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Technology is changing the music industry day by day. But, change without focus and compatibility delivers only chaos. Where should you turn?

The ADAT Group. Composed of a diverse group of manufacturers who have delivered extraordinarily focused products to the music industry, their products are successful because they shape technology into an extension of your creative personality.

Now, as members of the ADAT Developer's Program, they all agree on one thing: the technology of ADAT.

As a digital multitrack format. As a way of harnessing the incredible power of digital audio to make all the products of the ADAT Group work together as a compatible system.

In this day of leapfrog technology, the last place you want to be is on the bottom. Over 15,000 ADAT customers worldwide have chosen to stay on top. More than all other digital multitrack owners combined. To keep them there, The ADAT Group keeps pulling out all the stops. Making it safe for you to leap.

The ADAT Group - Focus on Compatibility™

For more information on The ADAT Group and the ADAT Developer's Program call 1-800-525-3747
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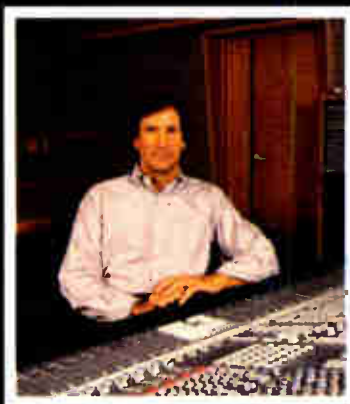
The ADAT Group™

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"G Plus Sounds Excellent By Any Standards"

Allen Sides, Ocean Way

The world's largest music console – a 100-channel SL 8000 G Plus – is installed at Ocean Way's 'Record One' facility in Sherman Oaks, California.



"Record One and Ocean Way share a common ethic – to provide the best possible equipment, classic and modern, to meet the needs of both artist and producer. I have always respected the ergonomics and automation of SSL desks. The addition of Ultimation™, bypassing the fader VCAs, and new audio enhancements mean that G Plus sounds excellent by any standards."

*Allen Sides, Owner
Ocean Way, Los Angeles*

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World Radio History





The More Sophisticated Woofer & Tweeter

Differential Material Technology (DMT™) is the study of Different materials and their relative behavior when in intimate contact. The starting point of any high grade professional monitoring system is properly engineered drivers that naturally work well together. With this established, the crossover can be designed purely for the function of filtering between high and low frequency drivers rather than the complex function of addressing limitations of the drivers themselves. Through the use of computer circuit analysis software, this would seem a simple task... But in the real world, not only do components not behave as their mathematical models predict, but components inter-react with the powerful magnetic and acoustic fields present within a loudspeaker system. Understanding and measuring these effects is extremely difficult, and rather than ignoring these previously unexplored aspects of crossover design, Tannoy's DMT research team has spent a great deal of time investigating the interactions of each element within the speaker system's design... Particularly through extensive listening tests.

Tannoy considered the new Dual Concentric driver as a complete system to both generate the signal and control the wavefront. The low frequency cone is designed and injection molded to work with the new Tulip HF waveguide so that the driver system shows no discontinuities of the response or wavefront at the critical crossover area. Research into component behavior and empirical tests showed that when a capacitor is encapsulated in vibration absorbing material, its noise performance noticeably changes, dramatically improving both the sonic texture and dynamics of the loudspeaker system; and so the DMT capacitor was born. Every aspect of Tannoy custom capacitor's, from the type of film employed to the high purity copper used for termination leads, has been optimized for sonic performance. Tests have also shown that reducing the effect on inductor coils of the immense internal

vibrations experienced within a loudspeaker cabinet, can improve overall system bass and midrange resolution. Consequently, within the DMT II crossover, Tannoy used coils vacuum impregnated with a resin selected to reduce vibration.

With the mechanical aspects of the DMT crossover design largely resolved, Tannoy engineers addressed the problems of interaction with magnetic fields within the system. Air cored inductors radiate a significant measurable magnetic field which can affect nearby components and the inductors are themselves affected by the driver's magnetic radiation. It was found that creating a split crossover, with the inductor mounted on the cabinet's cross-brace away from the other crossover components and driver magnets, produced sound quality improvements that more than justify the additional manufacturing costs.

The final components to come under scrutiny in the DMT system were internal connection cables. By using custom manufactured braided Teflon Kimber Kable, unwanted signals ordinarily induced into the internal wiring from within static and magnetic fields can be virtually eliminated, yielding substantial audible improvements.

The DMT II system is a result of using the best analytical tools, test equipment and computer analysis available, together with intuitive design ideas thoroughly tested by an extensive program of listening tests.

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DECEMBER 1993, VOLUME 17, NUMBER 12

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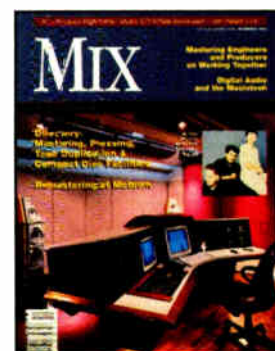
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DIRECTORY

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Cover: Quintessential Sound Inc. mastering facility recently opened in New York City. Designed by John Storyk and Beth Walters of the Walters-Storyk Design Group, QSI features the world's first Sonic Solutions SCS-1000 control surface with digital automation and direct-to-CD tapeless mastering. With two central mastering suites, the studio also features a Wilson Audio monitoring system, Krell KAS amplifiers and the Krell 64-times oversampling digital-to-analog converter. **Photo:** Robert Wolsch Designs. **Inset photo:** Kevin Davies.



With over 20,000 ADATs already in use all over the world, Alesis has made more digital multitrack tape recorders

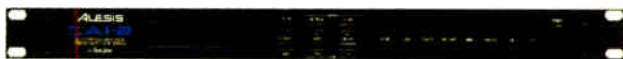
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And with good reason. Alesis was founded on digital technology, so we know what it

takes to make the best-selling digital multitrack. The Alesis ADAT® Digital Audio Recorder's sound quality, sample accurate synchronization capability (ADAT Synchronization Interface), fiber-optic digital interface (ADAT MultiChannel Optical Digital Interface), and wide range of peripherals available now, give ADAT owners the creative flexibility they need.



The Alesis AI-2™ ADAT to AES/EBU and S/PDIF Digital Interface with sample rate converter lets you transfer audio digitally to or from the ADAT system and external units such as DATs, CDs, and other digital recording formats.



The Alesis AI-2™ Multi-Purpose Audio/Video Synchronization Interface by TimeLine (the leader in synchronization products) connects ADAT to the world of video, film and multi-media production using SMPTE, 9 pin and TimeLine Lynx control protocols.

Focus on Compatibility™

Its revolutionary impact on the recording industry has made ADAT the de facto standard in digital multitrack. The enormous number of ADAT users worldwide, the fact that Fostex has licensed the ADAT format for their own digital recorder, and the growing list of leading companies focusing on industry compatibility by becoming members of The ADAT Group™, all mean that when you choose ADAT, you're compatible with a vast array of music and audio equipment, now and in the future. And, you're supported by a network of professionally trained Authorized ADAT Service Centers worldwide.



The ADAT Format – made for multitrack

ADAT records eight tracks of 16-bit linear, 48 kHz sample rate audio, with no data compression "tricks" or channel sharing. We chose Super VHS® (S-VHS®) tape as a foundation, then designed ADAT's data structure and heads specifically for the rough-and-tumble, back-and-forth, punch-in-and-out environment of multitrack recording. To make sure that recording one track wouldn't disturb any other track, we divided each helical scan into

An 8 track, 8mm recorder's helical scan: there are only four audio data blocks, forcing each track to share a block with another.



An ADAT's helical scan: ADAT tracks are safely separated into 8 discrete data blocks. (Both vertical dimensions enlarged for clarity)

eight separate data blocks. Some digital recorders combine data from two different channels into the same data block on tape, which means that each time you record a track, another track must be read into a buffer and actually re-recorded even though it is in "safe" mode.

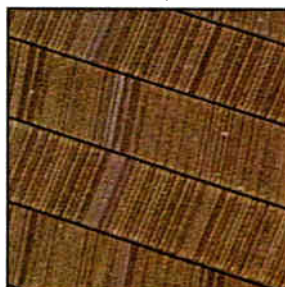


Bigger is Safer

Microscopic contaminants in the studio aren't just probable, they're statistically inevitable. If the format can't overcome them, they'll cause mistracking, noise, distortion, even total muting of the audio. Formats smaller than S-VHS are more vulnerable to contaminants, dropout, and misalignment, especially when exchanging tapes between machines. One 8mm digital format attempts to squeeze the same amount of sound into one-tenth the tape area that ADAT does. ADAT's S-VHS tape offers more total surface area to meet the demands of digital recording, and its wider 100 micron tracks are five times less vulnerable to being derailed by dust. Because even though technology makes it possible to make formats smaller and smaller, dust stays the same size.



Actual microscopic comparison of the ADAT tape format and the 8 track, 8mm helical scan format (enlarged approximately 100 times).



ADAT's wide 100-micron tracks offer an extra margin of safety for digital audio.



The 8mm's 20-micron tracks squeeze more data into the same area, with little room for error.

than any other company. More than Sony. More than Mitsubishi. More than Yamaha, Akai, and Tascam combined.

More than just a tape recorder— The ADAT System

ADAT, when combined with the BRC™ Master Remote Control, is a complete digital recording and digital editing system with features that no other recorder, analog or digital, can match. The BRC is a full-function autolocator and MIDI/SMPTE time code chase-lock synchronizer. Plus, it controls digital copying between ADATs, like a disk-based recorder, but much simpler to use.

A fiber optic cable for digital connection is included with every ADAT.

The ADAT MultiChannel Optical Digital Interface digitally transmits up to eight ADAT channels at once over a single fiber optic cable to any track on any ADAT in the system without repatching, all in the digital domain. Now you can "fly in" that perfect vocal part to multiple locations in seconds, with absolutely no generation loss. And our new QuadraSynth™ keyboard has an ADAT digital interface so you can record it without ever leaving the digital domain.



The BRC Master Remote Control, shown with optional RMB™ Remote Meter Bridge, supercharges your ADAT System by adding SMPTE and MIDI synchronization, storable autolocation points, copy and paste digital editing and more.

ADAT/BRC digitally stores important session notes

Instead of scribbling notes on cumbersome studio track sheets, the BRC lets you store 400 autolocation points, 20 Song start points, punch in and out points, MIDI tempo maps, SMPTE offsets, and more in the two-minute data header of the ADAT tape. The BRC's alphanumeric display lets you name each cue point and song. It even has a handy built-in list of 16 standard cue point names you can edit.

L14 "CHORUS 1"
00:25:38:15

Unlike analog autolocators, the BRC can recall 460 points, storable on each ADAT tape for later recall, so you can keep your mind on the project instead of having to remember minutes, seconds and frames.

The ADAT Worldwide Network

Thousands of ADAT Worldwide Network™ multitrack recording group members are reaping the benefits of choosing The ADAT System. As WWN members, they are able to collaborate and exchange ADAT tapes with other talented musicians, producers, composers and engineers throughout the world. Alesis is proud that so many creative people worldwide are using this American-made product, making ADAT the most popular digital multitrack tape recorder in history. The recording professionals below don't endorse ADAT, they use it every day. Their credentials speak for themselves. Visit your Authorized ADAT dealer and see what the new standard in digital multitrack recording can do for you.



Dave Roze
Technical engineer for Larry Carlton, currently using ADAT to record all Larry's live concerts. 2 ADATs and a BRC.



Jay Graydon
Two time Grammy® Award winning (twelve nominations) producer, engineer, writer, and guitarist. 4 ADATs and a BRC.



Owen Bradley
Country Music Hall of Famer, Producer of many legendary country music artists. 9 ADATs and a BRC.



Francis Buckley
One of the top dance and pop engineers in Hollywood. 4 ADATs and a BRC.



Web Staunton
Grammy-nominated chief engineer and studio owner. 3 ADATs and a BRC.



Mick Guzauski
L.A.'s leading platinum midtown engineer. 4 ADATs and a BRC.



Andy Hilton
Owner and Chairman of the largest pro-audio equipment-for-hire company in the U.K. and Europe. Plenty of ADATs.



Ray Benson
One of country music's hottest producer/arranger/writers. 3 ADATs and a BRC.



Tom Size
Has engineered and mixed a wide range of music from rock to legendary jazz. 3 ADATs and a BRC.



Russell Brower
Two Emmys (eight nominations). Sound designer and producer for film, television and major theme parks. 2 ADATs and a BRC.



Tim Wilson
Consultant and system designer for leading recording artists and songwriters. Has installed more ADATs than he remembers.

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FROM THE EDITOR

Our traditional December tape & disc issue has been transformed in recent years to our multimedia production issue, just as cutting lacquer on a lathe has given way to computerized disc manufacturing. Although disc cutting might be a lost art, the process of preparing a work for its reproduced form is more complex than ever. This complexity will increase over the next several years, as multimedia plays a larger role in home entertainment.

The impact multimedia will have on consumers is totally unpredictable, although there is no shortage of forecasts. Much will be learned, however, as record companies watch the early response to technology gamblers such as Todd Rundgren, David Bowie and Peter Gabriel. These musicians see parallels to the first days of music video: Some artists translated quickly to the new medium, some didn't, and some previously unknown artists made fast fortunes specifically from the opportunities inherent in the new medium.

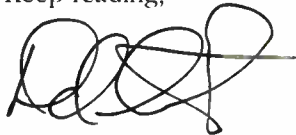
Being on the cusp of a new artistic/technology movement is heady stuff, and it is gratifying to see many of today's forward-thinking artists pushing the technological boundaries to find their artistic potential. At a recent CD-ROM expo in San Jose, Gabriel talked about this opportunity.

"It's a very exciting time for people to come up with alternative ideas and for the independents to lead the way," Gabriel said. "There is a great opportunity now for people to be brave with the work that they do—using their heart, their humor and different aesthetics. There are possibilities of including other cultures, including nature, personal growth and emotional issues. I think there are ways of getting some form of communication from this which will eventually give us a new language that will allow us, or perhaps our kids, means of communicating without language barriers...sort of a modern-day hieroglyphics."

Many high hopes are pinned on the future of multimedia, hopes that will be realized only when true art and brilliant execution begin to show up in quantity.

The job is being handed to us—to record makers, musicians, engineers, producers, songwriters or anyone willing to gamble their skills and talents on the future. Come on, we know you're out there. This could be your big chance.

Keep reading,



David Schwartz
Editor-in-Chief

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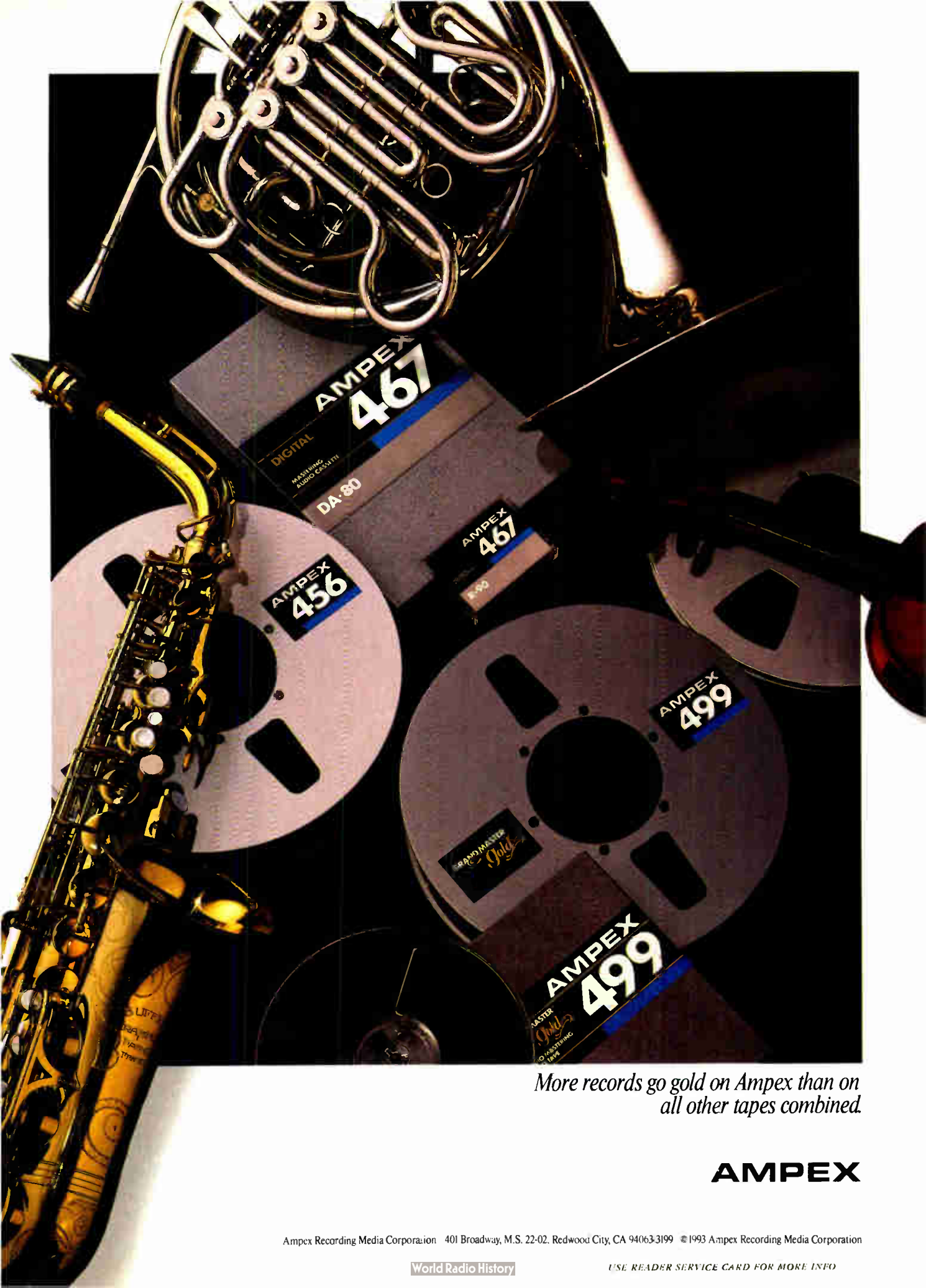
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David Schwartz and Penny Riker Jacob



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AMPEX

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NORMAL

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OPR MODE

PROGRAM

TIMER MODE

TIMER
MODE

TC
SET

TC CHASE SET UP

VARI

VARI SET

RESET

PEAT

METER SCALE REF MARKER OPR MODE SET

INSERTION ← →

SHUTTLE

JOG

CH-1

CH-2

TC

EDIT

ID/CUE MARKER

BEGIN END MARK

MODIFY DELETE INSERT

RENUMBER DATA SAVE

MUTE

REC

REC READY

REPRO

IN

OUT

ENTRY

AUTO EDIT

MS

INPUT

PLAY

STOP

REC

LOCATE

CURRENT

HARMAN NEW MAJORITY OWNER OF AKG

In September, Harman International Industries Inc. acquired a 76% interest in AKG. AKG has begun working on streamlining its product mix, developing a more market-oriented strategy and improving its efficiency.

The sale to Harman was prompted by the recession: Former owner GiroCredit needed to make large investments in AKG, but the equity capital base was small. As a large company, Harman was able to shore up AKG, and the two companies had loosely cooperated for years in several areas.

Hendrik Homan, new managing director of AKG, said, "A company that focuses on niches in a narrowing audio market needs a strong equity basis in order to survive cyclical earthquakes. We welcome this highly promising partnership, as it opens new perspectives for AKG. Harman offers AKG an improved distribution policy, synergies in research and development, complementing products and many other improvements."

To date, the only organizational change at U.S. subsidiary AKG Acoustics is in reporting responsibility: AKG, including the dbx and Orban divisions, will now report directly to Richard James, president of Harman Professional Group. In general, AKG will continue to operate independently, and next year, Harman predicts, AKG should be out of the red.

TIMELINE ACQUIRES WAVEFRAME

TimeLine Vista Inc. recently acquired WaveFrame, manufacturer of workstations for audio post-production. TimeLine, manufacturer of computer-based control systems for audio and audio post-

production, also retained WaveFrame's entire engineering and development group. Gerry Block, founder and CEO of TimeLine, stated "Our customers should expect to see accelerated enhancements for the WaveFrame Digital Compact Studio and some eye-popping future products that are already in development."

MATSUSHITA TO PRODUCE SPATIALIZER ICs

Matsushita Electronics Corporation will produce Spatializer 2-Speaker 3D Surround Sound Audio Processor integrated circuits for use by consumer electronics companies worldwide and will underwrite the associated development costs.

Spatializer is a stereo-enhancement technology for creating 3-D sound from any stereo source using two speakers. "The potential for this new technology is almost unlimited," said S. Teramoto, director of Matsushita's Integrated Circuit Division, "and we see markets worldwide from home audio electronics to multimedia computing."

The arrangement is the result of a letter of intent signed in September by Spatializer Audio Laboratories' U.S. subsidiary, Desper Products Inc., and semiconductor manufacturer Matsushita. Production quantities of Matsushita's Spatializer IC, dubbed EMR™ 4.0, are expected to be available to manufacturers by mid-'94.

SONIC SOLUTIONS AND SONY INK SUPER BIT MAPPING AGREEMENT

Sonic Solutions and Sony Corp. signed a licensing agreement to incorporate Sony's Super Bit Mapping technology into Sonic Solutions products. The agreement marks the beginning of an ongoing effort for both companies to

jointly develop SBM algorithm circuitry for use in CD mastering. These tools will be offered as an option to the Sonic System. Sonic Solution's line of workstations, which are widely used for CD mastering.

"We are honored to be selected by Sony to be the first Super Bit Mapping licensee," commented Robert Doris, president of Sonic Solutions. "As a collaborator with Sony, we share many of the same goals for improving CD sound, including the need to provide our industry professionals with the highest-quality production environment possible. We are confident that our involvement with SBM will underscore this effort."

This agreement is the latest collaboration between the two companies. Sonic Solutions developed the pro audio interface for Sony's CD recorders and is now the exclusive distributor for the Sony CDW-E1/W1 and CDW-900E write-once recorders. These are offered by Sonic as part of its CD PreMastering system.

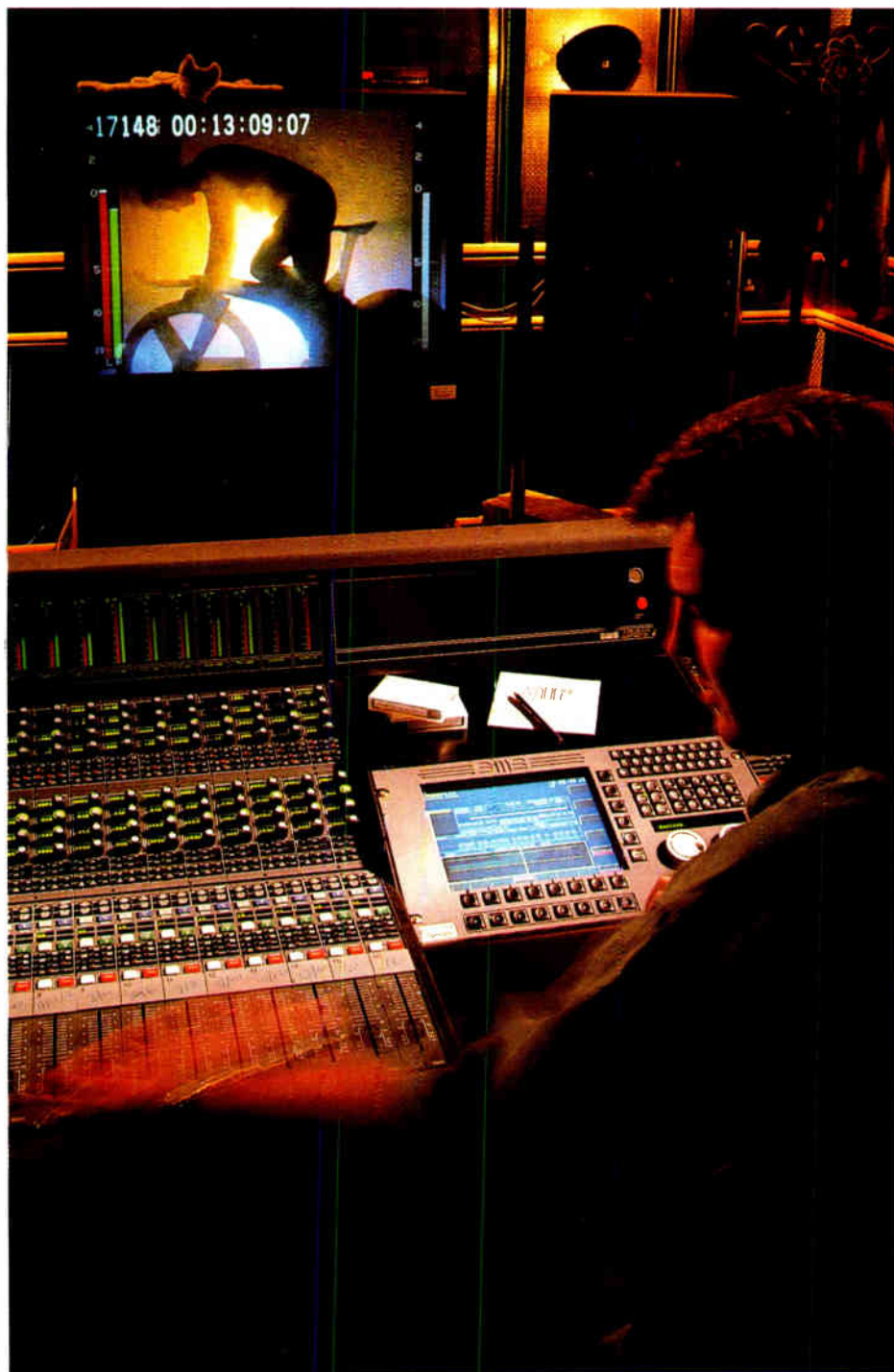
PRODUCERS, ARTISTS AND TECHIES GATHER FOR MACROMEDIA INTERNATIONAL USER CONFERENCE

More than 850 participants flocked to San Francisco in October, where Macromedia—the acknowledged leader in multimedia authoring software—hosted its fourth annual user conference.

Representatives from some of the heaviest hitters in the business were on hand to make newsworthy announcements and present new product demonstrations at the three-day event. Apple executive vice president Ian Dierly opened the conference by declar-

—CONTINUED ON PAGE 16

A N A I R O F C O N F I D E N C E .



CLIFF JONES AT AIR STUDIOS

"I remember this Logic 2 was up and running the day it arrived... and I don't believe it's been idle since.

"Of course, the assignable processing makes any layout you may prefer very easy to set up. The real difference is Dynamic Automation of the digital signal path - it's fast and flexible and means I can be more creative with changes in the mix.

"The integration with the AudioFile's Event Based Automation allows you to make changes to the edits, with the console automation following suit.

"I think the speed of it... the flexibility, is a standard I've come to expect now. I can sail through time consuming tasks and get on with the real business - getting a true feel for the mix.

"The on-board EDL conform allows greater control over source audio - saving on On-Line time - the system relays the tracks from first generation material.

"The sound? I love it. An acute lack of distortion.

"Essentially, Logic 2 is reliable and it's fast...and anything that makes me look the same, I want a piece of..."



A SIEMENS COMPANY

For more information contact:
AMS Neve Plc, Billington Road, Burnley, Lancs BB11 5ES,
England. Telephone: (44) 282 457011. Fax: (44) 282 39542.

USA Siemens Audio Inc., Hollywood, CA. Tel: (213) 461 6383.
Fax: (213) 461 1620. New York, NY. Tel: (212) 956 6464.
Fax: (212) 262 0848. CANADA Rupert Neve Inc., Toronto.
Tel: 416 365 3363. Fax: 416 365 1044.

T H E L O G I C 2

New! THE DIGIDESIGN TDM BUS™
 The Digidesign Trans-system Digital Matrix Bus™ is the best thing to happen to digital recording since digital. • So what is it? For starters, the TDM Bus is an open, 256-channel, 24-bit data highway for your studio — giving you the ability to route, automate, and process everything you do with full digital control. • How “open” is it?

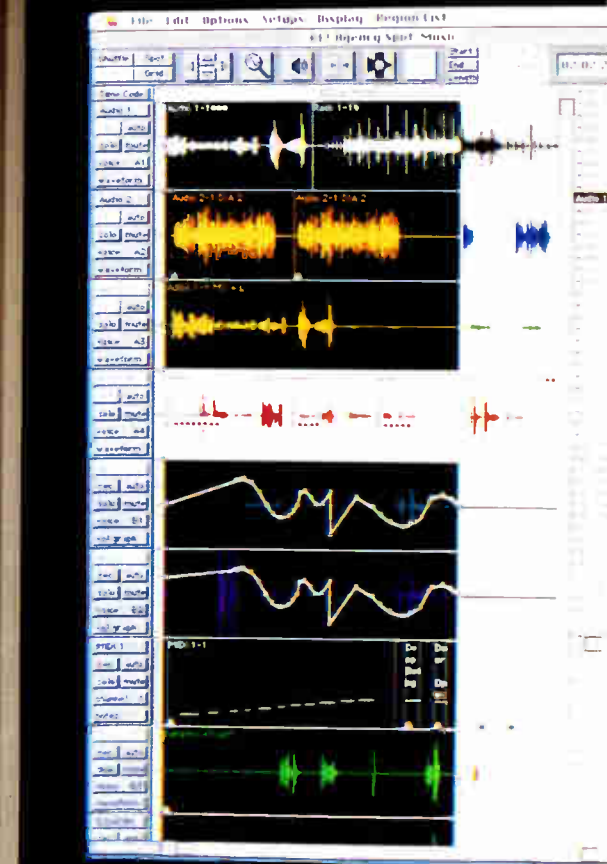
At Digidesign, we believe a workstation should increase your creative options, not restrict them. So a variety of Development Partners — from established leaders like Lexicon, and savvy upstarts like Waves — are building hardware and software for the TDM Bus. • And if that's not open enough, try this: You can even route and automate your beloved analog tube compressor within this digital environment. • For the complete story, call us at one of our numbers below.

BOB CLEARMOUNTAIN



"I mix records — lots of them. Some are too long for a medium called 'radio' to play (and still have time for all those wonderful commercials). Others are simply too long. So when it comes to the ultimate editing medium, I turn to Pro Tools. And with 2.0's multitude of truly remarkable uses and features, the end product is creatively enhanced — better and faster than any other means I know of, or can even imagine."

Bob Clearmountain, Mixer/Producer. Recent projects: Bryan Adams, Bruce Springsteen, Bon Jovi, INXS, Crowded House, The Pretenders, Squeeze, Morrissey.



WHY THOUSANDS OF AUDIO PROFESSIONALS WHO

In an industry overflowing with creative individuals, it takes exceptional talent to rise to the top. And in an industry loaded with workstations, it takes an exceptional product to rise above the competition.

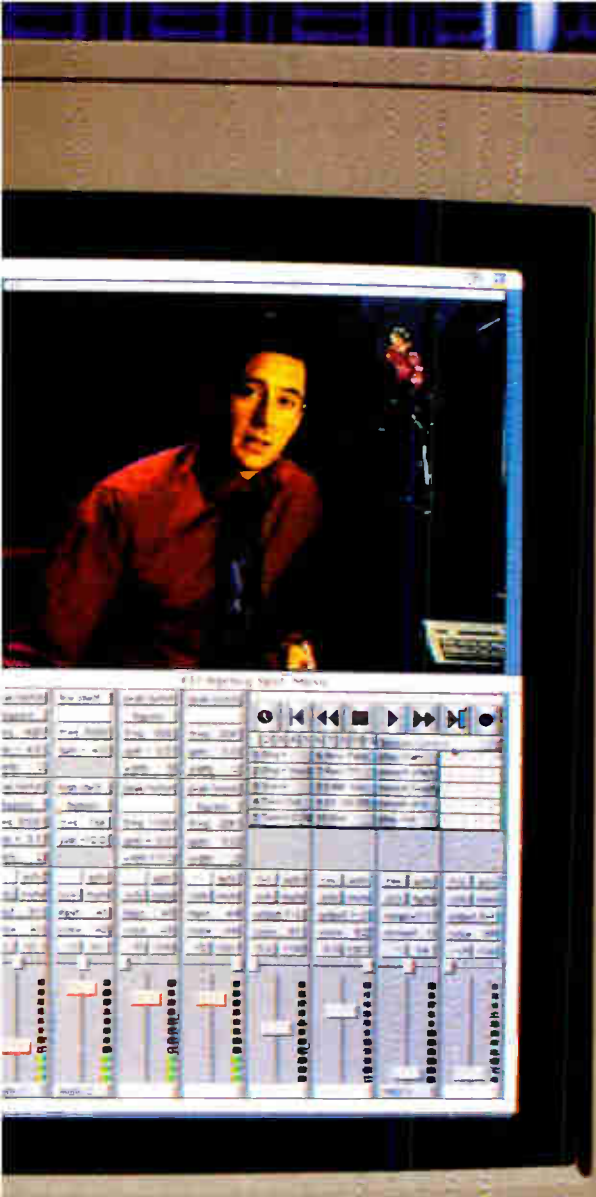
Perhaps then, it's no surprise that again and again, the industry's top professionals select one digital workstation above all others as their system of choice. The system is Pro Tools, and the reasons are simple: Pro Tools delivers uncompromising power and performance for audio post, broadcast, or music production — with an uncompro-

...mising commitment to the future. But there's more to this story.

More Than Just Power. We can't even begin to scratch the surface of everything Pro Tools can do for you within the confines of this ad. But frankly, what good is power if it's cumbersome to use?

At Digidesign, we believe that the most advanced tools are often the ones that make a giant leap towards greater simplicity. Our advanced user interface proves this point rather elegantly. For speed and sheer productivity, nothing else even comes

If you own Pro Tools version 1.x, and haven't ordered your exceptionally cool 2.0 Upgrade Kit, it's not too late! The cost is just US\$49, for residents of the US and Canada, including shipping. Internationally, the cost is just US\$69, including express shipping. Pro Tools owners must be registered directly with Digidesign to be eligible to receive the Upgrade Kit. PostView requires some additional third-party hardware and software, for capture and playback of digital video. Spotting to PostView Movies requires a 486 or Pentium PC, Macintosh Quadra or Centris 650; contact Digidesign for complete requirements. All trademarks and registrations are the property of their respective holders. © 1993 Digidesign. All rights reserved.



PostView™: More Than A Pretty Picture

Welcome to the future of audio post-production. • Digidesign's new PostView option for Pro Tools delivers full-frame, fully-synchronized random-access video, to serve as a fast and easy reference for matching sound to picture. You can even scrub your audio in frame-accurate sync with the PostView Movie on the same monitor screen as your Pro Tools session, or, if you like, on two separate screens. • PostView also includes VTR Control, an easy and effective transport control system for external video and audio transports which allows Pro Tools to serve as the control master. • PostView: Think of it as picture-perfect-audio-for-picture.



HARRY SNODGRASS

"Audio post-production for feature films is no picnic. With non-stop deadlines, I need a workstation that works as hard as I do — and that's Pro Tools. Sure, I've used other systems, but they don't offer the features and speed of Pro Tools, and they don't offer me the future I see with the TDM Bus and PostView. As for Pro Tools' quality, my clients couldn't be happier, and that's really what counts in this business."

Harry Snodgrass, Sound Designer. Recent projects: Aliens 3; Beverly Hillsbillies; Robin Hood; Men in Tights; Hot Shots, Part Deux.

NEED THE RIGHT TOOLS TURN TO PRO TOOLS™

close. The result? More projects in less time, and an outstanding return on your investment.

More Than Just Today. You'll be glad to know that by investing in Pro Tools you are investing in a very bright future, as well. By developing key technologies, such as our new Digidesign TDM Bus, we're opening the door to a plethora of options, and a long life for your investment.

More Than Just Talk. Of course, you don't have to take our word for all of this. But maybe you will take the word of the

gentlemen pictured above — just two of the many acclaimed professionals who swear by their Pro Tools systems. And if you're still unsure, do the smart thing. Check out any other competing system, at any price. Check the user interface for speed, ease, and flexibility. Check the sound for pure sonic performance. Check how open the system is for expansion today and tomorrow.

Then check out Pro Tools. We're confident that you'll find, just as Bob and Harry did, that when it comes to professional digital audio production tools, there's no substitute for Pro Tools.



For more information about Pro Tools, the Digidesign TDM Bus, PostView, or any other Digidesign product, call us at (800) 333-2137, ext. 344 (USA & Canada), or internationally at +1-415-688-0600. We'll get you the information you need right away. If you like, we'll also be happy to schedule you for a free, no-obligations Digidesign Professional Audio Seminar, or provide you with the name of your Digidesign Professional products Dealer.

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INDUSTRY NOTES

JBL Professional (Northridge, CA) named Mark Gander vice president of engineering for pro products. Gander started with JBL 17 years ago as a transducer engineer and most recently served as the company's VP of marketing. In other JBL news, the company changed the structure of its pro products marketing divisions, combining international marketing with the domestic division in order to pursue a more unified global strategy. Hope Neiman was hired as executive vice president of marketing...At October's AES convention, the SPARS membership elected officers and board members. New to the board are Steve Davis (Crawford Audio Services, Atlanta), Gary Ladinsky (Design FX, L.A.), Rick Stevens (Record Plant, L.A.) and Ian Terry (Studio Tempo, Montreal). Howard Schwartz is the new SPARS president, and Dwight Cook serves as chairman...Two hires at Fostex Corp. (Norwalk, CA): Chez Bridges is the manager of the company's Foundation Training Center, and Benjamin Ing is Western digital sales rep, responsible for sales of the Foundation 2000 and other digital products in Southern California. New firms representing Fostex include Highway Marketing in Texas, Oklahoma, Arkansas and Louisiana; J.B. Parent in Ohio, western Pennsylvania and West Virginia; and Midwest Audio Marketing in eastern Illinois, Michigan and eastern Wisconsin...SSL Inc. (NYC) appointed Rick Bozeat to the newly created position of West Coast digital products training manager. Bozeat will train West Coast Scenaria and Screen-Sound clients...Dr. James F. Abbott joined acoustic and design consulting firm Charles M. Salter Associates Inc. (San Francisco) as a principal consultant...North Hollywood, CA-based Euphonix opened two new offices in New

York and Nashville. The New York office, run in conjunction with Steve Strassberg Associates, also serves as Eastern region headquarters. The Nashville office is headed by regional manager Tom Semmes...Machine control and synchronization systems specialist Audio Kinetics (Hertfordshire, UK) appointed The Desk Doctor as its West Coast rep, part of its decision to continue developing the North American market...Audio Independence Ltd. (Mazomanie, WI) is the new exclusive U.S. distributor for the UK's Quested Monitoring Systems...Group One Ltd. was appointed as the international distributor for KRK Monitoring Systems (Huntington Beach, CA). Group One has handled KRK nationally for the past nine months...TDK (Port Washington, NY) expanded its pro division, hiring Ed Mino as technical and engineering services manager... Scott Watson recently joined the sales team at Digital Imaging Solutions (NYC). He will handle sales and customer service and training in Manhattan...Sabine Musical Manufacturing Co. (Gainesville, FL) was recently awarded a patent for the DSP-based method of controlling feedback it employs in its Feedback Exterminator products...CyberLogic (Pacheco, CA) is a new pro audio company founded by industry veterans Paul Kohut and David Solari. The new manufacturer's first product is the NC-800 Power System amplification system... AudioTechniques (NYC), the pro equipment division of Manny's Music, promoted Doug Cook to president...The Lowell campus of the University of Massachusetts opened a new Center for Recording Arts, Technology & Industry. Facilities include three studios for 24-track and 8-track recording, video post-production, and MIDI composition and production. ■

—FROM PAGE 12, CURRENT

ing that Apple plans to forego \$100 million in gross profits this year, selling its CD-ROM drive at cost in order to seed the market for interactive multimedia products. Additional speakers included representatives from some other big players in the emerging industry, including The 3DO Company, Microsoft, NEC, SuperMac and Kaleida Labs.

The sessions were divided into three tracks: Technical sessions examined such issues as cross-platform development and the implementation of audio; solutions sessions focused on the role that corporations, educators and the government can play in the development of multimedia applications; and marketing and distribution sessions investigated topics such as funding and pricing.

One of the most popular features of the event was the hands-on training sessions in Director, Authorware and other Macromedia authoring tools. In a separate workshop, participants were invited to present their works in progress for help from Macromedia's technical support staff. And finally, a trade show included more than 40 hardware, software, peripheral and titles developers, who demonstrated their latest products.

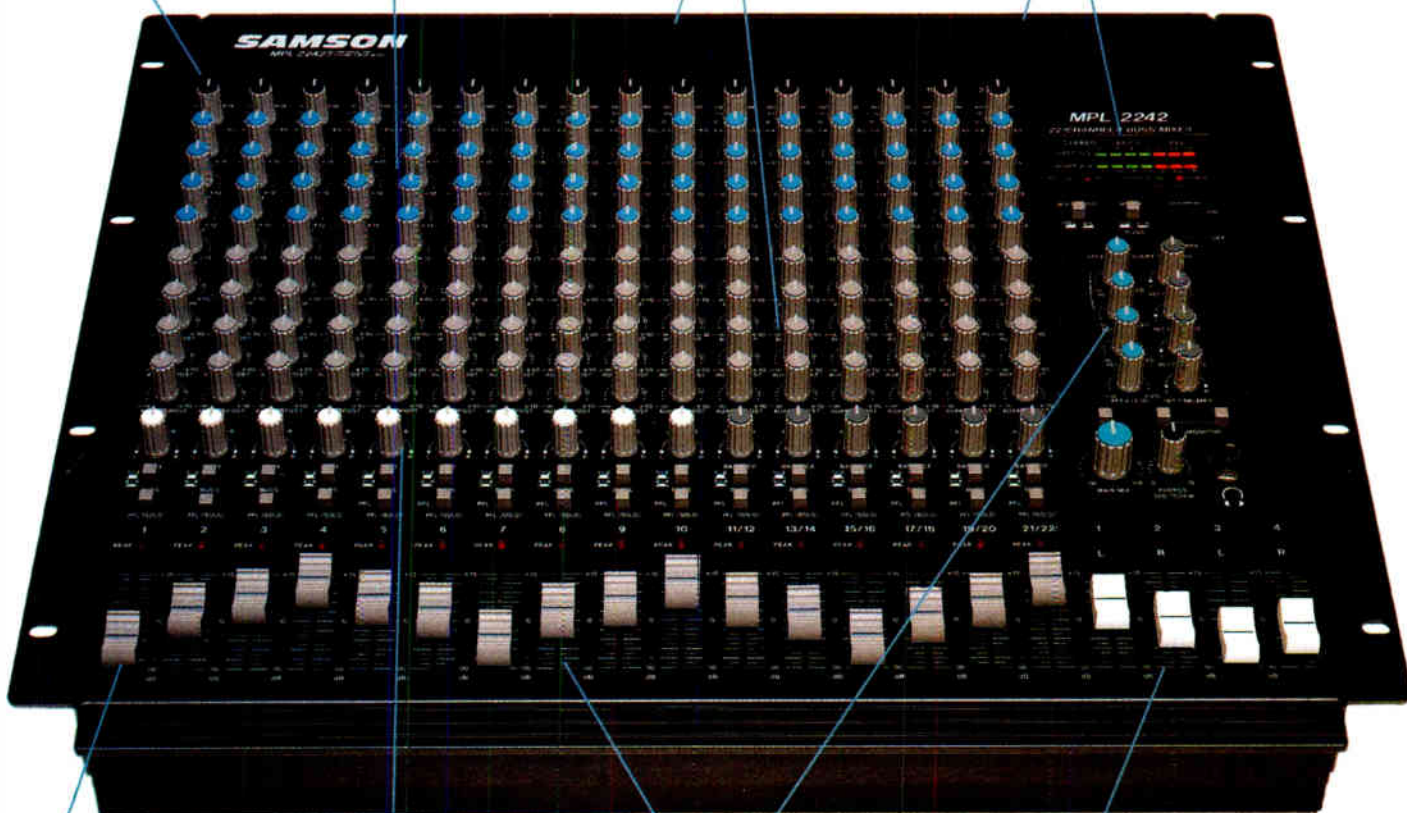
Next year's Macromedia International User Conference will be held in October in San Francisco.

CONVENTION NEWS

Winter NAMM will be held January 21-24 at the Anaheim Convention Center, outside L.A. For more information, call (619) 438-8001. Winter CES is January 6-9 in Las Vegas. Call (202) 457-8700. AES Europe happens February 27-March 2 at the RAJ Center in Amsterdam, Netherlands. Call the AES at (212) 661-8528 for more information. NAB attendees please note: This year's convention will take place in March rather than April in Las Vegas. Call (202) 293-3570. ■

WE CAN SHOW YOU ALL THE FEATURES THAT SET OUR NEW MPL 2242 APART EXCEPT ONE.

- 22 inputs. 10 XLR balanced inputs featuring a low noise, padless pre-amp design. Six true-stereo inputs.
- 4-Band EQ. High and low shelving filters: low band 80 Hz/high band 12 kHz. Two resonant mid-band filters: low mid 800 Hz/high mid 2.5 kHz.
- Quad discrete transistor mic preamps.
- Rotating jackfield for conventional mixing or rackmounting.
- 6 Aux sends: 1 pre; 5 post.
- 5 dB more overall gain than any mixer in its class.



- High quality, center-detent Panasonic® faders.
- Panasonic sealed potentiometers.
- 4 true-stereo returns.
- The only 4 buss design in its class (using 4 dedicated sub group faders) with discrete Group and Main summing outputs.
- 128 dB overall signal-to-noise ratio, A weighted.
- 10 Hz to 30 kHz frequency response.
- Ceramic hybrid channel design that further reduces noise and optimizes stability.

SOUND.

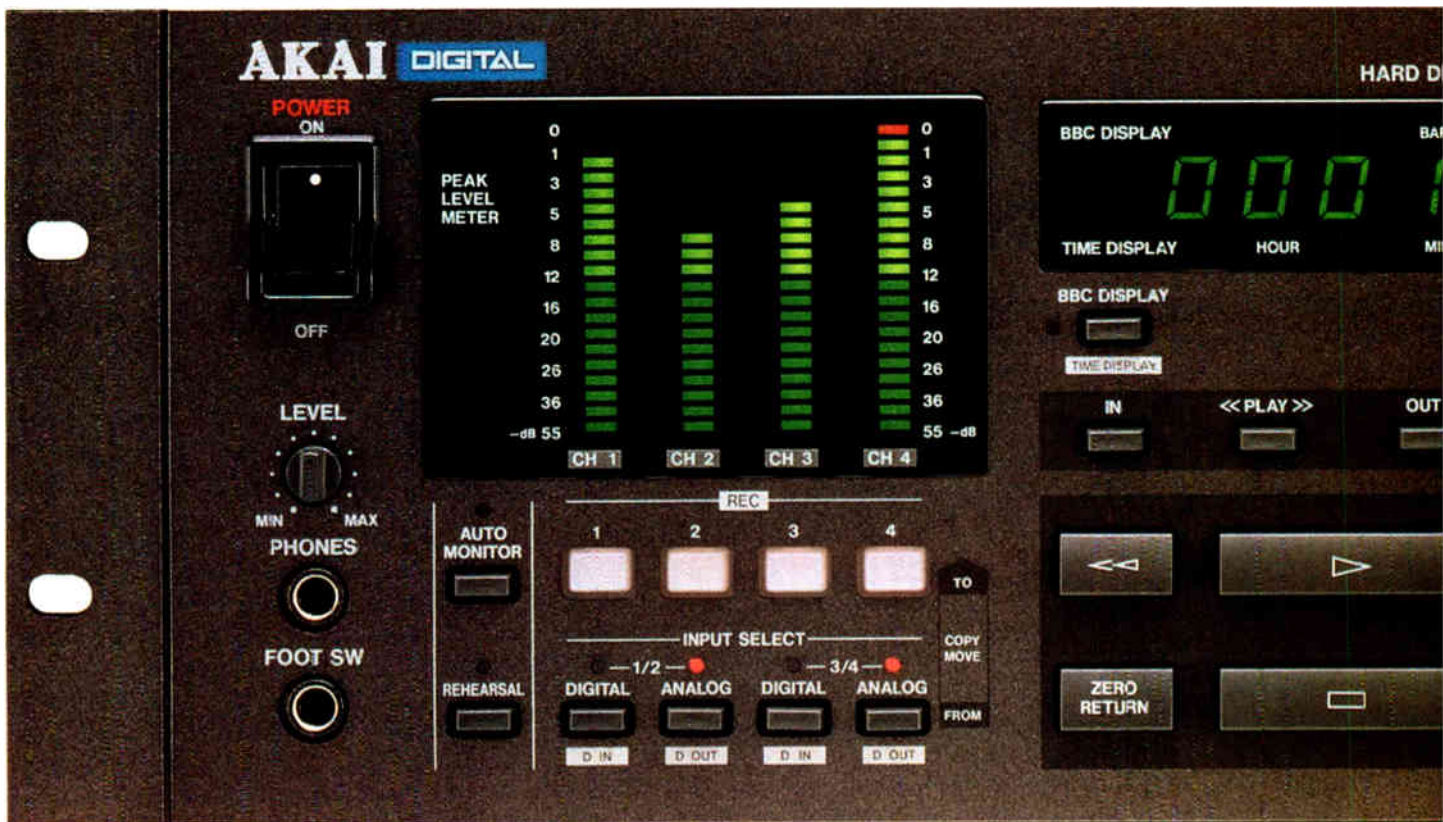
SAMSON AUDIO

For more information about the MPL 2242, please contact Samson Audio, a division of Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068 (516) 932-3810 FAX (516) 932-3815

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USE READER SERVICE CARD FOR MORE INFO

World Radio History



Ten Reasons Why You Should Choose

1. TAPELESS EDITING The DR4d can simultaneously record 4 tracks directly to standard SCSI-compatible hard disks, not tape. Tape recorders which use a cassette format (VHS, 8mm, etc.) have a huge problem: without at least two machines, you can't edit. But even a single DR4d allows random access editing that tape recorders just can't offer. Move, Copy, Insert, Copy + Insert, Move + Insert, Erase, and Delete with ease. Edit with complete confidence, because if you try an edit but change your mind, the Undo function will instantly restore the previous arrangement. It's a breeze to copy any part of a track and paste it anywhere on any track, even with a specified number of repeats. Or perhaps use the Insert commands to instantly slide track data in time against other tracks. This editing power encourages experimentation, and thus, your creativity! Imagine it. Do it.

2. NO WAITING Another problem with tape is the time required to physically move from one point on the tape to another. Concentrating on your music is what's important, not waiting for tape to shuttle back and forth. Never again waste such precious time: the DR4d allows you to instantly move to 108 different locations. Set up repeat sections, jam along with your tracks, then drop into record to capture it all while it's still immediate, fresh.

3. JOG/SHUTTLE Another cool DR4d advantage is the ability to offer scrubbing of audio, like "reel-rocking" on analog decks - only with much better quality. Our Jog/Shuttle wheel lets you scrub through the audio at various speeds, forwards or backwards. So finding precise editing points is only as complicated as using your ears.

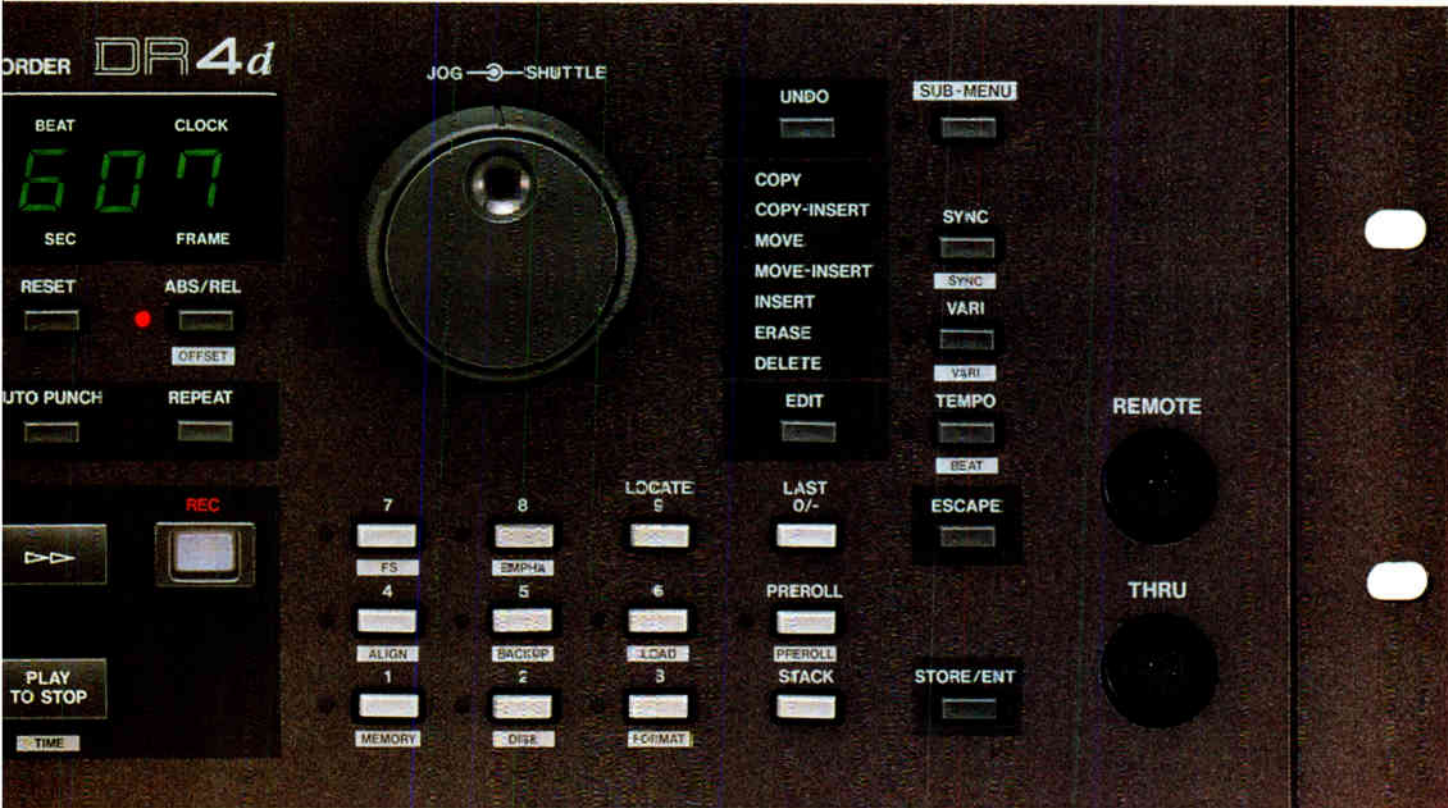
4. FAMILIAR OPERATION One concept we *did* want to carry over from tape recorders is the user interface. Friendly, tape machine-style controls make the DR4d by far the easiest hard disk recorder to use. With dedicated buttons for Play, Stop, Rewind, Fast Forward, and so on, what could be simpler? If you've used an analog deck, then you

know how to use the DR4d. Punch-ins/outs can be performed manually or automatically from the front panel, or via footswitch. Like you'd expect.



DL4d Remote

5. EXPANDABILITY Up to four DR4ds can be chained together to create a 16-track system, simply by plugging an optional cable between units! And the optional DL4d Remote makes it a snap to



Use the DR4d Hard Disk Recorder

control all of them. An optional, factory-installed 200 MB internal hard disk offers 32 track minutes of recording right out of the box. The DR4d can handle up to seven hard disks and supports seamless overflow recording across multiple disks. With enough disk storage space, you can actually record on all four tracks for an incredible 24 hours!

6. EXCELLENT CONNECTIONS Four balanced TRS 1/4" Input and Output jacks, easily switchable between -10 and +4 dBu levels, simplify interfacing with any type of console. The DR4d's pair of digital I/O ports allow communication with other digital devices in the form of both XLR and RCA connectors (AES/EBU or Type II selectable), as well as provide DAT backup. And then there's the supplied SCSI port for access to external hard disk drives. Just plug and play!

7. YOU'VE GOT OPTIONS And affordable ones, at that. For digital access to all four channels simultaneously, the IB110D provides the two additional AES/EBU ports. For SMPTE timecode applications (slave or master), the IB112T is installed in seconds. The IB113M interface gives you MIDI In, Out, and Thru, and the IB111S is a second SCSI port which will allow connection to computers for visual waveform editing and magneto optical drives for data backup.

8. DEDICATED DESIGN The DR4d is a dedicated digital audio product, rather than an add-in board for a computer. It's a tool designed for a single purpose: to record and edit audio precisely, effortlessly, and affordably. We think you'll agree that it succeeds on all counts beautifully.

9. SOUND QUALITY The DR4d contains Akai's own advanced digital technology, including super-clean 18-bit 64x oversampling A/Ds and advanced single-bit 8x oversampling D/A converters with 18-bit resolution. Industry standard sample rates include 48, 44.1, and 32kHz. In short, the quality is superb and with a full 96dB dynamic range, you can rest assured of always sounding your best.

10. \$1995.00 Simply put, the DR4d is the best value in digital recording today. For the first time, the nucleus of a professional quality 4-track hard disk recording system can be yours for only \$1995.00! Just add internal or external hard disks, and you're ready to use our latest masterpiece for creating your next masterpiece.

DR4d

AKAI
DIGITAL

by Ken C. Pohlmann



JUST SAY MO

Suppose you are a large, international corporation, specializing in the manufacture and sale of audio and video technology products for the consumer and professional markets. Magnetic tape has been very, very kind to your company. Your earliest products were open-reel tape recorders, people everywhere carry your battery-powered portable cassette recorders and video camcorders, audio studios and video broadcasters rely on your analog and digital tape recorders to get the job done. Whether it's spooled between aluminum flanges or packed inside plastic cartridges, whether analog or digital, your company's name is synonymous with tape excellence. Congratulations! Way to go!

Now suppose that sales of consumer analog cassettes have peaked and started to decline quite rapidly. Consumer cassette deck sales are off, and even car cassette players are being eaten alive by CD players. Sales of professional open-reel analog audio recorders have slumped, and even your digital multitracks are taking a beating from the new, low-

cost modular digital multitracks—a market you don't have a presence in. Clearly, the nature of tape recording is changing, or disappearing altogether. Where do you go from here?

The executive and engineering boys at Sony have been pondering that question for several years, and the direction of their thinking is becoming more and more evident with every new product announcement. Clearly, Sony believes that the future of storage is digital and that the medium will be magneto-optical disc.

Numerous technologies can be applied to the problem of recordable optical disc storage: Dye polymer, phase change and magneto-optical have all been extensively researched, and many products have been developed for each. Although each has its proponents, MO is the most impressive. Magneto-optical recording uses a material such as terbium ferrite cobalt. At room temperatures, the coercivity of the recording layer may be more than 10,000 Oersteds, effectively eliminating the possibility of accidental erasure. However, coercivity is inversely proportional to ap-

ILLUSTRATION: AD McCALLEY

Power Users Prefer Sonic

No other workstation
lets you wear so
many hats.



The Sonic System is ideal
for sound for picture work,
music editing, CD prep,
radio production, sound
restoration, and high-speed
networking.

Tools for Power Users

Power users around the world rely on their Sonic systems to provide the tools they need to meet their demanding production schedules. They need productivity tools like background loading and unloading to the hard disks so that they don't have to wait to start their creative work. They want tools for editing with speed as well as with surgical precision. DSP tools for mixing, EQ, TimeTwist, Reverb, and NoNOISE.® MIDI compatibility for sound design work. And serious tools for audio post—multi-track expansion, machine control, importing/conforming of edit lists, and playback of digital video from hard disk.



True, High-performance Networking

With MediaNet, power users can collaborate in a "studio without walls." MediaNet is the first true network for professional multimedia production of audio, video, and graphics. Soundfiles and system resources can be shared transparently across the network, and multiple users can play from the same hard disk or even the same soundfile simultaneously without any drag on the host system. From 80 to 100 channels of CD quality audio can be played across the network at one time!

