tape-based digital recording unit," she says. "Tracks can be bounced between them while editing, and there's no degradation and lower memory requirements. Overall, I think it's more cost-effective." Rounding out the list, she



mentions one of Yamaha's digital mixing consoles and a time code-capable DAT deck, preferably in the \$4,000 range.

"We believe digital is the future and we want to get into it now," she emphasizes. "All of our clients respond well to the word 'digital,' and most have had experiences of some kind where something could have ended disastrously, but because it was done in a digital format, that disaster was averted. We want to be able to take an entire project, vocals included, from start to finish and never have to go to the analog domain."

Jon Gordon, of Jon Gordon Productions in Manhattan, is finding the channel limitations of fewer MIDI lines constraining and would like to expand his present MIDI port capability with a multiport system such as Mark of the Unicorn's MIDI Time Piece or the forthcoming Opcode Studio 5 unit. He currently has a two-port interface but has found that those 32 channels get eaten up quickly. "If I add one more big multitimbral module, I'm going to wind up with a channel crunch," he says. "And now, if I have sequences with a lot of MIDI data density, I run into time-resolution problems since all the data is going over only two interfaces. So I need more interfaces to keep more time-critical units like drum machines

running on their own interfaces."

The 16-track Tascam 60-16 is plenty for now, Gordon says, getting cramped only when he goes outside to track live drums. And he says he can bypass the need for buying a dedicated sequencer in the immediate future by using the SMPTE sync from his Sound Tools and Studio Vision packages. This kind of thorough use of presently owned technology is critical, because Gordon also needs video monitors for the increased work in industrials he's aiming for in 1992.

That likely means putting off the purchase of a new console to replace his A&H 32, which he says has performed well but has become more difficult to service as it gets older. One upgrade that might move from wish to reality is a new iso booth. Gordon says recording acoustic instruments would be easier, and it would eliminate some of the less pleasant acoustic anomalies of his space. But, like dollars, space is an inherent project studio limitation, and Gordon says he'd have to relocate his tape storage area to accommodate a booth.

One final and ever-present wish: "More and better microphones."

That sentiment is echoed by Randy Bobo, engineer and sound designer at Independent Sound in Milwaukee. When he recently came out from San Francisco, he carried a Shure SM57, bringing the studio's microphone complement up to a full three (a U87 and 414 were already there). But the emphasis for '92 is on expanding the live capabilities of the studio. "We're moving toward more and more acoustic music," says Bobo, "and there is the room here to bring a better acoustic space online."

The wish list for Dennis Michaels' Manhattan-based High Tops Music House is elegantly simple and yet quite

far-reaching. "As far as technology goes, we are quite content," Michaels says. "We would like more alliances with larger studios."

Michaels refers to an overall economic picture rather than just a technological one; he feels that the consolidation throughout the larger corporate structure over the past decade will begin to show the same pattern in the recording industry in the '90s. "Just as banks merged with banks and corporations with other corporations, so too should larger studios consider restructuring by consolidation," he explains. "The benefits to the larger studios to merge or form alliances with smaller studios are numerous: reduced overhead, reduced debt, increased available cash and the ability to offer services more specialized for specific niche markets. In return, the smaller studios become part of a stronger organization with an increase in clientele."

As an example, Michaels suggests that a six-room, 24-track facility is not maximized when several of the rooms are doing simpler work, such as voice-



overs. If the larger studio reduces its size to two or three rooms and farms out the voice-over and related work to smaller studios with less track availability but a greater focus on that type of recording, both studios benefit. He further suggests that linkage between a commercial recording studio and a project studio could be done via ISDN

—CONTINUED ON PAGE 167

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*Alan Parsons, MIX Magazine (February 1991)*

**Rick Schwartz**

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*Rick Schwartz, Recording Engineer/Producer (October 1990)*

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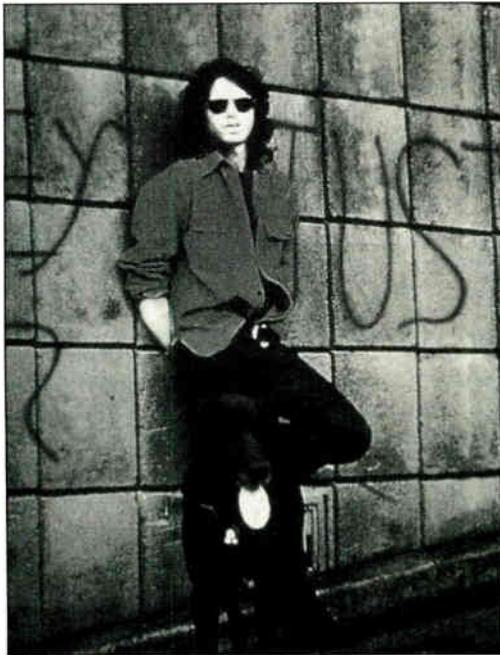
The screenshot displays the software interface for the DD1000. At the top, there's a menu bar with options: File, Edit, Display, Options, Windows, MD Drive, SCSI. Below it is a 'Cue List: QLIST 1' window showing a table of cues with columns for time, track, and other parameters. A 'Sound Cue' window is open, showing a waveform and editing controls for a cue named 'CHICAGO'. The 'Cue Edit: QLIST 1' window shows a list of cues with columns for cue name, start time, end time, and track. The 'Cue Edit' window also has buttons for 'Add', 'Delete', and 'Replace'.



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cilities used. "If we wanted a K-Scope or D2 machines or any extra bells and whistles, or to get into the PaintBox in the afternoon, Editel was always there for us. In fact, one afternoon we had a slight emergency and we needed to get in to do a quick Da Vinci for a teaser to show MCA, and it turned out their regular operator was off sick. So they flew down a guy from San Francisco—at the same rate—to help us out."

*The Soft Parade* video was online at Editel on D2, "because of all the multilayered images we used," states Schmidlin. "We also went with D2 because there's such a huge Doors following in Europe, and the system gives you a cleaner European format copy."



**Jim Morrison, 1969**

While working, the team also transferred the entire Doors library—some 15 hours of footage—onto D2.

"Although we used quite a few effects generators—such as the Abekas and K-Scope, especially for layering images—we're pretty much purists," Schmidlin adds. "What we wanted was to let the original footage just speak for itself."

According to the producer, the biggest problem facing the team was "the fact that there really wasn't a show to begin with. PBS had destroyed the original master, and the only known master when we started was a 1/2-inch copy of the PBS program, which contained about 30 percent of the finished

product, and it was glitched to hell. That was the reason we went to the Da Vinci session: to improve the quality.

"The only other leads we had were, first, the producer of the show, who'd made a Nagra recording, so we got a hold of that," Schmidlin says. "Then we found out that the associate producer had also kept a brand new master of the show in her closet for the past 22 years, and we eventually tracked that down."

According to engineer Tony Friedman of Post Logic, the main challenge in terms of audio was the "sheer scope of sources involved, all of which had to be made uniform. Our main source was the PBS show, where the audio was recorded on one machine without any reference to the video, so there was no sync at all."

Friedman started by transferring the audio to a coded source. "I found a sync point and then had to find out the correct varispeed to see just how long it would stay in sync," he reports. "So I had to keep slowing down or speeding up the audio reel ever so slightly to match it with the video for as long as it could go." Every time it went out of sync for more than a few frames, Friedman would re-sync and do a crossfade. "This often ended up happening every ten seconds or so in a song," he says.

Because the original audio was recorded in mono, Friedman's job included giving the tracks more of a stereo image. "But I'm not fond of any of these stereo imaging devices on the market," he says, "so instead, I created stereo ambience in as subtle a way as I could," which often meant using slight EQ variances on either side and then using that in combination with "very small room reverbs on each side, using two different rooms. So I'd use the left side of one room with one side of the program, and the right side of another reverb with the other program, and then I kept those as an ambience so you don't really hear the results as a reverb, but you hear the variances on each side. That way, you help the stereo imaging without messing with the phase, as most imaging devices do."

Piecing together the interview sections was just as challenging, says Friedman. "Although they'd come

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from the same source, we'd often have to piece them together ten frames at a time, one-third of a second at a time, which was very time-consuming."

The whole program was run through the Da Vinci video enhancer. "While that improves the picture quality, it also creates an inherent delay in the audio," Friedman points out. "So that again meant we had to continually re-sync footage.

"Obviously, the quality of the PBS show source, which was a mono 1/4-inch, was nowhere near the quality of the CD tracks that we edited into the

show," Friedman adds. "So we spent a lot of time balancing those sources.

"We also had to resort to some cheating at times," he continues. "For instance, the original sources were recorded on Nagras, but they weren't always running, and they were getting up to speed as we were trying to cut in an edit.

"Most of the source material I received was on D2, except obviously for the CD cuts," adds Friedman, who completed the entire project on 24-track with Dolby SR. "We made a conscious choice to go analog rather than digital, because it has the warmth, especially in a show like this where the

music is so dynamic."

According to Manzarek, the first track, "The Changeling," was a digital transfer direct from the CD. "And some of the talking at the top of the tape is taken from Jim and the 'Wild Child' sessions, and the other dialog featured in 'The Changeling' is Nagra material recorded by Babe Hill, who worked with Paul Ferraro, The Doors' camera-man who shot most of the original footage used in the video.

"As for 'Wishful Sinful,' that was a straight-ahead performance from the PBS show, and was basically a mono track that Tony fiddled around with using two separate delays to enhance the stereo," continues Manzarek. "In fact, that track has a surprisingly high standard of audio for a television show of that era, and the balance was really good."

Manzarek is less happy with some of the original visuals he had to deal with, especially the silhouette footage used in "The Soft Parade" track. "Don't ask me why, but right at the point where the song shifts gears and moves into the harder rock part—the funky section—the television crew decided to shoot everything in silhouette, and this goes on for over a minute-and-a-half. And that was way too long."

Eventually, in trying to come up with a variation for the video release, Manzarek and company decided to keep the original footage and then key in contemporary footage of the 1967 Renaissance Pleasure Faire. "So we matted in hippies posing as English villagers circa 1400—into the silhouettes and behind the band," he reports. "Otherwise, we used very few tricks throughout the piece.

"Fortunately, The Doors need very few tricks," he adds. "They exist and that's it. You want to see Morrison sing, Morrison talk, Morrison dance, and what's great about the video is that it's a historical record. It doesn't pretend to be anything other than what it is." ■

*Mix post-production editor Iain Blair is a freelance writer based in Southern California.*

## POST NOTES

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Musician Magazine, in cooperation with JBL, Shure and Sony, is pleased once again to invite all unsigned artists to submit their original music to our 4th Best Unsigned Band Contest. All entries will be reviewed by the publishers and editors of Musician Magazine. Finalists will then be submitted to an all-star panel of music industry judges featuring the likes of John Hiatt, Bootsy Collins, Chrissie Hynde and Don Was. The celebrity judges will ultimately choose the artists to appear on Musician's "Best of the BUBS" CD, which will be delivered to music and program directors at hundreds of radio stations, record execs, A&R departments, publishing companies and music journalists throughout the country. The one band singled out as everyone's fave will also take home a grand prize equipment package valued at over \$15,000. If your music deserves to be heard, we're ready to listen. Just read the rules carefully, fill out the entry form and send us your best on cassette.

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Includes: Soundcraft Spirit 1682 Console packed full of features for multi-track recording and mixdown, plus JBL 4412 three-way studio monitors and SR6615 150 watt power amp, Shure L Series Wireless Systems featuring outstanding design and reception, plus 6 Shure Beta 58 supercardioid dynamic microphones, a Sony PCM-2700 Pro 4-head DAT digital recorder and a Sony DPS-R7 digital reverb with 100-preset memory.



**Rules** No purchase necessary. One cassette per artist/band. Maximum two songs per cassette. Name, age and address of each band member, photo of band/artist and a \$15.00 processing fee must accompany each cassette and entry form (or facsimile). ALL ENTRIES MUST BE RECEIVED BY DEC. 31, 1991. All music must be original. If chosen, artists are responsible for final mix to appear on CD. Artists cannot be signed to a label. Tapes become property of MUSICIAN Magazine and will not be returned. Artists retain rights to their music. All decisions are final. Employees of Billboard Publications, Inc. and affiliated companies are not eligible. Void where prohibited.

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"Miami Vice" studio in Southfield, Mich. The AudioFile II Plus system is the latest generation of the AMS hard disk-based digital audio recording and editing equipment. It utilizes some of the same technology as F-15 jets. Ron Rose Productions is the first company in the metro Detroit area to offer this new, updated version.

Owner Ron Rose reports, "We tested a variety of this type of equipment over the past year, and the AudioFile II Plus was by far the best choice." In fact, Rose is so pleased with the system that two more units will be installed at the Studio Center facility and their Southfield HQ by the end of the year.

### U.S. Air Force Takes Off with New England Digital's PostPro SD

If post-production facilities and equipment are borrowing ideas and technology from the military, the reverse is also increasingly true these days. After a three-year review of digital recording technologies, the Eastern Space and Missile Center, located at Patrick Air Force Base in Florida, has chosen New England Digital's PostPro SD as part of a complete renovation and update of its audio production facilities. The PostPro SD, which integrates 16 tracks of Direct-to-Disk digital recording with 16 voices and 16 MB of RAM for onboard sound design, as well as 2 gigabytes of optical disc sound storage, will be used along with a new 32-channel TAC Bullet console for in-house production of training, education and public affairs videos and films for the U.S. Air Force Eastern Space and Missile Center and NASA's Kennedy Space Center. In fact, the PostPro SD isn't the first system used by NASA. Two years ago, a 7-year old Synclavier computer was modified by NASA and used to control an onboard camera on the Galileo Space Probe.

### POST BRIEFS

Nashville's Scene Three audio department just completed audio post work on a Filmhouse pilot entitled *Long Shot Cafe*, as well as mixing multiple versions of the Marty Brown video "High and Dry" for MCA Records... Film Bank Think Tank, the research arm of Burbank's Film Bank stock footage library, recently completed an unusual search

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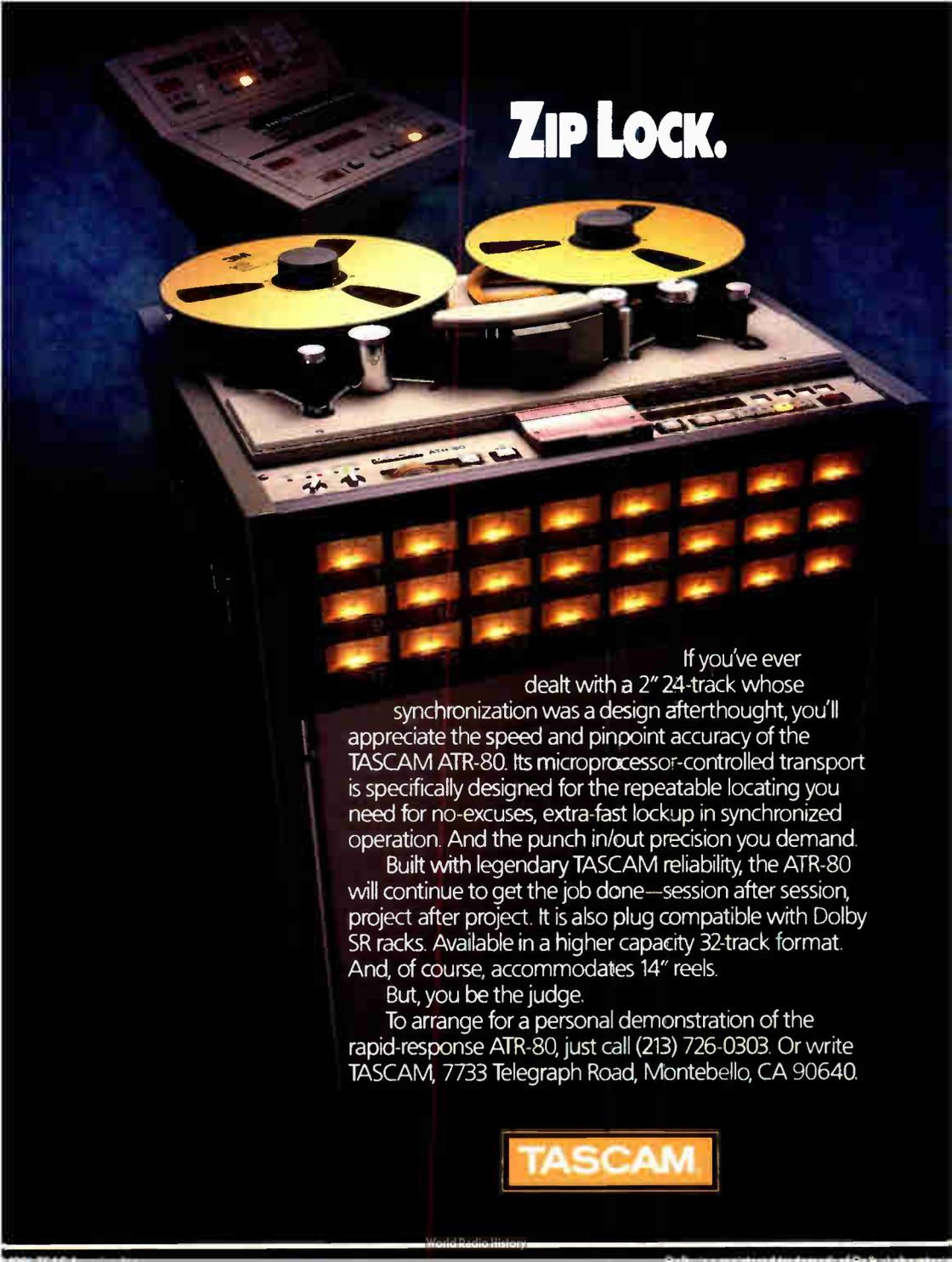
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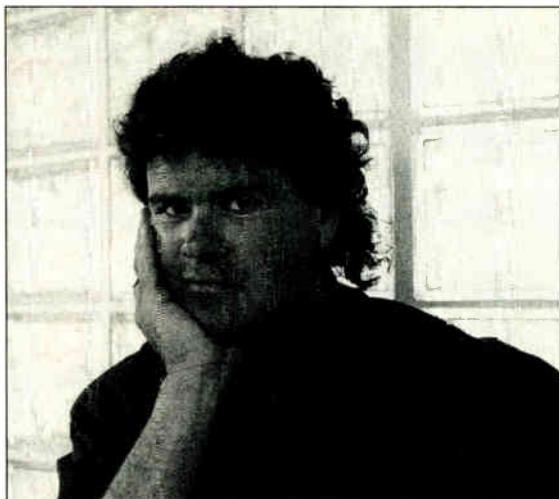
But, you be the judge.

To arrange for a personal demonstration of the rapid-response ATR-80, just call (213) 726-0303. Or write TASCAM, 7733 Telegraph Road, Montebello, CA 90640.

**TASCAM**

for Kresser/Craig, the Santa Monica agency, for its Daihatsu "Rare Sightings" campaign. Needed footage included sightings of such legendary creatures as the Loch Ness monster and Sasquatch, as well as UFOs...New York's Audio Post was recently chosen to master several prestigious projects for Invue Sound Inc. New digital masters and formatted works ranged from the classical—Andre Segovia's "The Art of the Guitar"—and a multivolume set of *The Ring*—to the classic rock of Eric Clapton, Bon Jovi, Billy Idol and others. Invue also provided digital mastering for the video promo clips "The Good Beat" by Deee-Lite and "The Very Thing" by Sarah Hicksman...Manhattan's Nutmeg Recording installed Solid State Logic's ScreenSound digital audio-for-video editing/mixing system for work on its post-production projects, which include a variety of station promos, radio spots and TV commercials...Still in the Big Apple, Howard Schwartz Recording was visited by veteran actor Tony Randall recently for the narration of a one-hour, read-along version of *Helena Grapevine*...The International Teleproduction Society (ITS) recently elected a new slate of officers, with Walter N. Hamilton (LRP Video) moving in as president. Hamilton succeeds Dan McGuire to become the third president of the worldwide association of production and post-production facilities, which was formed at NAB in 1986...Cheryl Pirello Neeson was recently promoted to president of Editel Boston Inc. Prior to her appointment, Neeson was VP and general manager of Digital Images, a division of Editel Boston specializing in graphic design and production services...Redman Productions of Orlando, FL, recorded and mixed the music to Universal's *An American Tale* and recently produced TV and radio spots for the Orlando Magic Organization...Chicago's Sparrow Sound has been busy with movie projects. First, Columbia's location shoot of *Mo' Money* called on Sparrow to work on the film's soundtrack; then Universal's Chicago shoot of *The Babe*, starring John Goodman, used Sparrow for location audio. Finally, film composer Bob McNaughton completed two projects: the transfer of his score to DAT for the release of *Henry, Portrait of a Serial Killer*, and the recording of an industrial. ■

**Frank Serafine, composer/sound designer of Serafine Incorporated, Venice, California, whose credits include this year's Oscar-winning Hunt for Red October, is currently doing the sound design for two feature films: Paramount's The Addams Family and Stephen King's The Lawn Mower Man.**

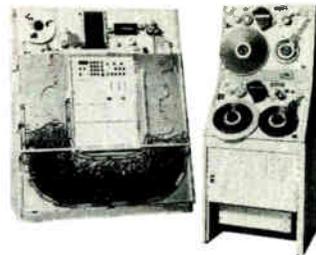
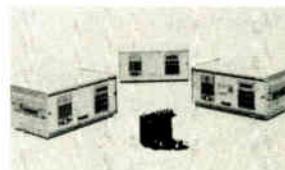


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# NEW PRODUCTS



## BEHRINGER SIGNAL PROCESSORS ▲

The German-made line of Behringer signal processors is now available in the USA from Samson Technologies of Hicksville, NY. These single-rack-space units include the Multiband Exciter, a box providing exciter enhancement in both low- and high-frequency bands; the Studio Denoiser, a single-ended noise reduction device with intelligent, program-dependent processing; the Multiband Expander Gate, which offers wide-ranging (3  $\mu$ s to 100 ms) attack times, along with expander, gate and ducking functions; the Studio Compressor, with an "easy control" that optimizes attack and release times based on program content; and the Studio Parametric EQ, a 5-band true parametric EQ/notch filter. All except the EQ are stereo/dual mono units, and transformer outputs are optional.

Circle #275 on Reader Service Card

## TIMELINE MICRO LYNX

Offering an economical method for synchronizing MIDI, audio and video transports is the \$2,495 Micro Lynx from TimeLine of Vista, CA. Consisting of a compact rack unit and remote keyboard with LCD, Micro Lynx includes MIDI and SMPTE time code generator readers, and two transport synchronizer/resolvers. Options include VITC reader, a third transport sync, NTSC/PAL video sync generator and a workstation interface with digital audio sampling clocks.

Circle #276 on Reader Service Card

## DEMETER TUBE GEAR ▼

Demeter Amplification of Los Angeles has two new products based on vacuum tube technology. Priced at \$1,395, the VTMP-2 is a stereo preamp featuring XLR mic and 1/4-inch instrument inputs; XLR, 1/4-inch and TT outputs; pad and level controls; peak LED indicator; and 48-volt phantom power—all in a two-rack-space chassis. The STDB-2 (\$850) is a 2-channel, rack-mount version of Demeter's popular VTDB-2 tube direct box.

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## ASHLY LINE MIXER

The LM-308 from Ashly Audio (Rochester, NY) is a single-rackspace mixer with eight stereo line-level inputs. Features include two 1/4-inch TRS balanced unbalanced outputs, LED clip and level meters, stereo mute switch, headphone out and a five-year warranty.

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## MARSHALL MONITORS

Nashville's Marshall Acoustics' new line of home and studio speakers feature phase-coherent, point-source coaxial drivers. Of seven speakers available, the Corner model is most unusual, combining a coaxial 8-inch speaker with full-size compression driver and rear-facing, 10-inch passive radiator. The wedge-shaped unit can be flown or placed on optional stands, and specs claim a usable frequency response of 15 to 24k Hz.

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## DIGITAL INTEGRATION SAMPLE RATE CONVERTER

New from Digital Integration (Dallas, TX) is the SRC-1000, a \$5,995 box that converts between any two sample rates from 30-50 kHz. Inputs and outputs are XLR AES/EBU format, and output sampling frequency is selectable from internal sync (32/44.1/48 kHz) or external sync from 30-50 kHz.

Circle #280 on Reader Service Card

## SHEP EQUALIZERS

The classic 31105 equalizer/mic preamp modules made by Neve in the mid-1970s are now being manufactured by Shep Associates (Royston, Herts, UK) and distributed in the USA by Valley Sound of Burbank, CA. The 31105 is a discrete, 4-band EQ/mic preamp with  $\pm 18$ dB cut/boost, a choice of two Q settings on the mid bands, and HP/LP filters. Racks are available to hold nine vertical modules or two/four horizontal modules. Valley Sound also stocks other modules (such as the 1073, 32261A and 31102), spare parts for older Neve consoles, and Shep's reissue of Neve's 2251 compressor/limiter, packaged with two units in a rack-mount case.

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**BAG END ELF SYSTEM**

Now in production is the ELF™ system from Bag End Loudspeaker Systems of Barrington, IL. ELF (extended low frequency) uses dual integrators, active equalization, frequency dividers and system protection to control bass speakers in compact enclosures (operating far below system resonance), providing improved fidelity at levels far greater than previously attainable from a small cabinet, without the drawbacks of vented and horn systems.

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**APOGEE A/D CONVERTER**

Apogee Electronics of Santa Monica, CA, is shipping its AD-500 analog-to-digital converter (\$1,695), a portable stereo unit providing a discrete front end for DAT recording, CD mastering, digital video and workstation applications. Sample rates of 32/44.056/44.1/48 kHz are selectable, and sync sources include internal crystal, word clock, NTSC or PAL video sync, S/PDIF, or optical. Both AES/EBU and S/PDIF digital outputs are provided.

Circle #283 on Reader Service Card

**HYBRID ARTS DIGITAL MASTER**

Hybrid Arts of Culver City, CA, offers the Digital Master, a complete hard disk-based recorder/editor priced at \$4,500, including CPU, monitor, mouse, 105MB hard disk, A/D and D/A converters, MIDI, SMPTE interface and software. Standard features include six selectable sampling frequencies, 64x oversampled ADCs, 18-bit DACs, SCSI port for additional hard drives and an S/PDIF digital interface that is said to be AES/EBU-compatible. Support is provided for 24, 25, 29.97 and 30 fps SMPTE time code, and options include time compression and digital filtering.

Circle #284 on Reader Service Card

**COOPER CS-10 A**

JL Cooper Electronics of Los Angeles offers the CS-10, an integrated control surface designed to work with Digidesign's Pro Tools workstation. The CS-10 features large tape recorder-style transport buttons, along with a jog wheel, eight 100mm faders, mute and solo buttons, and six rotary pots that can act as sends, EQ controls, pans, etc.

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**HOT OFF THE SHELF**

New for the Mackie CR-1604 mixer: "Mixer Mixer" combines up to three CR-1604s for 48 line inputs, 18 mic inputs, 24 direct outs and 12 stereo effects returns; "XLR-10" adds ten additional discrete mic preamps; "RotoPod" is a bracket set for mounting the mixer's jacks to face the operator. Call (206) 488-6843...New Auto-conforming software for the DAR SoundStation speeds up the drudgery of conforming audio to edited video. Call (213) 466-9151...The Antex Model SX-12 digital audio board, a PC-compatible, plug-in board for direct-to-hard disk recording, features sigma-delta ADCs with 64x oversampling and 18-bit DACs. Call (800) 266-3092 or (213) 532-3092...A three-year warranty on Drawmer products is now offered and is retroactive to customers who purchased Drawmer gear over the past year. Call QMI at (508) 650-9444

for details...Promusic now distributes the UBM/Largo production library with music in many styles on CD. Call (305) 776-2070 for info... A simple \$300 modification extends the record time of the Akai A-DAM digital multitrack system to 21.5 minutes. Call (817) 336-5114...Information Storage Devices' ISD 1016 stores up to 16 seconds of voice-quality analog audio on a single chip, requiring only a mic, speaker and +5 VDC source for a complete record/play system. Call (408) 428-1400...

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**VALLEY DYNAMITE 2 A**

Dynamite<sup>2</sup> from Valley International (Franklin, TN) is a multifunction signal processor offering users the ability to simultaneously compress, gate or expand the signal while providing peak-limit protection. Additionally, each section can be used independently. Priced factory direct at \$435, this 2-channel, stereo-linkable unit features balanced inputs/outputs and dual gain-reduction displays, and an anticipatory release computer delivers short release times without audible pumping or breathing.

Circle #285 on Reader Service Card

**GENELEC 1031A MONITORS**

Distributed in the USA by QMI of Natick, MA, is the 1031A studio monitor from Genelec. Designed for near-field listening, the 1031A is a bi-amped, two-way design with onboard amplification (dual 120-watt amps) and active crossover controlling the 8-inch woofer and 1-inch, aluminum-dome tweeter. Specs include a maximum SPL of 121dB/1m (per pair) and a frequency response of 47-20k Hz (±2 dB). The compact cabinets weigh under 27 pounds each and occupy a mere 15.5x10x11.5-inches.

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## FIELD TEST

analog or digital audio inputs and produces eight outputs, a right and a left for each input. It is designed to be used as an in-line device, with the processed (stereo) output completely replacing the original mono signal.

The SSC-8004 remote controller includes two large 360-degree rotary controls for each processing channel: one for azimuth (horizontal position), and one for elevation (vertical position). A ring of LEDs encircle each control to indicate current position, and an input-level indicator is also provided for each channel. The remote carries MIDI-in and -out jacks, and includes switches to trigger sys ex dumps. The SSC-8004 can be used to control as many as 16 processing units.

**THE RSS SHOULD NOT BE VIEWED AS ANOTHER DIGITAL EFFECT BUT AS A NEW FORM OF CONSOLE PERIPHERAL (AND A NEW PART OF THE MIXING PROCESS).**

A two-digit LED display indicates the unit currently under control. This system is also used to access utility and global adjustment modes on the processing unit.

A 7-pin DIN cable connects the controller to the RSS-8048 main processing unit, which includes two AES/EBU input jacks (two input channels per jack) and four output jacks (one stereo output per). In a suitably equipped digital studio, the RSS-8048 could be used without any additional I/O. The front panel has four input-level indicators, and a rotary switch that selects a machine number for using multiple RSS-8048s with a single controller.

Analog I/O is provided by a pair of ADA-8024 rack-mount ADCs, with two inputs and four outputs apiece. In keeping with the RSS's role as an in-line processor, the analog converters are of premium quality, with 18-bit oversampled A/D converters and 20-bit DACs.

### Into the Studio

Because of the unusual nature of this product, I was interested in getting the RSS into as many environments as possible. I also wanted to see how the RSS processing held up in different listening situations.

My first stop was The Plant Studios in Sausalito. (Special thanks to co-owner/chief engineer Bob Skye for arranging access to this historic facility.) I was assisted in evaluation there by Skye, staff engineer Mike Elwood and freelance engineer (and *Mix* contributor) Larry Oppenheimer. The results at The Plant and the reactions of all present were similar to those I encountered in subsequent sessions at San Francisco's Sound & Vision, Tarp Studios (San Rafael) and Alameda Digital Recording.