With so much flexibility and versatility, no other audio workstation matches the breadth and capability of the Sonic product family. And no other system can match the performance for the same price. An entry level SonicStation II including Macintosh and hard disk is under \$10,000. For more information, call our Sonic product hot line at (415) 485-4790.

A Sonic System is easily
expanded from 2 channels
to 24 channels; even the
smallest system can play
12 channels simultaneously
from a single hard disk.



The Sonic System supports
high-speed precision record-
ing of audio CDs, CD ROMS,
and the new CD-DV discs.



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Sonic Europe

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THE X-TRA POWER OF PEAVEY

INTRODUCING THE PEAVEY CS®-X SERIES

For many years, the Peavey CS® Series has lead the field in high performance power amplification. The CS Series has become legendary for ruggedness, dependability and superb performance with completely unmatched patching/plug-in capabilities. Now, Peavey is proud to announce the new CS-X Series with dramatically improved performance specifications at no increase in price! This startling achievement is made possible by Peavey's high volume production, state-of-the-art manufacturing, and advanced audio technology.



CS® 1200 X

X-TRA POWER.

The new CS-X Series power amplifiers reliably drive two ohm loads to extremely high power levels while maintaining current four and eight ohm ratings. For example, the industry leading CS-800 now delivers 600 watts RMS per channel into 2 ohms!

CS 400 X

- 210 W RMS into 4 ohms
- 300 W RMS into 2 ohms (per channel)
- 420 W RMS into 8 ohms
- 600 W RMS into 4 ohms (bridged)

CS 1000 X

- 525 W RMS into 4 ohms
- 750 W RMS into 2 ohms (per channel)
- 1050 W RMS into 8 ohms
- 1500 W RMS into 4 ohms (bridged)

CS 800 X

- 420 W RMS into 4 ohms
- 600 W RMS into 2 ohms (per channel)
- 840 W RMS into 8 ohms
- 1200 W RMS into 4 ohms (bridged)

CS 1200 X

- 630 W RMS into 4 ohms
- 900 W RMS into 2 ohms (per channel)
- 1260 W RMS into 8 ohms
- 1800 W RMS into 4 ohms (bridged)

X-TRA PERFORMANCE.

Along with increased power, the new CS-X Series maintain awesome industry standards for bandwidth, slew rate, distortion specifications and overall performance excellence and versatility.

- DDT[®] compression with LED indicators and defeat switch
- Slew Rate: 40 V/microsecond, stereo mode, each channel
- Power Bandwidth: 10 Hz to 50 kHz @ 4 ohms, rated power
- Total Harmonic Distortion: Less than 0.03%, rated power
- Hum and Noise: 100 dB below rated power, unweighted
- Auto 2-speed fan cooling
- Independent channel thermal / fault protection
- Transient free turn on / off
- Recessed crossover socket for plug-in modules

- 2 recessed balanced input transformer sockets for PL-2's
- Single XLR & dual phone plug inputs each channel
- Phone plug inputs are quasi-electronic balanced
- XLR input can be transformer balanced
- Dual phone plug and 5-way binding post outputs each channel
- DDT activation LED & power LED each channel (1000X and 1200X feature a power LED array and thermal indicator each channel)
- Rear panel DDT defeat & bridge mode select slide switches

Peavey's CS[®] Series plug-in modules offer you utmost patching flexibility allowing biamp and triamp configurations with various crossover points available



CS[®] 1000 X



CS[®] 800 X
World's Best Selling Power Amplifier



CS[®] 400 X



CS[®] 200 X

NO X-TRA COST!

Incredibly, all the extras have not increased the cost of these world-standard amplifiers (the CS 800 X is still only one dollar per watt)! Only from a company with nearly thirty years of power amp experience could you expect this. A company with the power of high volume production and advanced manufacturing technology...

The X-tra Power of Peavey.



PEAVEY ELECTRONICS CORP.

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plied temperature, and coercivity of a small area of the magnetic recording layer can be dramatically diminished when it is heated with a focused laser beam.

Specifically, when the material's Curie temperature is reached, the coercivity of the material is so diminished that only a very weak field is needed to magnetically orient the material. When a weak magnetic field is applied to the material, the small, heated spot magnetically responds by orienting according to the polarity of the applied data signal. As the area moves away from the beam, it cools below the Curie temperature, the applied magnetic field is withdrawn, and the data is "frozen" and retained. Data is retrieved with the Kerr effect in which the orientation of the recording layer's magnetic fields cause a rotation in the plane of polarization of the reflected laser beam. Moreover, data can be erased, and new data written. The MO medium is essentially open-ended with respect to recording cycles—over 10 million erasures are possible.

After developing its MO technology, Sony set out to commercialize it. The most visible example is the new MiniDisc format, a small MO disc designed to replace the analog cassette and challenge the CD in terms of recordability and portability. To provide 74 minutes of recording time on the 2.5-inch disc, the ATRAC data-reduction algorithm is employed. Although MD sales have not been dramatic, they have been reassuring and clearly more successful than its rival, the digital compact cassette. Sony now appears to be quite comfortable with MD and willing to let the consumer format evolve and build.

In another incarnation, the MD DATA format provides 140 MB of storage for personal computer applications. One disc can hold 2,000 frames of still-color images, and its data transfer rate is 150 KB/second. The format is transparent to the computer platform; once the MD software is installed, information written on an MD can be retrieved or modified, regardless of the differences in the computer's CPU or operating system.

Another very significant appearance of Sony MO occurs in the mas-

tering studio. The venerable PCM-1610 harkens back to the earliest days of digital audio when video recorders were the transports of choice. While still workable, the PCM-1610 (and PCM-1630) formats are cumbersome and are limited to 16-bit recordings. Thus, Sony has replaced it with the PCM-9000, an MO disc recorder that can record up to 80 minutes of 20-bit linear digital audio data on a single-sided disc. Alternatively, the recorder can be outfitted for 16- and 24-bit recording. Of course, you'll find AES/EBU input/output, RS-422 port, SCSI interface and DAQ-1000 interface. In addition, the PCM-9000 can be used as a player in Sony's DAE-3000 CD-editing system.

With MD covering the consumer market and the PCM-9000 heading for success in the mastering house, there only remains the vast middle ground of professional audio recording and production. There is absolutely no question that 2-track/open-reel tape recording and razor blade editing are no longer acceptable; that DAT recording is less than professional, and that hard disk recording and editing have limitations espe-

You've got a stereo signal. Why in the @#!? would you want to combine and process it in mono when you could process the whole thing in stereo with the exceptional effects processor you see right here.

The remarkable Yamaha SPX990. Which, unlike other processors in its price range, offers two discrete inputs from beginning to end.

Here's the other big reason why you're going to want this beauty.

It sounds a lot better.

Where other processors offer you standard 16-bit A/D and

D/A converters, the SPX990 boasts 20-bit A/D and D/A conversion. And internal 28-bit processing to deliver much greater dynamic range than most any effects processor you care to name.

And as you might expect from the company that brought you the legendary SPX90, the first affordable digital effect processor, everything about the new Yamaha SPX990 has been designed to silence other effect processors in its price range.

For starters, we've enhanced our algorithms to produce



So you'll have no trouble patching things up, the SPX990 takes either XLR or TRS phone jack connectors.

THERE'S NOTHING WRONG WITH YOUR LAST



cially in load-in and load-out time. What the world needs is an erasable, 2-track optical disc recorder and editor, not to mention a format that is interchangeable in multimedia, video and graphics post-production.

Sony is clearly moving to meet those needs with a variety of MO discs. The EDM-128 (512 bytes/sector) is a single-sided 128MB 3.5-inch disc (127.3MB, formatted). It can be used across all ISO standard drives, with rotation speeds of 1,800 to 3,600 rpm. It can be recorded, erased and played on a SMO-E301F internal drive, with a rotational speed of 3,000 rpm, user data transfer rate of 625 KB/second, average seek time of 38 milliseconds, and internal 256KB buffer.

The EDM-1DAOs (1024 bytes/sector) is a 5.25-inch double-sided disc storing 650 MB (325 MB/side, formatted). Significantly, a double-density version of this disc has recently been announced. Specifically, the newest 5.25-inch double-sided MO disc offers 1.3GB storage (652.3MB/side, formatted). The EDM-1300 (1024 bytes/sector) is a zoned CAV disc in which bit densities increase on the outer tracks. Track pitch has been

decreased from 1.6 microns to 1.39 microns, raising linear density from 1.019 micron/bit to 0.86 micron/bit. A single disc costs \$280, yielding a cost per MB of 22 cents. It can be recorded, erased and played on the new SMO-F521 half-height drive. The disc rotational speed of 3,000 rpm provides a maximum user data transfer rate of 2.0 MB/second.

In addition, a new head design improves the average seek time to 40 milliseconds. The drive also incorporates a 1MB buffer. MO discs such as the EDM-1300, with 1.3 GB of storage, fast access time and high data transfer rate, finally supply the missing link between general computer applications and a dedicated audio studio recorder. In other words, the time for a practical, optical disc studio recorder has at last arrived.

Meanwhile, back home, Sony engineers are still pushing the optical storage envelope. They recently demonstrated operation of a continuous-wave, blue-green semiconductor laser at room temperature. Although operation of this 523-nanometer wavelength is impressive, Sony is already pushing to perfect a blue laser in the

460- to 500-nanometer range. Wavelengths this short would increase optical disc storage capacity by a factor of 2.5.

Sony did not become preeminent in the audio and video technology industries by being meek and timid, or being afraid of change. Instead, Sony's strength has been the development of new technologies. That strength is already apparent in the MO computer industry; as of 1992, 40% of the worldwide installed base of rewritable optical drives were manufactured by Sony. Today, there is no question that Sony is beginning to engineer a transformation of its audio and video product line that is as radical as it has ever attempted. No one can guess its ultimate success, but given the advantages of magneto-optical recording, and Sony's commitment to it, one could predict that MO will soon be the storage mainstay of the multimedia industry, and that Sony's strategy is to dominate it. ■

Ken Pohlmann is director of the undergraduate and graduate Music Engineering programs at the University of Miami in Coral Gables, Fla.

far more natural sounding reverbs than you probably thought was possible.

But there's more to it than that.

The SPX990 features 39 different types of Reverbs, Delays, Echoes, Modulations, Pitch Changes and Sampling – plus variations on each – for a total of 80 all new effects. And if that's not enough, you can simultaneously add EQ and/or compression on top of any of these effects.

The SPX990 also features 100 internal memory locations to store your own variations.

And you can say goodbye to all the button pushing. The data entry wheel on the SPX990 lets you enter your data on the fly. Looks like we're running out of room. So here's the big finish.

Every so often, something comes along that makes people in the recording industry sit up and take a good hard listen to the way they're doing things. This is one of those times.

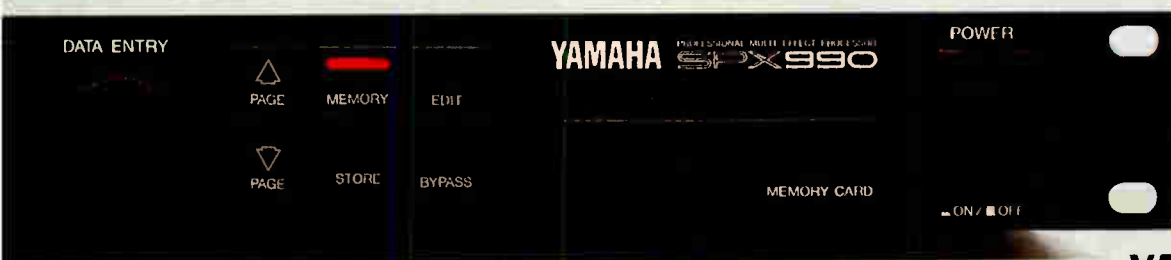
Stop by your nearest Yamaha dealer and check out the SPX990 today. For more information, call 1-800-937-7171 Ext. 310.

Your next mix will thank you for it.



Store up to 100 of your favorite effects programs on one of these cards and you can take them with you to every session.

MIX THAT A LITTLE MORE INPUT COULDN'T HELP.



by Stephen St.Croix

I'M A RAMBLIN' MAN

This month's column contains four totally unrelated sections. If you attempt to correlate them and search for continuity, you will hurt yourself, so don't.

1) MASTERING IN THE 20TH CENTURY

Mix wanted me to write about mastering because it is the main theme of this issue. I am not going to do that, however, as a service to you, the reader. This is best for everybody because, basically, I don't know anything at all about mastering. I send

gear, what settings, what he changed and what he left alone, and why.

I've been there to check it out and to hear the rooms so that I know where my work is going. We have discussed attitudes and techniques, monitors and earphones, converters, EQ, compression, limiting, tape, data widths, dither, TOCs, and, of course, cars, bikes and food.

In the end, I decided that he would master my stuff the way that I would master my stuff if I had the stuff to master my stuff with (and knew what I was doing).

So, in the end, I don't master in-house. I love it this way. But it means that what little I did know is obsolete now, so all I can tell you about mastering is these six paragraphs on why I can't tell you about mastering.

2) STOCKING STUFFERS FROM STUFF THAT'S IN STOCK

Ho, Ho, Ho. Merry Christmas. Or Happy Hanukkah, or whatever your (parents?) choice is. For me (I spent my kid-dom with Pima Indians), it's another day in the desert.

These are some of the little things that I have picked up in the last year that have made my life easier or more fun. To qualify for a "stocking stuffer," these things must be inexpensive and must fit into one of those commercially available, greedily oversized Christmas Hearth Stockings.

a) Radical woven guitar cords. These things look great and clearly add to the enjoyment of playing guitar. They come from two companies: Whirlwind and Spectraflex. The products of these two companies look and *feel* quite different. They are also made differently. Look and choose for yourself. I couldn't choose my favorite patterns, so I have nine of them.

b) Guitar distortion boxettes: Tech



my stuff to Masterfonics, and it comes back sounding a little better than I thought it could, and people buy the albums. I always figured that was all I needed to know.

Well, not really. I always ask Glenn [Meadows] what he did, and he always explains in great detail—what

What's more fascinating than
a man who can sing
two notes at the same time?



Imagine if you will the sound of a bullfrog swallowing a whistle. That's the startling result achieved by the throat singers of a South Siberian Shengri-la called "Yu a

A mixing system that and digital at the



That's the AT&T DISQ™ Digital Mixer Core.

Up until now, it's been the same old song. Your studio either stays analog or goes digital.

But all that's changing thanks to the AT&T DISQ Digital Mixer Core.

Invented by the company that's been involved with audio since its inception, this remarkable system offers you the unheard of. Namely, the capability to go back and forth between analog and digital. At the mere press of a button.

Analog is still music to many artists' ears.

After all, many rock musicians still prefer analog. To their way of thinking, digital lacks a certain wallop.

The great thing about the DISQ System is that it supports analog lovers while giving them the option of evolving to digital.



Others are really digging digital.

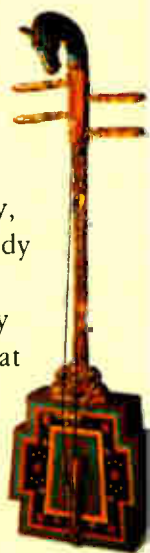
On the flipside, there are artists and producers—be they in Contemporary Pop, Country, Jazz or R&B—who are already sold on digital. They feel it lets them hear nuances they never heard before. And that digital is important in editing and mastering.

The bottom line? The DISQ System lets you cater to the exact tastes of any client.

Adding digital by adding to your analog system.

The DISQ System works in tandem with your existing analog boards.

Meaning you avoid the big learning curve a new digital console requires. So when clients ask for a certain sound,



can be analog same time.

an engineer still knows which of 3,000 faders and knobs to move a mere fraction of an inch to give 'em what they want.

Spend half as much to do twice as much.

Besides the incredible flexibility the DISQ System's capabilities afford you, there's also the cost savings.

Because you simply add the DISQ System rack to your existing hardware, there's not a ton of pricey equipment to buy. Or install. Meaning your downtime is kept to a bare minimum.

Add other stuff anytime down the line.

You won't get hit up for lots of gadgets when you want to upgrade, either.

Typically, all it takes is new software.

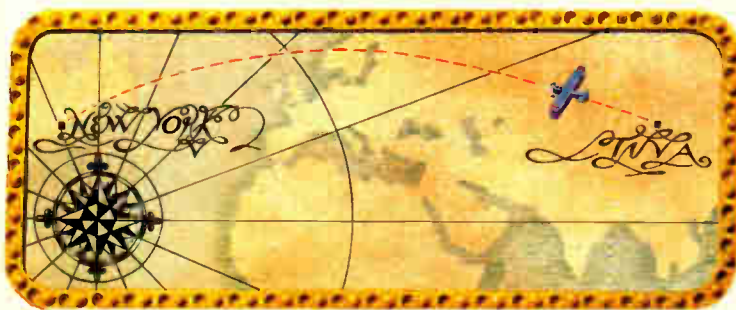
In fact, the DISQ System is so flexible that mixing board functions can be changed with a mere tweak.



AT&T Bell Labs: A name that's pure platinum.

Not surprisingly, the technology for the DISQ System came from the best R&D (not to be confused with R&B) facility in the world—AT&T Bell Labs.

A mixing system that's both analog and digital. It's not impossible. It's the AT&T DISQ Digital Mixer Core. For details, call 1 800 553-8805. Outside the U.S. and Canada, dial 919 668-2934.



If the Tuwans wanted to use the DISQ System to make an album, they might have to travel to a city many Americans find foreign.



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USE READER SERVICE CARD FOR MORE INFO

World Radio History

21's SansAmp and the little Zooms. Very different sounds, very different prices. Great toys, really.

c) The new version of the Yamaha QY. They won't let you use a CD player on airplanes anymore, but for some silly reason they *will* let you use these.

d) Active Direct Box from Stewart. Why, you ask? Because it uses a TL072 (the closest thing to the TL061 in the all-time-great MXR Microamp), and it has a balanced output. Solid, strong, simple. But beware: There is

no level pot as with the old MXR, and the output is mic level only. If you need to DI a bass and impedance problems are beating you up, this is a good solution. Keep in mind, though, that while the old MXR actually brightened the signal, these boxes soften it a little.

e) Pocket, color LCD TVs. Three companies have introduced active TFT versions that work. They are finally amazing! Check 'em out at your local high-end dweeb technostore.

f) 128MB magneto-optical drives and discs. You need these. Buy them. You can throw the discs in the

ocean, hose them off and still get another 13 years out of them. Epson and Fujitsu are the highest performers. The Fujitsu drive *will* fit in the stocking!

g) Not Ready Yet, Maybe Next Year: Apple Newton, heads-up TV glasses, IR stereo earphones, speech recognition interfaces, CD-I, MD, DCC.

3) ST.CROIX RESPONDS TO RESPONSES TO ST.CROIX

It seems that some people who read my July column, "Baiting Buyers With Bits for Bucks," felt strongly about what I had to say, and a few of them even wrote in.

It's not that I don't like small machines; they're fine. It's just that I can't accept a step backward in quality for any reason. Many of these machines produce final audio quality that is lower than we produced in 1950.

At least the distortion in the old days was harmonic. But the digital artifacts generated by some low-cost workstations produces a new kind of edginess—inharmonic distortion, hash. This is further aggravated by such tricks as brute force truncation, poorly implemented EQ math and jittery, inaccurate converters. The result is a wooden, collapsed stereo image and an invasive, surgical harshness. I guess what I'm saying is that today's hash is nowhere near as smooth as the hash of the '60s.

My favorite songs of all time are "Runaway" and "The Wanderer." The technical quality of these songs is horrible compared to what is possible today, but I still love them. I would love them more if they were a little cleaner and maybe had a bottom, but that's not the point.

The point is that it's a competitive world, and to be competitive today, technical quality has to be high. The same music presented with high technical quality and presented with low technical quality is going to elicit remarkably different responses from the people you are presenting it to. Since that is simply the cold, hard truth of the matter, don't take the step backward.

4) DON'T LOOK NOW, BUT WE ARE GROWING UP

Have you looked through the ads in *Mix*? Check out the general look and feel of the equipment that is offered in this issue. Think back to the gear of just five years ago (or look around



TRANSMISSION LINE MONITOR LOUDSPEAKERS

If you're searching for high quality loudspeakers that offer, exceptional bass extension, are both efficient and capable of reliably producing high SPL's, take a look at what the Professional Monitor Company's new versatile Transmission Line systems have to offer over conventional loudspeaker designs:

- Greater low frequency extension
- Higher SPL's without distortion or compression
- No loss of low frequencies at low listening levels
- Gradual low frequency roll-off
- Lower colouration
- Neutral yet dynamic performance
- Improved reliability
- Wide dispersion angle with stable and consistent 3D image

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It's nice to know an AKG studio standard isn't over anyone's head anymore.

Even among pros, there are times when your talent exceeds your budget. That's why we created the new AKG C3000. It has the warmth, clarity and character of the most popular AKG studio mic in the world — at about half the price. In fact, when you hear it you'll be amazed what a large, gold-coated diaphragm will do for your sound. The C3000 gives you all the quality of an AKG without having to pretend it's an AKG. It is.



Bean, from D'Clickoo, whose new "Umoja" CD is on RGB Records.

H A Harman International Company

AKG Acoustics, Inc. 1525 Alvarado St
San Leandro, CA 94577 USA
Phone: 1 (510) 351-3500
Fax: 1 (510) 351-0500

Ed Rak

DEMANDS DOLBY SR



Vincent Maricich

Ed Rak in Control Room B of Clinton Recording Studios

FAST LANE

your studio—mine is full of this “old” stuff). Check out the power, the functionality, the interfaces, the displays. Some of the new displays are actually getting big enough to display stuff! The new Eventide and Klark Teknik are good examples of this. Things are getting quite sophisticated. Motorola and AT&T are providing manufacturers with the power to morph our dreams into a new reality. Others are providing more extreme RISC, ASICs and stranger architectural technologies to bring us even more insane speed and power.

I can say without exaggeration that I am doing things in my studio today that NASA couldn't do for all the bucks on earth (or in orbit) six very short years ago!

Finally, the big players in the silicon sandbox are starting to take our little audio-visual industry seriously. We are heading into Christmas '93 from a different place than any other Christmas in audio history. This Christmas is never going to end. Toys will keep coming—toys that do things that we have dreamed of and things that we never thought could *actually* be done, and even things that we have never thought of (but when we see them we will really, really *need* them). Yes, that was a long sentence, but it's a long Christmas.

Even *I*—the guy who writes about how frustrating it is to be stuck with gear that is crippled, under-powered, under-featured, or just uncool in general, the guy who shows you just exactly how much you can complain and still (barely) stay in print—find myself wowed and impressed by some of these new toys.

Having designed several extreme toys in the past, I have developed a certain semi-jaded attitude toward most of the new-and-improved toys of today. Add to that the design work that I now do on today's (and tomorrow's) stuff, and it's easy for me to see through the hype, just as *any* current designer can.

With that in mind, I am truly impressed with some of the new gear, in almost all arenas: MI, DSP, analog, mixing and storage. I am finally spending money on this stuff again. ■

Steve St. Croix is not mellowing; he has just found 15 new toys that have impressed him.

“Digital was my first choice for ten years. So why am I recording analog again?”

Occupation

Engineer, producer, and owner of Clinton Recording Studios, NYC

Recent credits

Juan Luis Guerra, Patti LaBelle, Roy Hargrove, Cleo Laine, Liza Minnelli, John Pizzarelli, Michel Camilo

Career credits

Artists: Karen Carpenter, Steely Dan, Dave Grusin, NY Philharmonic, Diana Ross, Frank Sinatra

Films: “Manhattan,” “Reds,” “Peggy Sue Got Married,” “Tequila Sunrise,” “A Stranger Among Us”

Career direction

“Recording great film scores in one of New York's few remaining large orchestral recording spaces is a fabulous job, and I look forward to doing lots more.”

On his technique

“I capture the *sense* of each soloist and section, lock them together in perspective, and apply the glue when I mix.”

On Dolby SR

“Dolby SR hears it my way—everything I record sounds like I want it to, from start to finish. Plus Dolby SR has insured my investment in analog equipment for years and years to come.”



Studio A:
Clinton Recording

Dolby SR: now over 70,000 tracks worldwide.

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Dolby

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AS THE BUILDERS OF D&R mixing consoles, others have accused us of being rather zealous. Maniacally dedicated. Over the top. Passionately committed to crafting the finest consoles at any price.

We plead guilty as charged. After all, our shameless vendetta against smeared sonics leads us to the highly unreasonable length of phase-correlating every audio stage. We're the crazed console crafters who — in our unstoppable desire to eliminate RFI and other noise — starground every circuit on every console, with the aid of a custom-welded steel chassis.



Exhibit B: When Digidesign was judging new consoles to use with their own 20- and 16-bit digital recording & editing systems, they knew the board would have to be good. Very good. And quiet. Very quiet. Their verdict? The D&R Orion.

D&R handcrafts consoles for recording, live sound, theatre, post-production and broadcast. Whether you own a world-class facility or a serious project studio, there's a D&R for your needs and budget.

And yes, we're the ones responsible for "high-def" EQs, floating subgroups, and other pioneering features which show so little regard for ordinary designs.

While overcoming the challenges of physics and the temptations of mediocrity, our unreasonable standards deliver what many consider to be the best consoles on the market. At the most reasonable prices.

You might think life could be lonely when you're guilty of a passionate pursuit for perfection. But along the way, we've met thousands of others who understand our intolerance for anything short of excellence. They are the thousands who have asked us to handcraft them a D&R.

So if you've been accused of ridiculously high standards for your work, let us reassure you



Exhibit A: To find evidence of our remorseless commitment to sonic integrity, look no further than the new D&R Triton. Its transparency, flexibility, and unparalleled support put it in the same league as our flagship, the D&R Avolon.

that you're not alone. We're here whenever you need us. And we understand completely how you feel.

D&R

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D&R NASHVILLE: (615) 661-4892

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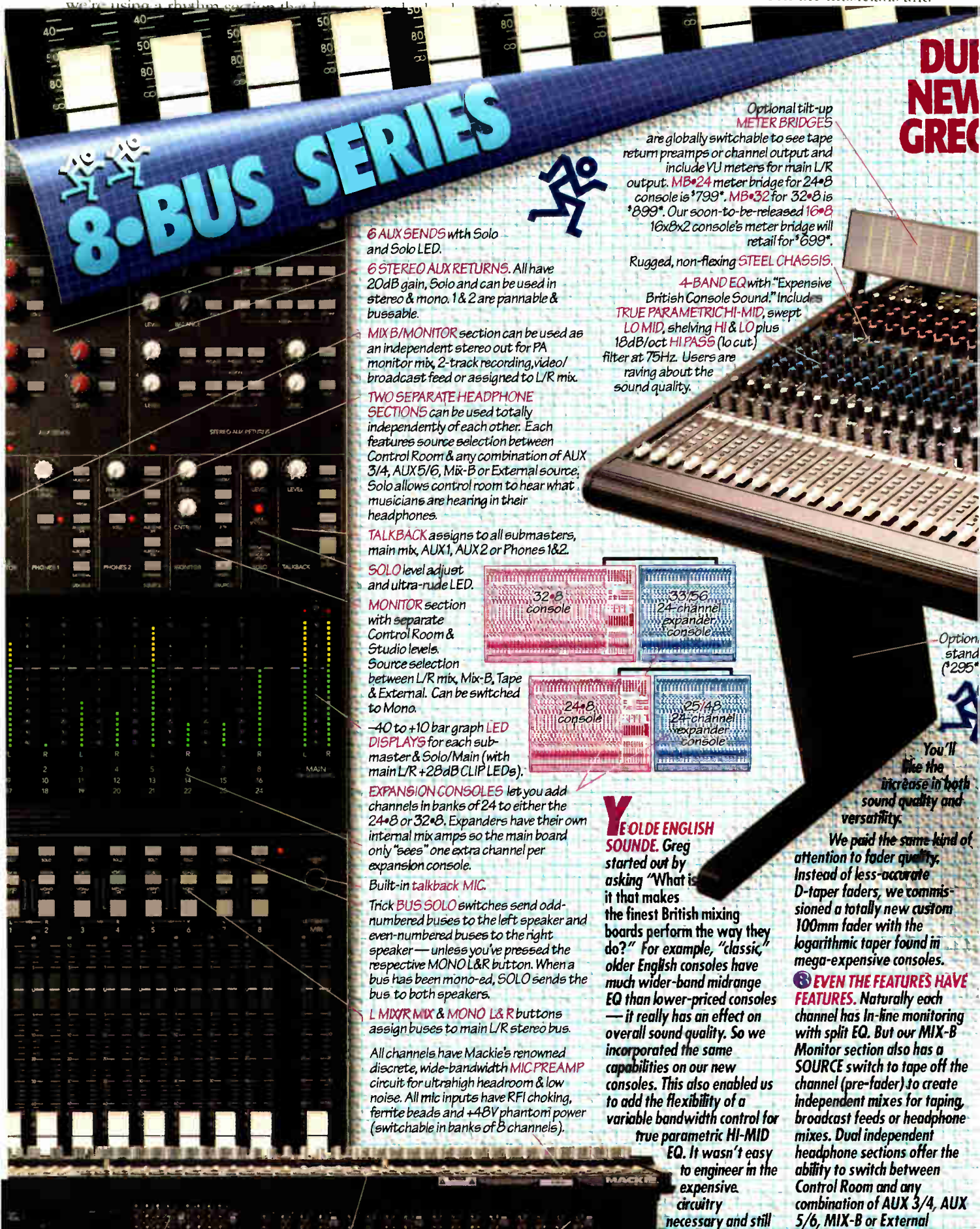
by Mr. Bonzai

LUNCHING WITH BONZAI

project such as this one, they have the chance to play like a band, rather than just being hired as musicians to play parts. You can feel it because

to be a film director. I won a scholarship to go one day a week to study filmmaking at Surrey College of Art and Design. It was an experiment, and I was the only student in the county that got this course. I was

the other never really popped out. It seemed to me that the guy who mixed the sound was like a 20th-century conductor. Moving the faders was like using the baton, and he was the interface between the musicians and



8-BUS SERIES

**DUI
NEW
GREG**

Optional tilt-up **METER BRIDGES** are globally switchable to see tape return preamps or channel output and include VU meter bridge for 24-B output. **MB-24** meter bridge for 24-B console is \$799*. **MB-32** for 32-B is \$899*. Our soon-to-be-released **16-B** 16x8x2 console's meter bridge will retail for \$699*.

Rugged, non-flexing **STEEL CHASSIS**.

4-BAND EQ with "Expensive British Console Sound." Includes **TRUE PARAMETRIC HI-MID**, swept **LO MID**, shelving **HI & LO** plus **18dB/oct HI PASS** (lo cut) filter at 75Hz. Users are raving about the sound quality.

6 AUX SENDS with Solo and Solo LED.

6 STEREO AUX RETURNS. All have 20dB gain, Solo and can be used in stereo & mono. 1 & 2 are pannable & bussable.

MIX B/MONITOR section can be used as an independent stereo out for PA monitor mix, 2-track recording, video/broadcast feed or assigned to L/R mix.

TWO SEPARATE HEADPHONE SECTIONS can be used totally independently of each other. Each features source selection between Control Room & any combination of AUX 3/4, AUX 5/6, Mix-B or External source. Solo allows control room to hear what musicians are hearing in their headphones.

TALKBACK assigns to all submasters, main mix, AUX1, AUX2 or Phones 1&2.

SOLO level adjust and ultra-rude LED.

MONITOR section with separate Control Room & Studio levels. Source selection between L/R mix, Mix-B, Tape & External. Can be switched to Mono.

-40 to +10 bar graph LED DISPLAYS for each submaster & Solo/Main (with main L/R +28dB CLIP LEDs).

EXPANSION CONSOLES let you add channels in banks of 24 to either the 24-B or 32-B. Expanders have their own internal mix amps so the main board only "sees" one extra channel per expansion console.

Built-in **talkback MIC**.

Trick **BUS SOLO** switches send odd-numbered buses to the left speaker and even-numbered buses to the right speaker — unless you've pressed the respective **MONO L&R** button. When a bus has been mono-ed, **SOLO** sends the bus to both speakers.

L MIX/R MIX & MONO L&R buttons assign buses to main L/R stereo bus.

All channels have Mackie's renowned discrete, wide-bandwidth **MIC PREAMP** circuit for ultrahigh headroom & low noise. All mic inputs have RFI choking, ferrite beads and +48V phantom power (switchable in banks of 8 channels).



Optional stand (\$295*)

You'll like the increase in both sound quality and versatility.

YE OLDE ENGLISH SOUNDE. Greg started out by asking "What is it that makes the finest British mixing boards perform the way they do?" For example, "classic, older English consoles have much wider-band midrange EQ than lower-priced consoles — it really has an effect on overall sound quality. So we incorporated the same capabilities on our new consoles. This also enabled us to add the flexibility of a variable bandwidth control for true parametric HI-MID EQ. It wasn't easy to engineer in the expensive circuitry necessary and still keep our consoles affordable, but we did it.

We paid the same kind of attention to fader quality. Instead of less-accurate D-taper faders, we commissioned a totally new custom 100mm fader with the logarithmic taper found in mega-expensive consoles. **EVEN THE FEATURES HAVE FEATURES.** Naturally each channel has in-line monitoring with split EQ. But our **MIX-B Monitor** section also has a **SOURCE** switch to tape off the channel (pre-fader) to create independent mixes for taping, broadcast feeds or headphone mixes. Dual independent headphone sections offer the ability to switch between Control Room and any combination of AUX 3/4, AUX 5/6, MIX-B or External sources. Tape inputs and outputs feature internal

+4dBu balanced **TAPE RETURNS**, switchable to to -10dBV unbalanced in banks of 8 returns.

Balanced **MIC**, bal./unbal. **LINE IN**, **MIC/LINE** switch, **DIRECT OUT & CH. INSERT** on every channel.

Three **TAPE OUTPUT** jacks per bus (total of 24). +4dBu balanced, switchable in banks of 8 to -10dBV unbalanced.

*Suggested Retail Price. Your actual price may vary.

GUILTY.

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D&R ELECTRONICA B.V.
Rijnkade 15B, 1382GS Weesp,
The Netherlands tel (-) 31 2940-18014

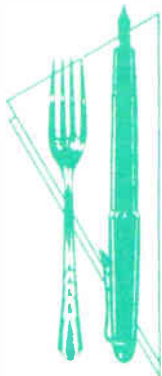
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by Mr. Bonzai

DAVID TICKLE

PRODUCER AS CONDUCTOR



Producer David Tickle has a bit of the ol' Midas touch these days, his latest chart triumph being the modestly titled *Bigger, Better, Faster, More!* from 4 Non Blondes. The innovative young Englishman got a very early start and has packed a lot into his years in the studio. His talents as engineer, mixer, producer and sound designer include much-respected work with artists such as Split Enz, Divinyls, Rod Stewart, Jackson Browne, Prince (co-produced and mixed five albums), U2 (co-producer/mixer on *Rattle and Hum*), Peter Gabriel (world tour sound designer), Joe Cocker, George Michael and Blondie.

We met at Tickle's secluded home outside of L.A. in the Santa Monica Mountains. Just a half hour from the heart of Hollywood, his house and adjacent studio seem hundreds of miles from show biz hustle. This afternoon, a tight rhythm section is assembled in the main house, connected by tielines to the naturally lit studio. Outside is a rock-lined swimming pool and gently rolling, grassy hillsides.

Tickle and his engineer, Chris Lawton, a five-year veteran of Peter Gabriel's Real World studios, are at the console listening to musicians laying down bass, drums and guitar tracks. The first take is good, a second has a minor flub, but the third really nails it. We retire to the dining hall, where I unpack an *obento* lunchbox of soy-boiled *shittake* mushrooms, *sato imo* mountain potato, carrot, *Tokyo negi* onion, *daikon* radish and rice balls wrapped in dried seaweed.

Bonzai: So, it was a good take?

Tickle: Yes, an *inspired* take.

Bonzai: You mentioned that the drummer, Charlie Drayton, and bass player, Darryl Jones, have worked together for a long time. Is that noticeably helpful when you're laying down the basic rhythm tracks?

Tickle: I find there are several differ-

ent situations. Sometimes you have a band that comes to you as a *band*, and everyone works fine, and you are able to keep the players together as a unit. In a true band, like U2, each member is equally integral to creating that overall sound and synergy.

And then there is the situation when you work with solo artists, or in this case, two guys, Kim Zetterstrom from Sweden and Simon Hawkins from England. After working together for eight years, they've been signed to BMG and are called "Colors." To make this record, we went for the best musicians to suit the music. It's like casting a film, and it can become country, rock 'n' roll, whatever—all depending on the style of the musicians you use. These guys really add exactly what I am looking for, and they enjoy working together. For a



PHOTO MR BONZAI



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project such as this one, they have the chance to play like a band, rather than just being hired as musicians to play parts. You can feel it because we're using a rhythm section that has played together for a long time.

Bonzai: How did you fall into this project?

Tickle: Bill Leopold, their manager, contacted me with the idea that as a producer I could nurture and develop the band. I really liked the tapes I heard, and after talking with the guys, we felt we had a shared vision.

Bonzai: 4 Non Blondes, whom you also produced, are doing quite well right now. Can you tell me about working with them?

Tickle: They are a San Francisco band that came to me through Tom Whalley, A&R man at Interscope Records, and through their manager, Cat. I think it was because of my work with the Divinyls that they came to me—I know that Krista Hillhouse, the bass player, really enjoyed my work with the Divinyls.

I went up to Haight-Ashbury to see the band perform on their home turf and really appreciated the raw energy, the songs and a quality that I haven't seen since the '60s. The lead singer, Linda Perry, is a true performer, like Janis Joplin. She is really on the edge, really *there*, really gives everything. She uses her voice as an instrument to do much more than just express the words. Another thing, it was an all-girl band when I first saw them—and the bass player and drummer were very impressive. After the show, we discussed some ideas, and it felt very comfortable. Rehearsals went very well, and I was determined to make a record where the musicianship came first. The fact that they were women was a secondary consideration. Girl bands tend to be lightweight-sounding, and this band had a very serious, tough sound.

Bonzai: You just turned 34. How many years have you been in the studio?

Tickle: Since I was 16. I started on May 31, 1976, at Zodiac Studios in London. After three months, Tony Visconti bought it, and it became Good Earth Studios.

Bonzai: Did you study at school for a career in audio?

Tickle: No, I didn't. The story goes back to when I was 14 and my goal

to be a film director. I won a scholarship to go one day a week to study filmmaking at Surrey College of Art and Design. It was an experiment, and I was the only student in the county that got this course. I was very lucky, but I found things to be rather slow, especially when they were setting up lights and such. I used to get bored, and I would walk down the hall to the next department, which was Photography.

This was in addition to my interest in music, because I had a small band of my own at the time. And I had been recording since I was about five years old, with my father and his home recording equipment—nothing fancy, just 2-track stuff. By the time I was 14, I was allowed to go to concerts by



ANDREW MACNAUGHTAN

Interscope recording artists 4 Non Blondes

myself. My first was David Bowie's "Jean Genie" concert, and then I saw Curved Air, a band that Stewart Copeland was in before The Police. I took photographs at the show, and Curved Air came back again in three months to play at the university in Guilford, and I showed them the photographs. Sonia Christina, the lead singer, loved the photographs and asked me to send them to their management company. It was BTM, British Talent Management, owned and run by Miles Copeland. I got a phone call telling me that Miles wanted to meet and discuss using my photos for a live album they were working on.

I walk into his office wearing my school uniform—blue blazer, school tie and little cap—and Miles couldn't believe this 14-year-old kid had taken these photographs. So, we started talking, and he asked what I wanted to do after finishing school, and I told him that I had really become interested in the live mixing of sound at these concerts. I realized that the guy who mixed the sound was so important. I saw Curved Air twice, with different mixers, and one show sounded incredible, and

the other never really popped out. It seemed to me that the guy who mixed the sound was like a 20th-century conductor. Moving the faders was like using the baton, and he was the interface between the musicians and the audience. I loved the excitement of concerts, but Miles proceeded to spend about two hours trying to talk me out of going into the music business. He tried to explain how screwed up the entire industry was.

Bonzai: Was he right?

Tickle: In a lot of ways, yes. The interface between business and creativity is always a frustration. There seems to be a lot of friction between the two. You do your best. I tend to work a lot more on the creative side, but you have to deal with the business.

You have conflicts, but overall, I love what I do. He didn't put me off enough, but he told me to go for the work in studios because it's a lot more stable than being on the road.

So, by the time I was 16, I told my school that I wanted to work in a studio. Being a very good school, they were able to put me in touch with the London Careers Office and found a job opening at Nomis Studios. I spent all my pocket money getting up to London, and after a 15-minute interview, I just knew I didn't have the job. Since I had come all that way, I decided to walk around London and knock on a few doors. The first place I stopped was Zodiac, and that very morning, they had fired their tape operator. I was interviewed and three days later was offered the job.

Bonzai: How long before you made your first record as a full-fledged engineer?

Tickle: About three months, when the engineer who had hired me had a big argument with the owner and quit. We had clients coming in, The Liverpool Express, and I was the only one there to do the session. Then came The Swinging Bluejeans, and so on.

Bonzai: As you look back now, what work was most gratifying?

Tickle: That's a tough one, because I have done so many different things, in so many different places. Working for Prince was the greatest challenge of all, because the job was so nebulous. It started out as, "Yes, come in and be an engineer," during the Purple Rain period.

Bonzai: Weren't you the sound designer for that tour?

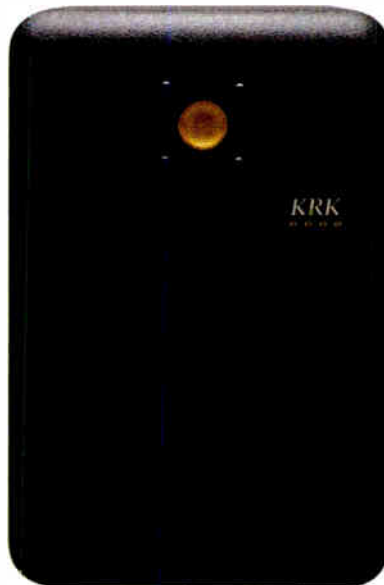
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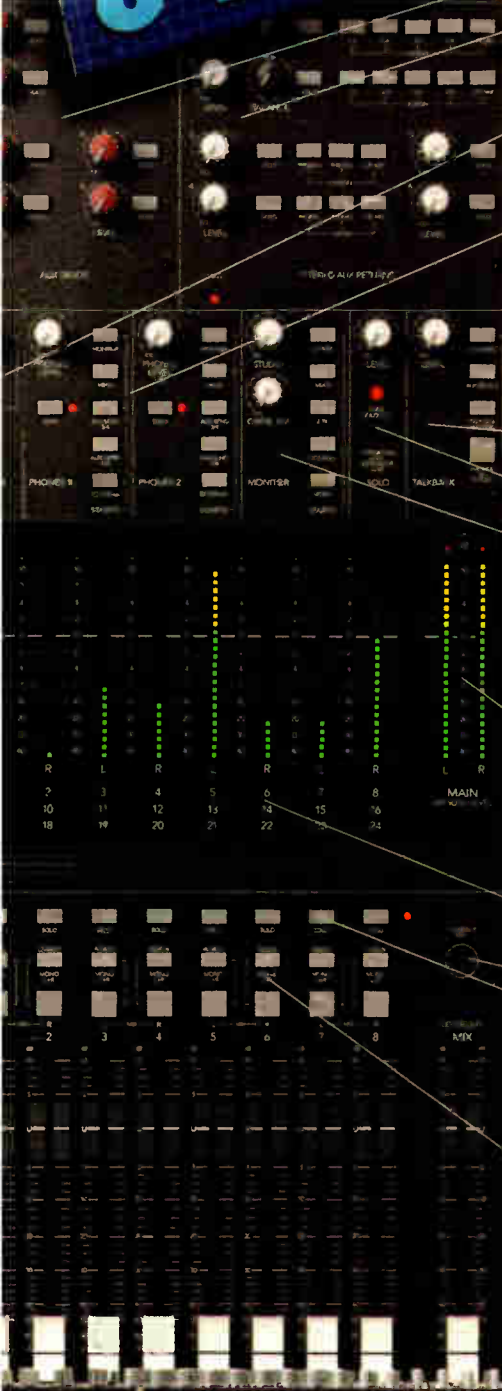


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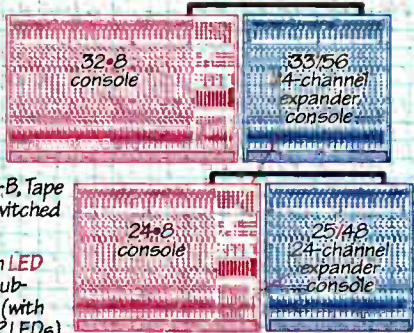
L MIX/R MIX & MONO L&R buttons assign buses to main L/R stereo bus.

All channels have Mackie's renowned discrete, wide-bandwidth **MIC PREAMP** circuit for ultrahigh headroom & low noise. All mic inputs have RFI choking, ferrite beads and +4BV phantom power (switchable in banks of 8 channels).

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Balanced **MIC**, bal/unbal. **LINE IN, MIC/LINE** switch, **DIRECT OUT & CH. INSERT** on every channel.

Three **TAPE OUTPUT** jacks per bus (total of 24), +4dBV balanced, switchable in banks of 8 to -10dBV unbalanced.

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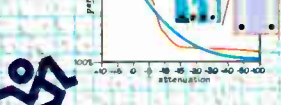
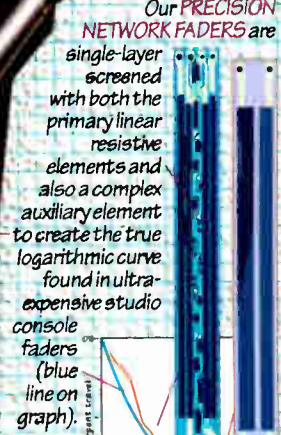
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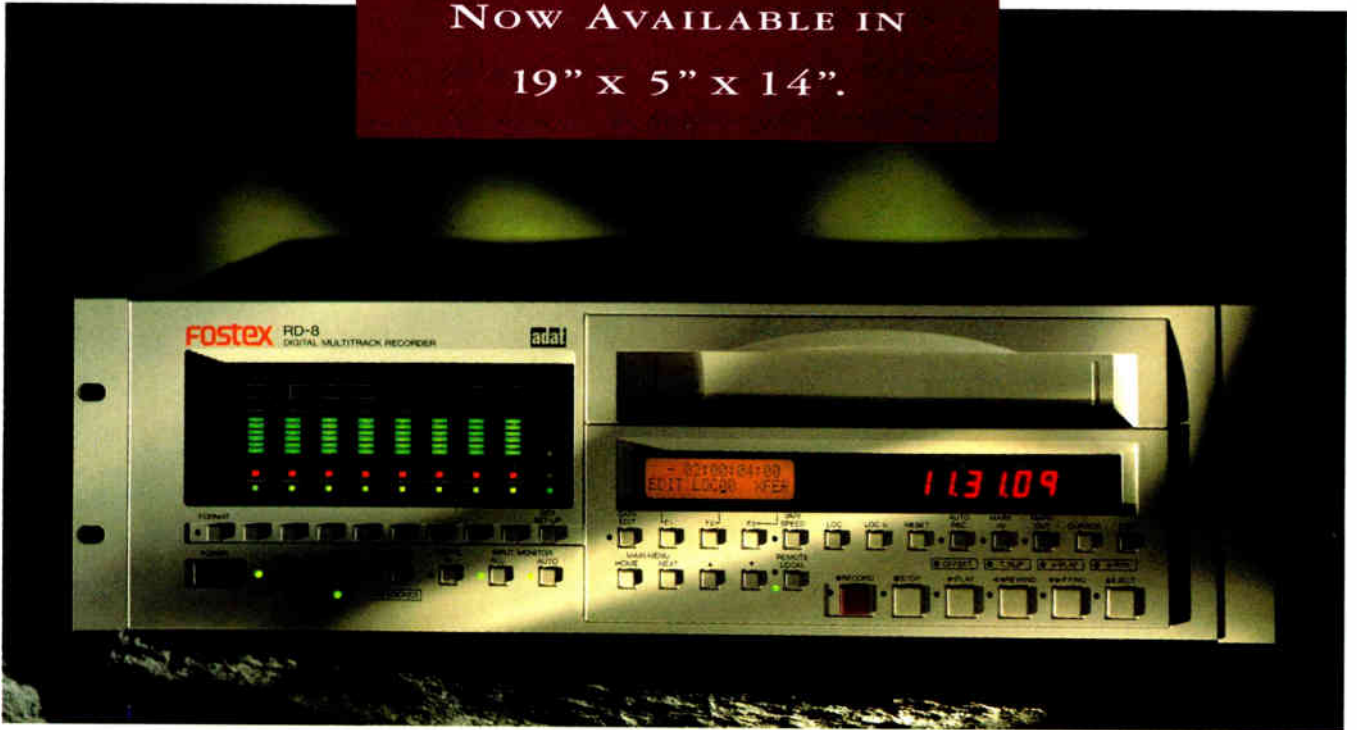
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Tickle: Yes, I did the live sound for him, and I had some assistants. On the road, we would stay in places for a week, playing a stadium for seven days. After the soundchecks, we would use the stage for recording. I had a truck with me permanently on the road, and we'd record tracks in the afternoon, then do the show, and afterward, record vocals and overdubs. While on the road, we did Sheila E.'s record and finished *Around the World In a Day* and others.

Bonzai: What's the most important thing you learned from working with Prince?

Tickle: Confidence. That if you have a feeling inside and you want to pull that feeling through, you can do it. He's the most talented person I've ever worked with: as a writer, a performer, an artist. He's incredibly talented. He has visions, and he is able to manifest these visions. Seeing his determination and clarity for what he wants to pull through was one of the big influences in my life—to have an idea, to really believe in it and to be able to pursue it and get there.

Bonzai: How long did you work with him?

Tickle: About two-and-a-half years. I did about 70 songs with him in that period, plus the Purple Rain tour, and I helped the architects in designing the layout and operation at Paisley Park Studios.

Bonzai: Let's talk about your work with U2. How did you get involved with *Rattle and Hum*?

Tickle: I went to Jimmy Iovine, who had the job. They hadn't started the album because they were still doing recordings of the live show and filming the movie. I had heard that Jimmy was going to produce, so I called him up. I didn't know him at the time, but I called and said that there was a band he was going to produce, and I thought that I should do it. It was sort of tongue-in-cheek. I had never met the guy and didn't know how to approach him, and sometimes people don't call you back. So I left this message and didn't say which band I was talking about. He called back out of curiosity and asked who I was referring to. I told him that if he would see me, I would tell him.

Bonzai: Had he heard of you?

Tickle: Yes, he said he knew who I was through some of the records I had done. So, I go in and see him, and he asked, "What's the big mystery? What band?" I said U2, and he said, "U2? Do you like U2?" I told him I loved the band as a true fan, and he said, "Well, let's do it together." I couldn't believe it! So I left for home, and about 5 I got a call, and he wanted me to come back to the studio and start that very night at 7:30.

I started with some of the live stuff, and they weren't quite ready to make the record because they were still working on the film. I knew Phil Joanou, the director, because I had done the soundtrack to his first movie, *Three O'Clock High*. Anyway, listening to the live stuff, I realized that for some of the footage they were going to use, they hadn't properly recorded the audience at some of the shows. I pointed this out, along with the fact that in theaters they wouldn't have a consistent surround sound with the environment of the audience. I spoke with Phil and Bono and The Edge, and for three weeks, my task was to rebuild the audiences from other shows. We ended up with some very interesting stuff,

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and "In the Name of Love" was released as a single, with all the live choirs from the shows.

The band went back to Ireland, and I got a call from Jimmy. They didn't want to come back here unless I worked on the album with Jimmy. I had to drop the project I was on, and we went into the studio for about five months. I did new songs for the album. For example, "God, Part II" was extracted from very long jams with the band and edited together. I was encouraged to experiment, and it was a

brilliant atmosphere in which to work. Bonzai: What is the secret of U2's overwhelming success?

Tickle: The band is very sincere, very heartfelt, very real. Every sound and part is questioned for its character and purpose. They are very focused on every single element that goes into the record. I think this has something to do with working with Steve Lillywhite, Brian Eno, Daniel Lanois. The thing that I learned from them was that there is not only one way to do something. There are 50 ways, and if you have the time, you will find them. And when you think you've

got something great, it's amazing how you can find something even better. Basically, their success is a result of their honesty and the fact that they are true to themselves.

Bonzai: And let's not forget their sense of humor.

Tickle: Yes, that's true. Well, they're Irish; they can't help it.

Bonzai: Do you still want to be a film director?

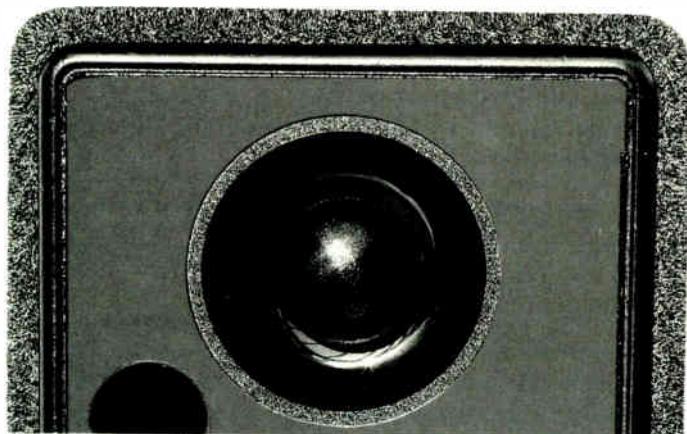
Tickle: Absolutely. I've made my first movie. I've been going to UCLA for three years, working on a couple of scripts now. My partner and good friend is John Farend, who is the president of Panavision, and so we have access to a lot of technology and tools in both the music and film worlds. I'm not in any major rush, and the reason I went into record production first is that I wanted to be in charge of my own life at an earlier age. I feel that to direct a movie, and to have enough knowledge to give to the world, you need more life experience. I have enough now that I have a point of view and can convey something coherently. I am not looking to do a budget film, a compromise. I am going for the top, and I am happy with this pace. And the interest is incredible, so I follow that energy.

Bonzai: How is your life different now that you have your own recording studio available all the time?

Tickle: When you are dealing with music and musicians, it's important to have everyone in a relaxed environment. I really believe that people often do their best work on demos. There is something warm about demos and something innocent that I like. So I wanted to create an atmosphere where the recording situation is very homey and the musicians don't feel like the equipment is overwhelming. I've tried to create the ideal home studio, not a commercial studio where the equipment melts into the walls; the environment is more important than the technology. We use rooms in the house that have good acoustics and tielines that connect to the control room. We have guitar amps blasting away down below in what was a nuclear fallout bunker built in the '50s. Bonzai: Could you tell me about the balance of analog and digital you are using?

Tickle: I'm a big fan of the Ampex analog tape machines, particularly the MM1200, which I used for Split Enz, all of Prince's albums, Divinyls, 4 Non

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—CONTINUED ON PAGE 183

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The new CS2000 digital control studio system from Euphonix leads the industry in computer aided mix management. With the powerful Version 2.0 software the CS2000 incorporates features that take it beyond any other system on the market.

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T h e N i n t h A n n u a l



Les Paul and John Sebastian brought the house down at the Ninth Annual Technical Excellence & Creativity Awards, held October 8 at the Marriott Marquis in New York City. Surprising the 650 attendees, Paul and Sebastian interrupted the steady stream of winners' accep-

tance speeches for a once-in-a-lifetime performance. Playing an impromptu 12-bar blues progression, with audio-related lyrics by Sebastian, the two guitarists charmed the audience. Even Paul's mid-song guitar-tuning received applause.

Digidesign and Bernie Grundman also received their fair share of applause, as both walked away double winners. Digidesign took home honors — *CONTINUED ON PAGE 48*



PHOTOS BY
SUSAN SALINGER

Presenters and producers at the TEC Awards gathered after the ceremony. Standing (L to R): TEC Awards producer Rick Miller, Mix Foundation president Hillel Resner, Mix products editor George Petersen, NARAS national chairman Hank Neuberger, producer/artist Sandy Bull, session musician Bernard Purdie, drummer/bandleader Max Weinberg, Mrs. Bonzai and Howard Sherman. Kneeling (L to R): TEC executive director Karen Dunn, Windmill Lane owner Brian Masterson, emcee Mr. Bonzai, the legendary Les Paul, musician John Sebastian and his wife, Katherine, Mix Editor-in-Chief and TEC executive producer David Schwartz. Front: Mix editor and TEC bandleader Paul Potyen and Mix events coordinator Jane Byer.

Les Paul and John Sebastian brought the house down with their 12-bar blues duet.



Digidesign president Peter Gotcher accepts the second of two awards for the evening, this for the company's Session-8XL workstation.



Presenters (L to R) Bernard Purdie, Max Weinberg and NARAS national chairman Hank Neuberger.



Hank Neuberger (L) and Al Schmitt (R) congratulate t.c. electronic's Ed Simeone and Kim Rishoej for winning the TEC Award for Signal Processing Technology for the M5000 Audio Mainframe.



(Center) John Gluck, president, and the staff of AMS/Neve pose with their TEC Award won for the Capricorn in the category of Recording Console Technology.

Producer extraordinaire Creed Taylor presents longtime friend Rudy Van Gelder with the Hall of Fame Award.



Brian Masterson (L) and Bernard Purdie with Skywalker Sound's Kiki Morris, who accepted the TEC Award for Audio Post-Production Facility.



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Winners

INSTITUTIONAL ACHIEVEMENT

Acoustics/Facility Design Company
Walters-Storyk Design Group (Highland, N.Y.)

Sound Reinforcement Company
Showco Inc. (Dallas, Texas)

Mastering Facility
Bernie Grundman Mastering (Hollywood, Calif.)

Audio Post-Production Facility
Skywalker Sound North (San Rafael, Calif.)

Remote Recording Facility
Westwood One Mobile Recording Division
(Culver City, Calif.)

Recording Studio
Ocean Way Recording (Hollywood, Calif.)

CREATIVE ACHIEVEMENT

Audio Post-Production Engineer
Bruce Botnick

Remote/Broadcast Recording Engineer
David Hewitt

Sound Reinforcement Engineer
Robert Scovill

Mastering Engineer
Bernie Grundman

Record Producer
Don Was

Recording Engineer
Hugh Padgham

TECHNICAL ACHIEVEMENT

Ancillary Equipment Technology
Lexicon 20/20 AD Analog-to-Digital Converter

Computer Software/Peripherals
Digidesign DINR Intelligent
Noise Reduction Software

Microphone Technology
Sony C-800/C-800G Tube Microphones

Sound Reinforcement Loudspeaker Technology
JBL Array Series Model 4894

Studio Monitor Technology
Genelec 1038A

Musical Instrument Technology
Kurzweil K2000RS Sampler

Signal Processing Technology
t.c. electronic M5000 Audio Mainframe

Recording Devices/Storage Technology
Digidesign Session-8 XL Workstation

Sound Reinforcement Console Technology
Yamaha PM4000

Recording Console Technology
Neve Capricorn

HALL OF FAME AWARD

Rudy Van Gelder

LES PAUL AWARD

Peter Gabriel

(L to R) Les Paul,
Rudy Van Gelder,
Bernard Purdie
and Barbara Purdie



David Hewitt
accepts his second
consecutive TEC Award
for Remote/Broadcast
Recording Engineer from
Max Weinberg (L)
and John Sebastian (R).