From the start, all were impressed by the RSS's ability to place a sound source well outside the arc of the loudspeakers. Listening in the premium environment of The Plant's newest room, Boomtown, sound sources were clearly located along a horizontal arc out to points slightly behind the listener's head position on either side (approximately 4 o'clock and 8 o'clock, if 12 o'clock is straight ahead). All present agreed as to the apparent locations of individual sources. The effect was startling enough that a real telephone ringing off to the side was momentarily mistaken for part of the mix.

Actual mixing with the RSS is a real pleasure. Even when left in a frontal position, RSS-processed sound elements seem to "stand away" from the rest of the mix. When multiple elements are processed, they acquire a distinctness from one another, and from non-RSS elements, which allows listeners to direct their attention to a chosen part, much as we can pull out a conversation we want to hear from the din of a cocktail party.

The ability to locate sounds at arbitrary spatial points suggests powerful musical applications. I found that locating sounds in unexpected spots was most effective when not overdone. In

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my view, spatial location "hits" should be set up as carefully as a musical hook, so as to delight and surprise the listener.

Musical styles oriented toward production effects, audio-for-picture and "sound drama" will be able to use the RSS's spatial locations more freely without seeming incongruous. Even here, though, the attention of the producer to tasteful creativity will make the difference between an exciting mix and a "mish-mash" of effects for their own sake.

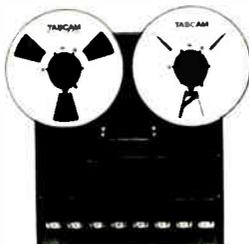
There are also limits on the conditions for producing the perception of specific sound localizations. To hear the illusion in full, it is necessary to listen from a center position, exactly equidistant from each loudspeaker. The specific quality of location is lost if the listener moves more than a foot or so from the center line between speakers, but RSS-processed sound preserves a pronounced sense of "spatial contrast" between individual elements, even when listening from positions that are well off-axis. Localization effects are most robust when reproduced over loudspeakers whose drivers are precisely aligned in the time domain, such as coaxial and other point-source designs.

The RSS's rotary controls cover a full 360-degree sweep for both horizontal and vertical dimensions. This would imply a great deal of freedom in placing sound sources behind, above or below the listener. In practice, however, the placement in those areas is much less convincing than on the lateral arc to either side of the loudspeakers. Illusions of far-rear placement were convincing only when "set up" as part of a trajectory of motion. Otherwise, they mostly sounded like sound coming from the front, with some lowpass filtering.

Convincing placement in the vertical dimension was not easy to obtain. The most successful example I heard came from a tape that Roland provided, a scene featuring the sound of a helicopter hovering above a couple enjoying a romantic outdoor rendezvous. The key seemed to lie in the combination of expectation (helicopter overhead) with some lateral motion (helicopter moving around). The latter cue seemed to hold in other situations as well. A bit of motion helped to convey a sense of elevation, though it was

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generally less emphatic than in this example.

Mono-compatibility and sound coloration are concerns with any type of studio processing, and especially so with a device that manipulates phase as the RSS does. The system can certainly be used in ways that result in problems in mono, but the exact results depend on the source, the specific settings and the audio context. As Bob Skye put it, "An engineer who doesn't check a mix in mono isn't doing their job."

Even in stereo, the RSS imposes a slight, but audible, artifact on the original sound, since the RSS resolves sound locations in 3-degree increments and applies a short (3 milliseconds, according to Roland) crossfade when moving from one position to another. This imparts a mild sort of flanging when a sound is moved between adjacent positions. These factors are generally subtle (but they *are* there), and the producer and engineer should be aware of them.

Based on other experiences and what I'm hearing on recent album releases, the limits and side effects of RSS processing are similar to those of other systems in use. It would seem that designers still face challenges in locating sound convincingly in all three dimensions, and under varied conditions.

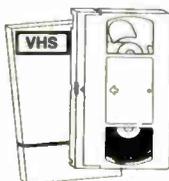
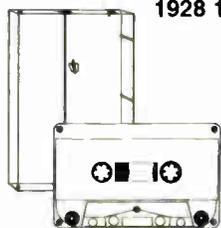
#### Use With Effects

Some of the nicest ways to use the RSS come from applying the process to the outputs of reverb, chorusing and delay devices. However, in doing this, it's important to be aware that if you put a mix of direct and reverberated sound through an RSS channel, all elements will receive the same localization. A far more powerful application is to route the direct and processed sound into *separate* RSS channels, and place them in contrasting spatial locations. This approach works nicely for any effect that creates a correlated, but separate, sound image, such as echo or micropitch shift. The separation of direct from delayed sound is striking and pleasing, with many variations possible.

One of my favorite tricks is routing stereo reverb outputs into two channels on the RSS, and spreading these wide in the stereo field. The result is remarkably spacious, but in a way that is more subtle than simply placing a sound source in some unusual spot.

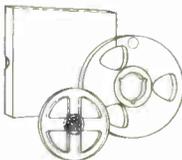
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**FIELD TEST**

My feeling is that listeners might eventually tire of "novelty" mixing, but this sort of "image manipulation" can be used to build mixes that have a pleasing sense of dimension and spatial differentiation.

**3-D MIDI**

Almost any MIDI sequencer can be used to automate the action of the RSS, using polyphonic aftertouch messages on MIDI Channels 1 through 4 to denote elevation (note number) and lateral position (aftertouch value). The normal application is to connect both MIDI in and out, and turn on the sequencer's MIDI data thru. In this way, the MIDI output of the RSS remote will pass through the sequencer and return to the MIDI input, so that the RSS behaves normally for manual operation. Any motion of the control can be recorded in the sequencer. (Be sure to turn off filtering of poly aftertouch messages.) On playback, the RSS will exactly replicate the operator's motions.

MIDI can also be used to automate the RSS in other ways. Using Max (Opcode's visual programming language), I was able to create some useful control functions. This Max patcher maps note numbers to RSS locations. You just play a note on your MIDI controller and set the RSS controls to the position you want to assign to that pitch. The patcher builds tables of elevation and azimuth values. When you play, the sound jumps to the preset positions. On arpeggios of percussive-type sounds, the effect was intriguing.

I also found it useful to add a little bit of "position envelope" at the attack of a note when I wanted to draw the listener's attention to a particular part. The "twitch" of motion—not enough to make the part move appreciably—serves to grab the attention of listeners without their becoming fully aware of the reason. Throughout my experience with the RSS, I found that many of its best uses lay in this sort of subtle psychoacoustical manipulation.

**Conclusions**

The Roland RSS System is a powerful tool for mixing. With it, engineers, artists and producers can create striking aural illusions. These can be startlingly extreme (such as sounds coming from points far outside the arc of the loudspeaker) or they can be more subtle

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(such as a spatial separation that lets the listener "pull out" and listen to individual parts more readily than in a conventional mix).

Even the more flamboyant uses were most effective when carefully set up. When everything is everywhere, the impact is lost after a while. But when most of the mix is conventionally placed, the element from far left field comes as a great surprise. As in every part of the production process, using the RSS to good effect is a matter of attention and creative thinking.

The RSS is a landmark in the development of true 3-D sound, but it doesn't do everything. Besides the differences of vividness of illusions in various directions, the RSS makes no attempt (at least in the current software version) to provide cues for distance, room or other environment, or Doppler pitch shift resulting from source motion. Engineers can incorporate these factors by careful use of reverb and delay, but I look forward to future processors that handle these manipulations automatically.

The RSS should not be viewed as another digital effect but as a new form of console peripheral (and a new part of the mixing process). It is an in-line component, rather than a sidechain device, that extends a console's capabilities in entirely new directions.

A premium in-line device must have top-notch signal quality, and the RSS's state-of-the-art converters and high-resolution digital processing meet this requirement handily. Localization processing also requires extraordinary DSP power and imposes steep development costs. With this perspective, the system price of \$44,500 does not seem unreasonable. Roland offers leasing options, and the RSS is available from equipment rental companies nationwide. Ultimately, the producer must determine the cost/benefit of using this new form of sound localization technology.

The RSS's technology represents a real advance for the mixer's art—one that will be with us in one form or another from here on in. Producers and engineers would do well to become familiar with the capabilities and benefits that the RSS System offers. ■

*Gary Hall lives in Alameda, California, where Star Trek's Mister Chekhov went to find the "nuclear wessels."*

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Landy; *Timmy T.* produced by Jon Ryan.  **The Castle** *Lee Greenwood* produced by Jerry Crutchfield; *Ricky Skaggs* produced by Mac McAnally.  **Chung King Recording Studios** *Run DMC* produced by Jam Master Jay; *3rd Bass* produced by Sam Sever, SD-50, KMD, Prince Paul & Marley Marl; *L.L. Cool J* produced by Marley Marl; *Nikki D* produced by Sid Reynolds.  **D & D Recording** *Vanilla Ice* produced by Gail "Sky" King; *Big Audio Dynamite* produced by Jr. Vasquez; *Herb Alpert, Ziggy Marley* produced by Bobby Konders.  **Electric Lady Studios** *Queen, West World* produced by John Luongo & Gary Hellman.  **Emerald Sound Studios** *Hank Williams Jr.* produced by Barry Beckett, Jim Ed Norman & Hank Williams Jr.; *Alabama* produced by Josh Leo & Larry Lee.  **The Enterprise** *Winger, Warrant* produced by Beau Hill; *Nelson, Trixter* produced by Mark Tanner; *The Fixx, Rebel Pebbles* produced by Tony Peluso; *Gladys Knight* produced by Michael J. Powell; *Henry Lee Summers* produced by Ric Wake; *Nia Peeples* produced by Howard Hewitt.  **Mad Hatter Recording Studios** *Chick Corea Elektric Band* produced by Chick Corea and Co-Produced by Dave Weckl and John Patitucci; *Lee Ritenour, David Benoit* produced by Mike Abene for "Shannons' Deal."  **Magee Audio Engineering** *Los Angeles Philharmonic Orchestra, Pacific Symphony Orchestra, Terry Trotter & Friends* produced by Joseph Magee.  **Mobile Fidelity Sound Lab** *Igor Oistrakh Trio* produced by S. R. Britton & Edward Shakhnazarian; *Gennadi Rozhdestvensky & The USSR Symphony Orchestra* produced by Krieg Wunderlich & Tori Swenson.  **Music Mill** *Eddie Rabbitt, Earl Thomas Conley, Oak Ridge Boys* produced by Richard Landis; *Anne Murray, Tanya Tucker* produced by Jerry Crutchfield.  **One Up/TMF** *Mussingtons, Dumpa* produced by Dianne Norris; *Anita Baker* produced by Michael J. Powell; *Natalie Cole, Smokey Robinson* produced by Terry Marshall.  **The Plant Recording Studios** *M.C. Hammer* produced by Felton Pilate; *Mariah Carey, Michael Bolton, Peabo Bryson* produced by Walter Afanasieff; *Tony!Toni!Toné!* produced by Tony!Toni!Toné!; *De Anna Eve* produced by Shake City Productions.  **Royal Sound Studios** *L.A. Guns* produced by Michael James Jackson; *Art Laboe* produced by Art Laboe; *Festival Fountain at Caesar's Palace* produced by Champ Davenport.  **Sixteenth Avenue Sound** *Ziggy Marley* produced by Ziggy Marley & Glenn Rosenstein; *Michelle Shocked* produced by Michelle Shocked & Glenn Rosenstein.  **Studio 4 Recording** *Phil Collins* produced by Phil Collins; *D. J. Jazzy Jeff & The Fresh Prince, Schooly D.* produced by Joe "The Butcher" Nicolo.  **For information on the SV-3700, contact Panasonic, 6550 Katella Ave., Cypress, CA 90632 (714) 373-7278. For more great music, listen to:**  **Taj Mahal** produced by Skip Drinkwater.  **Studio PASS** *Defunkt* produced by Bob Appel; *Nic Collins* produced by Nic Collins; *Paul DeMarinis* produced by Paul DeMarinis; *Tom Cora* produced by Tom Cora.  **Keith Thomas** (producer) *Whitney Houston, Amy Grant, Carman, BeBe & CeCe Winans.*  **Triad Studios** *Queensrÿche* produced by Peter Collins; *Michael Tomlinson* produced by Dan Dean & Michael Tomlinson.  **Trevor Rabin** *Yes.*  **Unicorn Studio** *Roger Hodgson.*  **Unique Recording Studio** *Mariah Carey, Lisa Lisa & Cult Jam* produced by Robert Chivilles & David Cole; *Madonna* produced by Lenny Kravitz; *Lisette Melendez* produced by Carlos Berrios.  **Don Was** (producer) *Bonnie Raitt, Glenn Frey, Paula Abdul, Neil Diamond, Lyle Lovett.*  **And this is just the beginning.** Professional Audio Systems

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by George Petersen

# PRODUCT CRITIQUES AND COMMENTS

## **M**icrotech Gefell UM70

Here's a little microphone with a lot of history behind it. Microtech Gefell is a small company located in the small village of Gefell, about three miles east of the border that once divided Germany into two portions. But the story of this microphone actually begins in 1943.

After an incendiary bomb destroys part of his factory, George Neumann moves his microphone-manufacturing facility from Berlin to Gefell. The first production unit is the famed CMV4 "bottle" mic, using the M7 capsule developed by Neumann and later employed in the U-47, U48, UM57 and today in the UM70.

In 1948, Mr. Neumann leaves Gefell to establish a nicad battery plant in another town, while the microphone employees remain and continue production in cooperation with Neumann. Eventually Neumann returns to build mics in his native Berlin. In 1956, the East German government nationalizes all manufacturing, taking 51% control of the Gefell operation, which continues to manufacture microphones.

In 1961 the Berlin Wall goes up, ending communications between the Neumann plants in Berlin and Gefell. In 1972, the company's name changes to VEB Microtechnic Gefell, which is more in keeping with the concept of a "people's" company. With the political collapse of the Eastern Bloc, Microtech is now under the trusteeship of the new German government, and the mics are

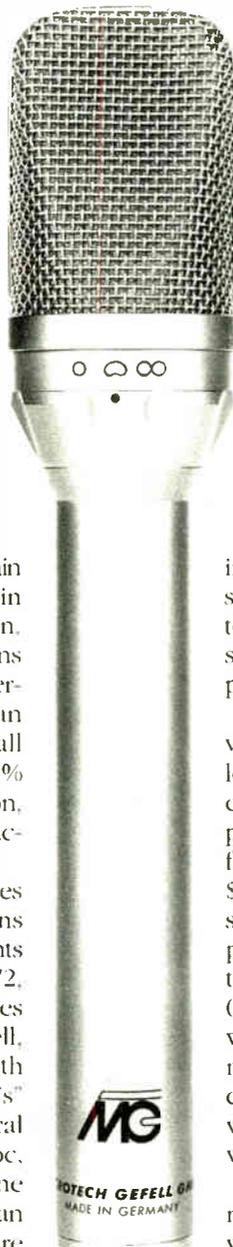
available to the outside world.

Today, Microtech Gefell manufactures a variety of models, including instrumentation-quality measurement microphones, as well as mics for sound reinforcement, broadcast and recording.

Most interesting to Westerners, perhaps, is the UM70, incorporating the legendary M7 large-diaphragm, dual-membrane capsule. In fact, Microtech still uses the same techniques to construct the M7 as in days past, with a hand-cast, 10-12mm PVC diaphragm and 153 hand-drilled holes in the backplate. One thing that did change, however, is the state-of-the-art machinery for gold-sputtering the diaphragm. The UM70's electronic design is anything but old-fashioned, including a switching power supply (fed from external phantom power) and an FET-input stage coupled to a hybrid amplifier.

The UM70 is available in two versions, both having three selectable polar patterns (omni, cardioid and figure-8), -10dB pad and switchable highpass filter. The UM70 is priced at \$995. At \$1,150, the UM70S is a select version with 3dB improved noise performance over the standard UM70. The M71 (\$795) is a cardioid-only version with standard electronics. All mics include a 25-foot, high-quality XLR cable, mic clip, windscreen and foam-lined, wood storage case.

While the UM70S's rated noise figures (16dB IEC, A-weighted) are not exactly in the



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## AUDITIONS

range of Neumann's TLM Series, they are certainly respectable, and they're approximately the same as the Neumann U89.

The UM70S capsule is extremely smooth on lead or background vocals, as well as spoken-word narration. I found the omni pattern to be better suited for female vocals, while the noticeable presence boost in the cardioid position really helped male vocals cut through the mix. The UM70S can handle SPLs of up to 135 dB, so recording horns was no problem; in fact, the mic really excels in this area, particularly for solo sax and trumpets.

Off-axis frequency response was uncolored, which is always an important consideration when working with vocalists who tend to move around a lot. I wasn't overly impressed by the onboard highpass (bass roll-off) filter, which seemed to have a steep slope and probably wouldn't be too useful in most studio applications. The very large foam windscreen included with the mic, however, is highly effective and does a good job in handling excessive breath noise.

Overall, the Microtech Gefell UM70S is a winner. It's versatile, sounds great and at \$1,150 would be a welcome addition to anyone's mic locker.

Distributed by Gotham Audio, 1790 Broadway, New York, NY 10019; (212) 765-3410.

## E-mu Proclusion

Some months ago, when I first saw this box, it seemed like a pretty cool idea: lots of great 16-bit drum sounds, six routeable audio outs, 32-voice polyphony and 16-channel, multitimbral operation. More recently, I needed

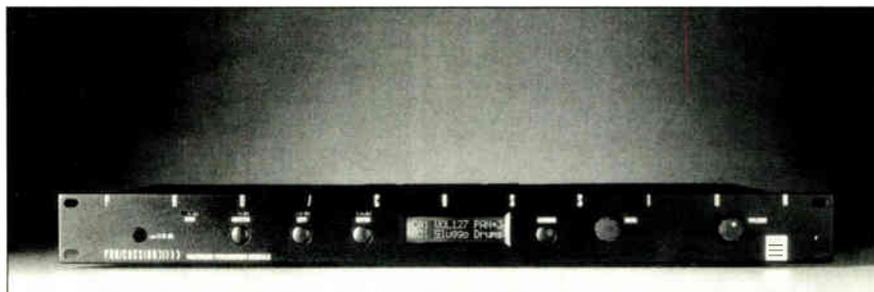
up buying the unit. Why? Because a MIDI percussion module makes a lot of sense. Why pay for buttons and features I don't use? I have numerous drum machines in my studio and haven't used the onboard pattern/song programming features on them in years, because my sequencing software does it better and faster.

And while we're on the subject of speed, any of Proclusion's 128 drum kits (64 factory, 64 user-definable) can be instantly accessed with a spin of the front panel data wheel. Likewise, any of Proclusion's 140 sampled sounds or 556 factory stacks (combinations of up to four percussion instrument sounds) can be auditioned with a couple of quick keystrokes. Proclusion also contains note-mapping schemes for ten popular drum machines and pad controllers, making the sometimes tedious process of drum-sound replacement a snap. All of this brings to mind the adage, "Time is money," which aptly applies to studio time.

Like its cousin, the E-mu Proteus, Proclusion's two pairs of "sub" outputs can be used either as additional outputs (with programmable pan and level control on any instruments assigned to each) or as effects sends and returns for processing selected instruments before routing them to the main stereo outputs.

Operation of the unit is intuitive. I used Proclusion for about two weeks before looking into the manual, which, incidentally, is thorough and well-written.

But Proclusion's real power comes from its extensive layering and editing capabilities, offering the user a dynamic palette from which to create new sounds. Among these are pitch shifting of any sound over a ten-octave



some additional drum sounds for a studio session, so I snuck out of the office one night with a Proclusion that was on loan to *Electronic Musician*, our sister magazine. It never went back.

After two sessions with Proclusion, I was completely addicted and ended

range, eight velocity curves, modulation control, envelope shaping, reverse sample play and one LFO per stack.

Offering flexibility and versatility (the unit also includes sound effects, tuned and ethnic percussion, and bass

sounds), Procussion is a powerful tool for either live performance or the studio. At \$995, it's quite a box and one heck of a studio time-saver.

E-mu Systems Inc., 1600 Green Hills Road, Scotts Valley, CA 95066; (408) 438-1921

### Stax SR-Lambda Professional Earspeakers

Recording engineers need to hear. The most difficult aspect of studio or remote recording is that the sounds we really need to hear are usually reproduced through a long chain of devices—microphones, preamps, mixing consoles, crossovers, amplifiers, speakers and then the dreaded control room acoustics. Occasionally, the audio chain works superbly, but more often what we hear is significantly colored by the time it reaches our ears.

A staff engineer at a studio can become accustomed to the quirks in any system and compensate accordingly. However, the independent engineer or producer in an unfamiliar listening environment is at a distinct disadvantage. Toting a pair of trusted close-field monitors may help, but in some instances, this may be difficult or even impossible, especially when working on location. One possible solution is Stax Earspeakers.

Yes, "earspeakers." You'd better not refer to these as mere headphones, especially considering the \$1,500 price. These are anything *but* ordinary.

The Stax SR-Lambda Earspeakers use an electrostatic drive system, whereby an extremely thin (one micron) transducing diaphragm, coated with conductive material, is suspended between two fixed electrodes. A polarizing current of 580 VDC charges the diaphragm, and when an audio signal is applied to the electrodes, the diaphragm is set into motion due to the repulsion and attraction of electrostatic charges.

Electrostatic headphones require a driver unit, an outboard electronics box that supplies the polarizing current and provides the audio-to-headphone interface. In the past, these driver units tended to be bulky, AC-powered devices about the size of a shoe box. However, the Stax company—which pioneered the application of electrostatic headphones more than 30 years ago—recently unveiled a compact driver unit, powerable via an AC adapter or an optional, rechargeable

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nicad battery pack. Designed for professional users and housed in a rugged, lightweight case, the new driver unit makes electrostatic monitoring a reality for location recording applications.

On the front panel, the pro driver has a power switch with LED indicator, 5- and 6-pin amphenol-type jacks for connecting either pro- or consumer-series headphones, and a stereo-mini-plug input jack. Equipped with a suitable adapter cord, the latter allows connecting various line-level inputs to the driver unit, useful when the optional nicad pack is attached to the rear panel, which blocks access to the two RCA-line inputs.

The Earspeakers are lightweight and comfortable, weighing in at 450 grams. Part of the reason for the lightweight design stems from the extensive use of plastic, which has a flimsy feel. With this and the steep system pricing in mind, it seems unlikely that Earspeakers will be used for musicians' monitoring on wild rock 'n' roll sessions. A more likely scenario is the use of the Earspeakers as a producer's or engineer's personal reference. The entire system fits nicely into an ATA-style briefcase, and perhaps Stax will offer such cases (with custom foam cutouts) as a future option.

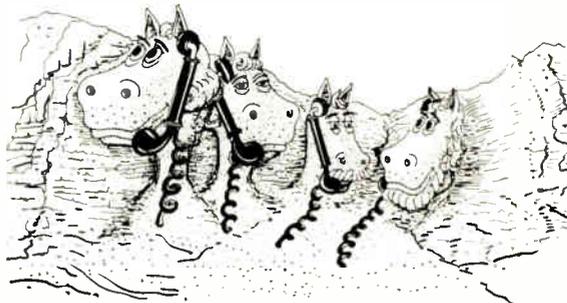
Listening on the SR-Lambda Pros is a real pleasure, without inherent ear fatigue that accompanies other headphones. The frequency response extends beyond 40 kHz, so I never felt that the system had to strain to adequately reproduce transients. The bass is full and solid. Whether running on battery or AC, the system packs plenty of volume, and I rarely needed to turn the level control beyond the noon or 1 o'clock mark. Maximum SPL at 400 Hz is rated at 118 dB.

At \$1,500, the Stax SR-Lambda Professional Earspeakers are obviously not for everyone. But if you're serious about listening and you've been disappointed with the usual approaches to headphones, perhaps you should give these a listen.

Stax Kogyo Inc., 20620 South Leapwood Ave., Suite F, Carson, CA 90746; (213) 538-5878. ■

*George Petersen lives with his wife and two musical dogs in a 105-year-old Victorian house on an island in San Francisco Bay.*

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(mik'sēr) *noun*. An electronic device used to *mix* music. Must be clean, transparent and punchy. See Alesis 1622 Mixer. Better yet, listen to it.



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\* Total Harmonic Distortion + Noise: too low to measure.\* Keyboard Magazine July 1990.



**Performer:** Van Halen  
**Venue:** Shoreline Amphitheater, Mountain View, CA, September 14, 1991  
**Rental Company:** Audio Analysts  
**FOH Mixer:** Jon Ostrin  
**Monitor Mixer:** Jim Yakabuski

Van Halen's two Shoreline dates were near the end of the first leg of the band's successful summer shed tour. Providing sound for the band was Audio Analysts, which coincidentally, was in the middle of a move from Plattsburgh, N.Y., to Colorado Springs, Colo. While previous outings with the band have been more extravagant, on this tour a "less is more" philosophy prevails. FOH mixer Jon Ostrin explains: "I had a conversation with Eddie [Van Halen] at the beginning where he said, 'It doesn't have to be a wall of thunder. Let's get this thing clean and distinct. Let's understand every word Sammy [Hagar] is saying and all the notes to all the riffs.' [On the last tour] I'm told they were running from 24 to 30 inputs on the drum kit. [This time] we're doing the whole band on 30 inputs. The simpler, the better."

It's always easier to please a client who knows what they want. "From day one in rehearsals, I got the idea they wanted it to sound like a band playing," says monitor engineer Jim Yakabuski. "Eddie's sound has changed a little over the

# VAN HALEN

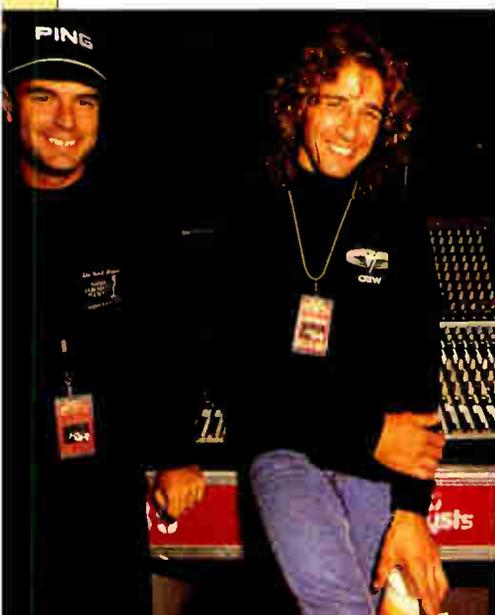
## On Tour: The Simpler, the Better



years, but it's pretty similar. I don't think Alex's drum sound has ever changed—he knows the frequency he likes, 500 Hz, and likes that boosted on the snare—a lot of 'wood' and that's all he wants to hear. There's no reverb on anything [in the monitors]. It's really just a balance. It's almost like a FOH system down low."

Ostrin agrees. "We get very similar sounds—the sound out front is very similar to the sound they're looking for onstage." Cooperation between house and monitor systems makes that goal easier to reach. "We work together," adds Yakabuski. "Just a couple of days ago we spent half an hour on the vocals. I wound up taking just about everything below 200 Hz off all the vocals to let Jon do the warming and filling up in the house. It keeps things really dry and tight onstage, and it really worked out well."

The FOH position centers around a CADD console. Ostrin notes, "It has features that can keep you busy for months, as far as routing and A/B switching for effects, but since we're doing the band with only 30 inputs, it's set up pretty straightforward. It's not a band where you can get away with big snare reverb shots, 'cause



**Center:** Alex Van Halen's brother. **Above right:** Alex Van Halen and his internally miked drum kit. **Below far left:** Van Halen's Jim Yakabuski (monitors) and Jon Ostrin (FOH).

PHOTOS: STEVE JENNINGS

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there are no ballads. I keep all my reverb times below 2 seconds, around 1.4 or 1.7 seconds, and let the cymbal overheads keep everything grooving. It's not a real effects-heavy band. I've got a couple of slaps on Sammy's vocal, which vary from song to song, but I'm not doing much changing, especially for the first leg." (A Lexicon 224 and Eventide 3000 Harmonizer are the FOH effects highlights.) Instrument effects, when used, come directly off the stage, with L/R and dry feeds provided to FOH from both bass and guitar rigs.

"This album has probably the most effects they've had," says Yakabuski. "Andy Johns came in and beefed the drums up. But Alex came into rehearsals and said, 'It's a great sound for the album, but I still want my drums to sound the way they have for 15 years.'" Drum mics are mounted inside the drums themselves, including Sennheiser 509s in the toms and 421s in the kick. This makes getting a consistent drum sound easier for everyone, and, of course, helps reduce leakage.

"I started out with noise gates on everything," says Yakabuski, "but they're not on any more. I don't even use the mute groups on the board. Everything is open during the show—it's a low-enough level that you can pull it off."

A CADD console also is used for monitors. "I don't think I have anything on the board cut or boosted more than 3 dB. If you do need to boost or cut a frequency, it's right there. It's a nice EQ. I have a graphic and a five-way parametric on each mix, but the way it's turned out, everything's almost flat. Some of the mixes have a little cut at 2.5 or boost at 10 kHz. You could almost do it off the board and the outboard parametrics, but for me the graphs are like a security blanket! The board also has an aux matrix remix section, which lets you take any one of the four aux mixes and reroute it to any stage mix. I use this when Eddie and Mike [Anthony, the bassist] come to the center to sing with Sammy. I just set up a little mix

of Eddie's guitar and drums, and bring that in Sammy's mix. You don't have to turn on four or five channels, just one matrix. The only thing about it that isn't great is that it weighs a ton. Four stage hands can lift a Series 4, but this takes at least six or eight guys. It's probably twice as heavy."

With this band's style of music, one might expect stage level to be pretty high. Fortunately, this is not the case. Yakabuski explains: "Mike is probably the loudest thing up there. He goes for that bassy tone, without a lot of cut in it, so to hear himself he has to be quite loud. But Eddie's real reasonable—he just uses three bottom cabinets at the end of his stack. He doesn't like to hear those straight on. And I put a little of him in his sidefill." Sidefills are Audio Analyst's A-3s, with one hung for lead vocal and two on the floor carrying a full mix on each side of the stage.

Analyst's crew chief Mario Leccesse notes the absence of subwoofers in the the tour's 56-cabinet, Crown-powered rig. For the arena leg of the tour they will increase the box count to 72, eight of which will be subs. Leccesse felt subs weren't required by the band's sound in the sheds, taking into consideration the full-range response provided by the HDS-4's dual 18-inchers. To prevent build-up in the lower seating area of the venue, Leccesse tilted the bottom row of HDS-4 cabinets up toward the grass seats, rather than the typical downward orientation.

"At this point in the tour, we've done about 15 shows," says Ostrin. "We've done totally outdoor ones and a lot of difficult venues, but it's at a point now where we're pretty locked in. The first week was pressure, with the guys out front every day or doing an hour-and-a-half just on monitors. But we're relaxed now, we've gotten over the big hump and finished the first leg pretty successfully. Now they don't have to worry about what we're doing—they can just concentrate on playing their music, which is exactly how it should be." ■

—FROM PAGE 132, SOUNDCHECK

any festival's set change-over is a penchant to keep the sound crew guessing. "Who's on the rider and who shows up to the gig are two different things," Mathews says. "We had an act a couple of years ago that was going to be a 15-piece orchestra. The guy showed up ten minutes before he was on, and it was just a piano and him. Or someone will show up with an eight-piece band instead of two acoustic guitars."