(L to R) Hall of Fame inductee
Rudy Van Gelder,
TEC Awards Executive
Producer/Mix Editor-in-Chief
David Schwartz and nominee
Russ Titelman relax before the
awards ceremony



Record Plant's Rose Mann, engineer and
nominee Ed Cherney and TEC Awards
Executive Director Karen Dunn
before the awards
ceremony



PHOTOS BY
SUSAN SALINGER

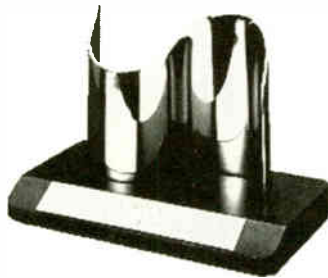


Rcn Means collects JBL's TEC Award
for the Array Series Model 4894 in the
category of Sound
Reinforcement Loudspeaker
Technology from George Petersen (L)
and Howard Schwartz.



THE NINTH ANNUAL TEC AWARDS WINNERS

—FROM PAGE 44, NINTH ANNUAL TEC AWARDS
 in the categories of Computer Software/Peripherals for its DINR Intelligent Noise Reduction software and Recording Devices/Storage Technology for its Session-8 XL workstation. Bernie Grundman captured his third consecutive award for Mastering Engineer and second straight award for Mastering Facility. Other three-time winners included Showco for Sound Reinforcement Company, Westwood One Mobile Recording Division for



Remote Recording Facility and Ocean Way Recording for Recording Studio.

Hall of Fame honors went to master recording engineer Rudy Van Gelder, and Peter Gabriel accepted the Les Paul Award, thanking the audience via videotape.

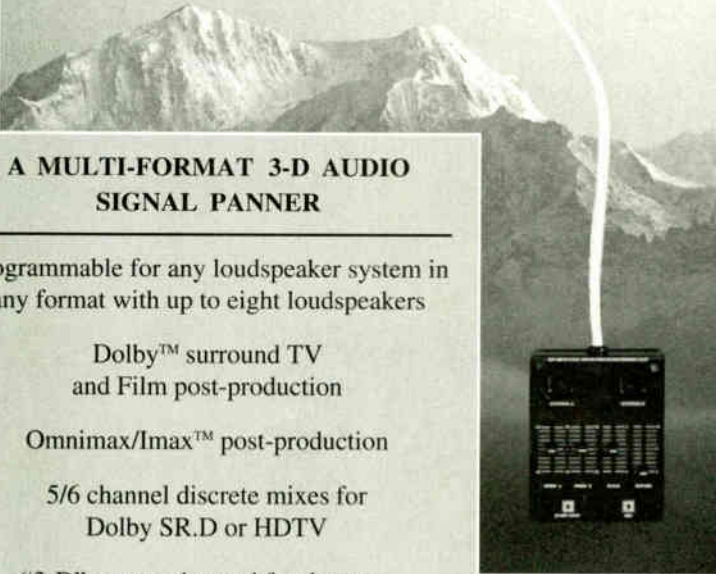
Once again, the TEC Awards raised funds for the House Ear Institute's Hearing Is Priceless (HIP) campaign, bringing the total contribution to nearly \$50,000 over the past four years. Co-sponsored by *Mix* magazine, the HIP campaign is a nationwide effort to increase the public's awareness of the irreversible effects of loud sounds on hearing.

Proceeds from the TEC Awards dinner will also be distributed to the AES Educational Foundation for grants for graduate university studies with an emphasis on audio topics; the Society of Professional Audio Recording Services to provide financial aid to qualifying students enrolled in audio recording programs nationwide; past recording schools winners and nominees that have established TEC Awards scholarship funds; and Hearing Education and Awareness for Rockers (HEAR), an internationally recognized, San Francisco-based organization that works to educate the public, especially musicians, about the dangers of noise-induced hearing loss.

The Ninth Annual TEC Awards were partially financed by the generous donations of Platinum sponsors Act III Publishing, Ampex Recording Media Corporation, JBL and Siemens Audio Inc.; Gold sponsors Alesis Corporation and Solid State Logic; Silver sponsors AKG Acoustics, Aphex Systems, Clair Brothers, Crown International, DOD Electronics Corporation, Dolby Laboratories, The Hit Factory, Lexicon Inc., Meyer Sound Laboratories, Panasonic/Ramsa, Roland Corporation US, Samson Technologies Corp., Sony Corporation, Studer Revox America Inc., 3M Corporation and Yamaha Corporation of America; and Supporter sponsors Digidesign, Otari Corporation, Peavey Electronics and Skywalker Sound. ■

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AES 1993

From October 7-10, 1993, thousands of audio professionals and 350 equipment manufacturers convened at New York City's Jacob K. Javits Center for the 95th Convention of the Audio Engineering Society. The Center proved an able venue for AES, and the spacious new site was a welcome change from the Hilton Hotel's

cramped hallways and dingy, low-ceiling exhibit space.

We asked five Mix editors to provide their slant on AES, with product picks and general impressions of trends that will shape the future of the industry. We'll continue our AES coverage with new technologies spotlighted in our product columns in the months to come.

Multimedia? Schmultimedia!!!

by **George Petersen**

The theme of this year's convention was "Audio in the Age of Multimedia." A seminar on the topic was presented, with

participation by speakers from Aware, Mediavision, Microsoft, SGI, 3DO, Avid and Philips, yet only the latter two actually exhibited at AES, and their emphasis had nothing to do with multimedia. Avid's main thrust was showing its upgraded AudioVision digital post-production workstation, while Philips hawked its DCC technology. Multimedia-specific products were nowhere to be found in the exhibit hall, so the "Multimedia" theme seemed more of a trendy buzzword than a new direction for the audio industry.

But while the rest of the planet waits for the next PC (personal computer or politically correct—your choice) catchphrase, there were plenty of hot new audio production products at AES. Interestingly, it was consoles—and not digital

Mark Cohen shows Tactile Technologies' M4000 console.

PHOTO: GEORGE PETERSEN

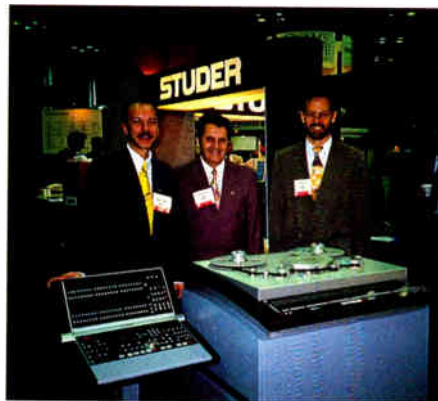


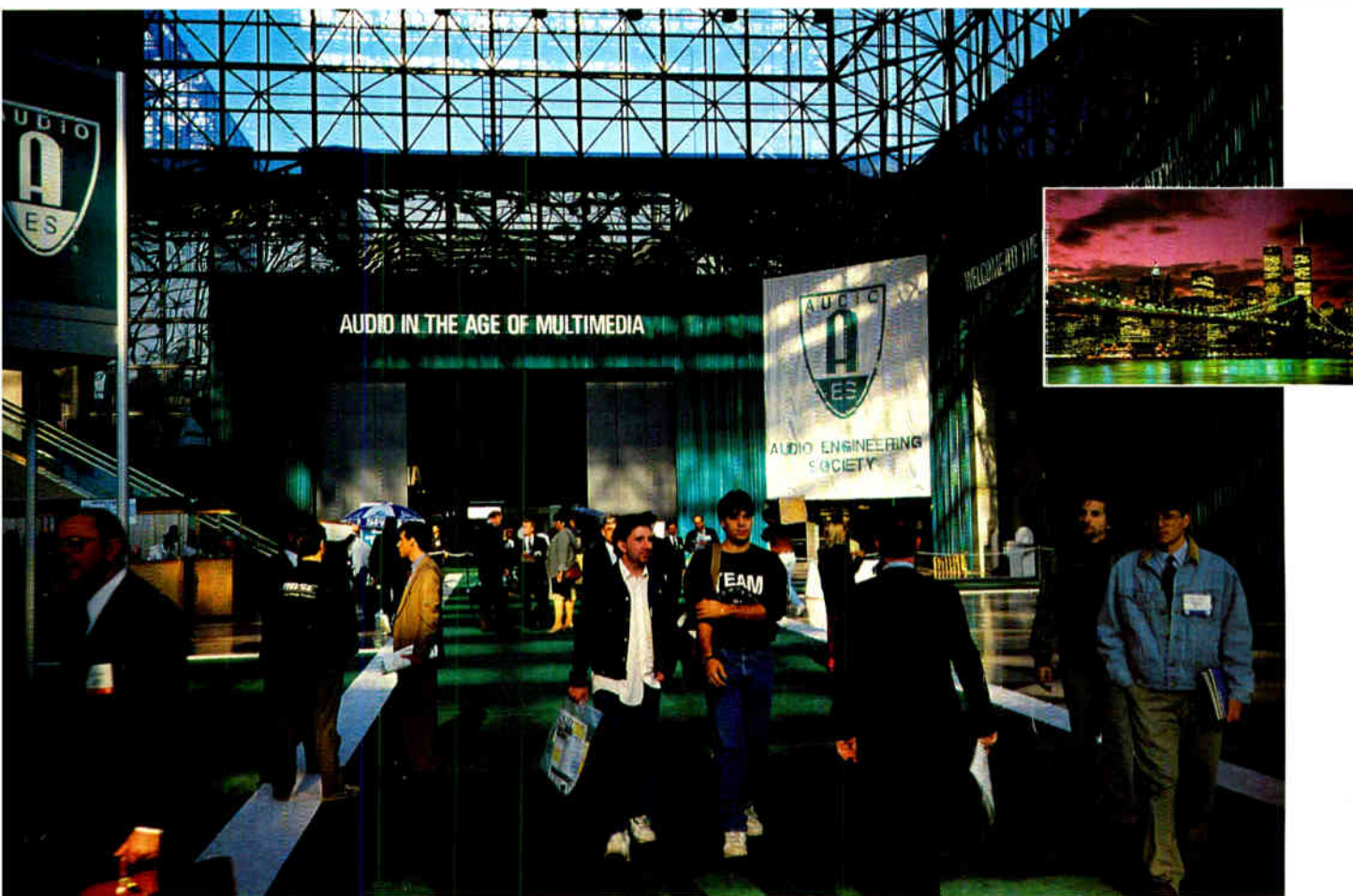
PHOTO: GEORGE PETERSEN

Thomas Knaple, Bruno Hochstrasser and Tom Jenny unveil Studer's new digital 48-track.

gizmooids—that stole the show.

The day before the show, newcomer Tactile Technologies (T2) of Orange, Calif., launched its M4000 digitally controlled analog console. The M4000 consists of a 48-channel controller with an assignable

—CONTINUED ON PAGE 53



AES PHOTO: GEORGE PETERSEN NYC PHOTO: INTERNATIONAL STOCK

Multimedia? Thumbs Up!!!

by Paul Potyen

The "M word" (no, not Madonna) was the word of the day at this year's Audio Engineering Society convention.

According to Ken Pohlmann, *Mix* columnist and this year's AES co-chairman of technical papers, "In terms of technology, there is no question that the industry is moving toward digital audio and multimedia ventures. In the near future, the terms 'digital audio' and 'multimedia' will become synonymous, and audio-only applications will fade away."

That attitude was brought out in Thursday's "Audio in the Age of Multimedia" workshop/seminar, chaired by Aware Inc.'s John Stautner. The panel included Microsoft soft-

ware development engineer Geoff Dahl; Perry Cook from PC sound card manufacturer Mediavision; a Philips spokesperson who discussed CD-I;

John Sell, interactive platform developer from 3DO; Ted Marsh, from computer maker Silicon Graphics; and Avid Technology's Mac Leatherby.

Multimedia technical sessions included a presentation

—CONTINUED ON PAGE 179

Digidesign's new hardware controller for Pro Tools



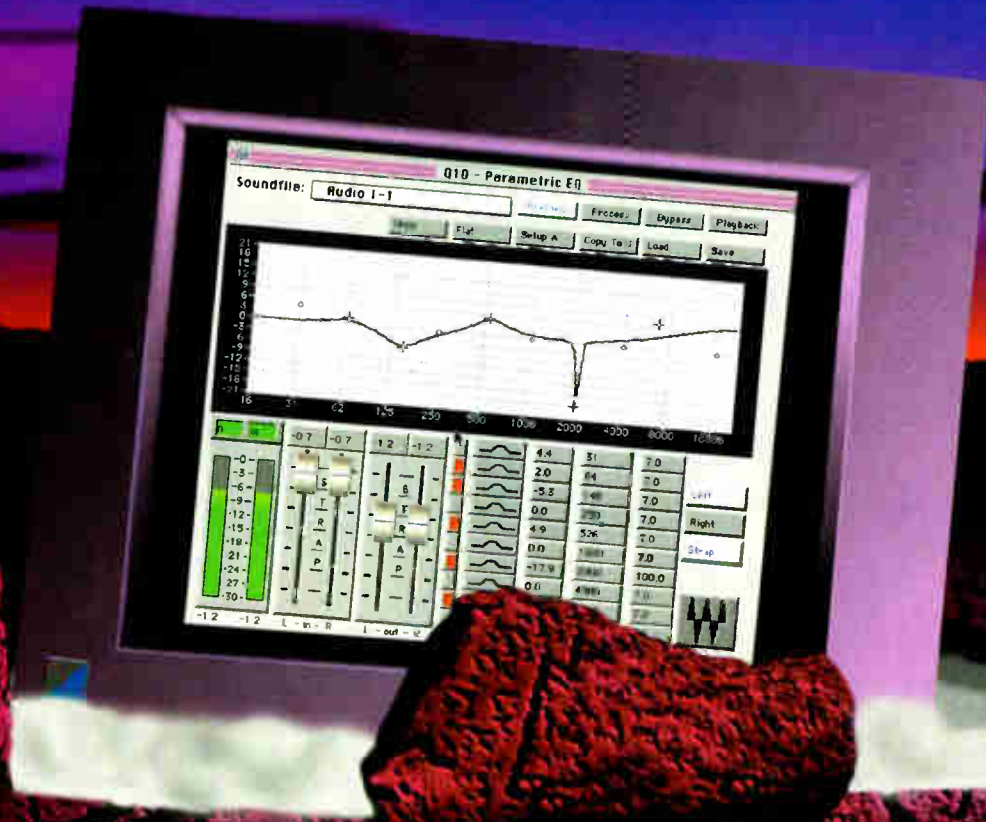
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Over Quality console

—FROM PAGE 50, SCHMULTIMEDIA!!!

central control section; out-board racks contain the power supplies, analog electronics, connectors and signal processing. All console parameters—except talkback and headphone levels—are automated with VCA faders and rotary encoders with LED positional indicators; moving fader automation is optional. Instantly reconfigurable for recording, mixing, sound reinforcement or post applications, the system can be expanded with up to five electronics racks (240 inputs), and any block of 48 inputs can be accessed via a simple bank select switch. The controller is \$10,000; each 48-track electronics package is \$20,000.

Other console offerings were no less impressive. Soundcraft's DC-2000 is a full-featured, in-line recording mixer with intuitive touchscreen control and a rock-bottom price starting at \$24,995 in a 24-channel (48-input) version—including moving fader automation! Not to be outdone, Soundtracs unveiled its in-line Solitaire Production Console, which borrows features from the more expensive Jade console and puts it into a \$19,399 24x24 configuration; frames up to 40-input are available; optional are patch bays, VCA automation, dynamics processing and moving faders. With the latter installed, Solitaire still starts at around \$24,000.

Also in the low-cost/high-performance arena is SoundTech's Panoramic TJO Series, a line of pro 24-bus recording consoles priced from \$12,499 (24-input) to \$18,999 (40-input). Created by noted British console designer John Oram, the TJOs feature 4-band EQ, ten aux sends and onboard gating.

Distributed in the USA by George Massenburg Labs, Japan's Over Quality consoles are now available, with the two first boards installed in two Japanese facilities. An 80-channel version retails for \$780,000; who'll be first to put one in North America? If you're in the market for a more cost-effective approach, Otari announced a new family of digitally controlled analog boards, starting with a 12-bus, \$30,000 model with 48 inputs, dynamic SMPTE-based automation and eight aux sends. De-



livery is expected in the second quarter of 1994.

Mics were big news. AKG unveiled its Vintage TL (C414B/TLII).

which re-creates the classic sound of the AKG C12. And in terms of classics, nothing beats the Neumann U47, which is being reissued (with

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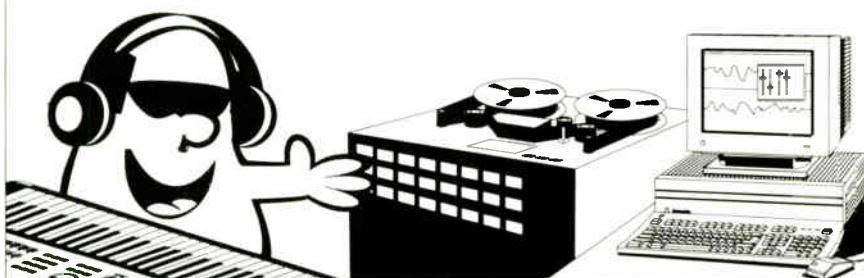
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Workstations were everywhere. Fostex launched the Foundation 2000 (previewed last issue), but the overall trend was integrating random-access video with the disk-based audio. Such systems on display at Avid, Digidesign, Solid State Logic, Sonic Solutions and Spectral Synthesis certainly spell the demise of videotape shuttling in the post suite.

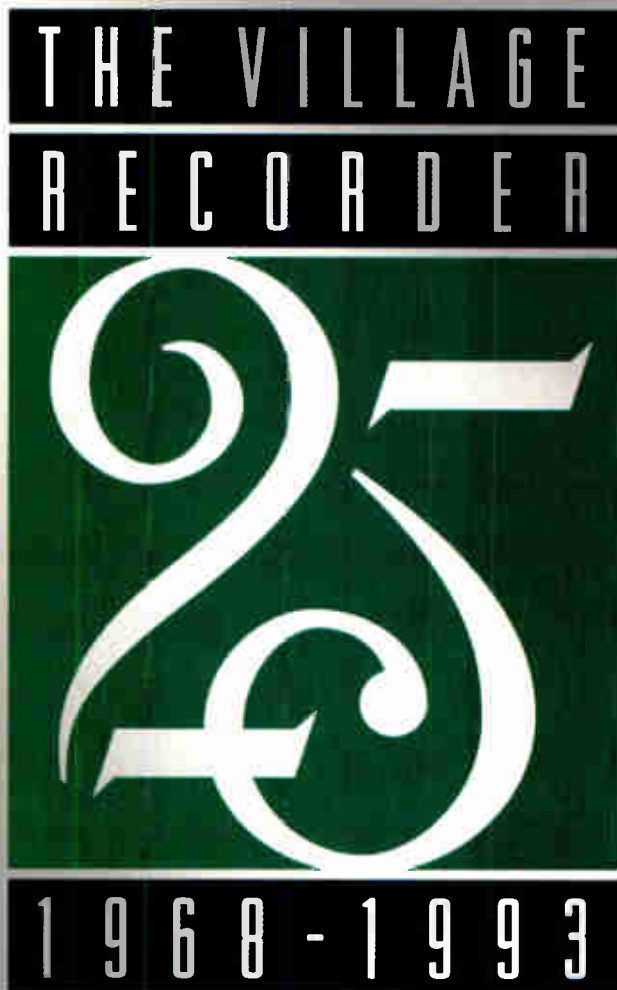
With all the recent attention paid to near-field speakers, seeing some new mains at the show was a welcome change. When you need to experience the bass, you need Hot House's High Output Series. Using Tannoy Super-Dual concentric technology, the model SD-312 provides wide 25 to 25k Hz response with levels approaching 140 dB; it includes front-panel sound level warning stickers. The tri-amped system ships with six Hot House M500 HV mono block amps and can handle 6,400 watts. A 5,000-watt subwoofer is optional.

JBL offered a sneak preview of a DSP-driven studio monitor based on dual-14-inch neodymium woofers and a 1.5-inch exit compression driver coupled to a waveguide horn. An outboard DSP engine provides crossover, phase response correction and transducer signal alignment. No word on availability or pricing, but it sure sounded great.

Studer showed its all-new D827-48, a 48-track DASH-format recorder, which uses Noise Shaping Technology™ to put 18-bit performance into the 16-bit medium. The recorder is also available in a digital I/O-only version, sans converters, for direct connection to a digital console. Prices begin at \$125,000 (\$88,000 for a 24-track version), and its too-cool purple color would enhance any decor.

Apogee debuted its UV22 Super CD Encoding system, a hardware solution to putting more than 16-bits of audio performance on a CD or other 16-bit storage system. The Apogee system goes beyond existing "noise shaping" or "bit mapping" techniques, instead using a digital equivalent of the HF bias frequency used in analog tape recorders. According to Apogee, the UV22 Super CD Encoding allows information normally lost in the truncation process to be retained—even an additional -30dB down in the noise floor. Prototype units have been in use at several top

happy holidays



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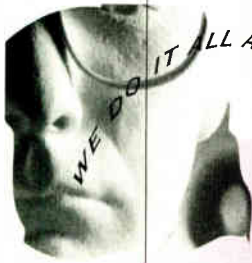
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mastering facilities over the past months, and production models should be available now.

I guess I'll have to take back those nasty multimedia comments I made earlier, as those ever-inventive chaps at HHB (distributed by Independent Audio, Portland, Maine) put together a hip CD-ROM press kit to promote the PortaDAT Series of portable DAT recorders. Available in standard (\$4,375) and time code (\$6,995) versions, the PortaDAT models feature 4-head operation, AES/EBU and S/PDIF digital I/O, balanced mic/line inputs with



HHB PortaDAT PDR1000TC
time code DAT

48VDC phantom power, and a rechargeable Nickel Metal Hydride battery that powers the deck for two hours, without the "memory effect" problems inherent in NiCads.

On the modular digital multitrack front, Tascam announced the shipment of the SY-88 sync cards for the DA-88 and showed its AES/EBU, S/PDIF and SDIF-2 digital interfaces for importing data to/from the DA-88 in the digital domain. In the ADAT camp, Fostex has begun delivering its \$4,795 RD-8 recorder with onboard SMPTE synchronization, and Digidesign showed its interface for transferring 8-tracks of ADAT material to/from its Session-8 and Pro Tools workstations. ■

Tape & Disc Developments

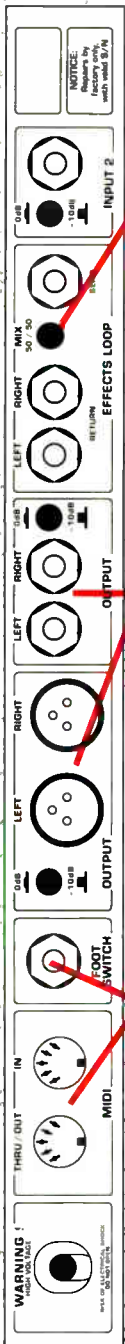
by Philip De Lancie

New technologies continue to be developed for master preparation. A unique entry from Sony is the PCME7700, a \$15,000 DAT-to-DAT editing station. The device incorporates two DAT transports and a micro-

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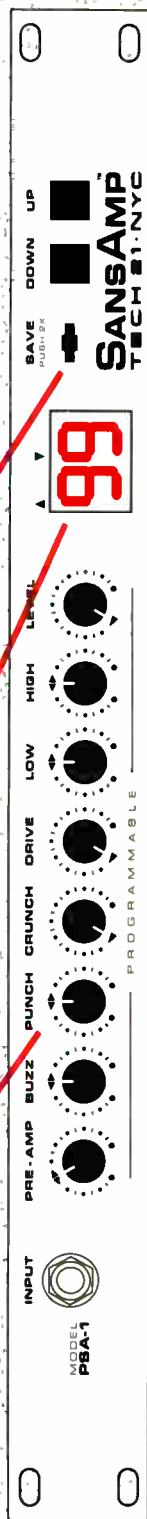
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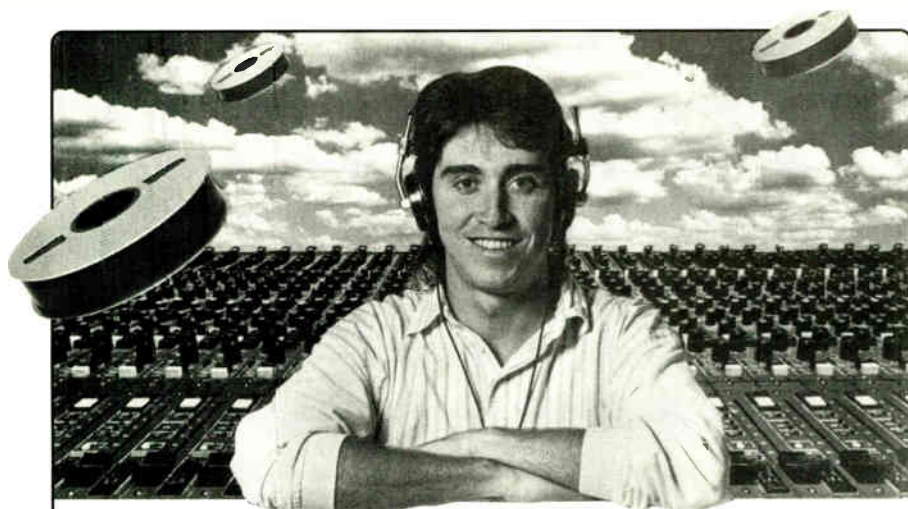
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processor-based edit controller with LCD, all built into one 18-pound unit. Working from a source DAT, an engineer can create an edit decision list and then record an edited copy at two-times real time.

Regarding developments in hard disk-based editors with mastering applications, an upgrade makes Version 2.0 of the SADiE system a new contender. The \$10,000 system is built around SADiE's X-S card, which uses the AT&T DSP32C processor. Designed to run on Intel 486-based PCs, SADiE features a beautifully implemented user interface that is both visually appealing and seemingly easy to use.

On the Mac side, a new 10-band, parametric-EQ software module called Q10 has been developed by Waves for use in the Digidesign Pro-Master 20, Sound Tools II and Audiomedia II environments. Digidesign also introduced Masterlist CD, a CD-mastering module for creating sequenced PQ-coded CD premasters on any SCSI CD recorder.

Sonic Solutions, meanwhile, debuted a new hardware control interface for its systems, available in a single-fader version for mastering applications. The company was also showing a software module allowing CD recording in the new video CD format for linear (noninteractive) programs on CD.

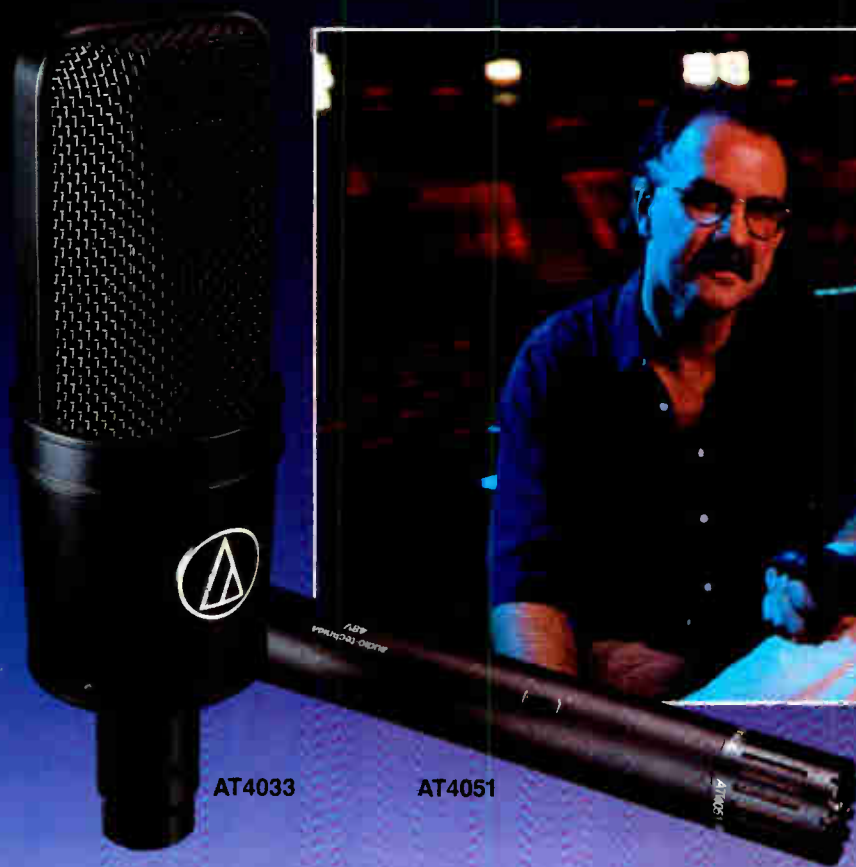
As more CD-recording applications come online, competition is heating up in the blank CD-R industry, with at least seven companies—BASF, DIC, Kao, Mag-Zon, Mitsu Toatsu, TDK and 3M—showing product.

In prerecorded media manufacturing, the show was somewhat less active than in years past, due to the recent emergence of REPLtech as a more focused exhibition alternative. Nonetheless, ODME launched its new media conversion system, which converts CD-ROM and CD-Audio premasters to the 8mm tape-based Exabyte format for glass-master cutting. Exabyte, already a common premaster format for CD-ROM, allows high-speed cutting, which the PCM-1630 format does not.

On the duplication side, Otari was showing revisions to its Loader line. The AL-632 II is an update to the AL632 dual-pancake loader, while the AL631 introduces the same technology in a single-pancake version at a lower price point. ■

Audio-Technica goes on stage 'live' with Jeff Cox!

Production Notebook



AT4033

AT4051

Maryland Sound's Jeff Cox, system designer and operational engineer for the world-renowned Universal Amphitheatre in Los Angeles, was recently asked to try some new microphones for use in the house sound system. Here's his report, verbatim.

"A few weeks ago I had the opportunity to audition a couple of Audio-Technica microphones; the AT4051 and the AT4033," said Cox. "I was thoroughly impressed with the performance of both microphones. I used the AT4051 under the snare, on high hat, overheads,

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audio-technica

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SR Products: Live! From New York!!!

by David (Rudy) Trubitt

The biggest buzz of the show was Peavey Electronics, which demonstrated its forthcoming MediaMation system, developed as a joint venture between Peavey's Architectural Acoustics Division and Boulder, Colorado-based Peak Audio and slated for an early '94 release. MediaMation's hardware starts with a rack-mountable IBM computer (the real IBM, not a clone) that contains slots for plug-in DSP cards. Each card is capable of being configured to perform numerous tasks found in every sound system, such as mixing, parametric EQing, compression, cross-overs and signal delay. Using a Microsoft Windows-based program, you literally draw the block diagram of your sound system onscreen and the audio connections between components.

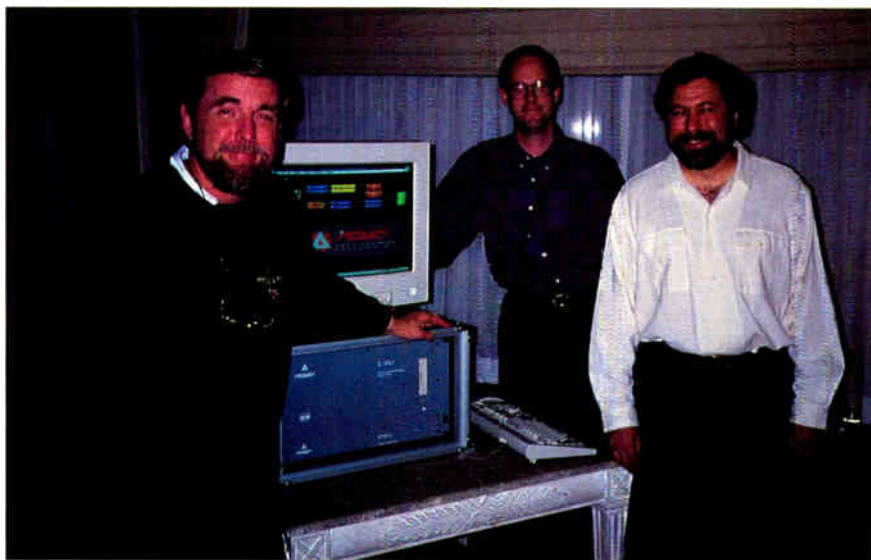


PHOTO: GEORGE PETERSEN

Hartley Peavey, Charles Anderson of Peak Audio and Rich Zweibel demonstrated the Peavey MediaMation system.

Audio specs include 18-bit converters running at 32, 44.1 or 48 kHz sampling rates. While this sort of system eventually will find its way into tour situations, installed sound systems are probably the most obvious candidates for the near term. Bear in mind that no price for the system has been set, and

its delivery date is a projection at this point. However, the system is an extremely significant development, and we'll keep you posted.

New live sound consoles were everywhere. Some were new versions of existing boards; others were entire-

—CONTINUED ON PAGE 177

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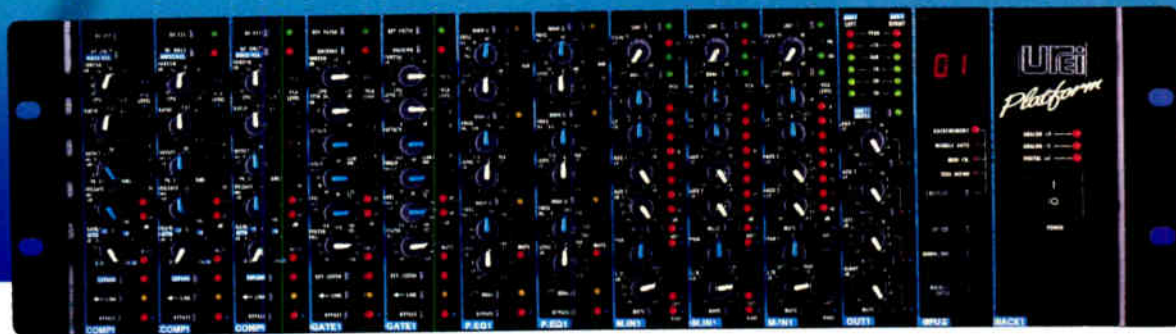
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MULTIMEDIA

MUSIC

BY PHILIP
DE LANCIE

Five Desktop CD-ROM Titles Reviewed

It is axiomatic in the consumer electronics and personal computing industries that software sells hardware. Japanese audio manufacturers got an unwelcome reminder of this fact when they tried to launch DAT without major record label support.

The proponents of CD-ROM technology don't have the label support problem; 1993 has seen the entertainment conglomerates dashing madly to catch the interactive multimedia bandwagon. But the general public remains only dimly aware of this new medium.

While this is widely assumed to be merely a marketing problem, it is fair to wonder if interactive multimedia software is ready to capture the imagination of the entertainment-hungry mainstream. I don't mean fringe cyber-trendies who speak knowingly of "post-linearism," or hypersynaptic preteens on video games. I mean the broad, multi-interest mainstream whose acceptance can turn a format into a universal standard such as CD-Audio or VHS.

If multimedia CDs are going to catch on big-time, they must pass two basic tests: Is the technology capable of consistently delivering a satisfying entertainment experience to the user? And if so, are the software developers using this capability effectively?

Much work remains to be done—particularly in the areas of universal compatibility, video fidelity and ease of use—before multimedia can pass either test with flying colors. But a look at the emerging field of music-related CD-ROMs reveals that entertaining, informative and inventive applications for interactive multimedia are being created and marketed right now, despite all the limitations.

ABOUT THE REVIEWS

Multimedia doesn't lend itself to verbal description. The best way to *get* it is to experience it. But the five reviews below give an idea of how well music and multimedia can go together. The titles reviewed aren't intended to be MTV on CD; they offer more substance than flash. Three of the five are classically oriented, but there is nothing inherent in their approach that could not be applied to other genres—at least those that offer sufficient depth for exploration.

Because the largest installed base of CD-ROM drives continues to be in the computer-hosted desktop market, I haven't looked at titles developed for CD-I, Sega CD or other stand-alone machines. Nor have I looked at projects—including some involving well-known music artists—that are in progress but have yet (as of this writing) to make it to market. All of the titles reviewed here are currently available for the Apple Macintosh; some have been released in MPC versions, also (for IBM-compatibles).

Technically, the discs fall into two categories, depending on how they deliver audio. Discs using "internal" sound store audio on disc in the format supported by the intended playback computer, usually 8-bit/22kHz linear PCM. The audio is played through the computer's built-in speaker or through external powered monitors connected to the computer's audio output jack. Eight-bit audio sounds okay, as long as program levels remain just under digital-zero at all times. In the real world, however, 8-bit usually has a fairly devastating effect on fidelity. But it takes up far less disc space than Red Book audio (16-bit/44.1 kHz).

A "mixed-mode" CD-ROM, on the other hand, is more like an enhanced form of CD-Audio. All tracks except track 1 are Red Book Audio and may be played on a regular CD player. Track 1 is CD-ROM data that includes all the elements of the multimedia program other than the Red Book audio. Put the disc in a CD-ROM drive hooked up to a computer and the multimedia program can direct the ROM drive to any address in the CD's audio tracks, playing the audio as needed throughout the program.

The sound on a mixed-mode disc comes through the audio outputs on the CD-ROM drive (instead of going through the computer). Most drives have a headphone out and RCA jacks that can be connected to self-powered monitors or a full stereo system. Compared to internal audio, mixed-mode can enhance the multimedia experience greatly, but it allows less total audio and data to be stored on disc.

Space limitations preclude listing the minimum system requirements for each of the titles, but none is terribly demanding. If you already have a CD-ROM drive hooked to your Macintosh, your system probably meets the requirements. For these reviews, the discs were run on a Mac IIX with a 50MHz/030 accelerator card, a double-speed CD drive and a 16-inch color monitor.

Most of the discs take a couple of minutes to get going, dragging various files here and there according to the included instructions. All installed and operated without substantial problems. Other users may have more difficulties, depending on CPU speed, memory availability/allocation (RAM and hard drive), monitor settings and conflicts with incompatible system-folder contents.

THE ORCHESTRA

This disc is part of the "Audio Notes" series from Time Warner Interactive (formerly Warner New Media). The titles in the series are mixed-mode discs authored in Hy-

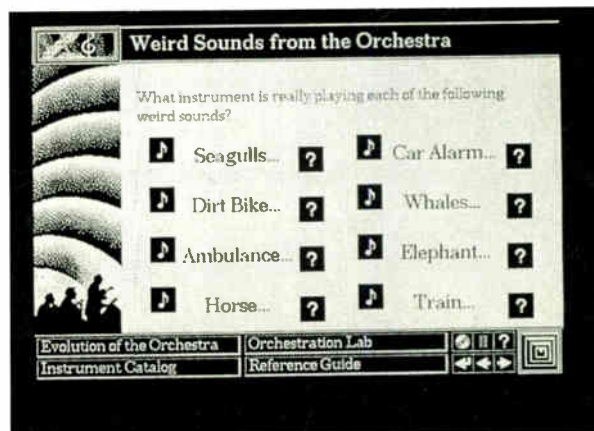
perCard. I looked at *The Orchestra* and *Beethoven: The String Quartet*. (Other titles include *Brahms: A German Requiem* and *Mozart: The Magic Flute*.) The discs are similar in approach and structure, but *The Orchestra* (\$79.99) is newer and, therefore, incorporates many noticeable refinements in operation and visual style.

Despite the rather dry title, British composer Benjamin Britten's *The Young Person's Guide to the Orchestra* (1946) is a brilliant exposition of instrumental texture in orchestral writing. The London Symphony Orchestra's 1963 recording of the work, with Britten conducting, is this title's primary focus and serves as a vehicle through which one can explore orchestral writing, the instruments and music in general.

The strength of the Audio Notes concept is in how it reveals the inner workings of the music as you listen to full-fidelity CD-Audio. The listener can choose from several "channels" of information, each of which is a series of screens flowing along with the music.

On *The Orchestra*, an Exploring the Music channel gives a general descriptive guide to what is happening in the piece, such as which orchestral section is featured at a given moment.

The Theme and Variations channel shows which instruments are carrying main and secondary themes,



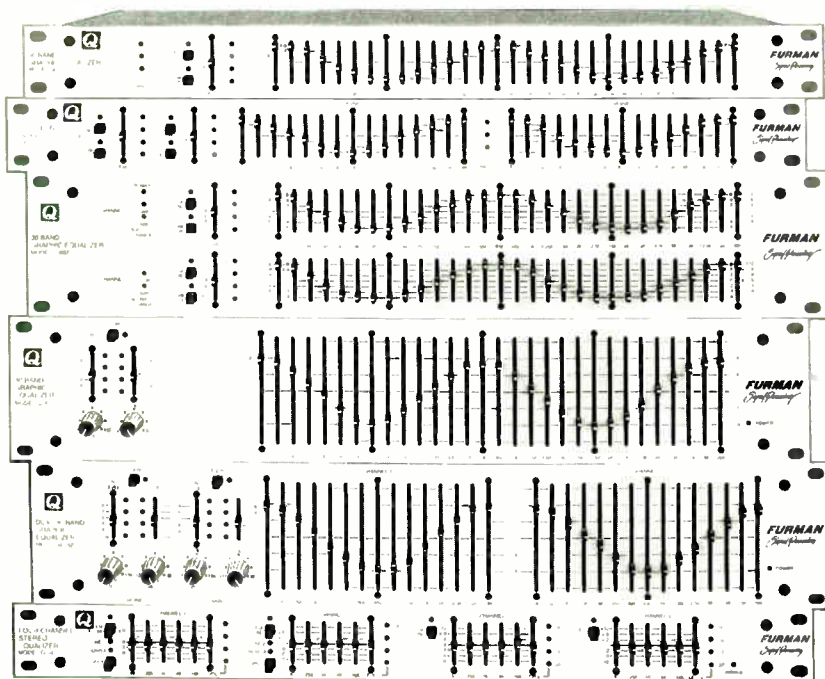
The Orchestra from Time Warner Interactive

which are answering the themes or playing variations, and which passages are transitional areas between main themes. The screens change every few measures as the music evolves. If you need a little help picking out the themes, a click of the mouse stops the main music and plays a solo piano demonstration of the theme from the disc's nearly 56 minutes of musical examples.

Channel 3 is the Music Guide, which outlines the structure of the piece in terms of sections (A, A', B, B', A, etc.). Click on any section and go directly to that part of the music, or just watch the progress of the piece through each successive section.

As the channels go by, certain words in the displayed text may be clicked on to get pop-up glossary entries, which include audio examples. For example, in the entry for dissonance, you can click on different intervals to hear more or less complex overtone relationships. When you close the pop-up explanation, you return to where you left off in

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the channel you were following.

In addition to the channels, the disc contains a wealth of background and explanatory information not directly synchronized to Britten's piece. *The Orchestration Lab*, for instance, lets you pick combinations of instruments and hear them play a melody and accompaniment together (though it won't play combinations it considers "wrong").

The disc also includes sections on conducting, on Britten's life, on the makeup and sections of the orchestra (including an instrument catalog that lets you see and hear instruments) and a time line of European music history with supporting text. Whenever you are in all this information, an easily accessible pronunciation guide lets you hear an announcer pronounce unfamiliar words, such as tempo and dynamics markings. Also included is an "Arcade" of games that let you test the knowledge you brought to or learned from the disc.

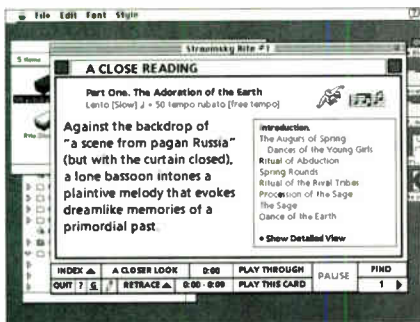
Though every user interface has a couple of quirks to get used to, *The Orchestra's* interface is fairly clear, so you usually have a pretty good idea of where you are and how to move somewhere else. All in all, *The Orchestra* is a fine example of an intelligent, informative and entertaining use of CD-ROM technology—highly recommended for anyone who has the slightest interest in or curiosity about orchestral music or what multimedia has to offer.

THE RITE OF SPRING

The CD Companion series from Voyager is similar in approach to Warner's Music Notes. The series is currently up to six mixed-mode HyperCard titles based on works by Dvorak, Beethoven, Mozart, Schubert, Strauss and Stravinsky.

Stravinsky's *The Rite of Spring* occupies a unique place in the history of music. Written as the score for a ballet, the work has been notorious since its literally riotous 1913 debut in Paris. With its unlikely bassoon opening, unconventional harmonies and shifting, aggressive polyrhythms, the piece upended the conventions of the Romantic era and ushered in the age of Modernism. Eighty years later, it continues to stand as one of the most inventive examples of orchestral writing. The fine recording featured on this disc was performed by the Orchestre Symphonique de Montreal, with Charles Dutoit conducting.

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The Rite of Spring from Voyager

Like *The Orchestra*, Voyager's *Rite* allows the user to hear supplementary examples of individual instruments, to explore orchestral sections and to gain quick access to any part of the composition. It has a series of screens with commentary and thematic analysis that change every few measures, as well as a separate detailed analysis of the work. It also has an exploration of *The Rite* as dance and a section of games/tests.

Particularly strong on this disc is the written commentary, which includes not only information on Stravinsky and the circumstances surrounding the composition and production of the work, but also a section on avant-garde Paris that places the work in the overall context of late 19th-/early 20th-century art. This illustrated text is the work of UCLA professor Robert Winter, who also contributes a spoken-word introduction and occasional audio comments.

Graphically, the design is simple—not unattractive but not particularly developed. As for the interface, I found it somewhat rougher than *The Orchestra's*. For instance, the music stopped when I broke away from the musical play-by-play for more detail from the dance point of view, and it wasn't always obvious how to get back to a given point in the program. But overall, *The Rite of Spring*, though priced a bit steeply at \$99.99, offers a wealth of material certain to enhance appreciation of a true milestone in cultural history.

A HARD DAY'S NIGHT

In a somewhat different vein is Voyager's groundbreaking CD-ROM of *A Hard Day's Night* (\$39.95). The disc uses Apple's QuickTime video compression, operating within HyperCard, to allow playback of the uncut 90-minute movie from CD.

A Hard Day's Night is not a mixed-mode disc; the sound is played through the computer's internal 8-bit/22kHz

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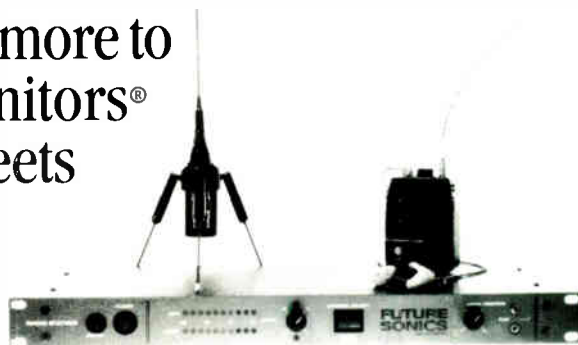
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audio hardware. This actually works alright on the songs, especially the louder ones. But quieter passages—silences in dialog, for instance—are marred by the intrusion of the grainy garbage that is a by-product of 8-bit's extremely limited dynamic range.

Visual fidelity is an issue as well. Because QuickTime uses "scalable" compression, picture quality will vary from machine to machine, depending on CPU speed. On my relatively fast machine, the film actually looked amazingly good in the small mode (about 4x3 inches on my 16-inch monitor). The optional full-screen display, however, which makes greater demands on the CPU, was pretty much unwatchable. Even the small mode was jerky (the frame rate is less than the 24-frames-per-second standard for film), which makes the movie a strain to watch for extended periods. For pure viewing enjoyment, then, the humble VHS format remains far ahead of CD-ROM.

What VHS can't do, however, is provide the true Beatlemaniac with all the supporting information available for enjoyment along with the movie. For example, imagine the thrill of executing a search for the word "dog," then clicking on one of several occurrences in the script and having the movie go directly to the scene on the train featuring a young woman with a dog on her lap.

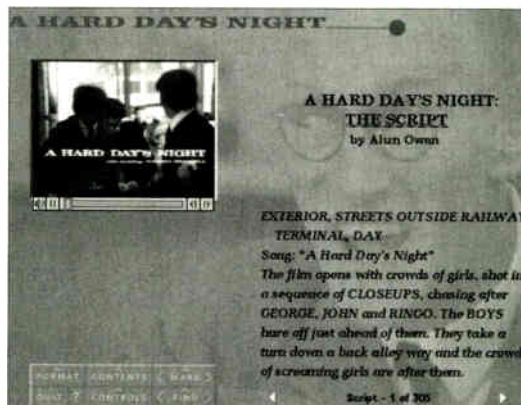
More importantly, the disc offers substantial commentary on the making of the film and the writing and recording of each of the songs (eight screens just on *I Wanna Be Your Man*), as well as profiles of the crew and cast (including the Fab Four themselves) and a gallery of production stills.

One nice feature (especially for the 8-bit-audio-challenged) is seeing the script flow along with the film. On my machine, however, there was a momentary glitch in sound and picture with every screen advance to a new page of text. Automatic page turn was supposed to work with the 166-page commentary, as well, but it didn't (even though it appeared to be selected on the pop-up menu).

As for graphics, *A Hard Day's Night* is a fine example of attractive design in black and white (actually 256 grayscale). The interface stands out as well, with clear controls and easy

access to any part of the material.

For most of us who like the Beatles, the current technological limitations of computer video playback probably mean that a good videotape and some Beatles bio-books with pictures offer a more pleasing (though less interactive) way to get at this material. But for the true fan/addict,



A Hard Day's Night from Voyager

Voyager's *A Hard Day's Night* is a must-buy CD-ROM.

BACH AND BEFORE

Bach and Before is built around a nine-chapter, 145-screen essay tracing European music from its origins in classical Greece up through the work of Handel and J.S. Bach. This mixed-mode disc is the first in Voyager's "So I've Heard" series, which will eventually comprise five discs (three of which are still in development).

The idea of the So I've Heard series is to provide a way to sample a selection of available music recordings from a particular era. The selection is chosen by the essay's author, music critic and lecturer, Alan Rich. Rich's intelligent and readable text is illustrated with attractive art works, and more than 40 buttons dispersed throughout allow the user to hear excerpts from the pieces discussed. (Unfortunately, the excerpts stop when you advance to the next page, so you don't get to read ahead while listening.)

Bach and Before also features a Catalog section linked to the essay. Each card in the catalog gives information about a recording of the period, including the record company and catalog number. There is also a very nice search feature for finding examples fitting a given set of user-defined parameters (Baroque dance, using a lute, on Angel Records). And a discount card included in the package offers \$2.00 off the regular price at

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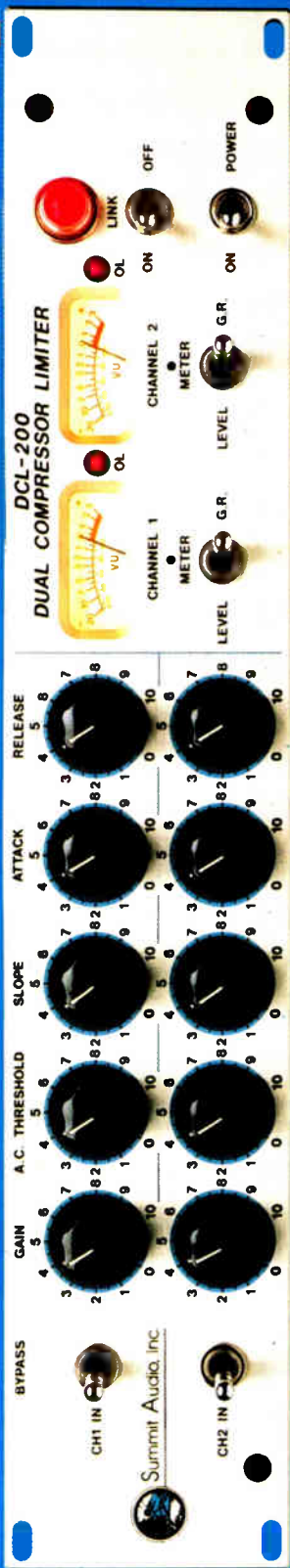
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Considering the So I've Heard series' modest \$24.95 price tag—likely within reach of any CD-ROM drive owner—Voyager appears to have come up with an effective way to broaden exposure to music that many people may know little about. That should work out well for the disc's users and for the artists and labels whose works are represented.

MUSICAL INSTRUMENTS

In *Bach and Before*, the main essay is used as a sort of linear frame on which to hang the supporting material and features. The movie itself plays this role in *A Hard Day's Night*, while the featured compositions serve the purpose in *The Orchestra* and *The Rite of Spring*.

Microsoft's *Musical Instruments*, on the other hand, has no such linear framework. Intended as a reference work, the title does without the narrative flow that makes some of the other discs so involving. Instead, it has a more compartmentalized feel: You work your way down through a couple of menu layers to the core information; you look, read and listen; and then you move on to another entry.

The core information in this case is a collection of detailed and beautifully illustrated explanations of more than 200 musical instruments from around the globe. Access to individual instruments is via any of four main routes: Families of Instruments (string, brass, woodwind, etc.); Musical Ensembles (rock band, jazz combo, orchestra, gamelan, etc.); Instruments of the World (choose a region from a world map, then an instrument from a regional map); and an alphabetical listing.

Each instrument page includes several views of the instrument, labeled for identification of important parts (headstock, tuning pegs, etc.). Some parts merit their own close-up photos: click on the backplate of a Stratocaster, for instance, and see a view behind the plate with the tremolo springs exposed.

Audio examples abound—more than 1,500 according to the box. You can hear the instruments play alone or

in typical ensemble settings. Pop-up windows let you play individual notes yourself with a click of the mouse.

Although *Musical Instruments* is not a mixed-mode disc, it uses 16-bit/22kHz internal audio. That means far better fidelity than the typical 8-bit sound—if you have a 16-bit internal playback card. Although such cards are quite common now on the MPC platform, for which *Musical Instruments* was first developed, they are a recent development in the Macintosh camp (see this month's "Byte Beat").

Microsoft's John Kertzer, who co-produced the title's audio, explains that the 16-bit sound will allow users to experience higher fidelity as they upgrade, rather than locking the title into an 8-bit limitation (as many other



Musical Instruments from Microsoft

Mac titles do). But until Apple's new 16-bit-capable Macs become commonplace, most users will be relegated to hearing the musical examples converted to the standard eight grainy bits.

Musical Instruments is based on a book from British publisher Dorling Kindersley, and it shows that company's trademark graphic style: clean, open pages and more than 500 beautiful photographs. As the only disc reviewed here to use much color, it appears visually richer than the others. The fonts chosen for small text, however, are somewhat hard to read.

Without a linear thread to give the disc direction, some users (the pre-postlinearists) may come away feeling as if they've been wandering rather than really digging deep into the material. Still, however you approach it, *Musical Instruments* (\$79.95) offers much to explore, whether for the student, the curious world music fan or the record producer in search of exotic new flavors. ■

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by Paul Potyen

DIGITAL AUDIO AND THE STATE OF THE MACINTOSH

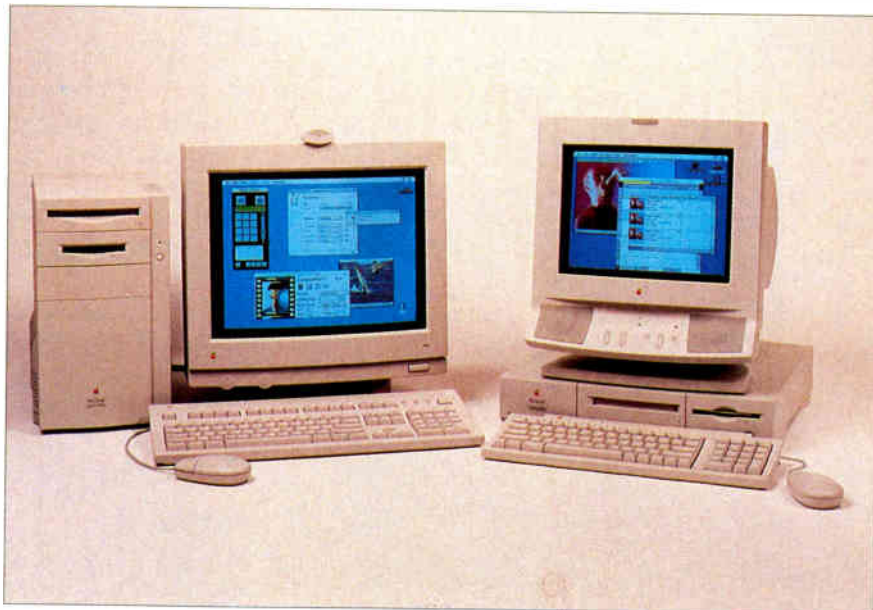
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hose frisky winds of change are gusting again. The high-tech audio landscape can shift quicker than the Sahara in a sandstorm, and recent events at Apple Computer are a case in point. Earlier this year, Apple finally released Sound Manager 3.0 software, which, together with QuickTime 1.6, makes it possible to integrate 16-bit, CD-quality audio into QuickTime movies, as well as the overall computing environment. And the September unveiling of the Quadra 840AV and Centris 660AV machines heralded the first of a new generation of Macs that don't require additional hardware to record and play back CD-quality digital audio.

The Mac has long been the platform of choice for computer-based digital audio production, thanks in no small part to the efforts of third-

party hardware/software solutions from Digidesign. Until recently, the Mac supported only 8-bit, 22kHz, mono digital audio playback. If you wanted to play a QuickTime movie containing 16-bit, 44kHz stereo audio through the speaker on your stock Mac (well, okay, I know none of you would *want* to do that), you would hear a truncated version of the audio at 8-bit, 22 kHz. Without Sound Manager 3.0, you wouldn't be able to route that audio through your 16-bit audio NuBus card.

The availability of Sound Manager also means that third-party developers can use Apple's Sound Manager code to develop their own audio record/playback hardware and software. The first company to do so is Spectral Innovations Inc. (San Jose, Calif.). Its NuMedia board uses



QUADRA 840AV

Apple's New Sound Manager (top) lets you select the input and output devices connected to your Mac. It's also where you specify the inputs for the NuMedia card.

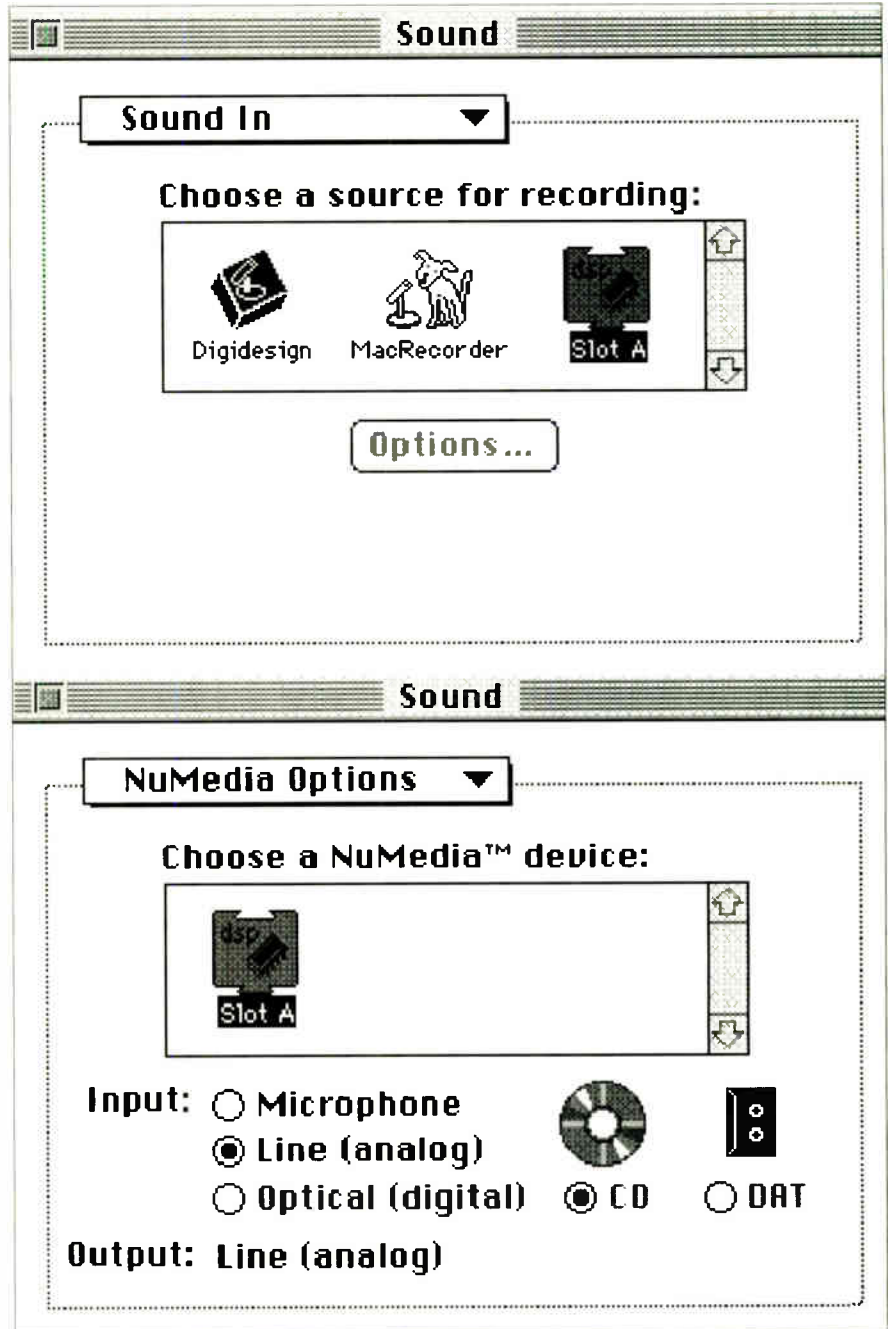
AT&T's DSP3210 chip to record and play back 16-bit stereo sound at sample rates up to 48 kHz, giving any NuBus Mac the same audio capabilities as an AV Mac, provided there is recording and editing software available. (As of this writing, OSC DECK II 2.1 is the only editing option.) It's a good bet that more companies will follow Spectral's hardware lead.