No one is more affected by unanticipated performers than the monitor engineer. That task fell to Sound On Stage veteran Chris Becker, who handled the stage's ten monitor mixes. Becker's busy weekend was capped by a birthday tribute to B.B., which included surprise appearances by Robert Cray, Bobby McFerrin, Boz Skaggs and Narada Michael Walden. During the extended birthday fest, the stage was also occupied by several film crews, some hoping for a monitor audio feed. Fortunately, the logistical hurdles were overcome, and the show ended with a bang.

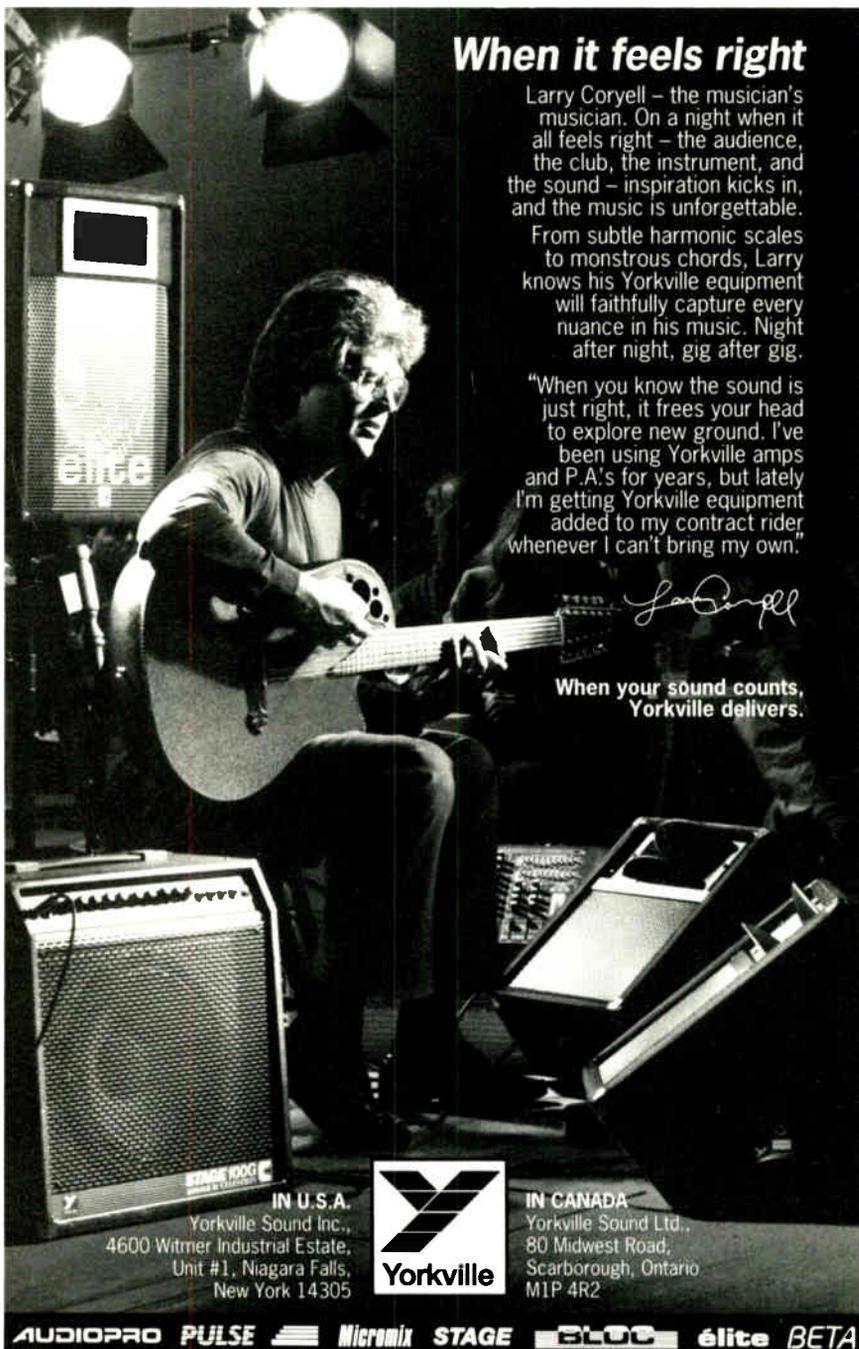
"We set up a generic mic chart and label every cable, mic stand and microphone onstage," Mathews says. "Then during set change, if there's three horns, you walk over and grab three horn channels and drag them out onstage. [This] gets us the least amount of gain and EQ changes." A common drum kit is used for all acts.

FOH equipment included a Gamble HC40 console (a pre-EX model Gamble was also used for monitors), Aphex gates and limiters on vocal and piano, and dbx limiters on horns and bass. Mathews particularly likes the Aphex's high-frequency expansion. "You know when someone like Etta James gets on the mic," he says, "you're going to have problems, because she's really loud and then really soft. [The Aphex] is great for anything that's got HF you can't afford to lose." Other outboard gear included Yamaha REV7s, SPX90s and a Lexicon PCM41. Getting it all on tape every year is JBL's Ken Lopez, who takes a house split and mixes an archival DAT off a Soundcraft 8000 console.

## Clair Brothers Update

Many of Clair Brothers' (Lititz, Pa.) successful summer tours are continuing into fall runs, including Sting, who is finishing in Europe this month and then moves on to Japan and Australia. Other long-running acts include Paul Simon's 14-month odyssey, which will make a Pacific Rim sweep before concluding next month. The Australian leg of the tour will exercise Clair's two-year-old cooperative relationship with that country's

Jands. Other Clair clients include Amy Grant, Roxette, .38 Special, Don Henley, Kenny Rogers, Kylie Minogue and Lynyrd Skynyrd. Also of note was the company's Steve Miller Band summer tour, which made even more use of the Future Sonics Ear Monitors than the Gloria Estefan/MSI tour profiled here last month. Finally, the first season of Clair's Mexico City office is complete. "Every domestic artist that's been down there has enjoyed the experience, and the Mexican artists who have



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used it have been pleased to have professional product available for the first time on a packaged basis," says Clair's Greg Hall.

### Golden Sounds

Golden State Sound has been operating in Northern California's wine country for nearly two decades. The company does mostly musical dates, but also covers a variety of corporate and other events. Golden State went shopping recently for a new loud-speaker rig to complement its Apogee A5/Intersonics Servo-Drive/Crest system. The company auditioned a number of systems with an ear toward musicality and intelligibility. In the end, an Adamson system was chosen. According to Golden State's Don Lind: "I could feel a relaxation in my brain every time I listened to the Adamson. It required less mental work to discern what was being said and what was happening." The configuration includes eight manifold bass enclo-

tures and eight mid/high units. "It's the meatiest thing I've ever heard for its size," says Lind.

The company took the new Adamson system out for the recent Russian River Jazz Festival, which included a set by bluesman Robert Cray. Golden State will also use the rig for several Mamas and Papas' dates. Despite the new addition to the family, the original Apogee/Intersonics system still garners praise from Lind. "I'd like to think we have the best of a couple of different approaches, and we try to use what's best for each particular event."

### January Sound Reinforcement Seminar

SYN-AUD-CON, in conjunction with PSN, will host a post-NAMM three-day live sound seminar, January 14-16, at Chapman College, Orange, Calif. "Concert Sound Reinforcement—Today and Tomorrow" will cover everything from grounding and rigging techniques to computer control and financial issues. For further information

contact Carolyn Davis at SYN-AUD-CON, (812) 995-8212 or (812) 995-2110 (fax).

## NEWS FLASHES

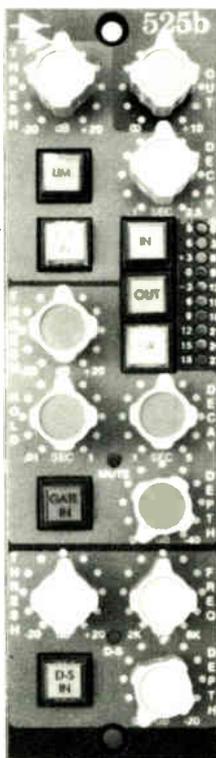
Tasco (Camarillo, CA) has been out with Cinderella, Warrant and Crowded House. I caught Crowded House with support act Richard Thompson at Berkeley's Greek Theatre in September. Tasco's PM3000/EAW-based system sounded good on Thompson's solo acoustic guitar, and FOH mixer Angus Davidson did a fine job of re-creating the depth and texture of Crowded House's detailed studio sound...Although "cautious optimism" seems to be the watchword in the industry these days, **Pro Media** of El Sobrante, CA, is expanding its sales force. Three new hires will help the company cover everywhere from Reno to San Jose. David Meyer (Sacramento) and Lawrence Lahl (San Francisco Peninsula) will cover outside sales, focusing on large and small system installs, while former Concord Pavilion engineer Jon Sager will cover inside sales, targeting live sound reinforcement clients...**Bernhard Brown** (Dallas, TX) was out with lights and sound for Ratt and L.A. Guns on a nationwide summer tour (L.A. Guns put on a good show in support of the AC/DC-dB Sound tour earlier this summer). Bernhard Brown is lining up industrial gigs for the fall, including a long-distance date with Beach Boy Mike Love at the Four Seasons in Nevis, West Indies...**RCI Sound Systems** (Rockville, MD) handled the National Symphony Orchestra's concerts on the Capitol Lawn for the fourth straight year. The show, which drew crowds of up to 20,000, included performances by Cab Calloway and Tony Bennett...

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*David (Rudy) Trubitt's new book, Managing MIDI Basics, will be available in January. He realizes that this may be of marginal interest to SR professionals, but he nevertheless succumbed to this shameless act of self-promotion.*

## SOUND REINFORCEMENT NEW PRODUCTS

**KLIPSCH KP-101** ▲

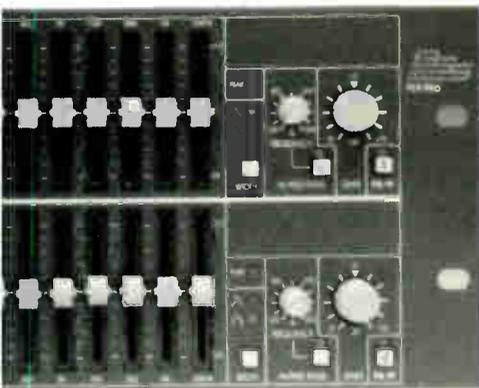
Designed for sidefill, foreground and near-field applications is the KP-101 from Klipsch, Hope, AR. The two-way system has an 8-inch woofer and horn-loaded, 1-inch compression driver providing a frequency response of 75-20k Hz,  $\pm 1$  dB (-10 dB at 51 Hz), a max continuous output of 113 dB (1m 80W) and 123dB peak handling. The 3/4-inch ply enclosure includes a drilling pattern for an Omnimount 50 Series bracket; an optional Klipsch bracket allows for wall or mic stand mounting.

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**BSS FCS-960 GRAPHIC EQ** ▼

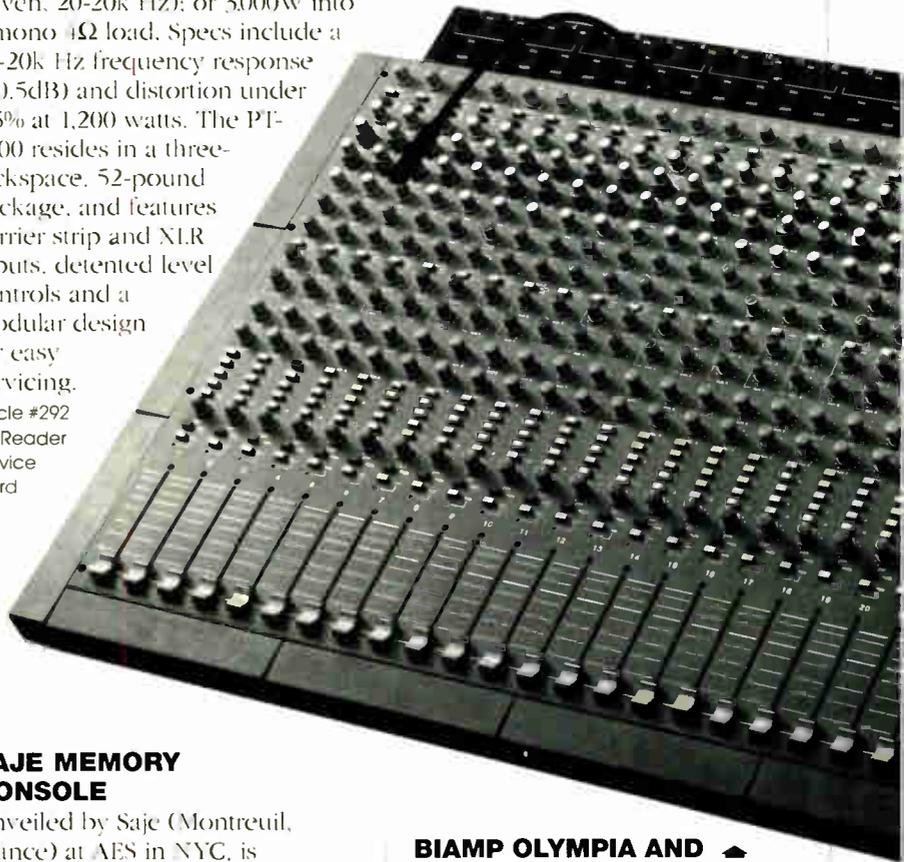
New from BSS Audio (a division of AKG, San Leandro, CA) is the FCS-960, a dual-channel, 1/3-octave graphic equalizer. The \$1,459 unit features selectable wide or narrow bandwidth characteristics, and each channel provides independent EQ bypass, overall gain and sweepable highpass filter controls. Electronically balanced XLR inputs/outputs are standard; transformer I/O and a security cover are optional.

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**CARVER PT-2400**

Designed for pro touring applications, the PT-2400 is a 2-channel magnetic field power amplifier from Carver Professional of Lynwood, WA. The PT-2400 is rated at 750W/8 $\Omega$ , 1,200W/4 $\Omega$  or 1,500W/2 $\Omega$  (both channels driven, 20-20k Hz); or 3,000W into a mono 4 $\Omega$  load. Specs include a 20-20k Hz frequency response ( $\pm 0.5$ dB) and distortion under 0.5% at 1,200 watts. The PT-2400 resides in a three-rackspace, 52-pound package, and features barrier strip and XLR inputs, detented level controls and a modular design for easy servicing.

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**SAJE MEMORY CONSOLE**

Unveiled by Saje (Montreuil, France) at AES in NYC, is Memory, a fully automated console using a digitally controlled analog design, where the console surface controls analog electronic racks located up to 100 meters away. Over 10,000 console configurations—levels, switching and EQ settings—can be stored to disk and recalled in under 30ms. Memory is available in 32- and 48-channel versions, with 16 stereo aux returns and 8 VCA-controlled groups. Additionally, each channel has three inputs, so the engineer can instantly select 48 out of 144 input sources. A 32-way I/O matrix permits the console to be configured for FOH, monitor or recording tasks.

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**EMILAR CATALOG**

E3MC Inc. of Anaheim, CA, offers a full technical catalog of its Emilar loudspeaker, horn and driver products, including the Series 2000 line. For a copy, call (800) 421-7071 or (714) 449-7779.

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**BIAMP OLYMPIA AND COLUMBIA CONSOLES** ▲

Now shipping are the Olympia and Columbia consoles from Biamp, Portland, OR. The 4-subgroup Olympia Series (offered in 16-, 20- and 24-channel versions) has 4-band EQ, six aux sends, a stereo input channel, and four mono and two stereo returns. The Columbia Series includes 8-subgroup boards with all the Olympia features, plus eight aux sends, direct outs and 24-, 32- or 40-channel frames. All offer discrete, transistorized preamps, an all-metal chassis and balanced subs, mains and aux sends. The Olympia 24 is \$6,599; the Columbia 40 is \$10,999.

Circle #295 on Reader Service Card

by Iain Blair

# BOB EZRIN

## ON LENNON AND A-DAM

**B**ob Ezrin is smiling, and no wonder. The veteran producer, whose credits include albums for the likes of Pink Floyd, Peter Gabriel, Rod Stewart, Kiss, Lou Reed and Kansas, is sitting in front of a console deep inside Burbank's aptly named Enterprise Studios. He's busy mixing Julian Lennon's new solo album, and what he hears back is pretty impressive—"even to my jaded ears," as he puts it.

The engineer syncs up three tracks, and the room resounds to the infectious, up-tempo "Get A Life," the atmospheric "Rebel King" and the plangent piano chords and stacked harmonies of "Would You." The three cuts off Lennon's new *Help Yourself* album possess all the trademarks of a vintage Ezrin production—a beautifully depicted aural landscape complete with both grand, sweeping vistas and highly detailed close-up work—which are even more impressive when you consider that the producer recorded much of the project using the relatively new Akai A-DAM portable digital multitrack system. The usually press-shy Ezrin talked to *Mix* about working with that system, his recording methods and his involvement with Julian Lennon.

**Mix:** Are you a tech head?

**Ezrin:** Not really. I come from a very musical background, and I'm only a tech head in the sense that I've always loved toys. When I was growing up in Toronto, my best friend was my transistor radio. I owned one of the first ones, and I used to listen to all these faraway stations. That's what really got me hooked on music and sounds. Over the years I've learned enough to be dangerous, but I couldn't build a circuit if my life depended on it! I just know how things work from having studied it, and if you showed me a schematic, I could only barely read it. But I have an instinctive feeling for technical things, and I have an

*Beautifully depicted aural landscapes complete with both grand, sweeping vistas and highly detailed close-up work—these are the trademarks of an Ezrin production. 🎧*

**Bob Ezrin and Julian Lennon during a break in sessions for Lennon's Help Yourself album.**



PHOTO: LESTER COHEN

innate understanding of how things work, if not why.

**Mix:** Do you usually work with the same engineers?

**Ezrin:** No, I rarely repeat myself, although I like to use the same family of people, who all come from either my Record Plant days in New York or my studio days in Toronto, the latter of whom probably wouldn't otherwise get much of a chance to work in the States on international projects. One of my Toronto connections, Lenny De Rose, is engineering this project, and although he's done a lot of mixing in New York, this is his first major project in L.A. Then James Guthrie is doing the mixing, and he and I worked on *The Wall* together.

**Mix:** How did you become involved in this project?

**Ezrin:** I've known Julian for many years, and we've run into each other in London over the years. At one point I was asked to produce his first album, but I was busy with Pink Floyd and he ended up going with Phil Ramone. Then I got a call about doing this fourth album after the less-than-successful third one, *Mr. Jordan*. So we met and discussed what kind of record he wanted to make, and I was immediately very interested and intrigued.

**Mix:** What intrigued you?

**Ezrin:** He seemed much more mature and focused about his songwriting, and he had a story to tell, and

that always intrigues me. I like working with personalities and helping define them through their music. I also saw this as a good opportunity to apply my craft and use a lot of the techniques I've acquired over the years working with personality-oriented artists. So I agreed to produce, with one proviso: that we wouldn't go into the studio until our material was absolutely brilliant.

**Mix:** I assume then that the pre-production period was very intensive.

**Ezrin:** In fact, it was the most intensive part of the whole project, and it was also the part when we made greatest use of the Akai A-DAM system. It was during pre-production that I realized we needed to store all of our ideas on some sort of medium that wasn't going to break down, that wasn't going to be too noisy, that was going to be relatively faithful, and that would also allow us, if necessary, to later use demo material in a master recording context. So we began with the Akai 12-track analog system, which is very popular among rock writers these days, and we hooked that up with various sequencers and drum machines and began to develop our musical ideas. We'd take a song, flesh it out on 12-track, do all the overdubs, add all the vocals and harmonies, and then step back and decide if the result was truly interesting. Meaning, are you going to carry

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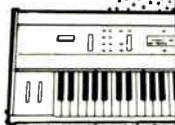
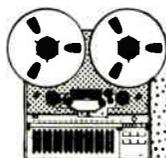
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on to the next refinement stage of recording, where you sequence out the song in terms of verse and chorus?

**Mix:** So when did you make the switch to the A-DAM system?

**Ezrin:** We recorded several songs on analog like I described, and then decided that many of the ideas we'd put on tape could be used if only they sounded better—less noisy and less distorted. So I started looking around for alternatives, and we played with hard disk, which was clean and easy to manipulate, but very inconvenient in terms of multitrack form. It gradually became obvious that we needed either a full-blown 24-track with Dolby SR or a system of equal quality—preferably less expensive. I happened to be in London, over at [film composer] Michael Kamen's house, and I noticed that he was using an A-DAM system hooked up with sequencers, and when he played me the results, I was amazed.

That's where I first saw the system in use, and it sounded just like master-quality recording. I'd read quite a bit about it, and obviously everyone's been talking about affordable digital for a long time now, and this totally convinced me. So we contacted Akai, and they very kindly provided us with two systems that we then synched together and used in place of a 24-track Studer with SR, or whatever.

**Mix:** So you went completely digital at this point?

**Ezrin:** Yes, and remember this was still in pre-production. Everything was laid down in a retrievable fashion, so if we recorded a killer guitar riff in a song that wasn't particularly successful, we could still salvage it because we also had SMPTE; often we were able to pull something out and drop it in to Sound Tools or some other medium where we could expand or contract it to suit. Since everything we did was in the digital domain, there was never any added noise or any appreciable amount of distortion.

**Mix:** How long did you spend on pre-production?

**Ezrin:** A long time. We started in July 1990 and didn't finish until the beginning of December. Then we started printing at the beginning of the year. During that time we grew 18 songs that we liked, 14 that we loved, 12 that we adored, and all of them were completely structured and fleshed out in a demo form. The great thing about working this way is that you can pick up a verse or chorus and move it around until you get the shape you

want. It's great, because it's virtually like having a completed album, and then you get an editing block out and sit there with an electronic razor blade and hack the album up into the absolutely perfect shape. Then you get to recut it. Now all this may sound too self-indulgent, but the fact is, this process eliminated a lot of the heartache of recording.

**Mix:** What was your next step once you'd completed pre-production?

**Ezrin:** We transferred all the digital 24-tracks across to a Sony 3348 machine and began the process of recording again.

**Mix:** What studios did you use?

**Ezrin:** All the pre-production was done at Amigo, as well as some of the initial tracking, and then we moved here to Enterprise, partly because the Sony system lives here—although we took it with us to Amigo—and the room has a Flying Faders system, which is a slightly later-generation Neve than the one at Amigo. Also, this room had QSound experience, and we'd decided to mix in QSound. So overall, I wanted to keep any possible problems to a minimum.

**Mix:** Why didn't you master the project on the A-DAM?

**Ezrin:** For several reasons. First, because of the transport, which has some slightly unwieldy characteristics. And second, because the sound, although excellent for the money, wasn't the very best we could do in the digital marketplace. We decided that the best was the Sony 3348. We compared them, and there was a noticeable difference. There was more air in the Sony, and it seems to have slightly less digital chatter. But we did find that a lot of the demo material we'd transferred, including stuff we'd recorded right at the beginning of pre-production, actually survived all the way to the end of the mix.

**Mix:** What are the A-DAM system's biggest drawbacks for you?

**Ezrin:** The fact that I can't see the tape. That worries me a lot. Also the fact that I can't hear it. In fact, one of its greatest strengths may be one of its greatest weaknesses, and that is that it's in the 8mm format. We don't know enough about the quality of 8mm cassettes yet to know whether or not they'll last, whether the transport is heavy-duty enough to withstand the wear and tear, and even more importantly, we don't know about the quality of the tape. Not enough people have been working in the medium on a professional level to

really nail it down, whereas conventional audio tape is under the microscope constantly.

**Mix:** Reservations aside, would you use it again?

**Ezrin:** Absolutely. It's very economical if you cost it out on a track-by-track basis. I'm still slightly hesitant about recording all my masters on 8mm, but then, in a sense I have committed to it, because some of this album comes direct from the A-DAM system, and I defy anyone to tell me which track was A-DAM and which was Sony. I even did some lead vocals using it. In fact, we should run a competition to see if anyone can spot the difference. ■

## VOICES:

### JOACHIM BERENDT RECORDS WORLD CHOIRS

by Bruce C. Pilato

German producer and jazz historian Joachim Berendt is in his Manhattan hotel room trying to explain what it was that convinced him to compile

*Voices*, a three-CD boxed anthology of some of the world's most memorable choir recordings.

"I was with a woman who sang in choirs," he says gazing out over the New York skyline, "and every time she came home from singing there was this beautiful glow on her face. I would see the same glow on the faces of these people in the choirs I was recording. Choir singing really cuts through the basic separation between us and nature. It's the same kind of feeling you get when you're in love."

Released early this year on Mesa/Blue Moon Records, *Voices* is one of the most comprehensive collections of human voices ever assembled for a recorded project. Included in the 33-song compilation are the Mystere des Voix Bulgares (Bulgarian Woman's Choir), the Tibetan Monks Choir, the Abyssinian Baptist Choir, the Israel Kibbutz Choir, Ladysmith Black Mambazo, and several other groups from areas as diverse as Bali, the Congo, Stockholm and Montreal.

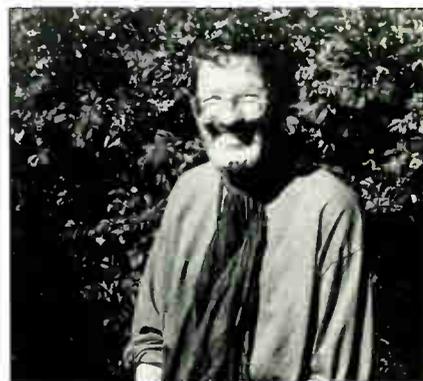
Running over 160 minutes in length, the *Voices* set is a compelling body of work. Beautifully recorded and remarkably soothing to listen to, *Voices*

is perhaps the greatest triumph in Berendt's career, which spans more than 40 years and several hundred recordings.

"*Voices* grew out of my work in a natural way," says Berendt. "Sooner or later it had to be done. I collected all these recordings over the world all these years without intending to do a compilation. My work is never the obvious one; the spirituality of the ear is really what I'm working on for the last couple of years. So, it became necessary to do this compilation."

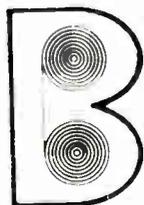
"I grew up in very Christian sur-

**Joachim Berendt**



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roundings and was active in music, playing organ and singing in the choir in my father's church," says Berendt, now a youthful 69. "When I was 5 or 6, I pumped the air for the organ, and that was really the beginning of my involvement in music. I grew up with the music of Johann Sebastian Bach."

The son of a German Protestant reverend who publicly opposed Adolf Hitler, Berendt became absorbed in music after his father was killed in the concentration camp at Dachau.

In 1945, still a very young adult, he founded the Southwestern German Radio (and later TV) network, where he remained program director until 1987. While at the network, he cultivated his love for jazz and other world music.

In 1948 and 1950, respectively, Berendt wrote the earliest of his 21 books. Simply titled *Jazz* and *The Jazz Book*, they are still highly valued philosophical, psychological and historical studies of this American art form. *The Jazz Book*, which Berendt has updated nine times, remains one of largest selling music-related books in history.

Since the early 1950s, Berendt has produced over 300 jazz albums by an amazing variety of artists, as well as countless other recordings. He founded the Berlin Jazz Days Festival in 1964, and two years later organized the first World Music Festival, which remains the largest gathering of ethnic music in the world.

He first began recording choirs more than 30 years ago at the urging of his close friend, saxophonist John Coltrane. "Coltrane really gave me a push to become aware of all this," he notes. "He also gave me a push to travel all over the world and record music from many different cultures. He didn't know very much about it, but he had a feeling we had to open up Western music and Western jazz.

"My recordings [for *Voices*] went back as far as 1962," says Berendt, "though my own recordings are the smallest portion of the compilation. I took many of these recordings from many popular recordings that were already existing."

In nearly every case, Berendt was able to get a hold of DAT copies of the 2-track masters, and he claims most of the recordings were not altered from their original state.

"There was no need to," he says. "I listened to all these [recordings] already with my technical ear and got the very best versions. There was some

work we had to do on my own recordings. For instance, when I recorded in Bali in 1962, I just had the Nagra recording off a film soundtrack, so we used some boosting to bring it up to today's standards."

On all of his own choir recordings, Berendt simply positioned each choir around a single mic and let the tapes roll. The Neumann U47 was generally his microphone of choice, but he also used various Sennheiser models on some of the *Voices* tracks.

"I think it's best to record a choir simply using one microphone," he says. "I used to record using lots of microphones, back when I was doing jazz. I would have a different mic for each musician. But I think there has been development. With all the good microphones out there now, it is really good to put the microphone in the situation of the human ear, using a stereo mic, of course."

Although many of the tracks on *Voices* were recorded in traditional recording studio setups, most of Berendt's recordings were not. "No, no—that would have been a mistake," he says. "In Bali, I was in a little village. Or in Japan I was in the Zen monas-

tery; I was in their shrine where they do their ritual. It would have been all wrong to take them out of their environment and put them in a recording studio. All of these people really *live* their music, and it would have given them a wrong feeling to bring them in a studio."

Though it took nearly two years to obtain all the rights from the different groups involved in the project, Berendt's labor of love was clearly worth the effort. It has been hailed by many as one of the most important recordings of its kind ever released, and it's been a surprisingly good seller for Mesa/Blue Moon.

In addition to the *Voices* project (which he may continue as another boxed set), Berendt says his primary interest these days is the human ear. His most current books, *The World Is Sound* and *The Third Ear*, both deal with the imbalance that exists between the human ear and eye.

"Our perception of the world is unbalanced," he says. "It is too visual and not enough auditive. The newer books I'm writing and the *Voices* project grew out of all this. This whole big project is to get us back to *listening*." ■

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# C O A S T

## L.A. GRAPEVINE

by Amy Ziffer

Best known for its stand against the unlawful commercial use of home studios, HARP (Hollywood Area Recording Professionals) has remained active and is developing into a true service organization for Los Angeles-area recording studios. A current project, according to Lion Share's Terry Williams, is worker's compensation. Williams and others believe audio recording studios are incorrectly classified with film studios and other facilities with much more dangerous working conditions. HARP's position is that audio recording studios pay more in worker's compensation insurance than is warranted by their history of claims. HARP has sent out nearly 200 petitions urging reclassification to L.A.-area studios, which will then be forwarded to the Worker's Compensation Insurance Rating Bureau.