So if you are looking to buy a Mac for audio production (or upgrade from your current model), it's time to start asking questions. Should you buy one of those new AV Macs? Would a Quadra 800 and a Digidesign product be a better choice? Is sophisticated editing software—a *la* Sound Designer and Alchemy—available for this new generation of AT&T-based audio products? Would it be better to wait until March, when the new PowerPCs are scheduled to ship? And what about other current (or future) alternatives to the industry-standard Macintosh/Digidesign solutions?

NUMEDIA

The first hardware to take advantage of Sound Manager 3.0, Spectral Innovations' NuMedia, addresses the needs of multimedia content developers who want higher-resolution audio. It consists of a single 7-inch NuBus card (the only audio card that will fit into a Centris 610), a NuMedia software disk, a manual and Passport Producer media integration software. The card offers stereo mini-jacks for mic level and line level analog inputs, and for line level analog outputs. Digital I/O is available only via fiber-optic connectors. No cables are included in the package. According to Spectral, the sigma-delta converters offer over 85 dB of dynamic range—less than that of an AudioMedia II card (90 dB) or Sound Tools II (95 dB).

NuMedia software consists of the



following:

- Apple's Real Time Architecture system extension, which provides the operating system support needed to take full advantage of the AT&T 3210 DSP—essentially the same audio functionality that exists in the AV Macs
- Spectral's NuMedia system extension, which provides the link between ARTA and the NuMedia

hardware

- Apple's Sound Manager 3.0 system extension, which provides the system support needed for 16-bit, CD-quality sound and the other audio features of NuMedia
 - A sound control panel device, which gives the user access to the added features provided by the system extensions.
- Basic recording and playback

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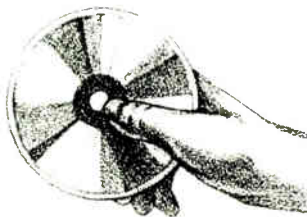
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using the NuMedia card are possible via software that uses ARTA, such as Adobe Premiere or Passport Producer. If you want to perform more than simple edits on a sound file, you can save the file as an AIFF file and use a program such as Sound Designer with corresponding Digidesign hardware, or you can use third-party editing software that supports the NuMedia card. To date, OSC's DECK II 2.1 is the only software that allows editing of sound files via the NuMedia card. In fact, DECK II is capable of recording and playing back as many as four tracks of 16-bit audio via any of the Digidesign cards and the NuMedia card, as well as via the audio I/O of the AV Macs. More about this later.

"We see our primary market to be users of non-AV Macs," says Michael Kane, vice president of marketing at Spectral Innovations. "However, ARTA is set up to support multiple DSPs. So you can use our card to add a second DSP to an AV machine, which is a good solution if you want more than two independent audio I/O channels." And, according to Kane, the NuMedia drivers are optimized for use with QuickTime, offering superior audio performance over other 16-bit audio cards in that environment. Although its primary customers are multimedia developers, the company is considering adding an S/PDIF I/O breakout box for its card in order to address the needs of the audio industry more adequately.

THE NEW MACS

Is there an advantage to buying a new AV Mac? Maybe. The new computers incorporate the same AT&T chip used in the NuMedia card to achieve 16-bit stereo audio directly from the motherboard. Despite the fact that these new machines lack digital I/O ports (not even fiber-optic, as in the NuMedia card), there is a market of musicians and independent audio-for-video and radio producers who would like an off-the-shelf computer that is capable of 16-bit multitrack audio. It's a safe bet that someone will come up with an inexpensive digital I/O add-on for those who want it.

At about 85 dB of dynamic range, the audio quality is the same as that of the NuMedia card, which is cer-

tainly acceptable for some purposes. For example, a facility could use AV Macs as inexpensive track-preparation stations for a more elaborate DAW-based suite. Audio could be digitally transferred in the big room, copied to removable media, then loaded into a stock Centris 660 AV with headphones for editing using an application such as DECK II. Alternatively, files could be transferred via Ethernet.

The AV Macs are also capable of asynchronous disk I/O, which allows them to perform *cooperative multitasking*—efficiently executing two separate tasks simultaneously. This capability serves the same purpose as Digidesign's System Accelerator card, which is used in Pro Tools systems that are more than four tracks. The result with the AV Macs is that screen redraws and other CPU-intensive tasks are not affected by the throughput of the audio—a big plus for multimedia developers.

One obvious benefit that can be derived from cooperative multitasking on the AV Macs is in audio post-production for video. Because of the system's high-bandwidth, frame-accurate, software-based synchronization is possible with DECK II's audio tracks and QuickTime video. If you need better video resolution, you can sync to live video on your AV Mac monitor, using your video deck as the source, while playing your audio tracks.

The Quadra 840AV is unquestionably the fastest Mac available today. If that's what you need, it's a good buy. But you'll probably want to use third-party audio hardware and software for pro-level production, rather than making use of the onboard audio features. The same holds for video production: Higher-performance solutions are available (for a price) from third parties.

OSC DECK II

DECK II is capable of four tracks of 16-bit audio—mixed to stereo—in addition to 24-bit mix automation on all the Digidesign cards (except the original Sound Accelerator), the RasterOps MediaTime board, Spectral NuMedia board and the native DSP on the AV Macs.

"We could write a version of DECK II that directly drove the Sound Manager," says Josh Rosen of OSC, "and that would be cool because we

—CONTINUED ON PAGE 74

CHIPSHOTS

OPCODE STUDIO VISION 1.5

Opcode Systems (Palo Alto, CA) released Studio Vision 1.5 MIDI and digital audio sequencer. The new software offers 4-channel compatibility with Digidesign's Audiomedia, Sound Tools and Pro Tools NuBus cards. Sound Tools II and Pro Tools cards provide simultaneous, independent 4-channel I/O with Studio Vision; the other cards allow four channels mixed to stereo. The software is the first to support the Digidesign Audio Engine, which allows integration with Digidesign's TDM bus for "patching" digital audio between software internally to the Macintosh. Other major enhancements include audio scrubbing and MIDI Machine Control.

Circle #200 on Reader Service Card

AVID MEDIA COMPOSER 1000 AND AUDIOVISION

Avid Technology Inc. (Tewksbury, MA) introduced a new model in its Media Composer family of digital nonlinear editing systems: The 1000 model systems began shipping in September, with real-time effects hardware planned for late fall. This new online editing system offers high-quality, 30-frame/60-field-per-second images and the ability to master programs directly from disk. Other features include 24 virtual tracks of 16-bit, 44.1kHz, CD-quality audio; audio scrub for pitch change and waveform display in the timeline; real-time digital video effects; and a titling tool. The system includes a Macintosh Quadra 950 with a 230MB hard drive; two 14-inch multisync monitors; video, advanced JPEG, audio and SCSI-II boards; an effects module; speakers; cables and documentation.

Version 2.5 of Avid's AudioVi-

sion digital audio workstation was released at AES '93, featuring time compression/expansion, pitch shift, waveform display enhancements, on-the-fly punch-ins, blip audio scrub, additional video support and other improvements. Customers can now purchase the Model 8, Model 4 or Model 4C as a baseline and choose from a range of storage and synchronization packages. Price points are approximately \$50,000 for the Model 8 and \$40,000 for the Model 4.

Circle #201 on Reader Service Card

ARBORETUM SYSTEMS HYPERPRISM

Arboretum Systems (San Francisco) announced Hyperprism, the first commercially available real-time audio signal-processing program for the Macintosh. Utilizing any Digidesign digital audio card, Hyperprism allows you to apply nondestructive, dynamic effects

—CONTINUED ON PAGE 76

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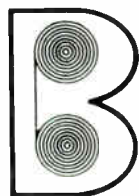
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—FROM PAGE 72, BYTE BEAT

wouldn't have to customize it for individual cards. Each hardware manufacturer's drivers would then take care of the I/O, but those drivers aren't efficient enough to do four tracks of audio plus automation. The Sound Manager sacrifices efficiency for generality. Our strategy was to write custom code for all the different configurations, rather than using the Sound Manager to perform the audio tasks." Because of this strategy, DECK II users can perform background tasks as intensive as optimizing a hard disk while they're playing audio from the program.

According to OSC, the latest version of DECK is capable of handling eight tracks of audio through a single Pro Tools card on a Quadra *without* a system accelerator.

DIGIDESIGN

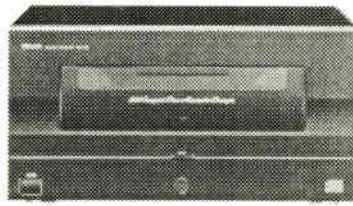
Some third-party developers are hesitant to provide support for the DSP on the AV Macs, at least partly because of Apple's unwillingness to promise that capability on future Macs—in particular, the PowerPCs. Digidesign is among those developers. According to Rob Curry, VP of software engineering at Digidesign (Menlo Park, Calif.), "We support Sound Manager with input and output drivers that are optimized to work smoothly with the QuickTime video boards from Radius, RasterOps and SuperMac. We expect that a lot of people will choose our AudioMedia II board for audio editing in connection with QuickTime applications.

"In addition, Turbosynth will run on a NuMedia card via the Sound Manager. And we're looking into doing a Sound Manager-savvy version of Sound Designer, which won't be linked to our cards as a way of copy protection. Of course, you wouldn't get all the DSP capabilities of the software. You'd simply have a SoundEdit Pro on steroids.

"But as far as the AV Macs go," he continues, "on one hand, we think that the AudioMedia market may be decreased by their existence; on the other hand, they provide a lower entry-level barrier, and we'd love to sell software-only products to that market. But until Apple decides to put the DSP chips and ARTA on the PowerPCs, we feel

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it wouldn't be a wise use of our resources to support that architecture, nor would it be wise to recommend to our customers to get into it.

"We are also pretty confident that Apple is not going to be building machines with XLR jacks or 20-bit converters on them. So for the high end, that world isn't going to change that much. We feel the AV Macs have a very limited lifespan. In the future, maybe the PowerPC could run Pro Tools via the Sound Manager because of its wider bandwidth. But we're taking a wait-and-see attitude."

ADDITIONAL SOFTWARE SUPPORT

What about the other companies who have made an investment in bringing high-resolution digital audio to the Mac? In case you were considering Passport Design's Alchemy for professionally editing your audio, think again. The company has taken the product off the market, and according to a company representative, Passport will only offer technical support and upgrades to its existing Alchemy customers.

According to Paul de Benedictis, communications director at Opcode Systems (Palo Alto, Calif.), next year that company will support the AV Macs—along with NuMedia and other third-party audio cards that mimic the audio functionality of the AV machines—with Studio Vision and other software. Mark of the Unicorn, Steinberg and EMagic also have promised AV Mac versions of their MIDI/audio sequencers at some point in 1994. ■

Mix associate editor Paul Potyten predicts with confidence that the weather will be windy, and then it will become calm at some point after that.

...CHIPSHOTS

—FROM PAGE 73, CHIPSHOTS

on the fly to an AIFF or Sound Designer II file, or to real-time audio routed through the sound card's digital or analog inputs. Effects include lowpass, highpass, bandpass or band-reject filters; modulation effects such as phasing, flanging, cho-

using, tremolo and vibrato; and other effects such as ring modulation, frequency shifting, simultaneously independent variation of speed and pitch, envelope and pitch followers, stereo dynamics and panning. The mouse is used to draw variations in the parameter settings while the audio is playing; the values are displayed and applied to the sound while you draw, and the result can be saved as a Hyperprism file and applied to the sound file to create a new AIFF or Sound Designer II file. Retail price is \$395.

Circle 202 on Reader Service Card

OMI HYBRID CD

Optical Media International (Los Gatos, CA) announced a version of its Macintosh line of QuickTOPIX CD publishing and mastering software that will work with Apple's Media Kit to produce multiplatform CDs in the new Hybrid format, which can be played back on Macs, Windows-based PCs and other platforms. The CD recorder and TOPIX software was scheduled to be available in the third quarter of '93, starting at \$8,500.

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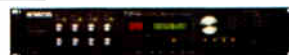
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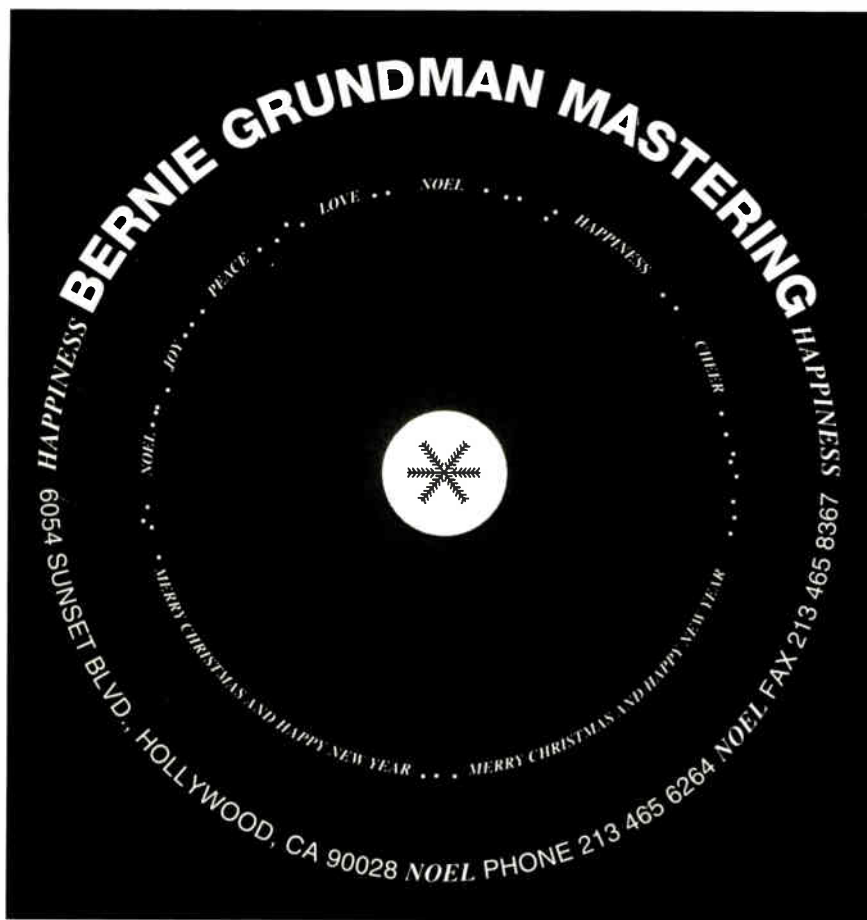


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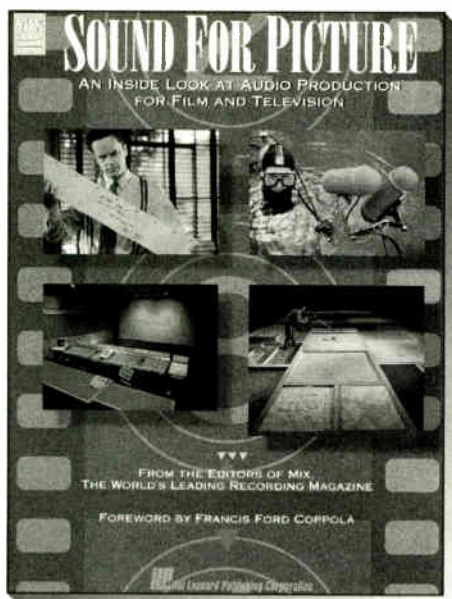


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DIGITAL

EXPRESSIONS SOFTSPICE

New from Digital Expressions Inc. (Bellevue, WA) is the SoftSplice Professional 4-Track Digital Audio Editor. The system starts at \$2,395 and includes 33MHz DSP, unlimited-length crossfades, SMPTE chase-lock support, parametric EQ, fully automated mixing and graphical nondestructive editing. SoftSplice is fully portable and requires only a 68020-based Macintosh.

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FUTUREVIDEO V-STATION II

This new desktop video post-production system from FutureVideo (Aliso Viejo, CA) is based on a 386DX, 40MHz, IBM/compatible platform. The system performs interformat edits, reads and writes SMPTE time code, generates titles and displays Targa-compatible computer graphic files, creates various video fades/wipes/dissolves, and fades and mixes six channels of audio. The V-Station II is available as a turnkey system, complete with SVGA color monitor, keyboard, mouse and cables. Prices start at \$3,995; components can be purchased separately.

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DATA TRANSLATION MEDIA 100

The Media 100 from Data Translation's Multimedia Group (Marlboro, MA) is a 100% digital online, nonlinear video production system for the Macintosh. The program lets users digitize analog video and audio, store it, edit it and record the results back onto videotape. Video output is 60 fields and 30 frames per second, and the system supports input/output of four independent stereo tracks of CD-quality audio. Requirements include a Quadra 800, 840 AV, 900 or 950 with two NuBus slots, 24MB RAM, System 7 and QuickTime; the system (minus the computer) is priced at \$11,995.

Circle #207 on Reader Service Card

by Dan Daley

THE NUMBERS GAME... NOW SANTA HAS A DATABASE

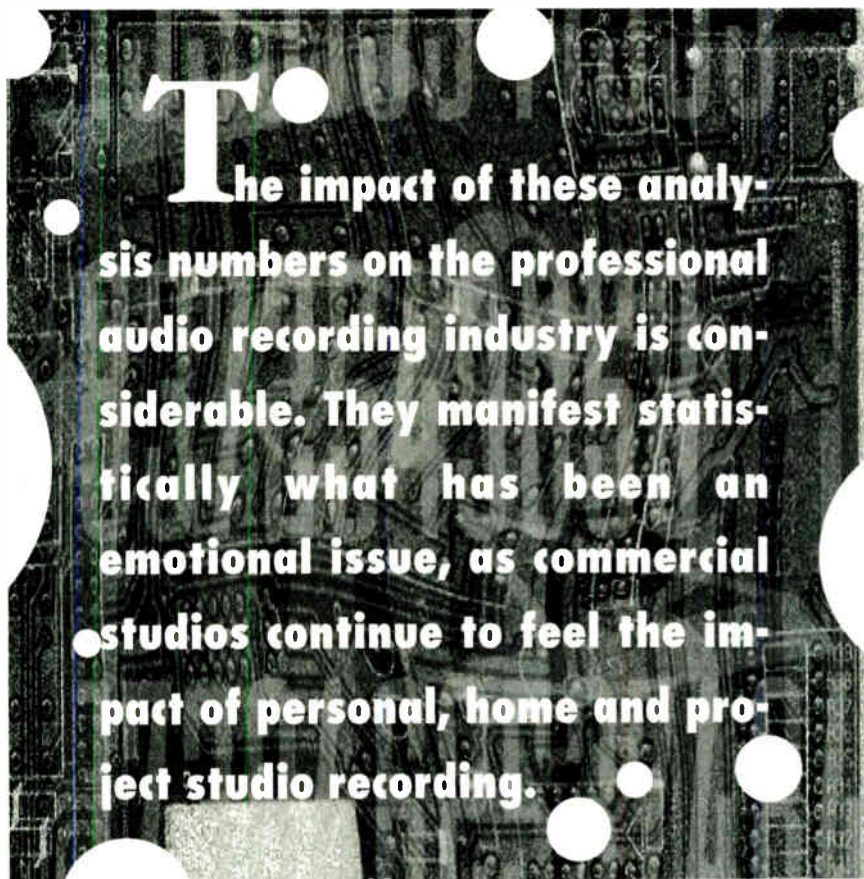


ast year at this time, "Studio View" asked around to see what project-studio people were putting on their holiday shopping lists for the coming year. Projects were still new enough for the industry to wonder about their technology tastes.

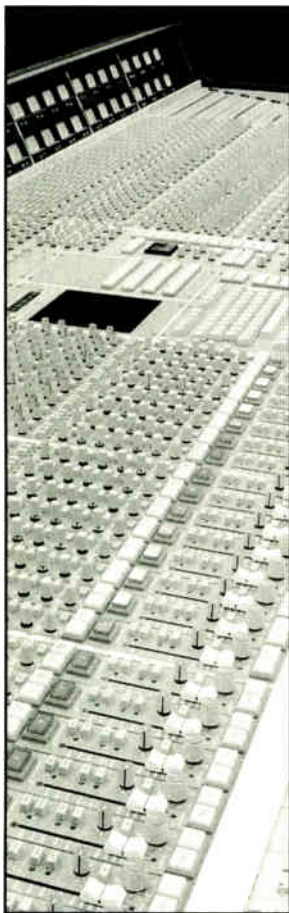
Now we know. Or at least, we know more than we did. For the first time, the National Association of Music Merchants has released a comprehensive statistical analysis, compiled by Music Trades Corp. from manufacturers' shipping re-

ports. The analysis lists a lot of the gear indigenous (though not solely so) to project studio use. Although interpreting some of the figures for this market requires some admittedly subjective reasoning, it provides a glimpse at the economic impact that project studios have had on our industry so far.

Before crunching the numbers, remember that this analysis is based on equipment sales from music stores, which used to have only a peripheral connection with the pro-



The impact of these analysis numbers on the professional audio recording industry is considerable. They manifest statistically what has been an emotional issue, as commercial studios continue to feel the impact of personal, home and project studio recording.



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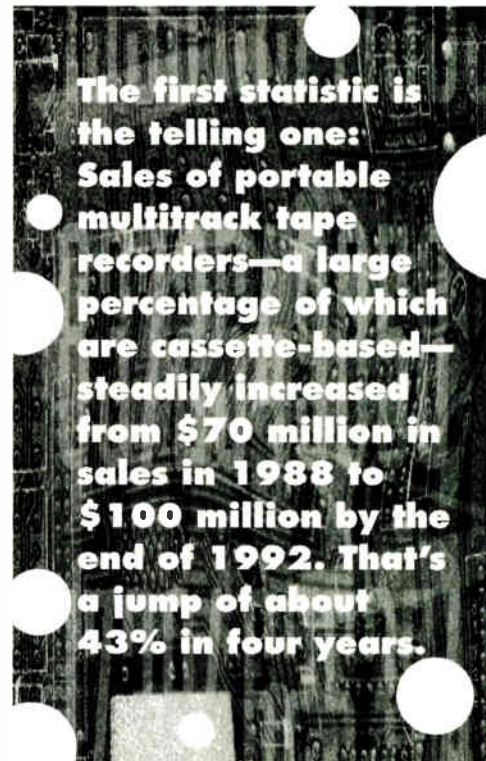
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STUDIO VIEW

professional recording industry. But now when you walk into Manny's and other major MI retailers, you'll see multitracks and DAT machines competing for space and attention with guitars and drums.

THE TALE OF THE TAPE

The first statistic is the telling one: Sales of portable multitrack tape recorders—a large percentage of which are cassette-based—steadily increased from \$70 million in sales



in 1988 to \$100 million by the end of 1992. That's a jump of about 43% in four years. Because Alesis' ADAT digital 8-track system, which is included in this statistic, was available for only a portion of 1992, and Tascam's DA-88 was still a year away, expect those new formats to push sales in this category even further, because both are being sold by MI dealers. (Multitrack sales figures do not take into account computer-based, hard disk systems.) In fact, the largest one-year jump in sales occurred between 1991 and 1992, the year the ADAT was introduced. Sales of multitracks went from a value of \$88.75 million to \$100 million, and sales of ADATs are reported to be somewhere around 12,000-plus units worldwide. Interpolate away.

Music software products, including sequencers, notators, and recording and editing programs, accounted for \$50 million in sales in 1992, showing steady if not spectacular increases since 1988. NAMM does not report on sales of computers and peripherals used for music or recording applications, so add several tens of millions into the equation, and you're looking at \$200 million-plus annual sales just for the multitrack storage hardware and software! If even half of that equipment is used in professional applications in project studios—and that's not an unreasonable assumption—then the impact of project studios on the commercial recording industry takes on a quantitative form.

SIGNAL PROCESSING, ETC.

It's hard to say who is responsible for signal processing sales jumping by more than 66% in four years: guitarists loading their racks or project studios loading theirs. Keep in mind that this category covers the gamut from a Lexicon LXP-15 to a DOD footpedal delay.

Storage system sales are probably the most reliable indicator for tracking the progress of project studios in the NAMM survey. Many of the other items are common to recording and musicians; however, they may tell a tale. For instance, though synthesizer sales increased from 52,424 units sold in 1991 to 54,929 units in 1992, they steadily declined in 1990 and 1989. In fact, in 1988, 91,000 synths were sold—65% more than last year.

Sound module sales have been increasing steadily, however—63,350 last year vs. 42,300 in 1988. Although sound modules can be used to increase anyone's range of sounds, it could be argued that racks heavily laden with them might be more at home in a project studio than in a road case. This position is also buttressed by sales of controller keyboards, which doubled from 1991 to 1992, to 4,850 units sold.

Drum machines, which tend to have fairly long lives compared to other electronic hardware, remained steady at 48,500 units for the last two years. Hardware-based sequencers have fallen out of favor, apparently, with sales tumbling from 21,100 units in 1988 to 8,660 last year. Sampler sales (including sampling keyboards) are also declining,

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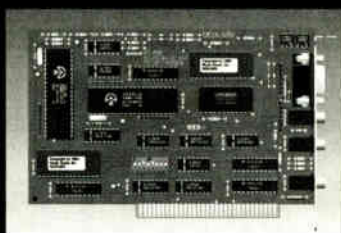


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down more than 20% over the past year. Considering their role as a storage device and the MIDI capability many of them now offer, this statistic just plain confounds me.

STATS OF THE FUTURE

How specific will figures get in the future? Hard to say, according to Jerry Derloshon, director of communications at NAMM's headquarters in Carlsbad, Calif. The whole phenomenon of personal, home and project studios wasn't part of the game plan when the parameters for the statistics were established. However, he added, any sort of statistical analysis, including the use of Roper polling, is feasible and possible in the future, once NAMM perceives some need or demand from its membership. "The potential is there for any type and degree of specialization that the industry deems necessary," Derloshon explained.

The most recent figures from NAMM are not as specific, but they point to at least a flat rate of sales for personal recording. These sales figures show that the items falling under the Recording Equipment category indicate a 10.9% growth as of last spring, but figures for July 1993—as compared to the year before—show recording equipment sales down 32.7%, with a year-to-date rate of 1.3% below last year. This is compared to an overall 4.3% growth for all sales combined. Signal processing shows flat sales, while synthesizer sales grew marginally at 2.1% YTD. These figures, however, reflect the status of sales as of the summer, not a notoriously hot sales period for anything but ski equipment.

The impact of these numbers on the professional audio recording industry is considerable. They manifest statistically what has been an emotional issue, as commercial studios continue to feel the impact of personal, home and project studio recording. And although numbers can be cold calculations, they do provide another kind of framework around this sensitive issue. Now, if we could only figure out how many project studios there are. ■

Dan Daley is Mix's East Coast editor. He's been involved in numbers games before, but of a slightly different nature. Mostly in New York.



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by Mel Lambert

TOUCHDOWN STUDIOS

A GERMAN STUDIO'S PLANS FOR PORTUGAL

In the few short years since it opened, Touchdown Studios, located 12 miles north of Munich, Germany, has attracted a great deal of international attention. In addition to offering a cross section of recording and production services, Touchdown's main remix room, Studio B (designed by Roger Quedstedt), features what is described as the world's first software-configurable processing and monitoring environment. This studio features multiple discrete channels of monitoring that can accommodate

complex will be completed in two phases. Phase One, due for completion by summer 1994, will include two state-of-the-art recording/overdub rooms, a dedicated remix suite with overdub booth, plus four editing suites. Phase Two, housed in a second building on the complex, will add two more mix suites: one for music production and the other for HDTV film/video dubbing and mix-to-picture.

Commenting on room configurations for Phase One of the project, Drivas explains that "the larger recording room, Studio A, is designed for orchestral or group sessions and will measure some 2,100 square feet with 30-foot ceilings." Variable acoustics will allow clients to tailor their sound to suit the session. The room also will feature lots of natural light and views out over the sea. The control room measures 650 square feet.

Studio B will be slightly smaller and features multiple isolation booths; it measures about 800 square feet with 15- to 18-foot ceilings. To ensure compatibility between sessions, the control room is virtually identical in size and features to Studio A's.

The four analog/digital editing suites are designed to accommodate audio-for-video, film, MIDI/music pre-production, CD mastering and other functions. The nine-acre complex also will offer a wide range of creature comforts, including townhouses for visiting artists, as well as a fitness center with tennis courts, swimming pool, sauna and Jacuzzi. The total equipment budget for Phase One is between \$15 million and \$20 million.

At press time, final equipment decisions for the new rooms had yet to be made. However, the studio's new



At the ground-breaking for Touchdown Portugal: Ed Evans, technical director; Karin Schone, executive assistant; Terry Drivas, owner; Kiera Leeming, head of marketing; and Neil Grant of Harris Grant Associates

multiple stereo, Surround Sound, HDTV and Ambisonic playback. Signal assignment to the various output channels is via a 32-bit DSP system developed by AGM Digital Arts, which handles the Surround Sound processing and vector positioning. Standard Dolby Surround decoding is also available.

Not content simply to rest on their laurels, Touchdown representatives recently announced ambitious plans to build a new recording center in Portugal. According to company founder Terry Drivas, the residential

technical director, Ed Evans, formerly with Power Station, N.Y., points out that "there is a high probability that we'll specify 96-input analog consoles, simply because most of our clients are familiar with those designs." Current indications are that these will be identical, large-format Neve consoles for the recording/overdub rooms—Touchdown already has two Neve-equipped rooms at its Munich location—and an SSL for the mix suite. Digital 48-track machines are also under consideration, in addition to analog multitracks with Dolby SR.

Evans is overseeing the design and construction of the Portuguese operation, working closely with Neil Grant of Harris-Grant Associates (Hit Factory, N.Y.; Peter Gabriel's Real World Studios; Sony Classical, Hamburg), which was retained to provide acoustic design for the new complex.

Also new to the Touchdown management crew is Barry Bongiovi, who most recently served as general manager at Sony Classical Productions, New York, and prior to that spent 12 years at Power Station. Bongiovi will supervise management as director of operations of both the Munich and Algarve facilities.

"My intention is to build a working, state-of-the-art complex," Terry Drivas says. "I plan to combine the best equipment with the best operational staff. Touchdown will be a center for making music as well as catering for all post-production needs ... in a flexible environment that can offer a 'get away from it all' atmosphere." Drivas chose Portugal because "the Algarve region of Portugal has a great, sunny climate.

"We have exclusive access to a secluded, white sand beach on the property, and Lisbon is just three hours away," he explains. "But, since we plan to be self-contained at the new Touchdown Portugal, I'm adding a top-class restaurant complete with gourmet chef. I think that in this day and age of time pressures and delivery schedules, an increasing number of producers and artists want to get away from it all and work in a premium facility where the staff looks after their interests. Touchdown Portugal has been designed to satisfy their needs."



Tony Cousins, Ian Cooper and Tim Young of Metropolis Mastering

METROPOLIS MASTERING

Metropolis Mastering Ltd. (London) was founded by four British engineers, in partnership with Metropolis Studios, on the premise that "mastering is the last stage in the creative process of making a recording, not the first stage in the manufacturing process." And the care that has been taken to design the equipment for this facility attests to the founders' belief in that philosophy.

The engineers—Tim Young, Ian Cooper, Tony Cousins and Crispin Murray, together with technical manager John Goldstraw—designed and built their own analog consoles, with an eye toward minimizing unwanted electronics in circuit at any one time. The group also recruited American analog designer Burgess Macneal to build a special set of matched Sontec mastering equalizers and compressors, and they designed their own Metropolis active equalizers and passive filters. The building itself was designed by the same team responsible for the rest of the Metropolis studios complex: architects Julian Powell-Tuck Associates, Metropolis managing director Carey Taylor and acoustical consultant Sam Toyoshima.

Engineers Murray, Young, Cooper and Cousins bring over 50 years of combined experience to Metropolis. Editor Crispin Murray's history includes six years at the BBC, where, he says, he learned about "the magic of it all. I've always enjoyed taking things apart and putting them together again."

Young engineered in CBS's mastering rooms (now The Hit Factory) for 17 years, working on literally thousands of hit records.

Ian Cooper has been involved with projects ranging from Des O'Connor to Jesus Jones. He joined the Metropolis Mastering team to build his ideal mastering room and give clients the time to do the job properly. "I like clients to attend the mastering process," Cooper says. "It enables me to demonstrate how the final sound can be altered, even at that late stage."

While working at Virgin's Townhouse cutting rooms, Tony Cousins engineered the Flying Pickets' Number One cover of Yaz's "Only You." He says he came to Metropolis because the facility "promises to deliver almost all the things a mastering room should be able to do in having superb monitoring and an absolutely clean signal path. We can sit and analyze rooms until the cows come home, but the way we've designed it is the summation of all our experiences, and so, hopefully, we've got something right."

Although its official grand opening was in September of this year, Metropolis Mastering has been working on projects since June. Its first client, Johnny Hallyday, went straight to Number One in France and stayed there for five weeks. Metropolis also has completed work for Kate Bush, Fripp and End, King Crimson, Indochine, Iron Maiden, Peter Gabriel and Right Said Fred.

—Barbara Schultz



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tion in real time, giving you the freedom to use it in all kinds of applications!



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BITS & PIECES

CANADA

Three studios, new this year, that missed mention in November's Canadian Bits and Pieces were designed by Toronto, Ontario, architectural/acoustic consulting firm Pilchner Schoustal Associates. Sessions Recording Studios (Downsview, Ontario) is in the space formerly occupied by Triton Recording Studios; the new facility's design features variable acoustic panels and an isolation booth that can be folded into the wall as a space-saving device. Sessions, with a D&R 4000 28x8 console and a recently installed MIDI setup, is busy completing the original music scores for two short films by Australian filmmaker Gordon Harris. Room with a View Productions, on the top floor of an office complex in Toronto, was designed with sensitivity to providing noise isolation without compromising the view or natural light. Since its opening in March, Room with a View has turned out four albums from regional artists, including Jazz Inspiration/MCA's Vito Rezza with Five after Four. This release, which also features guitarist Scott Henderson (Chick Corea's Elektric Band), was out in the U.S. last month. Recent installations at Room with a View include a video lock system and a SMPTE time piece for Pro Tools. The Power Plant has been hosting a syndicated program, broadcast on CKVR-TV featuring up-and-coming local artists; this complex is rigged with a comprehensive tieline system to allow recording in any space within the facility. The Power Plant is equipped with a 32-input AMR Peavey 1600 production series console, a 24-track 2-inch Studer A80 MkIV recorder and more.

UK

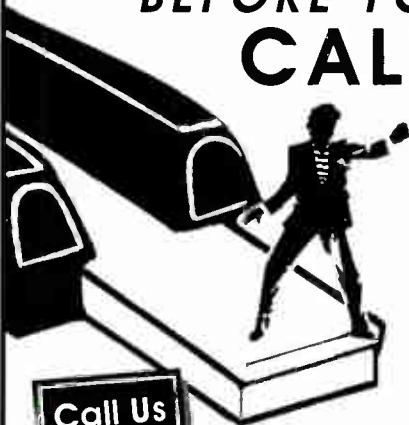
Eastman Kodak has opened a digital film center, Cinesite Ltd., at 9 Carlisle St., London. The facility includes a screening theater, as well as "clean rooms," to be maintained at optimum temperatures and air purity for the efficient operation of the company's high-resolution CCD film scanner, a gas laser film recorder and several high-performance image-computing

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workstations...London's **Mill Recording Studios** is adding a third room to accommodate East West artist Chris Rea, who booked Studio 2 for a full year. Managing director Rod Halling says the new Studio 3 will "initially be a programming suite, and we in-



Left: Control room 1 at the Power Plant

tend to keep it exclusively for our own projects." The Mill was also the choice of Jethro Tull guitarist Martin Barre for his first solo album, released this fall...**Twickenham Sound Station** purchased a new Digital Audio Research SoundStation Delta, the facility's third DAR workstation. The studio will use its new acquisition on *Little Buddha*, the latest film from Bernardo Bertolucci...Post-production facility **Wild Tracks Audio Studios** (London) also purchased a DAR SoundStation. Recent projects at Wild Tracks include British TV ads for *Jurassic Park* and Shell Oil...**Bunk, Junk and Genius Recording** of London purchased Dynaudio Acoustics M4 digital monitors. BJG's new system is identical to that installed in the mix rooms at the new Air Studios facility at Lyndhurst Hall...**BBC TV** took delivery of a MIDI-fitted Sony PCM-3348 recorder; the new machine will be used in the TMS music-recording studio at BBC Television Centre.

EUROPE

At this year's Montreux, Switzerland, Television Symposium, **Ampex Systems Corporation** announced plans to introduce a DCT-based automated cart machine in 1994. The company also received a visit from Switzerland's president, Adolf Ogi, who toured the Ampex exhibit and re-

ceived a hands-on demonstration of the DCT system...Berlin's **hor + lies Verlag GmbH** recording studio installed an AMS AudioFile Plus with 16 outputs. The facility also added a new edit suite, equipped with an Akai DD1000 MOD recorder and an ADR offline EDL computer by GTC...**VTTV Broadcast Mobile**, also in-

radio programs...The **Schools of Audio Engineering** at Hamburg and Amsterdam have each purchased a Soundtracs Jade 32 console. The school's Paris location recently installed a Soundtracs Solo MIDI...**NDR, Hamburg**, installed an SSL 4064 G Series console with bar graph meters, Total Recall and Ultimatum as part of the refurbishment of its light-entertainment music recording studio...German Broadcaster **Bayerischer Rundfunk** recently ordered its third SSL console, a portable 40-input 4000 G Series Master Studio System. The console will be installed in a new studio, from which a weekly discussion and pop music program will be broadcast...**RTBF**, Belgium's French-language national broadcast-



Right: Control room 2 at Sessions Recording Studios

Berlin, took delivery of a Graham-Patten Systems D/ESAM 800 digital audio mixer. VTTV also features five Sony digital VTRs linked to a BVE-9000 edit controller...A Graham-Patten D/ESAM digital mixer was also acquired by **GSP Film** in Stockholm, Sweden...Atlanta, GA's **Allgood Productions** is producing a documentary on Russia's **Balalaika Festival**, during which performers from around the world travel through the heart of the country on a 300-cabin river cruiser that stops daily in small Russian towns. The festival lasts more than two weeks and is sponsored by the Balalaika and Domra Association of America. Allgood will also record the Moscow and St. Petersburg orchestras for the film...Belgium's **RTBF MONS** center will install six Studer Digitec CS-PCs and one CS-WS workstation...Studer also will provide an archiving system to France's **Institut National de l'Audiovisuel**, which is required by French law to archive all

er, purchased a DAR SoundStation Delta digital audio production system to be used in audio-for-video production at the facility's Brussels studios...Now in its 25th year, the **RBS Group** in Holland purchased a second DAR SoundStation for its Rotterdam facility.

ASIA

Appo Sound Studios in Tokyo, Japan, ordered a 64-input API Legacy Series console. Through a special arrangement between API and Siemens Audio, Appo's console will feature Flying Faders...Five Japanese facilities purchased SSL Scenaria Systems: **NHK** (Japan's national broadcaster), **Sanwa Video**, **Omnibus**, **YTV** (Yomiuri Telecast) and **Imagica**...**ARX Systems**, Melbourne, Australia-based manufacturer of audio signal processing, power amplifiers and processed loudspeaker systems, appointed **Kingsbeam Electronics Corp.** as its Taiwanese distributor. ■

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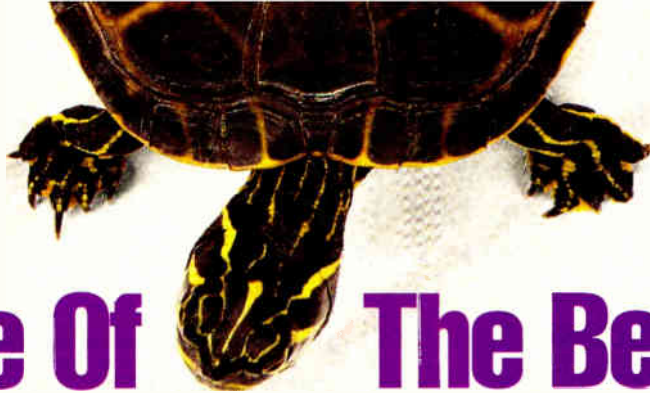
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by Camran Afsari

JACK ENDINO

THE GODFATHER OF GRUNGE

Seattle's '90s uprising has left the taste of nostalgia in the mouths (and ears) of older musicians who once belonged to an isolated community of bands. Only half a decade ago, this city's most celebrated exponents of rock and blues were still Jimi Hendrix and Robert Cray. Today, Seattle seems like a city defenseless against the media adoration it receives as a bastion of "new" music, and now home of grunge-wear fashion, as well.

Whether he likes it or not, Jack Endino is a focal point and primary pundit of today's grunge music. His influence is stitched right into the musical fabric of Seattle's revolution. Just about every Northwest hard rock band, with or without aspirations of fame, has been filtered through Endino's fader moves. The list of records he's credited on is staggering: somewhere around two releases a month. At last count, it was 80 LPs, 110 7-inch singles and more than 300 EPs from over 200 bands, including Soundgarden, Mudhoney, Screaming Trees, Afghan Whigs, L7, Babes in Toyland and Nirvana.

Endino's ability to work at lightning speed is famous. On Nirvana's album *Incesticide*, he's credited for "producing" about half of the record. But in fact, five of the songs were recorded and mixed in one afternoon; they were used originally on the band's demo tape, which eventually got them signed to Seattle's Sub Pop label. Endino went on to record Nirvana's first LP, *Bleach*, a "prerevolution" album that caused its own relative waves of hype and acclaim in the Northwest. His most recent projects include Babes In Toyland's *Pain Killers* EP and *Torreador of Love* by the Sub Pop band Hazel.

I spoke to the prolific producer/engineer after he returned from projects in three other countries: In Wales he worked with Kerbdog; in Brazil, with Titãs; and in Mexico with

Guillotina.

How did you start doing recordings, and what was the first piece of equipment you used?

The first recorder I used was a TEAC A3340S ½-inch 4-track with four channels of outboard Dolby A. It actually made some wonderful recordings. I used it for my own band, and then I started to record other bands in my basement for five dollars an hour. This was about ten years ago.

You were an engineer well before Sub Pop existed, right?

That's right. I was recording bands such as Soundgarden and Green River, who would later become Sub Pop

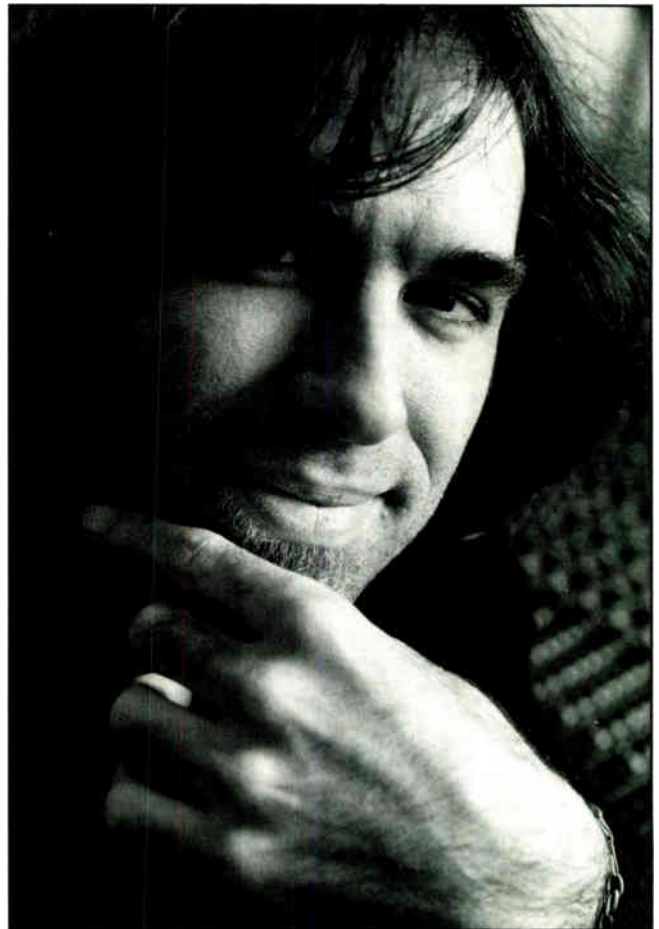


PHOTO SHOT IN THE DARK

bands. Sub Pop didn't put out their first record until about '87. Back in '85, a guy called Chris Hanzsek started a label in Seattle called C/Z records and released a well-known compilation album called *Deep Six*, which included songs by Soundgarden, The Melvins and my own band back then, Skin Yard. This recording inspired Bruce Pavitt and Jonathan Poneman to start Sub Pop records. Bruce and Jon eventually became marketing geniuses. They realized a lot of great music was starting in Seattle and wanted to give the bands a better deal than elsewhere, so they started to put together a locally intensive catalog of releases.

After *Deep Six*, Hanzsek decided to go into the recording business, and he started Reciprocal Studios. He needed an engineer, so I began to work for him because I still had a lot of clients from my basement days. During '85 and '86, there was nobody in Seattle who was good at recording grungy rock bands, and especially for cheap. It's a small town, and when people found out I was making decent-sounding recordings for next to nothing, they beat a path to my door. I was recording frantically—about a single a week. It seemed like everybody was coming to me with or without Sub Pop, with or without a record deal. Now, of course, there are a lot more people recording in studios here, so it kind of takes the pressure off. [Laughs]

If anybody knows exactly what grunge is, it's you. How would you define this ubiquitous term? It's even become a fashion statement.

Well, I can tell you right away that grunge in terms of appearing in these fashion articles is absolute fiction and pure fantasy—it has nothing to do with any reality that we ever knew here. [Laughs] To us and other people doing it back then, grunge was basically a sound and a style of playing. It was loud and very distorted noisy guitars, bashing drums, screaming vocals, and a certain classic rock mid-tempo, loping beat that's halfway funky and halfway rocking. It was also a style that had a definitive lack of any accent on technique: The idea was that you were not going to play like Eddie Van Halen. A good example is Tad Doyle from the Sub Pop band TAD: He used to be a drummer, but he just

picked up a guitar one day and said, "I'm going to play guitar in a band now." And he did; nobody could stop him. A lot of the earlier stuff was quite derivative. Green River, whose members splintered into Mudhoney and Pearl Jam, were a lot like Aerosmith and The Stooges. Probably the definitive grunge record of the time was Mudhoney's first EP, *Superfuzz Bigmuff*.

How would you say that Nirvana's first record, Bleach, differs from Nevermind, their second record?

We recorded *Bleach* in about 30 hours. It was done on 8-track; in fact, some of the songs are 6- or 7-track. In my opinion, *Nevermind* isn't really a grunge record. To me, it's a well-produced, riff-rock record with good melodies in the same vein as a lot of classic rock recordings from the '70s. I really believe that grunge music and bands like Nirvana have become so popular because their music is classic rock—with a simple production—and that's music that hasn't been around for a good decade or so. It's a very spare sound: bass, drums, guitar, loud vocals, powerful riffing and good melodies.

But this form of music wasn't charting throughout the '80s. Back then, the airwaves had mostly dance music, some post-punk bands and the new wave. I think it's a certain contingent of people in Seattle who remember their big brothers listening to Led Zeppelin and Black Sabbath records, then suddenly the time was right for them to begin listening to a basic guitar rock 'n' roll format.

You don't sound like a producer who "bates digital technology," as the British music paper Melody Maker said. How do you feel about these advanced recording technologies?

In fact, I just finished doing a record in Denmark for Sony on a Mitsubishi digital 32-track and an SSL board. I have no problem with digital multitracking. I think digital has a much nicer bottom end than using analog at 30 ips; it's flat down to about 5 Hz. The lower frequencies at 30 ips really bother me: It pisses me off to see the bottom just vanish at about 50 Hz—you lose an entire octave in the lows. Often I just end up recording at 15 ips, which is flat at the bottom to about 25 Hz. I don't get the clear, airy high end at 15 ips, but the sort of bands I've been recording don't really need that because they fill those frequencies with

guitars. I take my sweep generator and frequency analyzer to test these machines before I use them. I always take a load of CDs for reference as well.

Which outboard gear do you like to use?

I always mix through my ACI SA3050 spectrum analyzer—in case the monitors are not telling the truth. I like some of the new series of Symetrix compressors. Those guys are a local company here in Seattle, so many people have their equipment. The Aphex 612 stereo noise gate is really good: It doesn't make the popping noise when it opens up, and it's fast as well.

You captured some powerful drum sounds even when you were working with the limitations of 8-track. How do you go about a drum session? Any particular mics you like?

I'm not too picky with microphones. My favorite snare mic is a Beta 58. I love using the good old egg-shaped AKG D112 on the bass drum. Otherwise, it's just a matter of using the best mic a studio has: If I like it, then I'll use it.

The first thing is to tune up the drum set. I used to be a drummer, so I'm always grabbing the drum key and saying, "Excuse me, let me do my thing." Sometimes I've insisted that the drummer go and buy a new strainer if the snare drum needs it, and then there's the usual—making sure the tom-heads still have life in them, and so on.

As far as recording drums with just 8-tracks, it does enforce a kind of discipline on the engineer. You usually have three tracks to work with, and you're sort of stuck with them, so you have to get a decent drum sound to build on. Usually I put the snare on its own track and the rest of the kit on two tracks for a sub-mix. I don't mind recording drums in dead-sounding rooms, either. I use tight miking, so the acoustics of the room are rarely an issue. When we recorded *Bleach*, Kurt [Cobain, Nirvana's leader] said all the songs have just one vocal, one guitar, bass and maybe a solo overdub here and there. I thought, "Wow, I'm getting a whole four tracks for the drums." [Laughs]

How involved do you get with tweaking the guitar sounds? Do you help create the buzz you have in mind, or are you pretty hands-off in terms of the guitar player's rig?

I think I play an active role. If the guitar player has a shitty guitar sound, I go in the room and say, "Hey, you have a shitty guitar sound. Can we do something about it?" And they either say, "I think it's a great guitar sound," and I think, "Oh boy, this is going to a tough one." Or they might say, "Okay, how can we make it better?"

A lot of players' live guitar sound is pretty bad. It can be real loud with tons of distortion, and it does sound great when they're standing right next to it on stage. But in the studio, it's the fundamental notes that I'm after, and so you have to filter out some of the distortion. When you mix a tape of a "live" guitar sound with a load of cymbals, vocals, bass and other stuff, it just ends up as white noise. Sometimes I have to explain to musicians that what they hear standing next to their amps at a gig is quite different from what the mic is hearing an inch away from the cone in the studio. It's not a live recording, and I need to get it sounding good in the control room.

It's okay to let musicians do their own thing when tweaking a sound

out of their gear as well—you have to work around some problems. For example, certain 4x12 cabinets have a focal point that's about 21 inches in front of them; the four speakers make a combined wavefront, and if you put a mic there, you get a completely different sound than if you jam a mic in one of the speakers.

What would you say are the main differences between engineering for independent labels or producing for major labels?

The independent engineer does whatever he wants to because the bands he's working with do whatever they want to as well. Nobody is in the control room looking over your shoulder to make sure that it'll sound good on the radio or a TV speaker. The style of most independent labels is that, if they like you and sign you, they'll probably accept whatever tape you give them. For years and years here in Seattle, there wasn't the slightest concern that money was to be made. It was simply our music, and we made it sound the way we wanted it to be. On the other hand, you have to realize that major labels have departments oriented toward

alternative music, and most of these people are familiar and in tune to the needs of alternative bands.

How do you feel about some producers who will do anything to get the right sound, even if that means hiring outside musicians to come in and play the parts?

Well, that leaves a bad taste in my mouth. I guess there is value in that sterile sort of produced music, and there must be a market for it, but it's not the way I work. Sometimes I've been asked to play a bass part or something on a record, usually for a very practical reason though, such as there's no bass player, or the bass player had to go home. If you're recording musicians who are not technically the best that you can imagine, that's fine—you just have to work with them. I think these days people are valuing bands and respecting them as groups of people who have their own ideas and style of playing. What it all comes down to, and I think this is the most important thing, is you gotta let bands be bands. ■

Camran Afsari is a San Francisco-based writer and recordist.

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USE READER SERVICE CARD FOR MORE INFO

by Chris Stone

MUSIC FOR MULTIMEDIA

IS IT FOR YOU?

Those of us in the audio recording industry share an insatiable curiosity for new trends, equipment and technology. We are fascinated not only by "How do we make the music better?" but also by "How else and where else can we make and market the music?"

Sound the trumpets! Here comes Music for Multimedia in a big way. First, what is it and how did it begin? It started for me in the early '80s when I was a member of the fledgling "Compact Disc Group," which was formed by record labels, media suppliers, pro audio manufacturers and various audio trade associations to determine how this new phenomenon would be integrated into our industry. Combining all of our media (sound, picture, computers and software) was also an important mission for the group. Stan Cornyn, president of Warner New Technologies, was our guru, and the interest of mighty WEA in the process went a long way toward convincing all of us that multimedia was going to qualify as an evolving entertainment technology.

Just like multitrack digital, multimedia has taken a long time to become viable. One major reason for the time lag was the market forces necessary to reduce the cost of hard disk memory for the processing of the data in digital audio workstations. Another was the sale of a sufficient number of CD-ROM drives to provide a market to support the sale of this new music software medium.

Now, CD-V, CD-I and CD-ROM are almost household words. The buzz word is "interactive," and major record labels are starting to take serious interest. Media conglomerate BMG, for example, recently announced a multimillion-dollar joint venture with ION ("a six-month-old

firm boasting one half-developed product and no revenue...operating from a West L.A. living room," according to the *L.A. Times*) to form a music label using the interactive CD-ROM as the product in place of the standard CD. Their reason: "to give users a music video they can con-

OPERATOR TIP OF THE MONTH

"Multimedia producers

must know more than

how to program

CD-ROMs: They must

know how to repurpose

content in a fashion so

compelling that the

marketplace will buy it."

—Steve Rappaport

trol—a kind of cross between MTV and Nintendo that lets users select a song, choose the orchestration and attach it to a variety of still and moving images."

I asked my friend Larry Hamby, VP of A&R at A&M Records (now a part of the PolyGram music conglomerate) how he felt about the

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BMG move. "A&M is carefully monitoring this new distribution channel for music software with a very serious interest in substantial future involvement," he replied. "I believe the BMG announcement can be viewed as a preliminary step in the direction of what could prove to be the technological future of the home entertainment business."

In San Francisco, one of the first interactive music labels, *Interactive Records*, was formed by Steve Rappaport more than two years ago. Its

latest multimedia CD-ROM product for the Macintosh, "So You Want to Be a Rock and Roll Star," is already moving to Windows and CD-I. Rappaport is also a member of the board of directors of the San Francisco Multimedia Development Group, which was formed "to serve the needs of the multimedia creative community in the Bay Area."

Other important areas for interactive music include video games. Murray Allen, formerly with Universal Studios in Chicago, recently moved over to music multimedia as director of audio with Electronic Arts, a major

player in the Silicon Valley video game industry.

I spoke with Allen and Rappaport about this evolving industry and how recording studios can get involved.

Operator: Murray, as a former studio owner, what is different about getting interactive when compared with other new directions in audio post for video?

Allen: The basic difference is that, with audio post, we added a small amount of equipment, spent a small time learning how to operate it, and we were ready. After all, our consoles and multitrack audio equipment were the same that we had been using for straight music recording. The most important element in this new area of business is the word *multi*—many different types of media—making the role of the recording studio much different than playing host to an aspiring group of young musicians. The studio will need to become technically knowledgeable about these new arenas, hire or consult with a brilliant computer person to interface with the client's data and scheduling requirements, and hire a sound designer/composer who understands these new problems and their solutions. It is not much different than having a star mixer, except that this star must be a good musician, a good mixer, a computer whiz and have sensational communication skills.

Operator: What are the equipment differences?

Allen: Equipment is simple. What we used to have to pay hundreds of thousands for in hardware can be purchased now for very little in software. Also, you don't need those large, expensive rooms for tracking, except occasionally, so you can greatly reduce your square footage cost for space and let somebody else carry that overhead.

Operator: What direction do you see this business taking in the future?

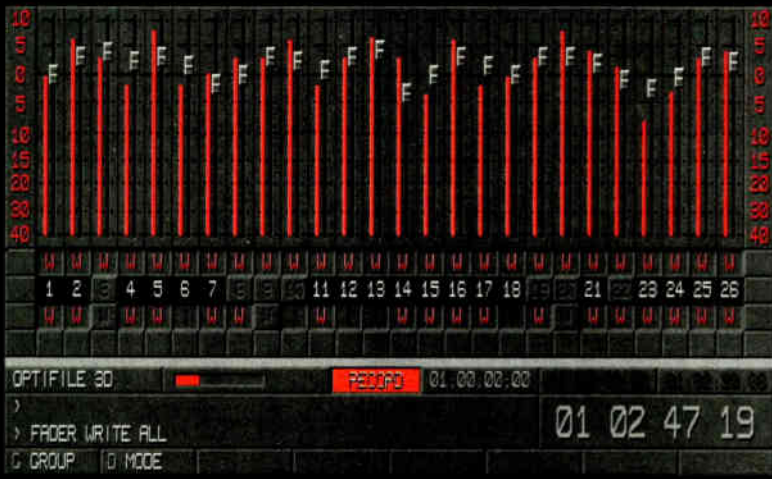
Allen: I don't think anyone can predict what form this business will take, since it is a very quickly evolving industry that may never settle on any one or even several ways of doing business. It may be the best example of "succeeding through chaos." The secret is to stay on top of what is happening and position your studio to be able to make quick changes.