Under the direction of Gary Denton of Stagg St. Studio, HARP

—CONTINUED ON PAGE 146

## SESSIONS & STUDIO NEWS

by Jeff Forlenza

### NORTHEAST

It was with shock and heavy heart that we realized another jazz legend left us. The recent deaths of Dexter Gordon, Art Blakey, Stan Getz and Sarah Vaughan decimated the jazz community. But the passing of Miles Davis is perhaps the hardest to accept. Having cut his musical teeth in the formative years of bebop with Charlie Parker, Miles kept evolving—*Kind of Blue*, *Bitches Brew* and *Tu Tu* all were initially criticized and yet soon accepted as new directions in jazz. It seems Miles was working on another project at the time of his death: Miles was working on five new songs for an upcoming Warner Bros. album at Unique Recording (NYC) with producer Easy Mo Bee, engineers D'Anthony Johnson, Eric "Corey" Lynch and assistant John McGloin. Our sympathies and condolences go out to friends and family. Miles Davis' effect on music and American culture will reverberate for decades to come...Over in Joizey, the Rollins Band began work on their album for Imago Records at Showplace

Studios in Dover, NJ. Producing and engineering was Andy Wallace... Spinderella, the DJ for Salt-n-Pepa, was at Bayside Sound (Bayside, NY) working on her solo project with Andre DeBourg engineering and Michael Tuosto assisting...Up in Warren, RI, Normandy Sound's Tom Soares engineered Marky Mark and the Funky Bunch's single "Good Vibrations," which went to number one on Billboard's Hot 100...New York City's Centerfield Studio had Mike Manieri (of Steps Ahead fame) producing Andy Summers' latest album, *World Gone Strange*. The album features—among others—Manieri on marimba, Tony Levin on bass, Chad Wackerman on drums, and Manolo Badrena on percussion. Garry Rindfuss engineered and Michael Manieri III assisted...Oops, we goofed! Richard Joseph recorded Atco artist Corina's "Temptation" and Lisette Melendez' debut album at Unique Recording (NYC) and not at Hip Pocket as reported in October's session news...

### SOUTHEAST

Fulfilling a lifelong dream, Steve Himelfarb purchased Southlake Recording Studios (Metairie, LA) from Paul DeCorte and renamed it The New Orleans Recording Company. DeCorte had plans to expand Southlake to include a downtown (the *Vieux Carre* to N'Awliners) club and recording complex, and he was working with noted acoustician Vincent Van Haaff on the specs of the complex, when DeCorte came to realize that his plan was not feasible and had to scrap his plans. Himelfarb was chief engineer at Southlake and had voiced his desire to take over the reins if DeCorte wanted out. And sure enough, Himelfarb got that chance when DeCorte decided to sell his interest in the studio once his expansion plans fizzled. Before landing in the bayou country, Himelfarb learned his craft in L.A. as assistant engineer at Capitol Studios and On



Seen here at Alpha Studios (Burbank, CA) are Russ Freeman (left) and GRP label-mate Carl Anderson (right). Freeman took time off his "Curves Ahead" tour to produce the project for Anderson with Bob Margouleff (not pictured) engineering.

# C O A S T

Cue Recording. As far as changes go, Himelfarb notes, "When you walk in the door, it's a more relaxed atmosphere." Some of the first clients into the studio included the Neville Brothers working with producer Hawk Walinski (Chaka Khan and others) and engineer Dave Leonard as they tracked their upcoming A&M release. Bands Himelfarb has been producing and working demos for include the Stone Poets (rumor has it that Epic is interested in this combo after college stations like Tulane's WTUL have given them plenty of air-time) and Evangeline, an all-female country band that has caused a stir in Nashville...At Recording Arts of Nashville, One Bad Pig mixed with producer Billy Smiley and engineer Lee Groitzsch; and Molly & The Haymakers recorded vocals and overdubs with producer Gregg Brown and engineer Rob Feaster...

## SOUTHERN CALIFORNIA

At Paramount Recording Studios (Hollywood) producer Sir Jinx worked on the new Ice Cube release, as well as 12" mixes for Tone Loc, Queen Latifah and Yo Yo...Zoo Entertainment artists Rhythm Tribe remixed the single "Family" from its *Sol Moderno* album at Encore Studios (Burbank) with producer Thomas Guzman-Sanchez, engineer Conley Abrams and assistant Tina Antoine...Marcel East was at Ocean Way Recorders (the TEC Award-winning facility in Hollywood) producing and mixing David Benoit's latest release for GRP Records...Gerald Albright was at Aire L.A. Studios, of Glendale, tracking and mixing his straight-ahead jazz album for Atlantic Records. Craig Burbridge engineered while Rusty Richards assisted...Don Henley was at Summa's Studio A (West Hollywood) with engineers Shelly Yakus and Bill Kennedy mixing tracks for the "In Concert" Series. Jim Champagne assisted...

## NORTHWEST

Jazz singer Madeline Eastman was working on her upcoming album at Bay Records in Berkeley, CA, with producer Paul Potyen and engineer Bob Shoemaker. The tracks feature veteran alto saxophonist Phil Woods and pianist Cedar Walton...Up in Vancouver, industrial dance band Skinny Puppy was back in Mushroom Studios for the eighth year in a row to record their latest album, *Last Rites*, for Nettwerk/Capitol Records. The album was produced by Dave Ogilvie and engineered by Ken "Hiwatt" Marshall...

## NORTH CENTRAL

ARS Recording (Alsip, IL) had Naked Raygun recording two songs that will be part of their latest release as well as part of a compilation album. The project was engineered by Martin Stebbing...

## N.Y. METRO REPORT

by Dan Daley

Continuing the upgrade trend that has engulfed Manhattan facilities (what recession?), East Side Film & Video purchased three custom SSL consoles for renovations now underway in three of its five rooms. Studio A is a theater-style projection room, while B and C are being utilized as more traditional audio-for-video, post-production suites. The new consoles, fitted with Total Recall and Ultimotion, are 48-input hybrids that fall between the 4000 and 5000 Series boards, according to studio chief engineer Jim Williamson.

—CONTINUED ON PAGE 146



PHOTO: DAVID A. TAFET

Over in the Second City, at Chicago Trax Recording, Ministry worked on their latest album for Sire Records with Jeff Newell engineering. Al Jourgenson of Ministry was at Chicago Trax remixing

—CONTINUED ON PAGE 148

**Behind the Neve 8078 at Manhattan's newly opened River Sound Studios (L to R), Roger Nichols is seen here with studio co-owners Gary Katz and Donald Fagen.**

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— FROM PAGE 144, L.A. GRAPEVINE

is also developing a database of everything from resumes and job openings to parts for old equipment. In addition, HARP held a seminar with Neve and Ampex several months ago, and intends to schedule more symposiums with other major manufacturers.

Speaking of servicing studios, Studio Referral Service recently celebrated its tenth anniversary. SRS helps L.A. studios keep their rooms booked by referring potential clients to appropriate facilities. Owner Ellis Sorkin was featured in issue No. 21 of the local magazine *Music Connection*. Congrats, Ellis, and best wishes for the second decade of SRS!

Over at Devonshire Audio/Video, traffic manager Kelle Creamer reports that a Neve VR72 just took the place of a V3 in Studio 3, while the V3 was moved to Studio 1, taking the place of a V2, and an 8232 was bought for Studio 6. Flying Faders were added to an 8128 in Studio 4, supplanting Necam 96. As you can see, Devonshire has a variety of Neves, ranging from vintage to modern.

Three of Devonshire's rooms—grouped separate from the rest—are booked primarily with animation sound effects work during the "high season," which ends for them in November. The remainder of the year, they are booked as demo rooms for lower-budget projects that are less appropriate for the three high-end rooms.

The studio also invested in three new Studer A827s and many pieces of outboard gear, so that each room now has a 480L, H3000SE, AMS reverb, and "tons of other stuff" as a minimum. The equipment purchases total more than a million dollars...but that's not all! Behind the blue curtain where Carol Merrill is standing...

Seriously, now, Devonshire also remodeled. "We got rid of the 1970s look in the front and lounge areas of the facility," says Creamer, "making it more modern, and the recreation room is next. We'll be building Studio 7 next year, and a new second floor will house production companies operating out of the facility."

All of this activity implies a need for some additional staff, and Devonshire picked up a new chief technician, 15-year industry vet Arthur "Midget" Sloatman. Sloatman's resume includes time spent at Adams-Smith and WaveFrame, in addition to a number of studios.

Finally, bid farewell to Topanga Skyline Recording, which closed its doors this month after 11 years of operation. Owners John Eden and Britt Bacon are going to pursue their respective careers of production and composition. The equipment and property are both being sold. The Topanga Skyline facility is located in one of the few remaining bohemian canyons for which L.A. was noted in years past. Inquiries are welcomed.

Send studio news to Amy Ziffer, c/o *Mix's* SoCal office, 19725 Sherman Way, Suite 380, Canoga Park, CA 91306; or call (818) 567-1429 or fax (818) 709-6773.

— FROM PAGE 145, N.Y. METRO

The facility will also be adding two Sony PCM-3324 digital multitrack decks and will locate all video machines in a central machine room for interchangeable access between the rooms. Another DAW will be added to the PostPro and two ScreenSound systems already in place. The \$2.5 million-plus upgrade was conceived and designed by Williamson and technical director Dan Zellman and should be complete by the first quarter of 1992.

New York State Of Mind: Former long-time Unique Recording engineer Michael Finlayson was involved in the design of Michael Ford's Red House Studio in Poughquag, in upstate New York. Finlayson was producer and engineer on recordings by Abduction, for whom Ford was the drummer. Red House has a Tascam 2500 Series 32-input console, Fostex 24-track deck with Dolby S-type N/R and MIDI implementation coupled with an Amiga-based editing and sequencing system with sync-to-SMPTE.

Bill Tesar at Toy Specialists reports high local interest in Roland's RSS spatial mixing system, including Steve Peck's remixing on Sting's upcoming release and Shep Pettibone's remixing of Lionel Richie's greatest hits package, being done at Right Track, and Martin Scorsese's next film project. "It's the only product that really addresses spatial enhancement," he says, "and it doesn't require a lot of manufacturer support. It works pretty much out of the box." Toy Specialists is the first New York-area rental company to offer the system.

Fax your New Yawk stuff to Daley at (212) 889-8874.

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**MIX**

## NASHVILLE SKYLINE

by Dan Daley

Music Mill Recording expects to install Nashville's first Focusrite console sometime this month. The 64-input desk with GML automation is replacing a Trident TSM in one of the studio's two rooms, according to chief engineer Paul Goldberg. The studio, owned by PolyGram creative VP and producer Harold Shedd, will also get a new overdub room adjacent to the mix studio, a 16x20-foot chamber designed by Steven Durr, as well as a full rewiring of its mic lines in the main room.

Carl Tatz at Recording Arts reports the installation of a 56-input Soundcraft 3200 console and Optifile automation, expected to have been fully implemented by mid-October. In addition, a Mitsubishi X-880 digital multitrack now has been added to the studio's arsenal. "I saw a market for a serious, affordable digital and analog mix studio," Tatz says of the upgrades. "Nashville studios are increasingly specialized in terms of different recording stages. It's been that way for a while from my

vantage point."

**Excursions—Memphis...**The only town where you can hear as good a band in church on Sunday morning as you did in B.B. King's blues bar the night before. That was exactly the case as Ardent Studios manager Ken Whitehead brought me up to speed on the town 200 miles west down I-40 from Nashburg. After a night spent pub crawling on Beale St., we paid for any sins the next morning at the Rev. Al Green's church, where the Grammy-winning soul and gospel singer holds forth every Sunday with choir and celestial rhythm section. Bibles and Marshall amps.

We confined our lounge lizard act to Beale Street, but Ardent itself was the scene of severe partying a couple of days before as it celebrated its 25th anniversary. Founded in 1966 by John Fry, Ardent moved to its current Madison Avenue location in 1971. Two Neves and an SSL 6000E occupy its three control rooms; virtually all sessions are done digitally on Mitsubishi X-880s, with analog serving as a slave or backup format. The client list looks like a Rolling Stone *fin-de-siècle*-issue index: ZZ Top, R.E.M., Steve Earle, the

Vaughan brothers, Lynyrd Skynyrd (whose latest was done virtually live there with 42 open mics), the Allman Brothers, the Fabulous T-Birds, George Thorogood and Johnny Winter, to name a few, and producers like Tom Dowd and Terry Manning have called the place home on and off for years. Ardent now reps producer/engineers who have come up through its ranks, also, including John Hampton (Robert Cray, the Vaughan brothers). Ken Whitehead says that an upcoming project will re-form the original M.G.'s around Booker T. Jones, including Donald "Duck" Dunn and Steve Cropper, to back up a Japanese recording artist. "We didn't build the place around bells and whistles," he explains. "Memphis is a big draw around the world, musically speaking, but we didn't want to become known for a certain type of sound. Our approach with clients is to give them great equipment, great talent and kill them with kindness."

Not far away is Kiva Recording, four-years-young but "striving and looking forward to 1992," according to studio manager Tim Ray. With two

— CONTINUED ON PAGE 148

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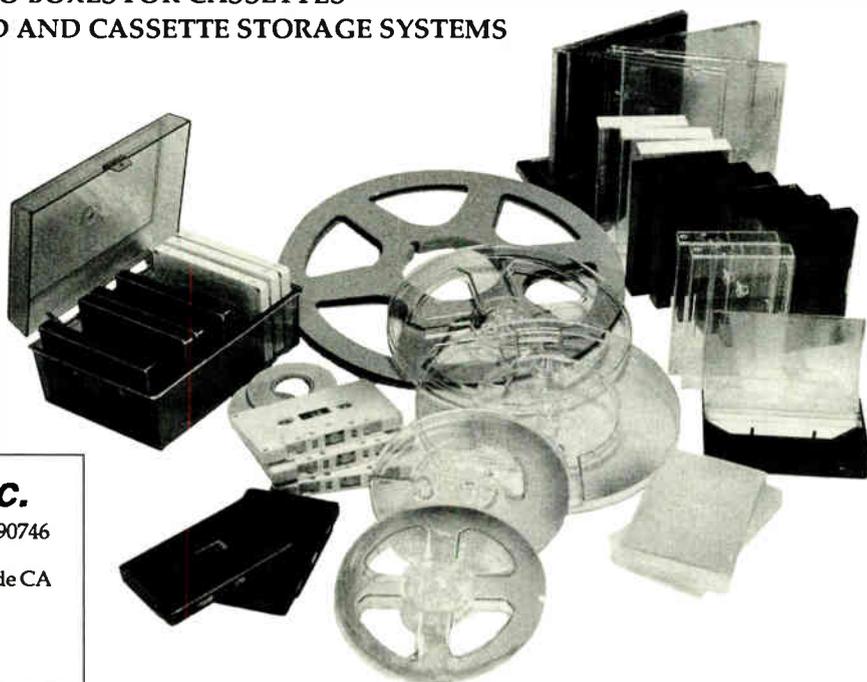
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—FROM PAGE 145, SESSIONS & STUDIO NEWS  
the Red Hot Chili Peppers for Warner Bros...

### SOUTHWEST

Jazz keyboardist Joey DeFrancesco brought his trio to Scottsdale, AR, after a European tour that included the North Sea Jazz Festival and recorded at Chaton Recordings' Studio B with staff engineer Steve Escallier (who also went to Europe with the trio to handle live sound)...

### STUDIO NEWS

Soundhouse Recording Studio received a permit to build from the city of Seattle and work has begun on the first studio in Seattle to be built from the ground up. Soundhouse will feature acoustics by Chips Davis of Frank Hubach Associates (Richmond, CA), with patch systems and Mogami wiring designed and installed by Mike Wolfe. Soundhouse's opening is slated for this month. Contact Scott Crane at (206) 784-4848 for more information... The Castle Recording Studio of Franklin, TN, purchased an Otari Series 54 console for their Studio B... Empty Street Productions has relocated to 1405 Greenbriar Drive, Champaign, IL 61820. For more info, contact Pat Ortman at (217) 398-1775... Jah Works Studio of O'Brien, OR, installed some new equipment: a Yamaha DMR-8 digital 8-track mixer/recorder, a Yamaha YPDR 601 CD recorder, a Mac II FX and Sony post-production services makes Jah Works the country's only solar-powered, fully automated, digital recording facility...

Send your nationwide sessions and studio news to sessions editor Jeff (Guido Coasto) Forlenza c/o *Mix* magazine, 6400 Hollis Street #12, Emeryville, CA 94608. ■

—FROM PAGE 147, NASHVILLE SKYLINE

studios and a MIDI pre-production suite, Kiva shares some of the local scene with Al Green and The Bar-Kays, as well as newer acts like Drivin' N' Cryin, and picks up overflow from Ardent. Consoles are a Solid State Logic 4000G and a Westar with Neve Flying Faders automation. "The thing about Memphis is that it gets right to the edge and then wavers," Ray says of the town's rep. "But I think it's still growing in a lot of ways. It's a very laid-back town musically, spiritually and economically. You can see why the blues has such a hold here." ■

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**AIRSHOW INC.;** CDM, 7021 Woodland Dr.; Springfield, VA 22151; (703) 642-9035. Contact: Ann Blonston or David Glasser. **MASTERING.** Mastering Console: AMS/Calrec M Series. Tape Machines: Sony PCM-1630 w/BVU-800 & DTA-2000, Sony APR-5003, Sony PCM-2500 DAT, Panasonic SV-3700 DAT, Sony PCM-601ESD processor w/Beta & VHS VCRs. **Noise Reduction:** Dolby SR & A, dbx. **Monitor Speakers:** Meyer Sound Labs HD-1. **Digital Editing Systems:** Digidesign Sound Tools w/Mac Iix, 2+ hours of stereo hard disk storage. **Signal Processing:** Lexicon 300, Sony DAL-1000, Sound Tools EQ, sample rate conversion & dynamics, APIEQ, API 525 compressors, various other analog & digital signal processing available. **Engineers:** David Glasser. **Rates:** Please call to discuss your project. Project pricing and block-booking discounts are available. **OTHER.** Airshow provides digital audio editing & CD premastering services. Our clients and projects in 1991 have included: Rounder, Sugar Hill, Smithsonian/Folkways, Positive Music, Rebel, Powerhouse Records, Peter Rowan, Beausoleil, Airmen of Note, Jerry Douglas, Basehead, John McCutcheon, Pete Seeger, Bob Margolin, Brian Bowers, Mike Aldridge, and the Smithsonian Chamber Players. SPARS member.

**AMERICAN HELIX TECHNOLOGY CORPORATION;** CDM, CDR, TM, TD; 1857 Colonial Village Ln.; Lancaster, PA 17601; (800) 525-6575; FAX: (717) 392-7897. Contact: Jim Boyer, VP; Marc Feingold, dir. of sales & marketing; Tracy Files, sales coordinator. **COMPACT DISC.** Services, prices: Full-service CD manufacturing facility located in Lancaster, PA, specializing in production runs of 500 to 50,000 units. Helix is a self-contained, fully automated CD-replication plant. Complete premastering, packaging and print services offered. Five-color, screen printing PicturaDiscs™ and gold-tone metallization available.

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**AMERICAN MULTIMEDIA INC.;** TD; 2609 Tucker Street Extension; Burlington, NC 27215; (919) 229-5554; FAX: (919) 228-1409. Contact: Tim Mallard. **MASTERING.** Mastering Console: Neve 8108. Tape Machines: Otari, Studer. **Noise Reduction:** Dolby A, B, C and SR, S Dolby. **Monitor Speakers:** UREI, JBL, Meyer. **Digital Editing Systems:** Sony 1610 & 1630, JVC BP-90, Nakamichi, DMP-100, Sony 1630. **Signal Processing:** dbx, Dolby A, B, C and SR capabilities, Aphex, Lexicon. **Engineers:** Richard Clark, Howard Hoyt. **TAPE**

**DUPLICATION.** Method of Duplication: Bin-loop, digital bin. **Duplicator:** Otari, Ami-modified Electro Sound slaves, Gauss. **Duplicating Speed:** 64:1, 80:1. **Capacity:** 50 million annually. **Tape Used:** By customer request. **Shell Used:** By customer request. **Loading Equipment:** 36 Concept Design modifications. **Packaging Equipment/Fulfillment Services:** Apex printing, Ilesman labelers, Scandia wrappers, Sentinel blistering, F-20, HS-3 and A-22 Shanklin, CST Pad printer, and Kbar thermo-forming blister packaging. **COMPACT DISC.** Services, prices: 4-color process, 5-color booklet and in-lay card printing. **OTHER.** Subsidiary: Amergraphics specializes in audio cassette J-card and label printing. Full-service 4- and 5-color services for audio, video and CD.

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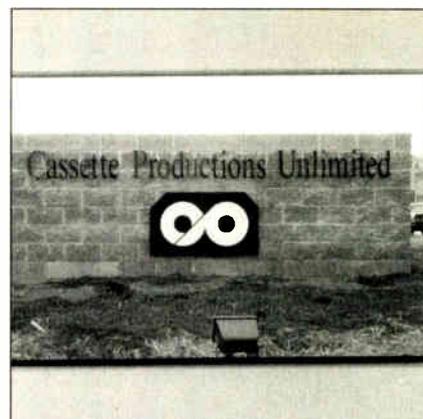
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DUPLICATED ON THE KABA SYSTEM

**ANALOGUE INDUSTRIES**  
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**ANALOGUE INDUSTRIES;** TD; 217 S. Union St.; Burlington, VT 05401; (800) 777-1927; FAX: (802) 863-1234. Contact: Rick Dexter. **TAPE DUPLICATION.** Method of Duplication: In-cassette. **Duplicator:** KABA 20 positions, Wollensak 16X. **Duplicating Speed:** Real time, 2 times and 16 times. **Capacity:** 12,500 per week. **Tape Used:** BASF. **Shell Used:** Shape. **Loading Equipment:** King. **Packaging Equipment/Fulfillment Services:** Shrinkwrap. **OTHER.** On-cassette printing, insert design and printing, custom-length blank cassettes. Personalized service and fast turnaround for short or long runs. Very competitive for larger orders.

**AUDIO ANTICS WEST/WINTHROP PRODUCTIONS;** TD; 156 W. 94th St.; New York, NY 10025; (212) 662-8685.

**AUDIO CRAFT COMPANY;** TM, TD, 2701 E. Sunrise Blvd., Ste. 404; Ft. Lauderdale, FL 33304; (305) 563-0553. Contact: Lonny Kelem. **MASTERING.** Tape Machines: Sony/MCI, Otari, Sony DAT 2500 & 50 ES. **Noise Reduction:** Dolby A, dbx. **Monitor Speakers:** Electro-Voice Sentry 100A. **Signal Processing:** Lexicon, UREI, dbx, Symetrix, EXR. **Engineers:** Bruce Marcho, Bob Kosiba, Paul Kurzweil, Lonny Kelem. **Rates:** Upon request. **TAPE DUPLICATION.** Method of Duplication: In-cassette. **Duplicator:** Studer Revox real time, Telex, Sony DAT. **Duplicating Speed:** Real time and 16:1. **Capacity:** 10,000 cassettes per week. **Tape Used:** BASF, Agfa. **Shell Used:** Magnetic Media, Shape. **Loading Equipment:** King/Concept Design. **Packaging Equipment/Fulfillment Services:** Fulfillment services and complete packaging. **Rates:** Upon request.



**CASSETTE PRODUCTIONS  
UNLIMITED  
Arden, NC**

**CASSETTE PRODUCTIONS UNLIMITED;** TD; 6 Commerce Way; Arden, NC 28704; (800) 545-3828. Contact: Jeff Baker, president. **MASTERING.** Tape Machines: Studer, Otari, Sony PCM-2500, Panasonic SV-3700. **Noise Reduction:** Dolby A, SR, B, dbx, Dynaflex single-ended. **Monitor Speakers:** JBL. **Digital Editing Systems:** Digidesign Sound Tools. **Signal Processing:** dbx compressors, de-essers, Klark-Teknik para EQ, Rane graphic EQ. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicator:** Electro-Sound 8000. **Duplicating Speed:** 64:1. **Capacity:** 100,000/day (C-40). **Tape Used:** By customer's request. **Shell Used:** 5-screw, sonic, all colors. **Loading Equipment:** King 790. **Packaging Equipment/Fulfillment Services:** Proprietary Audio Book packager, all standard packaging and shrinkwrapping configurations. **Rates:** Very competitive. **OTHER.** 24-track music/voice studio, audio producer(s), design, typesetting, printing, custom packaging, product assembly, video duplication, warehousing, fulfillment. A complete audio/video service. Established in 1978 with a reputation for on-time delivery of over 45 million cassettes.



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(DIV. OF AL JOLSON ENTERPRISES INC.)  
Nashville, TN**

**CASSETTE EXPRESS (DIV. OF AL JOLSON ENTERPRISES INC.);** 114 & 116 17th Ave. S.; Nashville, TN 37203; (615) 244-5667, (615) 244-5656. **MASTERING.** **Noise Reduction:** Dolby A/SR, dbx type 1. **TAPE DUPLICATION.** Method of Duplication: In-cassette. **Duplicator:** (110) KABA slave deck, (55) dual unit. **Duplicating Speed:** 1 7/8+3 3/4 or 1:1, 2:1. **Capacity:** 1,100 C-45 per shift. **Tape Used:** Agfa 649, BASF chromell. **Shell Used:** Lenco, Michelx. **Loading Equipment:** AEF, Kronos 4. **Rates:** Competitive rates, please inquire. Other services, print labels and inserts.

**CROWN MAGNETICS INC.;** TM, TD; 1223 Bittner Blvd.; Lebanon, PA 17042; (717) 274-2812; (800) 736-9001. Contact: sales. **MASTERING.** **Rates:** Call. **TAPE DUPLICATION.** Method of Duplication: In-cassette and bin-loop. **Duplicator:** Ampex modified bin-loop, Magnafax bin-loop, Telex 6120 stereo. **Duplicating Speed:** 16, 120, 240 ips. **Capacity:** 5 million annually. **Tape Used:** Ampex, BASF. **Shell Used:** Swire. **Loading Equipment:** AVA, Otari. **Packaging Equipment/Fulfillment Services:** Shrinkwrap and Scandia overwrap. **Rates:** Upon request.

**THE CUTTING EDGE;** DM; PO Box 217; Ferndale, NJ 12734; (914) 292-5965. Contact: Paul Gerry.

**D&G MASTERING;** PO Box 175; Englishtown, NJ 07726; (908) 446-2411. Contact: Don Van Gorden.

**BARRY DIAMENT AUDIO;** CDM, TM; 2728 Henry Hudson Pkwy.; Riverdale, NY 10463; (212) 543-2079. Contact: Barry Diament, Mary Antonelli. **MASTERING.** Tape Machines: Sony 1630 w/Apogee Filters, DMR-4000, DTA-2000. **Monitor Speakers:** Dahlquist DQ-20 with M.I.T. cables. **Digital Editing Systems:** Sony 1100A. **Engineers:** Barry Diament, Campbell Bonaire. **Rates:** Call. **OTHER.** Credits: AC/DC, Anita Baker, Edie Brickell and the New Bohemians, Cars, Phil Collins, Jim Croce, Crosby, Stills and Nash, Cult, Divinyls, Eagles, Enya, Kevin Eubanks, Genesis, Guns N' Roses, Ahmad Jamal, Kitaro, Eartha Kitt, Led Zeppelin, Julian Lennon, Bob Marley, Modern English, Stevie Nicks, Nico, Robert Palmer, Robert Plant, subdudes, Otis Redding, Rolling Stones, Linda Ronstadt, Simply Red, Steps Ahead, Tesla, Pete Townshend, U2, Joseph Villa, Yes, Warren Zevon.

**DIGITAL DOMAIN™;** CDM, CDR, TM; 309 E. 90 St.—B; New York, NY 10128; (212) 369-2932. Contact: Bob Katz. **MASTERING.** Mastering Console: Customized console. **Tape Machines:** Customized tube, Solid State 1/4" & 1/2" Studer. **Noise Reduction:** Dolby A & SR. **Monitor Speakers:** Symdex (customized). **Digital Editing Systems:** Sound Tools and 1630 transfer. **Signal Processing:** Bob Katz-built digital EQ and reverb. **Engineers:** Bob Katz. **Rates:** \$75 per hour except for 1630—\$140. **COMPACT DISC.** Services, prices: Digital Domain™ provides the right hand-holding first-time and experienced clients need, even inventing creative new hardware and software solutions to your problems. We can help you each step of the way, from mastering, graphic artwork, to CD Replication. Flexible, economical packages depend on the services you need. **OTHER.** Engineer Bob Katz, with his unique (20-bit, 128X oversampling) A-to-D, recorded Clark Terry, Phil Woods, McCoy Tyner, Kenny Rankin, Paquito D'Rivera, Arturo Delmonico, Antonio Carlos Jobim and countless others. Specializing in transparent analog transfers plus Digital Mastering. Ask Chesky Records, Laser's Edge, Omega/Vanguard, Mapleshade Prods, etc.

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**DISC MAKERS;** CDM, CDR, TM, TD, DM, RM; 1328 N. 4th St.; Philadelphia, PA 19122; (212) 265-7505 (NY); (800) 468-9353, (800) 740-0010 (Bayanun, PR); FAX: (215) 236-7763. Contact: Tony Van Veen. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicator:** Lyrec 16-slaves. **Duplicating Speed:** 40/80. **Capacity:** 150,000 a week. **Tape Used:** Sony, BASF. **Shell Used:** Shape. **Lenco.** **Loading Equipment:** Tapematic. **Packaging Equipment/Fulfillment Services:** Scandia. **Rates:** Call for price list/catalog. **COMPACT DISC.** Services, prices: All services—call for catalog. **RECORD MANUFACTURING.** Presses: Hamilton automatic 17 presses. **Capacity:** 150,000 week. **Rates:** Call for price list/catalog. **OTHER.** Complete design, typesetting, film and printing for all formats. Call for catalog for complete description of all services.

**DISC MASTERING INC.;** CDM, TM, TD, DM; 30 Music Square West; Nashville, TN 37203; (615) 254-8825. Contact: Karen Bush. **MASTERING.** Mastering Console: Neve DTC digital, Neumann SP 75. **Tape Machines:** Studer A820 1/4" and 1/2", A810, PCM-2500, PCM-1630, DMR 4000. **Noise Reduction:** Dolby A, SR, dbx. **Monitor Speakers:** Tannoy monitor series DMT. **Digital Editing Systems:** Sony DAC 3000. **Cutting Lathes:** YMS 70, SL 74B, SX 74. **Signal Processing:** Neve Custom 2087, Neumann 473 limiter/compressor. **Engineers:** Randy Kling, Chad Kling, Hoyt Dooley. **TAPE DUPLICATION.** Method of Duplication: In-cassette. **Duplicator:** (16) Studer A/10 cassette modified. **Duplicating Speed:** Real time. **Capacity:** 16x. **Tape Used:** Maxell, TDK. **Shell Used:** Maxell, TDK. **Rates:** Available upon request. **COMPACT DISC.** Services, prices: Upon request. **RECORD MANUFACTURING.** **OTHER.** Credits: Narada Productions, David Arkenstone, Paul Lanz, Blacktop Records, W.C. Handy, Blackfoot, Christy —LISTING AND PHOTO/LOGO CONTINUED TOP OF NEXT COLUMN

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**DUPLICATION SPECIALISTS INC.;** TD; 4584 Austin Blvd.; Island Park, NY 11558; (516) 432-7107.

**EASTCO PRO;** CDM, CDR, TD; 91 Haller Ave.; Buffalo, NY 14211; (800) 365-8273. Contact: Holt Vaughn.

**EASTERN STANDARD PRODUCTIONS INC.;** CDM, CDR, TM, TD, DM, RM; 26 Baxter St.; Buffalo, NY 14207; (716) 876-1454; (800) 527-9225; FAX: (714) 877-6395. Contact: Deborah L. Mekker, Teressa M. Fay.