Operator: Steve, you seem to have gotten in on the ground floor of this

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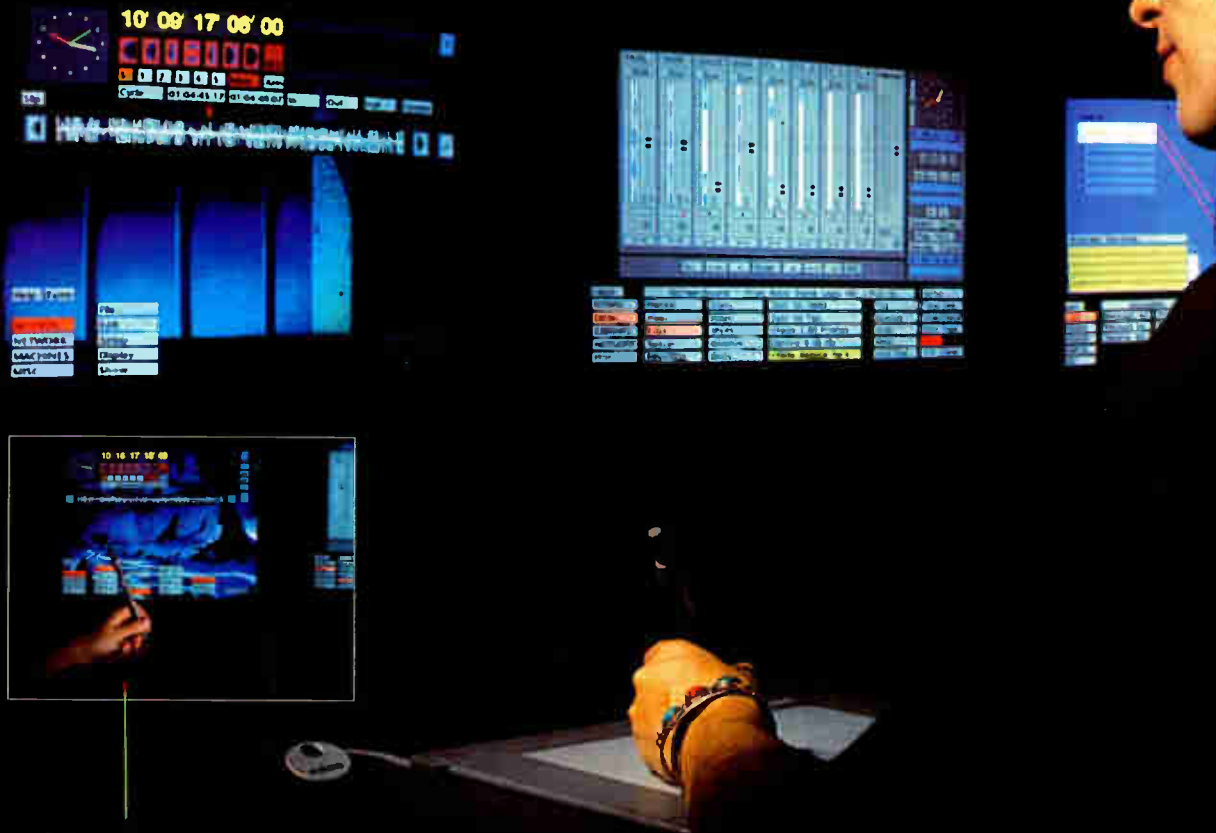
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new music format. How do you see it affecting the way audio is recorded and processed?

Rappaport: To the best of my knowledge, there is as yet nothing distinctive about the creation of *interactive* audio as opposed to any other kind of audio. As with any other sound sample, the higher the resolution, the better the sound, but the more CD-ROM space required. With 650 megabytes available, you still find yourself reducing the sampling rate as necessary to extend the playing time of your product. Our latest product, "So You Want to Be a Rock and Roll Star," offers six songs that play at Red Book Audio spec and also offers over three hours of audio instruction about how to play the instruments. To get all that on the CD-ROM, all audio, except the songs, was sampled at 11 kHz mono. Even then, we used 631 megabytes of the disc's capacity.

Operator: How will interactive music affect the current pro studio's clientele?

Rappaport: As far as pro audio

studios are concerned, multimedia companies are a new stream of customers that, in general, do not require new technology. The skills required of a producer of sound or music for multimedia are virtually identical with those for a traditional audio CD. What it comes down to for audio producers is more business! Software companies will either bring audio engineers in-house or contract audio work to audio production companies. Those companies will need to be familiar with digital technology.

Operator: Who are the clients who will be making interactive records?

Rappaport: For now, interactive records are going to be made by the pioneers who began working two to four years ago, people like Todd Rundgren, David Bowie, Thomas Dolby and Peter Gabriel. Multimedia producers must know more than how to program CD-ROMs; they must know how to repurpose content in a fashion so compelling that the marketplace will buy it. I think the BMG/ION merger is exactly what could happen to all the small producers who have had the courage and vision to work out of their living rooms for the

past couple of years, wondering where next month's rent is coming from. The synergistic merging of small creatives like ION and big channels like BMG is the wave of the immediate future.

Rappaport also recommended reading two articles to understand the potential of interactive audio better: the article about Thomas Dolby in the September-October issue of *Wired* magazine ([800] SO WIRED for back issues), and "Interactive Audio?" by Billy Brackenridge in the August-September issue of *Morph's Outpost on the Digital Frontier* ([800] GO MORPH for more information).

We all must look at every possible diversification that could add to our revenue stream and profit potential. Whether or not Music for Multimedia is the best choice for your operation is up to you. I urge you to take a closer look and consider its potential, because it is certainly the wave of the future. ■

Chris Stone is a former studio owner, consultant to the pro audio industry, and president of the World Studio Group.

CONTROL FREAK



The DC 24 is the first dynamic controller with a built-in 24dB/octave crossover to allow separate dynamic control of high and low frequencies. This *bandsplit dynamic processing* delivers tighter control more transparently than conventional compressor/limiters. It reduces "pumping," "breathing" and other annoying side effects that can result from a single side-chain trying to accommodate both high- and low-frequency demands simultaneously. The DC 24 gives you the choice of re-combining the split program to a single output for studio/broadcast applications, or leaving the highs and lows separate for biamped live sound performance.

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PRODUCT

CRITIQUES AND COMMENTS

JBL 4408A STUDIO MONITORS

by David (Rudy) Trubitt

I first encountered JBL's latest studio monitors at January's NAMM show. The three new models of the 4400A line were stacked up in a listening room, and my immediate favorite was the baby of the family, the 8-inch, two-way 4408A monitors, which retail at \$650/pair. I've had the chance to live with a pair for an extended period, and my first impression has been confirmed.

There are few things more subjective than evaluating loudspeakers, so let's start with the facts: The 4408A uses an 8-inch, felted-cone woofer and 1-inch, titanium-dome tweeter. They come as a mirror-imaged pair, which gives you a number of placement permutations (JBL says they were designed for upright use but can be placed horizontally, as I did). Though certainly manageable, these are not the smallest of near-field cabinets—roughly 17x12x12 inches—and each weighs in at 26 pounds. Power handling is rated at 100 watts for pink noise, with a sensitivity of 89dB SPL at 1 watt/1 meter.

The cabinet is constructed of ¾-inch particle board with an attractive gray Formica laminate. Inside the box is a blanket of 1-inch-plus Fiberglass batting with a neat hole cut for the plastic, five-way, binding-post cup. The cabinet appears to be of butt-joint construction and has no internal bracing, cleats or caulking; however, the enclosing laminate and adhesive certainly contribute to the air seal, and the cabinet seems to be quite rigid. A detachable grille cloth assembly is included, and the tweeters have a fixed-screen dome that provides additional protection.

Internal wiring is all 18-gauge, with spade lug connections on binding-post contacts and tweeter inputs. Spring-loaded push contacts are used on the cast-frame woofer, and solder

connections secure all wiring to the crossover circuit board. Crossover components are held in place both by their electrical connections and judicious dollops of silicon goo. All component values and wire color-codes are conveniently silk-screened onto the circuit board.

In sum, construction is clean and efficient inside and out—these speakers look to be designed for volume manufacturing but with tight tolerances.

Low end struck me on first listen. While the 4408As are only spec'd to 50 Hz at -2 dB (and -10 dB at 35 Hz), they were a refreshing change of pace from the much thinner near-fields I've been using in my small room. Of course, having the extra

JBL 4408A
Studio Monitor



low-end energy bouncing around points out the difficulties of my small room's acoustics. But I was able to identify and suppress one mechanical resonance as a result—I certainly prefer having that audio information there to work with.

At louder listening levels, low tones can push enough air to create a small breeze if you're directly on-axis with the ports. There's the potential for turbulence with any port, but only with isolated low-frequency sine waves at high levels was it noticeable on the 4408As.

Crossover between the drivers takes place at 2.5 kHz and sounds to be pretty steep—by an octave on either side of the crossover point, there's little if anything left of the other driver's band. Highs are smooth-sounding with great stereo imaging and depth of field. At the risk of using a monitor review cliché, I did hear new details in recordings that I'm very familiar with.

Careful positioning of the monitors is important, especially if you're very close (three feet or less). In different rooms, a bit of fiddling is required for best imaging—essentially, you want to be very close to on-axis with the tweeters at ear level. Once that's done, you can move comfortably in that zone and maintain your imaging.

I also did some A/B comparative listening with a couple of other smaller two-way speakers—the ubiquitous NS-10s (a pre-“studio” pair) and the Paradigm 3Se, a small bookshelf model that is seeing some

studio work. (Although neither represents direct competition for the 4408As, if you're familiar with either speaker, this comparison should give you a picture of how the JBLs sound.)

Though the larger cone and enclosure of the 4408A made for a much smoother low end, the mid-range comparison between the three was interesting. Using a variety of music and pink noise, the NS-10s seemed excessively harsh and forward, while the Paradigms were comparatively distant in the vocal range, with more of a hi-fi, smile-shaped curve. The 4408As fell mid-

way between the two; the vocal range is present but not overly forward. They were easily the most neutral of the three, although, to be fair, I suspect neither of the others was designed to be colorless.

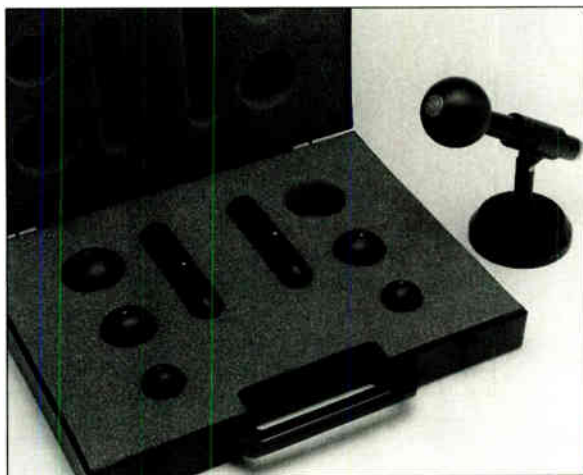
During the course of this review, I used the 4408As for general monitoring, sound effects editing and direct-to-DAT live mixing. In all cases, I found them to be non-fatiguing and neutral-sounding. The friend who joined me in the listening tests bought a pair of them for his own project studio, and I'm likely to do the same.

JBL Professional 8500 Balboa Blvd., Northridge, CA 91329; (818) 893-8411. ■

BRÜEL & KJAER ACOUSTIC PRESSURE EQUALIZERS

by Michael Cooper

To those in the know, the name Brüel & Kjaer is synonymous with world-class microphones. The Danish manufacturer's 4003 and 4006 mics, first introduced in 1981, are regarded by many as the absolute cream of the crop in small-diaphragm, omnidirectional mics. Now



Brüel & Kjaer's new APE Adapter Series

B&K has increased the versatility and value of these mics with the introduction of its Acoustic Pressure Equalization attachments, which were nominated for a 1993 TEC Award. Each of the four slip-on attachments produces a distinctive change in the microphone's frequency and polar responses, offering, in a broad sense, an upgrade to a modular system for a modest price.

Before I go ape over the APEs, let's take a brief stroll down memory lane to reacquaint ourselves with the mics themselves. The 4003 and 4006 are both prepolarized condensers

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that offer high sensitivity and low noise. Transient response is outstanding for both mics, obviously on account of their ultrathin, nickel-foil diaphragms and greatly extended high-frequency response. The two mics are acoustically identical but differ in the way their preamps are powered. The 4006 is a phantom-powered affair. The transformerless 4003 requires a higher voltage (130 V), such as that afforded by B&K's dual-channel Type 2812 power supply. The higher operating voltage gives the 4003 increased headroom and an earth-shattering sensitivity spec of 50 mV/Pa (fully four times that of the very respectable 4006). Additionally, the 4003 reaps the typical benefits of a transformerless system, including more linear low-frequency response at high SPLs and greater linearity of low-level signals at the AC zero crossover point.

The B&K 4003 and 4006 both list for \$1,660. An alternate protection grid that screws onto the microphone cartridge to give a flat diffuse field response is standard issue with both mics. The resultant 5dB boost (on-axis) in the 10 to 12kHz range is useful when miking in highly reverberant conditions or to compensate for high-frequency air transmission loss when miking from a considerable distance from an on-axis source.

I am constantly blown away by the 4006's transparency. They are my first choice when recording acoustic guitar, piano or classical harp. With ultracareful mic placement and technique, I've even obtained spectacular results on lead vocals with the 4006.

Assuming you've got your drool bib on by now, let's get back to the APE attachments for the 4003 and 4006. The APEs are all black and come in four different variations: three spheres (ranging from 30mm to 50mm in diameter) and one 110mm-long cylinder (i.e., resembling a cylinder but with elliptical ends). They're made out of an epoxy resin that maintains a consistent shape over time, and they are smooth, hard and fairly lightweight. Each attachment has a cylindrical sleeve that you slide your mic through until the end face of the capsule peeks out the other side and is flush with the surface of the attachment. A rubber O-ring on the inside of the sleeve isolates the mic from vibration and

firmly seats it so that it won't slide. By the way, the APE attachments only fit the B&K 4003 and 4006 mics.

The APEs affect equalization passively and acoustically. With an attachment in place over the mic, you've essentially changed the shape of the mic's end face. Sound now reflects, scatters and diffracts differently around the capsule, causing changes in both the microphone's frequency and polar responses.

The logic behind all of this is not so arcane. Remember when you were a kid, watching water flow under a bridge? The water hitting the large pylons would seem almost frozen in place, unable to go immediately around the obstacles and causing a huge buildup of water pressure in front of the structures. The larger the pylon, the greater the impediment to the water flow and the higher the pressure.

Here, the "water" is sound, and the "pylon" is the APE and the mic's end face. Where the dimensions of the attachment exceed the wavelength of sound impinging on-axis, the sound can't easily get around the obstacle. The result is a pressure buildup at the mic's diaphragm for short-wavelength (high-frequency) sound arriving on-axis. Furthermore, the APE attachments present a physical barrier to high frequencies arriving off-axis to the mic. In contrast, long wavelengths (bass frequencies) have little trouble wrapping around the obstacle to the front of the mic. From this, one would expect the polar response of the mic to take on an increasingly forward focus, with rising frequencies as the diameter of the spherical APEs increases. This is exactly the case, and the directionality starts becoming particularly manifest at about 5 kHz. Omnidirectional performance is completely preserved at low frequencies with the APE attachments in place.

If you're hip to the capsule design of Neumann's M50 and TLM50 pressure mics, you're probably getting a strong déjà vu hit right about now. Those mics actually directly incorporate the diaphragm into one side of a sphere, forcing an inherently omnidirectional mic to behave like a pressure-gradient (directional) mic at high frequencies. (The spherical capsule has other advantages over a cylindrical design, but that's another story.)

B&K takes the same basic principle one step further so that you can



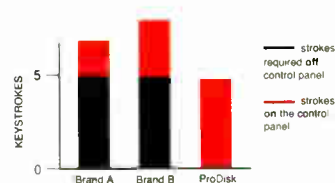
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have your cake and eat it, too. Leave the APE attachment off, and you have your original omnidirectional mic. Slide on an APE, and you change the directionality. Additionally, all of the attachments effect a presence boost on-axis in the upper midrange frequencies and bottom region of the highs (the largest sphere, the APE L50B, boosts response all the way out to 20 kHz).

At \$530 for a complete set of the four APE attachments with carrying case (\$770 for two sets), this is an in-

expensive option compared to buying four (or eight) complete mics. Just bear in mind that the resulting polar patterns with the APE attachments resemble more a supercardioid or hypercardioid response than a cardioid.

Even with the APE attachments on, the B&K 4003 and 4006 retain some of the benefits of being inherently omnidirectional. First, response in the bass frequencies remains more linear than with a pressure-gradient mic, which can exhibit phase shift for front-arriving signals. Second, the bass frequency response is not de-

pendent on distance from the source, as in a pressure-gradient mic.

For my tests of the APE attachments, I used the HV-3 mic preamp, an extremely clean and uncolored 2-channel unit from Millennia Media of Sacramento, Calif. In addition to standard 48VDC phantom powering, Millennia offers an option with dual 130-volt inputs specifically designed for B&K's high-voltage mics, such as the 4003. Priced at \$1,595 (\$1,895 with the HV power supply), the Millennia HV-3 is well worth looking into, considering the fact that B&K's Type 2812 power supply is \$1,690 and does not include preamps!

An obvious use of the APE attachments is miking a large ensemble at a distance. Here, the APEs' increased "reach" (due to the greater ratio of direct to reverberant sound at high frequencies) lent a more focused and present sound. I also found the APEs to be very useful for spot-miking a single acoustic guitar (at close distance) within an ensemble. Bleed from adjacent instruments was diminished, and, of course, there was no proximity effect. Had I used a cardioid mic, the sound would most certainly have required EQ to mitigate boominess.

Even when miking a boomy acoustic guitar alone, the APEs came in very handy. The two smaller spheres (APE L30B and L40B), as well as the cylindroid APE L110C, each provided a smooth boost on-axis in the upper midrange/lower high frequencies. The exact frequency-response curves imparted by each of these three APEs differ from one to another. By carefully choosing different attachments, I could clarify and define the guitar's sound to my liking without resorting to equalization.

Finally, I found the 50mm spherical APE L50B to be very handy when recording drums. By miking a hi-hat with a B&K 4006 fitted with an L50B, off-axis rejection of the rest of the kit was greatly improved.

The one limiting factor of the APE attachments is that you can't use them to change directionality without also affecting frequency response. In some situations, isolation was improved, but I found the result to be artistically unacceptable in terms of timbre. When miking a solo instrument, angling the mic's axis away from the source helps to tailor the timbre, but not without picking up more room sound.



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These minor gripes notwithstanding, the B&K APE attachments are extremely useful. They greatly expand the applications of the 4003 and 4006 mics, and that's a good investment.

Brüel & Kjaer microphones, distributed by TGI North America, 300 Gage Ave., Unit 1; Kitchener, Ontario, Canada N2M 2C8; (519) 745-1158. ■

Michael Cooper is a producer, engineer and owner of Michael Cooper Recording in Eugene, Ore.

"THE DIGITAL INTERFACE HANDBOOK"

by Mel Lambert
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Quite simply, *The Digital Interface Handbook* is the best source I've found for practical information on just about everything you might need to know about interconnecting digital audio and video systems. Written by Francis Rumsey and John Watkinson, two acknowledged experts in the field, this 220-page, \$35 text covers topics such as internal architec-

ture of the normal (and not so normal) digital I/O formats and how they should perform in the real world. Of inestimable usefulness is information and advice on what to do if the data does *not* produce the expected results. And chapters devoted to synchronization schemes (why, what and how) and methods of measuring interface and cable performance are a valuable resource to the audio professional.

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JUPITER SYSTEMS INFINITY DSP LOOPING TOOLS FOR THE MACINTOSH

by Paul Potyén

The first product from Jupiter Systems is impressive. Infinity is a powerful yet easy-to-use set of software tools designed to eliminate the time-consuming headaches of sample looping Sound Designer and AIFF files on the Macintosh. It requires a

68030 processor-based Mac with at least 4 MB of RAM, System 7.0 or greater and 32-bit addressing enabled. To make maximum use of Infinity, you'll want to use it with a Digidesign DSP card and an 040 machine with 8 MB or more of RAM.

Although Infinity isn't designed to record or transfer audio files to a sampler, it uses Apple Events to communicate with Digidesign's SampleCell Editor software, allowing you to load and play SampleCell from within Infinity. It also includes some editing tools, such as cut, copy, paste, normalize, insert silence, change gain and mix.

Once a file is loaded into Infinity, you can simply drop the Loop In and Loop Out markers into the file and drag them across while it's playing. The process can be that simple. But if you need more sophisticated tools, Infinity has them in spades. At the heart of the program are four different looping tools: Crossfade Looper, SPR Looper, Rotated Sums Looper and Freeze Looper. The Crossfade Looper uses the most familiar method. However, many helpful addition-

—CONTINUED ON PAGE 183

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NEW PRODUCTS



JBL CONTROL 1E

This new addition to the Control Series from JBL Professional (Northridge, CA) is a personal-sized, self-powered monitor that can be mounted in a variety of environments. A 20-watt amplifier is dedicated to the 5.25-inch bass driver, while a 10-watt amplifier drives the 1/2-inch HF dome. The unit also features magnetically shielded transducers, a balanced input with a high/low sensitivity selector, and a line output with pre/post-gain control for adjusting the level of other Control 1Es or driving a powered subwoofer or other device.

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GORDON MICROPHONE PREAMP

Gordon Instruments (Nashville) introduces its microphone preamp system, comprising an outboard 2-channel preamplifier (\$2,800) and a separate 4-channel (\$500) or 8-channel (\$750) gain control. A remote control allows for location of the preamp near the microphone, thus reducing cable losses and interference. Features include parallel XLR and 1/4-inch balanced inputs, and an intrastage digital attenuator automatically configures analog switches for maximum dynamic range for each gain setting.

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LEXICON JAMMAN

The \$449 JamMan from Lexicon (Waltham, MA) provides a new approach to creating echoes, samples and loops, with eight seconds of memory (expandable to 32 seconds). Echo tempo can be set simply by tapping, and the delay time can be automatically cut to one-half, one-third or one-quarter of the original. Tapping also sets the tempo in Loop mode, in which up to eight loops can be created (depending on memory) and used in conjunction to form songs; the JamMan can sync to a MIDI device or vice versa. Sample record and playback can be triggered via the front panel, a footswitch or an audio input level trigger.

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DBX 296 SPECTRAL ENHANCER

Part of the Project I Series, the single-rack-space 296 Spectral Enhancer from dbx (div. of AKG Acoustics, San Leandro, CA) features two independent channels with selectable amounts of high-frequency detail enhancement, low-frequency detail enhancement and hiss reduction, the latter indicated by an LED meter.

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DEMETER VTCL-2 COMPRESSOR/LIMITER

Demeter Amplification (Santa Monica, CA) unveiled the VTCL-2, a 2-channel stereo tube compressor/limiter for recording, live and broadcast applications. Listed at \$1,995, the two-rack-space unit features an all-tube audio path, variable attack and decay, high-quality VU meters, 40 dB of compression and limiting, electro-optical control, polypropylene capacitors and full regulation of B+ and filament voltages.

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CEDAR DC 1 DE-CLICKER

Designed for audio restoration projects, the CEDAR DC-1 (distributed in the U.S. by HHB/Independent Audio of Port-

land, ME) features a unique "four-pass" process that can remove up to 2,500 scratches per second in real time. It offers AES/EBU and S/PDIF digital I/O; balanced and unbalanced analog I/O; 16- and 18-bit, 64x oversampling bit-stream converters; an RS 232 remote control interface; and 16-channel MIDI control. An upgrade is available for SMPTE control as well.

Circle #231 on Reader Service Card

LA AUDIO 4-CHANNEL PROCESSORS

LA Audio (U.S. dist. by Pro-Musica, Keene, NH) announces two new signal processors priced at \$599. The 4G is a 4-channel noise gate with high and low filters that can be used independently of the gate by means of a front-panel switch; all four channels feature SNR, a single-ended noise reduction system. The 4C has four channels of compression and limiting, including a switchable high/low filter and selectable full/half-band operation on each channel. The filters can be used for full-band de-essing or for selecting crossover frequencies for each channel, providing up to four continuous bands of compression. Other features include sidechain facilities and balanced audio I/O.

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BBE 461/362 NOISE GATES

BBE (Huntington Beach, CA) announced two new noise gates, each incorporating the improved BBE II process for sonic enhancement. Signal-to-noise ratio for the 461 and 362 is -90 dBu, and the process sensitivity has been enhanced for greater dynamic range. The 461 features +18dBu headroom and a bypass switch for comparison of processed to unprocessed signals, while the 362 adds ganged definition and bass controls, and +15dBu headroom.

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BRYCO DAT STORAGE

Bryco Products (Marina del Rey, CA) announces the DSD-320, a four-drawer, stackable cabinet that holds up to 320 DAT tapes. Also available are carrying cases for 8, 16 or 40 DAT cassettes, plus wall-mount storage for up to 40 DATs, or for 8mm video or audio cassettes.

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THE PROFESSIONAL MONITOR COMPANY

Sascom Marketing Group (Pickering, Ontario) is now distributing monitors from the U.K.-based Professional Monitor Company. Available are the LB1, a passive, two-way near-field with 35Hz LF response and magnetic shielding for placement near video monitors; the AB1, a passive, two-way mid-field that features a 9-inch woofer with a 4-inch voice coil and enclosed magnetic circuit drive unit; the MB1, a passive/active, three-way, full-size studio monitor with a 12-inch woofer; and the BB5, a passive/active three-way, full-size monitor.

Circle #235 on Reader Service Card

ESOTERIC SOUND RAMSES TURNTABLE

To solve the problem of old records recorded at speeds slightly above or below 78 rpm, Esoteric Sound (Downers Grove, IL) introduces the Ramses, a turntable offering speeds of 33.33, 45, 71.29, 76.59, 78.26 and 80 rpm, with $\pm 8\%$ pitch control. Included is a cartridge with LP and 78 styli, and a variety of other accessories are available. Retail price for the Ramses is \$425.

Circle #236 on Reader Service Card

GENERALMUSIC SOUND ENGINEER

At the Fall '93 AES show, GeneralMusic Corporation (Bensenville, IL) announced U.S. distribution of the LEM line of sound reinforcement mixers and audio products, including Sound Engineer, a fully programmable, MIDI-controllable audio mixer. The graphic software system runs on Windows and the Atari (Mega ST and up) and will soon be available for the Macintosh; any device transmitting standard MIDI commands or any dedicated system can also serve as the operational interface. Timing and sync are via SMPTE time code. Channels feature 3-band EQ with sweepable mids, noise gate, VU meter and four aux sends. A 16-channel Sound Engineer starts at \$5,399, 24-channel is \$5,999, and the 32-channel version is \$6,999.

Circle #237 on Reader Service Card



MTC AMERICA AIRY CD-R

MTC America announces the first recordable CD with a three-year warranty. Available in 63-minute (\$25) and 74-minute (\$27) lengths, the Airy can be used in any Orange Book machine and is fully compatible with the CD and CD-ROM standards.

Circle #238 on Reader Service Card

**BARBETTA DIVA MONITORS**

Barbetta (Moorpark, CA) has introduced the DIVA 11A-3a near-field monitors, offering a frequency response of 30-20k Hz (± 2 dB) and a total equivalent audio headroom of 180 watts RMS. The bi-amplified, active power system drives a 6.5-inch woofer and 1-inch cloth dome tweeter, aligned off-axis for enhanced imaging. Retail price is \$1,895 per pair.

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**HOT OFF THE SHELF**

The Assignable Dynamics Processor for the Soundtracs Jade console now includes fully assignable and resettable dynamics, individually configurable as gates, compressors, limiters, expanders, auto-panners or modulators, with all settings on snapshot recall. Call Samson/Soundtracs at (516) 932-3810... **Tripp Lite's UPS Systems** brochure includes the entire line of battery backup models, including the BC Series standby UPS, the OMNIPOWER line-interactive standby UPS and the UNISON online, sine wave UPS. Call (312) 329-1601 for a free copy... **The Will Lee Bass Library—Volume 1** is a collection of samples from this famous bassist on an audio CD, including rare instruments such as 12-string and 8-string basses, plus classic 4-string, 5-string and jazz bass sounds. Retail is \$79.95; call Sampleheads at (212) 749-1613... Also on CD are Manhattan Production Music's "The Little People" and "The Hip-Hop Jam." The former features children's music, ranging from lullabies to grammar-school

sing-alongs, while the latter features ten pieces and a total of 60 cuts of hip hop/techno-pop for the teen/young adult market, each with either a rhythm track or drum loop. Call (800) 227-1954 or (212) 333-5766... Toroid Corporation's custom-designed "zero-noise" transformers are designed for amplifier and preamplifier applications. Standard vertical-mount models up to 5,000 VA are available, as well as chassis-mount versions up to 12,000 VA, single-phase, 60 Hz. Call (410) 860-0302... InterActive Publishing Corporation's "1000 of the World's Greatest Sound Effects" CD-ROM for Windows systems features digitally mastered sound effects from the Valentino Sound Effects Library, recorded in both 8-bit and high-fidelity 16-bit formats. Also included on the \$49.95 disc are four stand-alone utilities for organizing, editing and playing the effects. Call (914) 426-0400... The Neutrik FX-Spec is a 3-pole, XLR-compatible cable connector with a securing ring that eliminates contact-caused noise and guarantees uninterrupted IIF screening, even dur-

ing mechanical shocks. Call (908) 901-9488... **C.H. Ellis Company's new case line** includes three styles: vertical closure, sea chest and shell top on base. Standard features include recessed ATA 300-rated hardware and rubber-padded, spring-loaded handles, plus one to three inches of foam lining. Call (317) 636-3351... **Humfrees** are injection-molded mounting devices that isolate rack-mount units from one another to minimize ground loops. An 8-piece set isolates two rack units and goes for \$4.99. Call Dana B. Goods at (805) 964-9610... **Creative Sound Design** has released three "Maximum Impact" sound-effects CD-ROMs for E-mu Emulator III/Emix sampling keyboards. Each of the three volumes ("Planes/Trains/Autos," "Industry/Home/Office" and "Ambience/Water/Nature") contains 280 MB of DAT-recorded, effects. Retail: \$249 each or \$595 for the set; call (206) 441-7421... **Upgrades for ART signal processors**, including the SGX 2000, SGX Nightbass, DRX 2100, Alpha 2.0 and SGX T2, are now available, providing expanded memory, enhanced reverb algo-

rithms, regenerated delay-time increase and an expanded tuner algorithm. Also available is an upgrade for the X 15 MIDI Footcontroller, offering additional presets. Call (716) 436-2720... **Disc Makers' Guide to Independent Publicity** is a 48-page booklet for working bands, covering topics such as promoting gigs, keeping a fan list, selling independent releases and compiling a press kit; it also has a resource list of music publications, seminars and music-related organizations. For your free copy, call (800) 468-9353... The Sascom Marketing Group has introduced the Lafont Audio HD4, a rack of vertically mounted audio modules from the HD4 film/TV post-production console. The rack includes a unique telephone simulator and a compressor/limiter with de-esser, plus high-quality mic pre-amps and parametric EQs. Call (416) 420-3946... **Air-Craft Production Libraries' "Classical Strings"** and "Jazz: Bebop & Blue" CDs feature some of the country's finest studio musicians; call (800) 343-2514. ■

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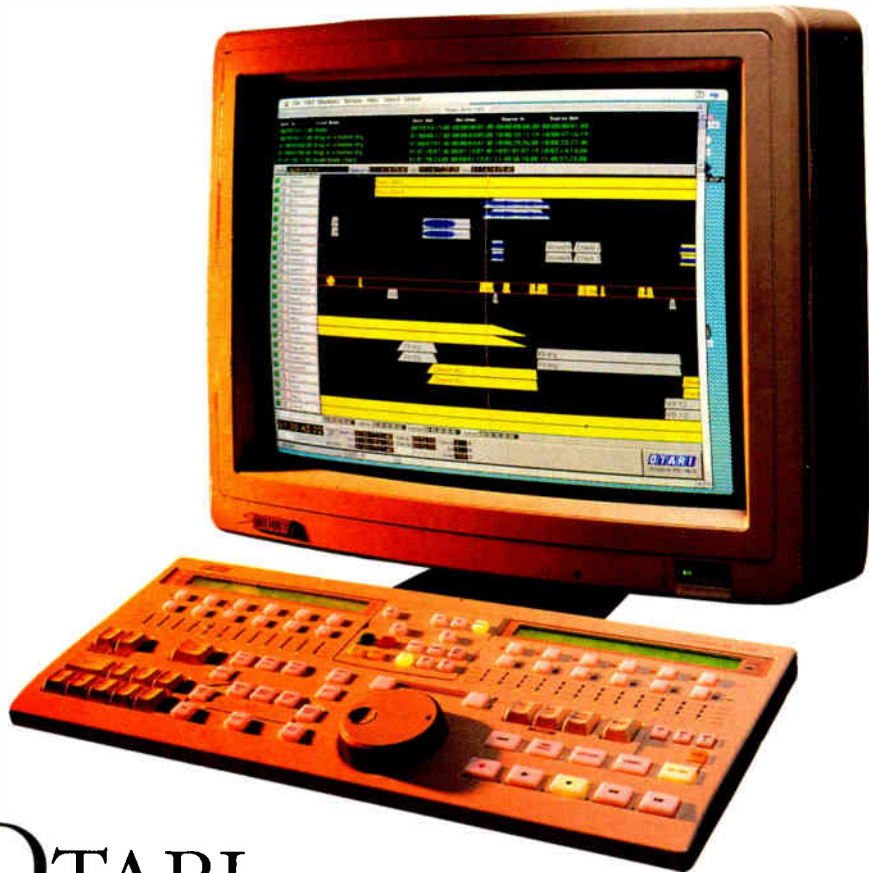
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by Mel Lambert



OTARI PRODISK 464

DIGITAL AUDIO WORKSTATION

In many respects, the Otari ProDisk 464 represents a watershed in workstation system design. From its origins four years ago at Digital Dynamics, the concept of a bulletproof, user-friendly, reliable workstation has been maintained by Otari. (The Japanese firm purchased Digital Dynamics in the early '90s, retaining the R&D team to continue refining the ProDisk system.)

As one might expect, the ProDisk 464 has evolved in terms of storage technology, processing hardware and controlling software. But the basic system architecture is relatively simple. A standard Macintosh II is used to provide a graphical interface and controller, connecting via a simple

RS-422 serial link to the Audio Control Unit. The ACU houses the main data-processing engines, digital and analog I/O cards, machine control, MIDI, time code, word clock and video sync I/Os. In addition, a high-speed TDM bus links the ACU to multiple hard drives housed in the Storage Unit. Each hard drive accommodates four discrete audio tracks; additional drives and drive-controller cards add more tracks to provide the required recording format and capacity.

Each ProDisk audio track is assigned to a dedicated analog or digital output port. Although internal digital mixing is possible via a DSP card that plugs into the ACU, most ProDisk systems are installed in

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rooms with a mixing console.

The DSP card provides limited internal mixing, with MIDI-based level and stereo pan control of basic mix functions. The ProDisk's MIDI-In port normally connects to a MIDI-capable controller, such as a JL Cooper Fader Panel. Up to 24 channels of output can be controlled and panned between stereo outputs. Dynamic level control is also available in real time from ProDisk, although the system only provides snapshot storage of MIDI-based level and pan settings. External dynamic automation is also possible via a MIDI sequencer.

ProDisk uses a graphic user interface controlled by conventional computer keyboard and mouse. The new ProDisk CB-158 Hardware Control Panel is an excellent alternate controller. Identical in size and shape to the familiar Macintosh extended keyboard, it features transport and editing buttons, plus a jog wheel and machine control of up to four external video or audio machines.

In terms of system nuts and bolts, digital sampling frequency can be set to 32, 44.1/44.056 or 48 kHz, with complete SMPTE/EBU-format time code interlock at all conventional frame and field rates. Digital I/O can be S/PDIF or AES/EBU format. Depending on the hard-drive capacity, each 4-track hard disk recording unit is capable of holding up to 120 track-minutes of digital audio on a 650MB fixed drive, or 190 track-minutes from new 1-gigabyte removable drives. Up to three drives can be housed per storage unit; cascaded units extend the storage capacity.

A proprietary file management system, using distributed processing and separate disk-control cards for each drive, ensures that, no matter how fragmented the data becomes, the user never encounters a delay in access to audio information from the storage units. (A housekeeping function handles routine defragmentation to make life easier for the master controller, but this function is completely transparent in operation.) I didn't experience a single glitch as the ProDisk accessed data.

My only complaint, a minor one, concerns the limitation of four tracks per drive: Relocating a cue from one track to another can require re-recording it to another drive. But since the copying is done via a high-speed trans-

fer across the TDM bus, it shouldn't hold up a session for too long.

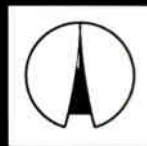
MACINTOSH GRAPHICS INTERFACE

At the heart of ProDisk is custom controller software that runs on the companion Macintosh. Because it simply handles graphics display, keyboard entry and the point-and-click user interface, the Mac can be a relatively modest system. I used a Mac IICI fitted with 5 MB of RAM and a Daystar PowerCache card, linked to a 20-inch SuperMac monitor via a Spectrum/24 PDQ card; Otari recommends a Centris 650 for systems with fewer than 16 tracks, and a Quadra 800 for 24-tracks and above. Because of the large amount of system information and other data that can be displayed at any one time, a 20-inch monitor is recommended for systems offering more than 4-track record/playback. All displays are to 8-bit color resolution and very fast!

If you saw the ProDisk at last year's AES Convention in San Francisco, you might appreciate the dramatic improvement in its user interface. And the enhancements continue with the latest revision of Otari's GUIDE Software (Graphic User Interface for Digital Editing). GUIDE provides interlinked displays of the main Project Status, with horizontal bars representing each data track, plus separate Metering, Time Code, Cue Editor and Sound Library windows. The system is extremely easy to set up and interrogate, and all screen displays are clear and unambiguous.

During normal operation, sound clips can be recorded directly to a selected track from analog or digital inputs, or they can be selected from the prerecorded library. Full serial control is also provided for external video and audio transports, allowing material from a time code DAT, for example, to be laid into ProDisk.

All events within the GUIDE environment are tagged with time code numbers. During the recording phase, these can be set to a real-time clock or tagged with the source code laid down during the remote session. Sound cues and elements can be edited within the Sound Library—in terms of readjusting the start/end time code labels and other "soft" handles—or within the main GUIDE window. The actual start/end and sync reference handles are manipulated within the companion Cue Ed-



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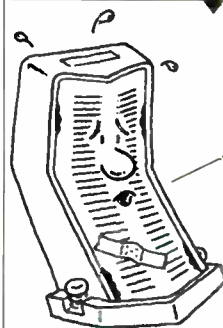
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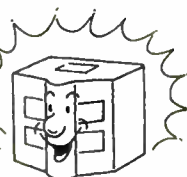
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itor window.

Sync references within the GUIDE time line display can be adjusted by moving the graphic section corresponding to the selected element or by typing in a new value for the designated tag point (In, Out or Sync). Alternatively, the selected cue point can be increased or decreased simply by dragging the mouse up or down the screen. Time compression/expansion of selected cues is also possible.

The graphic display is extremely clean and easy to follow, with color coding to designate which cue(s) have been selected and are therefore active for sync, level and other changes. Each cue can be set to display its name or a miniature representation of the amplitude envelope—very handy when laying up individual sound effects and setting them in rough sync with one another. Cross-fade envelope profiles can be set by typing a value into the corresponding window or by grabbing pointers on the front or back of the selected cue and dragging them to provide the desired shape. Cue in/ out and sync references can be moved in the same way. Cues can also be split and relocated as necessary.

DEDICATED HARDWARE CONTROLLER

Given my antipathy for Mac/PC-based workstations and editors that force the user to perform gymnastics with a mouse and a point-and-click graphical environment, I was particularly excited about the ProDisk's optional CB-158 hardware control panel. Measuring just 19x8 inches, the CB-158 connects to the Mac via a conventional ADB cable. (The units also require connection to an external 5V power supply.)

The combination of Otari's GUIDE graphic interface and the CB-158 hardware panel represents the best solution I have come across for handling complex recording, editing and machine control functions. When you need to get in tight for sample-resolution editing, the Mac's graphical environment is unsurpassed in speed and resolution. But for more complex functions and developing fast chops while performing routine tasks, I am convinced that nothing beats a collection of soft-labeled buttons, dials and displays.

The CB-158 offers two banks of definable buttons, arranged in two groups of 12 on either side of a central master record section. These buttons come with factory presets but can be remapped easily using standard Mac utilities, such as CE Software's QuickKeys. (The CB-158 simply outputs keystroke commands that are already available to users via a Mac keyboard, but without the complex keystroke combinations necessary to perform the desired task.) The soft-labeled buttons handle traditional cut, paste, insert, trim and slip functions, as well as open, save, close and other file-related commands for manipulating system setups on the Mac hard drive.

A central section houses a shuttle/jog wheel for external transports but also allows the user to scroll through the contents of the GUIDE sequence. A bank of dedicated transport controls can be set to command an external video deck, for example, or to cause ProDisk to act as master. In normal operation, the controls can operate a VCR holding a video workprint, for example, with the ProDisk following in chase-sync mode to LTC or VITC time code. Level and crossfade profiles of the various audio cues can be controlled from a cluster of buttons to the left of the jog wheel. Other banks of controls allow markers to be captured on the fly and Edit In/Out points to be nudged in time to suite the audio/video sync requirements.

The ProDisk 464 offers a fully integrated graphics and hardware interface. Virtually anybody—including non-computer-literate editors—could master this system within a couple of hours. The system has been designed to minimize the amount of typing and numeric entry necessary during a session; you can run the entire rig from the hardware controller easily by pulling out the Mac keyboard to label sound files and name master projects.

All editing functions, including cue loading, sync slip, cut/copy/paste and crossfade selection, are accurate and fast to implement. Rock 'n' roll scrubbing is precise and sounds just like tape!

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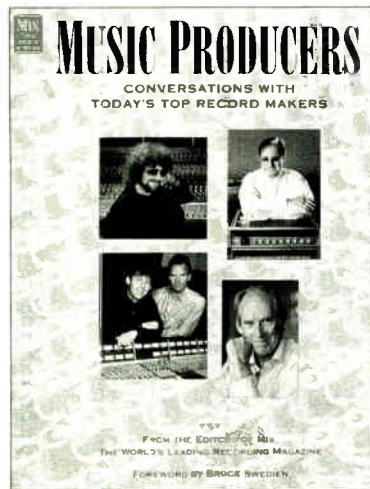


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can greatly speed the process of sound assembly to picture. The ProDisk accommodates virtually all popular file formats and allows the contents of a time code DAT, for example, to be loaded and checkerboarded across several tracks. The process can be automated or run in Operator Assist mode.

Variable-length front and back handles can be added so that additional material is available during subsequent editing sessions if you need to extend the start or end of a cue. ADR loops also can be set up for live recording into ProDisk.

System backup is to conventional 8mm Exabyte tape drives, which run at either three- (8200 Series) or six-times (8500 Series) real time. And the removable hard drives can be unplugged quickly and replaced with a new project. In addition, Otari offers a dedicated Backup Station, which allows the contents of removable drives to be archived and/or reloaded from Exabyte tape—or even copied, if that's your requirement—without taking up time or processing power from the ProDisk system. (A second, small-format Mac is required to run the operation software.)

Planned options for ProDisk include equalization, compression/limiting and more comprehensive internal digital mixing, plus integrated dynamic automation.

With products like the Otari ProDisk 464, sound editors can improve their creative options dramatically and achieve reliable, high-quality audio editing and synchronization to film/video. No longer should the word "workstation" strike terror in the hearts of producers, engineers and facility owners! ProDisk 464 has a wide range of applications throughout the audio-for-video, music-editing, broadcast production, CD-pre-mastering and related industries. All in all, I was extremely impressed with the processing power, ease of use and dramatically revised graphics interface.

Otari Corporation, 378 Vintage Park Dr., Foster City, CA 92352; (415) 341-5900. ■

Former magazine editor Mel Lambert now heads up Media&Marketing, a consulting service for pro audio firms and facilities.



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World Radio History



by David (Rudy) Trubitt

SOUND CHECK



dB Sound (Des Plaines, Ill.) and SSE Hire (Birmingham, England) have been working with Electro-Voice on modifications to increase the directivity of the MT-4 speaker system, including experiments with enclosure and manifold design on the MT-4H, shown above in Aero-smith's dB rig.

THE MONTREUX/DETROIT CONNECTION

Free Labor Day jazz festivals have showcased the diverse talents of Detroit annually since 1979. Former Detroit Renaissance Foundation director Bob Mills spearheaded diplomatic efforts to establish ties with the City of Montreux, Switzerland, prompting the event to be renamed "The Montreux/Detroit International Jazz Festival" in 1981. At that time, an exchange program was inaugurated enabling city-sponsored ensembles to travel between the two festivals. College-level jazz competitions and a cornucopia of educational festival activities were also established, in conjunction with the International Association of Jazz Educators.

All of this has combined to make Montreux/Detroit a huge success, drawing record crowds to the once-deserted Downtown Riverfront district. Festival manager Everett Armstrong confesses

that "we've been so successful that we stole NPR simulcast coverage away from Chicago. They had to reschedule their event for the following weekend because of it!"

Festival/stage coordination was handled through Armstrong's company, Third Ear Productions, out of Ann Arbor, Mich. Audio services were provided by Aerial Productions of Whitmore Lake, Mich. Continuous NPR simulcast coverage was provided by network affiliates WEMU and WDET. The 1993 equipment sponsors were Crest Audio and Beyer Dynamics.

This year, political uncertainties resulted in some belt-tightening for Montreux/Detroit. Only the three outdoor stages, located on Hart Plaza, were in use for the four-day weekend. Budgetary constraints meant only one exchange group, the Nicolas Hafner Swisstet, could attend the Detroit festival. Still, even this

—CONTINUED ON PAGE 124

VAN HALEN



Eddie Van Halen and Sammy Hagar

by Gregory A. DeTogne

VENUE

The World Music Theatre,
July 30, 1993

SOUND COMPANY

Audio Analysts

HOUSE ENGINEER

Jim Yakabuski

MONITOR ENGINEER

Brian Hendry

SYSTEM ENGINEER

Mario Leccese

Van Halen have been on the road for the better part of the last two years with the "For Unlawful Carnal Knowledge" tour, and they kept it going over the summer with a shed tour. Rehearsals began in L.A. in late May. By late June, the act was polished and on the road, with sound reinforcement again supplied by crew and components from Audio Analysts.

Midway through the tour, on July 30, the act reached The World Music Theatre. Located in the southwest reaches of greater Chicagoland, The World lays claim to being the country's largest outdoor amphitheater, with seating for more than 33,000—11,000 of whom can fit comfortably into the main pavilion. Since its inaugural season in

1990, the sprawling facility has been a fitting venue for larger-than-life performances, the type that Van Halen are known for.

Jim Yakabuski logged 15 dates at the front-of-house console in Europe earlier in the year and returned to manage FOH chores for Van Halen's shed tour. In between, he spent considerable time at the monitor desk, which was occupied this time around by Brian Hendry. Speaking from his designated perch at The World's freight terminal-sized loading dock, Yakabuski provided his perceptions of how the tour has evolved over the years. "There's more midrange in this band than most people would imagine," he observed. "It's the most prominent thing in the mix, with content coming

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from Eddie [Van Halen's] guitar, the snare drum and Sammy [Hagar's] voice. What we have here is definitely not all low end and top end like a lot of mixes tend to be."

To reinforce the midrange-dominated Van Halen sound optimally, Audio Analysts used its proprietary HDS-4 loudspeaker enclosures. Numbering 28 per side in flown arrays, the HDS-4s were tri-amped in a three-way configuration with a passive crossover to the tweeters. Each of the full-range devices received approximately 1,000 watts of Crown Macro-Tech power from substantial stacks of MA-2400s and MA-1200s. Eight subwoofer systems equipped with dual 18s were brought in for floor use to enhance low-frequency performance, while near-fill cabinets originally designed for use with John Mellencamp were hung below the HDS-4s for the front rows.

"The emphasis this time around was to get as many boxes as we could fit into each venue without hurting visibility," Yakabuski said. "And since everything is outdoors—some of the sheds we've been in didn't even have roofs—we brought in the subs to fill in the low end a bit."

If he'd had his druthers, system engineer Mario Leccese would have kept the P.A. in single, connected columns on both sides. However, in a move traditionally reserved for arenas, stage design called for ramps in some areas to allow the band to walk out near the crowd, thereby requiring a split in the singular column concept.

As for the newly added near-fills, Leccese found that they complemented the system well. "The primary function of these cabinets is to supply the front rows with something that will distinguish the sound on the stage from the sound in the P.A.," he explains. "We can run them on a separate feed so the level can be varied, and you don't need much bottom end because you get that from the P.A. You just need vocals, because at that

distance from the stage, you're also fighting the monitors."

House and monitor mixing chores were ably managed with two of Audio Analysts' CADD consoles. At the house position, 40 input channels were available, along with eight stereo effects returns. Another 40-channel CADD desk, with 16 mix outputs, controlled a fairly straightforward monitor system that emphasized clarity and intelligibility.

Processing for the system was housed in three vertical racks kept near the house console. Among the components at hand were Klark-Teknik graphic equalizers, dbx 901 noise gates, a TC Electronic 2290 digital delay, an Eventide H3000 Harmonizer, and AMS and Lexicon reverbs. Yakabuski used the preset up and down buttons on the 2290 to send MIDI program changes for quick resetting of all effects for different tunes.

One of the biggest changes in the Van Halen system since the outset of the tour was the addition of a SAORI digital signal processor from TOA Electronics. Capable of performing a variety of processing tasks, the unit was first added in Europe to supply crossover functions on a trial basis. "When I took over in Europe, the SAORI was being used, so I stuck with it across the continent with the idea of performing a series of A/B tests with other crossovers when we got back to the States," Yakabuski said. "Once we had the chance to listen to the three different units being considered, I picked the one I thought sounded best, and it was the SAORI. It had a sweeter top end and a little more level on the low end, plus a variety of other features such as a boost for the power-response curve, which supplies more tweeter sizzle without having to bring up the high end on all the [channel] strips."

Yakabuski also feels that the signal that passes through the digital SAORI is cleaner. "It tends to keep the noise down in the system, and I believe you get truer division of the frequencies,"

he said. "And given that we're using analog as well—there are Eddie's Groove Tube mics, tube guitar amps and so forth—a lot of the traditional warmth is still there."

Never known to rely upon effects, Eddie Van Halen keeps a Spartan assortment onstage, where he controls delay times and harmonizing himself. For miking the guitar virtuoso half of the Van Halen brothers, Yakabuski maintains three channels: center, left and right. The three mics are then taken dry into the house console.

Along with Eddie's guitar, Yakabuski's mix featured the dynamic personalities of Sammy Hagar and Alex Van Halen, all within the same frequency band. "The prime objective of mixing any show is to bring out the vocals," Yakabuski added. "If you can't hear the vocals, it's frustrating for everyone. With this mix, however, you have Eddie's guitar, Alex's snare drum and Sammy's voice all in the same place, so you have to make sure that all three of these elements are prominent and distinct, yet not overshadowing the rest of the band. As a result, there's a lot of interplay, and you have to be on your toes constantly. It's a balancing act, and whenever there's a chance to sneak one or the other up to fill in a hole, I do."

One of the long-running critiques of Van Halen's recorded material has been that the bass is often overshadowed in the mix. Yakabuski has maintained a keen awareness of this perception. "One of my other objectives when I took over was to ensure that the bass guitar had its place," he's quick to point out. "Alex isn't really big on having this massive kick drum sound—snare drum is his thing—so I took the opportunity to set up a mix with a nice tight kick drum and a lot of bass guitar to go with it. In effect, I've gotten rid of all the sub-end on the kick drum and saved it for the bass guitar." ■

Gregory DeTogne is a freelance writer in the Chicagoland area.

—FROM PAGE 120, SOUND CHECK

abbreviated version provided listeners with some of the hottest jazz around by headliners Arturo Sandoval, Charlie Hayden, Dave Brubeck, and the Jimmy Wilkins Orchestra featuring Joe Williams.

The Detroit Renaissance Foundation will no longer be involved in the promotional sponsorship of public events. This will not, Armstrong assures, mean the end of Montreux/Detroit. Rumor has it that Mills will continue to play a key role in this festival for many years to come.

—W.J. Duch

SOUND REINFORCEMENT SEMINAR

Synergetic Audio Concepts and *Pro Sound News* will host the fifth annual Sound Reinforcement Workshop. The event will be held just before the January NAMM show, from January 17-19 in Orange, Calif., at Chapman University.

The Live Sound workshop will focus on a systems approach. Afternoon sessions will be split into student and advanced groups, with instructors including workshop chairman Will Parry of Signal Perfection Limited, M.L. Procise of Showco, Albert Leccese of Audio Analysts and David Scheirman of Concert Sound Consultants. The advanced classes will be conducted by Mick Whelan of Electrotec and Kenton Forsythe of EAW.

Registration for the event is \$650, which includes all materials and meals. For information, call (812) 995-8212 or fax (812) 995-2110. Based on my experience at the last two workshops, you won't be disappointed.

MOODY'S ORCHESTRAL TOUR

On the heels of their successful Red Rocks live video and album, the Moody Blues have been touring the states with a pickup orchestra in each city. Three mix engineers—Jeff McGinnis and Gary Kundra (house) and Paul Sonthiemer (monitors)—are working the Showco rig.

The orchestra is covered by Crown GLM mics and contact

pickups, which feed a bank of mic preamps. These are connected to a PM3000 for the house orchestral mix. Its aux sends and subs are sent to a split to provide an orchestral premix to the stage monitor system, a Harrison with extender. A supplemental orchestra mix is provided to the band and a matrixed band mix to conductor Larry Baird, who also did the orchestral arrangements for the tour.

Sixteen sets of the musical scores were prepared for the tour. These are leapfrogged ahead to the next 15 orchestras for preparation. On the afternoon of each show, that show's group of players rehearses for 2½ hours with an Alesis ADAT loaded with band tracks from the Red Rocks date.

LIVE FROM THE WHITE HOUSE

Klondike Sound Co. of Greenfield, Mass., provided sound services for the 40th Anniversary Celebration of the Newport Jazz Festival at the White House last summer. The event, which was hosted by the President and First Lady, was recorded for a fall PBS broadcast. The performers included Wynton Marsalis, Rosemary Clooney, Herbie Hancock, Joe Henderson, Bobby McFerrin and dozens more. At the invitation of singer Joe Williams, Bill Clinton joined the finale on sax.

Representing Klondike Sound were technicians Ethan Williams (monitors), Erik vonRanson (system eng.) and John "Klondike" Koehler (house). Sound Reinforcement equipment was provided by Promix Inc. of Mount Vernon, N.Y. Audio producer James Anderson, assisted by David Gillette, engineered the digital recording in UNITEL's A/V truck for WETA/Washington.

The event was produced in a 131-foot x 180-foot frame tent erected on the South Lawn of the White House. The sound system featured flown Apogee 3x3's and Meyer UPA's, with Apogee AE-3M monitors. All amplification was by Crest. The house console was a new Crest Century GT-32, which provided outputs

to four speaker zones plus feeds to the White House and Press. Monitors were mixed on a DDA S Series 32.

AKG BLUES RESTOCK MIC CHEST

Jacobs Audio of Boulder, Colo., recently replaced its entire range of condenser microphones with 21 mics of the same model—the AKG C391B from the new Blue Line Series. "It's turned out to have been an excellent decision," explains Chris Jacobs, owner and chief engineer. "Now we don't have to take a large selection of specialty mics for various acoustic instruments along. The C391B is our exclusive choice for acoustic instruments because it provides us with consistent sound throughout the bandwidth."

Recent gigs with the new mics included National Public Radio's E-Town, which featured James Taylor, Julian Lennon, Rosanne Cash and T-Bone Burnett, among others. Another of the 20-odd orchestral gigs Jacobs Audio does each summer takes place at the Botanic Gardens, a 5,000-seat amphitheater in Denver. "Before, it took as many as four [mic] selections before we achieved the right sound on the orchestra," Jacobs says. "Now the sound is there almost immediately."

QSC + LONE WOLF = LONE STAR SPECTACULAR

The Fiesta Texas theme park added QSC amplifiers controlled via Lone Wolf's MediaLink networking system to one of its main musical productions, the "Lone Star Spectacular." The park is located in the middle of a limestone quarry, and the Spectacular uses speakers and amplifiers positioned at various heights along the high cliff walls.

"In this particular application, QSCControl (QSC's implementation of Lone Wolf's system) will allow remote control of speakers and amplifiers in restricted fire zones and other out-of-the-way places," according to park audio supervisor Dean Rayburn.

Bob McCrobie is Fiesta Texas' former technical services man-

ager. (He recently moved to a similar position at the new San Jose Arena—see related story in this issue.) He noted that the initial single-attraction install was designed to familiarize the crew with the system and begin training, but the overall intent is to integrate the system park-wide, including programmed background music, playback and paging.

"We've always used QSC amps exclusively," McCrobie adds. "Eventually we will use this system to control other components such as equalizers and crossovers and are now seeking out other MediaLink-adaptable products in those areas."

BURNS DOES "IT" FOR NIKE

Nike recently held its international sales meeting at the Portland Exposition Center in Portland, Ore., and Burns Audio (Burbank, Calif.) handled sound for the occasion. Company VP Kevin Sanford led a crew that spent an entire week in careful preparation and frequency coordination of the wireless systems required for the event—32 simultaneous channels of Vega Pro Plus wireless microphone systems in all. "We really had to do a lot of homework," Sanford says. "The expo center is right next to both the airport and a major broadcast antenna field, presenting the potential for major RF headaches. The Academy Awards show (which Burns has done for several years) doesn't provide nearly the challenges that the Nike Show did. However, all went well with this show—the Vega systems turned in their usual great performance."

RECENT WORK

Audio-Visual Communications Systems of Westerville, Ohio, put a sound system into a converted bowling alley for Denison University in Granville, Ohio. The room will serve as a campus pub featuring recorded and live music and other special events. "The room," explains AV's owner, Michael Zajd, "is 80 feet by 200 feet. The architect treated the ceiling with a fireproof coating

and painted it to match the decor, so that took care of most of the acoustical problems."

Three pairs of Tannoy CPA-15 speakers were used in the room, along with a pair of CPA-15.2 subs. Zajd reports, "Each pair of speakers has its own amplifier. We've managed to achieve excellent clarity with a high SPL level, and the amplifiers are only running at half power!"

Applied Audio of Rochester, N.Y., recently installed an EV MT-4 system in the Horizontal Boo-

gie Club, a live music venue in its home town. The long, rectangular 800-capacity club features music ranging from heavy metal to new age jazz. A single MT11-4H mid-high box was placed on either side of the stage with four MT-4Ls on the main floor below. MT-4A and MT-2 systems were also installed by in-house chief audio technician Chris Sannino and his staff at Harrah's Hotel and Casino in Atlantic City, N.J., in the hotel's "Broadway by the Bay" main showroom. ■

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SOUND REINFORCEMENT NEW PRODUCTS



AUDIO-TECHNICA PRO VHF WIRELESS

Audio-Technica (Stow, OH) unveiled the ATW-1235 and ATW-1236 professional wireless microphone systems. The ATW-12 receiver, used in both systems, is a half-rack unit featuring true dual-diversity operation and a choice of 20 frequencies within the VHF band. Transmitters include a handheld model with an A-T Hi-Energy dynamic element and a body-pack unit that has both instrument and low-impedance mic inputs, with powering for condenser microphones. Several lavalier mics are available, and the

system has a maximum range of 1,500 feet, providing approximately ten hours of operation from a 9-volt battery.

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STAGE ACCOMPANY NEODYMIUM DRIVER

New from Stage Accompany (Rego Park, NY) is the Neodymium Compact Driver, a high-frequency compression driver for pro applications. Despite the compact size of the unit, the driver is capable of reproducing sounds from 1,000 to 35,000 Hz at 109.5 dB, with a THD said to be 1.4%.

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AURA 1800 SERIES WOOFERS

Aurasound, a division of Aura Systems (El Segundo, CA) introduced its 1800 Series of 8- and 4-ohm, 18-inch woofers. The speakers feature a unique radially magnetized neodymium magnet enclosed in a tear drop-shaped steel structure, thus eliminating the top plate used in conventional designs. The voice-coil moves in the gap between the cylindrical magnet and the pole back-plate structure. According to Aura, this design focuses 95% of the magnetic flux on the gap area, resulting in greater power handling and efficiency. Another design advantage is that the drivers are inherently self-shielding, a plus in video applications.

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CARVER PM SERIES AMPLIFIERS

Carver Professional (Lynwood, WA) expanded its PM line of amplifiers with two completely new designs. Priced at \$658, the PM-120 is a 2-channel amp packing 200 W/channel (at 4 ohms) into a two-rack-space chassis. Features include rear-panel detented level controls, normal dual mono bridged mono modes and 1/2-inch TRS balanced inputs. The single-rack-space PM-120 delivers 60 W/ch into a 4-ohm load and retails at \$498. Both models include signal present/clip/fault status LEDs, internal level-select jumpers, 90-130 VAC operation and five-year warranties.

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ATM FLY-WARE FOR RAMSA T-SERIES

ATM Fly-Ware (Carson, CA) introduced a complete hardware kit for flying the Ramsa WS-T212 and WS-T215 speakers. Rugged, internal, four-corner bracing lets you safely suspend the speakers with a safety factor of 5:1—the professional rigging industry standard.

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RECORDING • NOTES



PHOTO: KEVIN DAVIES

COCTEAU TWINS:
HEART TO TAPE

by Adam Beyda

Throughout their more than ten-year career, the UK's Cocteau Twins have constructed thick, thoughtful music that weaves ethereal sounds with rhythmic and plaintive melodies. Multi-instrumentalists Robin Guthrie and Simon Raymonde combine layers of heavily processed, melodic guitar noises and washes with bass, piano, syncopated drum machine tracks and the odd sample. But it's singer Elizabeth Fraser's stirring voice that sends the songs into an uniquely emotional, intuitive space.

Intuitive is, not coincidentally, a good word to describe the trio's way of writing and recording. Rather than focusing on traditional songwriting, the Cocteaus work around a

—CONTINUED ON PAGE 130

The control room at the Cocteau Twins' *September Sound*. The Cocteau Twins, left to right, are Robin Guthrie, Elizabeth Fraser and Simon Raymonde.



PHOTO: GUY AROCH

RICKIE LEE JONES' EXQUISITE "PARADISE"

Over the course of 14 years and seven albums, Rickie Lee Jones has proven to be one of this country's most original and insightful singer/songwriters. Although many listeners undoubtedly have her pegged forever as the boho bard of Coolsville, thanks to the surprising success of the single "Chuck E's in Love"

from her Warner Bros. debut album in 1979, *all* of her albums have offered musically interesting and conceptually compelling slices of the human soul. I regard three of her LPs as absolute classics: the eponymous debut, the Walter Becker-produced *Flying Cowboys* and her latest—and first entirely self-produced

Julie Last, Rickie Lee Jones' engineer on her new album



PHOTO: ANNALISA

disc—*Traffic From Paradise*.

Jones is that rare songwriter who successfully mixes dreamy abstraction with an uncanny eye for poetic detail. Unflinching honesty, reality and metaphor combine to create a world that is unmistakably her own yet speaks clearly to the listener. Her vision is often bathed in darkness, but there are also

humor and hope mixed into the brew, and the beauty of her singing and the lilting instrumental arrangements often provide a wordless, optimistic subtext to her songs.

In fact, though many of the lyric themes on *Traffic From Paradise* obviously spring from uncertainty and existential angst, the tone of the album strikes

—CONTINUED ON PAGE 132

HITSVILLE REVISITED: REMASTERING AT MOTOWN

When we last checked in with ace mastering engineer Bill Inglot (*Mix*, December 1991), he had just completed work on the now-famous Stax Box, an ambitious collection of the best singles to come from the famous Memphis R&B label. He's worked on numerous projects since, but much of his time the past year-and-a-half has been

spent with frequent partner Dan Hersch, slaving away on one of the biggest remastering magillas to come down the pike: Motown Records' catalog.

Last year Inglot spearheaded the remastering effort on the label's four-CD retrospective of their hits, *Hitsville USA, Vol. 1* (1959-72). And in 1993 he helped put together retrospective of their hits, *Hitsville USA, Vol. 2* (1972-92), as well as anthologies by a number of top Motown artists (Martha Reeves & the Van-

—CONTINUED ON PAGE 180

The Four Tops



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complicated part, which is quite handy for the engineer; not a lot of

at best, a tenuous existence. Their music emerges not from a

preamp module. Interestingly, for most of the acoustic guitar tracking, she chose vocal mics—the 251 or a Neumann U67. “Rickie Lee often sang and played guitar at the same time,” Last says. Initially, when I tried something that would normally be considered an acoustic guitar microphone, like a [AKG] 452 or some other small capsule mic, the vocal leakage had a tinny, unpleasant quality to it. But the ‘vocal’ mics sounded fine on the guitar and helped the overall sound of her voice.” Most of Kottke’s guitar parts were recorded stereo using an AKG C-24.

“The arrangements weren’t at all

preconceived,” Last says. “A lot of times, it was a question of going out and picking up an instrument and seeing if anything happened. We might try to record, say, several tracks of a mandolin part, which is an instrument she was messing around with and was kind of new to her. I really like it when somebody picks up an instrument they’re not familiar with, because you get something an experienced player wouldn’t play. In that case, we’d record several tracks and then pick the little bits that worked.”

Experimentation was encouraged and serendipity welcomed. In fact,

one of the album’s most successful tunes, a sly, ultracool cover of David Bowie’s “Rebel Rebel,” just materialized magically in the studio one day. “We were working on another song,” Last explains, “and things were kind of hitting a wall, and people were getting a little frustrated. Rickie Lee started playing ‘Rebel Rebel’ just to sort of clear the air, and then the other members started to join in, and we ended up using it. She built on it later, but it came from a totally spontaneous moment.”

Other parts of the song also stemmed from happy accidents. In the case of the guitar part by Brian Setzer, “We had asked him to sing and play acoustic guitar, but he just happened to have an electric in his car, and they just happened to have a funky old amp in the equipment room at Conway, and it happened to sound great,” Last says with a laugh. As for Brad Dutz’s percussion part, “[Rickie Lee] told him she didn’t know what she wanted, and to just try anything. So Brad was sitting around banging mic stands and road cases and the floor trying to figure out what to use, and that’s what we ended up with. He wasn’t even near a mic particularly. It made it pretty interesting from my point of view.”

Setzer is one of four electric guitarists to appear on the album; the others are, on one track each, Los Lobos’ David Hidalgo, David Baerwald and Dean Parks. In each case, the guitars never dominate the arrangements; rather, they sound like equal partners in the mix with the acoustic instruments. “By the time we got to the electrics,” Last comments, “the tracks were pretty much together. Those players have all got unique sensibilities, and their individual characters added some wonderful flavor. They all had a good feeling for her music, so at that point, we were able to find sounds that would complement everything else.”

Last says that Rickie Lee was “extremely involved in the mix. She was very hands-on and had specific ideas in terms of the balances and the sorts of ambiances she wanted to hear, or *not* hear, on the instruments. She would let me work on my own and then come in and fine-tune things. At first I tended to polish things up, go for more of a traditional mix, but then she would come in and strip it down. In general, we

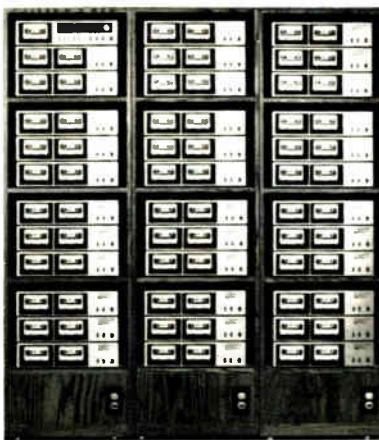
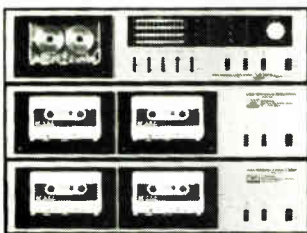
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RICKIE LEE JONES' EXQUISITE "PARADISE"

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PHOTO: ANNAUSA

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—CONTINUED ON PAGE 180

The Four Tops



PHOTO COURTESY OF MOTOWN RECORD COMPANY

—FROM PAGE 128. COCTEAU TWINS

sound or try to achieve a sonic feel. The band writes, performs and records all of their material, and they intermingle the writing and production processes; songs quickly coalesce out of finding sounds and laying down instrument tracks. More than most bands, they use the studio as an instrument, so right from the start, studio work is an integral component of their creative process.

Because of this, it's been important for the band to have their own recording capability. They've been collecting gear pretty much since they started out, and they had been recording at various temporary spaces since the mid-'80s. In 1989, they finally settled into their September Sound (named in honor of the birth month of Fraser and Guthrie's daughter, Lucy Belle), a 24-track studio located in The Boathouse, a studio complex owned by Pete Townshend in the Middlesex section of London. In addition to offices and a lounge, the well-equipped studio comprises a pre-production room, a small room used mainly for vocals and a control room (recently refitted

with a 40-channel Amek Hendrix), where most of the instrumentation is recorded. The Cocteaux' recently released seventh LP, *Four-Calendar Café* (on Capitol in the U.S.), is the second album they have completed at the studio.

The band worked with outside engineers and producers in the beginning of their career, but after some frustration, Guthrie realized that he had to take on the recording chores himself. "I had certain sounds in my head," he explains, "and I wasn't getting them. I was just searching for that sound, and I found it easier just to take off on my own. When we did our second album, *Head Over Heels*, I bullshitted the record company. I said, 'We've got loads of songs, and I'm going to try it myself. Of course I know how to do it.' I didn't, but it didn't take me long [to figure out]!" The band shared co-production credit on that one with John Fryer, and now Guthrie and Raymonde handle all the recording duties.

Raymonde says that they begin with piano and guitar and that guitars are mostly recorded direct. They

get sounds from a variety of sources: No less than three songs on the new album partially emerged from their experiments with a newly acquired Eventide H3000, and Raymonde says, "A lot of times we used little guitar processors, like the Marshall JMP-1, which is basically a reproduction of all the different Marshall tube amps from over the years. We tend to get a good sound from there and then spin some effects through and usually just go straight to tape."

To start the process, Guthrie says, "I like to have something to play to that's in time, so I'll usually generate something from a drum machine or a loop and build from there. I like a lot of synched-up delays and pulse-y and resonance-y things, just to get something that's almost musical to play to. I like things like little old analog beat boxes—pulsing 'em and sticking 'em through different effects. Then I have something I can play with. On some songs on the new record that are acoustic-y songs, I'd just strum the three chords and build from there. Others are more sort of soundscape type of songs. Basically, I don't think we've

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ever done two songs in the same way. It's always something different.

"In the getting-the-sounds stage," he continues, "I do use a lot of old pedals and old tape echoes and really just noise—getting all the knobs up to 11 just to see what stuff can do. I've got some bizarre old pedals like the Maestro guitar and rhythm box, where you plug in the guitar, and drum sounds come out. When you start messing around with things like that, and frequency analyzers and pulse modulators, you can get some good sounds. Then when I get some stuff on tape, I can start messing about with some of the more modern technology, just things as simple as gating."

"We work instinctively," Raymonde adds. "We don't like to have a set pattern to the way we work. In terms of sound, you've got to have an idea of what sound you want before you get there. You've got to have the sound that suits the song in particular. Sometimes you don't know what that's going to be until you're fiddling about with the parameters. You just know by mucking about with something when you're there. I like to get inside something and arse about with it, muck about with feedbacks and things."

"I have a clear-cut idea of what I want the thing to be like as I'm working on it," Guthrie says, "as opposed to not having an idea, putting it down and hoping to sort it out in the mix. By the time we have instruments going down, and the tune's being made, I know where I want it to go—I know the feel."

Much of the *feel* is actually achieved in the final steps before mixing—recording vocals and drum tracking. For the latter, Guthrie tackles the full drum programming only after the music is close to completion. He uses an Akai MPC-60 exclusively, relying mostly on a large library of samples. He admits to nicking loops off records and says that he'll often mix in real cymbals, shakers, tambourines or hi-hat, but he makes no bones about not using a live drummer (although the band may use a drummer for the first time on their upcoming tour).

"I'm under no illusions," Guthrie says. "I'm not trying to replace a drummer with a drum machine. When I start dropping the hi-hat out when somebody's playing the toms, then you'll know I'm trying to copy

a real drummer. But the fact of the matter is, I'm doing things with a drum machine that a drummer would do if he could."

The one wholly inimitable element of the Cocteau Twins is Elizabeth Fraser's singing. Her poignant, mellifluous vocalizing and eccentric phrasing are the signature of the band's constructions. She lays down her vocals after all the music's finished, with Guthrie and Raymonde taking turns at the board. A primary consideration is creating an atmosphere that will enable her to open up and give her best performance.

"She needs to be really relaxed," says Raymonde, "because she's quite a sensitive person, as many singers are. You need to create an atmosphere where there's no fear around. Just the presence of other people can be distracting. She has to have quiet and, ideally, no interruptions, which is tough around here. You have to be encouraging. I must say, it's the most brilliant thing recording Liz's vocals. If I'm doing it, I have to wear two hats: I have to pretend to be an engineer for a while, whereas really I'm like a fan. She's doing something, and I've maybe got it on solo so I can hear everything she's doing, and it can give me a real lump in my throat and shivers up the spine. When she's finished, I want to go, 'Yeah!' but I have to say, 'Umm, I'm not sure Liz, maybe you should do that again.'"

Fraser usually is recorded very dry with a Neumann U87i. "She likes to have reverb in her headphones just to help her relax, but we put all the effects on in the mix," Raymonde explains. They put some compression to tape on the vocals, often using a UREI 7110 or 1178, and limiting (Summit Audio TLA), too. Guthrie says that the BSS DPR 402 de-esser also comes in handy on vocals.

And though there's often multiple, intertwining vocal parts, individual tracks are generally one-offs, not composites. "She'll work out a whole part and sing it in one go, after lots of practice," Raymonde says. "No matter how idiosyncratic the vocal is—no matter how many strange little inflections there are—by the time we actually come to record it, she can lay down a 30-second verse and then double-track it exactly the same. She has this uncanny ability to reproduce the most

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complicated part, which is quite handy for the engineer: not a lot of cutting and pasting. There's not a lot of work to be done after she's sung the part."

There *is* a lot of work to be done in the mix, though. In the past, the band have spent days mixing a single song, an overindulgence that Guthrie, who tends to be responsible for the final, attributes to insecurity. "It's difficult to know when to stop," he says. "This time I really disciplined myself and said, 'Well, this song is okay. Let's not lose where it's coming from by tarting it up beyond belief.'" They mixed the entire new album in ten days.

"On the new record," Guthrie continues, "I would mix something and then listen to it at home, in the car, then come back the next day, do some fine-tuning and move on before I changed my mind. And if I do change my mind, I'll go back and do it again. I like to take a fresh approach each time I do something. I don't build up a monitor mix while I'm recording and then tart that up and finish it. I like to strip the whole board down and start afresh, and just get into the sounds individually.

"The mix is a building process," Guthrie says. "I like to slot everything into its own little place—using EQ for setting instruments, using panners. And then there's a big smoothing-out process, taking the lumps out—compressing things that need it, compressing the whole mix—that's something I do on virtually every mix. I use an Aphex Compellor religiously over the whole mix. I've got Virtual Dynamics on the board as well, which I use a lot more than I thought I would. For things like expanders and gates, it's so much easier and straightforward—you just press a button on the board, and it's happening. I rely on automation entirely! My idea of the perfect mix is just sitting at a desk and not touching anything, where every effect, every EQ and every level is automated. The Amek's SuperTrue automation is the best automation I've ever used."

The band do not do a variety of mixes of a particular song, instead treating each mix as *the* mix, stopping when it feels done. And because, in general, they work by following their feelings, talking about the Cocteau Twins' methods is a reconstruction of something that has,

at best, a tenuous existence. Their music emerges not from a set of procedures but from an experience.

"Basically, we go into something with no concept and come out with something complete," Guthrie says. "It's like producing something with your hands, like making something from nothing—I like that. It's not a fractured sort of process like a songwriter writing a song, making a demo, getting someone else to perform it, then going into a proper studio. [For us], from idea to creation is a very short period of time. I think that maybe comes out in the music, which can be quite intense. We *are* highly emotional people, I can swear to that, and just to be able to get it from heart to tape in a very quick time is something I'm really grateful for." ■

—FROM PAGE 129, RICKIE LEE JONES

me as the most upbeat of any record since her first. The feeling is loose and warm—the word Rickie Lee used in one interview is "friendly," and that seems about right. I would also add "accessible," an adjective that has fit her music only occasionally through the years. I can't imagine anyone hearing the beautiful "Running From Mercy" and not feeling its radiant glow. Or not being swept up in the New Orleans beat of "Jolie Jolie." Or not being captivated by the striking sonic textures of "Tigers." There's no filler on this album: This is the *real stuff*.

It's a beautifully recorded album, too, a testimony to Rickie Lee's sure vision and the technical skills of her engineer/mixer on the project, Julie Last, who is an interesting story herself. Last's extensive experience began with a stint as a second at New York's Record Plant in the late '70s, then in L.A. with Richard Perry at Studio 55, with Val Garay at Record One, and two years at Ocean Way. She engineered David Byrne's *The Catherine Wheel* and Brian Eno's *On Land* and has spent the last few years working with Joni Mitchell and producer Larry Klein.

Last got involved with Rickie Lee's record when she filled in one day for another engineer at the nascent stage of the project. She and Rickie Lee clicked, and Last went on to engineer the remaining lion's share of the record. "I've been working hard in the

trenches for many years," Last says, "and I'm happy that the music community is finally accepting and even welcoming the idea of having a woman at the helm. Being given the opportunity to do this album meant a great deal to me." Her outstanding work on this record, as well as an upcoming Shawn Colvin album, is sure to establish Last in serious engineering circles, where she'll be a welcome female presence in a world overwhelmingly dominated by men.

Working with Rickie Lee posed an interesting challenge for Last, in part because the artist came to the project with few preconceptions about how the songs would evolve. There were no demos to work from, and much of the material came to life in the studio. "Also," Last notes, "she's a very special artist—in the studio she gets herself in a very creative, vulnerable place, and that place has no room for any technical intrusions, which meant there was rarely an opportunity to work on sounds, adjust levels or try different mics. The first run-throughs were always recorded, and very often the first take ended up being 'the one.' I was frustrated not being able

to fine-tune things to tape, but Rickie kept saying, 'Don't worry, we'll tweak it later.' As a result, everything went to tape pretty flat, and I had to rely on a good familiarity with a lot of mics so that I could quickly put up something that I knew would work.

"A few times, I'd set up several mics—on the guitar or dulcimer for instance—then while she was tuning, I could switch around and get an idea if one was sounding better than another. Because there was very little EQ, and the sounds weren't 'fussed over,' as layer upon layer was added, the record took on a very raw and natural quality that really integrated with the character of the music. So it all worked out for the best."

The record was cut at Conway Studios using the Focusrite console with GML automation and analog Studer recorders with Dolby SR. "Conway has a great-sounding big room; it's very live," Last says, "and that fit in with Rickie Lee's desire to not use much signal processing: She pretty much insisted that we keep everything very natural-sounding. Any time it got at all slick, she made me back off, in terms of reverbs. Any-

thing that sounded obviously 'studio-ish' wasn't part of the program on this record. We ended up using the AMS on the ambience setting a little bit, but everything was used very subtly, and most of the reverbs were quite short."

At its heart, *Traffic From Paradise* is an album of stunning acoustic textures: neatly layered vocals; glistening acoustic guitars played by Rickie Lee, her longtime musical *compadre* Sal Bernardi and Leo Kottke (who also co-wrote three songs and contributes his *basso profundo* vocals on one track); wonderfully imaginative bass (and cello) support by John Leftwich; splashes of drums and percussion from Jim Keltner, Brad Dutz, Efrain Toro and, on one song, Alex Acuna; a little violin (Bobby Bruce); unobtrusive French horn (Doug Lyons); and some mandolin, dulcimer and keyboard parts from Rickie Lee.

Last says the tracks with Keltner on drums were cut live, including vocals, with the other players; the rest were layered from Rickie Lee's guitar or keyboard and vocals on out. For Rickie Lee's vocals, Last used a Telefunken 251 mic through a Neve 1073



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preamp module. Interestingly, for most of the acoustic guitar tracking, she chose vocal mics—the 251 or a Neumann U67. “Rickie Lee often sang and played guitar at the same time,” Last says. Initially, when I tried something that would normally be considered an acoustic guitar microphone, like a [AKG] 452 or some other small capsule mic, the vocal leakage had a tinny, unpleasant quality to it. But the ‘vocal’ mics sounded fine on the guitar and helped the overall sound of her voice.” Most of Kottke’s guitar parts were recorded stereo using an AKG C-24.

“The arrangements weren’t at all

preconceived,” Last says. “A lot of times, it was a question of going out and picking up an instrument and seeing if anything happened. We might try to record, say, several tracks of a mandolin part, which is an instrument she was messing around with and was kind of new to her. I really like it when somebody picks up an instrument they’re not familiar with, because you get something an experienced player wouldn’t play. In that case, we’d record several tracks and then pick the little bits that worked.”

Experimentation was encouraged and serendipity welcomed. In fact,

one of the album’s most successful tunes, a sly, ultracool cover of David Bowie’s “Rebel Rebel,” just materialized magically in the studio one day. “We were working on another song,” Last explains, “and things were kind of hitting a wall, and people were getting a little frustrated. Rickie Lee started playing ‘Rebel Rebel’ just to sort of clear the air, and then the other members started to join in, and we ended up using it. She built on it later, but it came from a totally spontaneous moment.”

Other parts of the song also stemmed from happy accidents. In the case of the guitar part by Brian Setzer, “We had asked him to sing and play acoustic guitar, but he just happened to have an electric in his car, and they just happened to have a funky old amp in the equipment room at Conway, and it happened to sound great,” Last says with a laugh. As for Brad Dutz’s percussion part, “[Rickie Lee] told him she didn’t know what she wanted, and to just try anything. So Brad was sitting around banging mic stands and road cases and the floor trying to figure out what to use, and that’s what we ended up with. He wasn’t even near a mic particularly. It made it pretty interesting from my point of view.”

Setzer is one of four electric guitarists to appear on the album; the others are, on one track each, Los Lobos’ David Hidalgo, David Baerwald and Dean Parks. In each case, the guitars never dominate the arrangements; rather, they sound like equal partners in the mix with the acoustic instruments. “By the time we got to the electrics,” Last comments, “the tracks were pretty much together. Those players have all got unique sensibilities, and their individual characters added some wonderful flavor. They all had a good feeling for her music, so at that point, we were able to find sounds that would complement everything else.”

Last says that Rickie Lee was “extremely involved in the mix. She was very hands-on and had specific ideas in terms of the balances and the sorts of ambiances she wanted to hear, or *not* hear, on the instruments. She would let me work on my own and then come in and fine-tune things. At first I tended to polish things up, go for more of a traditional mix, but then she would come in and strip it down. In general, we

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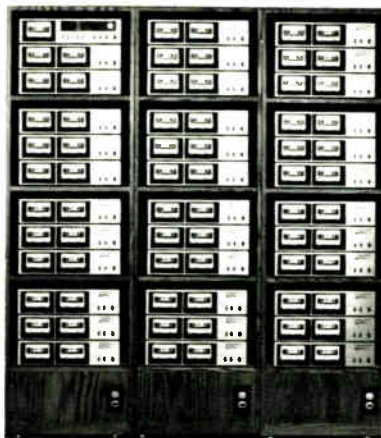
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INTERVIEW
WITH
STEVE
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ASTERING
THE GOLD DISC WAY



PHOTO CHRIS JURGENSON

Steve Hoffman may not be a household name, but his remastering of historic catalog classics by household-name artists has made this California-based music lover quite a name in certain audio circles, as well as with a legion of pleased consumers.

Hoffman's professional fascination with reissues developed shortly after he began working at MCA in 1978, when he looked over the label's extensive back catalog. With the advent of CD, Hoffman began to assemble compilations that won all sorts of acclaim, beginning with Buddy Holly and later including John Coltrane, Bill Haley & The Comets, Elton John, The Who and others. He set out to work with only first-generation masters, and it has made all the sonic difference in the world.

In 1987, Hoffman moved to Dunhill Compact Classics, a small California boutique CD-reissue label run by Marshall Blonstein, company president. There he worked on classic titles from the Shelter catalog (Leon Russell, Dwight Twilley, Freddie King) and Ray Charles, and he eventually became DCC's vice president of A&R.

BY
RICK
CLARK

In late spring of 1992, DCC entered the audiophile gold CD arena. (Since the CD oxidation scare of the late 1980s, gold has been favored over aluminum by the audiophile market due to its ability to withstand rust and resist "pitting.")

DCC's first gold CD offering was a first-class, two-disc reissue of Cream's *Wheels of Fire*, which featured impressive sonic integrity and set the standard for the label's obsessive attention to re-creating the original album graphics. In this case, that meant using the original foil paper and Day-Glo inner sleeve graphics that were used on the first LP packaging.

Since then, Hoffman has remastered a slew of notable reissues, such as Joni Mitchell's *Court and Spark*, Bob Dylan's *Highway 61 Revisited*, The Doors' self-titled first album, *Strange Days* and *L.A. Woman*, The Eagles' *Greatest Hits* and *Hotel California*, Paul McCartney's *Band on the Run*, Bob Seger's *Night Moves*, Creedence's *Bayou Country* and *Cosmo's Factory*, the Beach Boys' *Pet Sounds* and many more.

Mix managed to get Hoffman to take

CD PHOTO:
RON MILLER

some time off to share his thoughts on audiophile remastering.

Recently you released an impressive-sounding Eagles Greatest Hits. Keeping your remastering philosophy in mind, how did you go about working a collection culled from various albums?

Back in 1976, it was standard operating procedure for cutting a greatest hits album to use an EQ'd tape copy made from EQ'd album masters. That was the case for the Eagles' *Greatest Hits*. We only use original masters, which means I go pull the original LP master from each album and recompile it for this Eagles collection. It's a lot harder to do than a regular straight album reissue because of variations in azimuth, equalization and tape stock.

When I finally heard some of the actual masters of those Eagles songs, I was a bit disappointed, because they had some of the same problematic sonic characteristics of *Hotel California*, another gold disc reissue I worked on. Specifically, the tapes sounded very bassy, with absolutely no upper midrange definition and marginal high end. This was a direct result of the type of monitors chosen for mixing and their placement in the control room.

What monitors were they?

They were standard-issue JBL studio monitors of the '70s. These monitors were mounted in the mixing room, away from all walls. Therefore, there was not any low end reinforcement. As a result, most of these Eagles songs were mixed with extra bass. Obviously, in order to transfer a song like "One of These Nights" onto CD, some drastic changes had to be made. When I pulled my old JBL monitors out of the closet and set them up in the room, the Eagles stuff suddenly sounded great. All I had to do was translate that sound onto our compact disc.

What is your monitor setup?

We are using Tannoy System 215 DMT studio monitors. Our audiophile speakers are currently B&W 800 Series.

Tell me about your tape machine setup.

We have Studer transports with several sets of electronics—tube and solid-state. Among those are old, reconditioned Ampex tube innards, plus an Ampex ATR-100 unit for our album projects that don't need warming up by tubes. We also use a George Massenburg parametric equalizer that has been specially modified to make it easier to cali-

brate. We totally bypass the mastering console and go directly into our Wadia 4000 A/D converter. I use vacuum tubes in every possible part of my mastering procedure.

What is your general mode of operation in regards to equalization of your reissues?

I seldom need equalization, but when I do, it is very slight. I have certain ways to reduce unpleasant sonic anomalies. One thing I *do not* do is reduce the natural warmth of the upper bass frequencies. To tamper with them, a practice that seems to be common among mastering engineers, renders the music un-lifelike and harsh.

We all know that there are certain vintages of recording tape stock that haven't held up as well as others. Surely, this is a regular problem in your line of work.

I know. You could understand how happy I was to work on an album like *Wheels of Fire*, by Cream, that was mixed on the old audio tape equivalent of Scotch 111. Joni Mitchell's *Court and Spark* was old enough that it still played, unlike Steve Miller's *Fly Like an Eagle*, which wouldn't play without flambaying.

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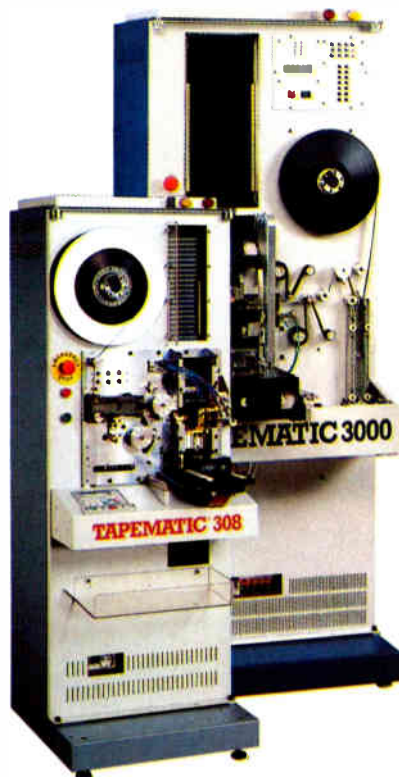
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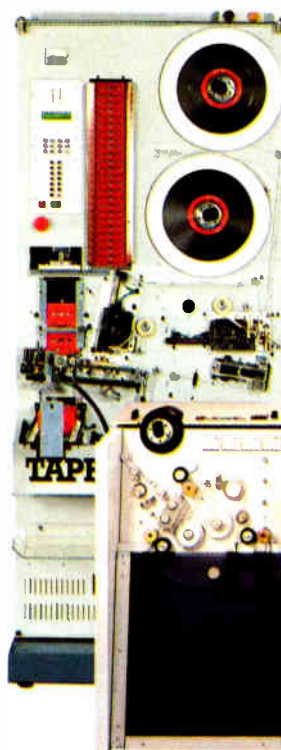
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My procedure is to keep it in analog until the last possible moment. Other companies might do their editing and sequencing on a digital workstation, but I feel that procedure would compromise our entire philosophy of mastering, which I believe dignifies the essence of the original recording.

Taking that line of thought one step further, would you say that compact disc, being a digital medium, is, by virtue of the marketplace, a necessary evil? Do you prefer vinyl?

No. I challenge anyone to play any of our gold CDs against the original vinyl pressing and still think that the vinyl sounds better. I'm firmly convinced that a CD can sound great if certain precautions are taken to retain the integrity of the original master. As a result, I don't feel the need to play my old LPs of the projects I've worked on. After all, I don't care to hear inner-groove distortion, off-centered pressing, pops and clicks, and related stuff.

How much time do you spend working on each gold CD release?

Well, for example, on *Wheels of Fire*, I spent one month just listening to that album—in my car, at home, in my office. It was constantly on. I listened to every pressing variation of the album that I could find, foreign and domestic. I compared them to the sound of the original master tape, and, not surprisingly, the pressings all fell short of the master's potential. Then I spent three weeks actually mastering it, until I was satisfied that I had captured the spirit of the original recording. I'm lucky that I have the luxury to approach my work in this fashion, because most engineers are not able to do that.

*Has your listening enjoyment of older albums like *Wheels of Fire* been tainted by the repeated exposure to the imperfections in the recordings?*

No, not at all. As a matter of fact, I really love the classic albums I work on, like *Wheels of Fire*, even more. That is because I can sense a legendary hand on a legendary console recording and mixing a legendary album. In this case, it was Tom Dowd. You know, Cream, as well as many of the artists whose work we remaster, took a long time to perfect their artistic vision, and so do we. ■

Rick Clark is a Memphis-based writer.

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by Philip De Lancie

THE MASTERING SESSION

MASTERING ENGINEERS AND PRODUCERS ON WORKING TOGETHER

Mastering engineers are sort of the obstetricians of the record industry. After months of nurturing a project through its various gestational phases—from composing through recording and mixing—the producer and artist call in the mastering engineer when their baby is ready to leave the womb and go out into the world.

As many mastering engineers will tell you, this birthing process can be laborious. But by and large, mastering engineers and producers seem to develop good doctor/client relationships. A producer's trust in a mastering engineer's advice is often the basis for many projects and many years of working together.

For further insight into this crucial interaction, we spoke with three veterans of the mastering scene, all nominees for best mastering engineer at this year's TEC Awards. George Marino works at Sterling Sound in New York City. Glenn Meadows at Nashville's Masterfonics and Doug Sax at The Mastering Lab in Hollywood.

Is there a particular style of producer with whom you find it easiest to work as far as how much and what type of guidance they give you?

Marino: Generally speaking, I don't like a wishy-washy type who doesn't care one way or the other. I appreciate a lot of input, but not necessarily from the standpoint of, "We need to do this, this and this." I like them to come in with some preconceived ideas but then ask me to go in a direction that I think things should go. And then I appreciate their feedback about what is improving and what is not taking on such good coloration. So it is a com-

bination of things: I do my own thing, and at the same time, take things in a direction they are going to be happy with. I like a free reign at first, but once we get things going, I really count on them for feedback, because you never really know what people have in their mind as far as how they are perceiving a certain sound quality.

Meadows: Sometimes it works better if the producer has a fair amount of knowledge about what different equalizers and things do and is able to vocalize the area of the spectrum they are talking about. If it sounds "muddy," do they mean it sounds muddy in the midrange or in the low end? You are trying to capture the idea the producer had when he was mixing, so that what comes out on the CD is what he wants. And if they are able to translate their thoughts into a general direction, it makes my life a lot easier. And it's a lot more satisfying for both sides, because we get where we need to go quicker.

Some of the clients I work with will say, "I think it needs a little top," or "I think we had a little problem in the midrange." But a lot of the time, we will get the tape up, and I will just listen for ten or 15 minutes to get a feel for what they are trying to accomplish. The producer, artist and engineer have been living with this project for who knows how long. They know every subtle thing about it; I've never heard it before.

Of course, it is a plus to put a fresh set of ears on it. That is part of the advantage of bringing a project to a mastering facility, whether it's a \$250,000 major-label project or a \$10,000 home studio project. Everyone working on the project has been

**“WHEN YOU HEAR THINGS
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—GEORGE MARINO

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—GLENN MEADOWS

**“MONITORS ARE A KEY
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WHEN THEY WORK IN
STRANGE STUDIOS HAS BEEN
A MOST POSITIVE THING.”**

—DOUG SAX

around it so long that getting a fresh approach is always very worthwhile. That is one of the biggest things that the home studios miss—taking the project to a professional mastering facility to have it finished—because we hear a cross-section of tremendous amounts of product on a daily basis. Taking that extra step can make a big difference.

Anyway, a lot of times it is best to just listen to the first three or four songs for a while to get a feel for where the producer and artist are going, rather than me saying right off, “We need to do this and this and this,” because that might not be the direction they really want to go. So then the producer will say, “What do you think?” And I will just start dialing some things in, and we listen back and forth, flat and processed, and he’ll say, “Yes, I like that,” or “No, I don’t,” or “Gee, that’s great, but...” and then tell me the exceptions to what I’m doing.

Sax: Most of the producers I work with know their product before they come in. They may have specific things they are concerned with—maybe to bring a vocal out in one cut, or maybe one cut needs some bottom. So they generally tip you as to what they are looking for.

Most of these people I have worked with for years, so I know the style they like. They will often just send their tapes in and say, “Do what you do.” And if I know that a particular person likes a clean bottom end and a lot of top, then I will go in that direction, as opposed to a producer like Don Was, who likes a full bottom.

What can be hard is to work with a new producer if you don’t know what he wants. They bring it in and say, “Do your thing.” But my thing is always geared to where the producer is. So, if you have no idea where they are at, then you might do your thing, and they will say, “Gee, the whole record sounds bottom-heavy.” So then you know that he doesn’t like a lot of bottom. It’s better to find out in advance.

I prefer a producer to be present. Then I don’t have to guess. I give them something, and they react, and then I know how to go. I don’t have to wait until they take it home and come back with their reaction.

How would you define the qualities that distinguish producers who are

just average from those who are truly exceptional?

Marino: Number one, beyond anything, is someone who is really into the project. Everybody has run across people who just go through the motions, but they are not really into the record or the group; they are just doing a job. So dedication is number one. And part of that comes with the right marriage—producers taking on projects they really enjoy doing.

The other thing that sets some people apart is that they know when to give people—the artist or anyone else involved in the project—the freedom to make their own decisions, as opposed to just having the “I’m the producer” attitude and ruling with an iron fist. And to know when to stand fast and do what you think is best, but in a way that is tactful. I’ve seen a lot of times when the producer is actually trying to do the best thing for the artist, but the artist doesn’t agree, and the way the situation is handled makes things very uncomfortable.

Meadows: The truly exceptional producers are the ones who have the ability to stop and say, “Yes. That’s it right there,” and not keep pushing and adding more stuff in the production until they have gone way past what was spectacular. As producers move along in their career, hopefully they develop that sense of nothing getting in the way of the emotion of the song.

In Nashville, you always hear the statement: “It all begins with the song.” And the production has got to wrap around and enhance the song and make the song the most important focus. The production should be so good that you don’t notice it until you take the time to stop and analyze what’s going on. It should feed the emotion of the song.

Sax: It has to do with the selection of songs and the selection of the engineer and the musicians around the artist. And getting inside the artist’s head, maybe moving an artist in a direction they otherwise wouldn’t go. That’s what separates the fine producers from the average producers.

There are a lot of producers who I call “credit producers.” If they are doing an R&B project, they go out and buy ten R&B records, and they pick their engineer from those, and their arranger. They are really coordinators, but they are not doing

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something creative. They are not going into the artist's head, pulling the artist in a new direction. They don't fight the artist if the artist has some ideas that won't work. They just let the artist do it.

The producer can be a good facilitator or a bad facilitator. If you have a good artist and you pick a good engineer, and you let him pick the studio, and you pick a good arranger and let him pick the musicians, you are going to have a totally professional, acceptable record. But if you pick poorly—for example, put the wrong engineer for the artist and the type of music you are doing—it never happens from a sonic standpoint.

The producer has to know he is getting the sound he wants, and if he's not, then he has to decide what he is going to do about it. Often, you will have a producer who will say after a couple of cuts with a given engineer, "This is not happening" and switch engineers. That is the producer's job, to be an evaluator. He's got to always taste the stew.

Do you see any common shortcoming in recordings today? Are there areas to which producers should, in general, be more attentive during the recording and mixing process?

Marino: There are some minor things, like people who spend hours agonizing over the sequence and then realize that the cassette has 40 minutes on side one and ten minutes on side two. But so many of the people I work with I have been working with for a time now, and I just think of the way they do things as their individual working patterns, as opposed to something detrimental.

I think of the problems that do come up occasionally as more engineering problems than producing problems. I think that a producer needs to be involved enough to make sure the engineer is doing everything he should. Sometimes there are incorrect alignments on tape machines, or they don't bring us tones that represent all the different mixes at different studios. Another thing we have learned to ask for is that people mixing with Dolby SR noise reduction bring in the same cards that they mixed with.

I always think of these as more engineering things, though ultimately, it is the producer's responsibility

to make sure things are getting done right. But these are the kinds of things that are problematic, and they may affect what the record sounds like but are not necessarily a production error, as far as what was intended to be done with the music. It may be a pain in the ass, but we find ways around the problems.

Meadows: I think more producers need to pay a little more attention to some of the subtle tunings that go on with instruments. I don't mean being fanatic, but sometimes a tiny little cent's worth of tuning can make the whole thing just shimmer and sound spectacular, and if it is just slightly off, things just don't lock together quite right.

There are some producer/engineer combinations I have worked with who are very cognizant of tuning, and the projects sound more cohesive, more together. Some of the people just starting don't give the care to that, and the instruments start to clash, and you get that weird, hard feeling when the harmonies are not all working together.

The other thing I see is people pushing the digital medium too far. They don't realize that downstream processing is going to require headroom on the digital side, so they push things up to zero, and you have to rescale it and redither it and move it around to have room to do any digital processing.

If you have a noise floor that is quieter than your console, why do you have to record so there is no headroom left? If you leave 5 or 6 dB of headroom on your mix, it gives the guy downstream some room to work with EQ or dynamics or anything else he needs to do.

Sax: Probably the most common error is that you have more elements on the record than you need. Less is more. Five pieces sound like ten, and ten pieces sound like five. So if you put too many elements in, it can keep things from happening. With a lot of the really great records, if you really listen to them, there are only three or four things going on.

Technically, monitors are obviously a key element, since everybody mixes by ear. That is probably an area that has improved over the years. I get fewer tapes that need saving than I did ten years ago. There is a spate of very good near-field monitors out there, many brands. The engineers getting their

own set of monitors and bringing them when they work in strange studios has, I think, been the most positive thing that has happened.

Ten or 15 years ago, good engineers would go to strange studios, and the studio would have some large monitors that the engineer would try to dope out. And when they would come in here, where they know what it sounds like, you would see the whites of their eyes: "Oh my God, what's that? Where's the vocal? What's all that bottom?" I would see them finish an album and then come in and realize that they had been misled by their monitors.

I thought it would be much better to have them come in and go, "Oh, we'd better change something, because this is not what I'm hearing in the studio." So I have a policy that I started over 20 years ago: Any of my clients, when they start a new project, are welcome to come in at no charge and listen to a couple rough mixes before they commit to them. And my customers take advantage of it. It's much better than finding out after the fact. And it saves me from trying to correct something that is best handled by the mixing engineer.

What are some of the albums that you have mastered recently that stand out in your mind as being well-produced?

Marino: When you talk about veteran producers, we just did a Neil Diamond record with Peter Asher producing. It's very well-recorded, with nicely done arrangements. You can see that there was a lot of attention paid to everything. Humberto Gatica, who co-produces and engineers, has done some nice things recently for Air Supply and on that Streisand Broadway album. Those are really both very good.

In the rock field, Mike Fraser did the David Coverdale/Jimmy Page record, and he just finished doing a Ronny Dio record. And John Purdell and Duane Barron just finished an album for Heart that I did.

Generally speaking, nowadays, I'm finding more consistency, more care taken with the details—better product than in the past. I don't judge that by how much EQ I have to do or how much work has to go into it. If there is something there about the way the record was produced so that, when all is said and

done, you enjoy sitting down and listening to it, that usually is the key for me. When you hear things achieving a certain amount of excitement or energy, or creating a certain amount of emotion, that is what sets the production apart.

Meadows: I really like the new George Strait and Reba McEntyre albums a lot, and Susie Bogguss. And the Vince Gill records that Tony Brown produced are just absolutely wonderfully done. It's one of those things that, when I listen to it, it sounds like it is all it should be. It's not overdone with six million things

running all over the place. It's whatever the song dictates for the arrangement.

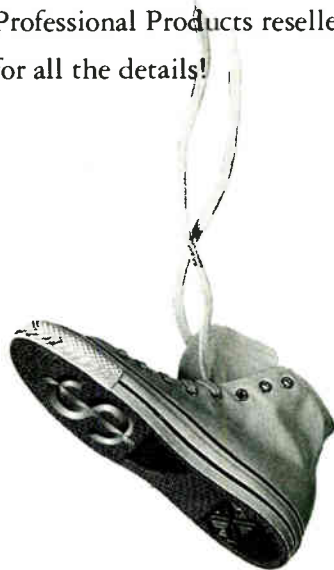
Sax: A first-rate album just coming out, the best he's done in years, is the new Jackson Browne album. Stunning songs, stunning sound. Ed Cherney mixed it, and Jackson Browne and Scott Thurston produced it. It sticks in my head for the whole year as being maybe the most exceptional album I worked on.

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burg produced. And there is the new Paul McCartney live album, engineered by Geoff Emerick. The energy and integrity of the music come off as really exceptional. Also terrific for both production and sound is the new Janis Ian album. It's actually really hard to separate the two elements, because you never really comment on albums that musically don't make it but sound good. ■

Philip De Lancie is a mastering engineer at Fantasy Studios in Berkeley, Calif.

And Now . . . Producers On Mastering

by Blair Jackson

To get a bit of the producer's perspective on mastering, we spoke briefly to three top names: Nashville-based James Stroud (Clint Black, John Anderson, Bellamy Brothers, Hank Williams Jr.); L.A.-based Tony Berg (Michael Penn, X, Public Image Ltd., Edie Brickell) and New York-based Jeffrey Lesser (The Roches, Kool & the Gang, Barbra Streisand, Timbuk 3).

Is there a particular style of mastering engineer that you find easier to work with than others?

Stroud: I like a mastering engineer who is informative. When I hear something that's different, or when I hear something that I like, I want the person to inform me as to what they're doing; that way, I learn. I like a person who's not only technical, but has "feel" when he masters.

Berg: This can best be answered by the fact that nearly everything I've done has been mastered with Bob Ludwig, and he typifies what it is I look for in a mastering engineer: someone with obvious expertise and taste, which precede my ever having worked with him, as manifest in a million records he's done. It was in my very first session with him that I

learned he is not shy to participate, and that's what I like about him most. I'm not looking for someone who sits there waiting passively for me to tell him what to do. I *want* someone's input. And the great thing about Ludwig is he infiltrates without domineering. He sees what your taste is about and then enhances what you've given him toward that end. I *have* worked with other people, who were also very good. I found George Marino an extremely nice man and very participatory, as well.

Lesser: Basically, what you need is a mastering engineer whose ears you trust, and that trust usually comes from working with them a lot. To me, the personal relationship and the working history you have with someone are more important than what they've done with someone else's record. These days, especially, it's harder to tell what a mastering guy is doing, what the mixers are doing: I think a lot of it has to do with digital recording. In the days of analog tape going onto vinyl records, it was a little more of a challenge to get a vinyl record up to the quality of what a studio master tape would sound like. Now, if you have a really fine-tuned digital mix on either a DAT or analog tape, most of that can be captured on the CD without too much problem. I'd like to add that I haven't had the greatest luck with full-digital mastering yet. I think there are still some advantages to mixing it up with some analog EQ and analog compression.

I do a lot of my work with Greg Calbi and Sterling, and when he was in New York City, I used to work with Bob Ludwig, as well. I haven't been up to Maine to see his new place [Gateway Mastering] yet. When I lived in California, I worked a lot with Bernie Grundman and Doug Sax, and they were both excellent.

Do you go into the mastering situation with fairly specific ideas of what you want to get out of it?

Stroud: Yes. It's who I'm cutting that determines how I want the record to sound. Some things I want to sound tough and hard; other things I want to sound soft. So I'll go in, and I'll explain to the mastering engineer what I'm looking for. For instance, if you have someone like John Anderson, who I produced, I

want it to be a little tougher-sounding because of his style, which is more aggressive, a little more raw country. If I do Clint Black, I want it to sound a little smoother and maybe a little larger-sounding. So ideally, what will happen is the mastering engineer will take that information and then give me options, informing me what he can do in terms of compression and EQ, or whatever. I don't use a lot of the expanders and other gadgets that some mastering places like to use these days. I like a natural sound in general, but there are times, like with John Anderson, where you want to turn up the heat a little, make it a little more pointed, edgy and in-your-face.

Berg: I go into it with great specificity. I will have made comprehensive notes on every song prior to arriving. Things like: "a little harsh in the 3.5k range on this song," "I'd like to raise the first chorus half a dB to increase its impact"; real specific notes. So I relay these to Bob [Ludwig], and as often as not, he'll come back with, "Here's *another* way you might achieve that" or "Let's copy the whole thing onto analog tape from

DAT and get that inherent low-end warmth you're looking for without doing it with EQ." He has a lot of ideas he brings to the equation.

Lesser: I get fairly specific. Basically, the way I work is I attend the first mastering session, sometimes with preconceived notions where I know there's a level adjustment or some EQ changes I'd like to try; and I'll always listen to the mastering engineer if he has some input or if he thinks some of my ideas aren't quite right. I like to then take something home that's sort of like the first attempt, and I'd say most of the time that's 90 percent of what I need to have done. Then there might be a few touch-ups or changes, but they're usually very minor.

What are a couple of albums you've worked on in the last few years that stand out to you as particularly good mastering jobs?

Stroud: I like the Clint Black record [*The Hard Way*], which was done by Glenn Meadows. That sounds real good. Glenn does a lot of my mastering. I like the new Doug Stone record that's coming out, done by

Hank Williams at Master Mix. To be honest, all the people I work with are really good, and from a technical standpoint, they all seem to have about the same equipment, so I don't even worry about the mastering too much. They all do the job well.

Berg: To this day, I think Ludwig's work on Michael Penn's first album was really helpful, because there were two mixers, and he helped unify that with great expertise. The other one that really stands out for me was the last X album [*bey Zeus!*]. He really brought a lot to it, just in the sense of bringing out some of the detail. Between Bob and Tchad Blake [who engineered it], I couldn't have asked for more. They really captured it.

Lesser: I really feel like almost every record I've produced has been enhanced to a certain extent by mastering. I loved the way the Lou Reed record I did [*New York*] sounded—Ludwig did that. More recently, this David Broza record, which is sort of folk/world beat, sounds real good, and I also like the New York Voices album I did. Both of those were done by Greg Calbi. ■

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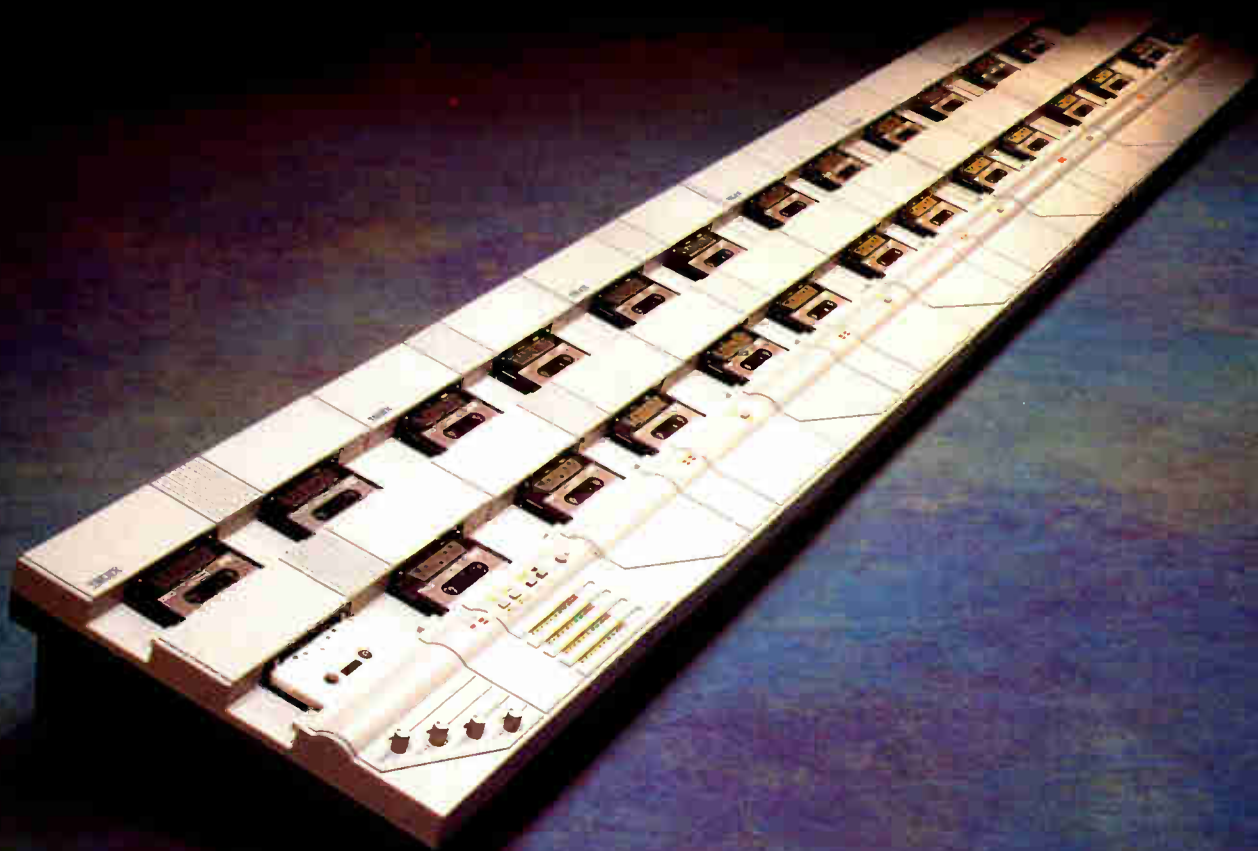
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Tape & Disc News

RECORDABLE CD DEVELOPMENTS

Eastman Kodak's Photo CD format now appears to be serving as an engine driving technological developments in CD recording. The company has just introduced the PCD Writer 600, capable of recording CD-Rs at up to six-times real time.

The machine is being marketed as part of Kodak's Photo CD Production Station, which brings small-scale automation to Photo CD recording. Photo CD allows photo finishers to record still images from conventional print or slide film onto CDs. The stored images may be viewed on TV via Photo CD or CD-I players, or imported into desktop computer applications via a Photo CD-capable CD-ROM drive.

While the production station is designed for Photo CD use, a similar device might prove useful in the audio field if a market develops for small-scale duplication on CD-Rs. And Kodak's announcement means that 6x-speed CD-R drives will probably be available soon for audio workstation systems as well.

As more and more plants accept audio CD-Rs as CD premasters, in lieu of Sony PCM-1630 format tapes, audio workstation-based CD recorders are becoming an increasingly common feature of mastering facilities. Philadelphia's Disc Makers, for instance, has begun using a system in which two CDs are recorded simultaneously, one of which is sent to the

client as a reference. When the client approves the disc, the other CD is sent to the CD plant, where it is used as a source for glass master cutting.

Disc Makers, offering the service under the trade name Proof Positive, provides the reference CD to its clients free of charge with any CD replication order. The company uses a modified Sonic Solutions system to record the discs.

The options in desktop CD recording just expanded with the introduction by Microboards (Carver, Minn.) of its \$3,899 PlayWrite system. PlayWrite is a turnkey package including a new CD-R drive from Ricoh, recording software from Dataware Technologies and customer support (one hour free) from National Computer Systems. The drive conforms to the Orange Book II standard, while the Dataware software supports writing on MS-DOS, UNIX and Macintosh systems.

Meanwhile, *Billboard* reports that the Recording Industry Association of Japan is upset by the planned introduction in that country of consumer-targeted CD-R systems. The RIAJ maintains that selling the machines without prior consultation with record labels violates the Athens accord. That agreement pledged hardware interests to respect record industry concerns over digital copying and paved the way for the introduction of DCC and MiniDisc.

Like so many promises made in hot, exotic locales, the accord is apparently open to interpretation. Hardware and blank media makers, including Yamaha, Kenwood, Pioneer, Marantz Japan (part of Philips), Taiyo Yuden and TDK have decided to forge ahead with consumer CD-R. Though no specific timetables or pricing have been released, *Billboard*

quotes trade sources in Japan as speculating that the recorders might eventually sell for under \$1,000. The machines are expected to include the SCMS digital copying limitation, and hardware makers have pledged to negotiate with the RIAJ to resolve issues related to copyright royalty payments.

SPLICES

Mastering engineer Bob Ludwig, interviewed in the August "Tape & Disc," would like the world to know that the diagram accompanying the story—a plan of his main room at Gateway Mastering (Portland, ME)—showed the design in progress and does not accurately depict the final version of the room...BASF (Bedford, MA) introduced the "Handygrip," a plastic pistol that locks into pancake



hubs to allow safer audio and video-tape pancake handling...Sony Music Entertainment in Holland became the first European major label to install a DAAD digital bin system from

Concept Design. Sony purchased a DAAD R² with the Master Maker and Master Transfer systems. Concept Design also reports that Recording Media & Equipment (Ft. Lauderdale, FL) is now representing the company in Latin America and the Caribbean...Gauss (Sun Valley, CA) sold Series 2400 high-speed cassette-duplicating systems to Super Cassette Industries and Jet Speed Audio, both of India. The Super Cassette order is part of an expansion that will bring the New Delhi plant up to a daily capacity of 800,000 units...Future Disc Systems (Hollywood, CA) announced the opening of its newest mastering suite. According to president Gary Rice, completion of the room makes the company the first independent mastering house in the nation to offer its clients on-site DCC premastering capability...Digital House (New York City) reports that it handled replication for Tommy James' *Discography: Deals and Demos*, a two-CD set that is the first release from Aura Records. The company also handled replication for *A Country Music Salute to America* for the U.S. Department of the Interior. The *Salute* features performances by Willie Nelson, Lee Greenwood and others. ■



Kodak's Photo CD Production Station, with PCD Writer 600 at rear in center

Small Duplicator Systems For The Studio

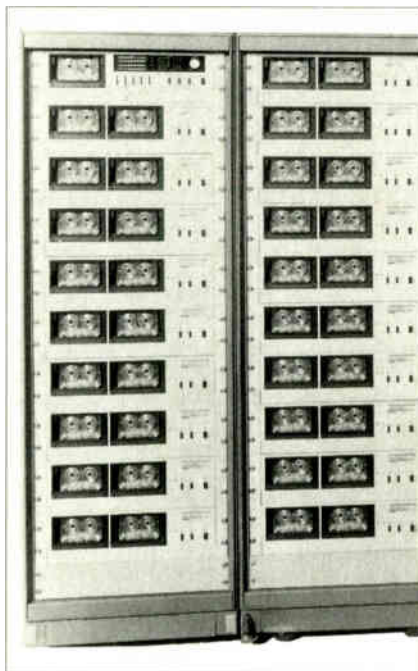
by George Petersen

Let's face it. When you first got into the recording studio business, you never wanted to become a cassette duplicator. However, somewhere along the way, the notion of doing short runs of, say, 10 to 100 tapes gained a lot of appeal from the standpoint of profitability. And running these off in real time in the control room, one or two at a time, makes little financial sense to the studio owner or client.

Somewhere between purchasing two Fisher dubbing boom boxes and installing a \$100,000 system lie a number of options more suited to short-run duplication operations. The first may be creating a real-time chain with multiple decks fed from a single source, but such systems require rugged decks (that will stand up to constant use) with remote-start capability, along with some audio distribution amplifiers to feed each machine. It soon adds up to a considerable investment. Recently, a number of new duplicators have come to market, providing good sound quality and sim-

ple operation in compact packages.

Over the years, the duplication systems from KABA Research & Development (Novato, Calif.) have become popular with small and large duplicators alike. The basic system consists of a \$1,972 4-track master control deck and as many dual-well 4-track slave decks as required. The KABA

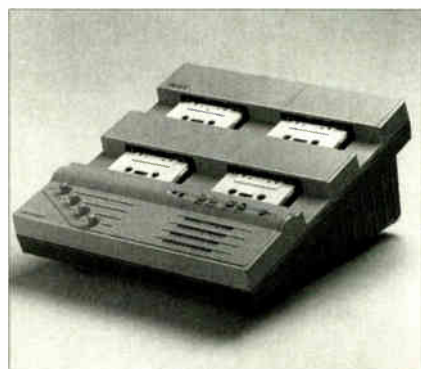


KABA System

system can operate at real time or double speed, and users have the choice of duplicating one or both sides of the tape simultaneously. So, an 11-slave (22-well) system couple produce up to 97 C-45 tapes per hour.

What's new from KABA are Dual-Speed CD Master transports (\$925/pair), which have the ability to duplicate from any compact disc source at two-times real speed. By combining a KABA tape system with the two CD master transports simultaneous two-side duplication is possible.