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**ELITE DUPLICATION INC.**  
Charlotte, NC

**ELITE DUPLICATION INC.;** TD; 4475 Morris Park Dr., Ste. K; Charlotte, NC 28227; (704) 545-9973; FAX: (704) 545-6296. Contact: Greg Auch, Tim Dixon. **MASTERING.** Tape Machines: Otari MX-55N-HS, (2) Panasonic SV-3500 R-DAT, Sony F-1/Beta/VHS, Tascam DA-30, Sony PCM-2500. **Monitor Speakers:** JBL. **Signal Processing:** Neve V Series available on request. **TAPE DUPLICATION.** Method of Duplication: In-cassette. **Duplicator:** (60) Nakamichi MR-2. **Duplicating Speed:** Real time. **Tape Used:** BASF Super chrome, Pro chrome. **Shell Used:** Shape Mark 10. **Loading Equipment:** King, Concept Design. **OTHER.** Elite Duplication—where our main goal is customer satisfaction without compromise. We maintain a personal touch with our clients who appreciate and understand the need for premium materials to achieve a superior end-product. Rates and other services available upon request.

**EUROPADISK LTD.;** CDM, CDR, TM, TD, DM, RM; 75 Varick St.; New York, NY 10013; (212) 226-4401; FAX: (212) 966-0456. Contact: Jeremy Gittenberg, Jim Shelton. **MASTERING.** Mastering Console: Neve Digital Transfer Console, Neumann SP-79 analog. **Tape Machines:** (2) Sony DMR-4000/PCM-1630, Sony DMR-2000/PCM-1610, Sony PCM-2500 Pro-DAT Sony PCM-1200 DAT, Sony JH-110M, 1/4"-1/2" inch analog mastering machine, Mitsubishi X-80 digital, Sony PCM-501 with Beta & VHS transports, Studer A80-MR 1/2" for cassette bin-masters. **Noise Reduction:** Dolby A, Dolby SR, dbx I and II. **Monitor Speakers:** JBL 250ti, Yamaha NS-10. **Digital Editing Systems:** Sony DAE1100A Digital Audio Editor, DAQ1000 PQ Cue Code Editor. **Cutting Lathes:** Neumann VMS-82 DMM (Direct Metal Mastering). **Signal Processing:** Neve DTC Digital Transfer Console, Neumann SP-79 Transfer Console, Sony DFX-2400 Sampling Rate Converter, Studer DAD (Digital Audio Delay). **Engineers:** Jim Shelton, Thom Spallone. **Rates:** Complete brochure on request. **TAPE DUPLI-** —LISTING AND PHOTO/LOGO CONTINUED ON NEXT PAGE

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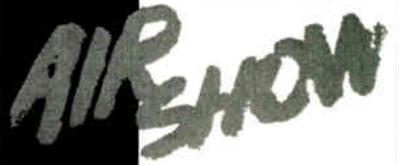
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**CATION.** Method of Duplication: Bin-loop. Duplicator: Lyrec (Danish). Duplicating Speed: 80:1. Capacity: 5,000,000 per year. **Tape Used:** BASF, Agfa, Sunkyoung. **Shell Used:** Michalex, Lenco, Shape, Beres. **Loading Equipment:** AEG Tachos-90. **Packaging Equipment/Fulfillment Services:** Roldex, Apex. **Rates:** Complete brochure on request. **COMPACT DISC.** **Services, prices:** CD premastering, replication, packaging, graphics printing, graphics design. Analog-to-digital transfers, digital conversions, sampling-rate conversions. Call for complete brochure. **RECORD MANUFACTURING.** **Presses:** Toolex-Alpha and Hamilton fully automatic. **Capacity:** 3,000,000 per year. **Vinyl Used:** Audiophile quality, dye-colored PVC compound. **Rates:** Call for complete brochure. **OTHER.** Complete audio software packages—CD, cassette, LP, including printed graphics (CD booklets, cassette J-cards, LP jackets).

# EVA-TONE

EVA-TONE INC.  
Clearwater, FL

EVA-TONE INC.; *TM, TD, DM, RM*; 4801 Ulmerton Rd.; Clearwater, FL 34622; (800) EVA-TONE; (813) 572-7000.

**Contact:** Norm Welch. **MASTERING.** Mastering Console: Sony and Eva-Tone customized. **Tape Machines:** Studer Revox, Otari, MCI, Nakamichi. **Noise Reduction:** Dolby A, B, SR, dbx type I. **Monitor Speakers:** Tannoy SGM-1000. **Cutting Lathes:** Scully automated and manual. **Signal Processing:** UREI, AMS, Sontec, Aphex, Orban. **Engineers:** Michael R. Newsome, Kristina Lucas, Michael Watkins, Peter Revron, Kim Garland. **Rates:** On request. **TAPE DUPLICATION.** **Method of Duplication:** Bin-loop. **Duplicator:** 4 lines. **Duplicating Speed:** 64:1, 96:1 and 128:1. **Capacity:** 24 million C-40 per year. **Tape Used:** Various high-quality sources. **Shell Used:** Various high-quality sources. **Loading Equipment:** King 790. **Packaging Equipment/Fulfillment Services:** Apex, Stoddard, Ilseman, Scandia, Custom E-T. **Rates:** On request. **RECORD MANUFACTURING.** **Presses:** Eva-Tone custom (flexible Soundsheets). **Capacity:** 200 million annually. **Vinyl Used:** Special order. **Rates:** On request. **OTHER.** Commercial printing, typesetting, packaging, mailing services.

**FOOTHILL DIGITAL PRODUCTIONS INC.;** *CDM, TM, TD*; 215 W. 91st St.; New York, NY 10024; (212) 877-0973. Contact: Allan Tucker.

**FORGE RECORDING STUDIOS INC.;** *CDM, CDR, TM, TD*; PO Box 861; Valley Forge, PA 19481; (800) 331-0405; (215) 935-1422; FAX: (215) 935-1940. Contact: Warren Wilson. **MASTERING.** Mastering Console: Neotek. **Tape Machines:** Ampex 100s, Scully. **Noise Reduction:** dbx, Dolby A, B, SR, S. **Monitor Speakers:** JBL, UREI. **Digital Editing Systems:** Sony 300. **Signal Processing:** Many as needed. **Engineers:** Warren Wilson, Mark McNutt. **Rates:** \$50/hour and materials. **TAPE DUPLICATION.** **Method of Duplication:** Bin-loop. **Duplicator:** MTL Versadyne. **Duplicating Speed:** 32:1, 64:1. **Capacity:** 10,000/shift. **Tape Used:** Cintas, Vac and Sunkyoung. **Shell Used:** Elmar, Lenco. **Loading Equipment:** King 790. **Packaging Equipment/Fulfillment Services:** Scandia. **Rates:** Call for brochure. **COMPACT DISC.** **Services, prices:** Mastering and premastering and proofs. \$50/hour. Replication, call for brochures.



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**FRANKFORD/WAYNE MASTERING LABS INC.;** *CDM, CDR, DM*; 1697 Broadway; New York, NY 10019; (212) 582-5473; FAX: (212) 245-2309. Contact: Jimmy Lee (studio manager), Carol Steele (operations manager). **MASTERING.** Mastering Console: (5) Ranssteele Audio Custom. (2) Harmonia-Mundi digital. **Tape Machines:** Sony/MCI JH-110M custom, Sony digital U-matic & R-DAT, Panasonic, JVC, Technics. **Noise Reduction:** Dolby A, B, C, SR, dbx I and II. **Monitor Speakers:** (6) JBL 4350B, Quedest 410, JBL BiRadials, Yamaha NS-10, Auratone, Tannoy. **Digital Editing Systems:** (4) Sony DAE-3000/DMR-4000/DMR-200, DTA, Sony PQ code

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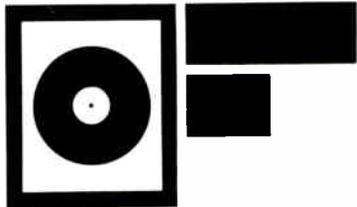
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editor. **Cutting Lathes:** (4) Neumann-Compudisk custom w/ SX-74/SAL-74B. **Signal Processing:** ITI, Sontec, GML, UREI analog, Valley Audio DCE, Harmonia Mundi, Sony digital. **Engineers:** Carlton Batts, Rick Essig, Michael Sarsfield, Tom Steele, Greg Vaughn. **Rates:** On request. **COMPACT DISC.** **Services, prices:** Yamaha PDS CD Recording system with Sony 1630/PQ encoding. CDs available in quantities from 1 up. **Pricing:** Call for rates. **OTHER.** Frankford/Wayne Mastering has been serving the recording industry for more than 25 years, always offering state-of-the-art technology with prompt and professional service. With credits too numerous to mention, hundreds of gold and platinum albums attest to Frankford/Wayne's commitment to the industry.

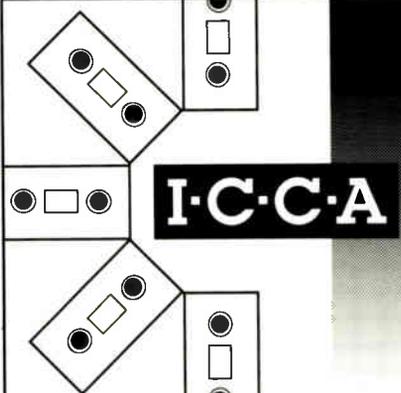


**FULLERSOUND, INC.**

FULLERSOUND INC.  
Miami, FL

**FULLERSOUND INC.;** *CDM, TM, DM*; 1755 NE 149th St.; Miami, FL 33181; (305) 945-6697. Contact: Michael Fuller/Margie Curry. **MASTERING.** Mastering Console: Neve DTC-1 Digital/Cybersonics custom automated MC2003E analog. **Tape Machines:** Sony 1630, 2500 DAT, PCM-601, 3402 DASH, Mitsubishi X-80. **Noise Reduction:** dbx, Dolby A, Dolby SR. **Monitor Speakers:** UREI 813A, Yamaha NS-100, Auratone Cubes. **Digital Editing Systems:** AMS AudioFile available on request. **Cutting Lathes:** Scully LS-76 with Ortofon DSS-821 cutter heads. **Signal Processing:** Neve DTC Digital, Sontec MES-430B EQ, Sontec DRC-400, Ortofon STL-852. **Engineers:** Michael Fuller and Rod Fuller. **Rates:** Available on request.

**GEORGETOWN MASTERS;** *CDM, TM, DM*; 33 Music Sq. W., Ste. 108; Nashville, TN 37203; (615) 254-3233; FAX: (615) 254-3237.



ICCA INC.  
Charlotte, NC

**ICCA INC.;** *TD*; 429 Briabend Dr.; Charlotte, NC 28209; (704) 523-7219; (800) 624-5940 (outside NC). Contact: John Firestone, Harrell Canning. **TAPE DUPLICATION.** **Method of Duplication:** Bin-loop. **Duplicator:** Electro Sound ES 8000, (5) master, (45) slave, Lyrec, (2) master, (10) slave. **Duplicating Speed:** 32:1, 64:1, 80:1. **Capacity:** 1.5 million per month. **Tape Used:** By customer request. **Shell Used:** By customer request. **Loading Equipment:** King 790, Tapematic. **Packaging Equipment/Fulfillment Services:** Apex printing, Islemann boxer, Islemann wrapper, Islemann labeler, O-card inserter and wrapper. **Rates:** Call for prices. **OTHER.** Graphic arts design, typesetting, desktop publishing, label and insert layout, blister packaging, custom package design, O-card packaging.

**KEWALL REAL TIME TAPE DUPLICATORS;** *TM, TD*; 77 Bayshore Rd.; Bayshore, NY 11706; (516) 586-2486; (800) 67K-EWALL(675-3925); FAX: (516) 586-2543. Contact: Keith or Dorothy.

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Please complete the information below to qualify for this special rate.

**1. Please check the business' activities** (all that apply)

**RECORDING STUDIO**

- A01  2-4 Tracks
- A02  8-16 Tracks
- A03  24 + Tracks
- A04  Digital Recording
- A05  Remote Truck
- A06  MIDI/Music Production

**SOUND REINFORCEMENT**

- B08  Sound Reinforcement

**VIDEO/FILM**

- C10  Production Company
- C11  Post-Production Company
- C12  Remote Truck
- C13  Multi-Image Production
- C14  Videotape Duplication

**EQUIPMENT**

- MANUFACTURING**
- D17  Audio
  - D18  Music
  - D19  Video

**DUPLICATION/DISC MFG.**

- E20  CD Manufacturing
- E21  Tape Duplication
- E22  Mastering Only
- E23  Other (please specify)

**ACOUSTICS/DESIGN CONSULTANT**

- F26  Acoustics/Design Consultant

**SOUND/VIDEO CONTRACTOR**

- F27  Sound/Video Contractor

**BROADCAST PRODUCTION**

- G30  Radio Station
- G31  TV Station
- G32  Other (please specify)

**MEDIA**

- H35  Ad Agency/PR Firm
- H36  Magazines/Newspapers/Books

**RECORD COMPANY**

- J39  Record Company

**INDEPENDENTS**

- K42  Audio Producer
- K43  Audio Engineer/Technician
- K44  Video Producer/Director
- K45  Video Editor/Technician

**EDUCATIONAL/INSTITUTIONAL**

- L47  Corporate Facility
- L48  Music/Recording/School/Program
- L49  Trade Association
- L50  Government

**RETAIL/RENTAL/MFRS.REP**

- M51  Audio/Music
- M52  Video/Film
- M53  Rep/Sales

**MUSICIAN/ARTIST/COMPOSER**

- N55  Musician/Artist/Composer

**INDUSTRY-RELATED**

- N56  Artist Management/Booking
- N57  Music Publisher
- N58  Student
- N59  Other (please specify)

**3. Please check ONE category that best describes your JOB TITLE**

- A.  Corporate Manager/President, owner, other manager, etc.
- B.  Technical & Engineering/Engineer, editor, design engineer, etc.
- C.  Production & Direction/Producer, director, etc.
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- E.  Other (please specify)

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**CD-LIKE  
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**KLARITY CASSETTE INC.**  
Waterville, ME

**KLARITY CASSETTE INC.;** *TD:* One Post Office Square Bldg.—Main St.; Waterville, ME 04901; (800) 458-6405; (207) 873-3911—Tech; *FAX:* (207) 873-3924. *Contact:* Michael Pepin, CEO. **MASTERING.** Mastering Console: Custom-designed, semi-automated with exclusive computer loopback. **Tape Machines:** Custom-modified, computer-assisted Studer Revox B-215, Panasonic DAT, Sony PCM F1. **Noise Reduction:** Dolby A, dbx Type I, Dolby B/HX-Pro. **Monitor Speakers:** Custom-designed digital loopback. **Signal Processing:** dbx computer/analyzer, various Tektronix, all necessary processing available, including: dbx compressor/limiters, dbx noise gates, dbx de-essers. **Engineers:** William Wheeler, Matthew York. **Rates:** Studio production/editing \$45 per hour, color brochure available for duplication rates. **TAPE DUPLICATION.** Method of Duplication: In-cassette. **Duplicator:** Custom-designed, Studer Revox B-215. (60) with computer circuitry—controlled bias, EQ, level and azimuth. **Duplicating Speed:** On: real time, direct form digital, no generation loss. **Capacity:** 40,000+ per month. **Tape Used:** Ampex, Agfa pure-chrome, BASF pure-chrome. **Shell Used:** Shape: IGM, MicheleX, Lenco and our own exclusive "Gold-Line" series shell. **Loading Equipment:** King. **Packaging Equipment/Fulfillment Services:** Autolabe, Simpulse, AAPEX. **Rates:** Ask for our detailed color-brochure. **Pricing guarantee** (please inquire). **OTHER.** Pope John Paul, Arlo Guthrie (exclusive), Yale Glee Club, Houston Symphony Orchestra and hundreds more. Full range of services including: typesetting, label printing, insert (J-card) printing, direct-stamp printing, custom packaging, custom-loaded blank cassettes and full 6-color printing. Quality control is Klarity Cassette's hallmark with continuous testing on a daily basis. New for 1992!! "Ult mate response" quality high-speed duplication. Ask for brochure!

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**LION AND FOX RECORDING INC.;** *CDM, TM, TD:* 1905 Fairview Ave. NE; Washington, DC 20002; (202) 832-7883. *Contact:* Jim Fox, Rob Buhman.



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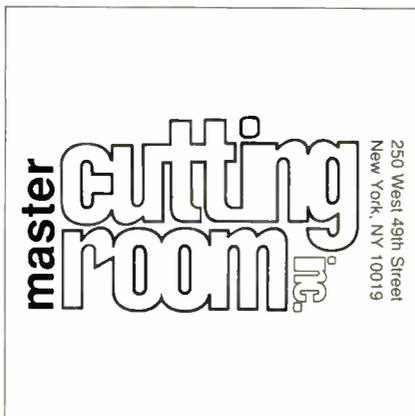
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**LRP CASSETTE PRODUCTION**  
New York, NY

**LRP CASSETTE PRODUCTION;** 32 W. 22 St., 2nd floor; New York, NY 10010; (212) 477-3785; (212) 807-9363. *Contact:* Mikhail Liberman. **MASTERING.** Mastering Console: Allen and Heath. **Tape Machines:** Any digital formats, Sony R-DAT 2500, 2000, DASH-3402. **Noise Reduction:** Dolby A, Dolby B330 w/cat 66 card. **Monitor Speakers:** JBL. **Digital Editing Systems:** Sony 3402, 1630. **Engineers:** Mikhail Liberman, Tatyana Liberman. **Rates:** \$85/hour editing, \$250 mastering. **TAPE DUPLICATION.** Method of Duplication: in-

cassette and direct digital. **Duplicator:** KABA 25 slaves, Telex 6120 XLP. **Duplicating Speed:** 1:1, 8:1, 2:1. **Capacity:** 7000/day. **Tape Used:** BASF chrome. **Shell Used:** Shape. **Loading Equipment:** Tapematic 2002. **Packaging Equipment/Fulfillment Services:** Shrinkwrap, OTHER. In-house J-card printing, plating, packaging, print on-shell. Full service all digital recording studio, digital editing, live digital recording and CD pressing.

**MARK CUSTOM RECORDING SERVICE INC.;** *CDM, TM, TD, DM;* 10815 Bodine Rd.; Clarence, NY 14031-0406; (716) 759-2600. *Contact:* Mark J. Morette.



**MASTER CUTTING ROOM INC.**  
New York, NY

**MASTER CUTTING ROOM INC.;** *CDM, TM, DM;* 250 W. 49th St., 3rd fl.; New York, NY 10019; (212) 765-8496; *FAX:* (212) 765-8630. *Contact:* Joe Brescio.

**MASTER RECORDS INC.;** *TM, TD, DM;* 3000 Biscayne Blvd., Ste. 105; Miami, FL 33137; (305) 573-8587. *Contact:* Aldo Vazquez. **MASTERING.** Mastering Console: Made in-house. **Tape Machines:** MCI, Otari, Scully, Studer. **Noise Reduction:** dbx, Dolby A (B-C). **Monitor Speakers:** (8) UREI 609, (2) JBL 4411, (2) JBL 4312. **Cutting Lathes:** Scully, Westrex (auto). **Signal Processing:** Aphex dominator, Klark-Teknik delay, Pultec. **Engineers:** Aldo Vazquez Sr., Aldo Vazquez Jr., Dora Padilla. **Rates:** LP \$100 per sides, 12" \$90 per sides, 7" \$45 per sides. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicator:** Electro Sound 6000, 10 slaves; Electro Sound 4000, 10 slaves. **Duplicating Speed:** 64:1. **Capacity:** 18 units/8 hrs. **Tape Used:** Various. **Shell Used:** Various. **Loading Equipment:** King 6. **Rates:** \$0.80 per unit for long running.

**MASTERDISK CORP.;** *CDM, TM, DM;* 545 W. 45th St.; New York, NY 10036; (212) 541-5022. *Contact:* Linda Duffany. **MASTERING.** Mastering Console: Analog custom Neumann, digital Neve DTC, Sonic Solutions, Harmonia Mundi. **Tape Machines:** Ampex ATR, custom Studer with Cello class-A amps, Sony 7050 & various DAT. **Noise Reduction:** Dolby SR, A, dbx, Sonic System No-Noise™. **Monitor Speakers:** Duntec Sovereign 2001, Cello Performance amps, Altec, Hartley, NS-10M, KRK, AR-18. **Digital Editing Systems:** (2) Sonic System editor 8-track software +No-Noise, (3) DAE-3000, DAT editor. **Cutting Lathes:** Neumann Direct Metal Mastering (DMM), VMS 70. **Signal Processing:** Sonic System No-Noise™, all Harmonia Mundi modules, Wadia converter, Pygmy. **Engineers:** Bob Ludwig—chief engineer, Hcwie Weinberg, Tony Dawsey, Scott Hull, Andrew Van Dette. **Rates:** Rate card available.



**MASTERFONICS INC.**  
Nashville, TN

**MASTERFONICS INC.;** *CDM, CDR, TM, TD, DM, RM;* 28 Music Square E.; Nashville, TN 37203; (615) 327-4533; *FAX:* —LISTING CONTINUED ON NEXT PAGE

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# AUDIO EDUCATION

IN THE

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Multitrack Recorders

Europe '92

DIRECTORY:

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In the February issue, *Mix* presents its annual directory of recording schools and programs, with additional articles on audio education and analog multitrack recorders. Also in February: a special feature on the European audio marketplace in 1992. Bonus distribution at AES Europe in Vienna, Austria!

Ad Close: December 6, 1991

Materials Due: December 16, 1991

## EASTERN

# Tape & Disc

Mastering, Pressing, Tape Duplication and Compact Disc Facilities

—LISTING CONTINUED FROM PREVIOUS PAGE

(615) 242-0101. Contact: Jim Loyd. **MASTERING.** Mastering Console: Neumann SP75 Custom, JVC DS-DM900 automated digital. **Tape Machines:** JVC VP-900, Sony 3402, Mitsubishi X-86C, Sony 1630, Sony 2500 DAT, Panasonic SV-3500 DAT, Fostex D-20 with time code, Otari MX-55MN with center-track time code, Studer A80 & B67, Sony F1, JVC FC901, Sony PCM-601, Akai DD1000. **Monitor Speakers:** Kinoshita/Hidley, Yamaha NS-10M, Genelec Tri-amp S30, Fostex RM780, Auratone 5C, B&W, KEF C55. All power amps by FM Acoustics. **Digital Editing Systems:** JVC AE-90 and AE-900 digital editors, (3) Turtle Beach 56K. **Cutting Lathes:** Neumann VMS70, SAL 74B, Zumaudio, JVC CD-90, Ampex ADD-1. **Signal Processing:** JVC DS-DM900 digital mixing/EQ, JVC DS-LC900 automated parametric EQ and dynamics controller, Sony DFX-2400 sample frequency/format converter, Wadia Digital 2000 digital decoding computer, Sony DAL-1000 digital limiter, Sontec EQ and DRC, Wadia Digilink 20 Fiber Optic distribution system, Pygmy A-D converter, Apogee D-to-A and A-to-D converters (10 each, supports all 2-track digital formats), DAR-DASS100, Harmonia-Mundi signal processing rack, Barth Dynaset, Outer Ear image recovery Dolby A and SR, BASE and custom spatial enhancement, Yamaha reference CD system. **Engineers:** Glenn Meadows, Milan Bogdan, Benny Quinn, Jim Loyd, David Boyer. **Rates:** On request. **TAPE DUPLICATION. Method of Duplication:** In-cassette. **Duplicator:** Tascam 122 MkII cassette deck. **Duplicating Speed:** 1:1. **Capacity:** 15. **Tape Used:** Ampex 472. **Shell Used:** Ampex. **Rates:** On request, per size of run. **COMPACT DISC. Services, prices:** Preparation/Manufacturing: Complete CD master tape preparation from any 2-track source. Ten years' experience with product from all major labels. Fully digital processing including compression, EQ, sample frequency conversion, format conversion, pre-emphasis removal, crossfades. JVC AE-90 digital editor. Sample accurate in-song editing. Custom CD duplication available, small or large quantity, any or all duplication services from mastering and artwork to packaging. Reference CDs available with Yamaha optical CD recorder. **OTHER.** Tom Hidley-designed, 20Hz monitoring environment mix room. Includes SSL 4000E (G computer, TR) 56x32 console, Otari DTR-900 II digital 32-track, JVC VP-900 digital 2-track, and a generous complement of outboard equipment. Hidley-designed tracking and overdub studio with SSL 4000E (G computer, TR) 48x32 console, Otari DTR-900 II digital 32-track with 64-track remote and more.



MASTERMIX  
Nashville, TN

**MASTERMIX; CDM, TM, DM:** 1808 Division St.; Nashville, TN 37203; (615) 321-5970. Contact: Chris Sullivan. **MASTERING. Mastering Console:** Neumann SP77, Harmonia Mundi. **Tape Machines:** Digital machines are: 3402 or 3/4" based 1630 system/analog; Otari or Studer. **Noise Reduction:** Dolby A and SR, dbx. **Monitor Speakers:** Meyer 833, Meyer HD-1, Rogers 3/5A. **Digital Editing Systems:** The Sonic System, AMS AudioFile and Sony DEA-1100. **Cutting Lathes:** Neumann VMS70 w/Technics quartz direct-drive and Zuma Audio Preview computer, Neumann SAL-74B cutter rack, Neumann SX-74 cutter head. **Signal Processing:** Digital signal processing, including level adjustment, compression, limiting, equalization and de-essing, is done with Harmonia Mundi System. Analog processing is done using a Neumann SP77 with EQ by Sontec, API, Summit and Neumann. Analog compressors available are by Sontec and NTP. **Engineers:** Hank Williams, Ken Love, Ronnie Thomas. **Rates:** Available upon request.



MASTERWORK RECORDING INC.  
Philadelphia, PA

**MASTERWORK RECORDING INC.; CDM, CDR, TM, TD, DM, RM:** 1020 N. Delaware Ave.; Philadelphia, PA 19125; (215) 423-1022; FAX: (215) 423-6020. Contact: Albert Oon, Peter Humphreys. **MASTERING. Mastering Console:** Custom/Proprietary by Masterwork. **Tape Machines:** MCI/Sony digital (PCM-1630 and PCM-2500 R-DAT). **Noise Reduction:** dbx, Dolby A, Dolby SR. **Monitor Speakers:** JBL, Tannoy, Yamaha, JVC, Sony. **Digital Editing Systems:** Digidesign SoundTools editing system. **Cutting Lathes:** Scully with Sontec "Compudisk" system, Westrex-Ranstele Driver Systems. **Signal Processing:** Sontec, UREI, Soundcraft, Ampex digital delay, Orban, Sontec/Valley People limiters/compressors. **Engineers:** Nimitz 'Nim' Sankananda, Peter Humphreys, David Humphreys. **Rates:** Available upon request. **OTHER. Credits:** Grover Washington Jr., Chuck Mangione, Levert, The Cutaways, The O'Jays, E.U., Lou Rawls, Phyllis Hyman, Miles Jaye, Third World, Michael Faith, Robbie Mychals, Exotic Birds, Sunni, Ferenzik, Dexter Wansel, Two Kings in a Cipher, Michael Pidin Jr. and many others. **Other Services:** Compact disc pre-mastering and preparation, submastering for cassette duplication, custom CD and record pressing, real-time and high-speed cassette duplication.

**MIRROR IMAGE SOUND & RECORDING INC.; CDM, TM, TD:** 619 S. Main St.; Gainesville, FL 32601; (904) 376-8742. Contact: Ray Valla, production manager.

**MULTITAPE; TM, TD:** 1630 Euclid St. NW, Ste. 131; Washington, DC 20009; (202) 332-1522. Contact: Bruce F. Moyer.



NASHVILLE RECORD PRODUCTIONS INC.  
Nashville, TN

**NASHVILLE RECORD PRODUCTIONS INC.; CDM, TM, DM:** 469 Chestnut St.; Nashville, TN 37203; (615) 259-4200. Contact: George Ingram, president; John Eberle, studio man-

ager. **OTHER.** Three mastering suites, MCI and Studer 1/4" and 1/2" analog tape machines. Sony PCM-2500 and Panasonic SV-3500 Pro R-DAT machines; Sony 1610 and F1 systems. Compusonics digital editing system. Neve, Sphere and Sontec EQ, Valley People 610. Neve compressors, Aphex Aural Exciter. Neumann VMS 70 lathe with Zuma computer and SAL 74 system. Scully/Capps lathe with Westrex cutting systems. Yamaha NS-10 and EV monitors. Special services: CD prep, digital editing and premium real-time cassette duplication (cassette loading and on-shell printing done in house). Also custom production of CDs, cassettes, LPs and 45s in small or large quantities. Credits: Artists: Clinton Gregory, Jerry Jeff Walker, Clarence Carter, Tommy Cash, Head Candy, Love and Sass, Rev. Al Green, Curtis Mayfield and Labecs. Stephone, Rykodisc, SHR, Playback, Link, Hot Productions, Ichiban, RCA, Door Knob, Sound of Gospel, A&M, and Morningstar/Harvest.

**NATIONAL TAPE DUPLICATORS, DIV. OF KEN-DEL PRODUCTIONS INC.;** *TM, TD, DM;* First State Production Center; 1500 First State Blvd.; Wilmington, DE 19804-3596; (302) 999-1110; FAX: (302) 999-1656. Contact: Edwin Kennedy, pres./gen. mgr.

**NATIONAL TAPE CORPORATION;** *TM, TD;* 1110-48th Ave. N.; Nashville, TN 37221; (615) 383-7881. Contact: Tom Beld, VP sales. **MASTERING.** Mastering Console: Sony MXP-2000. **Tape Machines:** Studer, Sony DMX-2000/1630, Sony R-DAT 2500. **Noise Reduction:** dbx type I, Dolby A, SR, B. **Monitor Speakers:** Tannoy 10. **Signal Processing:** TC Electronic, UREI, Valley People, BBE. **Engineers:** David Wirth, Bobby Newton, Bill Anderson, Eric Lancaster, Orville Holcomb, David Howard (chief engineer). **TAPE DUPLICATION. Method of Duplication:** Bin-loop. **Duplicator:** Electro Sound 8000. **Duplicating Speed:** 64:1. **Capacity:** 100,000/dup. **Tape Used:** Sunkyong, BASF. **Loading Equipment:** King/Concept Design. **Packaging Equipment/Fulfillment Services:** Scandia.

**NEW YORK AUDIO PRODUCTIONS;** *TM, TD;* 140 W. 22nd St.; New York, NY 10011; (212) 243-6826. Contact: Paul Barboza.

**NIMBUS RECORDS INC.;** *CDM, CDR;* PO Box 7427; Charlottesville, VA 22906-7427; (804) 985-1100. Contact: Ric Sherman (East Coast), Sandy Richman (West Coast).

**L. NIX & CO. INC.;** *CDM, TM, TD, DM;* 2000 Madison Ave.; Memphis, TN 38104; (901) 725-0855; FAX: (901) 725-7011. Contact: Larry Nix.



**NORTHEASTERN DIGITAL RECORDING INC.**  
Southborough, MA

**NORTHEASTERN DIGITAL RECORDING INC.;** *CDM, CDR;* 2 Hidden Meadow Ln.; Southborough, MA 01772; (508) 481-9322; FAX: (508) 624-6437. Contact: Anne Shepard. **MASTERING.** Mastering Console: Troisi 20 Series (analog), Sonic System (digital). **Tape Machines:** Sony PCM-1630/DMR 4000, Sony APR-5003 (analog 1/2" or 1/4"), Sony and Panasonic DAT. **Noise Reduction:** Dolby SR, Dolby A, dbx I, dbx II. **Monitor Speakers:** Studio A: Snell type C. Studio B: Tannoy DMT 12. **Digital Editing Systems:** Sonic System, Mac IIx, 2.4 Gbyte. (2) Sony DAE-1100. **Signal Processing:** Lexicon 300, PCM-70, Troisi analog EQ. **Engineers:** Dr. Toby Mountian, Jonathan Wyner. **Rates:** Sonic System, \$110 per hour, Sony system, \$85 per hour. **COMPACT DISC. Services, prices:** Recordable CDs: Sonic Solutions start lab system, \$200 each. Compact disc replication, production assistance. **OTHER.** David Bowie, Frank Zappa, Arlo Guthrie, Ritchie Havens, Paul Winters, James Montgomery, NRBQ, Charles Musselwhite, Alligator, Rykodisc, Rounder, Northeastern, Titanic, Biograph, Omega, Bangard Classic, Newport Classic, SBK.

**PRODIGITAL;** *CDM, CDR, TM, TD;* 3400 Pendleton Dr.; Wheaton, MD 20902; (202) 319-5588; FAX: (202) 319-4490. Contact: Bill Burns, Alan Wonneberger.

**PROJECT 70 AUDIO SERVICES INC.;** *CDR, TM, TD;* 777 Lambert Dr. NE; Atlanta, GA 30324; (404) 875-7000. Contact: Jerry L. Connell, president.

**PROTOSOUND;** *CDM, CDR, TM, TD;* 1 Mill St.; Burlington, VT 05401; (802) 864-9020. Contact: Nick McDougal.

**RANDOM ACCESS;** *CDM, TM;* 169 Massachusetts Ave., Ste. 23; Boston, MA 02115; (617) 547-7973. Contact: Jonathan A. Wyner, Robin Coxe-Yeldham.

## Digital Bin Duplication



S.A.S. INDUSTRIES INC.  
Lynchburg, VA

**S.A.S. INDUSTRIES INC.;** *TD;* 147 Mill Ridge Rd.; Lynchburg, VA 24502; (804) 582-6139. Contact: Sales. **TAPE DUPLICATION. Method of Duplication:** Dupltronics digital bin. **Duplicator:** Lyrec. **Duplicating Speed:** 80:1. **Capacity:** 200,000/week. **Tape Used:** Ampex, Aurex (cobalt), Sony, Sunkyong. **Shell Used:** Shape. **Loading Equipment:** Tachos 90B. **Packaging Equipment/Fulfillment Services:** Rokdex, Scandia, Print-Rite foil stamper. **OTHER.** Panasonic SU-2900 DAT, Nakamichi MR-2s, Dolby B & S Type noise reduction, JBL 4425 studio monitor, Bryston power amp. Complete packaging—on-cassette printing, foil or ink; inserts, cellophane over-wrap. Video duplication also available.

**SONY MUSIC STUDIO OPERATIONS;** *CDM, TM, TD, DM;* 49 E. 52nd St.; New York, NY 10022; (212) 445-2958; FAX: (212) 755-8311. Contact: Rob Grabowski, Tim Geelan, Risa Kantor.

**SOUND-ARTS CO. INC.;** *TD;* 5 Cindy Lane; Ocean, NJ 07712; (908) 493-8666; FAX: (908) 493-0667. Contact: Frank Gspann, vice president. **TAPE DUPLICATION. Method of Duplication:** Bin-loop. **Duplicator:** Otan DP-7300, DP-80 w/ 26 slave units. **Duplicating Speed:** 64:1. **Capacity:** 1.5 million/year. **Tape Used:** Sunkyong. **Shell Used:** Multi-vendors. **Loading Equipment:** King 790s. **Packaging Equipment/Fulfillment Services:** Heino-Islemann KZM3, CM-1. **Rates:** Fax (908) 493-0667 or telephone (908) 493-8666 per your specifications. **OTHER.** SOUND-ARTS is an advanced, state-of-the-art audio duplication and packaging facility. Since 1969, we have offered low prices and top-quality craftsmanship. We also produce high-quality blank audio tapes, normal-bias and high-bias chrome tapes in custom lengths up to 90 min.

**SOUNDMIRROR INC.;** *CDM;* 76 Green St.; Boston, MA 02130; (617) 522-1412. Contact: Nancy Grossman.

**SOUNDS, REASONABLE!** *TD;* 10203 Bent Tree Ln.; Massasa, VA 22111; (703) 631-6376. Contact: Fred Wygal.

**STRAIGHT ARROW RECORDINGS;** *CDM, TM;* 3 Kent St.; Montpelier, VT 05602; (802) 223-2551. Contact: Mike Billingsley, Geoff Brumbaugh.

**STUDIO MAGNETICS CO. INC.;** *TD;* 12 Long Island Ave.; Holtville, NY 11742; (516) 289-3400; (800) 874-2202; FAX: (516) 289-1604. Contact: Craig M. Balaban.

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TAPESOUTH INC.; TD, 1801 1st Ave. S., Ste. 333; Birmingham, AL 35233; (800) 248-2730. Contact: Jenno or Kerri. **TAPE DUPLICATION.** Method of Duplication: In-cassette. Duplicator: KABA real time 16 slaves, Telco, stereo 7 slaves. **Duplicating Speed:** Real time and 16x. **Capacity:** As many as you need. **Tape Used:** Agfa, BASF and TDK. **Shell Used:** American-made Shaper Mark 10 and Mark 1. **Loading Equipment:** King 790. **Packaging Equipment/Fulfillment Services:** Apex cassette imprinter, Ciampo shrinkwrapper, in-house type-setting for complete CD and/or cassette package design. **Rates:** Better than you'd think. Call us! **OTHER.** Direct-from-DAT and DAT-to-DAT duplication. Remote recording packages. System and acoustic design and consultation. Authorized dealers for BASF/Agfa and Akai. Recording studio supplies and accessories. Visa and MasterCard accepted.

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TRUTONE RECORDS; CDM, TM, TD, DM; 310 Hudson St.; Hackensack, NJ 07601; (201) 489-9180; FAX: (201) 489-1771. **MASTERING.** Mastering Console: Neumann, Studer,

custom. **Tape Machines:** Studer A80 MkIII, Studer A810, Studer B67, Ampex ATR-102, MCI JH-110B, Sony PCM-1630, PCM-2500, PCM-701. **Monitor Speakers:** UREI 813, B&W 801, B&W DM-220, JBL, Yamaha, Auratone. **Digital Editing Systems:** DAE 1100, DAE 3000, 1630 and 1610 PCM processors. **Cutting Lathes:** Neumann VMS70 with Zuma computer, Scully lathe with Capps Varipitch II computer. **Signal Processing:** Neumann, Pultec UREI, Sontec, Harmonia Mundi. **Engineers:** Carl Rowatti, Phil Austin, Ray Janos. **Rates:** Upon request. **TAPE DUPLICATION.** Method of Duplication: In-cassette and bin-loop. **Duplicator:** KABA real and double time Lyrec with HxPro high speed. **Duplicating Speed:** Real time, double time, high speed, 80:1 or 64:1. **Tape Used:** Agfa 649, 949, 647, 947. **Shell Used:** MicheleX, Swire, Lenco. **Loading Equipment:** Tapematic 2002. **Packaging Equipment/Fulfillment Services:** Scandia and Weldotron shrinkwrapping. **Rates:** Upon request. **COMPACT DISC.** Services: Preparation/assembly of Sony PCM-1630 masters for compact disc. Complete package from mastering to finished product available. Prices upon request. **RECORD MANUFACTURING.** Mastering and cutting of reference acetates and master lacquers. Complete package from mastering to finished product available (7" and 12"). **Rates:** Upon request. **OTHER.** Sony digital editing, digital EQ, R-DAT and F1 masters. High-quality, short-run cassette duplication. Cassette duplication available directly from analog source without running master (real and double time). Custom-loaded blank cassettes. Creative art and packaging services.

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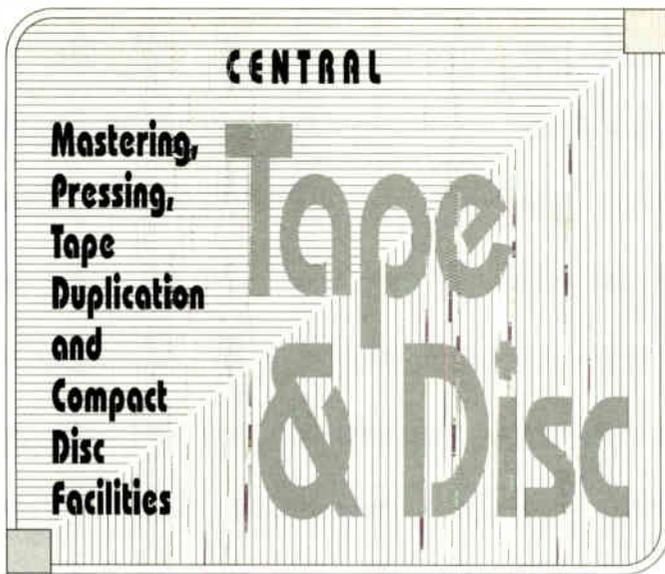
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**A & F MUSIC SERVICES;** 2834 Otsego; Waterford, MI 48328-3244; (313) 682-9025; (313) 669-3100. Contact: Frank Merwin.

**A & R RECORD & TAPE MFG. CO.;** CDR, TM, TD, DM, RM: 902 N. Industrial Blvd.; Dallas, TX 75207; (214) 741-2027. Contact: Richard Sobel, Stanley Getz II.

**A TO Z AUDIO SERVICES INC.;** TD; PO Box 26087; Fairview Park, OH 44126; (216) 333-0040; FAX: (216) 333-0104. Contact: Jean Rust.

**ACME RECORDING;** CDM, CDR, TM, TD: 1708 W. Belmont; Chicago, IL 60657; (312) 477-7333; (800) 826-2263. Contact: Jim Rasfeld, Sharon Quattrocchi.

**AMERICAN SOUND & VIDEO CORPORATION;** TE: 7290 Miller Dr.; Warren, MI 48092-4727; (313) 795-1900. Contact: Frank S. Day.

**AUDIO DUPLICATION & SERVICES;** CDM, CDR, TM, TD, DM, RM: PO Box 31546; St. Louis, MO 63131; (314) 965-8895. Contact: Rick Schaumberger.

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**AUDIO-VIDEOGRAPHICS;** TM, TD: 13801 E. 35th St.; Independence, MO 64055; (800) 322-2832; (816) 254-0400. Contact: Jeff Propst, Rich Hathorne. **MASTERING.** Mastering Console: TAC Scorpion 16x8, DigiDesign/MacIntosh digital software deck. **Tape Machines:** (3) Sony APR-5000 Series, (2) Sony 2500A DAT, Tascam DA-30 DAT, Sony PCM-F1, PCM-501 with JVC 1/2" BR 7000U, JVC 3/4" CR 850U recorders, DigiDesign MacIntosh Multichannel ProTools. **Noise Reduction:** Dolby A, Dolby SR, Dolby B-C-S, dbx. **Monitor Speakers:** JBL studio, Acoustic 3A Andante master control, PFM 3CES Peavey, Auratone. **Signal Processing:** Dorrough Inu Jness monitors, UREI 546 parametric EQ, UREI 1176LN and UREI 1178 level controllers, Aphex Dominator II precision peak limiter, Dynamic Sibilance controller, Lexicon digital reverbator, Dolby 422 B-C-S reference encoder/decoder, Yamaha SPX5011 ef-

fects processor, Technic CD high-resolution system SL-P770. **Engineers:** Kevin Davis, Tom Stack, Jerry Riegle. **TAPE DUPLICATION. Method of Duplication:** In-cassette and bin-loop. **Duplicator:** Dolby HX-Pro, KA/3A real-time, (3) bin-loop system, Magnefax 7802-4C professional duplication system, Sony CCP-200 cassette system, Texaco 20XLs, stem, Ampex 3200 R-R duplication system, Soni-DAT 2500A system, JVC BR 7000U VHS Hi-Fi stereo system. **Duplicating Speed:** Real-time, 2x, 16x, 24x and 32x. **Tape Used:** TOKI cobalt, BASF cobalt, BASF chrome, BASF/Agfa LHD ferric, Agfa 26, 3M-396, Ampex 456 mastering tape. **Shell Used:** Lenco clear/color sonic and 5 screw, Shape Mark 10, Microflex. **Loading Equipment:** Multiple King 790 loaders. **Packaging Equipment/Fulfillment Services:** in-house typesetting/layout IBM Windows 3.0, Aldus Pagemaker 4.0, laser jet printer with image scanner, in-house on-cassette printing, plate maker, custom computer label printer, shrinkwrapping, IBM-Mac shipping label and record keeping. **Rates:** Quote per job. **OTHER:** Video duplication and packaging, VHS Hi-Fi stereo, U-matic, Betacam 1", Capital Production music library, Quality control—Otari DP-1610 pancake checker, Janzen 831, Audico 200 Series Q.C.

**THE BROOKWOOD STUDIO INC.;** CDM, TM, TD: 1155 Rosewood, Ste. A; Ann Arbor, MI 48104; (313) 994-4992. Contact: David Lau, Matt Hanson.

**CREATIVE SOUND**  
HOUSTON

CREATIVE SOUND PRODUCTIONS INC.  
Houston, TX

**CREATIVE SOUND PRODUCTIONS INC.;** CDR, TM, TD: 8383 Commerce Park Dr. #604; Houston, TX 77036; (713) 777-9975; (800) 451-7034; FAX: (713) 774-3419. Contact: Edward B. Smith, president, Michele Crosby, dir. of duplication. **MASTERING. Tape Machines:** Otari MTR-10-4 with HX Pro, Otari 5050 Mark III-4, MCI JH-110, Ampex ATR 790, Panasonic SV-3500 R-DAT, Sony DCM-501 Tascam M32, M34, M38. **Noise Reduction:** dbx, Dolby A. **Monitor Speakers:** JBL. **TAPE DUPLICATION. Method of Duplication:** Bin-loop. **Duplicator:** Otari DP-80 with HX Pro 64:1, bin-loop master, 5 slaves, Otari DP-1010 master/bin-loop, 5 slaves, Infonics open-reel master, 8 slaves. **Duplicating Speed:** 64:1 and 16:1. **Capacity:** 10,000 per hour shift. **Tape Used:** BASF chrome, BASF 649 and 619, Ampex 315. **Shell Used:** Swire Premium, Lenco, Olamom. **Loading Equipment:** Tapeomatic 2000, Tape-matic 900HS. **King automatics. Packaging Equipment/Fulfillment Services:** Label printing, Apex imprint, Macintosh II

CTP graphic design system, shrinkwrap, custom vinyl albums. **Rates:** Quotes and catalog upon request. **COMPACT DISC. Services, prices:** CD services include CD replication, graphic design and printing of tray cards/booklets, complete packaging shrink blister, longbox. **OTHER:** In-house graphic design, label printing via Sohn Flexo Press, 1-4 color colorliner printing, Apex direct imprint on shell, video duplication and packaging, custom-loaded blank cassettes.

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**CRYSTAL CLEAR SOUND;** CDM, CDR, TM, TD: 4902 Don Dr.; Dallas, TX 75247; (214) 630-2957. **MASTERING. Mastering Console:** DDA 224V. **Tape Machines:** Sony 5000, (3) Panasonic SV-3700 R-DAT. **Noise Reduction:** Dolby SR, A, Jbx. **Monitor Speakers:** KRK, UREI, Yamaha, JBL. **Engineers:** Keith Rust, Sia Afmadzadeh. **TAPE DUPLICATION. Method of Duplication:** In-cassette. **Duplicator:** KABA 50 position. **Duplicating Speed:** Real time, double speed. **Tape Used:** BASF Cr02. **Shell Used:** Shape Mark 10. **Rates:** Very competitive, please call. **COMPACT DISC. Services, prices:** High quality, low rates. Please call for rates, requirements and turnaround time. **OTHER:** We duplicate your cassettes using the KABA system on BASF chrome tape housed in a clear shell made by the Shape company. This combination of a superior tape and the best duplicators available insures you the highest quality cassette copy you can get. ANYWHERE!

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DIGITAL EDITING SERVICES  
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**DIGITAL EDITING SERVICES;** CDM, TM: 10642 Cotillion; Dallas, TX 75228; (214) 686-5256. Contact: George Gourn. **MASTERING. Mastering Console:** Custom. **Tape Machines:** Tascam DA-30, Tascam 42B, Studer A-80 2-track, VHS/Beta PCM. **VHS/Beta Hi-Fi. Noise Reduction:** dbx type I and dbx source noise reduction. **Monitor Speakers:** Meyer Sound Labs HD-1, Tannoy NFM-8, Tannoy AVM. **Digital Editing Systems:** DigiDesign Sound Designer II. **Signal Processing:** Lexicon 300, Lexicon 224XL, PCM-41, PCM-70, LXP-1, Aphex compellor/dominator, UREI, Ashley parametric, dbx 900 rack, Teletronix LA-3A. **Engineers:** George Gourn. **Rates:** call. **OTHER:** Can arrange for small quantity CD production for local bands or large runs as needed. Can help in all phases of artwork, design and printing for CD inserts. Excellent processing for sweetening/cleaning up masters. Can accept any master format. Very experienced in restoring old 2-track masters. Dance remixes a specialty. D.E.S. specializes in editing and preparing master tapes for production. Original master format can be DAT, VHS/Beta PCM, 1/4" 2-track (7.5, 15 or 30 ips), 3/4" U-matic or VHS/Beta Hi-Fi.

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**JEWEL RECORDS; CDM, CDR, TM, TD, DM, RM; 1594 Kinney Ave.; Cincinnati, OH 45231; (513) 522-9336. Contact: Rick Hopkins**

**THE LITTLE WAREHOUSE INC.; TD; 5505 Valley Belt Rd., Ste. F; Independence, OH 44131; (216) 398-0022; (800) 445-8273. Contact: Joe Kauffman. TAPE DUPLICATION. Method of Duplication: In-cassette and bin-loop. Duplicator: Telex 6120XLP, Telex CD series, Magnafax LBC 82-QT, Magnafax LBC-8BT, Magnafax TM8-FT. Duplicating Speed: 8:1, 16:1, 24:1. Tape Used: Audio: Agta 619, 649, BASF chrome. Video: Ampez, BASF, Maxell. Shell Used: Magnetic Media 5-screw C-O, Shape HG-IV-O. Loading Equipment: King 790, King 2500. Packaging Equipment/Fulfillment Services: Conflex sealer and Weldotron shrink-tunnel. Rates: Quote on request. OTHER. In-house typesetting and printing of labels and inserts. Custom-loaded broadcast quality VHS and a full range of Audiocassette cassettes. Video duplication of 1", 3/4" and 1/2" masters to 3/4" and 1/2" VHS. Blank audio and videocassette labels are available in standard pressure-sensitive and laser formats.**

**MASTER TRACK PRODUCTIONS; CDM, CDR, TM, TD; 1045 W. Bond St.; Lincoln, NE 68521; (402) 474-4985; FAX: (402) 474-2535. Contact: Dan Norton. TAPE DUPLICATION. Method of Duplication: Bin-loop. Duplicator: Lyrec Dolby HxPro. Tape Used: Sunkyong, BASF. Shell Used: ICM, Michalex, Mag Media. Packaging Equipment/Fulfillment Services: On-shell printing, overwrap, full color insert. Rates: Call for price list. COMPACT DISC. Services, prices: Complete compact disc manufacturing including mastering, replication, insert printing and packaging. Call for price information.**

**NATIONAL SOUND CORP.; CDM, DM; 17610 W. Warren; Detroit, MI 48228; (313) 336-3800. Contact: Ron Murphy. OTHER. (2) Scully lathes with Haeco & Westrex cutter heads. Master lacquers and dub cutting of all sizes and speeds, specializing in clubrap. 12" singles including "reverse cut." Studer D740 compact disc recorder for CD reference cuts. Rate card sent on request.**

**QCA; CDM, TM, TD, DM, RM; 2832 Spring Grove Ave.; Cincinnati, OH 45225; (513) 681-8400. Contact: Amber Hines. MASTERING. Mastering Console: Neumann. Tape Machines: MCI, Otari, Sony 1610, Panasonic SV-3500. Noise Reduction: Dolby A, Dolby SR, dbx. Monitor Speakers: UREI 811, Eastern Acoustic Works. Yamaha NS-10M. Digital Editing Systems: Sony DAE 1100 A. Cutting Lathes: Neumann VMS66 with Zuma disc computer. Signal Processing: Sontec parametric EQ, Aphax Compeller, Aphex Dominator, Ortofon Limiter. Engineers: Donnie Kraft. Rates: Call sales department. TAPE DUPLICATION. Method of Duplication: Bin-loop. Duplicator: Ctec Gauss 2400 with Dolby HX Pro. Duplicating Speed: 32:1, 64:1, 128:1. Capacity: 9,000 per day. Tape Used: BASF chrome. Shell Used: ICM, Lenco. Shape Mark 10. Loading Equipment: King 790, 770. Packaging Equipment/Fulfillment Services: Apex printing, 4-color insert printing, packaging and wrap. Rates: Call sales department. COMPACT DISC. Services, prices: Q.C.A. handles complete manufacturing of CD from mastering to final packaging. RECORD MANUFACTURING. Presses: (5) S.M.T. automatic 12" presses, (2) S.M.T. automatic dual 7" presses. Ca-**



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**RSRT; CDM, TM, TD; 4020 State Line; Kansas City, KS 66103; (800) 776-4096; (913) 262-5335; FAX: (913) 262-5364. Contact: Royal Scanlon, Dan Shanks. MASTERING. Mastering Console: Soundcraft. Tape Machines: (2) Otari MTR-12, (2) Tascam BR-20, Tascam DA-30, Panasonic SV-3700. Noise Reduction: Dolby SR, Dolby A, dbx type I. Monitor Speakers: Yamaha NS-10M, Fostex LS2B, EAW MS-50. Digital Editing Systems: (Spring 1992) Digidesign ProTools system. Signal Processing: All standard outboard gear. Engineers: Royal Scanlon, Larry (ElJay) Johnson. Rates: Editing, sweetening and remastering \$60 per hour + materials, straight transfer time \$45 per hour + materials. TAPE DUPLICATION. Method of Duplication: In-cassette and bin-loop. Duplicator: (104) modified KABA system, Nakamichi MR-1, Magnafax 1x7. Duplicating Speed: Real time, double time and high speed. Capacity: 7,200 (2x) C-45 per day, 3,600 real time C-45 per day. Tape Used: BASF chrome, BASF LHD normal (others run upon request). Shell Used: Clear (All types available). Loading Equipment: Concept Design CD-9000. Packaging Equipment/Fulfillment Services: Complete fulfillment services available. Rates: Supplied upon request. COMPACT DISC. Services, prices: Supplied upon request. OTHER. "ElJay" has been Johnny Cash's F.O.H. mix engineer for the past 11 years. Royal Scanlon has worked as a recording artist and engineer for the past 26 years. RSRT's stringent quality control and attention to detail is well-known throughout the U.S.A.**

**RICHARDSON TAPE; TD; HC71, Box 231; Mountain View, AR 72560; (501) 269-3908. Contact: Aubrey Richardson. MASTERING. Tape Machines: Otari. Crown, Technics Digital, Panasonic R-DAT, Sony R-DAT. Noise Reduction: dbx, Dolby. Monitor Speakers: EV. Signal Processing: Aphex Type C, BBE, DOD Electronics EQ, UREI LA-3A. TAPE DUPLICATION. Method of Duplication: In-cassette. Duplicator: Nakamichi MR-2 (102 decks). Duplicating Speed: Real-time 1 7/8. Capacity: 1,500 C-30s per shift. Tape Used: BASF, Magnetic Media. Shell Used: Magnetic Media, Lenco. Loading Equipment: King, Superscope. Packaging Equipment/Fulfillment Services: Ciamco, APS. Rates: On request we do small orders (under 500). OTHER. Services from blank audio cassettes to full color packages—with direct-to-cassette printing, we also do small quantity demos.**

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**TERRA NOVA DIGITAL AUDIO; CDM, TM.** 2111 Dickson #18; Austin, TX 78704; (512) 326-5553. Contact: Jerry or Diane Tubbs.

**VAUGHN DUPLICATION SERVICES; TD.** 7951 Computer Ave. S.; Minneapolis, MN 55435; (612) 832-3150; (800) 323-0281. Contact: Cindy Verant.

**WORLD CLASS TAPES; TM, TD.** 670 Airport Blvd.; PO Box 7611; Ann Arbor, MI 48107; (313) 662-0669. Contact: Rob Martens.

**BASFTP-18, QP 12, Sunkyong UCR-60, 90, SKX60, 90. Shell Used:** Mainly Lenco. **Loading Equipment:** (8) Concept Designs modified King 775. (2) Modified King 790. **Packaging Equipment/Fulfillment Services:** Apex inserting machine, O&M folder machine, Scandia 607 shrinkwrappwr, Shanklin "L" sealer, Weldotron "L" sealer. **COMPACT DISC Services, prices:** Complete CD packages from mastering, pressing, graphic filmwork and printing. CD Reference Discs. **RECORD MANUFACTURING. Rates:** Available. **OTHER.** Graphic creation, filmwork, printing, warehouse order fulfillment, mail fulfillment, special assemblies, posters and mailers.

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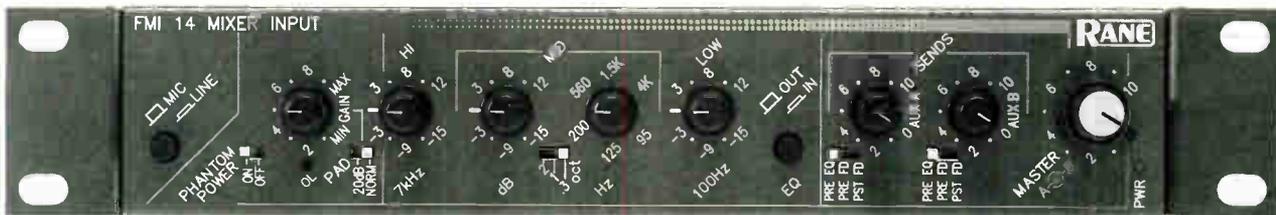
**TM CENTURY; CDM.** 14444 Beltwood Parkway; Dallas, TX 75244; (800) 937-2100; (219) 934-2121; FAX: (800) 749-2121. Contact: Gary Hollis, digital studios manager. **MASTERING. Mastering Console:** Sony MXP-2000, Yamaha DMP70. **Tape Machines:** Sony PCM-3202 DASH, (2) PCM-1630 DRM 4000, (3) Sony 2500 Pro DAT, Sony 501. **Noise Reduction:** Dolby A, Dolby SR, dbx. **Monitor Speakers:** JBL 4410, Yamaha NS-10M. **Digital Editing Systems:** (3) Sonic Solution with "No-Noise" Cutting Lathes: Sinc Solutions, Sony CD 1-OFF (WORM) system. **Signal Processing:** Yamaha DMP7D. **Engineers:** Gary Hollis, Ed Johnson, John Parthou, Del Anderson, Ryan Reid. **Rates:** Digital studio, \$150 per hour. No-Noise processing \$100 per finished minute. **OTHER.** Complete CD packages available, also custom CD 1-off service, digital sound effects library, in-house MIDI production studio, short-run and large-quantity CD projects accepted.

**WORLD MEDIA GROUP INC.; CDM, CDR, TM, TD, DM, RM:** 8472 Brookville Rd., Indianapolis, IN 46239; (317) 353-1113. Contact: Andrew Symons, Jeff Mellentine. **MASTERING. Tape Machines:** Studer A-80 1/2 with HX Pro Otari MTR-12 1 4" half-track, Tascam 122 MkII, Nakamichi MR-1B, (2) Panasonic SVR-3500 DAT, SVR-3700 DAT, Sony 601 processor w/VHS & Beta machine. **Noise Reduction:** Dolby A, Dolby SR, Dolby B, dbx type 1. **Monitor Speakers:** UREI 809 with Carver PM-175. **Signal Processing:** Klark Teknik DN410 parametric EQ, Drawmer M500 dynamics processor, Barcus Berry BBE442, (2) dbx 263X de esser. **Engineers:** Andrew Symons, Steve Crearh, Nancy Matter. **TAPE DUPLICATION. Method of Duplication:** Bin-loop. **Duplicator:** Gauss 1200 1/2" master, (7) Gauss 1200 slaves, Gauss 1200B QC machine, Lyrec P-4400 bin w/(2) P-2600 twin slaves. **Duplicating Speed:** Gauss 64:1, Lyrec 33/4=80:1, 71.2=64:1. **Capacity:** 700,000 monthly. **Tape Used:**

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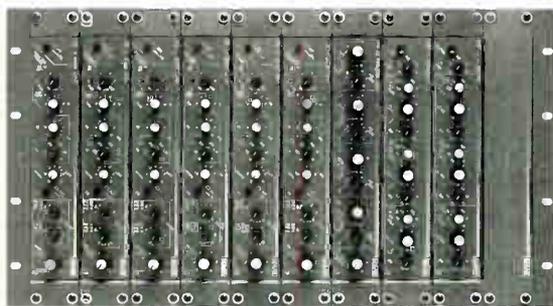


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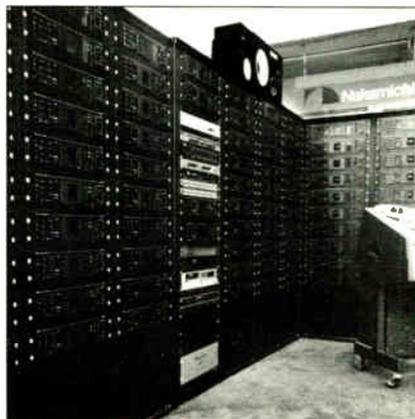
CDM: CD Mastering/  
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CDR: CD Replication  
TM: Tape Mastering  
TD: Tape Duplication  
DM: Disc Mastering  
RM: Record Mastering

**A&M POST-PRODUCTION; TD:** 1416 N. La Brea Ave.; Hollywood, CA 90028; (213) 856-2797; FAX: (213) 856-2712. Contact: Bill Lazerus.