The Mothers System, from Now Recording Systems of New York City, is a 10-well duplicator housed in a chassis barely larger than some cassette boom boxes. Each transport has four cassette wells on the front and back and one on each side for a total of 10 tape positions. This real-time or 2x system accepts either cassette masters or any line input source. The one-master/nine-slave (convertible to ten-slave operation when fed from



AC4000 from Telex

an external source) M-1010 is priced at \$6,495; additional 10-slave expanders (model M-1020) are \$6,195. The compact system design makes the Mothers System ideal for location duplication chores, or for recording multiple first-generation copies for on-site sales immediately following concerts, lectures or seminars.

Otari (Foster City, Calif.) upgraded its DP-4050 system with the new DP-4050F (\$6,200), a three-well cassette system with selectable 8x or 16x tape speed operation. The basic DP-4050F can make two C-60 copies in under two minutes, and the system can be expanded with additional 3-well slave units and/or a 3.75/7.5 ips reel-to-reel master deck.

The T-2600 line of dual-well, in-cassette duplicators from Tascam (Montebello, Calif.) operates at 8-times normal speed. The T-2640/MS (\$2,999) has one master and one slave position; the system can be expanded with 10 additional T-2640/2S slave units (\$2,749), providing up to 21 simultaneous duplications. The system can be used in 4-track (simultaneous two-sided recording) or track-independent modes for duplicating any combination of tracks at the same time.

New from Telex (Minneapolis, Minn.) is the ACC4000 Series of 4-track, in-cassette duplicators with switchable operation for stereo or 4-track (simultaneous two-sided) recording. The system operates at 16x normal speed, so a C-60 can be copied in under two minutes. The ACC4000 master unit has one master and three slave positions, while the ACC4000 slaves are 4-well units. The units are priced at \$2,600 each, and up to six slaves can be added to a single master for 27 simultaneous copies. ■



Mothers System from Now Recording

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C O A S T

L.A. GRAPEVINE

by Fred Jones

Studio whiz Allen Sides built a new room at his Record One studio in Sherman Oaks, and it houses the first SSL that he has ever purchased. It is fitting that it is the largest 8000 G Series console ever built for a music studio. Never let it be said that Allen does things halfway.

"This 100-channel console also sports Ultimatum that bypasses the fader VCAs and has the latest audio enhancements, which means that the

—CONTINUED ON PAGE 153

Allen Sides' Record One in L.A. recently added an SSL 8000 console. The 100-channel SSL G Plus console resides in Studio A.

NASHVILLE SKYLINE

by Dan Daley

Milan Bogdan, former partner in Masterfonics, had come to an agreement as of September with Woodland Digital to set up a new mastering suite at that facility, pending Bogdan's securing of financing. Woodland will be a joint partner on one or more rooms, according to studio owner Bob Solomon. Eventually, it will become four or five rooms of mastering, CD prep, editing and tape duplication. The initial mastering room will be an early '70s Tom Hidley-designed Westlake room that saw lathe mastering before the studio's previous owners closed it more than 15 years ago; they will keep the vintage Neumann VMS 66 head lathe. Woodland's chief engineer, Dave Cline, said that the room could be up and running sometime in November.

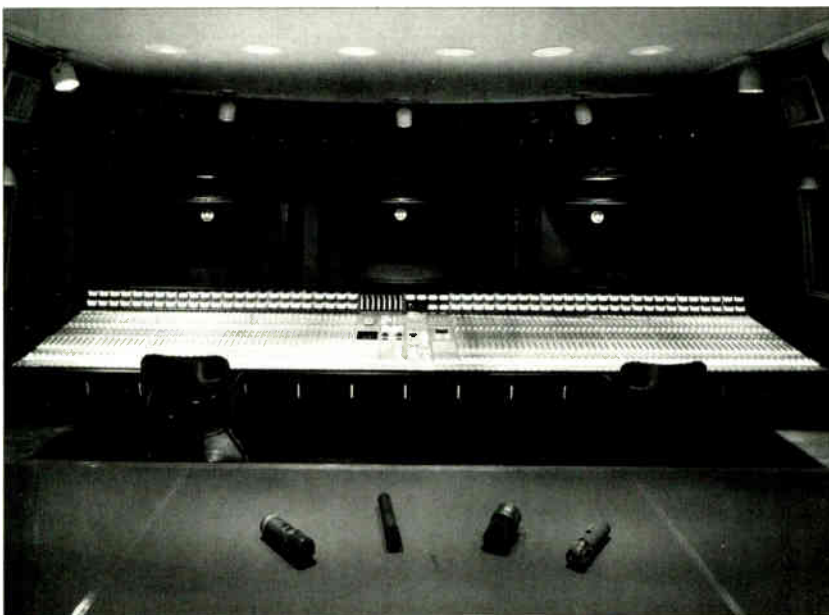
Speaking from his Hendersonville

home, Bogdan said he can get started for less than \$1 million, and he has already been getting booking inquiries. "I don't think we'll have any trouble finding business," he said. "My main concern is finding the money." Hidley has redrawn the plans to incorporate a new three-way monitoring system with TAD and JBL components. Meanwhile, Bogdan is pursuing a joint venture with Jim Della Croce of the Press Office, a Nashville PR firm. The venture is called CD Profiles, and they will produce celebrity interviews for radio distribution.

Meanwhile, over at Masterfonics, newly appointed managing director of recording, Lisa Roy, co-founder of Ground Control in Santa Monica, said the DISQ system is up and running. The digital interface is fitted to the studio's 64-input SSL 4064 E, with G Series computer, coupled to a pair of Otari DTR 900H digital multitracks. The shakedown sessions included a mix for Diamond Rio, with producer Monty Powell and engineer Mike Clute; a film score track for *The Lane Frost Story* by Reba McEntire with producer Tony Brown and engineer John Guess; and Tracy Byrd with producer Jerry Crutchfield and engineer Lynn Peterzel. DISQ co-developer George Massenburg was also in, with multitracks from the new Linda Ronstadt project. The rate structure for the system was not finalized at press time; the room goes for \$1,900 per day, and there will be an additional per diem charge for the DISQ system.

Ed Seay test-ran the new EQ 3 from NTT on a Colin Raye television cut at Money Pit. "There wasn't time or budget to do mastering for the track, so we used it to premaster," he explained. "It's detented in quarter-dB steps, and it produced a smooth, sort of across-the-board

—CONTINUED ON PAGE 154



C O A S T

SESSIONS & STUDIO NEWS

by Jeff Forlenza

NORTHWEST

Tito Puente (El Rey, the real Mambo King) was at San Francisco's Coast Recorders tracking his timbales for Concord Jazz. Phil Edwards engineered, and John Burke produced

Big Daddy Kane was at NYC's Platinum Island Studios producing lady rapper TamRoc for his management company, Black Caesar. Kane and TamRoc mixed a song called "Miss 45" for Biv 10 Records (an affiliate of Motown).



PHOTO: JIM CARROLL

the album, which was completely recorded in three days...San Francisco's Alpha & Omega Studios hosted the *San Francisco Blues Guitar Summit*, tracking it all for Blues Bureau International. SF guitarslingers on the three-CD set include Chris Cobb, Dave Goodman, Garth Weber and Johnny Nitro. The rhythm section included Brad Russell on bass and Andy Doerschuk (editor of *Drum!* magazine) on drums. The mini-bluesfest was engineered by the team of Steve Fontano, Gregg Schnitzer, Mark Hutchins and Terry Weeks. Kevin Rusell and Fontano produced the blues sessions at A&O...Nude Recording artists Suede were at San Francisco's Different Fur studios. Ed Buller produced and engineered, and Mark Slagle assisted...

SOUTHEAST

Wayne's World II, no way...way. Brendan O'Brien was at Doppler Stu-

dios (Atlanta) mixing two live Aerosmith tunes for the upcoming Paramount movie: "Dude Looks Like a Lady" and "Shut Up and Dance," both in Dolby Surround Sound... Rock 'n' roll Hall of Famer Sam Moore was at South Beach Studios (Miami Beach) working on his solo project with legendary producer Tom Dowd. Ben Stivers handled programming, and engineer Cesar

Sogbe worked the board for the rocking soul sessions...At Windmark Recording (Virginia Beach), the New Kids on the Block were laying vocal

—CONTINUED ON PAGE 154

NY METRO REPORT

by Dan Daley

Jingle and scoring house Sutcliffe Music took delivery of two Otari Concept One consoles, the second and third to be installed in New York. (The first was at Manhattan Beach.) The first of Sutcliffe's two boards came in mid-October and the second a month later, according to chief engineer Angela Dry-

—CONTINUED ON PAGE 156

Robert De Niro was at The Edison (a division of National Video Center) mixing the orchestral score and jazz arrangements for his film *A Bronx Tale*. (L to R) The Edison's chief engineer Gary Chester, De Niro and composer Butch Barbella (of the singing group The Earls). Not pictured is music editor Todd Kasow.



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—FROM PAGE 150, L.A. GRAPEVINE

G Plus sounds excellent by any standard," Sides explains. He should know, because he prides himself on offering clients at Record One and Ocean Way (which he also operates) the finest of new and vintage equipment. Sides is known for purchasing equipment that has long since been out of production, then painstakingly refurbishing and modifying it to his specifications.

On an unrelated note, Sides reports that Ocean Way recently withdrew from the Hollywood Association of Recording Professionals due to differences of opinion with some HARP members on the home studio issue. Ocean Way/Record One firmly supports home studios, Sides says, and has designed and built many home studios for clients.

After operating out of temporary offices for 17 months at the former Broadway Building at Hollywood and Vine, Shoreline Video Systems just reopened its doors at 1622 N. Highland Ave., in the heart of Hollywood. In case you are unaware, Shoreline was a victim of the L.A. riots last year. On the evening of April 30, 1992, the facility was looted thoroughly. What was left inside was destroyed (along with the building) at around 2 a.m. on May 1. Losses totaled approximately \$3 million dollars.

With the building still smoldering, Shoreline owner Chris Baumgart decided to rebuild on the same spot. "I had to make a choice," he says. "Leave what now was ashes or stay and rebuild." Determined to get back to business as soon as possible, Baumgart opened temporary offices three days later.

The new Shoreline is 10,500 square feet of professional audio and video products. More than 150 manufacturers are represented at the company. The new facility includes a state-of-the-art demonstration suite and a suite for training seminars and workshop programs.

The past 17 months were long and filled with disappointments and setbacks, but Baumgart says it was all worth it. "We preserved 22 jobs and have a great new home because a lot of people cared. Our heartfelt thanks go out to everybody for making it possible." Welcome back.

The Record Plant has blossomed for the third time this year with the addition of the "Mini-Plant." De-

signed by the renowned team at studio bau:ton, the Mini-Plant is designed as a sophisticated digital processing/MIDI/overdub suite, featuring a completely restored, original API-DeMedio console, Mastering Lab monitors, a Studer A800 24-track and lots of computer stuff, including the latest hardware and software from Digidesign.

The Record Plant also has upgraded its entire TimeLine synchronization system to the new Lynx-2 modules. Art Kelm, director of engineering, says, "With these new modules, we have cut our setup time and are now fully capable of handling

the most difficult film-mixing situations: where you may have two 48-track digital machines, a 24-track analog machine, a 4-track and a 3/4-inch video deck all running at once."

Solid State Logic appointed Rick Bozeat as West Coast products training manager. This means that he will be the guy who teaches you how to run your new Scenaria or Screen-Sound system.

If you have any information about your studio or company that you think might be appropriate for this column, write to 859 Hollywood Way #128, Burbank, CA 91505, or fax the information to (818) 506-1071. ■

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—FROM PAGE 150. NASHVILLE SKYLINE

mastering effect with no phase shifting. It won't replace mastering, but for jobs like these, it's great."

Nashville Rocks? That's what an organization of the same name contends. It's a nascent conglomeration of Nashville pop, rock and alternative musicians who are looking to make the Music City rubric more reflective of the city's creative base. They, along with the Nashville Entertainment Association, which sponsors the annual Extravaganza, are trying to promote Nashville's own noncountry musical base.

The studios agree. Several of the

facilities with regular noncountry clientele include Emerald Recording, The Castle, 16th Avenue Sound, The Vortex, Sound Emporium and Quad Recording. Preston Sullivan, manager at 16th Avenue, says rock accounts for about 35% of the two-room facility's bookings, aided by a relationship with Carlyle Records in the same building. "The media have reinforced the perception of country recording in Nashville, and that's still the dominant music here," he said. "But that's changing. The country people at the labels here have not shut out rock."

At The Castle, manager Mike Janis

sees 40% of his bookings as non-country and growing. He echoed a sentiment that everyone felt when he said, "The problem with local pop and rock acts is that, once they get signed, they take direction from New York or L.A., and their original vision gets changed. It's the demos that get them signed, and they sound great, but they get forced to make pop records that don't sound like they do."

Kelly Pribble, manager of Quad, has more than 80% of his bookings noncountry, and they've produced Number One pop (Amy Grant) and R&B (The Winans) singles. "The problem is, too many pop acts look down here and say, 'If it's not a Neve VR or an SSL, we don't want it.' They think that's what you need to make a hit record. Well, that's not the case."

Jason & The Scorchers, The Questionnaires, Webb Wilder...The Nashville noncountry scene is littered with nice tries that eventually suffer in the maw of the coastal pop machines. Don't blame the studios.

Dan Daley is *Mix's* East Coast editor. In Nashburg, he can be reached at (615) 646-1100. ■

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—FROM PAGE 151. SESSIONS & STUDIO NEWS

tracks for their upcoming Future Entertainment project. Leon Silvers and Teddy Riley produced, while Kim James engineered with assistance from Skip DeRupa...The 20th anniversary album from Sweet Honey in the Rock, titled *Still on the Journey*, was recorded at Bias Studios in Springfield, VA. Producers Toshi Reagon and Bernice Johnson Reagon tracked the female African-American a cappella tracks with engineer Bill McElroy, then mixed with engineer Mike Zook for EarthBeat! Records...

NORTHEAST

Bel Biv DeVoe mixed and recorded two songs from their MCA album *Hootie Mack* at Philadelphia's Sigma Sound with Sigma president and chief engineer Michael Tarsia. Tarsia recorded "Please Come Back" and "Lost in the Moment" in Studio 1 on the Neve 8078 console...Contemporary classical composer Philip Glass was tracking and overdubbing new recordings of his compositions "Music in 12 Parts" and "Music in Similar Motion" at his Manhattan recording facility, Looking Glass Stu-

dios. The sessions were produced by Kurt Munkasci and Michael Riesman, and engineered by James Law, Dante DeSale and Skoti Eliot for Elektra/Nonesuch Records...Johnny Gale produced, recorded and mixed his debut on Guitar Recordings at Avalon Recording Studios (Douglaston, NY) with Bob Stander engineering...Rapper Fat Joe was at Power Play Studios (Long Island City, NY) finishing up his LP for Relativity Records. Funk Master Flex produced Fat Joe, with Chris Conway engineering and Mac Robinson assisting...

SOUTHERN CALIFORNIA

Blues guitarist Robben Ford and his group, the Blue Line, were at Sound City Studios (Van Nuys) tracking material for Castle Rock Entertainment's new show, *The Second Half*. Walter New worked the Neve 8028 console with Jeff Sheehan assisting...House of Pain were at Image Recording (Hollywood) working in Studio B with producers DJ Muggs and DJ Lethal. Muggs is the mastermind behind the slow-groove, sampled-funk of bong-bombers Cypress Hill and others like Funkdoobiest. The recent HOP sessions at Image were engineered by Jason Roberts and assistant Terri Wong...Dr. Dre was producing the latest from his homey, Snoop Dog, at Larrabee Sound (West Hollywood) for the Dog's debut on Death Row/Interscope Records. Keaton Wright and Nyabinghi Al Singleton engineered the sessions from the SSL G Series console...Alice In Chains were at Scream Studios (Studio City) mixing their latest for Sony Music with engineer Toby Wright...Producer Mitchell Froom and Elvis Costello were at Sunset Sound Factory in Hollywood mixing Costello's upcoming Warner Bros. release. Tchad Blake engineered the sessions with assistant John Paterno...

NORTH CENTRAL

At Detroit's United Sound Systems, producer Mike Powell was overdubbing strings for the new Winans album with conductor/arranger Paul Riser. Also at USS, L.J. Reynolds of the Dramatics was completing tracks for his solo release...At Electro-Sound Recording (Kent, OH), King Minus tracked, mixed and mastered a demo for Atlantic Records. King Minus self-produced the sessions with engineer Greg D. Feezel and assistant Erik Hoover...

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SOUTHWEST

At Houston's Digital Services, owner John Moran reports recent sessions: Rap-A-Lot Records' first R&B act Another Level worked with mixer Mike Dean. Tommy Boy Records act De La Soul did a remix with engineer Mike Dean and producer "No" Joe Johnson. Depeche Mode was in overdubbing their forthcoming live album with engineer Steve Lion...

STUDIO NEWS

Barking Spider Studios (Sudbury, MA) recently installed an Amek Einstein Super E console with Supertrue automation to go along with its Otari MTR-90II, Genelec monitors and extensive outboard gear...Engineer/musician John Pond recently opened Sound Bytes recording studio in Sacramento, CA. Sound Bytes is a completely digital facility...Atlanta's Southern Tracks Recording, where hot producer Brendan O'Brien recently set up shop, acquired two Studer 827 24-tracks...Baltimore's Oz Recording Studio recently added a Trident Series 90 console...Atlanta-based Catspaw Productions added senior engineer/producer Ben Pizzuto to its staff. Pizzuto specializes in digital audio post-production and sound design for radio production...John Alberts Sound Design (NYC) recently added a 16-track Digidesign Pro Tools workstation to its existing SSL ScreenSound setup. ■

—FROM PAGE 151, NY METRO

den. Both consoles have full Otari automation packages, and one sports a mic/line preamp patching modification specified by Dryden and implemented by New York Otari tech Gary Britten.

Don't Cure the Darkness, Light a Candle Dept.: Engineer Tony Maserati (Jodeci, David Bowie, Tina Turner) formed the Allied Pool Corp. earlier this year with ex-RPM studio manager Doreen Staire to address two problems that he said plague New York engineers: bookings in an unbelievably competitive market, and what he feels is the lowest level of assistant engineer training he's seen in ten years of knob twiddling in town. The Pool, as it's called, has a growing membership of local engineers, mostly urban/temporary in base, who cover each other's gigs and refer one another for open gigs.

Members—including Bob Brockman, Pat Dillet, Fernando Kral, Johnny Most, Rich Travali, Rob Paustian and Mario Rodriguez—who take referrals from another Pool member pay The Pool a 15% commission, which is used to help pay Staire's salary as the central booking agent and to finance a newsletter. Engineers referring other engineers to the Pool get 5% of the new member's gross from referred gigs. Maserati says the honor system has resulted in an almost break-even cash flow.

The Pool is having somewhat less success with its other mandate: to raise assistant engineer capabilities around town. "Rob Cavecchio of Soundtrac has been the most responsive so far," said Maserati. "The problem is that there's no traditional passing along of what an assistant is supposed to know anymore since the old-line studios like Media went out of business. It's so competitive out there that no one has time to train people anymore. The Pool isn't about making a lot of money; it's just that we've all watched the scene in New York deteriorate over the years. We want to try to foster a vibe where engineers can come in and be creative and not have to worry that the machines are locking together or if the assistant knows how to make a patch."

City Sound Productions opened a one-room studio on lower Broadway in October, designed by Fran Manzella and wired by Will Schillinger. Owner Bob Kirschner's facility is an example of what happens to project studios in densely populated Manhattan. The 16-track, ADAT-based studio originally filled up his downtown apartment, where he used a bedroom as a vocal booth, serving his scoring clients and outside hourly clients. But the proximity of neighbors and a touchy landlord forced Kirschner into commercial space, a move he said was "a kick in the right direction." City Sound's revenues are weighted toward outside clients, mainly urban music producers, said Kirschner, a former engineer at the now-defunct Evergreen Recording. City Sound's console is a 36-input Soundtracs Megas; monitoring is done with Tannoy DMT-15s and Genelec near-fields powered by Hot House amps.

Keep in touch. Fax Dan at (212) 685-4272 with New York news. ■

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EASTERN



ABSOLUTE AUDIO INC.
New York, NY

ABSOLUTE AUDIO INC.



56 W. 45th St., 3rd Floor, New York, NY 10036; (212) 730-2044; FAX: (212) 730-2204. Contact: Murat Aktor. **Equipment and Services:** CD premastering/disk mastering/hard disk editing/real-time cassette duplication. Consoles: Neve DTC, custom Neve analog console and Neumann analog console. Tape machines: Studer, Mitsubishi, Sony, Panasonic. Cutting lathes: Neumann. Monitors: Meyer HD-1, Wright, Yamaha, Tannoy, Kef. Converters: Apogee 20-bit D/A, Apogee A/D. Cassette duplication: 20-position Tascam Mark III. Acoustic design: Francis Manzella of FMRTS. Engineers: Leon Zervos, Tom Brick and Jim Brick have mastered numerous Gold and Platinum projects spanning a wide variety of musical styles. Engineer's credits include: INXS, Crowded House, Midnight Dil, Paul Collins, Jean-Paul Bourelly, James Blood Ulmer, the Stone Roses, Alan Vega, Ant Banks, Giant Sand, Robert Hurst. Comments: Our recently completed state-of-the-art studios combined with a commitment to excellence in every facet of our work makes Absolute Audio the logical choice.



AIRSHOW INC.
Springfield, VA

AIRSHOW INC.



7021 Woodland Dr., Springfield, VA 22151; (703) 642-9035; FAX: (703) 658-2070. Contact: David Glaser. **Equipment and Services:** Digital editing and CD mastering on 2 Sonic Solutions systems linked via SonicNet. CD-Rs on a Sonic Solutions CD Printer. Meyer HD-1 monitoring. Custom API Legacy & Calrec consoles. Signal processing: API, Lexicon, Sontec, Sony, Sonic Solutions, etc. A/D/A conversion: Lexicon 20/20, Apogee DA-1000E, Sony 1630, Sony APR-5003 (1/4" & 1/2"), Dolby SR/A, Sony PCM-601, assorted DATs, Sound Tools. Airshow is pleased to provide CD-mastering services to Sugar Hill, Rounder, Folkways, Positive Music, Rebel & others. Recent projects: Beausoleil, Cheryl Wheeler, Basehead, Jerry Douglas, Sweet Honey in the Rock, Ranch Romance, Seldom Scene, Airmen of Note, Ralph Stanley, Ken Navarro, Peter Kater, Telluride Bluegrass Festival, Bill Monroe. Tim D'Brien, Doc Watson, & music editing for CBS-TV special *Women of Country*. Studio acoustics recently refined by John Storyk. Please call David Glaser of Lea Anne Sonnenstein to discuss your CD mastering & production requirements.

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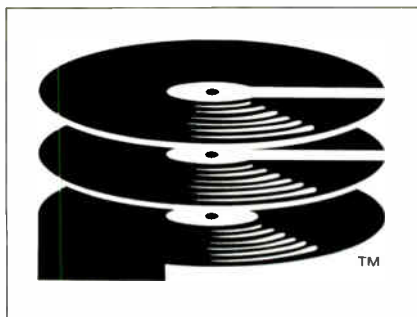
AMERICAN MULTIMEDIA INC.
Burlington, NC

AMERICAN MULTIMEDIA INC.



2609 Tucker St., Burlington, NC 27215; (919) 229-5554; FAX: (919) 228-1409. Contact: Tim Mallard. Equipment and Services: 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 163. Signal processing: dbx, Dolby A, B, C and SR capabilities, Aphex, Lexicon. Engineers: Richard Clark, Howard Hoyt. Method of duplication: D.A.A.D., bin-loop, digital bin. Duplicator: Otari, Ami-modified Electro Sound slaves, Gauss. Duplication speed: 64:1, 80:1. Capacity: 50 million annually. Tape Used: by customer request. Shell used: by customer request. Loading Equipment: 36 Concepts Design modifications. Packaging equipment/fulfillment services: Apex printing, Ilseman 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 and prices: 4-color process, 5-color booklet and inlay card printing. Other: CD/CD ROM/ CD+G with complete in-house mastering; Subsidiary: Amerigraphics specializes in audio cassette J-card and label printing Full-service 4- and 5-color services for audio, video and CD. We are a fulfillment, distribution and contract packaging facility that offers 2-day service to 75% of the U.S. population. New facility opened September 1, 1992, with over 100,000 additional square feet.

mastering and duplication facility specializing in superior real-time duplication using state-of-the-art Studer/Revox 82155 cassette decks. We also offer in-cassette high speed duplication on modified Telex with duplication speed of 16:1. We accept any formatted master tape: DAT, 2-track 1/4", 2-track 1/2", 1/4-track or 1/2-track, VHS digital, VHS Hi-Fi or cassette. All cassettes are custom-loaded and individually checked. We offer a complete professional package including printed cassettes, J-cards & shrinkwrap. Tape machines: Sony/MCI 2-track, Otari 2-track, Sony DAT 2500, Sony DAT 500ES and JVC 3700. Signal processing: Dolby A, dbx, Lexicon, UREI, Symetrix EXR. Monitor speakers: Electro-Voice Sentry 100A. Shells used: Magnetic Media, Lenco. Tape used: BASF Chrome. Loading equipment: King/Concept Design. Other services: video duplication. Rates: on request. Chief Engineer: Bruce Marcho. Engineers: Mike Novack, Lonny Kæem.



CAROLINA CUSTOM PRESSING
Greensboro, NC

CAROLINA CUSTOM PRESSING

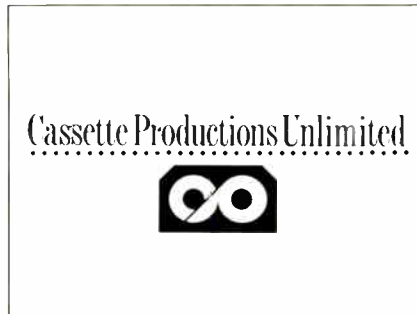


2705 Branchwood Dr., Greensboro, NC 27435; (910) 288-6929; FAX: (910) 288-0060. Contact: Mark Roberts. Equipment and Services: High-quality Neumann Mastering System with SX-74 cutter head, high-power amps and rare Zuma computer. SMT presses, virgin dye-based vinyl for superb-sounding records. Fast and friendly personalized service. We specialize in 12" singles.

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116 17th Ave. S., Nashville, TN 37203; (615) 244-5667; FAX: (615) 242-2472. Contact: Dan Griffin. Equipment and Services: 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 user: Agfa 649, BASF chrome II. Shell used: Lerzo, Michelex. Loading equipment: AEG, Kronos 4. Rates: competitive rates, please inquire. Other services: print labels and inserts.



CASSETTE PRODUCTIONS
UNLIMITED
Arden, NC

CASSETTE PRODUCTIONS UNLIMITED



6 Commerce Way, Arden, NC 28704; (704) 684-4300; FAX: (704) 687-3558. Contact: Jeff Baker, Bruce Dowdy. Equipment and Services: Mastering—tape machines: Studer, Otari, Sony PCM-2500, Panasonic SV-3700. Noise reduction: Dolby A, SR, B dbx, Dynaflex single-ended. Monitor speaker: JBL. Digital editing system: Digidesign Sound Tools. Signal processing: dbx compressor, de-esser, Klar.-Teknik para EQ, Rame 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 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: 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 100 million cassettes.

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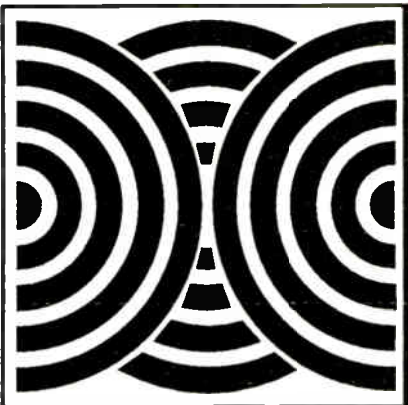
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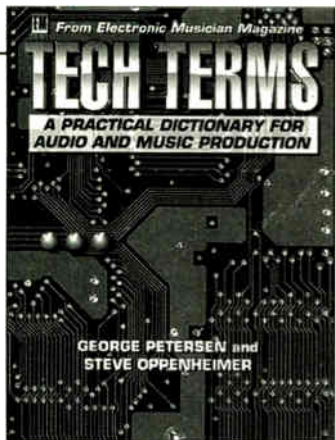
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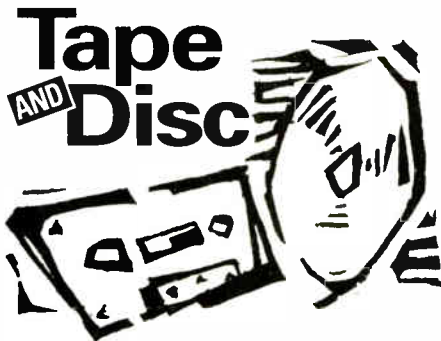
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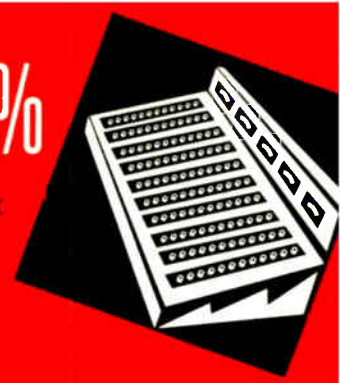
    
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- A02 8-16 Tracks
- A03 24+ Tracks
- A04 Digital Recording
- A05 Remote Truck
- A06 MIDI/Music Production

SOUND REINFORCEMENT
B08 Sound Reinforcement

VIDEO/FILM
C10 Production Co.
C11 Post-Production Co.
C12 Remote Truck
C13 Multi-Image Production
C14 Videotape Duplication

EQUIPMENT MANUFACTURING

D17 Audio Equipment
D18 Music Equipment
D19 Video Equipment

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
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

L48 Music/Recording School or Program

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L47 Corporate Facility
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M51 Audio/Music
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M53 Rep/Sales

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- A04 Digital Recording
- A05 Remote Truck
- A06 MIDI/Music Production

SOUND REINFORCEMENT
B08 Sound Reinforcement

VIDEO/FILM
C10 Production Co.
C11 Post-Production Co.
C12 Remote Truck
C13 Multi-Image Production
C14 Videotape Duplication

EQUIPMENT MANUFACTURING

D17 Audio Equipment
D18 Music Equipment
D19 Video Equipment

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

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G31 TV Station
G32 Other (please specify): _____

MEDIA

H35 Ad Agency
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

L48 Music/Recording School or Program

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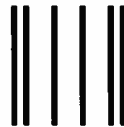
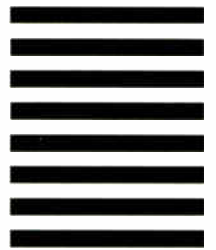
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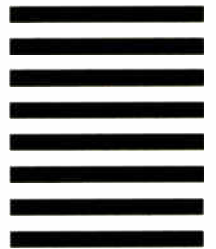
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215 W. 91st St., New York, NY 10024; (212) 877-0973; FAX: (212) 877-8305. Contact: Allan Tucker.

FORGE RECORDING STUDIOS INC.



Lincoln & Morgan St., 3rd fl., Phoenixville, PA 19460; (800) 331-0405; (215) 935-1422; FAX: (215) 935-1940. Contact: Warren Wilson. Equipment and Services: Equipment and services: Services: cassette duplication and custom packaging, reel-to-reel duplication, CD replication, video duplication, CD pre-mastering and digital editing. Studio rates: \$55 per hour plus materials. Equipment: Sony 3000 Editor, 1630 processor, 3402 1/4" and R-DATS and 24-track digital, 2-bin systems, MTI and Versadyne 64/1 and 32/1, any type of noise reduction. Minimum order 100 pieces, maximum unlimited. Capacity: 20,000 per day. Other services: drop shipping and packaging, custom 4-color printing for J-cards and CD booklets. Syndicated radio programs both reel-to-reel and

cassette. For a brochure and demo tape, please call 1-800-331-0405.

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New York, NY

FRANKFORD/WAYNE MASTERING LABS



130 W. 42nd St., Ste. 1000; New York, NY 10036; (212) 302-8300; FAX: (212) 764-3466. Contact: Tracy Steele. Equipment and Services: Frankford/Wayne Mastering Labs, Inc. is a full-service facility with state-of-the-art equipment for mastering to CD, vinyl or cassette from any analog or digital format while providing prompt, friendly and professional service and quality. We have 3 multipurpose mastering suites that feature superb equipment including Sony DAE-3000 editors; Harmonia-Mundi, Sony, Sontec, Massenburg, ITI, UREI and Valley signal processing; JBL, Quedest, Yamaha and B&W monitoring systems; PCM-1630 and DAT recorders by Sony and Panasonic; all Dolby, dbx and Burwen noise reduction; Yamaha PDS CD recording system; SAL-74B mastering lathes by Neumann with Compudisks; ADT, Lexicon and Sony format converters and the new Dolby 740 Spectral Processor. A fourth mastering suite is now under construction. Owner/chief engineer Tom Steele and senior engineers Carlton Batts, Michael Sarstfield, Rick Essig and Greg Vaughn are available to provide creative guidance and technical expertise in a friendly and comfortable environment. With credits too numerous to mention, hundreds of Gold and Platinum records attest to Frankford/Wayne's commitment to the recording industry for over 28 years.

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1755 NE 148th St.; Miami, FL 33181; (305) 945-6697; FAX: (305) 949-4864. Contact: Margie Curry/Michael Fuller. **Equipment and Services:** Consoles: Neve DTC, Cybersonics custom MC2003E. Tape machines: Sony 1630/OMR-4000, PCM-2500 DATs, PCM-601, Mitsubishi X-80. Noise reductions: Dolby SR, A, dbx. Speakers: UREI 813A, Yamaha NS-1000. CD recording: Gotham/Yamaha PDS-CDR90. Lathes: Scully LS-76, Ortofon DSS-821. Signal processing: Neve DTC, Sontec MES-430B-DRC-400, Ortofon CPS-741, STL-852. Digital editing: Sonic Solutions available on request. Cassette duplication: 10 Denon DRM-710. Engineers: Michael Fuller, Rod Fuller. Rate card available on request. Comments: Michael Fuller has been serving the recording industry for 18 years and opened Fullersound in 1986. Through the years Michael has achieved numerous Gold and Platinum awards. Nominated twice for the *Mix* TEC awards, Fullersound has always maintained the highest possible level of mastering and state-of-the-art technology. We at Fullersound pride ourselves on our personal commitment to our clients and high quality of workmanship.

GEORGETOWN MASTERS

33 Music Sq. W., Ste. 108; Nashville, TN 37203; (615) 254-3233; FAX: (615) 254-3237. Contact: Denny Purcell. **Equipment and Services:** Five rooms, hand-built analog console, Audio Animation "Muse" digital console. Two edit suites capable of any type of audio editing. Three Sonic Solutions Systems with "Sonic Net" Network. 20-bit A/D. D/A converters. Speakers: Duntech Sovereigns, KRK, B&W, Tannoy, Yamaha, Genelec, etc. Matching preamps in each room; Yamaha and Sony CD recorders. We offer both mini-disc and DCC encoding. We have a THX Surround Sound nine-seat theater for label, management and artist video presentations. We currently process 50% of the country charts, 50% of the inspirational charts and 15% of the pop charts.

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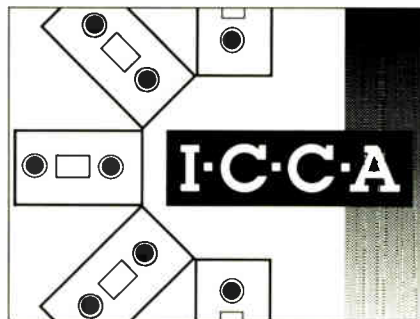
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13 Ray Ave.; Burlington, MA 01803; (617) 229-7500; FAX: (617) 229-5777. Contact: Richard B. Berberian. **Equipment and Services:** IAN Communication Group Inc. is the largest audio/video tape duplicator in New England. Operations include cassette and open-reel audio duplication; compact disc replication; video duplication in 1889 and international standard, and complete facilities for commercial printing of labels, J-cards, VHS sleeves and manuals; packaging, warehousing and fulfillment. Mastering: Otari MTR-101LX, Ampex ATR-102 and 104, Sony 1630, DAT, Dolby SR, Dolby

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B, Dolby HX-Pro. Audio duplication: Otari DP-7000 and DP-85 systems with Dolby HX-Pro. Video duplication: 1", Beta-SP, 3/4" U-matic, VHS, S-VHS, 8MM and Hi-8 in NTSC/PAL/SECAM. Four-field broadcast standards conversion. Tape loading: OTARI AL-632 automated loaders. Printing: Heidelberg GTO, ATF, Harris Offset AGFA process camera. LOG-E film processing, typesetting, full tundry and shrink wrap. Packaging: Roldex direct imprinting, Ilsemann boxer/inserters, Scandia overwrap.



ICCA INC.
Charlotte, NC

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4447 South Blvd.; Charlotte, NC 28209; (800) 624-5940; FAX: (704) 529-5277. Contact: John Firestone. **Equipment and Services:** ICCA is dedicated to manufacturing our industry's highest-quality cassettes at competitive prices. Utilizing 10 bir masters with 75 slaves, 36 loaders and 3 print-packaging lines, our monthly production capacity is 2.5 million cassettes. ICCA's graphic services division offers graphic design, typesetting, layout, film separation, custom package design and printing. The ICCA team knows how important the sound and image of your product is to you and your marketing effort. Call us for a brochure or pricing on your current project.



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1857 Colonial Village Lane; Lancaster, PA 17601; (800) 525-6575; FAX: (717) 392-7897. Contact: Tracy Files. **Service mgr. Equipment and Services:** Full-service CD manufacturing facility located in Lancaster, PA. KAO is a self-contained, fully automated CD Replication plant. Complete premastering, mastering, packaging and printing services offered. Five-color, Screen Printing Picture Discs™ and Gold-Tone Metallization, custom packaging and fulfillment available. Cassettes, professional audio tape and CDR's available.

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955 Massachusetts Ave. #137; Cambridge, MA 02139; (617) 577-0089; FAX: same. Contact: Jonathan Wyner. Equipment and Services: Mastering for tape and disc from all formats using equipment by Sonic Solutions, Digidesign (DINR), Summit Audio, Sontec, Troisi (A to D conversion), Lexicon and Sony. Monitoring system employs Tannoy DMT monitors with a Sigtech AEC 1000 and a reference D to A converter. Services include transfers to/from PCM 1630 format, digital editing, digital and analog signal processing, CD-one offs, and CD brokerage. Chief engineer is Jonathan Wyner with credits from David Bowie, Mickey Hart, Heretrix, Eugene Fodor, Basehead, Anthony Newman, D Positive, Lemonheads, Tom McKinley, and many others. We have years of experience with digital audio, and even more experience with a wide variety of musical idioms. Please call for rates and availability.

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545 W. 45th St.; New York, NY 10036; (212) 541-5022; FAX: (212) 265-5645. Contact: Stephanie Maelen, studio mgr. **Equipment and Services:** From Aerosmith to Carlene Carter, Snow to Donald Fagen, Masterdisk continues its tradition of excellence across all musical boundaries. Integrating vintage analog gear with the latest digital technologies, our engineers create the sound that's made Masterdisk the first word in mastering for over 20 years.



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MASTERFONICS

28 Music Square E.; Nashville, TN 37203; (615) 327-4533; FAX: (615) 242-0101. Contact: Traci Samcysk. **Equipment and Services:** A premiere mastering facility, Masterfonics features two Tom Hidley-designed mastering suites equipped with Neumann consoles; Hidley/Kinoshita 28Hz monitors; power amps by JDF/FM Acoustics; digital EQ and dynamics by JVC/Sony; analog processing by Sontec/Base; AD/DA conversion by Apogee/Wadia; DAT, JVC DAS and CD-R. Mastering Suite 1, staffed by Glenn Meadows, offers hard disk editing by Sadie; Harmonia-Mundi digital processing; CEDAR audio restoration processing for noise, click and crackle removal. Mastering Suite 2, staffed by Benny Quinn, has digital editing by JVC; Studer analog tape machines; Dolby/dbx noise reduction; and Neumann vinyl mastering. A JVC digital editing suite and copy room are staffed by David Boyer and Tommy Dorsey, offering special presentation assembly, radio liner compilations, video track preparation, format and sample rate conversions from all stereo digital formats, reference CDs, DAT and cassette copies, Wadia fiber-optic digital distribution. Mastering and premanufacturing services for CD, cassette, vinyl, and DCC.

SEE PAGE 163 FOR AN EXPLANATION OF TAPE AND DISC ICONS.



MASTERMIX
Nashville, TN

MASTERMIX

1808 Division St.; Nashville, TN 37203; (615) 321-5970; FAX: (615) 321-0764. Contact: Hank Williams, studio mgr., Kathi Dement, scheduling. **Equipment and Services:** This year MasterMix celebrates its eleventh anniversary with a completely redesigned acoustic environment and a doubling of mastering facilities. We continue our tradition of offering complete editing and mastering services for all audio formats including CD reference discs. We continue to provide the latest in hard disc editors, digital signal processing and classic analog devices to ensure the maximum in creative control without compromising sonic integrity. Call Kathi for prices and equipment specifics. Acoustic design: Neil Muncy Associates and Russ Berger Design Group. Monitors: Claude Fortier and E.M. Long. Tape machines: Studer with Cello playback electronics, Sony 1630 and 3402, DAT, Dolby SR. Signal processing: Sontec, API, NTP, Harmonium Mundi Acoustics, Wadia, Apogee. Editing: Sonic Solutions, Audio File. Engineers: Hank Williams, Ken Love, Ronnie Thomas.



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Philadelphia, PA

MASTERWORK RECORDING INC.

1020 N. Delaware Ave.; Philadelphia, PA 19125; (215) 423-1022; FAX: (215) 423-6020. Contact: Albert Oon, Peter Humphreys. **Equipment and Services:** Our staff has been servicing the mastering needs of both major and independent labels since 1972. Over the years, we have expanded our services to include the complete manufacturing of compact disc, cassettes (high-speed and real-time) and records while maintaining the quality, attention to details and services already established in mastering. Credits: Grover Washington Jr., Chuck Mangione, Levert, The O'Jays, E.U., Lou Rawls, Phyllis Hyman, Miles Jaye, Third World, Michael Fath, Patti LaBelle, Peter's Cathedral, Trudy Pitts, Ben Arnold, LeCompt, Bobby Rydell, Pat Godwin, Lorenzo, Dexter Wansel, Michael Pedicin Jr., and many others. Equipment available includes Sony digital (PCM-1630/DMR-4000 and PCM-2500 R-DAT); Studer CD recorder (CD-R), dbx, Dolby A, Dolby SR noise reduction; JBL, Tannoy, Yamaha monitor speakers; Digidesign Sound Tools digital editing system; Scully with Sontec "Compudisk"/Westrex-Ransteede driver cutting system. Sontec, UREI, Soundcraftsmen signal processing; Klark-Teknik digital delay; Sontec limiters/compressor. Engineers: Nim Sarikanda, Peter Humphreys, Joe Deluca. Please call to discuss your project.

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10 Music Circle S.; Nashville, TN 37203; (615) 726-1982; FAX: (615) 726-2628. Contact: Jim Loyd. Equipment and Services: MediaWorks is a company dedicated to manufacturing the highest-quality music products anywhere. We provide the best of graphic design and production, cassette duplication, CD replication and vinyl pressings. You can choose from dozens of packaging options for CDs or cassettes. We also provide concert concession items—T-shirts, posters, flyers, photos, bumper stickers, keychains, buttons, etc. Depend on MediaWorks for your manufacturing needs. Let us put our 20+ years of music industry experience to work for you. Call Jim Loyd or Bob McKewon for a free information package on our services, products and pricing.

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MULTITAPE



1630 Euclid St. NW; Washington, DC 20009; (202) 332-1522; FAX: (202) 332-1507. Contact: Bruce F. Moyer.

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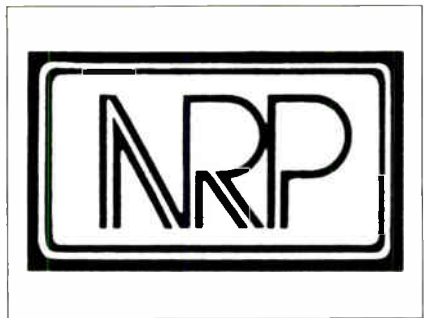
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175 Fifth Ave.; New York, NY 10010; (212) 529-0557; FAX: (212) 529-1281. Contact: Ira Cohen. Equipment and Services: A one-stop facility, with complete CD, cassette and vinyl manufacturing in one factory. Available on both coasts, free warehousing, drop shipments, DJ mailings, CD mastering, cassette mastering (digilog available), vinyl mastering, graphic design, film, print. Never an extra fee for these services. Project remains entirely under your control, subject to your approval. Call 800 number for competitive pricing, personalized service and to have your questions answered.



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Nashville, TN

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469 Chestnut St.; Nashville, TN 37203; (615) 259-4200; FAX: (615) 244-3734. Contact: John Eberle, studio manager; George Ingram, president. Equipment and Services: At NRP, our three mastering suites offer complete mastering services for compact disc, vinyl or cassette from any digital or analog source. Our analog tape machines are Studer and MCI. Our digital tape machines include Sony PCM 2500 R-DATs, Sony 1610, 1630 Processors and Sony F-1. Mastering consoles are Neve and Sphere, including Neve EQ and compressors, Sontec MES 430 parametric EQ, Sphere graphic EQ, Dolby A and SR noise reduction and Valley 610 compressors. We also feature the Sonic Solution CD Premastering System and Lexicon Model 300 Processors with version 3.0 software. Compusonics Digital Editing is also available. Our spacious and comfortable suites have Yamaha NS-10M near-fields and custom monitors with E-V components and Bryston amps. For vinyl we offer both Neumann and Westrex service including mastering, printing, and packaging, also premium-quality real-time cassette duplication and custom vinyl production. NRP is proud to be the mastering studio of choice for: Step One Records, Americana, CMH, Pinecastle, Playback, Radical Records, Hot Productions, Link Records, Goldband and many more.

NATIONAL TAPE CORPORATION



1110-48th Ave. N.; Nashville, TN 37209; (800) 874-4174; FAX: (615) 383-1768. Contact: Tom Beld, VP sales. Equipment and Services: Mastering console: Sonic Systems, Sony MXP-2000. Tape machines: Studer, Sony DMX-2000/1630, Sony R-DAT 2500 & 2700. 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 Hayward (chief engineer). Tape duplication. Method of duplication: DAAD. Duplicator: Electro Sound 8000. Duplicating speed: 64:1. Capacity: 120,000/day. Tape used: Sunkyong, BASF. Loading equipment: King/Concept Design. Packaging equipment/fulfillment services: Scandia.

NATIONAL TAPE DUPLICATORS



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140 W. 22nd St., New York, NY 10011; (212) 243-6826; FAX: (212) 243-7210. Contact: Paul M. Barboza, Amanda A. Smith.

L. NIX & CO. INC.

2000 Madison Ave., Memphis, TN 38104; (901) 725-0855; FAX: (901) 725-7011. Contact: Larry Nix.



NORTHEASTERN DIGITAL RECORDING
Southborough, MA

NORTHEASTERN DIGITAL RECORDING

2 Hidden Meadow Ln., Southborough, MA 01772; (508) 481-9322; FAX: (508) 624-6437. Contact: Anne Shepard, studio manager. **Equipment and Services:** Northeastern Digital Recording specializes in CD remastering and digital editing using the Sonic System, the Sony PCM-1630 and the new PCM-9000. We can handle transfers from any digital or analog format. Write-Once CDs, CD-ROMs, and CD replication services are also available. Our multimedia suite offers multitrack digital audio mixing and editing with Sound Tools, DECK and MIDI in conjunction with computer graphics and video (Quick-Time). Credits: The Beach Boys, David Bowie, Frank Zappa, Elvis Costello, Bob Marley, Arlo Guthrie, Buddy Guy, Alison Krauss, Big Star, Richard Thompson, Nils Lofgren, Paul Winter, Richie Havens, Rykodisc, Hannibal, Rounder, Heartbeat, Alligator, Omega/Vanguard Classics, East Side Digital, Musical Heritage Society, New World, Newport Classic, Northeastern, Biograph, Atlantic, Chrysalis, CRI, SBK, EMI, A&M, RCA. Please call for rates and information.

PERSON TO PERSON PRODUCTIONS

342 Norfolk Rd., Litchfield, CT 06759-0546; (203) 567-9012; FAX: (203) 567-7001. Contact: Chris Brown, proprietor.

PRODIGITAL

3400 Pendleton Dr., Wheaton, MD 20902; (202) 319-5588; FAX: (202) 319-4490. Contact: Bill Burns, Alan Wonneberger. **Equipment and Services:** Prodigital, the first CD-remastering facility in the Mid-Atlantic, is currently in its eighth year of operation. Prodigital offers complete mastering, replication, duplication and packaging services. Complete CD services include remastering, digital editing, reference CD's and complete retail-ready CD packages. Our latest offering is single CD's. Get up to 60 minutes of program on CD starting at \$75 for the first disc. Prodigital also supplies Digital Bin cassettes of unsurpassed quality at reasonable prices. Some of our clients even comment that Digital Bin cassettes sound even better than real time! Digital Bin cassette packages on TDK SA tapes start at \$800 including full color J-cards. Other services include real time duplication on TDK SA, blank cassettes, graphics, printing, fulfillment and full studio services. Prodigital can control the quality from start to finish, ensuring the client of the best possible product available.

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New York, NY

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1600 Broadway, Ste. 610; New York, NY 10019-7485; (212) 586-4200; FAX: (212) 586-5339. Contact: Gabe M. Wiener, dir. **Equipment and Services:** State-of-the-art post-production and mastering services for classical music: Full Sonic Solutions DAW with SCS-1000 control surface including moving-fader automation. Fully automated tape system including Otari DTR-90T time code DAT machines. Unparalleled monitoring system: Krell Audio Standard Amplifiers; Speakers by Wilson Audio. Custom designed suite by John Storyk. Formats: DAT, Nagra-D, F1, 1/4", Dolby A/RSR, all historical formats on request. On-site CD master recorder for direct-to-disc tapeless mastering without any PCM-1630. Full historical restoration services including audio forensics. Complete NoNoise digital processing. Expert location recording using minimalist microphone techniques. Schoeps, Sonosax, FM Acoustics, Benchmark, Lexicon, etc. Nagra-D 20-bit 4-channel digital portable recorder. Specialists in choral, organ, chamber, orchestral, etc. Call, write, or fax for literature.

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PO Box 131875; Staten Island, NY 10313-0011; (718) 494-3184. Contact: Jon Almeleh.

SOUND-ARTS CO. INC.

5 Cindy Lane; Ocean, NJ 07712; (800) 862-8273; FAX: (908) 493-0667. Contact: Ethel Davidson.



SOUNDMIRROR INC.
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76 Green St., Boston, MA 02130; (617) 522-1412; FAX: (617) 524-8377. Contact: Ken Silverman, John Newton. **Equipment and Services:** Our staff offers fifty years of combined professional experience in a facility with the widest selection of digital signal processing equipment in New England. Soundmirror is a full-service house specializing in CD-mastering and replication services at attractive rates, with ultraquick turnaround. Our two new suites, designed by Acentech, provide a spacious and distinctive environment in which to make your musical inspirations reality. Equipment: Sonic Solutions, two Sony DAE-3000 systems, Apogee converters, B&W 801M loudspeakers. Satisfied clients include John Bayless, the Boston Pops, Canadian Brass, Keith Jarrett, Kronos Quartet, Oscar Peterson Trio, Andre Watts, Bare Necessities, Big Bam Burning, Big Wheel, Bukhara, Clockhammer, Dinosaur Jr., Eithe/Ochestra, Field Trip, Gobblehoof, Hypnotovewheel, Matt Johnson, Juice-men, Patty Larkin, The Lemonheads, Bill Morrissey, Elliot Murphy, Out of the Blues(s), Duke Robillard, SSD, Think Tree, Uncle Tupelo, Vanilla Train Wreck, John Lincoln Wright, Rounder Records, Flying Fish, Critique, Caroline, Mammoth, Alias, Folkways, Resonance.

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STERLING SOUND INC.



1790 Broadway; New York, NY 10019; (212) 757-8519; FAX: (212) 757-4607. Contact: Larry Lachmann, studio manager. Equipment and Services: During this eligibility period, Sterling Sound continued in its tradition of mastering some of the years most honored and top-selling projects in the industry. They include Eric Clapton, Whitney Houston, Mary J. Blige, Metallica, Barbra Streisand, Madonna, Spin Doctors, Jodeci, Bon Jovi, Daniel Lanois, Coverdale/Page, Marc Cohn, Pat Metheny, Deep Purple, Michael McDonald, Lenny Kravitz, Levert, Ugly Kid Joe, Heavy D & the Boyz, Taylor Dayne, and the Waterboys.

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1112 1st Ave. N.; Birmingham, AL 35203; (205) 250-8015; FAX: (205) 250-8008. Contact: Jeino, Kerri, Gaston. Equipment and Services: Method of duplication: in-cassette. Duplicator: KABA real-time 24 slaves, Telex stereo 7 slave. Duplication speed: real-time and 16x. Capacity: as many as you need. Tape used: BASF. Shell used: American made Shape Mark 10 and Mark 5. Loading equipment: King 790. Packaging equipment/fulfillment services: Apex cassette imprinter, Clamco shrinkwrapper, in-house typesetting for complete CD and/or cassette package design. Rates: Better than you 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 and Akai. Recording studio supplies and accessories. Full package CD replication. Visa, Mastercard and Discover card accepted.

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310 Hudson St.; Hackensack, NJ 07601; (201) 489-9180; FAX: (201) 489-1771. Contact: Adrienne Rowatti, studio manager. Equipment and Services: Trutone's new spacious facility is located in mastering suites offer a relaxed, creative atmosphere, where a producer can add final touches to a CD, cassette or LP master. At his disposal is an array of the latest digital processing equipment. For hard disc editing and equalization, we offer the Sonic Solutions system equipped with the No Noise option. For tape-based editing, equalization and dynamics processing, we employ the Harmonia Mundi Acoustica and Sony DAE-3000 that operates in conjunction with our Sony PCM-1630 units. Sampling frequency and digital format conversion are performed in all-digital environments. For the warm characteristics of vacuum tube gear, we offer the classics; Fairchild 670 and Teletronix LA-2A limiters. Pultec EOP-1 and EQH-7 equalizers.

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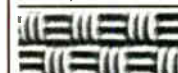
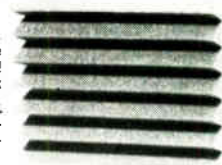
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CREATIVE SOUND PRODUCTIONS INC.



8383 Commerce Park Dr. #604; Houston, TX 77036; (713) 777-9975; (800) 451-7034; **FAX:** (713) 774-3419. **Contact:** Edward B. Smith, pres.; Michele Busse, dir. of duplication. **Equipment and Services:** Creative Sound is a quality-oriented, full-service cassette duplication facility utilizing two Otari stereo bin loop duplicating systems including our Otari DP80, 64:1 w/Dolby HX-Pro. We duplicate on chrome and ferric tape from 7.5 ips running masters. With an Audio Precision automated test system we continually monitor total system performance with 18kHz freq. response on BASF Chrome Plus. Automatic loaders are Tapematic 2002s, Tapematic 900 HS, Concept Design 765s. Services we provide include complete graphic design on MAC IIs for caseliners and CD artwork; 1-4-color printing of caseliners and CD booklets/tray cards; Apex imprinting w/UV; custom label printing; complete packaging including custom packaging; custom-loaded blank cassettes. We offer complete CD services including replication, graphic art design and printing of folders, booklets and tray cards and packaging in all formats. Call for information, quotes and sampler demo. At Creative Sound, "we care enough to sound the very best."

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Dallas, TX

DIGITAL EDITING SERVICES



10642 Cotillion; Dallas, TX 75228; (214) 686-5256; **FAX:** (214) 686-5256. **Contact:** George Geurin. **Equipment and Services:** D.E.S. has expanded to include CD recording and a full-featured MIDI production room. We can now record one or several CDs for purposes of archiving, reference, live performance tracks, backup masters etc. Our editing/premastering system includes Digidesign Sound Tools II, Pro Tools, Sample Cell and Opcode's Studio Vision. We have premastered local and national CD releases ranging from classical piano to heavy metal to rap. We can accept practically all analog or digital tape formats for mastering or restoration. We have excellent experience in tape restoration and have superb gear for audio sweetening including Lexicon 300, Roland E-660, R-880 and SN-550, RSP 2000, parametrics by UREI, Ashley and Roland, Aphex Compellor/Dominator II/Exciter III, more. Dance remixes are a specialty. CD recorders: Marantz and Pinnacle Micro. Monitors: Tannoy NFM-10, NFM-8 and AVM. DAT: Tascam DA-30, DA-50, Panasonic SV-3700, 2-track: Studer A-80, Tascam 42B. MIDI production includes Pro Tools 8 and 4 track systems, Studio Vision, Sample Cell, Roland S-770 and R-8M, E-mu E III and SP-1200, Kuzweil K-2000s, much more. SMPTE lock via Studio 5, MTP II. Also most popular IBM, Atari and Amiga sequencers. Extensive library of samples and sounds including samples of in-house modular analog systems by Moog, Arp and Buchla.

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IMAGITRAX RECORDING CO.



122 W. Lockwood; St. Louis, MD 63119; (314) 963-0155; **FAX:** (314) 963-1865. **Contact:** Bonnie Gleason, Cheri Hasse. **Equipment and Services:** Audio cassette duplication and packaging. Mastering equipment: Otari MTR-12 1/2" 4-track with HXPro, Otari MX-5050 BII, Panasonic 3500 DAT, Dolby SR/A Model 363/Dolby B Model 330, dbx 180A, Aphex Studio Dominator/Aphex Aural Exciter Type III/Aphex Compellor, GML 8200 parametric EQ, Drawmer 1960 compressor, JBL and Yamaha monitoring. Duplication equipment: Mag-

nifax 7801/7 Slave 1/2" Bin-Loop duplicator, KABA Real Time System, Otari DP 4050 10-slate unit. Loading equipment: King 2797 Dual-Hub Loader, Concept Design 9002 Dual-Hub Loader. Tape: Sunkyong Ferric/Chrome/Cobalt II. Shells: Michelex, Lenco, Mag Media. Printing: CST Pad Imprinter. In-house typesetting: QuarkXpress/Photo-Finish, HP ScanJet II c, HP LaserJet 4/600 DPI.

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7115 N. Barry St.; Rosemont, IL 60018; (708) 298-8555; FAX: (708) 298-1880. Contact: Paul Mally.

THE LITTLE WAREHOUSE INC.



5505 Valley Belt Rd., Ste. F; Independence, OH 44131; (216) 398-0022; FAX: (216) 398-9980. Contact: Joe Kauffman. Equipment and Services: Method of duplication: real-time, high-speed in-cassette and bin-loop. Duplicator: Telex 6120XLP, Telex ACC series, Marantz PMD500 system, Magnafax LBC-82-QT, Magnafax LBC-88TT, Magnafax TM81-FT. Audio tape used: BASF 619, 649, chrome plus and magmedia. Video: BASF, TDK, Maxell, Ampex and 3M. Shell used: Magnetic Media 5-screw C-O. Shape C-O's, and SI V-O's. Loading equipment: King 790s and King 2500s. Packaging equipment: Conflex sealer and Weldotron shrink-tunnel. Apex Z100 overwrap system. Rates: quote on request. Other: in-house typesetting and printing of custom labels and inserts. Four-color process printing.

MASTER TRACK PRODUCTIONS



1045 W. Bond St.; Lincoln, NE 68521; (402) 474-4985; FAX: (402) 474-2535. Contact: Jan Norton.

MASTERTAPE AUDIO INC.



1631 S. Gold; Wichita, KS 67213; (316) 264-0505; FAX: (316) 264-0505. Contact: Paul Bliss. Equipment and Services: KABA real time audiophile, cassette duplication, artwork & design service for cassettes and CD, blank audio cassettes/labels/boxes/supplies, duplicator sales/service, CD/cassette package production, custom-loaded audio tape, hot foil on cassette imprinting.