**A&M MASTERING STUDIOS**  
Hollywood, CA

**A&M MASTERING STUDIOS; CDM, TM, DM:** 1416 N. La Brea Ave.; Hollywood, CA 90028; (213) 856-2775; FAX: (213) 856-2600. Contact: Sandi Johnson. **MASTERING. Mastering Console:** A & M custom discrete transformerless. **Tape Machines:** Mastering deck, modified MCI deck, custom elec., ATR-102, Yamaha K2000. **Noise Reduction:** A&M custom transformerless discrete rack, Dolby A, SR, dbx. **Monitor Speakers:** Tannoy 15" drivers with A&M custom cabinets and crossovers. **Digital Editing Systems:** Sony digital editor, DMR 4000, 1630. **Cutting Lathes:** Modified Scully with custom discrete electronics, modified Westrex head. **Signal Processing:** Digital Harmonia Mundi Acustica, analog Sontec, API, UA, Aphex, dbx.



**AAPEX TAPE DUPLICATION**  
San Rafael, CA

—LISTING AND PHOTOLOGO CONTINUED TOP OF NEXT COLUMN

**AAPEX TAPE DUPLICATION; TD:** 28 Paul Dr., Ste. E; San Rafael, CA 94903; (415) 492-1300. Contact: Devon Hulatt. **MASTERING. Tape Machines:** Sony Beta VCR and Quazar VCR, Panasonic SV-3500 DAT, Otari MTR-12.2 track (7.5, 15 or 30 ips). **Noise Reduction:** Dolby A or SR or dbx I (master), Dolby B or C (cassette). **Monitor Speakers:** JBL. **Signal Processing:** Sony PCM-501ES digital processor, Aphex Compellor, Aphex Aural Exciter type B, Yamaha 3-d-octave equalizer. **Engineers:** Keith Bender, Denis Hulet. **TAPE DUPLICATION. Method of Duplication:** In-cassette. **Duplicating Speed:** 1:1 real time only. **Capacity:** 1,500/day. **Tape Used:** BASF CR02, Agfa 649 normal. **Shell Used:** Quality 5-screw clear, black or white shell. **Shape Mark 10** (upon request). **Packaging Equipment/Fulfillment Services:** X-Rite shrink-wrap machine, Auto-label automatic labeler. **Rates:** Upon request, please call. **OTHER.** Sonic enhancement, analog-to-digital mastering, full graphic design and printing services offered. Full mixing, mastering and recording at our 24-track recording studio, Banquet Sound Studio.

**AAZTEC RECORDING AND TAPE DUPLICATING INC.;** TD: 1110 E. Missouri, Ste. 400; Phoenix, AZ 85014; (602) 279-0808. Contact: Ron Briskman.



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**ABBEY TAPE DUPLICATORS, INC.;** TM, TD: 9525 Vassar Ave.; Chatsworth, CA 91311; (818) 882-5210. Contact: Bill Snow. Norman Cooke. **MASTERING. Mastering Console:** Tascam. **Tape Machines:** MCI, Ampex, Nakamichi F-1, Panasonic R-DAT, Technics, Sony. **Noise Reduction:** dbx, Dolby. **Monitor Speakers:** JBL. **Signal Processing:** UREI, Kepex, Aphex. **Engineers:** Rudy Menart (Chief), Boris Menart, Dave Steele. **Rates:** \$48/hour. **TAPE DUPLICATION. Method of Duplication:** In-cassette and bin-loop. **Duplicator:** Duplicators 24-slave (bin-loop), KABA 50 slave (real time). **Duplicating Speed:** 36 ips and real time. **Capacity:** 5,000/day. **Tape Used:** BASF-LHD, BASF-chrome. **Shell Used:** 5-screw white, black or clear. **Loading Equipment:** King 790s. **Packaging Equipment/Fulfillment Services:** ITI labeling, Rolif-Dex imprinting, shrinkwrapping, albums, individual mailing. **OTHER.** Complete narration studio and audio production facilities, editing, sequencing, equalizing, mixing. Video duplication. Reliable personal service for over 22 years.

**ALSHIRE INTERNATIONAL INC.;** CDM, CDR, TM, TD, DM, RM; 1015 Isabel St., PO Box 7107; Burbank, CA 91510; (213) 849-4671; (818) 843-6792; FAX: (818) 569-3718. Contact: Al Sherman, Richard Sherman

**ARTISAN SOUND RECORDERS;** CDM, TM, DM, 1500 N. Wilcox Ave.; Hollywood, CA 90028; (213) 461-2751. Contact: John Austin.



**AT&T RECORDING/DUPLICATING**  
Los Angeles, CA

**AT&T RECORDING/DUPLICATING;** TM, TD; 501 N. Larchmont Blvd.; Los Angeles, CA 90004-1305; (213) 464-9000; FAX: (213) 467-6615. Contact: Kathy Van Boover. **MASTERING.** Mastering Console: Ramsa. **Tape Machines:** Studer 1/4", Otari 1/2" 8-track, Scully 1/2" 4-track, Sony DAT 2500, Panasonic DAT 3500. **Noise Reduction:** dbx, Dolby. **Rates:** \$80/hour + materials. **TAPE DUPLICATION.** Method of Duplication: In-cassette and bin-loop. **Duplicator:** (94) KABA real-time decks, (10) Nakamichi real-time, high speed cut of-cassette duplication; 16x speed. **Duplicating Speed:** Real time, 2:1, 16:1. **Tape Used:** Agfa 649, 647, 9:9, 947 for cassette; Agfa 468 for masters. **Shell Used:** Shagex Mark 10 Magnetic Media. **Loading Equipment:** King. **Rates:** Competitive rates. Call for quotation. **OTHER.** Label printing, packaging, shrink-wrapping.

**AUDIO CASSETTE DUPLICATOR CO.;** TM, TD; 12426 1/2 Ventura Blvd.; Studio City, CA 91604; (818) 762-ACDC. Contact: Steve Mitchell or Steve Katz.



**BAUER COMMUNICATIONS INC.**  
North Hollywood, CA

**BAUER COMMUNICATIONS INC.;** TM, TD; 6887 Farmdale Ave., Bldg. 12; North Hollywood, CA 91605; (800) 627-7277. Contact: Jim Baue. **MASTERING.** Mastering Console: Soundcraft. **Tape Machines:** Nagra T Audio, Ampex, Technics. **Noise Reduction:** Dolby, dbx, Burwen, SAC. **Monitor Speakers:** Yamaha, Nestorovic. **Signal Processing:** UREI, Dolby, dbx, Burwen, Aphex, Modulation Sciences, Lexicon, Sony, Boulder. **TAPE DUPLICATION.** Method of Duplication: In-cassette. **Duplicator:** Modified KABA w/8 positions. **Duplicating Speed:** Real time. **Tape Used:** BASF chrome. **Shell Used:** EMC/Group. **Loading Equipment:** TTL. **Packaging Equipment/Fulfillment Services:** WrapMaster. **Rates:** In quantities of 100 C-30=\$1.58, C-60=\$2.31, C-90=\$3.14 (other quantities and enclosures available). **OTHER.** S/Tor runs (\*2 to 5,000) requiring fast turnaround and audiophile quality are our specialty, utilizing state-of-the-art mastering equipment and real-time duplication. In-studio labels and shrinkwrap done in-house for immediate turnaround. We emphasize personalized service. 24-hour turnaround available. Bauer Communications is now also selling the world's finest audio transformers formerly marketed through Jensen Transformers.

**BONNEVILLE COMMUNICATIONS;** CDM, TM, TD; 130 Social Hall Ave.; Salt Lake City, UT 84111; (801) 237-2619. Contact: Tim Dool, vice president, production.



**CAPITOL RECORDS STUDIOS**  
Hollywood, CA

**CAPITOL RECORDS STUDIOS;** CDM, CDR, TM, TD, DM, RM; 1750 N. Vine St.; Hollywood, CA 91355; (213) 871-5001. Contact: Docken Polk (production supervisor). **MASTERING.** Mastering Console: Neve, Sony, Studer. **Tape Machines:** Studer, Sony 1630, Mitsubishi X-86 IIS. **Noise Reduction:** Dolby A/SR. **Monitor Speakers:** JBL custom. **Digital Editing Systems:** Sonic Solutions. **Sony DAE 3000.** **Cutting Lathes:** Neumann SAL 74B with Zuma computer. **Signal Processing:** Harmonia Mundi, Sontec EQ, NTP EQ, Sonic Solutions. **Engineers:** Wally Traugott, Ron McMaster, Larry Walsh, Odeia Murphy, Kevin Reeves, Bob Norberg. **Rates:** Call for pricing and information. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicator:** Capitol, Gauss. **Duplicating Speed:** 80:1, 40:1. **Capacity:** Millions per year. **Tape Used:** Various manufacturers. **Shell Used:** Capitol. **Loading Equipment:** Tapematic, Tacos. **Packaging Equipment/Fulfillment Services:** Apex. **Rates:** Custom, please call. **COMPACT DISC.** Services, prices: CD pressing, artwork, printing, packaging, graphics. Prices: custom—please call. **OTHER.** At the Capitol mastering facilities in Hollywood we will provide CD pre-mastering, EQ and PQ encoding, CD reference discs, cassette mastering for duplication, reference/master lacquers, cassette copies, DAT copies. Credits: Richard Marx, Julio Iglesias, Kenny Rogers, Lee Ritenour, Dwight Yoakam, Stryder, Shalamar, The Whispers, The Bangles, Crowded House, and many more.

**CASSETTE PRODUCTIONS;** TM, TD; 4910 W. Amelia Earhart Dr.; Salt Lake City, UT 84116; (800) 622-6036. Contact: Marvin Curtis.

**CMS DIGITAL INC.;** CDM, CDR, TM, DM; 182 S. Raymond Ave.; Pasadena, CA 91105; (818) 405-8002. Contact: Diana Mundy.

**COMMAND PRODUCTIONS;** CDM, TM, TD; 107 Industrial Center Bldg., Harbor Dr.; Sausalito, CA 94965; (415) 332-3161. Contact: Warren Weagant.

**CUSTOM DUPLICATION INC.;** CDR, TD; 3404 Century Blvd.; Inglewood, CA 90303; (213) 670-5575. Contact: Rick Hively. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicator:** Otari, Gauss. **Duplicating Speed:** 64:1. **Capacity:** 100,000 C-45 per day. **Tape Used:** Agfa, BASF. **Loading Equipment:** King. **COMPACT DISC.** Services, prices: Printing, duplication, packaging, fulfillment, inventory control. **OTHER.** Warehousing, fulfillment, packaging, printing, inventory control. A total turnkey service.

**DAVKORE CO.;** TM, TD; 1300-A Space Park Way; Mountain View, CA 94043; (415) 969-3030. Contact: Tom Sherry, Jeanne Horan.

**DIFFERENT FUR RECORDING;** CDM; 3470 19th St.; San Francisco, CA 94110; (415) 864-1967. Contact: Susan Skaggs.

**DIGIPREP;** CDM; 1425 N. Cole Pl.; Hollywood, CA 90028; (213) 461-1709; FAX: (213) 461-8890. Contact: Warren Salyer.

**DIGITAL BROTHERS;** CDM, CDR, TM, TD; 1125 Victoria St., Unit C; Costa Mesa, CA 92627; (714) 645-9702. Contact: Bryan Shaw, Ben Shaw.

**DISC MANUFACTURING INC.;** CDR; 3500 W. Olive Ave., Ste. 1020; Burbank, CA 91505; (818) 953-7790; FAX: (818) 953-7791. Contact: Sue Simone, VP sales.

**FANTASY STUDIOS MASTERING;** CDM, CDR, TM, TD, DM, RM; 10th & Parker Streets; Berkeley, CA 94710; (510) 549-2500. Contact: George Horn. **MASTERING.** Mastering Console: Sony SDP-1000 digital console. **Tape Machines:** Sony 1630, Mitsubishi X-86C, Studer A80. **Noise Reduction:** All  
—LISTING CONTINUED ON NEXT PAGE

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types. **Monitor Speakers:** Hidley. **Digital Editing Systems:** Mitsubishi. **Cutting Lathes:** Neumann. **Signal Processing:** Sony digital. **Engineers:** George Horn, Phil De Lanue. **Rates:** Call for rates.

**FDSL LABORATORIES INC.;** CDM, TM, DM; 4007 W. 6th St.; Los Angeles, CA 90020; (213) 383-2155; FAX: (213) 383-2158. Contact: Harx Warrig, Paul Delliquadri.

**FUTURE DISC SYSTEMS INC.;** CDM, TM, DM; 3475 Cahuenga Blvd. W.; Hollywood, CA 90068; (213) 876-8733; FAX: (213) 876-8143. Contact: Susan West.

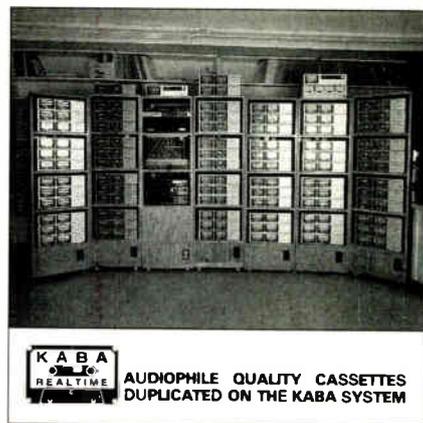
**GOOD VIBRATIONS RECORDING AND PRODUCTION CO.;** CDM, CDR, TM, TD, FM; PO Box 764; Bonita, CA 91908; (619) 267-0307; FAX: (619) 267-0307. Contact: Don Marshall, Karl Fitch. **MASTERING:** Tape Machines: Sony R-DATs. **Monitor Speakers:** Akai MS200. **Digital Editing Systems:** Digidesign Sound Tools/Macintosh Icx/600 MB hard drive. **Signal Processing:** B.A.S.E. (Bedini Aud o Spatial Environment), digital EQ, digital mixing. **Engineers:** Don Marshall, John Hendrickson. **Rates:** \$40/hr. (editing); \$350 (pre-mastering). **TAPE DUPLICATION.** Method of Duplication: In-cassette. **Duplicator:** KABA, Otari. **Duplicating Speed:** Real-time, double-time, high-speed (x1). **Capacity:** 34 :lates. **Tape Used:** BASF chrome, BASF LDH, Ampex. **Shell Used:** Mchilex, Magnetic Media, Lencro. **Rates:** Various rates based on quantity and mode of duplication. **COMPACT DISC Services,** prices: Analog-to-digital mastering; digital editing; typesetting and printing of CD brochures, tray card, CD labeling. Minimum 500, price for 1,000—\$2.80 each complete. **OTHER.** Cassette J-cards: 4 color (1,000); \$195 includes color separation.

**GRD/INVINCIBLE RECORDING;** TD; 2323 E. Magnolia, Ste. 119; Phoenix, AZ 85034; (602) 275-2101. Contact: Michael Good.

**BERNIE GRUNDMAN MASTERING;** CDM, TM, DM; 6054 Sunset Blvd.; Hollywood, CA 90028; (213) 465-6264; FAX: (213) 465-8367. Contact: Nickie Walters.

**JACKSON SOUND PRODUCTIONS;** TD; 3897 S. Jason St.; Englewood, CO 80110; (303) 761-7940; (800) 623-6773. Contact: Linda Camp-Rodriguez. **MASTERING.** Mastering Console: Custom Spectra-Sonic. **Tape Machines:** Studer A-80 1/2", 3M 1/2" & 1/4" (3M79), Sony PCM-2500 A. **Noise Reduction:** Dolby E, dbx. **Monitor Speakers:** JBL 4311. **Signal Processing:** Orban, RCA, UREI, Bercus-Bary, dbx, EBS, Furman. **Engineers:** Doug Brand. **Rates:** \$50 per hour. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicator:** Gauss 2400 Series duplication system with Dolby HXPro. **Duplicating Speed:** 96 to 1 music, chrome and normal; 128 to 1 voice. **Capacity:** 10,000 per shift. **Tape Used:** BASF, Mag Media. **Shell Used:** Mag Media. **Loading Equipment:** King 790s, Tapemate. **Packaging Equipment/Fulfillment Services:** Full service, imprinting, inserts, cassettes, shrink-wrap. **Rates:** Competitive quotes upon request. **OTHER.** Jackson Sound Productions: Ltd., in business for 27 years, has just completed a major expansion, including a new Gauss 2400 Duplicator, widely considered the most advanced equipment in the industry. With the ability of complete packaging, we offer the most competitive prices and the best service in the Midwest. Call us for your next project at (800) 621-6773.

**KABA AUDIO PRODUCTIONS;** CDM, CDR, TM, TD; 24 Commercial Blvd.; Novato, CA 94949; (415) 883-5041; (800) 231-TAPE; FAX: (415) 883-KABA. Contact: Tom Lynn, sales manager; Nate Hazing, Ted Stratton. **MASTERING.** Mastering Console: Specially designed. **Tape Machines:** KABA. —LISTING AND PHOTO-LOGO CONTINUED TOP OF NEXT COLUMN



**KABA AUDIO PRODUCTIONS**  
Novato, CA

Nakamichi, Sony DAT. **Noise Reduction:** Dolby A, B, SR, Dynafex. **Monitor Speakers:** JBL, Tannoy, Yamaha NS-10. **Digital Editing Systems:** Studer Dyaxis 2+2, DigiDesign ProTools. **Signal Processing:** Aphex Dominator, Orban Copercator, Aphex Compellor, Klark-Teknik Graphic Equalizer. **Engineers:** Gordon Elliott, Margaret Olney, Ted Stratton, Tom Anderson. **Rates:** Call for estimate. **TAPE DUPLICATION.** Method of Duplication: In-cassette, bin-loop, direct from digital. **Duplicator:** KABA audiophile quality cassette duplication system—100 positions. **Duplicating Speed:** Real time 1:1 - Double time 2:1, 16:1 and 32:1. **Capacity:** 80,000 to 100,000 per month. **Tape Used:** BASF, Agfa, Sunkyong, TDK. **Shell Used:** Mchilex, EMC, Shape, Elmar, Lenco. **Loading Equipment:** AEG. **Packaging Equipment/Fulfillment Services:** Kent Padprinter, Roldex printer, ITT cassette labeler and Pack-All shrinkwrap. **Rates:** Call for estimate. **COMPACT DISC Services,** prices: Complete packages from 500 and up. Call for estimate. **OTHER.** Audiophile cassette copies using the KABA 4-track real-time system with the Studer and Digidesign digital workstations. Complete packaging and graphics capabilities with on-cassette printing, J-cards, O-cards and multi-cassette albums. Cassette/CD combo packages available. Very personalized service, estimates while you wait.

**KDISC MASTERING;** CDM, TM, DM; 6550 Sunset Blvd.; Hollywood, CA 90028; (213) 466-1323; FAX: (213) 466-7237. Contact: Julie Kruger, office manager.

**TERRY LESSIG SOUND;** TD; 1626 N. 7th St.; Phoenix, AZ 85006; (602) 255-0155. Contact: Terry W. Lessig. **MASTERING.** Tape Machines: Otari MTR-10. **Noise Reduction:** Dolby 330 B. **Monitor Speakers:** JBL 4311. **Signal Processing:** Aphex Dominator, Valley People Gain Brain II. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicator:** Magnetax LB-72, seven-slave mono duplicator. **Duplicating Speed:** 24:1 mono and stereo. **Capacity:** 50,000 units per month. **Tape Used:** BASF chrome, 649, 619. **Shell Used:** Lenco. **Loading Equipment:** (2) Concept Design 775. **Packaging Equipment/Fulfillment Services:** On-shell imprinting, cellophane overwrap. **Rates:** Prices quoted on length and quantity. **OTHER.** Open-reel 1/4-inch duplication for broadcast programming and spot syndication. Specialist in high-quality acoustic music duplication, books-on-tape duplication and quick-turnarounds for monthly subscription cassettes.

**LOCATION RECORDING SERVICE INC.;** CDM, DM; 2201 W. Burbank Blvd.; Burbank, CA 91506; (213) 849-1321. Contact: Shari Fraiberg, general manager. **MASTERING.** Mastering Console: (2) Neumann SP79, Neumann MT66. **Tape Machines:** (4) Studer A80 Mk II 1/4" and 1/2", (3) Studer B57, (4) Nakamichi MR-1, Sony PCM-1630, (2) DMR 4000. **Noise Reduction:** Dolby SR, A, dbx type I. **Monitor Speakers:** UREI B11-A, Studer A68 amps. **Cutting Lathes:** (3) VMS-70 with SAL-74 amps, SX74 heads. **Signal Processing:** Sontec Mes 430, EMT 240 plates, Yamaha REV5, UREI 1178 limiters. **Engineers:** Bruce Kennedy, David Ellsworth, Kevin Gray. **Rates:** \$95/hour analog, \$150/hour digital. 12-inch LP \$105/ side, 1630 CC submaster \$400, CD clones \$180. **OTHER.** Complete printing services: record labels, jackets, CD inserts and tray cards, cassette J-cards, commercial printing, complete record production.

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AUDIOPHILE QUALITY CASSETTES  
DUPLICATED ON THE KABA SYSTEM

MARTIN AUDIO GROUP  
Seattle, WA

**MARTIN AUDIO GROUP;** CDM, CDR, TM, TD: 1200 Westlake Ave. N., Ste. 414; Seattle, WA 98109; (206) 784-0139. Contact: Scott Olsen. **MASTERING. Tape Machines:** Panasonic 3700, Otari 15 ips/30 ips. **Noise Reduction:** Dolby SR. **Digital Editing Systems:** Spectral multitrack hard drive system. **Signal Processing:** Parametric and graphic EQ. **Engineers:** Bob Boeck. **Rates:** \$50-\$65 per hour. **TAPE DUPLICATION. Method of Duplication:** In-cassette. **Duplicator:** KABA real time, digital hard drive master, 50 slaves. **Duplicating Speed:** 1:1 and 2:1. **Capacity:** 44,000/month. **Tape Used:** BASF chrome, BASF cobalt. **Shell Used:** Shape. **Packaging Equipment/Fulfillment Services:** Manual. **Rates:** 1,000 pieces C-45; real time—\$1.11; double time—\$0.94. **COMPACT DISC. Services, prices:** Exclusive dealer for American Helix. Full service, manufacturing of all parts. **OTHER.** Graphics dept., design and typesetting. Full color printing, J-card, O-card, CD book and tray. Project management.

**MASTER TRACK PRODUCTIONS;** CDM, CDR, TM, TD: 1524 W. Winton Ave.; Hayward, CA 94545; (510) 782-0877; FAX: (510) 782-6280. Contact: Sandi Larson. **TAPE DUPLICATION. Method of Duplication:** Bin-loop. **Tape Used:** Sunkyoung. **Shell Used:** ICM, Michelex, Magnetic Media. **Packaging Equipment/Fulfillment Services:** On-shell printing, overwrap, full-color inserts. **Rates:** Call for detailed price list. **COMPACT DISC. Services, prices:** Complete compact disc manufacturing including mastering, replication, insert printing and packaging. Call for price information. **OTHER.** Complete 24-track recording studio. Custom MIDI service.

**THE MASTERING LAB;** CDM, TM, DM: 6033 Hollywood Blvd.; Hollywood, CA 90028-5492; (213) 466-8589. Contact: Shannon Ahern, studio manager; Doug Sax, owner.

**MELODY PRODUCTIONS;** TM, TD: 7712 23rd Ave. NW; Seattle, WA 98117; (206) 783-8694; FAX: (206) 781-1765. Contact: James A. Bostad Sr., CEO. **TAPE DUPLICATION. Method of Duplication:** In-cassette and DAT. **Duplicator:** Nakamichi MR-2B, Otari 4050 Cassette to Cassette and 1/4" 7.5 on 15 ips to cassette. **Duplicating Speed:** 1:1 and 8:1. **Capacity:** 480/day real time and 1,750/day high speed. **Tape Used:** Full line BASF studio products (LNS, LHD, CRO, Super chrome and "New" COFFE tape). **Shell Used:** Shape Mark-10, Michelex, Lenco, Magnetic Media and MPC. **Loading Equipment:** Exclusively King 790s. **Packaging Equipment/Fulfillment Services:** Seal-A-Thon. **Rates:** Call for rates. **OTHER.** Full audio services, from mixing to mastering in our 8-track studio, to custom loading of cassettes, to duplication and pad printing, J-cards and shrinkwrapping. Included in our production studio is a video editing suite, with effects and duplication from 1/2" or 3/4". Credits: soundtracks and endless cassettes for international exhibits and museums. New for '92—full line of BASF studio products.

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MUSIC ANNEX DUPLICATION  
Fremont, CA

**MUSIC ANNEX DUPLICATION;** CDM, CDR, TM, TD: 42650 Christy St.; Fremont, CA 94538; (510) 226-0800. **MASTERING. Mastering Console:** Custom (Neve components). **Tape Machines:** Otari, MCI, various DAT. **Noise Reduction:** Dolby B, C, S type, Dolby HxPro. **Monitor Speakers:** Westlake JBL. **Digital Editing Systems:** Studer/Dyaxis. **Signal Processing:** Focusrite, Drawmer, Apogee, Aphex Dominator, BBE. **Engineers:** Ramer Gembalczyk, Pall Grondal, Lambert Woo. **TAPE DUPLICATION. Method of Duplication:** Bin-loop. **Duplicator:** Otari DP-80 (6 slaves), Electro Sound 8,000 and (6) 4800 model slaves. **Duplicating Speed:** 40:1, 64:1, 80:1. **Capacity:** 300,000 units per month. **Tape Used:** Sunkyoung, BASF. **Loading Equipment:** Tapematic, King. **Packaging Equipment/Fulfillment Services:** Apex, Shape, Weldotron, Scandia, ITI. **COMPACT DISC. Services, prices:** Complete CD manufacturing and packaging available. Jewel, blister and longbox assembly done in-house. **OTHER.** Full service graphics design and printing department. Cassette and CD fulfillment/warehousing services.

*music*

CASSETTE PRODUCTION

(800) 637-9493

MUSICON  
Wilsonville, OR

**MUSICON;** CDM, TM, TD: 27501 SW 95th Ave.; Wilsonville, OR 97070; (503) 682-8468. Contact: Steve Ziegler. **MASTERING. Mastering Console:** DDAAMR-36 automated Tape Machines: Studer 820 1/2", 827 1/4", Otari MTR12 1/2", Panasonic DAT. **Noise Reduction:** Dolby SR/A, Dolby B, C, S, dbx. **Monitor Speakers:** Meyer HD-1, Tannoy DMT15, Yamaha NS-10, Smithline. **Digital Editing Systems:** Studer Dyaxis 2+2. **Signal Processing:** Ever-thing from digital to tube. **Engineers:** Mike Newman, Jim Rogers. **TAPE DUPLICATION. Method of Duplication:** Bin-loop. **Duplicator:** Versadyne 1500 8-slave. **Duplicating Speed:** 64:1, 32:1. **Capacity:** 1,000,000 cassettes per month. **Tape Used:** Sunkyoung, BASF chrome. **Shell Used:** L.E.S., Cosmo. **Loading Equipment:** (6) King 790. **Packaging Equipment/Fulfillment Services:** Apex J card/Norelco inserter, Roldex on-cassette imprinter, ITI & Avery labeling machines, Pakte; boxing machine. **Rates:** Please call **OTHER.** From script to shrinkwrap, we can do it all. From our digital production suite and state-of-the-art studio to our automated duplicating plant, we focus on quality every step of the way. Please give us a call to discuss your project.

**NORTHWESTERN INC.;** TM, TD: 15938 SW 72nd Ave.; Portland, OR 97224; (800) 547-2252; (503) 624-7800. Contact: Jeanne Aldredge, Len Thompson. **MASTERING. Mastering Console:** TAC Bullet. **Tape Machines:** Ampeg ATR-800, Sony PCM-2500 DAT. **Noise Reduction:** Dolby SR, Dolby A, Dolby B, Dolby S, dbx. **Monitor Speakers:** Tannoy NFM-8. **Signal Processing:** Ampeg Compellor-Dominator, BBE 822, UREI 1/3-octave, etc. **Rates:** Please call with any questions.

—LISTING AND PHOTO/LOGO CONTINUED ON NEXT PAGE

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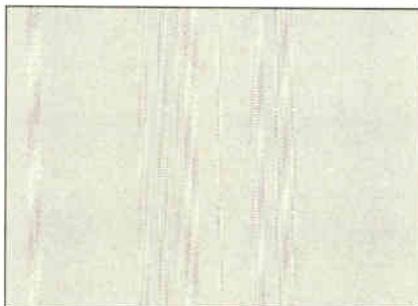
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—LISTING CONTINUED FROM PREVIOUS PAGE



# Northwestern

NORTHWESTERN INC.  
Portland, OR

**TAPE DUPLICATION.** Method of Duplication: In-cassette and bin-loop. **Duplicator:** KABA real time Otari in-cassette, Audio-Tek bin-loop. **Duplicating Speed:** Real time, 8:1, 32:1. **Capacity:** 1-100,000 piece orders our specialty. **Tape Used:** BASF, Agfa, Ampex, TDK, Shell Used; Shape Michelex. **Loading Equipment:** King loaders with Concept Design upgrade. **Rates:** Call us for competitive rates. **OTHER.** Cassette imprinting, complete packaging, labeling and fulfillment services. DAT duplication, custom-load blank cassettes, complete voice recording studio, replication and packaging, VHS duplication with Sony Sprinter. We specialize in custom services designed to meet your exact needs. Give us a call to discuss your next project.

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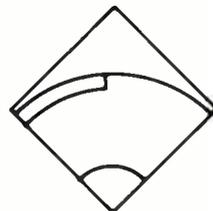


## OCEANVIEW DIGITAL MASTERING

OCEANVIEW DIGITAL MASTERING  
West Los Angeles, CA

OCEANVIEW DIGITAL MASTERING; *CDM, TM*; 2323 Corinth Ave.; West Los Angeles, CA 90064; (213) 444-9904. Contact: Lisa Dunne, Joe Gastwirt, Cal Roberts. **MASTERING.** Mastering Console: Neumann custom; Sonic Solutions digi-

tal. **Tape Machines:** Custom Ampex ATR-104, Sony 1630, various DAT machines. **Noise Reduction:** Dolby, dbx, No-Noise System. **Monitor Speakers:** Custom ATC, Tannoy SGM-10B with Mastering Lab crossover. **Digital Editing Systems:** Sonic Solutions hard disk editing system. **Cutting Lathes:** Sony/Start Labs CD writer. **Signal Processing:** Sontec, Neumann, NTP, etc. **Engineers:** Joe Gastwirt, John Modell. **Rates:** Rate card upon request.



## OPTICAL MEDIA INTERNATIONAL

OPTICAL MEDIA INTERNATIONAL  
Los Gatos, CA

OPTICAL MEDIA INTERNATIONAL; *CDM, CDR*, 180 Knowles Dr.; Los Gatos, CA 95030; (408) 376-3511. Contact: Sylvester Pesek. **MASTERING.** Mastering Console: Topix CD Audio, CD-ROM premastering workstation. **Tape Machines:** Sony DMR 4000, Fostex D-201 DAT. **Noise Reduction:** Sonic Solutions, Sound Tools. **Digital Editing Systems:** Topix workstation, Sonic Solutions, Sound Tools. **Signal Processing:** Sony DFX-2400. **Rates:** Call for Quote. **COMPACT DISC.** Services, prices: CD-Audio, CD-ROM, and mixed mode CD preparation, tape premaster and encoding, Yamaha, Sony reference disc systems. CD pressing in any quantity—24-karat gold compact discs. **OTHER.** Complete services for all CD formats: CD-Audio, CD-ROM, CD-ROM XA, CD-I, including program design, graphics, packaging and fulfillment. Call for price quote.