METROPOLIS MASTERING LTD.



6400 N. Leoti Ave.; Chicago, IL 60646; (312) 631-3526. Contact: Mark Richardson. Equipment and Services: Equipment: Neumann factory transformerless disc mastering system, built in 1988. (1) SP 79B console. (1) SAL 74b cutter track. (1) VMS 80 lathe. Also in-house. (1) A80 Studer 1/4" prev., (1) Studer 1/4" B67, (2) SV 3500 DAT decks, (2) Orban 642B EQ, (4) Dolby SR, A, & dbx Type 1 noise reduction, UREI 813 & Yamaha NS-10M monitors with Carver amps. Services: All forms of vinyl mastering, CD premastering, & sonic restoration. Recent clients: Power House Records, Strickly Hype Records, AF-Ryth-mix Records, Cajoual Records, DJ International, Victory Records, Shakelork Records, Underdog Record Joann's Face Records, Proflane Existence Records. Recent CD pi for the Bad Examples, Focus Music Group, Gauge.

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208 N. 4th St.; Bismarck, ND 58501; (701) 223-7316; FAX: (701) 255-8287. Contact: Craig A. Schweitzer.

MICROBOARDS INC.



308 Broadway; Carver, MN 55315; (612) 448-9800; FAX: (612) 448-9806. Contact: Craig Hanson. Equipment and Services: Microboards Inc. integrates multimedia and CD-ROM technologies to deliver systems solutions for business and industry. Headquartered in Japan, Microboards also a major distributor and OEM representative for major Japanese manufacturers. Through its U.S. office, Microboards offers a wide range of CD products for the audio and video market including: blank media (all sizes, lengths and most brands); quantities from 10 to 10,000 (volume discounts); CD-recordable hardware and software, turnkey CD-recordable systems; CD jukeboxes, CD replicator, real time MPEG-1 standard authoring systems.

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MUSIC MASTERS INC.



2322 Marconi Ave.; St. Louis, MO 63110; (314) 773-1480; FAX: (314) 773-0073. Contact: Cindy Trampe.

MUSICOL INC.



780 Oakland Park Ave.; Columbus, OH 43224; (614) 267-3133; FAX: (614) 267-3135. Contact: Warren Hull.

NATIONAL SOUND CORP.



17610 W. Warren; Detroit, MI 48228; (313) 336-3800; FAX: (313) 336-4449. Contact: Ron Murphy. Equipment and Services: (2) Scully lathes with Heaco and Westrex cutter heads. Master lacquers and dub cutting of all sizes and speeds specializing in Techno/dance 12" singles including "reverse cutting." Yamaha 601 compact disc recorder for CD references. Rate card sent on request.

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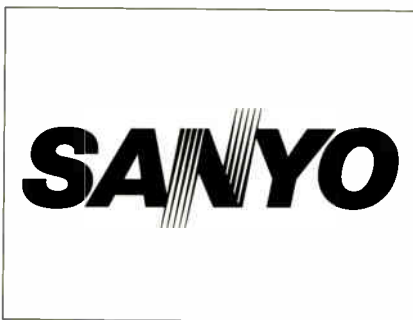
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PO Box 412732; Kansas City, MO 64141; (800) 776-4096; FAX: (913) 262-5335. Contact: Dan Shanks, Lois Scanlon-Gelfert. Equipment and Services: RSRT offers: sonic restoration, CD-R archiving, CD mastering, CD replication, high-speed stereo bin and real-time audio cassette duplication, videotape duplication, and complete packaging services. Whether you're ordering one CD-R, a thousand cassettes or twenty-five thousand CDs, we've got you covered. Our state-of-the-art mastering and production facility utilizes the finest digital and analog equipment available. But we believe that it's not the equipment that sets us apart; it's our staff. At RSRT, we're dedicated to "treating you as we would have you treat us." Whether your order is for 50 or 500,000 plus, our focus is on quality. From mastering to shipping, the same attention to detail is given to every job. So for high-quality, on-time service at reasonable rates, call RSRT today. 1-800-776-4096.



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2111 Dickson, Ste. 18; Austin, TX 78704; (512) 326-5553. Contact: Jerry or Diane Tubb.

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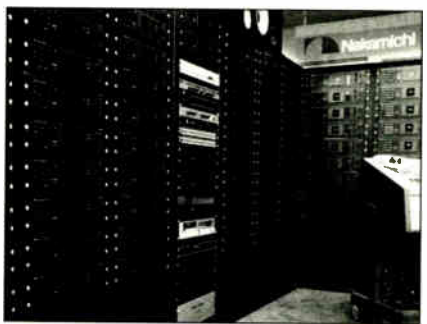
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8472 Brookville Rd.; Indianapolis, IN 46239; (317) 353-1113; FAX: (317) 353-0750. Contact: Andrew Symons, Jeff Mellentine, Curt Albright or Mary Schatz. Equipment and Services: Studer A-80 1/2" with HX Pro, Otari MTR-12 1/4" machine, Tascam 122 MkII, Tascam DA-30, Panasonic 3700, Sony 601 processor for F1 transfers with VHS and Beta compatibility, Dolby A, B, C, SR, dbx Type 1 noise reduction all available. Studio monitors are UREI 809s driven by a Carver PM175. Signal processing includes: Klark-Teknik DN410 parametric EQ, Drawmer M-500 dynamic processor, Aphex compellor, BBE 442 processor, (2) dbx de-essers, Valley DSP, Audio Control RTA and Tascam 401 CD player. Duplication equipment includes: Gauss 1200 master with 7 slaves, Lyrec P4400 master with 6 slaves. Gauss system is 64:1 and Lyrec system is 64:1 and 80:1. We use BASF "Chromex" and Sunkyoung ferric tape. Our loading equipment includes (9) concepts designed modified 775s and (2) modified 790s. We use an Apex CA-30 printer, and Apex 2-90 inserter, Q&M folder, and a Scandia 607 shrinkwrapper. We offer complete CD packages including mastering, processing, graphic film work, printing and packaging, as well as video duplication and LP manufacturing. W.M.G. Inc. can also provide graphic design, custom film work, printing, warehousing, order fulfillment, mail fulfillment, special package assembly, poster printing and mailers.

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28 Paul Dr., Ste. E; San Rafael, CA 94903; (415) 492-1300. Contact: Sherry Jones. Equipment and Services: Tape duplication: method of duplication: in-cassette/Nakamichi MR2. Duplicating speed: 1:1 real time only. Capacity: 1,500/day. Tape Used: BASF Superchome, BASF CR02, AGFA Normal. Shell used: Shape Mark 10, Quality 5-screw clear, black or white. Packaging equipment/fulfillment services: X-Rite shrinkwrap machine, Autolab automatic labeler. Rates: upon request, please call. Mastering: tape machines: Sony Beta VCR and Quazar VHS, Panasonic SV-3500 DAT, Otari MTR-12 2-track (7.5, 15 or 30 ips). Noise reduction: Dolby A or SR or dbx 1 (master), Dolby B or C (cassette). Monitor speakers: JBL. Signal processing: Sony PCM-501ES digital processor, Aphex Compellor, Aphex Aural Exciter type B, Yamaha 3rd-octave equalizer. Engineer: Keith Bender. Other: sonic enhancement, analog-to-digital mastering, full graphic design and printing services offered. Full

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1750 N. Vine St.; custom production services; Hollywood, CA 90028; (213) 960-4672; FAX: (213) 960-4680. Contact: Jim Coffee. custom sales & services mgr. Equipment and Services: The custom production services department of Capitol-EMI Music Manufacturing offers state-of-the-art cassette and CD production services for all your sound recording needs. One of the most respected names in the music industry, Capitol-EMI Music Manufacturing can provide personalized service for each of your recording projects, with experienced production coordinators. Tape duplication—method of duplication: bin-loop. Duplicator: Capitol, Gauss Duplicating speed: 80:1, 40:1. Capacity: 100 million annually. Tape used: Sunkyong. Shell used: Capitol. Loading equipment: Tapenatic, Tacos. Packaging equipment/fulfillment services: Apex. Compact disc services: CD pressing, artwork, printing, packaging, graphics. Rates: call for competitive price quotations. Mastering: see Tower Mastering.

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1815 E. Wilshire Ave., #904; Santa Ana, CA 92705; (714) 667-0714; FAX: (714) 667-3921. Contact: Dave Morton.

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4910 W. Amelia Earhart Dr.; Salt Lake City, UT 84116; (800) 622-6036; FAX: (801) 531-0740. Contact: Mary'n Curtis. Equipment and Services: Magnetic & Optical Duplication Services: videocassettes:

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1911 Betmor Lane; Anaheim, CA 92805; (714) 634-9016; FAX: (714) 938-5058. Contact: Scott Ragotskie, Todd Cashman.

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—LISTING CONTINUED FROM PREVIOUS PAGE

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10th & Parker Streets; Berkeley, CA 94710; (510) 549-2500; FAX: (510) 486-2248. Contact: George Horn. **Equipment and Services:** Mastering—mastering consoles: Sony SDP-1000 digital console. Tape machines: Sony 1630, Mitsubishi X-86C, Studer A80. Noise reduction: all types. Monitor speakers: Hidley. Digital editing system: Mitsubishi. Cutting lathes: Neumann. Signal processing: Sony digital. Engineers: George Horn, Phil De Lancie. Rates: call for rates.

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846 33rd Ave.; San Francisco, CA 94121; (415) 386-2722. Contact: Victor Flaviani.

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6054 Sunset Blvd.; Hollywood, CA 90028; (213) 465-6264; FAX: (213) 465-8367. Contact: Nickie Walters.

HI-SPEED TAPE DUPLICATION COMPANY



943 Howard St.; San Francisco, CA 94103; (415) 543-7393; FAX: (415) 543-0858. Contact: Rick, Vince, Brian or John.

JACKSON SOUND PRODUCTIONS LTD.



3897 S. Jason St.; Englewood, CO 80110; (303) 761-7940; FAX: (303) 789-0557. Contact: Linda Cano-Rodriguez. **Equipment and Services:** Jackson Sound, a leader in audio since 1964, is equipped with the Gauss 2400 duplicator, King and Tapematic loaders and the Roldec imprinter, widely considered the most advanced equipment in the industry. Featuring the Digidesign Pro Tools 2.00 to enhance our capability to record, edit, filter and provide a superior mastering quality. We offer competitive prices and the best service in the west. Call us for your next audio project at (800) 621-6773.



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24 Commercial Blvd.; Novato, CA 94949; (800) 231-8273; (415) 883-5041; FAX: (415) 883-5222. Contact: Bill Collins, Nate Hazing, Brian Howe. **Equipment and Services:** Direct-from-digital double-time duplication from CD masters is a new service offered by KABA Audio. The KABA real-time and double-time duplication system with Dolby S provides 20-20k Hz frequency response offering cassette copies of CD-like quality and dynamic range. Duplication can also be done direct from DAT, DAW, R/R or cassette. Hi-speed is available for less demanding projects. With over 18 years experience in the audio duplication industry, KABA Audio offers personalized, full-service for audio cassette and CD packages, from concept to fulfillment, featuring the world-class 100-position KABA 4-track audiophile real time and double time duplication system. Mastering room: Nakamichi, Sony R-DAT, Digidesign Pro Tools DAW and JBL, Tannoy and Yamaha NS-10 speakers; custom console, Dolby A, B, S, SR and Dynaflex single-ended N/R. Various outboard audio processing gear, Tapematic 2002 and AEG tape loaders. Computerized graphic arts department for full-color cassette D- and J-cards, CD covers and booklets. Pad and Roldec on-shell printers. ITT labeler; Pack-All shrinkwrapper.

KDISC MASTERING



6550 Sunset Blvd.; Hollywood, CA 90028; (213) 466-1323; FAX: (213) 466-7237. Contact: Julie Kruger, office mgr.

LOCATION RECORDING SERVICE INC.



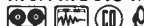
2201 W. Burbank Blvd.; Burbank, CA 91506; (213) 849-1321; FAX: (818) 845-8357. Contact: Shari Fralberg, gen. mgr. **Equipment and Services:** Mastering—Mastering console: (2) Neumann SP79, Neumann MT66. Tape machines: (4) Studer A80 MkII 1/4" and 1/2". (3) Studer B67, (4) Nakamichi MR-1, Sony PCM-1630, (2) DMR 4000. Noise reduction: Dolby SR, A, dbx Type I. Monitor speakers: UREI 811-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,

Kevin Gray. Rates: studio analog & digital \$110/hour LP master per side \$120, 1630 CD submaster \$400, CD \$200/clone. Other: complete printing services, record labels, jackets, CD inserts and tray cards, cassette J-cards, commercial printing, complete record production.



MCA MUSIC MEDIA
North Hollywood, CA

MCA MUSIC MEDIA



5161 Lankershim Blvd., Ste. 201; North Hollywood, CA 91601; (818) 777-9200; FAX: (818) 777-9235. Contact: Michele Mosler.

MARTIN AUDIO GROUP



1200 Westlake Ave. N., Ste. 414; Seattle, WA 98109; (206) 784-0139; FAX: (206) 782-9044. Contact: Mike McCreery, Robert Boreck, Stace Forte.

MASTER TRACK PRODUCTIONS



1524 W. Winton Ave.; Hayward, CA 94545; (510) 782-0877; FAX: (510) 782-6280. Contact: Sandi Larson.

THE MASTERING LAB



6033 Hollywood Blvd.; Los Angeles, CA 90028; (213) 466-8589; FAX: (213) 465-7570. Contact: Docken Polk, studio mgr.

MAXI CASSETTE PRODUCTIONS INC.



1440 E. Arrow Hwy., Unit L; Irwindale, CA 91706; (818) 358-1644; FAX: (818) 357-1666. Contact: Michael T. Aris.

MELODY PRODUCTIONS



7712 23rd Ave. NW; Seattle, WA 98117; (206) 783-8694; FAX: (206) 781-1765. Contact: James A. Bostad Sr., CEO. **Equipment and Services:** Method of duplication: in-cassette, reel-to-reel, and DAT. Dupli-cator: Nakamichi MR-2B, Otari 4050 cassette-to-cassette and 1/4", 7.5 or 15 ips to cassette. Duplication speed: 1:1 and 8:1. Capacity: 480/day real-time and 1,750/day high-speed. Tape used: full line BASF products (NB voice & music, and HB, Chrome Plus, Super Chrome). Shell used: Shape Mk-10, Michelex, Lenco, Magnetic Media and MPC. Loading equipment: Exclusively King 790's. Packaging equipment/fulfillment services: Seal-A-Thon. Rates: Call for rates. Other: Full audio services, from mixing/mastering in our 8-track studio to custom loading of cassettes, to duplication and pad printing, J-card and shrinkwrapping. We are the Pacific Northwest's exclusive custom blank loader of cassettes which are manufactured for real time in cassette duplication. We stock many custom-manufactured transparent cassettes and clear C-O's with colored components. Included in our production studio is a video editing suite with effects and duplication from 8mm, 1/2" or 3/4". Credits: soundtracks and endless cassettes for international exhibits and museums. New for '93—full line of BASF studio products, from 1/4" to 2" 911 and DAT tape.



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Fremont, CA

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42650 Christy St.; Fremont, CA 94538; (800) 869-0715 outside CA; (510) 226-0800. Contact: Steve Urquhart or Kathy Fry. **Equipment and Services:** What makes Music Annex Duplication unique is our ability to deliver the highest-quality cassettes and compact discs at competitive prices. We have the latest equipment and an experienced staff to ensure your satisfaction. From 1 CD or cassette up to 1 million, Music Annex offers you the quality and service that labels like Windham Hill, IRS Records and JVC Jazz count on. Make sure your product looks and sounds the best that it can. Choose Music Annex Duplication. Call 1-800-869-0715 (outside CA) or (510) 226-0800 (in CA) for our free duplication information pack.

THE MUSIC NETWORK



41 Clark St.; San Rafael, CA 94901; (415) 453-5881; FAX: (415) 457-8028. Contact: Phill Groves or Kirk Schrell.

Musicraft
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1-800-637-9493

MUSICRAFT
Wilsonville, OR

MUSICRAFT



27501 SW 95th Ave.; Wilsonville, OR 97070; (503) 682-8668; FAX: (503) 682-3043. Contact: John Zobrist. **Equipment and Services:** Everything to complete your audio project under one roof. Complete audio service from "script to shrinkwrap." Record in our state-of-the-art studio featuring all Studer tape machines with Dolby SR, moving fader automation and a huge assortment of outboard equipment and microphones. Edit in our production suites on one of our three digital workstations choosing from our huge sound FX library. Your product will be duplicated and packaged in our large-scale cassette duplication plant, which has a daily capacity of over 30,000 units. We feature multicolor on-cassette imprinting, automated inserting and cello wrapping. We can store your materials and products in our 5,000-sq.-ft. fulfillment warehouse. Call for our CD/cassette package. We offer the best quality, the best service, the best price.

NORTHWESTERN INC.



15938 SW 72nd Ave.; Portland, OR 97224; (503) 624-7800; FAX: (503) 624-2185. Contact: Ken Thompson, Jeanne Alldredge, Kathy Lawrence. **Equipment and Services:** Bin-loop duplication with 6 slave Versadyne 1500 system. Real-time duplication with KABA system on TDK SA Cobalt tape for music duplication. Complete compact disc services including CD-R for single CD copies. Quality mastering with Digidesign Pro Tools, in-house in our fully equipped recording studio. Large voice talent pool. In-house on-cassette imprinting, overwrap, packaging and fulfillment services. From our master or script to retail ready packaged product, we are experts at delivering the finest quality, on time, with the best service in the business. Of course our pricing is always competitive. Please call us for quick quotes or more information. Be sure to ask for a free catalog or sample.

OCEANVIEW DIGITAL MASTERING



2323 Corinth Ave.; Los Angeles, CA 90064; (310) 444-9904; FAX: (310) 478-0659. Contact: Sandy Siegel. **Equipment and Services:** Custom analog and digital mastering, editing and No-Noise services featuring "The Sonic System" Hard Disk Digital Editing and CD PreMastering Desktop™. Mastering console: Neumann SP-79 and SP-77 modified mastering consoles. Tape Machines: Ampex ATR 104s with Custom Playback Electronics, Studer A80 preview machines with custom A-800 Playback Electronics, Sony 1630, various DAT machines. Analog to digital conversion: Proprietary Design Ultra Analog 20 bit, Wadia Reference. Digital to analog conversion: Wadia Pro Reference, Theta Generation III, Apogee. Noise reduction: Sonic Solutions No Noise System, Dolby A and Dolby SR, dbx. Monitor speakers: Custom ATC with Hartley sub-woofers, Tannoy SGM 10B, Altec 19. Sony Start Labs CD Writer, Neumann VMS 70 mas-

2323 Corinth Ave. Los Angeles, CA 90064



OCEANVIEW
DIGITAL MASTERING

OCEANVIEW DIGITAL MASTERING
Los Angeles, CA

tering lathe, Phillips DCC Mastering System. Signal processing: Sontec, Neumann, NTP, etc. Chief engineer: Joe Gastwirt. Rates available upon request.

OPTICAL MEDIA
INTERNATIONAL

OPTICAL MEDIA INTERNATIONAL
Los Gatos, CA

OPTICAL MEDIA INTERNATIONAL



180 Knowles Dr.; Los Gatos, CA 95030; (408) 376-3511; FAX: (408) 376-3511. Contact: Sylvester Pesek. **Equipment and Services:** Mastering—Mastering consoles: Topix CD Audio, CD-RDM premastering workstation. Tape machines: Sony DMR-4000, PCM-1630, 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-RDM and mixed mode CD preparation, tape premaster and encoding, Yamaha, Sony reference disc systems. CD pressing in any quantity—24-karat gold compact discs. Dther: complete services for all CD formats: CD-Audio, CD-RDM, CD-RDMXA, CD-I, including program design, graphics, packaging and fulfillment. Call for price quote.

PACIFIC COAST SOUND WORKS



8455 Beverly Blvd., Ste. 500; W. Hollywood, CA 90048; (213) 655-4771; FAX: (213) 655-8893.

TOM PARHAM AUDIO PRODUCTIONS



1140 S. Cypress #D; La Habra, CA 90631; (714) 871-1395; (800) BIN-LOOP (246-5667). Contact: Tom Parham. **Equipment and Services:** World-class direct from digital cassette duplication by the state-of-the-art Dupltronics tapeless digital bin and lyric slaves with HX-Pro (Dialog). This is the best cassette duplication process using RAM memory chips instead of the standard 3.75 ips analog master; the quality of the product is unbelievable and better than real time at speeds of 80:1 and 100:1. Custom bin-loop hi-speed duplication, Electro Sound bin-loop, Roldex cassette imprinting, King loaders, Ddari mastering equipment, Tascam real time decks 50 copies per pass, Sony CCP-310 in-cassette duplicators. Every master format available, preferably DAT or cassette. 1/4" 2-track, 1 7/8 to 30 ips, 1/4" 4-track, 7 1/2 to 15 ips. Custom recording & mixing available on: Panasonic, Sony, Sharp DATs, 1/4" 8-track, 15 ips, 1/2" 16-track 15 ips, 2" 16-track 15 & 30 ips, complete on-site recording studio, music and voice production available. Custom cassette & CD duplication, albums, shrink wrap or cello wrap available. Complete typesetting & graphic art layout in-house. Please call for specific quote so we can accommodate your turnaround time and budget. No minimum quantity, absolutely the best quality.

PHYLCO AUDIO/VIDEO DUPLICATION



11693 Old Stage Rd.; Gold Hill, OR 97525; (800) 348-6194; FAX: (503) 855-7581. Contact: Robert Deates, Gail Husa, Ken Husa. **Equipment and Services:** Tape duplication: method of duplication: realtime in-cassette on a KABA duplication system and bin-loop systems at 32:1 duplicating speed. Monthly capacity: 200,000. Loading

—LISTING CONTINUED ON NEXT PAGE

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TURN TO PAGE 169 FOR AN EXPLANATION OF RECORDING SERVICE SYMBOLS.



—LISTING CONTINUED FROM PREVIOUS PAGE

phylco audio

(Established 1974)

KABA REALTIME **AUDIOPHILE QUALITY CASSETTES**
DUPLICATED ON THE KABA SYSTEM

PHYLCO AUDIO/VIDEO DUPLICATION SERVICE
Gold Hill, OR

equipment: King 790s. Tape used: BASF chrome and normal bias and Sunkyong normal bias. Shells used: Michelex, Lenco. Packaging equipment: Belco. On-cassette imprinter: Roldex. We offer full-service graphic design and full-color printing for J and O cards. Also offer "books on tape" packaging. CD services: replication, graphic design, full-color printing and packaging. Our services are used by large nationwide corporations as well as the small just getting start-

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1145 12th Ave. NW, Ste. C-6; Issaquah, WA 98027; (206) 391-0590; FAX: (206) 392-4610. Contact: Lesley or Dianne. **Equipment and Services:** Finest quality cassette, CD and CD-ROM duplication, graphic design, printing and video duplication, all at unbeatable prices. CD mastering, high-speed and real-time cassette duplication, DAT editing. We build hundreds of thousands of cassettes and CD's every month, and pride ourselves on fast, friendly service. No job too big or too small. Equipment includes Versadyne high-speed and KABA real-time recorders, BASF and Sunkyong chrome, music and voice tape, shells and boxes from Elmar, Lenco, Shape, and Michelex, Concept Design/King loaders. DAT machines by Sony and Panasonic, CD-R by Philips. Digidesign Sound Tools. Complete graphic design studio, service bureau, print shop and bindery. Fully loaded Mac Quadra-950 and Centris-650, 3400 dpi Varityper film image-setter, State-of-the-art software, Heidelberg press. Clients include Sub Pop, PopLama, Bad Animals, Music Source, Ironwood, and Triad Studios, National Music Service, Seattle Art Museum, Zygon, Muzak, Seattle Filmworks and Seattle-area bands too numerous to mention.

QUAD TECK DIGITAL/FDS LABS INC.



4007 W. 6th St.; Los Angeles, CA 90020; (213) 383-2155; FAX: (213) 383-2158. Contact: Hank or Joani Waring.

QUADIM CORPORATION



5356 Sterling Center Dr.; Westlake Village, CA 91361; (818) 706-8843; FAX: (818) 706-8426. Contact: Guy or Paul Costa at 1-800-576-EDIT.

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RAINBO RECORDS AND CASSETTES



1738 Berkeley St.; Santa Monica, CA 90404; (310) 829-3476; FAX: (310) 828-8765. Contact: Jack G. Brown, Steven E. Sheldon. **Equipment and Services:** Tape duplication—method of duplication; bin-loop. Duplicating speed: 64:1. Capacity: 50,000 per 24-hour day. Tape used: BASF chrome and normal, Sunkyong 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—pressing: 26 Lened Automatic, labels, jackets, sleeves—prg, drop shipping. Capacity: 50,000-12", 18,000-7". Vinyl used: Keycor KC 588. Rates: send for brochure or phone. Other: 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. Serving the music industry for over 50 years.

RAINBOW CASSETTE STUDIO



PO Box 472; Taos, NM 87571; (800) 748-1540. Contact: Judy Lujan.

BILL RASE PRODUCTIONS INC.



955 Venture Ct.; Sacramento, CA 95825; (916) 929-9181; FAX: (916) 929-4751. Contact: Bill Rase.

REALTIME AUDIO (THE DUB TRAIN)



334 NE 89th; Seattle, WA 98115; (206) 523-8050. Contact: Pip McCaslin.

RECORDED MEDIA SERVICES



98-027 Hekaha St., #44; Aiea, HI 96701; (808) 487-0110; FAX: (808) 487-3731. Contact: Mike Wilcox.

REELTIME TAPE DUPLICATION



125 Altana St.; San Rafael, CA 94901; (415) 459-7180; FAX: (415) 459-7180. Contact: Tony Johnson.

ROCKET LAB



51 Federal St. #100; San Francisco, CA 94107; (415) 495-2297; FAX: (415) 495-2684. Contact: Kay Floyd. **Equipment and Services:** Mastering—mastering console: JVC, Sonic Solutions. Tape machines: Ampex ATR-104, Studer 820, Sony 2700, Panasonic SV-3700, Sonic Solutions CD Printer. Noise reduction: Dolby SR, A, dbx. Monitor speakers: Meyer Sound Labs HD-1, Velodyne UL18". Digital editing system: Sonic Solution, Studer Dyaxis. Cutting lathes: Scully/Westrex/E.A.R. Signal processing: Massenburg, EAR, Sonic Solutions, Studer Dyaxis, NTP, Sontec, Dynacord DRP20. Engineers: Paul Stubblebine, Ken Lee, Marc Senasac. Compact disc services, prices: call for quotes. Other: CD reference discs available. Complete digital editing including audio-for-video.

STARSHINE AUDIO ENTERPRISES



932 Nord Ave.; Chico, CA 95926; (916) 345-3027. Contact: Hugh Santos, John Peters.

SULLIVAN RECORDING



1390 Frank Hill Rd.; Ashland, OR 97520; (503) 482-8181. Contact: Frank Sullivan.

SUPER DUPER AUDIO DUPLICATION SVCS.



1634 SW Alder St.; Portland, OR 97205; (503) 228-2222; FAX: (503) 228-6819. Contact: Rick McMillen, Todd Chatalas, Scott Blaylock.

TAPE SPECIALTY INC.



13411 Saticoy St.; N. Hollywood, CA 91605; (818) 786-6111; FAX: (818) 904-0267. Contact: Stuart Feldman. **Equipment and Services:** When you've tweaked your last knob, bring us your master tape. We'll provide you with finished product fast, including custom J-cards or CD booklets in any quantity desired. Whether you envision a package that's standard or completely unconventional, involves handwork or complex processing, we can handle it. There are enough details to keep you occupied during recording and mixing. We make the duplication part easy. We're specialists. After 17 years in business, we understand what recording artists need. And what they don't.

TOWER

MASTERING

TOWER MASTERING
Hollywood, CA

TOWER MASTERING



The Capitol Tower, 1750 N. Vine St.; Hollywood, CA 90028; (213) 871-5003; FAX: (213) 871-5008. Contact: Pete Papageorges, mgr. **Equipment and Services:** Mastering—mastering console: Neve, Sony, Studer, Muse. Tape machines: Studer, Sony 1630, Mitsubishi X-86, Ampex ATR-100. Noise reduction: Dolby A/SR. Monitor speaker: JBL custom, TAD custom. Digital editing systems: Sonic Solutions, Sony DAE-3000. Cutting lathes: Neumann SAL 74B with Zuma computer. Signal processing: Harmonia Mundl, Sontec EQ, NTP EQ, Sonic Solutions. Engineers: Wally Traugott, Bob Norberg, Larry Walsh, Kevin Reeves. **Services:** Tower Mastering offers analog and digital EQ, Sonic Solutions hard disc editing, EQ, no-noise and Time Twist, EDnet 4 channel transmission, CD remastering and PC encoding, sound effects library, DCC premastering, CD reference discs, lacquer reference/masters, tape copies: 1630, DAT, 1/2", 1/4" and audio cassettes. Credits: Soul Asylum, Harry Connick Jr., Frank Black, Blind Melon, Frank Sinatra, Black Crowes, Fourplay, Gershwin, Whispers, Hammer, Red Hot Chili Peppers, Duran Duran, Beach Boys Box Set and many others.

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WINGSPAN PRODUCTIONS



404 W. 16th St.; National City, CA 91950; (619) 474-2877; pager: (619) 493-9456. Contact: Carl McKellips.

OUTSIDE U.S.

ANALOGUE INDUSTRIES



211 St-Antoine St. W., Ste. 100; Montreal, QC H2Z 1H4; (514) 878-TAPE (8273); FAX: (514) 878-3693. Contact: Rick Dexter.

AUDIOBEC RECORDING INC.



600 Port Royal W.; Montreal, QC H3L 2C5; (514) 384-6667; FAX: (514) 388-1488. Contact: Mike Tubie.

CANATRON CORP.



4-35 Stafford Rd. E.; Nepean, ON K2H 8V8; (613) 726-1660; FAX: (613) 726-1609. Contact: Ron Drake.



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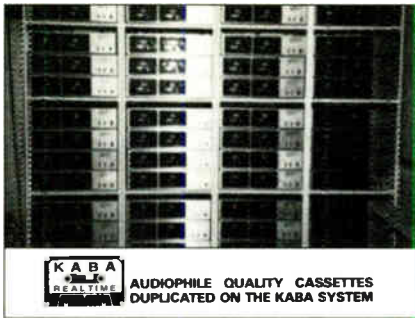
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THE LACQUER CHANNEL INC.



297 Lesmill Rd.; Don Mills, ON M3B 2V1; (416) 444-6778; FAX: (416) 444-0251. Contact: Scott Murley, Bob Trowell. Equipment and Services: Two mastering consoles: Sony DSP-1000 digital transfer console & modified Neve analog mastering console. Tape machines: Studer A80 1/2" and 1/4", Otari 1/2". Noise reduction: Dolby A, B, & SR, Jbx Type I. Two matched transfer rooms each containing: Monitors: SOTA CF-750 in two. Sony PCM-1630 Transfer systems w/RAR & RAW. Special equipment: Sonic Solutions Hard Disc based editing system with CD Maker, PQ & CD cutter for OneWrite CDs. Pultec EQs. UREI LA-4s, Sontec & Neve mastering EQs & more. Everything you need for mastering under one roof. From tubes to transistors and back again. Chief mastering engineer: George Graves. Call for rates and quotations. Music industry services: tape duplication, CD & vinyl manufacturing. At the Lacquer Channel, it is not our policy simply to satisfy our customers, we make it our business to amaze them.

TURN TO PAGE 169 FOR AN EXPLANATION
OF RECORDING SERVICE SYMBOLS.



AUDIOPHILE QUALITY CASSETTES
DUPLICATED ON THE KABA SYSTEM

LES INDUSTRIES MAGRA LTEE
Montreal, QC

LES INDUSTRIES MAGRA LTEE



55 Ave. du Mont Royal W., Ste. 802; Montreal, QC H2T 2S6; (514) 288-AGRA (286-2472); FAX: (514) 286-0341 X9785. Contact: Mario Paquet, president; Pauline Roy, mgr. Equipment and Services: Mastering: mastering console: Chilton DM5. Tape machines: Studer A807-2/2, Studer A807 4/4, (2) Revox. Noise reduction: Dolby B. Monitor speakers: JBL 4312. Signal processing: Klark-Teknik EQ, Symetrix noise reduction. Engineer: Barney Bemrger. Tape duplication: in-cassette and bin-loop. Duplicator: (102) KABA slaves, bin-loop, (10) Studer tape deck (B215). Duplicating speaker: KABA (real time only), AEG Lyrec 1-40 and 1-80. Capacity: 1,200. Tape used: Sunkyong, Maxell. Shell used: Micalex. Loading equipment: (2) Electro Sound (2002), (3) AEG Koros-4. Inset Card: Graphic & print for CD and audio cassette. Complete CD services. Packaging equipment/fulfillment services wrap or shrink. Other KABA, demo, new age on CrO2, cassette album kits, 48-hour service. Bin-loop, low minimum and choice of colors for printing. DAT-to-DAT copy, reel-to-reel copy.

MEDIA HOUSE PRODUCTIONS INC.



1174 Winnipeg St.; Regina, SK S4R 1J6; (306) 359-0977; FAX: (306) 569-2240. Contact: B.A. Soillo, Joan Ann Datter.



Specializing in compact disc
and cassette premastering,
digital editing

(905) 479-7560

MUSICLANE INC.
Markham, ON

MUSICLANE INC.



110 Conrad Cres. Unit 6; Markham, ON L3R 9X2; (905) 479-7560; FAX: (905) 477-0075. Contact: Ted Carson. Equipment and Services: Specializing in CD premastering, digital editing using Sonic Solutions PCM-1630, DAT. Mastering: Sonic Solutions CD premastering system, PCM-1630, DAT. Digital domain EQ (up to 8 bands per channel) compression/expansion, level adjustment, digital varispeed, sampling frequency conversion, real-time or snapshot automation, PQ and ISRC encoding. Digital editing: Sonic Solutions—seamless, non-destructive, complete user-created fade/crossfades up to 100 seconds, segment editing and more. For more detailed information, quotes, bookings for client attended sessions, free brochure, etc., call Ted Carson at (905) 479-7560.

PRECISION SOUND CORP.



3117 Norland Ave.; Burnaby, BC V5B 3A9; (604) 299-4141; FAX: (604) 299-4146. Contact: Dan Howton.

SONRISE AUDIO DUPLICATION LTD.



#12 12840 Bathgate Way; Richmond, BC V6V 1Z4; (604) 278-1544; FAX: (604) 278-3486. Contact: Lorne P. Klassen.

WAVE (WORLD AUDIO VIDEO ENTERPRISES)



4-35 Stafford Rd. E.; Nepean, ON K2H 8V8; (613) 726-1660; (810) 363-TAPE; FAX: (613) 726-1609. Contact: Ron Drake.

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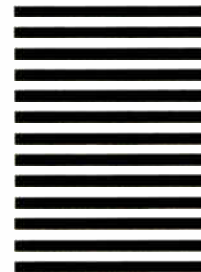


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—FROM PAGE 60, LIVE FROM NEW YORK!

ly new models, and interestingly, many featured new automation options. One such example is the Recall by Langley (made by Amek): This console has the ability to store snapshots of all input strip controls, subgroup channels and matrices. Recalling a full console setup is done by hand with the aid of an external computer, using screen graphics or computer-generated voice commands. Also available is the virtual dynamics option, allowing one dynamics-processing effect to be assigned to each channel under control of the external computer. These effects include gates, compressors, a limiter, expander and autopanner.

Another entry into the onboard dynamics-processing arena is the Soundtracs Sequel 2. This fully featured 8-bus, 8-VCA-group console has an Assignable Dynamics Processor that provides DSP-based processing available

to each channel. Compression, expansion and modulation effects (i.e., autotuning) can be controlled on an attached computer screen or by an on-board panel with five "soft" knobs and an LCD.

Yamaha's M2000 console is available with 16, 24, 32 or 40 mono inputs. All configurations include two additional stereo inputs, eight output groups and a mono output bus. All outputs can be summed into a 4-channel matrix, each with two separate level controls. On the MIDI control front, the device holds 128 mute scenes, with eight recallable from individual front-panel buttons.

Soundcraft showed three new models. The Vienna II incorporates features that were optional in the original Vienna: a two VCA grand master option and optional stereo inputs. The Delta Theater board comes with 8, 16, 24 or 32 inputs. A new input module offers

AES: Working The Edges

by Dan Daley

The periphery of the show floor regularly produces the kinds of small stories that illuminate the industry in a way that big-ticket digital consoles cannot. They often don't have media reps to herald them before and during the show, but their effect is felt nonetheless.

E&E Llectronix, of Kingston, N.Y., showed electronic components for vintage consoles. Co-owner James Eppard pointed out that business has been growing in the aftermarket parts business. "Neve and API aren't supporting their old series consoles," he said. "They can't. They simply can't keep all the parts on hand. That's what we're doing—making new parts for older consoles."

Neve is the big one thus far, but API and other consoles are all going to need the small stuff at some point. "The key is to get a good idea of what components fail most often and make those," Eppard said.

Mackie consoles are small, but the crowds they drew to their booth weren't. Small consoles have grown

up, but how much further can they grow before they leave their original markets behind? "We've thought about that, and we don't want to grow out of the market niche that made us," said Keith Medley of Mackie. What the company is doing is packing as much punch into the small boards as possible, particularly in automation, but the goal is not to exceed an \$8,000 price point, according to Greg Mackie.

Andrew Barta's SansAmp products never would have seen the AES floor periphery—or any other part of the show—as little as five years ago. The DI approach that project studio recording encourages, and a re-acceptance of tube sounds, has propelled sales of what ordinarily would be regarded as a distinctly MI product into the pro-audio market.

The decided tone of the scaled-down systems shown on the floor backed up Barta's observation of how the line between pro and MI has blurred over the last few years. But while Barta says his PSA-1 programmable SansAmp system, the fourth generation of the technology, has probably reached the limit of amplifier emulation, he is looking into other product areas. "People tend to buy what other people are buying," Barta explains. "I want to build products for people who want something different." ■

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Soundtracs Sequel II Sound Reinforcement Console

discrete routing and pre/post aux switching with a sixth send that can be individually switched to a direct out with level control. Also new was the SM16 stage

monitor console, available in 16, 32, 40 or 48x16 configurations.

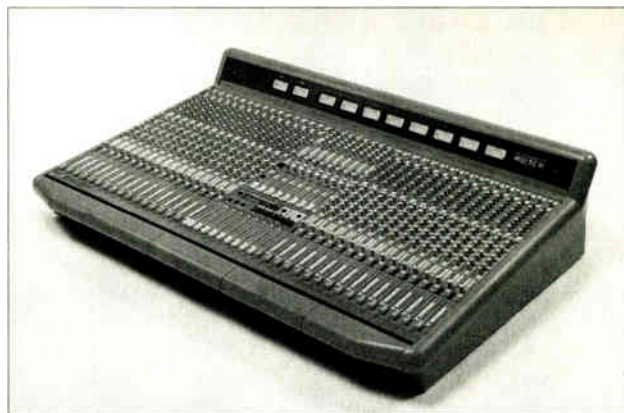
DDA's Q2 console has true left-center-right panning with three group output module options: mono, stereo or LCR groups. A flexible cueing system is included, as well as a mute group system with reversible "polarity" (i.e., "mute engaged" settings on the entire console can mean "channel on" instead). Overall, aspects of this board seem novel and practical.

Midas showed the latest incarnation of the popular XL3 console, the XL-348. Changes from the original XL-3 include stereo input modules with a built-in M/S decoder and an improved EQ section. Additional changes were made to the matrix and cue systems. Although the intent was to make these mods a field-installable option, it turns out that a trip to the factory will be required to upgrade existing XL-3s.

Spherical waveguides appeared in loudspeaker offerings by several manufacturers. Rather than the traditional horn, these devices do away with the throat and sound more like a direct-radiating dome tweeter than a horn but retain spherical pattern control. (See October's Jimmy Buffett tour profile for a look at Sound Image's approach to this technology.)

Ramsa debuted the WS-T212 (dual 12-inch) and WR-T215 (dual 15-inch), two two-way designs (with spherical waveguide horns) that expand its popular T-Series line. Ramsa also debuted a retrofit ATM Flyware option for the T-Series.

Yamaha showed a line of new cabinets using spherical waveguides, designed for the installed and semipermanent market. The Waveforce Series includes a trapezoidal under-balcony, the WF206; a stage wedge, the WF112M; two front-of-house boxes, the WF112 and WF115; and the WF215SB subwoofer enclosure. An inexpensive ATM Flyware system is



available as an option.

Perhaps the smallest sound reinforcement speaker shown was the Martin Audio EM15. Intended for fill and corporate A/V work, this 11-inch-tall, trap-sized box uses two 5-inch woofers. One of these has a coaxially mounted tweeter with a twist—it's wireless! The tweeter has its own voice coil, which sits in the gap along with the woofer's voice coil. Above frequencies at which the woofer can move, the magnetic field in the gap is inductively coupled to the tweeter.

EAW debuted the E Series, an upgrade for all existing KF850 owners. The kit includes a new 2-inch titanium diaphragm. Ferrofluid is used to increase long-term power handling and reduce distortion. A new 15-inch woofer has air vents on two sides of the voice coil for enhanced cooling. The LF venting of the 850 cabinet has been sealed, with a pillow-like device placed around the woofer cavity to control reflections from the low end of the horn's operating range.

EAW now offers a lease package to encourage regional sound companies to adopt the KF850 line; options include no payments during the off-season. And Siemens is now the exclusive EAW distributor for Germany, Austria and Eastern Europe.

Turbosound (distributed by Independence Audio of Madison, Wis.) announced the release of the TFL Series Floodlight high-power sound reinforcement system. Developed as a wider dispersion complement to its Flashlight system, Floodlight features a four-way active design with a constant coverage polar response of 50° horizontal by 25° vertical. The system uses paper-cone drivers through 8 kHz and a 1-inch titanium compression driver above that. The cabinet is available in rectangular and trapezoidal enclosure formats. Several subs are available. ■

—FROM PAGE 51, MULTIMEDIA? THUMBS UP!!!

by Philip Ackermann on intramedia synchronization issues in multimedia applications; a talk on the role of broadcasting in a multimedia environment by Skip Pizzi, editor of *Broadcast Engineering*; and several sessions on multimedia network issues from representatives of Lone Wolf, Sonic Solutions and others.

On the convention floor, the multimedia buzz words were not as evident as they were at NAB earlier this year; nevertheless, the evidence of digital convergence at the New York AES show was unprecedented. Before true digital media integration can take place in a significant way, standards must be adopted for incorporating these different media types in a wide variety of platforms and formats. Sonic Solutions described new extensions to its MediaNet high-speed network for multimedia applications. The system, based on 100-megabit FDDI standard, will now permit connection to Silicon Graphics and Sun Microsystems computers, as well as Macintosh machines. Sonic also announced that it will bring a Silicon Graphics' Indigo version of its Sonic Station to market in the spring of 1994. These developments could be important in the integration of pro-level audio production tools with an already impressive set of graphics tools available on the SGI platform.

Avid Technology Inc. and Studer Editech demonstrated the first exchange of Open Media Framework-format files between digital audio workstations from different manufacturers. Avid first proposed OMF as an interchange standard for digital media more than a year ago, and the first adoptees of OMF-compatible products are coming online after AES. Foremost among them are audio companies such as Studer, Digidesign, Sonic Solutions, Doremi Labs and AMS Neve. OMF is also being considered by the Interactive Multimedia Association as a Recommended Practice for digital media interchange.

Digidesign was on hand to demonstrate its Trans-system Digital Matrix Bus. The TDM Bus is an optional enhancement for Digidesign's Pro Tools system and is designed to allow high-fidelity, high-bandwidth communication with third-party products. Once TDM-compatible devices—such as Lexicon's NuVerb card—are connected to the TDM ma-

trix, audio patching, routing and processing can all be done within the digital domain. Avid is among those who have announced plans to incorporate TDM into some of its products.

So while some argue about what the term multimedia really means, others in the audio industry are positioning themselves to take advantage of a new universe of opportunities—the inevitable consequence of the trend toward integration of digital media in the production environment.

IN OTHER AES NEWS...

Spectral Synthesis introduced its AudioPrisma, a 96-track, 12-channel, real-time mixing workstation with dedicated multiband parametric EQ, 24-bit DSP and much more—all on a single PC board for a suggested list price of \$3,995. The card is controlled by Spectral's Prismatic system software, which runs under Windows. Spectral also introduced a new nonlinear video subsystem for use with its DAWs. Developed in partnership with D.S.P., S.I., of Madrid, Spain, the system's video access is completely controlled within Spectral's StudioTracks 2.0 software, with video instantly tracking to nonlinear audio edits.

Digital Expressions Inc. (Bellevue, Wash.) showed its SoftSplice 4-track digital audio recorder, editor and mixer for 68020-based Macs. It consists of an external box with AES/EBU and S/PDIF I/O and a 33MHz 56001 DSP chip, which is controlled via SCSI by Digital Expressions' own software. It could be a good option for anyone looking for a low-cost, portable, random-access system.

Doremi Labs (Covina, Calif.) unveiled the new DAWN IIxe, its low-cost multitrack Digital Audio Recorder/Editor. Designed for audio post applications, this expandable

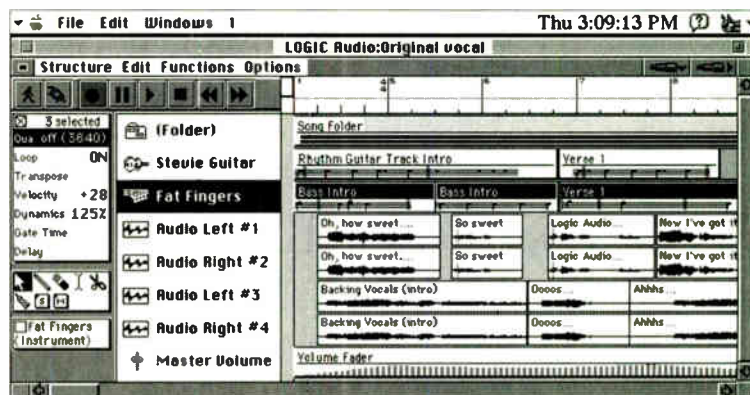
18-bit system boasts a dynamic range of 104 dB with a minimum of two input channels, two output channels (mixed from 8 tracks via a DSP 56001 chip), AES/EBU I/O and excellent software for \$12,500. DAWN IIxe is a less expensive alternative to the basic 8-track (expandable to 48) DAWN II system.

Digital Audio Labs (Minneapolis, Minn.) introduced the CardD Plus board, featuring simultaneous record/playback capability. CardD Plus can be controlled by EdDitor Plus software, which runs on Windows machines. Boasting a dynamic range of 92 dB, the card is available for \$795; the software is \$349.

Digidesign showed a new futuristic control surface for its Pro Tools system. Code-named "Miles," it features motorized faders and a touchscreen as well as programmable rotary knobs, transport control and autolocate controls, and a variety of dedicated control buttons. Scheduled release was for second quarter 1994.

On the MIDI side, Emagic (dist. by Ensoniq, Malvern, Penn.) showed its Logic Audio software for the Macintosh. Aside from powerful MIDI sequencer functions, Logic Audio is capable of unlimited digital audio tracks. It works with Digidesign hardware, and when used with a 16-track Pro Tools system, is capable of 16 independent I/Os. Powerful, flexible digital EQ is possible from within Logic Audio. A host of additional professional features are also included, such as a Source Sample Editor, customizable display of controls and extremely fast waveform redraw. And Opcode demonstrated Vision 2.0, a major revision of its sequencing software that incorporates a redesigned user interface and many additional features resulting from customer feedback. No ship date was announced. ■

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—FROM PAGE 134, RICKIE LEE JONES

kept it as natural as possible—not slick, not prettied up. And though I understood the direction she wanted, there was still the temptation to ‘engineer’ it. Ultimately, I was asked to mix the project because Rickie felt the rough mixes were very close to the way she wanted the final album to sound. With too much polish, the honesty would have been lost—and honesty is the most important thing about this record.”

The album was nearly a year in the making, but Last points out that it was accomplished in fits and starts, and because Rickie Lee has a 4-year-old daughter, she steered clear of marathon studio sessions. “Charlotte is a beautiful little girl,” Last says, “and she loved watching her mother work. Sometimes she’d sit in my lap [in the control room] and watch her mom and then tell her stories on the talkback. It was so sweet.”

Some of the sweetness of that mother-daughter relationship seems to have infused parts of *Traffic From Paradise*, but more in the spirit of the music than the content of the songs, which touch on everything from mortality to isolation to forgiveness: the sort of variegated psychic terrain we expect from Rickie Lee. “This is really her record completely,” Last notes. “She produced it; she arranged it, and it’s her vision from beginning to end. So much recorded music these days is based on false perfection and computerized timing, but there can be a great deal of beauty in imperfection and time that flows freely. To me, this album is a breath of fresh air.” ■

—FROM PAGE 129, MOTOWN

dellas, Smokey Robinson, The Marvlettes, Mary Wells, etc.) and numerous individual Motown albums from different eras.

“Motown is something I’ve always wanted to be involved in because I’ve always felt that, through no particular person’s fault, their catalog hasn’t always been that well-served up until now,” Ingot says. Indeed, Motown, like most labels, was guilty of releasing many CDs—anthologies and regular LPs—that were not culled from the original master tapes, resulting in a number of issues that were clearly inferior to their vinyl counterparts.

When I good-naturedly remind Inglot that Motown had already mined its catalog for CDs several years ago, he sighs and agrees, "It's bad enough that CDs made you buy your record collection twice, but it's getting to the point now with certain artists' catalogs that you're buying it three and four times. In some cases, they weren't remastered right the first time; in others, the new CDs are better because the technology has improved.

"The quality of A-to-D converters has gotten better through the years," he continues, "and then there's the whole thing that has happened in some circles where people involved in remastering are realizing that it isn't just a question of getting as much gear as you can into a room that reads in ones and zeros—you get the pieces of gear that *sound good*. In other words, people are questioning using all-digital equipment." Inglot claims no real preferences on converters, noting, "It seems like there's a flavor-of-the-month. The ones I use change from project to project. I work out of a few different studios and do a lot of listening tests, so I can say, yeah, this one sounds good. But so does the stock Sony 1630 modified with Apogeos."

As was the case with the Stax Box, the two *Hitsville* collections consist almost entirely of the single mixes of the featured tunes. "Motown did dedicated singles mixes in the '60s and '70s," Inglot says. The version you bought in a store as a single didn't necessarily bear a substantial resemblance to the version that was included on the subsequent LP. They were mixing for singles—some would say they were mixing for AM radio; certainly that was part of it. They would spend an inordinate amount of time making the single, and then when the album came out, a more cursory mix was often done."

Not surprisingly, a fair amount of detective work was required to track down the masters for the two *Hitsville* packages, though Inglot says, "In general, their production file was well-organized. But Motown, being an independent label, had always pressed their records outside and distributed them outside, so you have to deal with the peculiarities of the people they worked with. For instance, for a good part of the '60s and into the '70s, their

records were custom-pressed by RCA, but in those days, mastering wasn't the sort of boutique-type thing it is today; it was usually done at the label where a guy sat there and pressed the 'spread' button while reading the newspaper; it was a very mechanical thing.

"When the distribution deal with RCA ended," Inglot continues, "these tapes were sent back to Motown, but a lot of them had been reboxed with different matrix numbers and no code book, so to speak, so we spent a lot of time just identifying what tapes are in their vault. We'd take a tape out of the box—the label had

long since fallen off—and it might be something like the original Mary Wells *Two Lovers* LP. All of a sudden, you realized why that had never been reissued before—nobody knew where it was. For *Hitsville 1*, out of 105 songs, we found 99 of the original first-generation masters. That's pretty good."

Because the two *Hitsville* packages cover a span of some 35 years, the tapes Inglot worked with had different requirements from a mastering standpoint, depending on how they were recorded originally. "We used tube machines and tube playback electronics on most of the

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**Stevie
Wonder
in the studio,
mid-'60s,
Motown**

early stuff," he explains, "some vintage tape transports—Scullys, Ampex; equalizers if and when we saw fit—the usual suspects, everything from Sontec to Langevins. But obviously, if you're transferring a track from 1992, like Boyz II Men, it's not about having vintage equipment, because you have to be contemporary. Just as there's a perceived sound of the old music, there's a perceived sound of the new music, too: You can't be making the '90s sound like the '60s, or vice versa. Actually, there were more format differences in the '80s music when we had Mitsubishi X-80, X-86 and Sony 1630. I got a hold of all the machines I could lay my hands on," for the final transfer to 1630.

And what, in Inglot's view, was the main component of the fabled "Motown sound" of the '60s? "It's hard to pinpoint exactly," he answers, "but listening to multitracks of some unreleased material. I've thought, 'Jesus, how did they ever get this to sound like *that*?' And I decided that the Motown sound, say from '59 to '70—because when they moved to L.A. it became 16-track, and the rules of the game sort of changed—is really in the mix." In the balance of instruments, the reverb chosen? "Both of those," he adds. "Based on who I've spoken to and what I can hear, I think a major component of the sound is some sort of plate—probably not something as fancy as an EMT—and something resembling a smallish, tiled room; bathroom echo, so to speak. You put up the multitracks, and they sound *naked*. There was a lot of work that went into the reverb, and they used a limiter the

size of Cleveland.

"I think most of them were mixed by four or five guys, and these people really knew what they were doing," Inglot says. "There's a gentleman named Ed Wolfren, who still lives in Detroit, who was on a lot of the sessions. Another guy named Russ Terrana made the move from Motown Detroit to L.A. I'd love to see a book on these guys as well as all those great engineers who worked on R&B records in the '40s and '50s, because what they were able to do is really a lost art."

And finally, are there parallels Inglot can draw between Stax and Motown? "They were quite different," he replies. "Stax was more blues-based; Motown was more pop-based. There aren't too many Motown records that sound like Stax records, and vice versa; there are a couple. The parallel is that they were both very close-knit groups of people making records that stylistically had something in common but which weren't, by and large, carbon copies of one another. There was a color there, but many shades of the color. You know, [The Supremes'] 'Baby Love' was its own sound. And [Otis Redding's] 'Try a Little Tenderness' was, too. Each was great.

"Sometimes in remastering you work on something and you think after a while, 'Man, this doesn't really hold up that well,'" Inglot concludes, "but that certainly hasn't been my experience working with the Motown catalog—and there's *still* lots of great stuff waiting to come out." ■

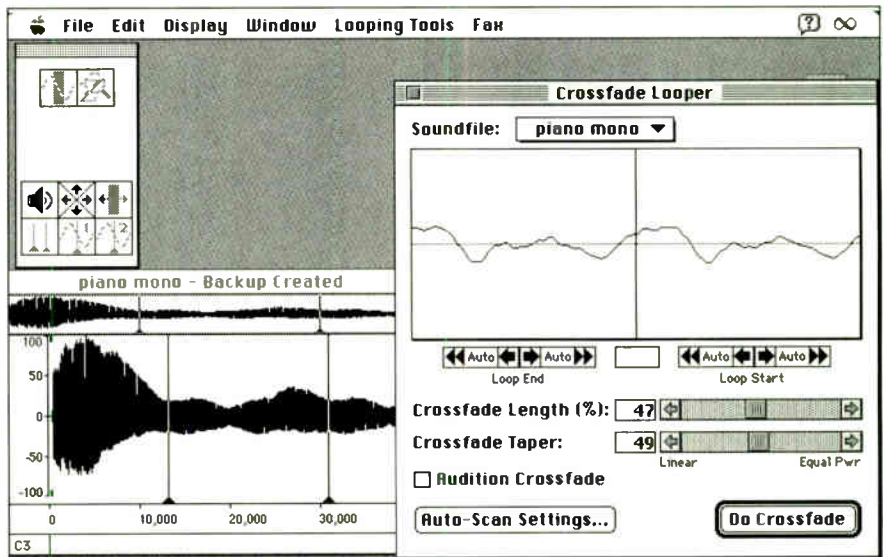
Blair Jackson is managing editor of Mix.

—FROM PAGE 107, INFINITY

al features have been added, including automatic location of optimal loop points within adjustable tolerances. And a "Smart Auto-Scan" feature allows you to match loop points at any point on the waveform, not just at the zero-crossing.

SPR, which stands for Spectral Phase Randomization, works well with complex, non-periodic waveforms, such as strings and chorus sounds, randomly distributing the energy of the analyzed spectral content evenly over the length of the loop. The result is a seamless loop that doesn't sacrifice the stereo image. I tried it on a single female vocal note, and the results were impressive—a pleasant, slightly chorused effect. The Rotated Sums Looper is recommended for the same class of sounds as the SPR, yielding slightly different results.

The Freeze Looper tool analyzes the contents of a loop and then reconstructs an even, periodic waveform. This is useful for creating short loops without the characteristic "flut-



Infinity looping software working environment

ter." All of these looping algorithms have controls for adjustment and fine-tuning. The process is quick, and the interface is well-designed, with layout, menus and key commands that are familiar to Sound Designer and other sample editors.

With Infinity, Jupiter Systems has created a powerful toolbox for creating seamless loops of sampled sounds

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LUNCHING WITH BONZAI

—FROM PAGE 42, DAVID TICKLE

Blondes. I like the big fat sound. They are a bit tricky for punching in and out—not the best for that, but they sound great. I use Dolby SR, and depending on the project, I use different brands of tape. Even with digital, I still record my bass, drums and guitars—the basic tracks—on analog to get that big, warm sound.

Now, with the advent of the Euphonix console, it puts a professional, high-level console at the fingertips of the home studio, because the price is so much lower. The same with the Tascam DA-88 recorders, which we have three of, giving us 24 digital tracks. The economics are so much lower, and judging from our sound tests with these digital machines, I'm stunned at how good it is. When we put drums across to make a slave, they have retained that warmth from the analog tape. And we did a piano overdub that was a comp between analog and digital tracks. We had a test where we put them up side by side, and I asked my engineer, Chris, to not tell me which was which. Out of eight times, I could only guess

correctly three times. That told me that this is a really good system. So, we have that for doing our overdubs, and Digidesign in a computer for another eight tracks used for editing. Bonzai: Have computers made the creative process more pleasurable for you? Tickle: It's just a tool that comes in very handy for such things as trying out edits, making loops, using it to trigger off time code for the band to play without having the singer repeat the vocal over and over.

Bonzai: Are you still engineering?

Tickle: The last thing I did strictly as an engineer was with Animal Logic, because I wanted to work with Stewart Copeland and Stanley Clarke. I am often involved in the actual recording process, and I really enjoy mixing and producing records and soundtracks. But I don't like to do too much engineering. I like to move from one role to another, to stay fresh.

Bonzai: Do you think an engineer reaches a point of burnout?

Tickle: It's an occupational hazard if you are overworked, but the really great ones stay great. Shelley Yakus is an example of an engineer who has been at it for a long time and just gets

better and better. Hugh Padgham, Bob Clearmountain just get better.

Bonzai: Where does the name Tickle come from?

Tickle: From Yorkshire. It's from the Doomsday Book, the original census from 1066. William the Conqueror sent one of his barons to a place in Yorkshire, and the place was called Tick Hill. Three families lived there, and one became Tick Hill, another Tick-elle, and my branch became Tickle. Bonzai: You've been in the business for many years, and things have changed since you walked into a studio and got your first job. What advice would you give to a 16-year-old now?

Tickle: Well, some things remain the same. Ask your heart what it is that you should truly do—not your head, your heart—then just go for it. You have to make the difference. Jobs don't come to you. You have to go and search them out. If you have the energy and the will to knock on some doors, you'd be surprised at what chances you may run into. And it's only caused by you. ■

Roving editor Mr. Bonzai is also decidedly nonblonde.

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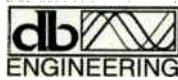
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