# phylco audio

(Established 1974)

PHYLCO AUDIO/VIDEO DUPLICATION SERVICE  
Gold Hill, OR

PHYLCO AUDIO/VIDEO DUPLICATION SERVICE; *CDR, TD*; 11693 Old Stage Rd.; Gold Hill, OR 97525; (800) 348-6194. Contact: Robert E. Deates, Gail Husa. **MASTERING.** Mastering Console: Custom. **Tape Machines:** Tascam, TEAC, Sony. **Noise Reduction:** Dolby B, dbx 1. **Monitor Speakers:** Technics. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicator:** Audio/Tek, GRT. **Duplicating Speed:** 32:1. **Capacity:** 200,000+ per month. **Tape Used:** BASF, Sunkong Shell Used; Michelex, Swire, Lenco, Shape. **Loading Equipment:** King 960s. **Packaging Equipment:** Full service, imprinting, J- and O-card printing, custom packages, plastic wrap. **Rates:** Call for quotes. **COMPACT DISC.** Services, prices: Complete package available. Call for quote. **OTHER.** We are a family-owned and operated company. We are practical, hard working and believe in "going that extra mile" for our clients by giving them personalized service, maintaining high-quality standards and delivering on time. Call us, we know you'll be glad you did.

QUAD TECK DIGITAL; *CDM, TM, DM*; 4007 W. 6th St.; Los Angeles, CA 90020; (213) 383-2155; FAX: (213) 383-2158. Contact: Joani Wang.

QUADIM CORPORATION; *CDM, TM, TD*; 31542 Rustic Oak Dr.; Westlake Village, CA 91361; (818) 706-8843; FAX: (818) 706-8426. Contact: Guy Costa.

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**RAINBO RECORDS AND CASSETTES; CDR, TM, TD, DM, RM;** 1738 Berkeley St.; Santa Monica, CA 90404; (310) 829-3476; FAX: (310) 828-8765. Contact: Jack G. Brown, Steven E. Sheldon. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicating Speed:** 64:1. **Capacity:** 50,000 per 24-hour day. **Tape Used:** BASF chrome and normal, Sunkyoung chrome and normal. **Shell Used:** Michelex, Lenco. **Loading Equipment:** King 790. **Packaging Equipment/Fulfillment Services:** Scandia. **COMPACT DISC. Services, prices:** CD replication, packaging, blister-pak multiples. **RECORD MANUFACTURING.** Presses: 26 Lened Automatic, Labels, Jackets, Sleeves—Prg Drop Shipping. **Capacity:** 50,000-12", 18,000-7". **Vinyl Used:** Keysor KC 588. **Rates:** Send for brochure or phone. **OTHER.** Over 50 years of serving the music industry. Layout and design department and typesetting at \$50 per hour. Complete CD service, minimum 500 per order, quick turnaround. In-house services. Special prices on combined orders. Large package department specializing in multiple units.

**REALTIME CASSETTE DUPLICATION (DUB TRAIN); CDM, CDR, TM, TD, DM;** 334 NE 89th; Seattle, WA 98115; (206) 523-8050. Contact: Philip "Pip" McCaslin.

**REELTIME TAPE DUPLICATION; TD;** 125 Altana St.; San Rafael, CA 94901; (415) 459-7180. Contact: Tony Johnson. **MASTERING.** Tape Machines: Panasonic 3700 DAT, Nakamichi MR1, Sony DTC-1000 ES DAT, Scully 280 1/2-track, Tascam BR-20, Tascam 112. **Noise Reduction:** Dolby B, C. **Monitor Speakers:** JBL 4411. **Digital Editing Systems:** Sound Tools available. **Signal Processing:** Orban parametric. **Engineers:** Yep. **Rates:** \$40/hour. **TAPE DUPLICATION.** Method of Duplication: In-cassette, Duplicator; (34) Nakamichi MR-2. **Duplicating Speed:** Real time. **Tape Used:** BASF chrome. **Shell Used:** S-Screw—Precision molding. Shape available. **OTHER.** We also have packaging and printing options to fit your budget. After 10 years of service to some of the S. F. Bay Area's most famous (and not so famous) clients, we feel we can satisfy your most exacting standards.

# ROCKET LAB



L A B

THE ROCKET LAB  
San Francisco, CA

**THE ROCKET LAB;** 51 Federal #100; San Francisco, CA 94107; (415) 495-2297. Contact: Anne Maria Scott. **MASTERING.** Mastering Console: JVC, Sonic Solutions. **Tape Machines:** Ampex ATR-104, Studer 820, Sony PCM-2500, Panasonic SV-3500. **Noise Reduction:** Dolby SR, A, dbx. **Monitor Speakers:** Meyer Sound Labs HD-1, Velodyne ULD 181L. **Digital Editing Systems:** Studer Dyaxis, Sonic Solutions. **Cutting Lathes:** Scully/Westrex. **Signal Processing:** Masenbourg, EAR, Sonic Solutions, Studer Dyaxis, Roland, NTP, Sontec, Dynacord DRP 20. **Engineers:** Paul Stubblebine, Ken  
—LISTING CONTINUED TOP OF NEXT COLUMN

Lee. **COMPACT DISC. Services, prices:** Call for quotes. **OTHER.** CD reference discs available. Complete digital editing including audio-for-video.



RTI-RECORD TECHNOLOGY INC.  
Camarillo, CA

**RTI-RECORD TECHNOLOGY INC.;** CDM, CDR, TM, TD, DM, RM; 486 Dawson Dr.; Camarillo, CA 93012-8090; (805) 484-2747; FAX: (805) 987-0508. Contact: Linda Pierce Ferguson, Mamie Miller, Don MacInnis, Bill Bauer. **MASTERING.** Mastering Console: Amek. **Tape Machines:** Otari, Studer, Sony, Panasonic, Nakamichi. **Noise Reduction:** Dolby, dbx. **Monitor Speakers:** JBL. **Engineers:** Mark Hashimoto, Sean Waldron. **Rates:** Please call for brochure and information package. **TAPE DUPLICATION.** Method of Duplication: Bin-loop. **Duplicating Speed:** 64:1. **Tape Used:** BASF, Sunkyoung. **Shell Used:** Lenco. **Loading Equipment:** King. **Packaging Equipment/Fulfillment Services:** Shanklin. **Rates:** Please call or write for brochure and information package. **COMPACT DISC. Services, prices:** RTI offers complete CD production services. Minimum order quantity: 500. Please call or write for brochure and information. **RECORD MANUFACTURING.** Presses: SMT. **Vinyl Used:** Keysor. **OTHER.** Now in its 20th year of operation, RTI specializes in providing top-quality goods and complete, reliable services to independent labels of all sizes and genres. Please call or write for brochure and information package.

**SOUNDWORKS WEST LTD.;** CDM, TM, DM; 7317 Romaine St.; W. Hollywood, CA 90046; (213) 850-1510; FAX: (213) 874-1420. Contact: David Dubow.

**TAPE SPECIALTY INC.;** TD; 13411 Saticoy St.; N. Hollywood, CA 91605; (818) 786-6111; (213) 873-5400. Contact: Customer service.

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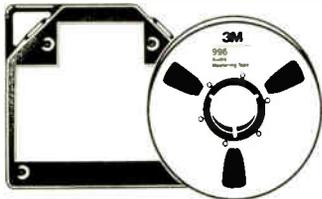
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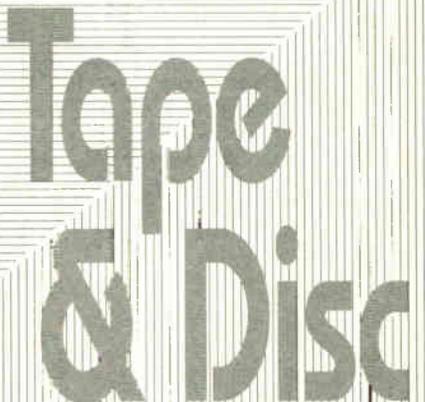
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**ANALOGUE INDUSTRIES**; 6902 Park Ave.; Montreal, Quebec, H3N 1W9 Canada; (514) 278-8273; FAX: (514) 273-8883. Contact: Rick Dexter.

**AUDIOBEC RECORDING CANADA INC.**; *CDM, TM, TD, DM*; 600 Quest Port Royal; Montreal, Quebec, H3L 2C5 Canada; (514) 384-6667. Contact: Mike Tubie, Jean Desrosiers.

**DEMRO ELECTRONIQUE INC.**; *TM*; 145, Rue Barr #6; Ville St-Laurent, Quebec, H4T 1W6 Canada; (514) 737-0818. Contact: M. Fernand Robillard.

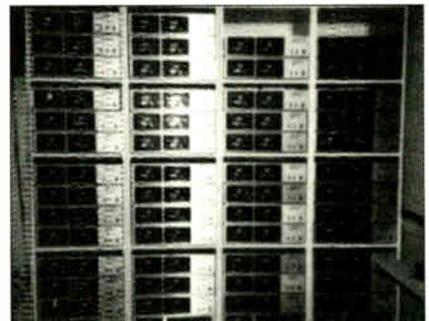


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**DISQUES RSB INC.**; *CDM, TD*; 8420 Cote De Liesse; St. Laurent, Quebec, H4T 1G7 Canada; (514) 342-8511; FAX: (514) 342-0401. Contact: Richard Belanger.

**THE LACQUER CHANNEL INC./MUSIC INDUSTRY SERVICE CORP.**; *CDM, CDR, TM, TD, DM, RM*; 297 Les Mill Rd.; Toronto, Ontario, M3B 2V1 Canada; (416) 444-6778; FAX: (416) 444-0251. Contact: Ted Carson, mgr.; George Graves, chief engineer; Bob Trowel, graphic manager. **MASTERING.** Mastering Console: Sony SDP-1000 digital transfer console, modified Neve analog console. **Tape Machines:** Studer A80 1/2" and 1/4", Otari 1/2", Studer Revox cassette deck. **Noise Reduction:** Dolby A, SR, B, dbx type I. **Monitor Speakers:** SOTA CF-750 in two acoustically matched sets. **Digital Editing Systems:** (2) Sony PCM-1630, (4) BVU-820, (2) PCM-2500, DAL-1000 limiter. **Cutting Lathes:** Neumann VMS 70 with Zuma audio. **Signal Processing:** Pultec EQ, UREI LA-4 limiter, BBE-202R. **Engineers:** George Graves, Chris Flint, Allan Moy, Ted Carson. **Rates:** \$135 (Canadian funds) per hour, base rate. Call for full quotation on requirements. **TAPE DUPLICATION.** **Method of Duplication:** SAM. **Packaging Equipment/Fulfillment Services:** Imprinted shell or labels. **Rates:** Quoted to client specs./quantity. **COMPACT DISC.** **Services, prices:** Standard and mini, quantities from 300 up, one to five color imprint. **OTHER.** Record Manufacturing: 7 1/2"-33.3/45 RPM. Quantities from 100 up. Plating services: masters, molds and stampers from lacquers. Full Service: from original location recording (pop to classical) through mixing, editing, mastering, art, type, color seps., printing, CD, cassette, record production & packaging. Tax-free exports arranged.



**AUDIOPHILE QUALITY CASSETTES  
DUPLICATED ON THE KABA SYSTEM**

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Montreal, Quebec

**LES INDUSTRIES MAGRA LTEE**; *TD*; 5722 St-Andre; Montreal, Quebec, H2S 2K1 Canada; (514) 272-8224; FAX: (514) 272-9785. Contact: Mario Paquet, president; Francois Godard, engineer. **MASTERING.** Mastering Console: Chilton DM15. **Tape Machines:** Studer A807-2/2, Studer A807 4/4, (2) Revox. **Noise Reduction:** Dolby B. **Monitor Speakers:** JBL 4112. **Signal Processing:** Klark-Teknik EQ, Symetrix noise reduction. **Engineers:** Francois Godard. **Rates:** On request. **TAPE DUPLICATION.** **Method of Duplication:** In cassette and bin-loop. **Duplicator:** (102) KABA slaves, bin-loop. **Duplicating Speed:** KABA 1-1 and 1-2, AEG Lyre T-40 and 1-80. **Capacity:** 1,200,000. **Tape Used:** Ampex, Sunkyong, Agfa, Shell Used Magnetic Media, Shape Mark IV, Michelex. **Loading Equipment:** (3) AEG Kenos 4, (2) Electro Sound. **Packaging Equipment/Fulfillment Services:** Shrink and print on cassette with Rollex. **Rates:** On request. **OTHER.** KABA, demo, new age on CD, cassette album kits, 48-hour service, Bin-loop copy minimum and choice of colors for printing, DAT-to-DAT copy, reel-to-reel copy. Free demo sample on cassette and studio accessories available. Distributor of Ampex and 3 products.

**MCCLEAR PLACE STUDIOS**; *CDM, DM*; 225 Mutual St.; Toronto, Ontario, M5B 2B4 Canada; (416) 977-9740; FAX: (416) 977-7147. Contact: Kathy Birkett.

**PRECISION SOUND CORP.**; *CDM, CDR, TM, TD*; 3117 Norland Ave.; Burnaby, B.C., V5B 3A9 Canada; (604) 299-4141; FAX: (604) 299-4146. Contact: Sonja Forsyth, Dan Fawcett.

**SONRISE AUDIO DUPLICATION LTD.**; #7 12840 Bathgate Wy.; Richmond, B.C., V6V 1Z4 Canada; (604) 278-1544; FAX: (604) 270-2745. Contact: Lorne Klassen.

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## LUNCHING WITH BONZAI

—FROM PAGE 66, PHIL WOODS

when they did the Grammy Legends show last year. Billy asked me to play. Just piano, voice and sax. Eight bars with me. James Woods announced me as the guy who played on the record. We taped it, and I told all my friends. I'm home watching the show, the last segment, and they cut out my eight bars. And James Woods came on and said, "That was Phil Woods." You couldn't see me or hear me. Cutting-room floor. I understand; it's a cold business, but that's pretty cold. And it was one of the few live numbers on the show—most of it was canned. I got my exorbitant fee, and that was it.

**Bonzai:** What do you tell a young player who wants to be a jazz great?

**Woods:** I didn't have the nerve to go up to my heroes when I was a kid and ask them what I should do. The kids today have a lot more chutzpah, but I don't have the answer for their lives. If they have the burn, no matter what I say, they will do it. If I'm doing a lecture or a workshop, I talk to the *iffy* cases. They might think that once they've got their diploma, they are going to go out and play. There's no gigs, kids. If you're a young person and you're toying with the idea of being a brain surgeon or a tenor player, I always say go for the brain surgery. Play tenor for your joy, not for your income. If you are considering two things, then music can't be the prime one. It's only for guys like me who could never entertain any other notion. At 14, I knew it in my bones. Kids major in Coltrane, go on the road with Maynard Ferguson for six weeks, and they find out this is a ridiculous way to make a living. It's bad enough that we've got too many lawyers, but too many tenor players? It's not fair to the kids. It's great for the instrument manufacturers, and great for the schools, great for the teachers. Sure, it's a positive force, but it needs to be dealt with more truthfully. They would lead you to believe that there is such a thing as a jazz business. It's simply not true. The work is mostly in toilets. There are some nice clubs like Catalina's here in L.A., but in general...

**Bonzai:** Can you balance a jazz career with other forms of music that are more lucrative?

**Woods:** I don't think you can water down your lifestyle. I don't think the audience would believe you if you made your living someplace else. Like

the guy who won the lottery and said, "Now I'm gonna play jazz." Sure, until the money runs out. It's a big commitment. Economically, you have to be prepared to scuffle. I didn't make any real bread until I was in my 40s, but I've raised a family and always made a living. And it's still a scuffle to keep a band together. But we're off to do the Monterey Jazz Festival, then Europe for a project for alto sax and orchestra written by my pianist Jim McNeely for the Radio Cologne Big Band. In Europe they still have such things as big jazz bands.

**Bonzai:** Your gripes are valid, but in your own mind, are you a success?

**Woods:** I'm having a ball. I love life. But I must be as abrasive as possible. If people are going to read this, I gotta tell it like I feel it. The band and I are living to the fullest and giving some people some pleasure. I just wish we could reach more folks. I'd like to see 'em lined up at the clubs all over America. ■

*In deference to jazz greats everywhere, Mix roving editor Mr. Bonzai composed this interview on a manual typewriter, in the smoky basement of a long-forgotten club.*

—FROM PAGE 103, STUDIOVIEW

or even two-pair telephone lines, further reducing costs while projecting an enhanced technological image. "This umbrella studio design is not a dream, but a reality that can be attained today with existing technology," he says.

But how realistic is it? Very, he replies, and although he is not actively looking for such an alliance at this point, he says that's due mainly to the fact that the larger studios haven't come to the same realization yet. "It's going to happen," he states. "I think the bigger studios don't know how to do it yet, though. I would consider such a proposition in a test arrangement sometime next year if I can find the right facility to ally with. But the larger studios will have to feel more of an economic crunch to make them more receptive to the idea. And I think that's going to happen in the coming year." ■

*Dan Daley is Mix's East Coast editor. You better watch out, you better not cry, you better not pout, I'm telling you why—Claus Von Bulow's coming to town.*

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50	001	Accurate Sound						109	092	Musician Magazine	
154	002	Ace Music Center		IBC	048	DigiTech		86	-	Neve	
56	003	Acoustical Solutions		56	049	Disc Makers (Cassettes)		34	093	Northeastern Digital Recording (NDR)	
162	004	Advance Recording Products		151	050	Disc Makers (CDs)		82	094	Oceanview Digital Mastering	
151	005	Airshow		53	-	Dolby		22	095	Opcode	
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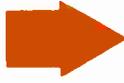
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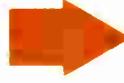
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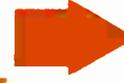
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004	034	064	094	124	154	184	214	244	274
005	035	065	095	125	155	185	215	245	275
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007	037	067	097	127	157	187	217	247	277
008	038	068	098	128	158	188	218	248	278
009	039	069	099	129	159	189	219	249	279
010	040	070	100	130	160	190	220	250	280
011	041	071	101	131	161	191	221	251	281
012	042	072	102	132	162	192	222	252	282
013	043	073	103	133	163	193	223	253	283
014	044	074	104	134	164	194	224	254	284
015	045	075	105	135	165	195	225	255	285
016	046	076	106	136	166	196	226	256	286
017	047	077	107	137	167	197	227	257	287
018	048	078	108	138	168	198	228	258	288
019	049	079	109	139	169	199	229	259	289
020	050	080	110	140	170	200	230	260	290
021	051	081	111	141	171	201	231	261	291
022	052	082	112	142	172	202	232	262	292
023	053	083	113	143	173	203	233	263	293
024	054	084	114	144	174	204	234	264	294
025	055	085	115	145	175	205	235	265	295
026	056	086	116	146	176	206	236	266	296
027	057	087	117	147	177	207	237	267	297
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022	052	082	112	142	172	202	232	262	292
023	053	083	113	143	173	203	233	263	293
024	054	084	114	144	174	204	234	264	294
025	055	085	115	145	175	205	235	265	295
026	056	086	116	146	176	206	236	266	296
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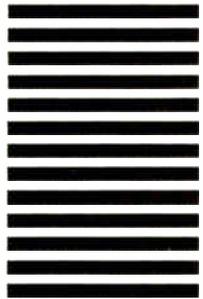
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—FROM PAGE 34, MASTERING ENGINEERS

masters was a big part of the battle on most of these projects. "A lot of the tapes were over at [Capitol's] Los Angeles Distribution Center, sitting in boxes in the corner of this giant room where they used to [manufacture] records, so they were covered with an 1/8-inch of black shit. There were all these priceless master reels there. Some Nat Cole tapes and Sinatra 3-track masters were downstairs here in the [Capitol] Tower library. In those days they did 'A' and 'B' reels, and they would cut up the 'A' reel and keep the 'B' reel intact. On the Sinatra box, in

really committed to making things sound as good as they could. Frank and Nat did most of their stuff in Studio A, and it had a particular sound back then. Now it's been redone to be a multitrack room, and it's a lot different. But that doesn't really matter, does it? With technology, you can make it sound any way you want to.

"My philosophy when I'm working on something like [the Sinatra box] is to stay true to the original performance as much as possible," he adds. "You don't hype something that isn't supposed to be hyped. With 3-tracks, if you try to affect one thing, you're actually going

to be affecting a lot of things, so you have to be very careful. You usually have a little more control on the voice, so that gives you some latitude."

Like Gastwirt, Walsh is high on the Sonic System, particularly the automatic de-click and de-crackle feature. "But as far as removing tape noise," he cautions, "you have to be careful not to go overboard. Use it too much, and it starts to sound real woolly, with no high end and all the air gone. It can get fuzzy around the vocals. My heart of hearts tells me not to use it because it's not the true performance, but it's certainly been useful in some situations." That said, it should be noted that Capitol doesn't own a NoNoise system; they farm that work out to places like OceanView Digital.

Though Walsh has done sterling work on reissue discs by everyone from Steve Miller to Ricky Nelson, he does more conven-

◀ **Larry Walsh**

tional mastering these days, and Kevin Reeves and Bob Norberg have become the label's remastering specialists (see Les Paul reissue story, page 36). "I've gotten more into music editing recently, and album projects where you have multiple producers. What happens on those is you end up with 50 tapes of half-inch, and they need to get it down to an album and make music edits—and, most of all, make it somewhat cohesive. That's a real challenge, and that's what I like the most right now." ■

*Mix* managing editor Blair Jackson recently purchased a NoNoise system to use on his year-old son.



PHOTO, COURTESY OF CAPITOL-EMI MUSIC

some cases I'd have both pulled to check them out. A lot of the 'B' reels had literally not been touched since they were made and were in excellent shape."

Walsh gives very high marks to the original engineers who worked on the classic Capitol Sinatra reels. "Some of those 3-tracks are really great recordings," he says. "In fact, I'd say about 80 percent are phenomenal, better than a lot of digital recordings I've heard. Some of it is the track width and the warmth of the tube electronics. Some of it is just great miking and attention to detail. Those guys at Capitol were

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—FROM PAGE 29, ALAN STOKER

transferring disc material to tape for the archive collection. For the past two years, though, he has been spending at least 50% of his time restoring material for re-releases. One of his most successful projects is the Country Music Hall of Fame Series for MCA Records.

The CMF lab is modest compared to most studios around Nashville. All of the gear is analog, with the exception of a Sony PCM-601, which records onto 1/2-inch videotape. For noise suppression, Stoker uses a Packburn 101. "It reacts to the clicks. Sometimes you have to adjust its rate of attack so that it doesn't take out any musical notes that it thinks are clicks," he says.

When archiving for the Foundation, he transfers the material to 1/4-inch, full-track at 15 ips. "I don't archive to digital," he notes. "I haven't read anything that says that a digital track has a longer shelf-life. I know that if analog is stored properly, it will last. We have paper-backed tape in our archives from the 1940s that still sounds good. Until it's proven to me that digital technology is going to last as long or longer, I'll keep using analog."

Stoker records the material flat, without any equalization. "I wear two hats, an archivist and a restoration engineer," he says. "I don't want to impose what I think is a good sound on an archived recording. Years down the road, there may be new technology that needs the unaltered sound. And if I've added some arbitrary EQ, it may mess it up."

Working with a variety of old discs, it is necessary for Stoker to have the right stylus. He uses seven different sizes of styli for disc playback, which are custom-made in England using a Shure Brothers body fit with custom diamond heads. "Different record labels from different time periods have different-sized grooves," he says. "After cleaning the disc, I pick a stylus and trade them off to see which one has the hotter sound."

Stoker begins his cleaning with a physical inspection where he looks for cracks or any other problems that might cause trouble in the transfer. He then cleans it with a manual parastat and places the disc on a rubber mat on the 16-inch transcription turntable. Stoker uses a paper towel and a cup of warm water to wet the disc. Then he uses a drop of Ivory dishwashing liquid and cleans the disc in a circular motion. He then uses another paper towel to get all the soap off. He keeps the record wet

## "FINDING SOMETHING YOU DIDN'T KNOW EXISTED—THAT'S WHAT'S EXCITING ABOUT BEING A RESTORATION ENGINEER."

during the transfer to prevent minerals from drying on the surface.

"The prep work usually takes ten to 20 minutes," says Stoker, adding that other times it may take as long as two hours, such as the time he restored glass-based discs for the acetate recordings of some early 1940s Grand Ole Opry shows. "There was an inevitable click," he notes, "but it was restored."

An Ampex 440 tape transport, which Stoker affectionately refers to as the "work horse," was converted by Shifrin with Inovonics Electronics. It has a set of three playback heads for 1/4-inch, 1/2-inch and 1/4-inch full-track recordings. "People send me a lot of tapes," Stoker says. "Most of the time I don't know what I'm getting. I can switch between the heads and see how it was recorded."

This "work horse" is also equipped with four speeds, 3-3/4 to 30 ips, with variable-speed operation. The VSO is convenient in transferring warped discs and field tapes. And Stoker notes that some old field tapes were recorded with a car battery during the recording. Using the VSO, he can restore the recording to one speed.

Stoker consistently receives source material in varied conditions. For the MCA Hall of Fame releases, he worked with 78 metal mothers. "They were a little bent, and it takes a long time to center them," he says. Often, he had to file the hole to make it larger or center the disc so that it would spin properly

on the turntable. "I had never worked with metal parts before. It was quite an experience," he adds.

One of his "professional audio restoration tools" that came in handy on the project was a rubber mallet, which he used to pound the bent metal mothers.

Stoker has also received material for this collection and other projects on tape. "I received tapes of metal parts, and they just didn't cut it," he says. "Sometimes, I would just pull the song from the CMF collection and transfer it off [vinyl] disc."

Included in the group of tapes were some tape masters. "The tapes were wound every way possible—heads out, tails out. You never knew what you were going to find," he says. "Sometimes there was no pad in the beginning or on the end," which often resulted in the loss of music on the tracks.

The Foundation begins each collection with a list of recordings that they consider to be most significant. Once the material is found, the burden is then on Stoker to restore the material as best he can and make it all sound uniform—like it is all from the same source.

That's not always easy. For the *Elvis Gospel* RCA release, produced by the CMF, he used a clip from *The Ed Sullivan Show*, which was the first time Elvis sang gospel music for a national audience. The recording came off a kinescope that had a small bandwidth.

One of the perks of restoring material for the Foundation is that new archive material comes in daily. Recently, someone living outside of Nashville found some transcription recordings under the floor of a smokehouse they were tearing down. They turned out to be transcriptions of Border Radio programs by the Pickard Family from 1929. According to Stoker, there are only two known commercial recordings by the Pickards. "That's what's exciting about this, finding something you didn't know existed," he says.

Another project Stoker was privileged to work on was a recording of "I'm Not Coming Home Anymore," cut in May 1942 in Montgomery, Ala., which could be the earliest known recording by Hank Williams Sr. According to Stoker, "The words of the song were published in a songbook, but no one knew how the melody went. Now we do." ■

*Missy Baker is a Nashville-based writer.*

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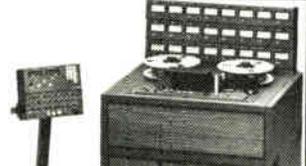
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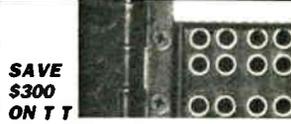
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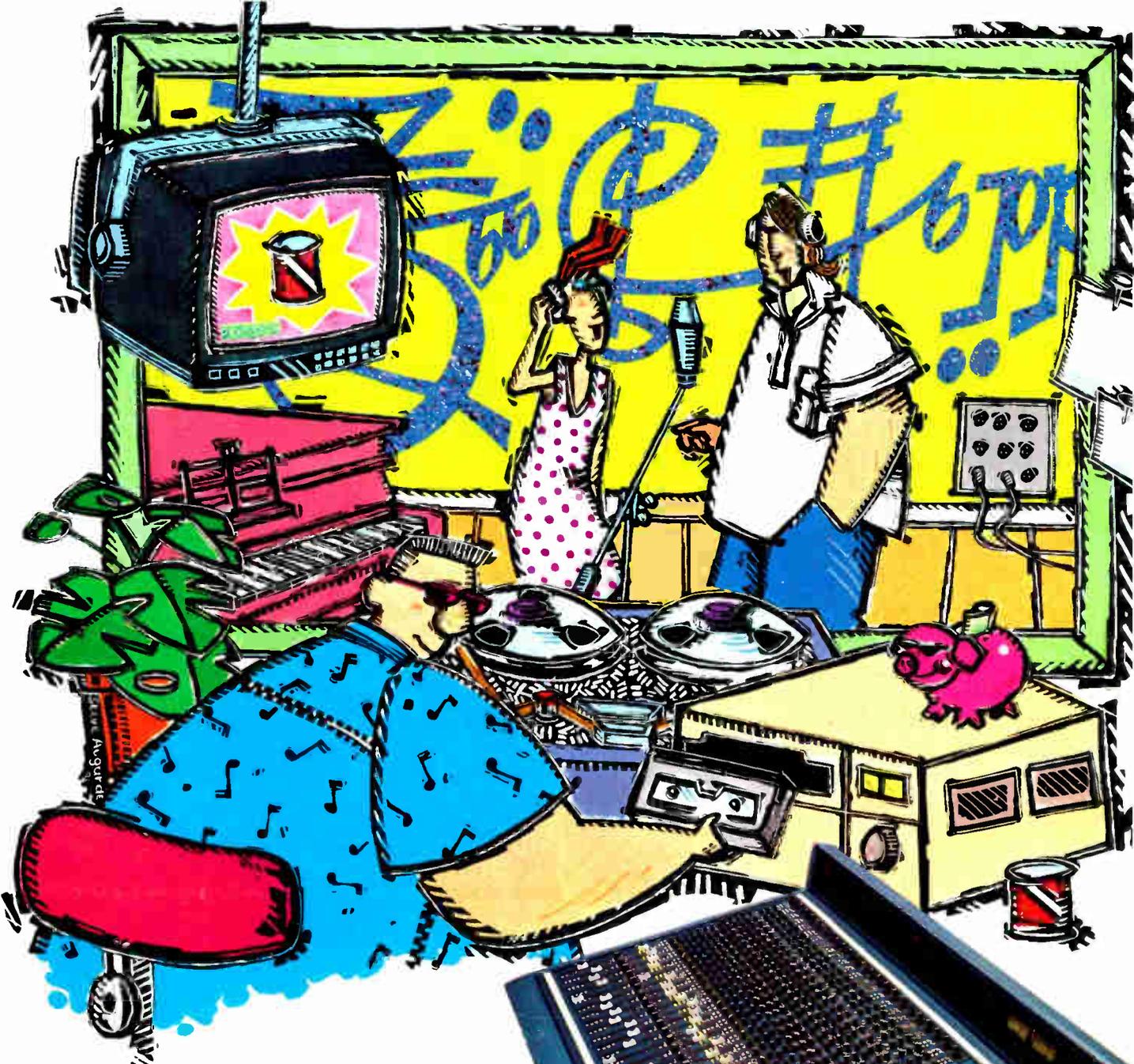
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